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Narragansett Bay Watershed SCP
Bailey Brook (RI0007035R-01)
Middletown, RI

Key Findings

This SCP Report is for Bailey Brook (RI0007035R-01) located within the Narragansett Bay Subwatershed (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
Enterococcus Phosphorus Lead	IC Standard	69% (27.8 ac)	16.1 ac	25.1 ac	37.8 ac-ft	0 ac	73.5%

Site Description

Subwatershed Description

- The subwatershed is located in Middletown, RI.
- The subwatershed is 1,798 acres and 32.4% impervious (583 acres).
- The general land uses within the subwatershed are residential, commercial, forest and wetland, and agricultural.

RIDOT Discharging Area

- RIDOT maintained property is 48.4 total acres and 40.4 impervious acres.
- No “Other RIDOT roadways” exist in this subwatershed.
- The subwatershed area decreased from approximately 1,898 acres to 1,798 acres (-5.2% percent) due to changes identified during desktop review and site visits.
- There are no TMDL priority outfalls.
- There are no High Priority Outfalls (Appendix 6).
- There are 7 Priority outfalls (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 are 15 incoming MS4 interconnections and 55 private incoming interconnections.

- There are 4 outgoing interconnections.

Non-Discharge Areas

- RIDOT did not identify any non-discharge areas.

Sewered/Combined Sewer Areas

- A portion of the subwatershed has been identified as a sewered area.
- There are no areas that discharge to a combined sewer system.

Reduction Target Development

- RIDOT's IC reduction target is 27.8 acres
- Enterococcus is covered by TMDL: Rhode Island Statewide TMDL for Bacteria Impaired Waters – September 2011. The TMDL required that RIDOT reduce stormwater runoff volume to reduce bacteria and phosphorus loading.
- A TMDL for Newport Water's surface reservoirs and their tributaries is under development to address total phosphorus impairments.

Existing Stormwater Controls

- 3 Stormwater Treatment Units (STUs) currently exist within the subwatershed and have a total IC reduction credit of 16.1 acres

Potential Enhanced Non-Structural Stormwater Controls

- RIDOT has identified that additional control measures besides existing STUs are needed to reduce its effective IC to achieve the RIDOT IC reduction target.
- RIDOT will perform enhanced street sweeping within the Consent Decree designated Area of Interest (AOI).
- RIDOT will perform catch basin cleaning within the subwatershed for a total IC reduction credit of 0.9 acres.

Potential Structural Stormwater Controls

- RIDOT has identified that additional control measures in addition to existing STUs and potential enhanced non-structural STUs are needed to reduce its effective IC to achieve the RIDOT IC reduction target.
- RIDOT identified 42 opportunities for STUs within the subwatershed (Table 2-A) with a total IC reduction credit of 22.3 acres
- This SCP includes areas that will be modified as part of a TIP projects (as of November 2018) scheduled for the next 1 year within the subwatershed are included within this SCP with an assumed 50% treatment level with a total IC reduction credit of 1.9 acres.

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)[1]	Estimated Cost	Cost per IC Reduction Acre ($/ac)	Retrofit Priority
SCP-BLB-043	Wet Pond	7.0	6.3	1.1	0.6	3.1	--	--	Existing
SCP-BLB-044	WVTS	80.5	28.3	0.6	1.3	12.6	--	--	Existing
SCP-BLB-045	Hydrodynamic Separator	3.6	3.3	0.0	0.0	0.3	--	--	Existing
SCP-BLB-046	Catch Basin Cleaning	--	--	--	--	0.9	--	--	Non-structural
							Percent RIDOT Reduction Target Reached		61%
SCP-BLB-009	Bioretention Basin	3.6	2.0	1.3	1.4	1.2	$124,000	$102,500	1
TP-BLB-026	TIP	0.6	0.5	2.0	0.9	0.2	--	--	1
TP-BLB-027	TIP	0.5	0.4	2.1	0.8	0.2	--	--	1
TP-BLB-028	TIP	0.7	0.6	1.0	1.1	0.3	--	--	1
TP-BLB-029	TIP	0.02	0.01	1.0	0.03	0.01	--	--	1
TP-BLB-030	TIP	1.5	1.4	1.0	2.6	0.7	--	--	1
TP-BLB-031	TIP	0.2	0.2	1.0	0.3	0.1	--	--	1
TP-BLB-032	TIP	0.3	0.2	1.0	0.4	0.1	--	--	1
TP-BLB-033	TIP	0.6	0.5	1.0	0.9	0.2	--	--	1
							Percent RIDOT Reduction Target Reached		72%
SCP-BLB-010	Bioretention Swale	0.2	0.2	0.6	0.04	0.1	$17,900	$137,100	2
SCP-BLB-013	Bioretention Swale	0.3	0.2	0.5	0.05	0.1	$17,200	$124,400	2
SCP-BLB-014	Bioretention Basin	2.4	1.0	0.9	0.4	0.5	$57,900	$187,700	2
SCP-BLB-015a	Underground Infiltration System	1.8	1.4	0.9	4.2	1.3	$605,600	$473,100	2
SCP-BLB-015b	Wet Vegetated Treatment System	18.0	5.7	1.7	1.1	3.0	$555,600	$184,600	2
SCP-BLB-017	Bioretention Swale	0.6	0.4	0.5	0.1	0.2	$25,700	$135,300	2
SCP-BLB-022	Bioretention Swale	0.5	0.2	1.1	0.1	0.1	$31,700	$264,200	2
SCP-BLB-023	Bioretention Swale	0.1	0.1	1.3	0.1	0.05	$20,400	$408,000	2
SCP-BLB-024	Bioretention Swale	0.1	0.1	1.3	0.1	0.05	$20,400	$408,000	2
SCP-BLB-025	Bioretention Swale	0.1	0.1	1.0	0.05	0.1	$20,400	$408,000	2
SCP-BLB-026	Bioretention Swale	0.2	0.1	0.8	0.05	0.1	$20,400	$340,000	2
SCP-BLB-027	Bioretention Swale	0.4	0.4	0.2	0.1	0.1	$20,400	$145,700	2
SCP-BLB-028	Bioretention Swale	0.2	0.1	0.9	0.05	0.1	$20,400	$340,000	2
SCP-BLB-029	Bioretention Swale	0.2	0.1	0.7	0.05	0.1	$20,400	$291,400	2
SCP-BLB-030	Bioretention Swale	0.2	0.1	0.8	0.05	0.1	$20,400	$340,000	2
SCP-BLB-031	Bioretention Swale	0.2	0.2	0.6	0.05	0.1	$20,400	$255,000	2
SCP-BLB-032	Bioretention Swale	0.2	0.1	1.1	0.05	0.1	$20,400	$408,000	2
SCP-BLB-033	Bioretention Swale	0.1	0.1	0.9	0.05	0.1	$20,400	$340,000	2
SCP-BLB-034	Bioretention Swale	0.1	0.1	1.4	0.1	0.05	$20,400	$408,000	2
SCP-BLB-035	Bioretention Swale	0.1	0.1	0.8	0.05	0.1	$20,400	$340,000	2
SCP-BLB-036	Bioretention Swale	0.1	0.1	1.3	0.1	0.05	$20,400	$408,000	2

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)[1]	Estimated Cost	Cost per IC Reduction Acre ($/ac)	Retrofit Priority
SCP-BLB-037	Bioretention Swale	0.1	0.1	0.9	0.05	0.1	$20,400	$340,000	2
SCP-BLB-038	Bioretention Swale	0.2	0.1	1.0	0.05	0.1	$20,400	$408,000	2
SCP-BLB-039	Bioretention Swale	0.1	0.1	1.1	0.05	0.1	$20,400	$408,000	2
SCP-BLB-040	Bioretention Swale	0.1	0.1	1.6	0.1	0.04	$20,400	$510,000	2
SCP-BLB-041	Bioretention Swale	0.1	0.1	1.4	0.1	0.05	$20,400	$408,000	2
SCP-BLB-042	Bioretention Swale	0.1	0.0	2.1	0.1	0.03	$20,400	$680,000	2
							Percent RIDOT Reduction Target Reached		96%
SCP-BLB-001	Underground Infiltration System	0.8	0.6	1.7	2.1	0.6	$516,900	$847,400	3
SCP-BLB-002	Underground Infiltration System	2.6	2.5	0.6	6.3	2.0	$783,300	$382,100	3
SCP-BLB-003	Underground Infiltration System	3.3	1.9	1.0	6.1	1.8	$925,300	$514,100	3
SCP-BLB-004	Bioretention Basin	1.2	0.9	0.9	0.4	0.5	$49,800	$101,600	3
SCP-BLB-005	Bioretention Swale	0.2	0.2	1.2	0.1	0.1	$30,900	$280,900	3
SCP-BLB-006	Bioretention Basin	0.2	0.2	1.3	0.1	0.1	$21,800	$218,000	3
SCP-BLB-008	Bioretention Swale	2.4	1.7	0.4	0.4	0.7	$75,400	$103,300	3
SCP-BLB-011	Bioretention Basin	35.6	12.3	0.3	1.9	4.3	$147,700	$34,100	3
SCP-BLB-012	Bioretention Basin	11.4	6.9	0.6	2.1	3.3	$224,700	$67,900	3
SCP-BLB-019	Bioretention Basin	0.4	0.3	1.7	0.3	0.2	$35,000	$159,100	3
SCP-BLB-020	Bioretention Basin	0.5	0.4	1.5	0.3	0.3	$40,300	$161,200	3
SCP-BLB-021	Bioretention Basin	1.9	1.0	1.0	0.5	0.5	$60,700	$112,400	3
							Percent RIDOT Reduction Target Reached		148%
Total		191.8	86.9		37.8	41.1	$4,755,400		

Site Description

Subwatershed Description

Bailey Brook and its tributaries (RI0007035R-01) are located within the Narragansett Bay watershed (Figure 1-A). The subwatershed is located in Middletown, RI. Flowing north to south, Bailey Brook and its tributaries cross much of the town of Middletown, effectively dividing the town in two. From its headwaters north of Oliphant Lane, Bailey Brook flows south crossing Forest Avenue (municipal), Valley Road (RIDOT), and East Main Road (RIDOT) before ultimately discharging to North Easton Pond, a Newport Water surface water supply reservoir. Two unnamed tributaries enter west of Newport State Airport. A third unnamed tributary carries water across Aquidneck Avenue (RIDOT) and Valley Road. Each major road-stream crossing receives water from RIDOT or municipal outfalls.

Much of the stream has been straightened or channelized by past land owners (ArcGIS online Figure 1/2). From the headwaters to the confluence with the second unnamed tributary, Bailey Brook is partially protected from developed land uses by upland buffer and wetland area, but passes by a sand and gravel operation. The unnamed tributaries pass through residential and agricultural areas, as well as underneath Newport State Airport. From the second confluence to East Main Road, Bailey Brook passes through residential and commercial development, often with minimal buffer. South of the East Main Road crossing, Bailey Brook passes through several parcels owned by the Town of Middletown

or the City of Newport. Finally, Bailey Brook passes through a culvert on Green End Road, discharging to North Easton (Green End) Pond.

The Rhode Island Department of Environmental Management (RIDEM) water quality classification for Bailey Brook is Class AA. This water quality classification is designated for drinking water supplies, though it has not been recently assessed for that designated use. Bailey Brook's does not support its designated uses of primary and secondary contact recreation and fish and wildlife habitat. It was not assessed for fish consumption. According to RIDEM's Clean Water Act (CWA) Integrated List of Waterbodies – Appendix A 2016 Index of Waterbodies and Category Listing,[1] the impairments affecting this waterbody segment are enterococcus, phosphorus, and lead. The bacteria impairment is subject to the Statewide Bacteria TMDL. The bacteria TMDL for Bailey Brook lists as bacterial sources developed area stormwater runoff, onsite wastewater treatment systems, sewer leaks (including illicit discharges), agricultural activities, and wildlife and domestic animal waste. No TMDLs exist for the other impairments, however a TMDL for phosphorus was under development at the time of SCP writing. An impairment for benthic macroinvertebrate bioassessments was delisted in the 2016 List of Impaired Waters. A TMDL for lead is planned for 2026.

RIDOT maintained property in the subwatershed is 48.4 acres, 40.4 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 Geographic Information System (RIGIS),[2] the subwatershed is largely comprised of commercial, residential, forest, agriculture, and airport land use.

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 1,898 acres to 1,798 acres (-5.2 percent). A subwatershed boundary modification memo was sent to RIDEM on December 31, 2018 and is under review.

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

[1] 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

[2] Rhode Island Department of Environmental Management, Rhode Island Department of Administration, Statewide Planning Program, Photo Science, Inc. www.rigis.org

delineation. Beyond the minor variations due to topographic data, six specific modifications were made to the Bailey Brook subwatershed boundary.

1. West of the intersection of West Main Road and Oliphant Lane, a large detention basin receives stormwater from an outfall on West Main Road. The catchment for this outfall collects water north of the intersection with Oliphant Lane. Because this detention basin discharges to a non-impaired water, its contributing drainage area was removed from the Bailey Brook subwatershed.
2. At the headwaters of the northeastern most tributary of Bailey Brook, the existing delineation crosses a segment of Bailey Brook identified by the RIGIS Freshwater Rivers and Streams data set. The revised subwatershed delineation draws a boundary between this headwater stream and the headwater stream of Mother of Hope Brook, which flows northward, without intersecting either stream.
3. On the east side of the proposed subwatershed, along East Main Road (Route 138) between Turner Road and Oliphant Lane, RIDOT Contract 3306 plans indicate a break in longitudinal drainage that determines the boundary between the Bailey Brook subwatershed and Maidford River (RI0007035R-02A) subwatershed.
4. According to RIDOT Contract 4202 plans entitled "Plan, Profile and Sections of Proposed Access Highway, Coddington Highway, Middletown – Newport, Newport County; Defense Access Highway Project No. DA – NR 2", the catch basins along Coddington Highway, west of the intersection of West Main Road (Route 114), drain north into the existing drainage infrastructure of US Naval housing neighborhood. Based on these plans, and information from VHB (Reconstruction of Two Mile Corner – Drainage Report, 2015) it was concluded that these interconnections contribute to a combined sewer system. This combined sewer system was noted in the Drainage Report as passing through the United States Navy base, which is outside the watershed. The naval housing was removed from the watershed. Four outgoing interconnections on Coddington Highway drain the Bailey Brook portion of this RIDOT road out of the watershed.
5. Based on the Town of Middletown's drainage information, in conjunction with RIDOT-mapped drainage interconnections, drainage from the Longmeadow Avenue, Continental 2Drive and Harvey Road neighborhoods connects into Valley Road (Route 214) and Green End Avenue. The infrastructure along Green End Avenue in this area drains south into the North Easton Pond (RI0007035L-03) subwatershed.
6. Based on historic aerial imagery, Town of Middletown drainage data, and RIDOT-mapped interconnections, runoff from the Goldenrod Drive subdivision enters two detention structures near the intersection with Valley Road before discharging to a tributary of Bailey Brook. An overflow structure visible on historic aerials was confirmed during a field visit. This structure connects the two basins under Goldenrod Drive. Nearby, an outgoing RIDOT interconnection on RI-138A discharges to a drainage ditch between Goldenrod Drive and Longmeadow Avenue. This drainage ditch reenters RIDOT's system as an incoming interconnection to Valley Road, ultimately discharging to North Easton 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

RIDOT maintained roadways in the subwatershed include: East Main Road (RI-138), Aquidneck Avenue (RI-138A), West Main Road (RI-114), and Valley Road (RI-214). RIDOT maintains 48.4 acres of property (impervious and pervious) within the subwatershed, all of which are directly or indirectly discharging to Bailey Brook and its tributaries with 40.4 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
East Main Rd RI-138	four-lane roadway with sidewalks on both sides	Right-of-way (ROW) width ranging from 60 to 100 feet	high density residential and commercial, agricultural	closed drainage systems with direct discharge to Bailey Brook
Aquidneck Ave RI-138A	two-lane roadway	ROW width ranging from 45 to 50 feet	high density residential and commercial	mix of open and closed drainage systems with direct discharge to Bailey Brook tributary
West Main Rd RI-114	four-lane roadway with sidewalks on both sides	ROW width ranging from 65 to 80 feet	high density residential and commercial	closed drainage system with direct discharge to Bailey Brook
Valley Rd RI-214	two-lane roadway with sidewalks on one side	ROW width ranging from 65 to 95 feet	medium density residential, commercial, institutional	closed drainage system with direct discharge to Bailey Brook

Outfall Catchment Delineation

RIDOT catchment areas by discharge location within the subwatershed are summarized in Appendix A-A. Catchments in the Bailey Brook subwatershed were delineated based on a desktop review of RIDOT drainage data, 1-meter resolution LiDAR data, and Google Earth tools. The RIDOT right-of-way (ROW) boundary was determined based on parcel boundaries obtained from the Town of Middletown. Non-RIDOT catchments were delineated only for those RIDOT catchments with a proposed STU. In this subwatershed, Non-RIDOT catchments are often limited on East Main and West Main Roads because the RIDOT roads frequently represent or are very near to the subwatershed boundary. On Valley Road and Aquidneck Avenue, the RIDOT roads run perpendicular to the slope, and only receive non-RIDOT runon from the east. In general, runoff is conveyed to the outfalls via a closed drainage systems. Aquidneck Avenue is the exception, with a combination of open drainage ditches connected by culverts. Catchments were confirmed by a field visit that took place in November 2018. The field visit confirmed general questions regarding roadway crowns and superelevation, drainage patterns and infrastructure, utilities, etc.

