Town of Wilmington

Stormwater Infrastructure Mapping Project

September 2019

VTDEC – CLEAN WATER INITIATIVE PROGRAM, WATERSHED MANAGEMENT DIVISION

https://dec.vermont.gov/water-investment/cwi/solutions/developed-lands/idde

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Overview

This stormwater infrastructure mapping project was completed for the municipality by the Agency of Natural Resources Clean Water Initiative Program to supplement the existing drainage data collected by the town and with the intention of providing a tool for planning, maintenance, and inspection of the stormwater infrastructure.

The GIS maps and geodatabase are meant to provide an overall picture and understanding of the connectivity or connectedness of the storm system on both public and private properties. They can be used to: (1) raise the awareness of the need for regular maintenance, the generation and transport of nonpoint source pollution increases with increasing connectivity of a drainage system, (2) as a valuable tool for hazardous material spill planning and prevention, (3) for the detection and elimination of illicit discharges; outfall locations and system connectedness data are used as a base for locating illicit or illegal discharges of non-stormwater to the municipal storm system and tracing them up to the source, (4) better assist the municipality in planning and implementing combined stormwater-sewer separation projects, (5) inform options for cleaning up existing polluted stormwater discharges; this report provides information and guidance for potential retrofit treatment locations and opportunities, (6) assist municipalities and residents with emergency preparedness for large rainfall events (i.e. Tropical Storm or Hurricanes) or spring snowmelt runoff events, by keeping storm drains clean, clear and open a good deal of localized flooding could be prevented, and (7) the basis for a local stormwater ordinance or be used to help enhance an existing stormwater management program.

Project Summary

The principal goal of this project was to develop up to date municipal drainage maps. These drainage maps were created showing the paths that stormwater runoff travels from where it falls on impervious surfaces such as parking lots, roads, and rooftops, to the outfall points in various receiving waters. These maps show the stormwater infrastructure including features like pipes, manholes, catchbasins, and swales within a municipality. Data sources included data collected from field work, a mapping grade Trimble GPS unit, available state permit plans, record drawings, town plans, WWMD plans, existing GIS data from contractors, and the input and guidance of knowledgeable members from the municipalities.

A second goal of this project was to establish potential locations for Best Management Practice (BMP) stormwater retrofit sites. These are sites where stormwater treatment structures could be added and where they would be most cost effective and efficient for sediment and phosphorus or nitrogen removal. In order to develop a retrofit site list, drainage area subwatersheds were delineated around the drainage networks. Determining how the stormwater infrastructure was connected was necessary in determining the subwatershed drainage areas within the town.

Delineating the drainage areas was done using the stormwater infrastructure maps, along with satellite imagery, a Digital Elevation Model (DEM), and USGS topographic maps. These data sources were used to approximate where the land area within each municipality was draining to; as well as where the high points were that divided the sub-drainage areas. The completed maps show the drainage coverage for essentially the entire municipality, but with a focus on areas with greater concentrations of impervious cover.

Impervious cover layers were created by either hand digitization or by using a method of raster pixel calculation (with ArcGIS spatial analyst extension) to create a vegetation index using the best available 4 band imagery (2016 NAIP). The area which contrasted with the vegetation represents impervious surfaces and was then modified with buffered water and roads layers to make it more accurate. A more detailed explanation of this process is available in a separate document. The impervious layer was used to calculate the

percent of each delineated drainage area that would generate stormwater runoff. The percentage of impervious surface number for each subwatershed was then adjusted with a connectivity rating. A rating was assigned to each drainage area polygon describing how directly connected the impervious surfaces within that subwatershed are to the receiving water. By adjusting the percent impervious area numbers with this connectivity rating the effective impervious area (EIA) was established for each subwatershed (*Sutherland, 1995*). This effective impervious number is a more accurate description of the amount of runoff produced by each of the subwatersheds because it helps to take factors such as infiltration into account.