Illicit Discharge Detection and Elimination Priority Outfalls

There are 17 mapped RIDOT outfalls within Bailey Brook subwatershed. There are no High Priority outfalls (as defined in Appendix 6 of the Consent Decree) located in the subwatershed. 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).

There are 7 Priority Outfalls (as defined by paragraph 20.b) in the subwatershed where dry-weather discharge was noted during outfall mapping and dry weather screening (ArcGIS online Figure 3):

- Outfall 17333 – 22 Valley Road, direct discharge Bailey Brook
- NARR167 – 22 Valley Road, direct discharge Bailey Brook
- NARR426 – 125 East Main Road, direct discharge Bailey Brook
- Catch Basin 6853 – 329 Valley Road (Kempenaar's Clambake), direct discharge Bailey Brook
- Catch Basin 21043 – 1036 Aquidneck Ave, direct discharge, Tributary
- Outfall 9008841 – 1005 Aquidneck Ave, direct discharge, Tributary
- NARR181 – 1036 Aquidneck Ave, direct discharge, Tributary

Note: where an outfall or structure ID was unavailable, the next upstream structure with a structure ID is provided.

These outfalls will be reinvestigated and samples of any observed flow will be collected prior to June 30, 2019 and analyzed for the parameters described in paragraph 20d. If the discharges are determined to be non-stormwater in origin, RIDOT will use the methods described in the Consent Decree to detect and eliminate the source of the non-stormwater flow.

TMDL Priority Outfalls

There are no TMDL priority outfalls located in the subwatershed. It was not known at the time of SCP development if the Town of Middletown had identified any Priority Outfalls as required by the Bailey Brook Bacteria TMDL.

Interconnections

Interconnections are shown on ArcGIS online Figure 3 RIDOT used available Town of Middletown drainage data, RIDOT drainage data, and reviewed local topography and surface drainage patterns to identify possible interconnections. RIDOT will continue to work with the Town of Middletown to maintain stormwater systems that are interconnected with the RIDOT drainage system.

MS4: RIDOT identified 15 locations where the Town of Middletown's municipal separate storm sewer systems (MS4s) tie into the RIDOT drainage system (incoming interconnections) and 4 locations where RIDOT drainage ties into the Town of Middletown's MS4 adjacent to the ROW (outgoing interconnections).

Private: The desktop review, drainage system mapping, and field visits identified 55 potential private incoming interconnections. Based on existing mapping, the owners of these private interconnections were inferred to originate from both untreated stormwater and overflow structures from private STUs.

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 contained some but not all mapped interconnections noted above. The interconnections listed in the PAPA database are included in RIDOT's online mapping database. Two applications, permit numbers 30826 and 060331-A, have a location of Aquidneck Avenue, and a third application, permit number 110715, has a location of West Main Road. This review was unable to determine whether these connections occurred within the subwatershed, because Aquidneck

Avenue and West Main Road cross the subwatershed boundary. 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. Further, 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.

For this subwatershed, the Statewide Bacteria TMDL and the North Easton Pond phosphorus TMDL specify that RIDOT must reduce stormwater runoff volume, but do not provide a target for phosphorus or bacteria reduction in Bailey Brook. The TMDL does, however, indicate that RIDOT must develop and implement stormwater retrofits targeting both pollutants. The TMDLs do not identify a particular reach or outfalls where this must occur.

Non-Discharge Areas

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

Sewered/Combined Sewer Areas

A portion of the subwatershed has been identified as a sewered area. Based on mapping from RIDEM, most of the RIDOT ROW includes areas that are sewered by the Town of Middletown as shown in ArcGIS online Figure 3.

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

Flow and Water Quality Monitoring Data

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

- Bailey Brook TMDL[3]
- University of Rhode Island (URI) Watershed Watch[4]
- Groundwater Elevation Data

Bailey Brook TMDL

The Statewide Bacteria TMDL for Bailey Brook is based on both dry- and wet-weather samples from three stations in Bailey Brook collected from 2006-2008.

URI Watershed Watch

The URI Watershed Watch program has conducted monitoring at several sites within the Bailey Brook subwatershed, though none are currently monitored by the program. URI faculty and staff maintain a monitoring station at one of these monitoring stations.

[3] Rhode Island Statewide TMDL for Bacteria-Impaired Waters, 2011. Bailey Brook. http://www.dem.ri.gov/programs/benviron/water/quality/swbpdf/bailey.pdf

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

Groundwater Elevation Data

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

Reduction Target Development

The impairment(s) affecting Bailey Brook and its Tributaries (RI0007035R-01) are enterococcus, phosphorus, and lead. The enterococcus impairment is covered by the Statewide Bacteria TMDL developed for the subwatershed in September 2011. A TMDL was under development for phosphorus at the time of SCP development. TMDL development for the lead impairment is scheduled for 2026.

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: IC Reduction Target Summary

Subwatershed Total Area:	1,798 acres
Subwatershed Total IC Area (%):	583 acres (32%)
Subwatershed Target IC (10%):	180 acres
Subwatershed IC Reduction Target:	69%
RIDOT Contributing Total Area to Waterbody:	48.4 acres
RIDOT Contributing Total IC Area to Waterbody:	40.4 acres
RIDOT IC Reduction Target:	27.8 acres
Pollutants of Concern:	Enterococcus, Phosphorus, Lead

Additional TMDL Requirements

The following lists the TMDL information and recommendations applicable to RIDOT for this subwatershed:

- The 2011 Bacteria TMDL identified potential bacteria sources as developed area stormwater runoff, onsite wastewater treatment systems, sewer leaks (including illicit discharges), agricultural activities, and wildlife and domestic animal waste.
- The TMDL requires that RIDOT, as an MS4 operator, revise its post-construction ordinances and evaluate whether the six minimum control measures alone are sufficient to meet the bacteria reduction targets.
- The North Easton Pond TMDL (RIDEM, 2007) required RIDOT to develop and implement STUs to reduce phosphorus loading to both North Easton Pond and Bailey Brook subwatersheds. The Bailey Brook TMDL further requires that any proposed STUs in the Bailey Brook subwatershed also address bacteria loads. The TMDLs do not identify a particular reach or

outfalls where this must occur. A target for phosphorus or bacteria reduction was not provided as part of either TMDL.

- The TMDL states that "[the] Town [of Middletown] should continue to locate priority areas to identify and eliminate illicit discharges in the Bailey's Brook (sic) watershed (Geosyntec, 2005[5]; Berger, 2008[6]). Illicit discharges can be identified through continued dry weather outfall sampling and microbial source tracking."

Non-Stormwater Related Impairments

Bailey Brook (RI0007035R-01) is not impaired by any non-stormwater related impairments, though lead could be either a stormwater or non-stormwater impairment.

Existing Stormwater Controls

RIDOT identified 3 existing stormwater treatment units (STUs) in the Bailey Brook (RI0007035R-01) subwatershed that treat stormwater runoff, as shown in ArcGIS online Figure 4. A recently constructed 1.2-acre gravel wet vegetated treatment system (WVTS) south of East Main Road receives water from approximately 80 acres around Two Mile Corner (the intersection of East and West Main Roads). This STU was to be constructed by RIDOT and maintained by the Town. RIDOT is currently working with the Town to transfer ownership. A second STU, either a wet pond or gravel WVTS, was constructed north of RK Middletown Square (1315 West Main Road). Approximately 2.2 acres of RIDOT IC is mapped as discharging to this location. A mapped RIDOT outfall appears to discharge to this private STU. A third STU is a hydrodynamic separator at 165 East Main Road. These STU(s) will be visually inspected by RIDOT staff for proper function and issues including sediment accumulation, erosion and damaged drainage features were noted in the RIDOT asset database and communicated to RIDOT maintenance staff for follow up action.

Stormwater Controls Description

BLB-SCP-043

An STU on private property, north of RK Commons in Middletown, appears to be either a WVTS or Wet Pond. Based on GIS measurements, aerial imagery, and topography, it may treat up to 25,000 ft^3 of runoff from West Main Road and the RK Commons parking lot. A RIDOT outfall is mapped discharging to this STU from West Main Road. This outfall could not be located during a site visit due to fencing and dense vegetation. This site visit also documented a substantially blocked STU outlet. Property boundaries and wetland buffer regulations will likely prevent expansion of this existing STU. RIDOT will review its plans to determine ownership, dimensions, treatment volume, and the volume of RIDOT stormwater discharging to this STU.

[5] Geosyntec (2005). Bailey Brook Watershed Plan: Preliminary Investigation. Prepared for NRSC, Warwick, RI; Prepared by Geosyntec Consultants, Acton, MA. July 2005.

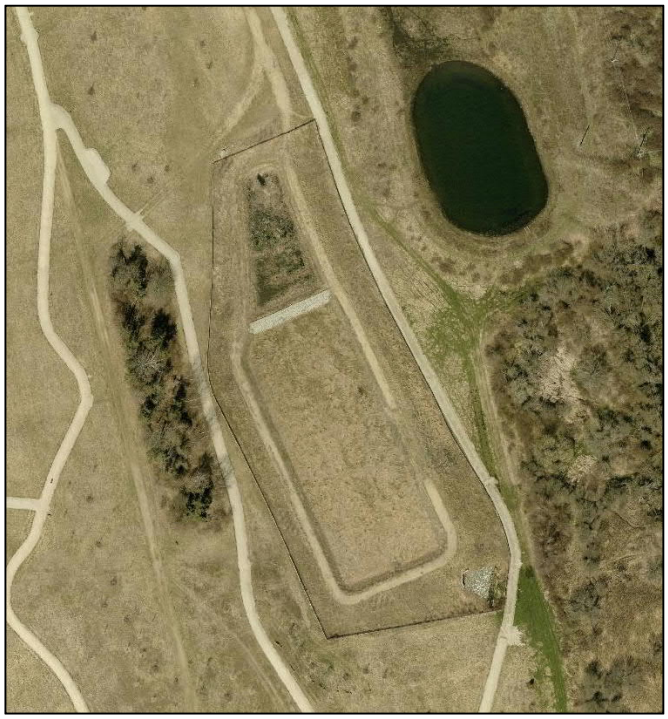
[6] Berger (2008). Phase II Stormwater Management Plan Wastewater Management Plan: Town of Middletown, Rhode Island. Submitted by The Louis Berger Group, Inc, Providence, RI. December 2003, Updated May 2008.

Photo 1: Top, aerial view of STU, pink triangle indicates RIDOT outfall mapped location. Bottom, outlet blocked by leaves and branches.

BLB-SCP-044

This gravel WVTS was constructed adjacent to Bailey Brook south of O'Neil Boulevard in Middletown Valley conservation area. RIDOT designed and constructed the WVTS, which treats approximately 64,338 ft^3 of both RIDOT and municipal runoff. RIDOT is working to transfer ownership of the WVTS to the Town of Middletown. This STU was constructed to offset the required IC reduction associated with the Reconstruction of Two-Mile Corner (TIP project 1356) due to limited available ROW, the presence of underground utilities, and existing development.

Photo 2: Photo of STU



BLB-SCP-045

This hydrodynamic separator was constructed at 165 East Main Road. RIDOT designed and constructed this STU, which contributes approximately 0.3 acres of IC removal credit, during a project entitled Reconstruction of East Main Road/Arterial Improvements East Main Road, STA. 116+00. A bypass or diversion structure is located upstream of this STU to pass flows beyond the design volume to the RIDOT outfall downstream.

Stormwater Controls Calculations

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

Under existing conditions, RIDOT's estimated equivalent IC exceeds the RIDOT IC reduction target.

Potential Enhanced Non-Structural Stormwater Controls

RIDOT has identified that additional control measures 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 enhanced non-structural control measures, as shown in ArcGIS online Figure 4.

Stormwater Controls Description

As part of compliance with the Consent Decree, RIDOT will be performing enhanced street sweeping (estimated two times per year) within the Consent Decree designated Area of Interest (AOI). These roadways include a total of 5.5 miles containing all 40.4 impervious acres within this subwatershed, shown on ArcGIS online Figure 2.

SCP-BLB-046 Catch Basin Cleaning – All RIDOT roads in subwatershed

> RIDOT will inspect all catch basins at least annually in the subwatershed. Catch basins more than half-full of sediment will be cleaned. If RIDOT concludes that any catch basins collect sediment at a higher rate requiring more frequent inspection and cleaning, then it will increase inspection and cleaning efforts for these outfalls.

Stormwater Controls Calculations

Calculations showing effective IC treatment credit for enhanced non-structural controls is attached as Appendix B-A and summarized in Table 1-A.

Potential Structural Stormwater Controls

RIDOT has identified that additional control measures in addition to existing STUs and potential enhanced non-structural STUs 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-BLB-001, -002

> These are offline underground infiltration systems located along the east and west sides of West Main Road (Route 114) between Gate 17 Access Road and Forest Avenue under the sidewalk. The majority of the STU catchment for SCP-BLB-001 is within the RIDOT ROW and the majority of the STU catchment for SCP-BLB-002 is outside the RIDOT ROW. Stormwater will enter both STUs via pipes from the upstream catch basins, passing through 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. 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 additional constraints including utility

poles, and possible subsurface water, electrical, and telecommunication lines, which may impact STU design at these locations.

SCP-BLB-003

SCP-BLB-003 is an offline underground infiltration system located southwest of the intersection of West Main Road and Gate 17 Access Road in a vacant private lot, adjacent to the edge of the ROW. Half of the STU catchment is within the RIDOT ROW. Stormwater will enter the STU via a pipe from the upstream 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. An overflow system will be designed to bypass flows in excess of the design volume to RIDOT's storm drain system. Site review identified additional constraints including overhead and potential subsurface wires and a RIPTA bus stop, however these constraints are unlikely to prevent STU implementation at this location. This STU is proposed on a private parcel (Middletown 106 81A) and will require a partnership with the parcel owner.

SCP-BLB-004, -006, -011

These STUs are offline underdrained bioretention basins located along the west side of West Main Road north of Coddington Highway (-004, -006) and on the east side of 123 Valley Road (-011) adjacent to the edge of the ROW. With the exception of SCP-BLB-004, the entirety of each STU catchment is within the RIDOT ROW (-004 receives water mostly from outside the RIDOT ROW). Stormwater will enter the STU as sheetflow via curb cuts passing through pretreatment systems. Poor soils in the area will prevent infiltration, so an underdrain will be installed and connected to the existing drainage system in the road. An overflow system will be designed to bypass flows in excess of the design volume to RIDOT's storm drain system. Site review identified existing vegetation at -004, above- and below-ground electrical utilities at -006, and overhead wires, water and sewer lines at -011, however these constraints are unlikely to prevent STU implementation at this location. These STUs are located on Town of Middletown property and will require a partnership with the Town.

A VHB report entitled West Main/Coddington Development Center Master Plan from September 2011 describes a preferred redevelopment scenario of retail, office, housing, and civic uses for the parcels where STUs (-004 and -006) are proposed. The development master plan recommends use of low impact development and STUs but did not specify locations or types. In addition, several traffic pattern alterations were proposed along West Main Road and Coddington Highway. This also represents a potential future municipal partnership where additional RIDOT stormwater runoff could be treated along with municipal stormwater in an off-site STU location.

SCP-BLB-005, -008, -010, -013, -017, -022 to -042

These STUs are offline underdrained bioretention swales located on the west side of 700 West Main Road (-005), the west side of 123 Valley Road (-010, -013) and east side of 345 Valley Road (-017) and east and west sides of East Main Road (-022 to -042). With the exception of -008, the entirety of each catchment is within the RIDOT ROW. Stormwater will enter each STU via a curb cut immediately upstream of an existing catch basin passing through pretreatment systems. Poor soils in the area will prevent infiltration, so an underdrain will be installed and connected to the existing drainage system in the road. An overflow system will be designed to bypass flows in

excess of the design volume to reenter the existing storm drain system. Site review identified additional constraints including vegetation (-005) and overhead utilities (all), however these constraints are unlikely to prevent STU implementation at this location. SCP-BLB-008 is located in the ROW of the Town of Middletown along Maplewood and Ridgewood Roads and will require a partnership with the Town. All STUs except SCP-BLB-005 are located in a segment of a RIDOT ROW subject to a TIP for 2024 (Project IDs 1357 and 1358) and may be implemented as part of those projects.

SCP-BLB-005 may be subject to the same redevelopment plan noted above for SCB-BLB-004 and-006.

SCP-BLB-009

This STU is bioretention basins located along the west side of 15 Valley Road within the ROW. The majority of the STU catchment is outside the RIDOT ROW. Stormwater will enter the STU via a diversion structure and pipe from the upstream catch basin, passing through a pretreatment system. Poor soils in the area will prevent infiltration, so an underdrain will be installed and connected to the existing drainage system in the road. 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 additional constraints including water, sewer, and buried and overhead electrical lines, however these constraints are unlikely to prevent STU implementation at this location.

SCP-BLB-014, -019 to -021

These STUs are offline underdrained bioretention basins located in the RIDOT ROW along the east side of 220 Valley Road (-014), and both sides of East Main Road between Aquidneck Avenue and Forest Avenue (-019 to -021) behind the sidewalk. The majority of each STU catchment is outside the RIDOT ROW. Stormwater will enter each STU as sheetflow via curb cuts passing through a pretreatment system. Poor soils in the area will prevent infiltration, so an underdrain will be installed and connected to the existing drainage system in the road. An overflow system will be designed to return flows in excess of the design volume to RIDOT's storm drain system. Site review identified existing trees as potential constraints, however these are unlikely to prevent STU implementation at this location.

SCP-BLB-012

This STU is proposed as two offline bioretention basins at Middletown High School, one located near the school entrance at Valley Road, the other in the large grassy area at the front of the school. The entirety of the STU catchment is outside the RIDOT ROW, but ultimately drains to RIDOT's storm drain system. Stormwater will enter the basin in front of the school via a pipe from the upstream catch basin, while it will enter the lower basin as sheetflow via a curb cut, passing through pretreatment systems. Poor soils in the area will prevent infiltration, so an underdrain will be installed and connected to the existing drainage system in the road. An overflow system will be designed to return flows in excess of the design volume to the existing storm drain system. This STU is located on Town of Middleltown property and will require a partnership with the Town.

As these STUs are proposed at a school, a wider variety of grasses, shrubs, and/or trees could be considered and paired with educational resources to create a living classroom for students.

SCP-BLB-015a and -015b

These STUs are proposed as a combination of an offline underground infiltration system (-015a) on the east side of 303 Valley Road in the shoulder and and an online WVTS (-015b) behind 333 Valley Road in a municipally-owned parcel. The majority of the STU catchment is outside the RIDOT ROW. Stormwater will enter the underground infiltration STU via a diversion structure and pipe from the upstream catch basin. Despite the poor soils mapped in this area, locating this STU on the high side of a super-elevated road, may provide sufficient separation distance to groundwater than what is reflected in the soils data (1.5-3.2 feet). A bypass system will be designed to divert flows in excess of the design volume to the existing storm drain system.

These two STUs are not intended to treat stormwater in series. Instead, the WVTS will receive stormwater beyond the design capacity of the underground infiltration system. Stormwater bypassing the underground infiltration system will enter the proposed WVTS downstream via the existing upstream pipe. Treated stormwater will exit the STU as overland discharge. An overflow system will be designed to bypass stormwater in excess of the design flow to Bailey Brook. Site review identified additional potential constraints including wetland extent on the private parcel. Permits will likely be required. As sited, the STU is adjacent to the area of 0.2% Annual Flood Percent Chance for Bailey Brook.

SCP-BLB-015b is proposed on Newport Water property on which the Aquidneck Island Land Trust has been granted a conservation easement in perpetuity. RIDOT will therefore need to seek permission and a possible easement over part or all of the property. This would represent a municipal partnership with the beneficiary (Newport Water) of improved water quality in downstream water supply reservoirs. The proposed use as a WVTS is intended to follow both the letter and spirit of the existing conservation easement and associated management plan recorded in the Town of Middletown's Land Evidence Records (Book 1272 Page 197). The WVTS further represents a potential enhancement of a wetland that appears to be dominated by Phragmites.

SCP-BLB-016

This STU is proposed as a retrofit of a private extended dry detention basin as a WVTS and would not treat RIDOT runoff, though overflow discharges to a RIDOT outfall. The current basin may treat approximately 8,300 cf of private runoff. Retrofitting to a WVTS would increase the efficiency of IC removal. The existing private STU is located in a mapped wetland. Space exists on the current parcel to expand the STU northward, though this would further encroach on mapped wetlands.

SCP-BLB-018

This STU is proposed as online bioretention swales along both sides of Aquidneck Avenue between Green End Avenue and East Main Road. Stormwater will enter as sheetflow and pass through pretreatment. Poor soils in the area will prevent infiltration, so an underdrain will be installed and connected to the existing drainage system in the road. Utility poles, driveways, vegetation, and water and sewer lines may cause siting conflicts at certain locations. A number of existing private STUs at commercial developments discharge into the RIDOT conveyances, so appropriate flow controls should be incorporated to prevent erosion. This is a TIP area scheduled for 2019. Existing drainage ditches represent retrofit opportunities as bioretention swales. Because the TIP project is scheduled for 2019, it is understood that this project is already in

design. Individual catchments to each swale were therefore not delineated: instead, 50% treatment was assumed across the whole TIP project area. STU footprints have been drawn to indicate where retrofitting is possible and based on these footprints, an approximate storage volume has been calculated.

TIP STUs

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

Areas that will be modified as part of a near-term TIP project (as of December 2018) where potential STU locations were sited but not sized 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-BLB-018 (TP-BLB-026 to -033)

- TIP ID: 1355
- TIP Year: 2019
- TIP Category: Pavement Capital
- Project Name: Rt 138A, Aquidneck Ave (East Main Rd to Green End Ave)
- Municipality: Middletown
- Description: This line item involves resurfacing to the roadway and includes drainage and sidewalk improvements (one side).

For all other planned TIP projects, STUs were sited and sized to aid in the design process. Appendix D-A lists the TIP projects scheduled for the next 6 years within the subwatershed.

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 treatment 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)[1]	Estimated Cost	Cost per IC Reduction Acre ($/ac)	Retrofit Priority
SCP-BLB-043	Wet Pond	7.0	6.3	1.1	0.6	3.1	--	--	Existing
SCP-BLB-044	WVTS	80.5	28.3	0.6	1.3	12.6	--	--	Existing
SCP-BLB-045	Hydrodynamic Separator	3.6	3.3	0.0	0.0	0.3	--	--	Existing
SCP-BLB-046	Catch Basin Cleaning	--	--	--	--	0.9	--	--	Non-structural
							Percent RIDOT Reduction Target Reached		61%
SCP-BLB-009	Bioretention Basin	3.6	2.0	1.3	1.4	1.2	$124,000	$102,500	1
TP-BLB-026	TIP	0.6	0.5	2.0	0.9	0.2	--	--	1
TP-BLB-027	TIP	0.5	0.4	2.1	0.8	0.2	--	--	1
TP-BLB-028	TIP	0.7	0.6	1.0	1.1	0.3	--	--	1
TP-BLB-029	TIP	0.02	0.01	1.0	0.03	0.01	--	--	1
TP-BLB-030	TIP	1.5	1.4	1.0	2.6	0.7	--	--	1
TP-BLB-031	TIP	0.2	0.2	1.0	0.3	0.1	--	--	1
TP-BLB-032	TIP	0.3	0.2	1.0	0.4	0.1	--	--	1
TP-BLB-033	TIP	0.6	0.5	1.0	0.9	0.2	--	--	1
							Percent RIDOT Reduction Target Reached		72%
SCP-BLB-010	Bioretention Swale	0.2	0.2	0.6	0.04	0.1	$17,900	$137,100	2
SCP-BLB-013	Bioretention Swale	0.3	0.2	0.5	0.05	0.1	$17,200	$124,400	2
SCP-BLB-014	Bioretention Basin	2.4	1.0	0.9	0.4	0.5	$57,900	$187,700	2
SCP-BLB-015a	Underground Infiltration System	1.8	1.4	0.9	4.2	1.3	$605,600	$473,100	2
SCP-BLB-015b	Wet Vegetated Treatment System	18.0	5.7	1.7	1.1	3.0	$555,600	$184,600	2
SCP-BLB-017	Bioretention Swale	0.6	0.4	0.5	0.1	0.2	$25,700	$135,300	2
SCP-BLB-022	Bioretention Swale	0.5	0.2	1.1	0.1	0.1	$31,700	$264,200	2
SCP-BLB-023	Bioretention Swale	0.1	0.1	1.3	0.1	0.05	$20,400	$408,000	2
SCP-BLB-024	Bioretention Swale	0.1	0.1	1.3	0.1	0.05	$20,400	$408,000	2
SCP-BLB-025	Bioretention Swale	0.1	0.1	1.0	0.05	0.1	$20,400	$408,000	2
SCP-BLB-026	Bioretention Swale	0.2	0.1	0.8	0.05	0.1	$20,400	$340,000	2
SCP-BLB-027	Bioretention Swale	0.4	0.4	0.2	0.1	0.1	$20,400	$145,700	2
SCP-BLB-028	Bioretention Swale	0.2	0.1	0.9	0.05	0.1	$20,400	$340,000	2
SCP-BLB-029	Bioretention Swale	0.2	0.1	0.7	0.05	0.1	$20,400	$291,400	2
SCP-BLB-030	Bioretention Swale	0.2	0.1	0.8	0.05	0.1	$20,400	$340,000	2
SCP-BLB-031	Bioretention Swale	0.2	0.2	0.6	0.05	0.1	$20,400	$255,000	2

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)[1]	Estimated Cost	Cost per IC Reduction Acre ($/ac)	Retrofit Priority
SCP-BLB-032	Bioretention Swale	0.2	0.1	1.1	0.05	0.1	$20,400	$408,000	2
SCP-BLB-033	Bioretention Swale	0.1	0.1	0.9	0.05	0.1	$20,400	$340,000	2
SCP-BLB-034	Bioretention Swale	0.1	0.1	1.4	0.1	0.05	$20,400	$408,000	2
SCP-BLB-035	Bioretention Swale	0.1	0.1	0.8	0.05	0.1	$20,400	$340,000	2
SCP-BLB-036	Bioretention Swale	0.1	0.1	1.3	0.1	0.05	$20,400	$408,000	2
SCP-BLB-037	Bioretention Swale	0.1	0.1	0.9	0.05	0.1	$20,400	$340,000	2
SCP-BLB-038	Bioretention Swale	0.2	0.1	1.0	0.05	0.1	$20,400	$408,000	2
SCP-BLB-039	Bioretention Swale	0.1	0.1	1.1	0.05	0.1	$20,400	$408,000	2
SCP-BLB-040	Bioretention Swale	0.1	0.1	1.6	0.1	0.04	$20,400	$510,000	2
SCP-BLB-041	Bioretention Swale	0.1	0.1	1.4	0.1	0.05	$20,400	$408,000	2
SCP-BLB-042	Bioretention Swale	0.1	0.0	2.1	0.1	0.03	$20,400	$680,000	2
							Percent RIDOT Reduction Target Reached		96%
SCP-BLB-001	Underground Infiltration System	0.8	0.6	1.7	2.1	0.6	$516,900	$847,400	3
SCP-BLB-002	Underground Infiltration System	2.6	2.5	0.6	6.3	2.0	$783,300	$382,100	3
SCP-BLB-003	Underground Infiltration System	3.3	1.9	1.0	6.1	1.8	$925,300	$514,100	3
SCP-BLB-004	Bioretention Basin	1.2	0.9	0.9	0.4	0.5	$49,800	$101,600	3
SCP-BLB-005	Bioretention Swale	0.2	0.2	1.2	0.1	0.1	$30,900	$280,900	3
SCP-BLB-006	Bioretention Basin	0.2	0.2	1.3	0.1	0.1	$21,800	$218,000	3
SCP-BLB-008	Bioretention Swale	2.4	1.7	0.4	0.4	0.7	$75,400	$103,300	3
SCP-BLB-011	Bioretention Basin	35.6	12.3	0.3	1.9	4.3	$147,700	$34,100	3
SCP-BLB-012	Bioretention Basin	11.4	6.9	0.6	2.1	3.3	$224,700	$67,900	3
SCP-BLB-019	Bioretention Basin	0.4	0.3	1.7	0.3	0.2	$35,000	$159,100	3
SCP-BLB-020	Bioretention Basin	0.5	0.4	1.5	0.3	0.3	$40,300	$161,200	3
SCP-BLB-021	Bioretention Basin	1.9	1.0	1.0	0.5	0.5	$60,700	$112,400	3
							Percent RIDOT Reduction Target Reached		148%
Total		191.8	86.9		37.8	41.1	$4,755,400		

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 will perform enhanced street sweeping on all RIDOT roads in the subwatershed per the Consent Decree (as defined by paragraph 41), as these roads indirectly drain to a Newport Water Supply Reservoir (North Easton Pond). RIDOT will also inspect catch basins at least annually. Catch basins greater than 50% full will be cleaned.

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

- Middletown and RIDOT are MS4 operators in the Bailey Brook 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. Funding for the resurfacing project on Aquidneck Avenue north of Green End Avenue (TIP ID 1355) begins in 2018 and continues through 2019. For TIP projects beyond 2019, this 50% treatment level was not included and structural STU credit calculated.

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 watersheds 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.

Eight potential STUs are proposed on land not within the RIDOT ROW. Six STUs (SCP-BLB-004, -006 to -008, -011, -012, and -015b) are proposed partly or entirely on parcels owned by the Town of Middletown. Four STUs (SCP-BLB-004 to -006) are proposed on or immediately adjacent to Town-owned parcels that are the subject of a redevelopment plan. Two STUs (SCP-BLB-003 and -016) are proposed on privately owned parcels. The parcels are owned by 936 Hospitality II LLC and 303 Valley Road Middletown LLC, respectively. RIDOT will coordinate with the Town of Middletown, Middletown Public Schools, and the private parcel owners to discuss the possibility of easements or other mechanisms to construct these STUs.

SCP-BLB-015b is proposed on Newport Water property on which the Aquidneck Island Land Trust has been granted a conservation easement in perpetuity. RIDOT will therefore need to seek permission and a possible easement over part or all of the property. This would represent a municipal partnership with the beneficiary (Newport Water) of improved water quality in downstream water supply reservoirs. The proposed use as a WVTS is intended to follow both the letter and spirit of the existing conservation easement and associated management plan recorded in the Town of Middletown's Land Evidence Records (Book 1272 Page 197). The WVTS represents a wetland enhancement that would, under the anticipated phosphorus TMDL for the subwatershed, also provide a high level of nutrient removal.

IDDE Activities

RIDOT has completed IDDE dry-weather screenings at its outfalls within this subwatershed. During system mapping activities, dry-weather discharge was observed at 7 outfalls in the subwatershed. Follow-up dry-weather sampling at these outfalls 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 the outfalls where flow was not observed during dry weather under wet-weather conditions and analyze samples for parameters listed in Paragraph 21c.

Public Outreach

During development of this SCP, RIDOT conveyed the Consent Decree requirements and the SCP Plan development schedule and made a request to the Town of Middletown for available stormwater system mapping data. RIDOT will continue coordination with the Town of Middletown 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,[7] 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.

[7] 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

SEGMENT NAME (RIXXXXXXXX-XX)

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
OF-17333	Stream/River	30” Concrete Headwall	6.5	5.7	0.7	Grass
OF-900061	Private STU	Wet Pond/WVTS	0.9	0.9	0.1	Grass
MH-47514	Outgoing Interconnection	32” Concrete Pipe	4.0	3.8	0.2	Grass
OF-CO-6340	Non-wetland	12” Concrete Pipe to Conveyance	0.5	0.4	0.1	Grass
OF-NARR167	Stream/River	36” Concrete Headwall	2.7	1.5	1.3	Grass
OF-NARR181	Stream/River	24” Pipe	1.5	1.4	0.1	Grass
OF-NARR425	Stream/River	24” Concrete Headwall	2.4	2.4	0.0	Grass
OF-NARR426	Stream/River	36” Concrete Flared End	16.1	12.3	3.7	Grass
OF-9008841	Stream/River	18” Corrugated Metal Pipe	0.7	0.6	0.04	Grass
OF-CB-6852	Stream/River	12” Concrete Headwall	0.6	0.4	0.2	Grass
OF-CO-203981	Non-wetland	Conveyance to 18” Concrete Headwall Outfall	0.6	0.5	0.1	Grass
OF-MH-63372	Outgoing interconnection	12” Corrugated Metal Pipe		Included in OF-CO-203981, see note		
OF-CB-6853	Stream/River	36” Concrete Headwall	4.2	3.2	1.0	Grass
OF-CO-6339	Stream/River	Bituminous ditch	0.02	0.01	0.01	Grass
OF-CB-21038	Non-wetland	12” Concrete Headwall	0.3	0.2	0.05	Grass
CB-49404	Outgoing interconnection	30” Concrete Pipe	3.1	3.1	0.1	Grass
OF-STU-923	STU (Via Outgoing interconnection)	WVTS	3.5	3.3	0.2	Grass
Sheet Flow	Non-wetland		0.7	0.6	0.1	Grass

Notes: - Where Outfall Structure ID and Outfall ID were blank, the next available upstream structure ID is supplied.
- There are a total of 13 outfalls and 4 outgoing interconnections in the subwatershed
- One outgoing interconnection from East Main Road at Wyatt Road is included under OF-CO-203981, which discharges from RIDOT’s system, before reentering as an incoming interconnection on Aquidneck Avenue.
- The outfall receiving water from CB-21043 is mapped as originating from the same structure as NARR181 and was not given its own catchment.