After the effective impervious numbers were calculated for the subwatersheds the Simple Method was used to estimate the annual sediment (TSS) and phosphorus (TP) or Nitrogen (TN) loads generated by each subwatershed. The Simple method uses information which includes the adjusted impervious value, average annual rainfall for the location, total subwatershed area, and a given pollutant concentration value to calculate an annual load for various pollutants (*Schueler,1987*). Pollutant loads estimated by the Simple Method in this project are planning level estimates and are meant to give a general idea of the amounts of sediment or nutrient wash-off produced by each subwatershed for prioritization purposes. Subwatersheds were then prioritized, using the loading calculations as well as other criteria, and given Action List numbers ranging from 1 to 3 (one being the highest priority). The Action List number depends both upon loading values and feasibility of potential retrofit treatment options. Potential retrofit options listed in the TARGET maps are based on field observations and not on actual availability of land or willingness of landowner.

Water Quality Volume (WQv – the amount of storage needed to treat stormwater from a 0.9-1.0-inch storm) and Channel Protection Volume (CPv – the volume of storage that is needed to hold and slowly release stormwater for a 2.1inch rain event) were also calculated for delineated subwatershed areas. CPv calculations are only applicable if the receiving water is not a large body of water and is therefore susceptible to channel erosion. These numbers were used in the retrofit recommendation process because the volume of water to be treated was a key factor in determining the type of retrofit.

Project References

Schueler, T. 1987. Technical Documentation of a Simple Method for Estimating Urban Storm Pollutant Export. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs. Appendix A.

Schueler, T. et.al., 2007. Urban Stormwater Retrofit Practices, Version 1.0. Manual 3, Center for Watershed Protection, August 2007.

Sutherland, R. 1995. Methodology for Estimating the Effective Impervious Area of Urban Watersheds. Technical Note 58 – Pervious Area Management. Watershed Protection Techniques. Vol. 2, No. 1

***All data was created in an ArcGIS 10 Geodatabase format and is available from VTDEC.**

Act 64 Municipal Roads General Permit (MRGP)

The 2015 Vermont Legislature adopted Act 64 which will require all municipalities to address stormwater runoff from all hydrologically connected existing municipal roads. In January 2018 the final general permit was issued; municipalities must file a notice of intent to comply with the permit by July 31, 2018. As part of this permit all municipalities will be required, as explained below, to evaluate connected road segments with catch basin served infrastructure to determine compliance with MRGP Standards by December 31, 2020 as part of their road erosion inventory. The permit will require:

- Municipalities to develop road stormwater management plans. These plans will include a comprehensive (1) Road Erosion Inventory (REI) of hydrologically-connected road segments and (2) an Implementation Table.
- The inventory will include an evaluation of municipal hydrologically-connected road segments to determine if they meet the MRGP standards.
- Those road segments that do not currently meet MRGP standards and that can impact waterways will be prioritized for remediation within the Implementation Table. DEC has developed an Implementation Table-excel spread sheet template for this purpose.

Municipalities will submit annual reports to DEC due on April 1st starting in 2019. The Annual Reports will document progress in upgrading roads to meet MRGP standards. Municipalities will be able to use the spread sheet, mentioned above, for annual compliance reporting requirements. This report and the mapping information contained in it can be used by municipalities to develop the plan for the paved road segments with catchbasins that are hydrologically directly connected. The map(s) and data provided with this report indicate where these road segments outfalls are located using the best available mapping information DEC has to date. The MRGP standard for paved roads with catch basins is that any outfalls that are eroded will have to be stabilized with practices such as stone aprons, culvert headwalls, and stone-lined ditches. As with other classes of roads covered by this permit the municipality should first check the maps provided. DEC suggests municipalities take the following steps to check the maps and/or data provided to determine what outfalls will require municipal attention for erosion repair:

1. Using the provided maps and/or data as a guide confirm that the road draining to this outfall is paved, has at least two catch basins or drop inlets, and the discharge pipe from those catchbasins is directly discharging to waters of the state. Include any outfall from these road segments that discharges within 500 linear feet of surface waters.