APPENDIX B-A

Bailey Brook (RI0007035R-01)

STORMWATER CONTROLS
POLLUTANT CALCULATIONS

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - RIDOT_Catchment

Segment Name: Bailey's Brook (RI0007035R-01), Group 1A
Date: 12/31/2018

Catchment ID	WBID	Discharge ID	STU ID (if applicable)	Treatment Status*	Impervious Area (sq ft)	IDDE Exemption Status*	TIP Project ID	TIP Year	Notes	Shape_Length (ft)	Total Area (sq ft)	Catchment Pollutant Load, lb/yr			
												P	TSS	N	Zn
EX-BLB-001	RI0007035R-01	OF-900061	SCP-BLB-043	Existing	38140	Not Exempt			RIDOT Outfall to existing wet pond or WVTS. Assumed 100% WQv sizing	1349.368461	41363.80859	1.18	539	7.42	1.08
EX-BLB-013	RI0007035R-01	OF-STU-923	SCP-BLB-044	Existing	142960	Not Exempt			RIDOT outgoing interconnection on Commercial Blvd to existing WVTS. Intended to be accepted by Town, but not yet accepted.	4920.066534	152910.8857	4.41	2019	27.77	4.04
NF-BLB-002	RI0007035R-01	OF-CB-49404		Not Feasible	133772	Not Exempt			Inferred an unmapped outgoing interconnection to Forest Ave, discharging to Bailey Brook.	4397.379329	136594.3543	4.11	1884	25.85	3.78
NF-BLB-006	RI0007035R-01	OF-17333		Not Feasible	158940	Not Exempt			Assumed us to them interconnection is an error. It would represent a non-standard configuration and is less likely given topography. Insufficient ROW space for STUs	4949.319186	178547.7484	4.92	2250	31.05	4.49
NF-BLB-007	RI0007035R-01	OF-MH-47514		Not Feasible	84236	Not Exempt			RIDOT plan Reconstruction of Two-Mile corner, drainage and utility plan no. 3 indicates outgoing interconnection along Maplewood Rd through Manhole, Unknown MH-47514	3412.258504	87654.43423	2.59	1188	16.31	2.38
EXF-BLB-015	RI0007035R-01	OF-NARR426	SCP-BLB-045	Existing	144712	Not Exempt			Structure ID 35 Hydrodynamic separator, Vortechs 1421C, 2004-CH-006	4362.340249	155164.1069	4.46	2044	28.12	4.09
NF-BLB-016	RI0007035R-01	OF-NARR167		Not Feasible	37284	Not Exempt				1760.98871	81019.41213	1.26	554	8.07	1.07
PT-BLB-003	RI0007035R-01	OF-17333	SCP-BLB-001	Potential	22104	Not Exempt			Super elevated road at northern end. Follows watershed boundary by General Dynamics	1341.733005	25151.17698	0.69	313	4.32	0.63
PT-BLB-004	RI0007035R-01	OF-17333	SCP-BLB-002	Potential	23824	Not Exempt				1290.208519	24423.00636	0.73	336	4.61	0.67
PT-BLB-005	RI0007035R-01	OF-17333	SCP-BLB-003	Potential	43404	Not Exempt			Western end follows watershed boundary.	1756.332546	54006.38252	1.36	618	8.58	1.23
PT-BLB-008	RI0007035R-01	OF-MH-47514	SCP-BLB-004	Potential	5708	Not Exempt			RIDOT plan Reconstruction of Two-Mile corner, drainage and utility plan no. 3 indicates outgoing interconnection along Maplewood Rd through Manhole, Unknown MH-47514	442.6877708	6524.472478	0.18	81	1.12	0.16
PT-BLB-009	RI0007035R-01	OF-MH-47514	SCP-BLB-005	Potential	8436	Not Exempt			RIDOT plan Reconstruction of Two-Mile corner, drainage and utility plan no. 3 indicates outgoing interconnection along Maplewood Rd through Manhole, Unknown MH-47514	607.0990802	9931.485048	0.26	120	1.66	0.24
PT-BLB-010	RI0007035R-01	OF-MH-47514	SCP-BLB-006	Potential	7368	Not Exempt			RIDOT plan Reconstruction of Two-Mile corner, drainage and utility plan no. 3 indicates outgoing interconnection along Maplewood Rd through Manhole, Unknown MH-47514	537.9718574	8586.934779	0.23	105	1.45	0.21
PT-BLB-017	RI0007035R-01	OF-NARR167	SCP-BLB-009	Potential	27436	Not Exempt				1187.733103	38709.6308	0.87	394	5.52	0.78
PT-BLB-019	RI0007035R-01	OF-CB-6853	SCP-BLB-011	Potential	16824	Not Exempt	1359	2024	Super elevated road at northern end.	1221.531921	23594.81838	0.53	241	3.38	0.48
PT-BLB-020	RI0007035R-01	OF-CB-6853	SCP-BLB-015a	Potential	61508	Not Exempt	1359	2024		4047.260767	79610.03985	1.93	878	12.23	1.74
PT-BLB-021	RI0007035R-01	OF-CB-6853	SCP-BLB-010	Potential	6676	Not Exempt	1359	2024		571.481852	8689.782652	0.21	95	1.33	0.19
PT-BLB-022	RI0007035R-01	OF-CB-6853	SCP-BLB-013	Potential	8696	Not Exempt	1359	2024		643.5845108	10897.57565	0.27	124	1.72	0.25
PT-BLB-023	RI0007035R-01	OF-CB-6853	SCP-BLB-014	Potential	21444	Not Exempt	1359	2024		1501.104959	27049.93388	0.67	306	4.25	0.61
PT-BLB-024	RI0007035R-01	OF-CB-6853	SCP-BLB-015b	Potential	23944	Not Exempt	1359	2024		1384.079511	32110.57729	0.76	342	4.78	0.68
PT-BLB-025	RI0007035R-01	OF-CB-6852	SCP-BLB-017	Potential	17908	Not Exempt	1359	2024		1043.913114	26737.76348	0.57	258	3.63	0.51
PT-BLB-035	RI0007035R-01	OF-NARR426	SCP-BLB-021	Potential	9104	Not Exempt	9005	2021		688.1988796	15776.97891	0.3	133	1.89	0.26
PT-BLB-036	RI0007035R-01	OF-NARR426	SCP-BLB-020	Potential	6284	Not Exempt	9005	2021		410.0501382	8355.349176	0.2	90	1.25	0.18
PT-BLB-037	RI0007035R-01	OF-NARR426	SCP-BLB-019	Potential	14688	Not Exempt	9005	2021		977.5821801	16476.71113	0.45	208	2.87	0.42
PT-BLB-039	RI0007035R-01	OF-NARR426	SCP-BLB-022	Potential	6656	Not Exempt	1357; 9005	2024		758.5148405	10323.53995	0.21	96	1.36	0.19
PT-BLB-040	RI0007035R-01	OF-NARR426	SCP-BLB-023	Potential	3360	Not Exempt	1357; 9005	2024		449.0526873	5612.760561	0.11	49	0.69	0.1
PT-BLB-041	RI0007035R-01	OF-NARR426	SCP-BLB-024	Potential	3412	Not Exempt	1357; 9005	2024		471.4610651	5928.439505	0.11	50	0.71	0.1
PT-BLB-042	RI0007035R-01	OF-NARR426	SCP-BLB-025	Potential	4344	Not Exempt	1357; 9005	2024		409.3789642	5033.904634	0.13	62	0.85	0.12
PT-BLB-043	RI0007035R-01	OF-NARR426	SCP-BLB-026	Potential	4420	Not Exempt	1357; 9005	2024		542.5908645	6862.754103	0.14	64	0.9	0.13
PT-BLB-044	RI0007035R-01	OF-NARR426	SCP-BLB-027	Potential	9980	Not Exempt	1357; 9005	2024		800.369534	10255.24258	0.31	141	1.93	0.28
PT-BLB-045	RI0007035R-01	OF-NARR426	SCP-BLB-028	Potential	4644	Not Exempt	1357; 9005	2024		562.5944726	7153.496917	0.15	67	0.95	0.13
PT-BLB-047	RI0007035R-01	OF-NARR426	SCP-BLB-029	Potential	6180	Not Exempt	1357; 9005	2024		676.5805827	9677.481348	0.2	89	1.26	0.18
PT-BLB-048	RI0007035R-01	OF-NARR426	SCP-BLB-030	Potential	5564	Not Exempt	1357; 9005	2024		674.2196744	9768.913388	0.18	81	1.16	0.16
PT-BLB-049	RI0007035R-01	OF-NARR426	SCP-BLB-031	Potential	7672	Not Exempt	1357; 9005	2024		685.5679121	8778.436613	0.24	109	1.5	0.22
PT-BLB-050	RI0007035R-01	OF-NARR426	SCP-BLB-032	Potential	4068	Not Exempt	1357; 9005	2024		523.2203489	7267.048523	0.13	59	0.85	0.12
PT-BLB-051	RI0007035R-01	OF-NARR426	SCP-BLB-033	Potential	4772	Not Exempt	1357; 9005	2024		432.8486776	5270.129889	0.15	67	0.93	0.13
PT-BLB-052	RI0007035R-01	OF-NARR426	SCP-BLB-034	Potential	3128	Not Exempt	1357; 9005	2024		427.1247281	5717.222594	0.1	46	0.66	0.09
PT-BLB-053	RI0007035R-01	OF-NARR426	SCP-BLB-035	Potential	5248	Not Exempt	1357; 9005	2024		473.5473985	5857.374123	0.16	74	1.02	0.15
PT-BLB-054	RI0007035R-01	OF-NARR426	SCP-BLB-036	Potential	3396	Not Exempt	1357; 9005	2024		432.4038733	5829.972831	0.11	49	0.7	0.1
PT-BLB-055	RI0007035R-01	OF-NARR426	SCP-BLB-037	Potential	4644	Not Exempt	1357; 9005	2024		468.4049654	5805.166611	0.15	66	0.92	0.13
PT-BLB-056	RI0007035R-01	OF-NARR426	SCP-BLB-038	Potential	4232	Not Exempt	1357; 9005	2024		491.7136277	7049.868531	0.14	61	0.87	0.12
PT-BLB-057	RI0007035R-01	OF-NARR426	SCP-BLB-039	Potential	3928	Not Exempt	1357; 9005	2024		459.5630564	5412.362753	0.12	56	0.79	0.11
PT-BLB-058	RI0007035R-01	OF-NARR426	SCP-BLB-040	Potential	2688	Not Exempt	1357; 9005	2024		313.6500221	4128.301754	0.09	39	0.55	0.08
PT-BLB-059	RI0007035R-01	OF-NARR426	SCP-BLB-041	Potential	3128	Not Exempt	1357; 9005	2024		307.6990194	3491.281571	0.1	44	0.61	0.09
PT-BLB-062	RI0007035R-01	OF-NARR426	SCP-BLB-042	Potential	2056	Not Exempt	1357; 9005	2024		278.4966404	4025.965689	0.07	30	0.44	0.06
TP-BLB-011	RI0007035R-01	OF-MH-47514		Not Feasible	58800	Not Exempt	1356	2017	RIDOT plan Reconstruction of Two-Mile corner, drainage and utility plan no. 3 indicates outgoing interconnection along Maplewood Rd	1954.952687	59754.26712	1.8	828	11.36	1.66
TP-BLB-014	RI0007035R-01	OF-NARR425		Not Feasible	102504	Not Exempt	1356	2017		3428.490875	104375.7727	3.15	1444	19.8	2.89
TP-BLB-018	RI0007035R-01	OF-NARR426		Not Feasible	37540	Not Exempt	1359	2024		1211.673949	52477.46527	1.19	538	7.54	1.07
TP-BLB-026	RI0007035R-01	Sheet Flow	TP-BLB-026	TIP	21000	Not Exempt	1355	2019		2032.639811	25042.95888	0.65	298	4.13	0.59
TP-BLB-027	RI0007035R-01	OF-CO-6340	TP-BLB-027	TIP	18504	Not Exempt	1355	2019		1834.908353	21361.97969	0.57	262	3.63	0.52
TP-BLB-028	RI0007035R-01	OF-9008841	TP-BLB-028	TIP	26788	Not Exempt	1355	2019		1395.534296	28659.22107	0.83	378	5.2	0.76
TP-BLB-029	RI0007035R-01	OF-CO-6339	TP-BLB-029	TIP	640	Not Exempt	1355	2019	Bituminous Ditch outfall	128.6453268	953.1444322	0.02	9	0.13	0.02
TP-BLB-030	RI0007035R-01	OF-NARR181	TP-BLB-030	TIP	62288	Not Exempt	1355	2019		3053.691841	65749.84884	1.92	879	12.08	1.76
TP-BLB-031	RI0007035R-01	Sheet Flow	TP-BLB-031	TIP	7100	Not Exempt	1355	2019		712.1711719	7172.727436	0.22	100	1.37	0.2
TP-BLB-032	RI0007035R-01	OF-CB-21038	TP-BLB-032	TIP	10772	Not Exempt	1355	2019		1114.728664	12773.90707	0.34	153	2.12	0.3
TP-BLB-033	RI0007035R-01	OF-CO-203981	TP-BLB-033	TIP	21472	Not Exempt	1355	2019		1515.572576	27172.84098	0.67	306	4.26	0.61
TP-BLB-034	RI0007035R-01	OF-NARR426		Not Feasible	113704	Not Exempt	9005	2021		4499.813177	171495.0009	3.64	1639	23.09	3.24
TP-BLB-038	RI0007035R-01	OF-NARR426		Not Feasible	82320	Not Exempt	9005	2021		4208.256679	104189.8408	2.58	1173	16.32	2.33
TP-BLB-046	RI0007035R-01	OF-NARR426		Not Feasible	12724	Not Exempt	1357; 9005	2024		906.8265463	13366.76085	0.39	179	2.47	0.36
TP-BLB-060	RI0007035R-01	OF-NARR426		Not Feasible	9436	Not Exempt	1357; 9005	2024		1036.816975	11877.41749	0.3	134	1.87	0.27
TP-BLB-061	RI0007035R-01	OF-NARR426		Not Feasible	2040	Not Exempt	1357; 9005	2024		263.09882	3538.486282	0.07	30	0.42	0.06
TP-BLB-063	RI0007035R-01	OF-NARR426		Not Feasible	7212	Not Exempt	1357; 9005	2024		667.0306162	8493.958862	0.22	102	1.42	0.2

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - Non-RIDOT_Catchment

Segment Name: Bailey's Brook (RI0007035R-01), Group 1A
Date: 12/31/2018

Catchment ID	WBID	Discharge ID	STU ID	Treatment Status*	Impervious Area (sq ft)	Ownership*	Ownership Notes	Land Use*	Notes	Shape_Length (ft)	Total Area (sq ft)	Catchment Pollutant Load, lb/yr			
												P	TSS	N	Zn
EX-BLB-001	RI0007035R-01	Private OF	SCP-BLB-043	Existing	236392	Private		Commercial	Private STU mapped as receiving water from RIDOT outfall StructureID 900061. Parking lot drains to STU to north, building and parking areas drain to STUs at rear.	2618.750341	262789.877	9.7	2060.8	82.3	7.5
EX-BLB-007	RI0007035R-01	OF-STU-923	SCP-BLB-044	Existing	1390148	Private	Mostly residential, some commercial	Residential	Existing RIDOT-constructed STU. Currently being transfered to municipal ownership. Drainage area estimated. VHB report indicates 80.5 acres but mapping not available at time of SCP development.	11766.17954	2308605.002	76.3	14593.5	473.2	22.9
PT-BLB-002	RI0007035R-01	OF-17333	SCP-BLB-001	Potential	4508	Private		Commercial	Overland flow to RIDOT catch basins on West Main Rd, discharge to subsurface infiltration	744.0079001	8101.783677	0.2	41.4	1.7	0.1
PT-BLB-003	RI0007035R-01	OF-17333	SCP-BLB-002	Potential	84228	Private		Commercial	Overland flow to RIDOT catch basins on West Main Rd, discharge to subsurface infiltration	1669.541442	88587.32177	3.5	730.9	29.2	2.7
PT-BLB-004	RI0007035R-01	OF-17333	SCP-BLB-003	Potential	40640	Private		Residential	Overland flow to RIDOT catch basin and discharges to STU on west side of West Main Rd	1390.988893	91677.03789	2.3	442.9	14.5	0.7
PT-BLB-005	RI0007035R-01	OF-MH-47514	SCP-BLB-004	Potential	34060	Municipality	School	Institutional	STU proposed on municipal property, overland flow to RIDOT catch basins on Valley Rd	962.7287188	46144.63673	1.4	302.5	12.1	1.1
PT-BLB-006	RI0007035R-01	Municipal OF	SCP-BLB-008	Potential	71964	Private	Offsite STUs on municipal streets	Residential	Overland flow to proposed surface bioretention. Middletown OF BB05 possible discharge point	3189.768241	102482.8646	3.9	744.0	24.0	1.2
PT-BLB-008	RI0007035R-01	OF-NARR167	SCP-BLB-009	Potential	57800	Private		Commercial	Downstream of existing private STU, overland flow to existing RIDOT catch basins	1723.177139	117735.9413	2.5	540.0	21.5	1.8
PT-BLB-009	RI0007035R-01	OF-CB-6853	SCP-BLB-011	Potential	519408	Municipality	Public school fields, some commercial and residential	Institutional	Northbound lane of Valley Rd due to road crown	7618.293727	1525985.92	23.9	5167.7	206.1	16.9
PT-BLB-010	RI0007035R-01	OF-CB-6853	SCP-BLB-015b	Potential	225996	Private	Public school, private residential, commercial	Residential	Flow to municipal/private interconnections	3148.340283	750818.8995	13.4	2625.6	86.9	3.9
PT-BLB-011	RI0007035R-01	OF-CB-6853	SCP-BLB-012	Potential	299932	Municipality	Mostly school. Some private residential	Institutional	Overland flow from Reardon Dr into school parking lot	4196.407902	497381.4698	12.8	2725.3	108.8	9.5
PT-BLB-012	RI0007035R-01	OF-CB-6853	SCP-BLB-014	Potential	22636	Private		Residential	Downstream of existing private STU from subdivision on Atlantic Dr, overland flow to proposed surface bioretention	1517.131059	77659.0204	1.3	264.6	8.8	0.4
PT-BLB-013	RI0007035R-01	OF-CB-6853	SCP-BLB-016	Potential	123788	Private	Parcel for existing detention pond	Commercial	Overland flow to private catch basins	1955.644495	237398.6983	5.4	1146.4	45.8	4.0
PT-BLB-014	RI0007035R-01	OF-NARR426	SCP-BLB-021	Potential	33580	Private		Commercial	Overland flow to Forest Ave to proposed surface bioretention	1212.153697	65873.92311	1.5	312.0	12.5	1.1
PT-BLB-015	RI0007035R-01	OF-NARR426	SCP-BLB-020	Potential	10624	Private		Residential	Overland flow to proposed surface bioretention in RIDOT ROW	523.886141	15368.41221	0.6	110.0	3.6	0.2
PT-BLB-016	RI0007035R-01	OF-NARR426	SCP-BLB-022	Potential	2720	Private		Agriculture	Overland flow to proposed surface bioretention	490.4273506	9280.90141	0.2	44.9	1.1	0.0
PT-BLB-017	RI0007035R-01	OF-NARR426	SCP-BLB-026	Potential	1020	Private		Agriculture	Overland flow to proposed surface bioretention	159.6731671	1347.492599	0.0	15.4	0.3	0.0
PT-BLB-018	RI0007035R-01	OF-NARR426	SCP-BLB-027	Potential	8672	Private		Commercial	Overland flow to proposed surface bioretention	508.2877844	8942.364099	0.4	75.1	3.0	0.3