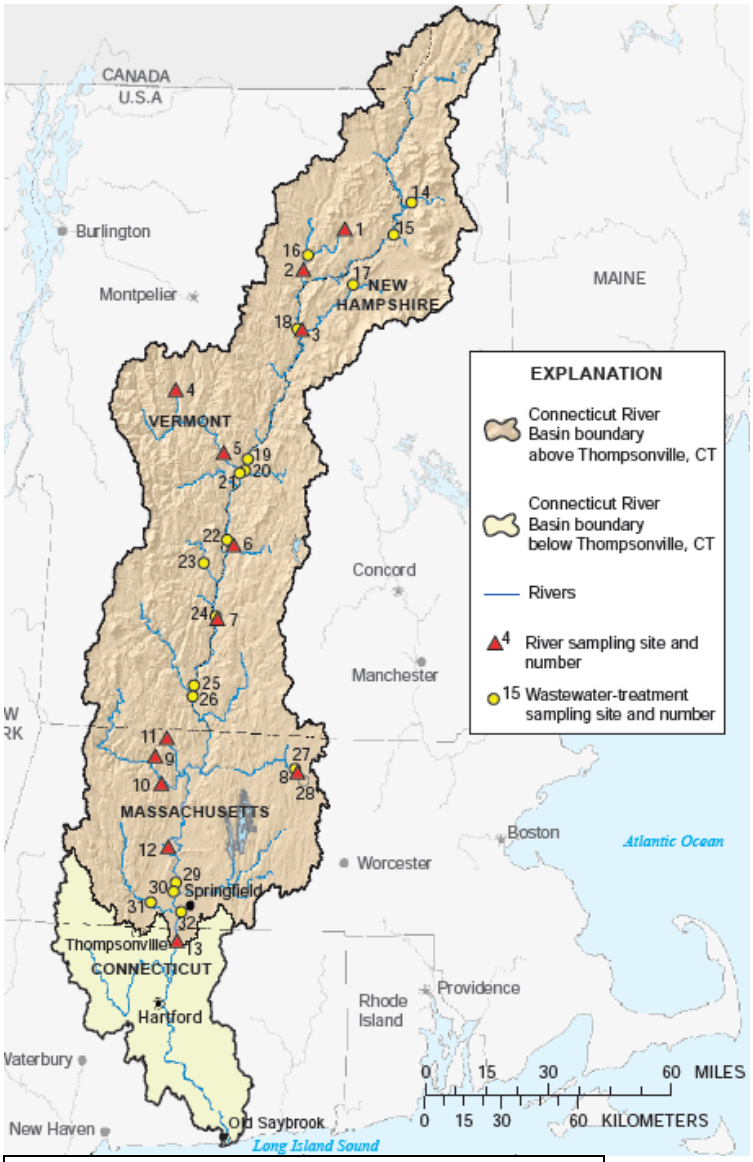
2. Using the maps locate the outfall and note any level of erosion present in the outfall and/or in the 500 foot or less long swale between the pipe outlet and waters of the state.

3. Prepare a list of all outfalls with notes pertaining to the erosion using the Guidance and Field Sheet or the i-phone application.
   Inventory Guidance:
   http://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/Permitinformation/MunicipalRoads/sw_MRGP_PavedRoadsWithCathBasins_REI-Supplement.pdf

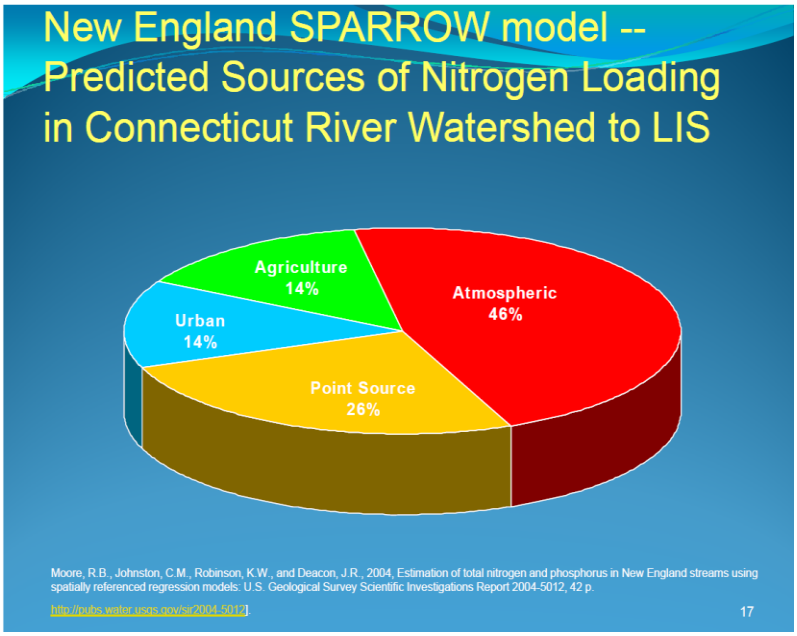
   Field Sheet (use form C only):
   http://dec.vermont.gov/sites/dec/files/wsm/stormwater/docs/Permitinformation/MunicipalRoads/sw_MRGP_RoadErosionInventory.pdf

   i-phone application: Please contact Ryan Knox at Ryan.Knox@vermont.gov

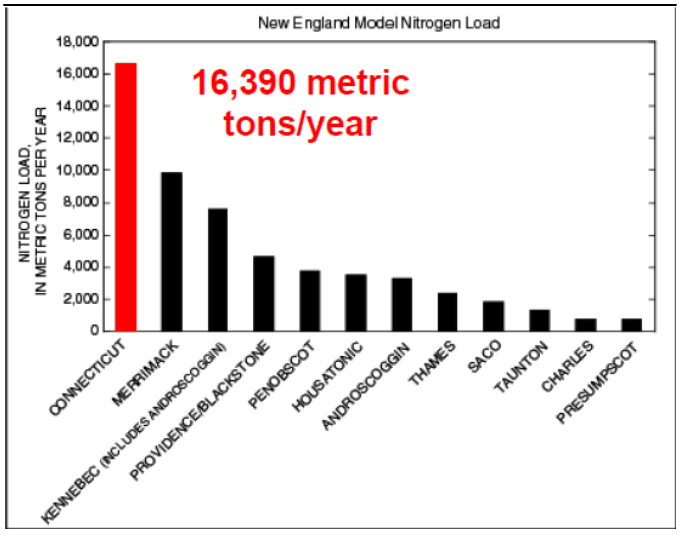
Long Island Sound – Connecticut River Watershed Nitrogen Overview



- This map shows an overview of the extent of the Connecticut River watershed including areas of Vermont, New Hampshire, Massachusetts, and Connecticut.



- This figure shows the modeled nitrogen loading contribution per year from the Connecticut River basin to the Long Island Sound.



- This graph shows the breakdown of the modeled nitrogen load from the Connecticut River watershed to the Long Island Sound from various sources.

- Above figure taken from USGS – *Assessment of Total Nitrogen in the Upper Connecticut River Basin in New Hampshire, Vermont, and Massachusetts, Dec 2002 – Sept 2005*. http://pubs.usgs.gov/sir/2006/5144/pdf/sir2006-5144.pdf

- Above figures taken from EPA/USGS – *Application of NHDPlus for SPARROW nutrient modeling of the Northeastern and Mid-Atlantic Region of the US* http://www.awra.org/orlando2010/presentations/Session22/NHDPlus_SPARROW_AWRA20100330-good.pdf

Subwatershed Data

Tables showing calculations and Priority drainage area retrofit possibilities

This is a key showing the abbreviations of the different funding programs listed in the calculation sheets.

Abbreviation Key	
Code	**Funding Program**
BR	Better Roads-VTrans
ERP/CWIP	VTDEC Clean Water Initiative Program
LCBP	Lake Champlain Basin Program
LISFF	Long Island Sound Futures Fund
SRF	Clean Water State Revolving Loan Fund
VTrans	Vermont Agency of Transportation Alternatives or Municipal Highway and Stormwater Mitigation Programs

This is a key showing the abbreviations of the different stormwater treatment structures or practices listed in the calculation sheets.