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - Existing_STU

Segment Name: Bailey's Brook (RI0007035R-01), Group 1A
Date: 12/31/2018

STU ID	WBID	STU Category*	STU Type*	STU Soil Type*	STU WQ Treatment Volume (ft^3)	STU Depth (ft) (Depth of STU. This field is optional to help calculate water quality treatment volume.)	STU Status*	Notes	Total Area (sq ft)
SCP-BLB-043	RI0007035R-01	Structural	Wet Vegetated Treatment System	Silt Loam (0.27 in/hr)	25000		Existing	Private. RIDOT outfall at western side, potentially discharging to extended detention cell. Volume estimated from GIS measurements, aerial imagery, and elevation data.	
SCP-BLB-044	RI0007035R-01	Structural	Wet Vegetated Treatment System	Silt Loam (0.27 in/hr)	64338		Existing	Public. Structure ID 923. RIDOT constructed, for acceptance by Town. Not yet completed or accepted by Town. Treatment Volume from Reconstruction of Two Mile Corner (Routes 138/114) Drainage Report. Drainage area 80.5 ac per this report, but mapping not available at time of SCP development.	
SCP-BLB-045	RI0007035R-01	Structural	Hydrodynamic Separator	Unknown			Existing		

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - Potential_STU

Segment Name: Bailey's Brook (RI0007035R-01), Group 1A
Date: 12/31/2018

STU ID	WBID	STU Category*	STU Type*	STU Soil Type*	STU WQ Treatment Volume (ft^3)	STU Depth (ft) (Depth of STU. This field is optional to help calculate water quality treatment volume.)	STU Status*	Notes	Shape_Length (ft)	Total Area (sq ft)
SCP-BLB-001	RI0007035R-01	Structural	Underground Infiltration System	Loam (0.52 in/hr)	3809		Potential	Inlet from new CB, tie in to existing pipe to the north. HSG A for infiltration practice. Based on 1 row of 23 Stormceptor SC740. Overhead wires, subsurface electric	347.8349434	1813.868495
SCP-BLB-002	RI0007035R-01	Structural	Underground Infiltration System	Loam (0.52 in/hr)	5772		Potential	Inlet from existing pipe. HSG A for infiltration practice. Based on 1 row of 35 Stormceptor SC740. Overhead wires, subsurface utilities possible	753.580378	3627.009051
SCP-BLB-003	RI0007035R-01	Structural	Underground Infiltration System	Loam (0.52 in/hr)	6819		Potential	Inlet from corner catch basin, overflow to existing pipe. Based on 8 rows of 6 Stormceptor SC740. Overhead wires. nearby trees	188.1418106	2170.755126
SCP-BLB-004	RI0007035R-01	Structural	Bioretention Basin	Silt Loam (0.27 in/hr)	3120		Potential	Curb cut, overflow to existing pipe. Partner with school, receive parking lot and school runoff. Pretreatment by parking lot. Poss pipe conflict (stormwater?)	288.2107706	3320.359463
SCP-BLB-005	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	845		Potential	Curb cut, overflow to existing pipe. Utility pole conflict, poss tree conflict	272.8919428	660.4361174
SCP-BLB-006	RI0007035R-01	Structural	Bioretention Basin	Silt Loam (0.27 in/hr)	819		Potential	Curb cut, overflow to existing pipe. Utility pole conflict, poss tree conflict	118.5808141	757.9903001
SCP-BLB-007	RI0007035R-01	Structural	Bioretention Basin	Silt Loam (0.27 in/hr)	0		Potential	Full depth reconstruction TIP project. Separate existing cycle lanes with curbed bioretention cells, curb cut inlet, overflow to existing storm pipes. ROW width sufficient for this STU type. Not sized in this process	501.652399	10468.0552
SCP-BLB-008	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	2665		Potential	Retrofit existing ditch on Ridgewood, 2 curb cuts. Install bioretention swales in ROW along Maplewood	951.5143559	3806.116103
SCP-BLB-009	RI0007035R-01	Structural	Bioretention Basin	Silt Loam (0.27 in/hr)	9536		Potential	Replace upstream catch basin with diversion structure (eg with a weir) to send design volume to pretreatment. Overflow to existing pipe	615.0382568	9776.450674
SCP-BLB-010	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	312		Potential	Curb cut, overflow to existing pipe	114.5134149	389.8310469
SCP-BLB-011	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	12188		Potential	Curb cut, overflow to existing pipe. Conflict existing drainage pipes, overhead wires.	459.764825	2015.411739
SCP-BLB-012	RI0007035R-01	Structural	Bioretention Basin	Silt Loam (0.27 in/hr)	15210		Potential	Narrow rectangle-curb cut to bioretention, overflow to existing CB. Wide rectangle-pipe inlet over riprap from catchbasin in parking lot, overflow to existing pipe downhill.	1156.949092	13702.1505
SCP-BLB-013	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	99.84291045	412.244994
SCP-BLB-014	RI0007035R-01	Structural	Bioretention Basin	Silt Loam (0.27 in/hr)	3159		Potential	Curb cut, overflow to existing pipe, overhead wires, likely maintained by adjacent property owner	364.0642916	2848.179693
SCP-BLB-015a	RI0007035R-01	Structural	Underground Infiltration System	Loam (0.52 in/hr)	4463		Potential	Inlet/overflow from/to existing 30" pipe. May be sufficient depth for infiltration resulting from banked curve. Based on 1 row of 27 Stormceptor SC740. Volume in excess of treatment volume diverted to WVTS downstream (SCP-BLB-015a)	1582.984148	73362.81222
SCP-BLB-015b	RI0007035R-01	Structural	Wet Vegetated Treatment System	Loam (0.52 in/hr)	35616		Potential	Inlet from existing 30" pipe. Volume in excess of design flow bypassed to Brook. Npt water owns parcel, ALT has conservation easement	1582.984148	73362.81222
SCP-BLB-016	RI0007035R-01	Structural	Wet Vegetated Treatment System	Silt Loam (0.27 in/hr)	0		Potential	Retrofit existing basin to WVTS (not sized)	655.6659518	25864.86536
SCP-BLB-017	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	811		Potential	Curb cut either side of catch basin, overflow to existing outfall	180.2333709	807.7703899
SCP-BLB-018	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	0		In Design	TIP 2019, suggest retrofitting bioretention swales in existing drainage ditches, not sized in this process	4096.268665	12416.9503

SCP-BLB-019	RI0007035R-01	Structural	Bioretention Basin	Silt Loam (0.27 in/hr)	2080		Potential	Curb cut, overflow to existing pipe on East Main Rd. State-owns parcel w Npt Water	173.9220479	1860.643056
SCP-BLB-020	RI0007035R-01	Structural	Bioretention Basin	Silt Loam (0.27 in/hr)	2106		Potential	Curb cut, overflow to existing pipe	230.8090638	1928.492559
SCP-BLB-021	RI0007035R-01	Structural	Bioretention Basin	Silt Loam (0.27 in/hr)	3640		Potential	Curb cut, overflow to existing pipe. May require additional excavation. May have subsurface utilities near inlet due to signal	334.1127611	3230.009549
SCP-BLB-022	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	878		Potential	Curb cut, overflow to existing pipe	291.5091359	868.2934047
SCP-BLB-023	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	176.1399735	508.6693083
SCP-BLB-024	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe, Farm access conflict, subsurf elec	176.1399735	508.6693083
SCP-BLB-025	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe, Farm access conflict, overhead wires	176.1399735	508.6693083
SCP-BLB-026	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	176.1399735	508.6693083
SCP-BLB-027	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe, overhead wires	176.1399735	508.6693083
SCP-BLB-028	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	176.1399735	508.6693083
SCP-BLB-029	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	168.2667234	518.1789368
SCP-BLB-030	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	163.8144259	509.6316903
SCP-BLB-031	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe, overhead wires	163.8144259	509.6316903
SCP-BLB-032	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	163.8144259	509.6316903
SCP-BLB-033	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe, overhead wires	163.8144259	509.6316903
SCP-BLB-034	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	163.8144259	509.6316903
SCP-BLB-035	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe, overhead wires	163.8144259	509.6316903
SCP-BLB-036	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	163.8144259	509.6316903
SCP-BLB-037	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe, overhead wires	163.8144259	509.6316903
SCP-BLB-038	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	163.8144259	509.6316903
SCP-BLB-039	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe, overhead wires	163.8144259	509.6316903
SCP-BLB-040	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe	163.8144259	509.6316903
SCP-BLB-041	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe, overhead wires	163.8144259	509.6316903
SCP-BLB-042	RI0007035R-01	Structural	Bioretention Swale	Silt Loam (0.27 in/hr)	364		Potential	Curb cut, overflow to existing pipe. Subsurface utilities may complicate overflow	163.8144259	509.6316903
SCP-BLB-043	RI0007035R-01	Structural	Wet Pond	Silt Loam (0.27 in/hr)	25000		Existing	Existing. Private STU. Volume estimated from GIS measurements, aerial imagery, and elevation data	1230.284997	81289.0725
SCP-BLB-044	RI0007035R-01	Structural	Wet Vegetated Treatment System	Silt Loam (0.27 in/hr)	64338		Existing	Existing. Public. Structure ID 923. RIDOT constructed, for acceptance by Town. Not yet completed or accepted by Town. Treatment Volume from Reconstruction of Two Mile Corner (Routes 138/114) Drainage Report	1314.559384	91114.18527
TP-BLB-026	RI0007035R-01	Structural	TIP	Silt Loam (0.27 in/hr)	3493		Potential	TIP 2019, suggest bioretention swale, WQv=catchment IC area/1"		
TP-BLB-027	RI0007035R-01	Structural	TIP	Silt Loam (0.27 in/hr)	3168		Potential	TIP 2019, suggest bioretention swale, WQv=catchment IC area/1"		
TP-BLB-028	RI0007035R-01	Structural	TIP	Silt Loam (0.27 in/hr)	2232		Potential	TIP 2019, suggest bioretention swale, WQv=catchment IC area/1"		
TP-BLB-029	RI0007035R-01	Structural	TIP	Silt Loam (0.27 in/hr)	53		Potential	TIP 2019, suggest bioretention swale, WQv=catchment IC area/1"		
TP-BLB-030	RI0007035R-01	Structural	TIP	Silt Loam (0.27 in/hr)	5191		Potential	TIP 2019, suggest bioretention swale, WQv=catchment IC area/1"		
TP-BLB-031	RI0007035R-01	Structural	TIP	Silt Loam (0.27 in/hr)	592		Potential	TIP 2019, suggest bioretention swale, WQv=catchment IC area/1"		
TP-BLB-032	RI0007035R-01	Structural	TIP	Silt Loam (0.27 in/hr)	898		Potential	TIP 2019, suggest bioretention swale, WQv=catchment IC area/1"		
TP-BLB-033	RI0007035R-01	Structural	TIP	Silt Loam (0.27 in/hr)	1789		Potential	TIP 2019, suggest bioretention swale, WQv=catchment IC area/1"		

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

Segment Name: Bailey's Brook (RI0007035R-01), Group 1A
Date: 12/31/2018

Fields from GIS			Ponding (Surface) Volume				Void (Subsurface) Volume					Total Storage Volume (ft^3)
STU_ID	STU Type	Storage Volume (ft^3)	Length (ft)	Width (ft)	Depth (ft)	Notes	Length (ft)	Width (ft)	Depth (ft)	Void Space	Notes	
SCP-BLB-001	Underground Infiltrati	3809									Based on 1 row of 23 Stormceptor SC740 chambers	3809
SCP-BLB-002	Underground Infiltrati	5772									Based on 1 row of 35 Stormceptor SC740 chambers	5772
SCP-BLB-003	Underground Infiltrati	6819									Based on 8 rows of 6 Stormceptor SC740 chambers	6819
SCP-BLB-004	Bioretention Basin	3120	80	30	0.5		80	30	2	0.4		3120
SCP-BLB-005	Bioretention Swale	845	130	5	0.5		130	5	2	0.4		845
SCP-BLB-006	Bioretention Basin	819	35	18	0.5		35	18	2	0.4		819
SCP-BLB-008	Bioretention Swale	2665	410	5	0.5		410	5	2	0.4	combines two 60x5, one 45x5, and one 245x5 bioretention swales	2665
SCP-BLB-009	Bioretention Basin	9536	163	45	0.5		163	45	2	0.4		9536
SCP-BLB-010	Bioretention Swale	312	48	5	0.5		48	5	2	0.4		312
SCP-BLB-011	Bioretention Swale	12188	125	75	0.5		125	75	2	0.4		12188
SCP-BLB-012	Bioretention Basin	15210	616	19	0.5		616	19	2	0.4	combines a 90x50 biorention basin and a 400x18 bioretention swale	15210
SCP-BLB-013	Bioretention Swale	364	35	8	0.5		35	8	2	0.4		364
SCP-BLB-014	Bioretention Basin	3159	162	15	0.5		162	15	2	0.4		3159
SCP-BLB-015a	Underground Infiltrati	4463									Based on 1 row of 27 Stormceptor SC740	4463
SCP-BLB-015b	Wet Vegetated Treatn	35616	0	0	0.5		840	53	2	0.4	Based on 44,520 sq ft of Gravel WVTS	35616
SCP-BLB-016	Wet Vegetated Treatn	0										0
SCP-BLB-017	Bioretention Swale	811	78	8	0.5		78	8	2	0.4		811
SCP-BLB-018	Bioretention Swale	0									TIP project in 2019. Treatment credit calculated in TP-BLB-026 to -033. Treatment volume estimated as 13,598 cf or 2,615 ft by 4 ft footprint (average width) with depth and void space as elsewhere in this table for depth and void space	0
SCP-BLB-019	Bioretention Basin	2080	40	40	0.5		40	40	2	0.4		2080
SCP-BLB-020	Bioretention Basin	2106	90	18	0.5		90	18	2	0.4		2106
SCP-BLB-021	Bioretention Basin	3640	140	20	0.5		140	20	2	0.4		3640
SCP-BLB-022	Bioretention Swale	878	135	5	0.5		135	5	2	0.4		878
SCP-BLB-023	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-024	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-025	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-026	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-027	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-028	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-029	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-030	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-031	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-032	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-033	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-034	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-035	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-036	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-037	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-038	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-039	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-040	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-041	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364
SCP-BLB-042	Bioretention Swale	364	70	4	0.5		70	4	2	0.4		364

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - Reduction Targets

Segment Name: Bailey's Brook (RI0007035R-01), Group 1A
Date: 12/31/2018

Subwatershed ID:	Total Subwatershed Area (ac)	Total Subwatershed IC Area (ac)	RIDOT Total Area (ac)[1]	RIDOT Total IC Area (ac)
RI0007035R-01	1,798	583	48.4	40.4

[1] 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)
32%	180	69%	27.8

TMDL Method

Pollutant of Concern[2]	Potential Required TMDL Pollutant Reduction Target (%)[3]	Current RIDOT Load (lb/yr)	RIDOT Pollutant Reduction Target (lb/yr)
Aluminum	0	49.6	0
Cadmium	0	49.6	0
Copper	0	49.6	0
Lead	0	49.6	0
Zinc	80	49.6	39.67
Phosphorus	0	53.9	0
Nitrogen	0	339.0	0

[2] Zinc used as a surrogate for all metals per consent decree.

[3] Assumed pollutant load reduction (%) per TMDL in development. Not yet required.