Abbreviation Key	
Code	**Structure Type**
BB	Baffle Box
BFCB	Baffled Catchbasin
BRA	Bioretention Area or Raingarden
BS	Buffer Strip (25' Min.)
CB	Catch Basin
CBI	Catch Basin Insert
CD	Check Dam
CR or ESRD	Impervious Disconnection Credits
DP/DS	Dry Pond or Dry Swale
DW	Drywell
EDP (EDPMP)	Extended Detention Pond (with Micropool)
GS	Grass Swale
IB/ IG	Infiltration Basin or Infiltration Gallery
MOD	Modifications/upgrade to 2017 SW Standards
OF	Overland Flow
OGF	Organic Filter
PA/PC/PV	Pervious Asphalt or Pervious Concrete or Pervious Pavers
POP	Pocket Pond
PP	Perforated Pipe or Underdrain
PS	Pump Station
RDD	Roof Drain Disconnect
RR/RS	Rock Riprap or Rock Swale
SB	Sedimentation Basin
SF	Sand Filter (aka Surface Sand Filter)
SS or VS	Swirl Separator
SWPPP	Stormwater Pollution Prevention Plan
TT	Treatment Tank
WL/WP/WS	Wetland (Constructed) or Wet Pond or Wet Swale (aka Bioswale)

Wilmington - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
1 Wilmington			CB/GS		7.1	46.9	3923	3923	32.70	32.70
2 Wilmington			OF/GS/CB		4.2	39.2	1505	1505	12.54	12.54
3 Wilmington			CB/GS		7.4	53.7	3954	3954	32.95	32.95
4 Wilmington			OF		3.2	17.1	488	488	4.07	4.07
5 Wilmington			GB/GS		6.7	32.6	2549	2549	21.24	21.24
6 Wilmington			CB/GS		6.8	29.9	2377	2377	19.81	19.81
7 Wilmington			CB		18.7	13.1	3187	3187	26.56	26.56
8 Wilmington			OF		6.2	38.3	2157	2157	17.97	17.97
9 Wilmington	1	Modify existing Detention Pond to 2002 standards, add bioretention area in front of Shaws at 97 E Main St	BRA/MOD/SB/CB/ GS	3223-9010	12.1	33.6	1460	876	16.22	9.73
10 Wilmington			CB		0.5	80.4	466	466	3.89	3.89
11 Wilmington			GS		8.2	7.0	720	720	6.00	6.00
12 Wilmington			OF/URB/DB	5363-9010	11.3	19.3	250	250	6.26	6.26
13 Wilmington			OGF/GS		4.5	28.4	1116	1116	9.30	9.30
14 Wilmington			OF		19.9	7.6	1817	1817	15.14	15.14
15 Wilmington			CB		6.9	34.3	2745	2745	22.88	22.88
16 Wilmington			CB		6.1	37.9	2694	2694	22.45	22.45
17 Wilmington			OF/GS		19.6	14.2	2555	2555	21.29	21.29
18 Wilmington			GS/CB		4.0	31.9	1496	1496	12.47	12.47
19 Wilmington			OF/GS/CB		11.7	29.6	3016	3016	25.13	25.13
20 Wilmington			OF/GS/CB		10.2	11.2	1133	1133	9.44	9.44
21 Wilmington			GS		8.9	5.8	741	741	6.17	6.17
22 Wilmington			GS/CB		9.7	3.6	724	724	6.04	6.04
23 Wilmington			OF/GS		21.6	9.2	2146	2146	17.89	17.89
24 Wilmington			GS		5.2	26.5	1196	1196	9.96	9.96
25 Wilmington			CB		33.3	6.1	2808	2808	23.40	23.40
26 Wilmington			GS/CB		3.9	43.6	1587	1587	13.23	13.23
27 Wilmington			OF/CB		5.0	29.9	1743	1743	14.52	14.52
28 Wilmington			GS/WP/CB		59.2	6.4	3047	3047	33.85	33.85
29 Wilmington			GS		10.2	24.9	2191	2191	18.25	18.25
30 Wilmington			CB	5066-9015	0.6	70.9	483	483	4.03	4.03
31 Wilmington			CB	5066-9015	2.5	74.1	2412	2412	20.10	20.10
32 Wilmington			CB/EDPMP	5066-9015	3.2	54.9	273	273	6.82	6.82
33 Wilmington			GA/OF		46.9	9.5	4753	4753	39.61	39.61
34 Wilmington			OF/CB		5.0	20.0	861	861	7.17	7.17
35 Wilmington			CB		1.2	34.3	377	377	3.14	3.14
36 Wilmington			CB		1.8	27.8	593	593	4.94	4.94
37 Wilmington			CB		1.0	25.5	308	308	2.57	2.57
38 Wilmington			CB		1.1	19.0	179	179	1.49	1.49
39 Wilmington			CB		12.2	21.8	3170	3170	26.42	26.42
40 Wilmington			CB/GS		35.1	6.8	3061	3061	25.51	25.51
42 Wilmington			CB/OF		16.3	9.2	1623	1623	13.52	13.52
43 Wilmington			OF		82.5	5.9	6875	6875	57.29	57.29
44 Wilmington			CB/GS/SWPPP	4657-9003	130.9	5.3	9532	9532	79.43	79.43
45 Wilmington			CB		19.8	12.8	2401	2401	20.01	20.01
46 Wilmington			CB/SWPPP	4657-9003	5.0	22.2	854	854	7.11	7.11
47 Wilmington			OF		17.4	1.9	1210	1210	10.08	10.08
48 Wilmington			CB/GS		4.3	8.7	417	417	3.48	3.48
49 Wilmington			CB		5.1	20.8	911	911	7.59	7.59
50 Wilmington			OF/GS		23.5	5.0	1873	1873	15.61	15.61