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - Structural Water Quality Calcs

Segment Name: Bailey's Brook (RI0007035R-01), Group 1A
Date: 12/31/2018

									Water Quality Results								
									Impervious Cover							Runoff Reduction	
STU ID	STU Type*	Total Catchment Area (sq. ft.)	Impervious Catchment Area (Sq. Ft.)	STU Storage Volume definitions (ft^3)	STU Treatment Depth (in.) (Depth of Runoff Treated)	STU Soil Type*	Pervious Catchment Area (sq. ft.)	Catchment % Impervious	Impervious Catchment Area (Acres)	TSS Reduction Factor	Phosphorus Reduction Factor	Runoff Factor	Flow Factor	Pervious Cover Factor	Effective IC Reduction (acres)	Runoff Reduction %	Runoff Reduction (ac-ft)
SCP-BLB-001	Underground Infiltration System	33,253	26,612	3,809	1.72	Loam (0.52 in/hr)	6,641	80%	0.6	1.0	1.0	1.0	1.0	100%	0.6	95%	2.1
SCP-BLB-002	Underground Infiltration System	113,010	108,052	5,772	0.64	Loam (0.52 in/hr)	4,958	96%	2.5	1.0	0.9	0.8	0.6	82%	2.0	72%	6.3
SCP-BLB-003	Underground Infiltration System	145,683	84,044	6,819	0.97	Loam (0.52 in/hr)	61,639	58%	1.9	1.0	1.0	0.9	0.8	93%	1.8	85%	6.1
SCP-BLB-004	Bioretention Basin	52,669	39,768	3,120	0.94	Silt Loam (0.27 in/hr)	12,901	76%	0.9	1.0	0.6	0.1	0.4	54%	0.5	12%	0.4
SCP-BLB-005	Bioretention Swale	9,931	8,436	845	1.20	Silt Loam (0.27 in/hr)	1,495	85%	0.2	1.0	0.6	0.2	0.6	59%	0.1	16%	0.1
SCP-BLB-006	Bioretention Basin	8,587	7,368	819	1.33	Silt Loam (0.27 in/hr)	1,219	86%	0.2	1.0	0.6	0.2	0.6	62%	0.1	19%	0.1
SCP-BLB-008	Bioretention Swale	102,483	71,964	2,665	0.44	Silt Loam (0.27 in/hr)	30,519	70%	1.7	1.0	0.4	0.1	0.3	44%	0.7	6%	0.4
SCP-BLB-009	Bioretention Basin	156,446	85,236	9,536	1.34	Silt Loam (0.27 in/hr)	71,210	54%	2.0	1.0	0.6	0.2	0.6	62%	1.2	19%	1.4
SCP-BLB-010	Bioretention Swale	8,690	6,676	312	0.56	Silt Loam (0.27 in/hr)	2,014	77%	0.2	1.0	0.5	0.1	0.3	47%	0.1	8%	0.0
SCP-BLB-011	Bioretention Swale	1,549,581	536,232	12,188	0.27	Silt Loam (0.27 in/hr)	1,013,349	35%	12.3	0.9	0.3	0.0	0.2	35%	4.3	4%	1.9
SCP-BLB-012	Bioretention Basin	497,381	299,932	15,210	0.61	Silt Loam (0.27 in/hr)	197,449	60%	6.9	1.0	0.5	0.1	0.3	48%	3.3	8%	2.1
SCP-BLB-013	Bioretention Swale	10,898	8,696	364	0.50	Silt Loam (0.27 in/hr)	2,202	80%	0.2	1.0	0.5	0.1	0.3	45%	0.1	7%	0.0
SCP-BLB-014	Bioretention Basin	104,709	44,080	3,159	0.86	Silt Loam (0.27 in/hr)	60,629	42%	1.0	1.0	0.5	0.1	0.4	52%	0.5	11%	0.4
SCP-BLB-015a	Underground Infiltration System	79,610	61,508	4,463	0.87	Loam (0.52 in/hr)	18,102	77%	1.4	1.0	1.0	0.9	0.7	90%	1.3	82%	4.2
SCP-BLB-015b	Wet Vegetated Treatment System	782,929	249,940	35,616	1.71	Loam (0.52 in/hr)	532,989	32%	5.7	1.0	0.7	0.0	0.3	53%	3.0	5%	1.1
SCP-BLB-016	Wet Vegetated Treatment System	237,399	123,788	-	0.00	Silt Loam (0.27 in/hr)	113,611	52%	2.8	0.0	0.0	0.0	0.0	0%	0.0	0%	0.0
SCP-BLB-017	Bioretention Swale	26,738	17,908	811	0.54	Silt Loam (0.27 in/hr)	8,830	67%	0.4	1.0	0.5	0.1	0.3	47%	0.2	7%	0.1
SCP-BLB-018	Bioretention Swale	-	-	-		Silt Loam (0.27 in/hr)	-		0.0	0.0	0.0	0.0	0.0	0%	0.0	0%	0.0
SCP-BLB-019	Bioretention Basin	16,477	14,688	2,080	1.70	Silt Loam (0.27 in/hr)	1,789	89%	0.3	1.0	0.7	0.3	0.7	67%	0.2	24%	0.3
SCP-BLB-020	Bioretention Basin	23,724	16,908	2,106	1.49	Silt Loam (0.27 in/hr)	6,816	71%	0.4	1.0	0.6	0.2	0.7	65%	0.3	21%	0.3
SCP-BLB-021	Bioretention Basin	81,651	42,684	3,640	1.02	Silt Loam (0.27 in/hr)	38,967	52%	1.0	1.0	0.6	0.1	0.5	55%	0.5	13%	0.5
SCP-BLB-022	Bioretention Swale	19,604	9,376	878	1.12	Silt Loam (0.27 in/hr)	10,228	48%	0.2	1.0	0.6	0.2	0.5	57%	0.1	15%	0.1
SCP-BLB-023	Bioretention Swale	5,613	3,360	364	1.30	Silt Loam (0.27 in/hr)	2,253	60%	0.1	1.0	0.6	0.2	0.6	61%	0.0	18%	0.1
SCP-BLB-024	Bioretention Swale	5,928	3,412	364	1.28	Silt Loam (0.27 in/hr)	2,516	58%	0.1	1.0	0.6	0.2	0.6	61%	0.0	18%	0.1
SCP-BLB-025	Bioretention Swale	5,034	4,344	364	1.01	Silt Loam (0.27 in/hr)	690	86%	0.1	1.0	0.6	0.1	0.5	55%	0.1	13%	0.0
SCP-BLB-026	Bioretention Swale	8,210	5,440	364	0.80	Silt Loam (0.27 in/hr)	2,770	66%	0.1	1.0	0.5	0.1	0.4	51%	0.1	10%	0.0
SCP-BLB-027	Bioretention Swale	19,198	18,652	364	0.23	Silt Loam (0.27 in/hr)	546	97%	0.4	0.8	0.3	0.0	0.2	33%	0.1	3%	0.1
SCP-BLB-028	Bioretention Swale	7,153	4,644	364	0.94	Silt Loam (0.27 in/hr)	2,509	65%	0.1	1.0	0.6	0.1	0.4	54%	0.1	12%	0.0
SCP-BLB-029	Bioretention Swale	9,677	6,180	364	0.71	Silt Loam (0.27 in/hr)	3,497	64%	0.1	1.0	0.5	0.1	0.4	50%	0.1	9%	0.0
SCP-BLB-030	Bioretention Swale	9,769	5,564	364	0.79	Silt Loam (0.27 in/hr)	4,205	57%	0.1	1.0	0.5	0.1	0.4	51%	0.1	10%	0.0
SCP-BLB-031	Bioretention Swale	8,778	7,672	364	0.57	Silt Loam (0.27 in/hr)	1,106	87%	0.2	1.0	0.5	0.1	0.3	47%	0.1	8%	0.0
SCP-BLB-032	Bioretention Swale	7,267	4,068	364	1.07	Silt Loam (0.27 in/hr)	3,199	56%	0.1	1.0	0.6	0.2	0.5	56%	0.1	14%	0.0
SCP-BLB-033	Bioretention Swale	5,270	4,772	364	0.92	Silt Loam (0.27 in/hr)	498	91%	0.1	1.0	0.6	0.1	0.4	53%	0.1	12%	0.0
SCP-BLB-034	Bioretention Swale	5,717	3,128	364	1.40	Silt Loam (0.27 in/hr)	2,589	55%	0.1	1.0	0.6	0.2	0.7	63%	0.0	20%	0.1
SCP-BLB-035	Bioretention Swale	5,857	5,248	364	0.83	Silt Loam (0.27 in/hr)	609	90%	0.1	1.0	0.5	0.1	0.4	51%	0.1	11%	0.0
SCP-BLB-036	Bioretention Swale	5,830	3,396	364	1.29	Silt Loam (0.27 in/hr)	2,434	58%	0.1	1.0	0.6	0.2	0.6	61%	0.0	18%	0.1
SCP-BLB-037	Bioretention Swale	5,805	4,644	364	0.94	Silt Loam (0.27 in/hr)	1,161	80%	0.1	1.0	0.6	0.1	0.4	54%	0.1	12%	0.0
SCP-BLB-038	Bioretention Swale	7,050	4,232	364	1.03	Silt Loam (0.27 in/hr)	2,818	60%	0.1	1.0	0.6	0.1	0.5	55%	0.1	13%	0.0
SCP-BLB-039	Bioretention Swale	5,412	3,928	364	1.11	Silt Loam (0.27 in/hr)	1,484	73%	0.1	1.0	0.6	0.2	0.5	57%	0.1	15%	0.0
SCP-BLB-040	Bioretention Swale	4,128	2,688	364	1.63	Silt Loam (0.27 in/hr)	1,440	65%	0.1	1.0	0.7	0.3	0.7	66%	0.0	23%	0.1
SCP-BLB-041	Bioretention Swale	3,491	3,128	364	1.40	Silt Loam (0.27 in/hr)	363	90%	0.1	1.0	0.6	0.2	0.7	63%	0.0	20%	0.1
SCP-BLB-042	Bioretention Swale	4,026	2,056	364	2.12	Silt Loam (0.27 in/hr)	1,970	51%	0.0	1.0	0.7	0.3	0.7	69%	0.0	28%	0.1
SCP-BLB-043	Wet Vegetated Treatment System	304,154	274,532	25,000	1.09	Silt Loam (0.27 in/hr)	29,622	90%	6.3	1.0	0.7	0.0	0.3	50%	3.1	3%	0.6
SCP-BLB-044	Wet Vegetated Treatment System	3,506,580	1,232,748	64,338	0.63	Silt Loam (0.27 in/hr)	2,273,832	35%	28.3	1.0	0.6	0.0	0.2	45%	12.6	1%	1.3
SCP-BLB-045	Hydrodynamic Separator	155,164	144,712	-	0.00	Unknown	10,452	93%	3.3	0.3	0.1	0.0	0.0	10%	0.3	0%	0.0
TP-BLB-026	TIP	25,043	21,000	3,493	2.00	Silt Loam (0.27 in/hr)	4,043	84%	0.5	0.5	0.5	0.5	0.5	50%	0.2	50%	0.9
TP-BLB-027	TIP	21,362	18,504	3,168	2.05	Silt Loam (0.27 in/hr)	2,858	87%	0.4	0.5	0.5	0.5	0.5	50%	0.2	50%	0.8

TP-BLB-028	TIP	28,659	26,788	2,232	1.00	Silt Loam (0.27 in/hr)	1,871	93%	0.6	0.5	0.5	0.5	0.5	50%	0.3	50%	1.1
TP-BLB-029	TIP	953	640	53	1.00	Silt Loam (0.27 in/hr)	313	67%	0.0	0.5	0.5	0.5	0.5	50%	0.0	50%	0.0
TP-BLB-030	TIP	65,750	62,288	5,191	1.00	Silt Loam (0.27 in/hr)	3,462	95%	1.4	0.5	0.5	0.5	0.5	50%	0.7	50%	2.6
TP-BLB-031	TIP	7,173	7,100	592	1.00	Silt Loam (0.27 in/hr)	73	99%	0.2	0.5	0.5	0.5	0.5	50%	0.1	50%	0.3
TP-BLB-032	TIP	12,774	10,772	898	1.00	Silt Loam (0.27 in/hr)	2,002	84%	0.2	0.5	0.5	0.5	0.5	50%	0.1	50%	0.4
TP-BLB-033	TIP	27,173	21,472	1,789	1.00	Silt Loam (0.27 in/hr)	5,701	79%	0.5	0.5	0.5	0.5	0.5	50%	0.2	50%	0.9

Segment Name: Bailey's Brook (RI0007035R-01), Group 1A
Date: 12/31/2018

						Water Quality Results					
STU ID	Activity Type*	Contributing Area (ac)	Impervious Cover (ac)	Volume of Solids Collected Per Event (ft^3)	Annual Sweeping or Cleaning Frequency*	Annual Volume of Solids (ft^3)	Phosphorus Reduction (lb/year)	Nitrogen Reduction (lb/year)	TSS Reduction (lb/yr)	Zinc Reduction (lb/yr)	Equivalent IC Removal Credit (ac)
SCP-BLB-046	Catch Basin Cleaning	50.3	42.1	10	2	20	1.19	11.9	1700	2.04	0.891385768

Pollutant to TSS Ratio[1]		
lbs P/ lbs TSS	lbs N/ lbs TSS	lbs Zn/ lbs TSS
0.0007	0.0070	0.0012

[1] calculated from Table 16 of the USGS Report Quality of Stormwater Runoff Discharged from Massachusetts Highways, 2005-2007 .

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - STU_WaterQuality

Segment Name: Bailey's Brook (RI0007035R-01), Group 1A
Date: 12/31/2018

STU ID	Catchment Area (sqft)	RIDOT Catchment Area (sqft)	Impervious Area of STU catchment (sqft)	RIDOT Impervious Area of STU catchment (sqft)	Treatment Depth (inches) (Depth of Runoff Treated)	TP Load (lb/year)	RIDOT TP Load (lb/year)	TP Removal (%)	TP Removal (lb/year)	RIDOT TP Removal (lb/year)	TN Load (lb/year)	RIDOT TN Load (lb/year)	TN Removal (%)	TN Removal (lb/year)	RIDOT TN Removal (lb/year)	TSS Load (lb/year)	RIDOT TSS Load (lb/year)	TSS Removal (%)	TSS Removal (lb/year)	RIDOT TSS Removal (lb/year)	Zinc Load (lb/year)	RIDOT ZN Load (lb/year)	Zinc Removal (%)	Zinc Removal (lb/year)	RIDOT ZN Removal (lb/year)	Effective IC Reduction (acres)	RIDOT Effective IC Reduction (acres)	IC Removal (%) (Pervious Cover Factor *100)	Runoff Reduction (ac-ft)	Runoff Factor	Flow Factor	Total Phosphorus Factor	Total Suspended Solids Factor	Cost	Cost Per Acre IC Removed	Retrofit Priority
SCP-BLB-001	33253	25151	26612	22104	1.7	0.9	0.7	98	0.9	0.7	6.0	4.3	100	6.0	4.3	354	313	100	354	313	0.8	0.6	100	0.8	0.6	0.6	0.5	100	2.1	1.0	1.0	1.0	1.0	516900	847400	3
SCP-BLB-002	113010	24423	108052	23824	0.6	4.2	0.7	83	3.5	0.6	33.8	4.6	96	32.3	4.4	1067	336	98	1048	330	3.3	0.7	99	3.3	0.7	2.0	0.5	82	6.3	0.8	0.6	0.9	1.0	783300	382100	3
SCP-BLB-003	145683	54006	84044	43404	1.0	3.7	1.4	93	3.4	1.3	23.1	8.6	99	22.8	8.5	1061	618	100	1060	617	1.9	1.2	100	1.9	1.2	1.8	0.9	93	6.1	0.9	0.8	1.0	1.0	925300	514100	3
SCP-BLB-004	52669	6524	39768	5708	0.9	1.6	0.2	52	0.8	0.1	13.2	1.1	32	4.2	0.4	384	81	99	379	80	1.2	0.2	97	1.2	0.2	0.5	0.1	54	0.4	0.1	0.4	0.6	1.0	49800	101600	3
SCP-BLB-005	9931	9931	8436	8436	1.2	0.3	0.3	55	0.1	0.1	1.7	1.7	34	0.6	0.6	120	120	99	119	119	0.2	0.2	97	0.2	0.2	0.1	0.1	59	0.1	0.2	0.6	0.6	1.0	30900	280900	3
SCP-BLB-006	8587	8587	7368	7368	1.3	0.2	0.2	56	0.1	0.1	1.5	1.5	35	0.5	0.5	105	105	100	105	105	0.2	0.2	98	0.2	0.2	0.1	0.1	62	0.1	0.2	0.6	0.6	1.0	21800	218000	3
SCP-BLB-008	102483	0	71964	0	0.4	3.9	0.0	39	1.5	0.0	24.0	0.0	24	5.8	0.0	744	0	92	687	0	1.2	0.0	95	1.1	0.0	0.7	0.0	44	0.4	0.1	0.3	0.4	1.0	75400	103300	3
SCP-BLB-009	156446	38710	85236	27436	1.3	3.4	0.9	56	1.9	0.5	27.1	5.5	35	9.6	2.0	934	394	100	931	393	2.6	0.8	98	2.6	0.8	1.2	0.4	62	1.4	0.2	0.6	0.6	1.0	124000	102500	1
SCP-BLB-010	8690	8690	6676	6676	0.6	0.2	0.2	43	0.1	0.1	1.3	1.3	27	0.4	0.4	95	95	96	91	91	0.2	0.2	96	0.2	0.2	0.1	0.1	47	0.0	0.1	0.3	0.5	1.0	17900	255700	2
SCP-BLB-011	1549581	23595	536232	16824	0.3	24.4	0.5	29	7.2	0.2	209.5	3.4	19	38.8	0.6	5409	241	77	4165	186	17.3	0.5	91	15.7	0.4	4.3	0.1	35	1.9	0.0	0.2	0.3	0.9	147700	34100	3
SCP-BLB-012	497381	0	299932	0	0.6	12.8	0.0	44	5.6	0.0	108.8	0.0	28	30.6	0.0	2725	0	97	2645	0	9.5	0.0	96	9.2	0.0	3.3	0.0	48	2.1	0.1	0.3	0.5	1.0	224700	67900	3
SCP-BLB-013	10898	10898	8696	8696	0.5	0.3	0.3	41	0.1	0.1	1.7	1.7	26	0.4	0.4	124	124	94	117	117	0.3	0.3	96	0.2	0.2	0.1	0.1	45	0.0	0.1	0.3	0.5	1.0	17200	191100	2
SCP-BLB-014	104709	27050	44080	21444	0.9	2.0	0.7	48	1.0	0.3	13.0	4.3	31	4.0	1.3	571	306	98	559	300	1.0	0.6	96	1.0	0.6	0.5	0.3	52	0.4	0.1	0.4	0.5	1.0	57900	111300	2
SCP-BLB-015a	79610	79610	61508	61508	0.9	1.9	1.9	91	1.8	1.8	12.2	12.2	98	12.0	12.0	878	878	99	872	872	1.7	1.7	100	1.7	1.7	1.3	1.3	90	4.2	0.9	0.7	1.0	1.0	605600	473100	2
SCP-BLB-015b	782929	32111	249940	23944	1.7	14.2	0.8	64	9.1	0.5	91.7	4.8	74	67.6	3.5	2968	342	99	2927	337	4.6	0.7	91	4.2	0.6	3.0	0.3	53	1.1	0.0	0.3	0.7	1.0	555600	184600	2
SCP-BLB-016	237399	0	123788	0	0.0	5.4	0.0	0	0.0	0.0	45.8	0.0	0	0.0	0.0	1146	0	0	0	0	4.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0		3
SCP-BLB-017	26738	26738	17908	17908	0.5	0.6	0.6	42	0.2	0.2	3.6	3.6	27	1.0	1.0	258	258	95	246	246	0.5	0.5	96	0.5	0.5	0.2	0.2	47	0.1	0.1	0.3	0.5	1.0	25700	135300	2
SCP-BLB-018	0	0	0	0																									0.0	0.0	0.0	0.0	0.0	0		TIP
SCP-BLB-019	16477	16477	14688	14688	1.7	0.5	0.5	60	0.3	0.3	2.9	2.9	38	1.1	1.1	208	208	100	208	208	0.4	0.4	98	0.4	0.4	0.2	0.2	67	0.3	0.3	0.7	0.7	1.0	35000	159100	3
SCP-BLB-020	23724	8355	16908	6284	1.5	0.8	0.2	58	0.5	0.1	4.8	1.3	37	1.8	0.5	200	90	100	200	90	0.4	0.2	98	0.3	0.2	0.3	0.1	65	0.3	0.2	0.7	0.6	1.0	40300	161200	3
SCP-BLB-021	81651	15777	42684	9104	1.0	1.8	0.3	53	0.9	0.2	14.3	1.9	32	4.6	0.6	445	133	99	441	132	1.3	0.3	97	1.3	0.3	0.5	0.1	55	0.5	0.1	0.5	0.6	1.0	60700	112400	3
SCP-BLB-022	19604	10324	9376	6656	1.1	0.4	0.2	53	0.2	0.1	2.5	1.4	33	0.8	0.4	141	96	99	139	95	0.2	0.2	97	0.2	0.2	0.1	0.1	57	0.1	0.2	0.5	0.6	1.0	31700	264200	2
SCP-BLB-023	5613	5613	3360	3360	1.3	0.1	0.1	56	0.1	0.1	0.7	0.7	35	0.2	0.2	49	49	100	49	49	0.1	0.1	98	0.1	0.1	0.0	0.0	61	0.1	0.2	0.6	0.6	1.0	20400	408000	2
SCP-BLB-024	5928	5928	3412	3412	1.3	0.1	0.1	56	0.1	0.1	0.7	0.7	35	0.2	0.2	50	50	100	50	50	0.1	0.1	98	0.1	0.1	0.0	0.0	61	0.1	0.2	0.6	0.6	1.0	20400	408000	2
SCP-BLB-025	5034	5034	4344	4344	1.0	0.1	0.1	53	0.1	0.1	0.9	0.9	32	0.3	0.3	62	62	99	61	61	0.1	0.1	97	0.1	0.1	0.1	0.1	55	0.0	0.1	0.5	0.6	1.0	20400	408000	2
SCP-BLB-026	8210	6863	5440	4420	0.8	0.2	0.1	48	0.1	0.1	1.2	0.9	31	0.4	0.3	79	64	98	78	63	0.1	0.1	96	0.1	0.1	0.1	0.1	51	0.0	0.1	0.4	0.5	1.0	20400	340000	2
SCP-BLB-027	19198	10255	18652	9980	0.2	0.7	0.3	27	0.2	0.1	4.9	1.9	17	0.8	0.3	216	141	73	157	103	0.6	0.3	89	0.5	0.2	0.1	0.1	33	0.1	0.0	0.2	0.3	0.8	20400	145700	2
SCP-BLB-028	7153	7153	4644	4644	0.9	0.2	0.2	52	0.1	0.1	1.0	1.0	32	0.3	0.3	67	67	99	66	66	0.1	0.1	97	0.1	0.1	0.1	0.1	54	0.0	0.1	0.4	0.6	1.0	20400	340000	2
SCP-BLB-029	9677	9677	6180	6180	0.7	0.2	0.2	46	0.1	0.1	1.3	1.3	30	0.4	0.4	89	89	98	87	87	0.2	0.2	96	0.2	0.2	0.1	0.1	50	0.0	0.1	0.4	0.5	1.0	20400	291400	2
SCP-BLB-030	9769	9769	5564	5564	0.8	0.2	0.2	48	0.1	0.1	1.2	1.2	31	0.4	0.4	81	81	98	79	79	0.2	0.2	96	0.2	0.2	0.1	0.1	51	0.0	0.1	0.4	0.5	1.0	20400	340000	2
SCP-BLB-031	8778	8778	7672	7672	0.6	0.2	0.2	43	0.1	0.1	1.5	1.5	27	0.4	0.4	109	109	96	105	105	0.2	0.2	96	0.2	0.2	0.1	0.1	47	0.0	0.1	0.3	0.5	1.0	20400	255000	2
SCP-BLB-032	7267	7267	4068	4068	1.1	0.1	0.1	54	0.1	0.1	0.9	0.9	33	0.3	0.3	59	59	99	58	58	0.1	0.1	97	0.1	0.1	0.1	0.1	56	0.0	0.2	0.5	0.6	1.0	20400	408000	2
SCP-BLB-033	5270	5270	4772	4772	0.9	0.2	0.2	51	0.1	0.1	0.9	0.9	32	0.3	0.3	67	67	99	66	66	0.1	0.1	97	0.1	0.1	0.1	0.1	53	0.0	0.1	0.4	0.6	1.0	20400	340000	2
SCP-BLB-034	5717	5717	3128	3128	1.4	0.1	0.1	57	0.1	0.1	0.7	0.7	36	0.2	0.2	46	46	100	46	46	0.1	0.1	98	0.1	0.1	0.0	0.0	63	0.1	0.2	0.7	0.6	1.0	20400	408000	2
SCP-BLB-035	5857	5857	5248	5248	0.8	0.2	0.2	49	0.1	0.1	1.0	1.0	31	0.3	0.3	74	74	98	73	73	0.2	0.2	96	0.1	0.1	0.1	0.1	51	0.0	0.1	0.4	0.5	1.0	20400	340000	2
SCP-BLB-036	5830	5830	3396	3396	1.3	0.1	0.1	56	0.1	0.1	0.7	0.7	35	0.2	0.2	49	49	100	49	49	0.1	0.1	98	0.1	0.1	0.0	0.0	61	0.1	0.2	0.6	0.6	1.0	20400	408000	2
SCP-BLB-037	5805	5805	4644	4644	0.9	0.2	0.2	52	0.1	0.1	0.9	0.9	32	0.3	0.3	66	66	99	65	65	0.1	0.1	97	0.1	0.1	0.1	0.1	54	0.0	0.1	0.4	0.6	1.0	20400	340000	2
SCP-BLB-038	7050	7050	4232	4232	1.0	0.1	0.1	53	0.1	0.1	0.9	0.9	32	0.3	0.3	61	61	99	60	60	0.1	0.1	97	0.1	0.1	0.1	0.1	55	0.0	0.1	0.5	0.6	1.0	20400	408000	2
SCP-BLB-039	5412	5412	3928	3928	1.1	0.1	0.1	54	0.1	0.1	0.8	0.8	33	0.3	0.3	56	56	99	56	56	0.1	0.1	97	0.1	0.1	0.1	0.1	57	0.0	0.2	0.5	0.6	1.0	20400	408000	2
SCP-BLB-040	4128	4128	2688	2688	1.6	0.1	0.1	59	0.1	0.1	0.6	0.6	38	0.2	0.2	39	39	100	39	39	0.1	0.1	98	0.1	0.1	0.0	0.0	66	0.1	0.3	0.7	0.7	1.0	20400	510000	2
SCP-BLB-041	3491	3491	3128	3128	1.4	0.1	0.1	57	0.1	0.1	0.6	0.6	36	0.2	0.2	44	44	100	44	44	0.1	0.1	98	0.1	0.1	0.0	0.0	63	0.1	0.2	0.7	0.6	1.0	20400	408000	2
SCP-BLB-042	4026	4026	2056	2056	2.1	0.1	0.1	63	0.0	0.0	0.4	0.4	40	0.2	0.2	30	30	100	30	30	0.1	0.1	99	0.1	0.1	0.0	0.0	69	0.1	0.3	0.7	0.7	1.0	20400	680000	2
SCP-BLB-043	304154	41364	274532	38140	1.1	10.9	1.2	62	6.7	0.7	89.7	7.4	69	62.0	5.1	2600	539	97	2531	525	8.5	1.1	90	7.7	1.0	3.1	0.4	50	0.6	0.0	0.3	0.7	1.0			Existing
SCP-BLB-044	3506580	152911	1232748	142960	0.6	80.7	4.4	50	40.6	2.2	500.9	27.8	57	283.1	15.7	16613	2019	90	14986	1821	26.9	4.0	88	23.6	3.5	12.6	1.5	45	1.3	0.0	0.2	0.6	1.0			Existing
SCP-BLB-045	155164	155164	144712	144712	0.0	4.5	4.5	10	0.4	0.4	28.1	28.1	0	0.0	0.0	2044	2044	25	511	511	4.1	4.1	0	0.0	0.0	0.3	0.3	10	0.0	0.0	0.0	0.1	0.3			Existing
TP-BLB-026	25043	25043	21000	21000	2.0	0.7	0.7	45	0.3	0.3	4.1	4.1	45	1.9	1.9	298	298	45	134	134	0.6	0.6	45	0.3	0.3	0.2	0.2	50	0.9	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-027	21362	21362	18504	18504	2.1	0.6	0.6	45	0.3	0.3	3.6	3.6	45	1.6	1.6	262	262	45	118	118	0.5	0.5	45	0.2	0.2	0.2	0.2	50	0.8	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-028	28659	28659	26788	26788	1.0	0.8	0.8	45	0.4	0.4	5.2	5.2	45	2.3	2.3	378	378	45	170	170	0.8	0.8	45	0.3	0.3	0.3	0.3	50	1.1	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-029	953	953	640	640	1.0	0.0	0.0	45	0.0	0.0	0.1	0.1	45	0.1	0.1	9	9	45	4	4	0.0	0.0	45	0.0	0.0	0.0	0.0	50	0.0	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-030	65750	65750	62288	62288	1.0	1.9	1.9	45	0.9	0.9	12.1	12.1	45	5.4	5.4	879	879	45	396	396	1.8	1.8	45	0.8	0.8	0.7	0.7	50	2.6	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-031	7173	7173	7100	7100	1.0	0.2	0.2	45	0.1	0.1	1.4	1.4	45	0.6	0.6	100	100	45	45	45	0.2	0.2	45	0.1	0.1	0.1	0.1	50	0.3	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-032	12774	12774	10772	10772	1.0	0.3	0.3	45	0.2	0.2	2.1	2.1	45	1.0	1.0	153	153	45	69	69	0.3	0.3	45	0.1	0.1	0.1	0.1	50	0.4	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-033	27173	27173	21472	21472	1.0	0.7	0.7	45	0.3	0.3	4.3	4.3	45	1.9	1.9	306	306	45	138	138	0.6	0.6	45	0.3	0.3	0.2	0.2	50	0.9	0.5	0.5	0.5	0.5	0	0	TIP

APPENDIX B-A
Stormwater Controls
Pollutant Calculations - STU_WaterQuality

Segment Name: Bailey's Brook (RI0007035R-01), Group 1A
Date: 12/31/2018

STU ID	Catchment Area (sqft)	RIDOT Catchment Area (sqft)	Impervious Area of STU catchment (sqft)	RIDOT Impervious Area of STU catchment (sqft)	Treatment Depth (inches) (Depth of Runoff Treated)	TP Load (lb/year)	RIDOT TP Load (lb/year)	TP Removal (%)	TP Removal (lb/year)	RIDOT TP Removal (lb/year)	TN Load (lb/year)	RIDOT TN Load (lb/year)	TN Removal (%)	TN Removal (lb/year)	RIDOT TN Removal (lb/year)	TSS Load (lb/year)	RIDOT TSS Load (lb/year)	TSS Removal (%)	TSS Removal (lb/year)	RIDOT TSS Removal (lb/year)	Zinc Load (lb/year)	RIDOT ZN Load (lb/year)	Zinc Removal (%)	Zinc Removal (lb/year)	RIDOT ZN Removal (lb/year)	Effective IC Reduction (acres)	RIDOT Effective IC Reduction (acres)	IC Removal (%) (Pervious Cover Factor *100)	Runoff Reduction (ac-ft)	Runoff Factor	Flow Factor	Total Phosphorus Factor	Total Suspended Solids Factor	Cost	Cost Per Acre IC Removed	Retrofit Priority
SCP-BLB-001	33253	25151	26612	22104	1.7	0.9	0.7	98	0.9	0.7	6.0	4.3	100	6.0	4.3	354	313	100	354	313	0.8	0.6	100	0.8	0.6	0.6	0.5	100	2.1	1.0	1.0	1.0	1.0	516900	847400	3
SCP-BLB-002	113010	24423	108052	23824	0.6	4.2	0.7	83	3.5	0.6	33.8	4.6	96	32.3	4.4	1067	336	98	1048	330	3.3	0.7	99	3.3	0.7	2.0	0.5	82	6.3	0.8	0.6	0.9	1.0	783300	382100	3
SCP-BLB-003	145683	54006	84044	43404	1.0	3.7	1.4	93	3.4	1.3	23.1	8.6	99	22.8	8.5	1061	618	100	1060	617	1.9	1.2	100	1.9	1.2	1.8	0.9	93	6.1	0.9	0.8	1.0	1.0	925300	514100	3
SCP-BLB-004	52669	6524	39768	5708	0.9	1.6	0.2	52	0.8	0.1	13.2	1.1	32	4.2	0.4	384	81	99	379	80	1.2	0.2	97	1.2	0.2	0.5	0.1	54	0.4	0.1	0.4	0.6	1.0	49800	101600	3
SCP-BLB-005	9931	9931	8436	8436	1.2	0.3	0.3	55	0.1	0.1	1.7	1.7	34	0.6	0.6	120	120	99	119	119	0.2	0.2	97	0.2	0.2	0.1	0.1	59	0.1	0.2	0.6	0.6	1.0	30900	280900	3
SCP-BLB-006	8587	8587	7368	7368	1.3	0.2	0.2	56	0.1	0.1	1.5	1.5	35	0.5	0.5	105	105	100	105	105	0.2	0.2	98	0.2	0.2	0.1	0.1	62	0.1	0.2	0.6	0.6	1.0	21800	218000	3
SCP-BLB-008	102483	0	71964	0	0.4	3.9	0.0	39	1.5	0.0	24.0	0.0	24	5.8	0.0	744	0	92	687	0	1.2	0.0	95	1.1	0.0	0.7	0.0	44	0.4	0.1	0.3	0.4	1.0	75400	103300	3
SCP-BLB-009	156446	38710	85236	27436	1.3	3.4	0.9	56	1.9	0.5	27.1	5.5	35	9.6	2.0	934	394	100	931	393	2.6	0.8	98	2.6	0.8	1.2	0.4	62	1.4	0.2	0.6	0.6	1.0	124000	102500	1
SCP-BLB-010	8690	8690	6676	6676	0.6	0.2	0.2	43	0.1	0.1	1.3	1.3	27	0.4	0.4	95	95	96	91	91	0.2	0.2	96	0.2	0.2	0.1	0.1	47	0.0	0.1	0.3	0.5	1.0	17900	255700	2
SCP-BLB-011	1549581	23595	536232	16824	0.3	24.4	0.5	29	7.2	0.2	209.5	3.4	19	38.8	0.6	5409	241	77	4165	186	17.3	0.5	91	15.7	0.4	4.3	0.1	35	1.9	0.0	0.2	0.3	0.9	147700	34100	3
SCP-BLB-012	497381	0	299932	0	0.6	12.8	0.0	44	5.6	0.0	108.8	0.0	28	30.6	0.0	2725	0	97	2645	0	9.5	0.0	96	9.2	0.0	3.3	0.0	48	2.1	0.1	0.3	0.5	1.0	224700	67900	3
SCP-BLB-013	10898	10898	8696	8696	0.5	0.3	0.3	41	0.1	0.1	1.7	1.7	26	0.4	0.4	124	124	94	117	117	0.3	0.3	96	0.2	0.2	0.1	0.1	45	0.0	0.1	0.3	0.5	1.0	17200	191100	2
SCP-BLB-014	104709	27050	44080	21444	0.9	2.0	0.7	48	1.0	0.3	13.0	4.3	31	4.0	1.3	571	306	98	559	300	1.0	0.6	96	1.0	0.6	0.5	0.3	52	0.4	0.1	0.4	0.5	1.0	57900	111300	2
SCP-BLB-015a	79610	79610	61508	61508	0.9	1.9	1.9	91	1.8	1.8	12.2	12.2	98	12.0	12.0	878	878	99	872	872	1.7	1.7	100	1.7	1.7	1.3	1.3	90	4.2	0.9	0.7	1.0	1.0	605600	473100	2
SCP-BLB-015b	782929	32111	249940	23944	1.7	14.2	0.8	64	9.1	0.5	91.7	4.8	74	67.6	3.5	2968	342	99	2927	337	4.6	0.7	91	4.2	0.6	3.0	0.3	53	1.1	0.0	0.3	0.7	1.0	555600	184600	2
SCP-BLB-016	237399	0	123788	0	0.0	5.4	0.0	0	0.0	0.0	45.8	0.0	0	0.0	0.0	1146	0	0	0	0	4.0	0.0	0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0		3
SCP-BLB-017	26738	26738	17908	17908	0.5	0.6	0.6	42	0.2	0.2	3.6	3.6	27	1.0	1.0	258	258	95	246	246	0.5	0.5	96	0.5	0.5	0.2	0.2	47	0.1	0.1	0.3	0.5	1.0	25700	135300	2
SCP-BLB-018	0	0	0	0																									0.0	0.0	0.0	0.0	0.0	0		TIP
SCP-BLB-019	16477	16477	14688	14688	1.7	0.5	0.5	60	0.3	0.3	2.9	2.9	38	1.1	1.1	208	208	100	208	208	0.4	0.4	98	0.4	0.4	0.2	0.2	67	0.3	0.3	0.7	0.7	1.0	35000	159100	3
SCP-BLB-020	23724	8355	16908	6284	1.5	0.8	0.2	58	0.5	0.1	4.8	1.3	37	1.8	0.5	200	90	100	200	90	0.4	0.2	98	0.3	0.2	0.3	0.1	65	0.3	0.2	0.7	0.6	1.0	40300	161200	3
SCP-BLB-021	81651	15777	42684	9104	1.0	1.8	0.3	53	0.9	0.2	14.3	1.9	32	4.6	0.6	445	133	99	441	132	1.3	0.3	97	1.3	0.3	0.5	0.1	55	0.5	0.1	0.5	0.6	1.0	60700	112400	3
SCP-BLB-022	19604	10324	9376	6656	1.1	0.4	0.2	53	0.2	0.1	2.5	1.4	33	0.8	0.4	141	96	99	139	95	0.2	0.2	97	0.2	0.2	0.1	0.1	57	0.1	0.2	0.5	0.6	1.0	31700	264200	2
SCP-BLB-023	5613	5613	3360	3360	1.3	0.1	0.1	56	0.1	0.1	0.7	0.7	35	0.2	0.2	49	49	100	49	49	0.1	0.1	98	0.1	0.1	0.0	0.0	61	0.1	0.2	0.6	0.6	1.0	20400	408000	2
SCP-BLB-024	5928	5928	3412	3412	1.3	0.1	0.1	56	0.1	0.1	0.7	0.7	35	0.2	0.2	50	50	100	50	50	0.1	0.1	98	0.1	0.1	0.0	0.0	61	0.1	0.2	0.6	0.6	1.0	20400	408000	2
SCP-BLB-025	5034	5034	4344	4344	1.0	0.1	0.1	53	0.1	0.1	0.9	0.9	32	0.3	0.3	62	62	99	61	61	0.1	0.1	97	0.1	0.1	0.1	0.1	55	0.0	0.1	0.5	0.6	1.0	20400	408000	2
SCP-BLB-026	8210	6863	5440	4420	0.8	0.2	0.1	48	0.1	0.1	1.2	0.9	31	0.4	0.3	79	64	98	78	63	0.1	0.1	96	0.1	0.1	0.1	0.1	51	0.0	0.1	0.4	0.5	1.0	20400	340000	2
SCP-BLB-027	19198	10255	18652	9980	0.2	0.7	0.3	27	0.2	0.1	4.9	1.9	17	0.8	0.3	216	141	73	157	103	0.6	0.3	89	0.5	0.2	0.1	0.1	33	0.1	0.0	0.2	0.3	0.8	20400	145700	2
SCP-BLB-028	7153	7153	4644	4644	0.9	0.2	0.2	52	0.1	0.1	1.0	1.0	32	0.3	0.3	67	67	99	66	66	0.1	0.1	97	0.1	0.1	0.1	0.1	54	0.0	0.1	0.4	0.6	1.0	20400	340000	2
SCP-BLB-029	9677	9677	6180	6180	0.7	0.2	0.2	46	0.1	0.1	1.3	1.3	30	0.4	0.4	89	89	98	87	87	0.2	0.2	96	0.2	0.2	0.1	0.1	50	0.0	0.1	0.4	0.5	1.0	20400	291400	2
SCP-BLB-030	9769	9769	5564	5564	0.8	0.2	0.2	48	0.1	0.1	1.2	1.2	31	0.4	0.4	81	81	98	79	79	0.2	0.2	96	0.2	0.2	0.1	0.1	51	0.0	0.1	0.4	0.5	1.0	20400	340000	2
SCP-BLB-031	8778	8778	7672	7672	0.6	0.2	0.2	43	0.1	0.1	1.5	1.5	27	0.4	0.4	109	109	96	105	105	0.2	0.2	96	0.2	0.2	0.1	0.1	47	0.0	0.1	0.3	0.5	1.0	20400	255000	2
SCP-BLB-032	7267	7267	4068	4068	1.1	0.1	0.1	54	0.1	0.1	0.9	0.9	33	0.3	0.3	59	59	99	58	58	0.1	0.1	97	0.1	0.1	0.1	0.1	56	0.0	0.2	0.5	0.6	1.0	20400	408000	2
SCP-BLB-033	5270	5270	4772	4772	0.9	0.2	0.2	51	0.1	0.1	0.9	0.9	32	0.3	0.3	67	67	99	66	66	0.1	0.1	97	0.1	0.1	0.1	0.1	53	0.0	0.1	0.4	0.6	1.0	20400	340000	2
SCP-BLB-034	5717	5717	3128	3128	1.4	0.1	0.1	57	0.1	0.1	0.7	0.7	36	0.2	0.2	46	46	100	46	46	0.1	0.1	98	0.1	0.1	0.0	0.0	63	0.1	0.2	0.7	0.6	1.0	20400	408000	2
SCP-BLB-035	5857	5857	5248	5248	0.8	0.2	0.2	49	0.1	0.1	1.0	1.0	31	0.3	0.3	74	74	98	73	73	0.2	0.2	96	0.1	0.1	0.1	0.1	51	0.0	0.1	0.4	0.5	1.0	20400	340000	2
SCP-BLB-036	5830	5830	3396	3396	1.3	0.1	0.1	56	0.1	0.1	0.7	0.7	35	0.2	0.2	49	49	100	49	49	0.1	0.1	98	0.1	0.1	0.0	0.0	61	0.1	0.2	0.6	0.6	1.0	20400	408000	2
SCP-BLB-037	5805	5805	4644	4644	0.9	0.2	0.2	52	0.1	0.1	0.9	0.9	32	0.3	0.3	66	66	99	65	65	0.1	0.1	97	0.1	0.1	0.1	0.1	54	0.0	0.1	0.4	0.6	1.0	20400	340000	2
SCP-BLB-038	7050	7050	4232	4232	1.0	0.1	0.1	53	0.1	0.1	0.9	0.9	32	0.3	0.3	61	61	99	60	60	0.1	0.1	97	0.1	0.1	0.1	0.1	55	0.0	0.1	0.5	0.6	1.0	20400	408000	2
SCP-BLB-039	5412	5412	3928	3928	1.1	0.1	0.1	54	0.1	0.1	0.8	0.8	33	0.3	0.3	56	56	99	56	56	0.1	0.1	97	0.1	0.1	0.1	0.1	57	0.0	0.2	0.5	0.6	1.0	20400	408000	2
SCP-BLB-040	4128	4128	2688	2688	1.6	0.1	0.1	59	0.1	0.1	0.6	0.6	38	0.2	0.2	39	39	100	39	39	0.1	0.1	98	0.1	0.1	0.0	0.0	66	0.1	0.3	0.7	0.7	1.0	20400	510000	2
SCP-BLB-041	3491	3491	3128	3128	1.4	0.1	0.1	57	0.1	0.1	0.6	0.6	36	0.2	0.2	44	44	100	44	44	0.1	0.1	98	0.1	0.1	0.0	0.0	63	0.1	0.2	0.7	0.6	1.0	20400	408000	2
SCP-BLB-042	4026	4026	2056	2056	2.1	0.1	0.1	63	0.0	0.0	0.4	0.4	40	0.2	0.2	30	30	100	30	30	0.1	0.1	99	0.1	0.1	0.0	0.0	69	0.1	0.3	0.7	0.7	1.0	20400	680000	2
SCP-BLB-043	304154	41364	274532	38140	1.1	10.9	1.2	62	6.7	0.7	89.7	7.4	69	62.0	5.1	2600	539	97	2531	525	8.5	1.1	90	7.7	1.0	3.1	0.4	50	0.6	0.0	0.3	0.7	1.0			Existing
SCP-BLB-044	3506580	152911	1232748	142960	0.6	80.7	4.4	50	40.6	2.2	500.9	27.8	57	283.1	15.7	16613	2019	90	14986	1821	26.9	4.0	88	23.6	3.5	12.6	1.5	45	1.3	0.0	0.2	0.6	1.0			Existing
SCP-BLB-045	155164	155164	144712	144712	0.0	4.5	4.5	10	0.4	0.4	28.1	28.1	0	0.0	0.0	2044	2044	25	511	511	4.1	4.1	0	0.0	0.0	0.3	0.3	10	0.0	0.0	0.0	0.1	0.3			Existing
TP-BLB-026	25043	25043	21000	21000	2.0	0.7	0.7	45	0.3	0.3	4.1	4.1	45	1.9	1.9	298	298	45	134	134	0.6	0.6	45	0.3	0.3	0.2	0.2	50	0.9	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-027	21362	21362	18504	18504	2.1	0.6	0.6	45	0.3	0.3	3.6	3.6	45	1.6	1.6	262	262	45	118	118	0.5	0.5	45	0.2	0.2	0.2	0.2	50	0.8	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-028	28659	28659	26788	26788	1.0	0.8	0.8	45	0.4	0.4	5.2	5.2	45	2.3	2.3	378	378	45	170	170	0.8	0.8	45	0.3	0.3	0.3	0.3	50	1.1	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-029	953	953	640	640	1.0	0.0	0.0	45	0.0	0.0	0.1	0.1	45	0.1	0.1	9	9	45	4	4	0.0	0.0	45	0.0	0.0	0.0	0.0	50	0.0	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-030	65750	65750	62288	62288	1.0	1.9	1.9	45	0.9	0.9	12.1	12.1	45	5.4	5.4	879	879	45	396	396	1.8	1.8	45	0.8	0.8	0.7	0.7	50	2.6	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-031	7173	7173	7100	7100	1.0	0.2	0.2	45	0.1	0.1	1.4	1.4	45	0.6	0.6	100	100	45	45	45	0.2	0.2	45	0.1	0.1	0.1	0.1	50	0.3	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-032	12774	12774	10772	10772	1.0	0.3	0.3	45	0.2	0.2	2.1	2.1	45	1.0	1.0	153	153	45	69	69	0.3	0.3	45	0.1	0.1	0.1	0.1	50	0.4	0.5	0.5	0.5	0.5	0	0	TIP
TP-BLB-033	27173	27173	21472	21472	1.0	0.7	0.7	45	0.3	0.3	4.3	4.3	45	1.9	1.9	306	306	45	138	138	0.6	0.6	45	0.3	0.3	0.2	0.2	50	0.9	0.5	0.5	0.5	0.5	0	0	TIP

APPENDIX C-A

SEGMENT NAME (RIXXXXXXXX-XX)

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	Constructability	Other	STU Recommended
EX-BLB-001				X				X		X								X	X					X					
EX-BLB-013				X								X	X		X			X	X					X					
EX-BLB-015				X								X	X				X	X	X					X					
NF-BLB-002				X				X					X				X	X	X					X					
NF-BLB-006				X									X		X		X	X	X					X					
NF-BLB-007				X											X		X	X	X					X					
NF-BLB-016				X													X	X	X					X					
PT-BLB-003				X								X	X		X				X					X		X			X
PT-BLB-004				X								X	X						X					X		X			X
PT-BLB-005				X								X							X					X					X
PT-BLB-008				X									X					X	X										X
PT-BLB-009				X														X	X							X			X
PT-BLB-010				X														X	X					X		X			X
PT-BLB-017				X														X	X					X					X
PT-BLB-019				X								X						X	X					X					X
PT-BLB-020				X						X									X				X	X		X			X
PT-BLB-021				X														X	X				X			X		X	X
PT-BLB-022				X														X	X										X
PT-BLB-023				X														X	X					X					X
PT-BLB-024				X						X									X					X		X			X
PT-BLB-025	X			X														X	X					X		X			X
PT-BLB-035				X														X	X				X	X		X			X
PT-BLB-036				X														X	X				X			X			X
PT-BLB-037				X									X					X	X					X		X			X
PT-BLB-039				X														X	X					X		X			X

	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	Constructability	Other	STU Recommended
PT-BLB-040				X														X	X							X			X
PT-BLB-041				X														X	X					X		X			X
PT-BLB-042				X														X	X					X		X			X
PT-BLB-043				X														X	X							X			X
PT-BLB-044				X				X				X						X	X					X		X			X
PT-BLB-045				X				X										X	X					X		X			X
PT-BLB-047				X				X										X	X							X			X
PT-BLB-048				X				X										X	X							X			X
PT-BLB-049				X				X		X								X	X					X		X			X
PT-BLB-050				X														X	X							X			X
PT-BLB-051				X						X								X	X					X		X			X
PT-BLB-052				X														X	X							X			X
PT-BLB-053				X						X								X	X					X		X			X
PT-BLB-054				X														X	X					X		X			X
PT-BLB-055				X						X								X	X					X		X			X
PT-BLB-056				X														X	X							X			X
PT-BLB-057				X														X	X					X		X			X
PT-BLB-058				X													X	X					X			X			X
PT-BLB-059				X													X	X					X			X			X
PT-BLB-062				X													X	X					X			X			X
TP-BLB-011				X								X					X	X					X	X					X
TP-BLB-014				X								X					X	X					X	X					X
TP-BLB-018				X								X					X	X					X	X					X
TP-BLB-026				X													X	X					X						X
TP-BLB-027				X													X	X					X						X

	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	Constructability	Other	STU Recommended
TP-BLB-028	X			X									X				X	X					X						X
TP-BLB-029	X			X													X	X					X						X
TP-BLB-030	X			X								X					X	X					X						X
TP-BLB-031				X													X	X					X						X
TP-BLB-032				X													X	X					X						X
TP-BLB-033				X									X				X	X					X						X
TP-BLB-034				X								X	X				X	X					X	X					
TP-BLB-038				X													X	X					X	X					
TP-BLB-046				X								X	X				X	X					X						
TP-BLB-060				X													X	X					X						
TP-BLB-061				X													X	X					X						
TP-BLB-063				X													X	X					X						

APPENDIX D-A

Bailey Brook and Tribs (RI0007035R-01)

TIP PROJECTS

TIP ID	Location	Description	Year(s)
1355	RT 138A, Aquidneck Ave (East Main Rd to Green End Ave)	This line item involves resurfacing to the roadway and includes drainage and sidewalk improvements (one side).	2018-2019
1356	Two Mile Corner	Reconstruction of Two Mile Corner (Routes 138/114) East Main Road (West Main Rd to Bailey Brook) and West Main Rd (Smythe St to Maplewood Rd), Middletown. Remove and replace pavement structure, widening to accommodate additional turn lanes, new drainage system, new traffic signal systems, and new sidewalk/ADA improvements	2018
1357	RT 138, East Main RD (Portsmouth T/L To Aquidneck Ave)	This line item involves resurfacing to the roadway.	2024-2025
1359	RT 214, VALLEY RD (GREEN END AVE TO RT 138)	This line item involves resurfacing to the roadway, limited sidewalk replacement and handicapped ramp installation.	2024-2025
9005	East Main Road Shard Use Path - Hedly St to Enterprise Drive	Create shared-use path for ped & bike within the East Main Road (RI-138) corridor, from Enterprise Dr to Hedly St, including signal improvements to intersections of Union St & Sandy Point Rd at East Main Road. This project is a subset of project ID #5080	2021-2022

FIGURE 1-A

Bailey Brook and Tribs (RI0007035R-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

N

0 3,000 Feet

Figure 1-A

Bailey's Brook
RI0007035R-01
Impaired Subwatershed

December 2018

RI dot
Driven to get you there