Wilmington - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Nitrogen or Phosphorus Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
1 Wilmington	0.22	FALSE					CWIP,SRF,LISF	111	$51,056
2 Wilmington	0.09	FALSE					CWIP,SRF,LISF	43	$19,578
3 Wilmington	0.22	FALSE					CWIP,SRF,LISF	112	$51,458
4 Wilmington	0.03	FALSE					CWIP,SRF,LISF	14	$6,353
5 Wilmington	0.14	FALSE					CWIP,SRF,LISF	72	$33,165
6 Wilmington	0.13	FALSE					CWIP,SRF,LISF	67	$30,933
7 Wilmington	0.18	FALSE					CWIP,SRF,LISF	90	$41,472
8 Wilmington	0.12	FALSE					CWIP,SRF,LISF	61	$28,066
9 Wilmington	0.14	FALSE		$50,000	$86	$4,743	CWIP,SRF,LISF	69	$31,656
10 Wilmington	0.03	FALSE					CWIP,SRF,LISF	13	$6,068
11 Wilmington	0.04	FALSE					CWIP,SRF,LISF	20	$9,369
12 Wilmington	0.07	FALSE					CWIP,SRF,LISF	35	$16,293
13 Wilmington	0.06	FALSE					CWIP,SRF,LISF	32	$14,528
14 Wilmington	0.10	FALSE					CWIP,SRF,LISF	51	$23,641
15 Wilmington	0.16	FALSE					CWIP,SRF,LISF	78	$35,726
16 Wilmington	0.15	FALSE					CWIP,SRF,LISF	76	$35,062
17 Wilmington	0.14	0.31					CWIP,SRF,LISF	72	$33,244
18 Wilmington	0.08	FALSE					CWIP,SRF,LISF	42	$19,472
19 Wilmington	0.17	FALSE					CWIP,SRF,LISF	85	$39,248
20 Wilmington	0.06	FALSE					CWIP,SRF,LISF	32	$14,747
21 Wilmington	0.04	FALSE					CWIP,SRF,LISF	21	$9,640
22 Wilmington	0.04	FALSE					CWIP,SRF,LISF	20	$9,425
23 Wilmington	0.12	FALSE					CWIP,SRF,LISF	61	$27,929
24 Wilmington	0.07	FALSE					CWIP,SRF,LISF	34	$15,559
25 Wilmington	0.16	FALSE					CWIP,SRF,LISF	79	$36,546
26 Wilmington	0.09	FALSE					CWIP,SRF,LISF	45	$20,656
27 Wilmington	0.10	FALSE					CWIP,SRF,LISF	49	$22,681
28 Wilmington	0.29	0.42					CWIP,SRF,LISF	144	$66,074
29 Wilmington	0.12	0.28					CWIP,SRF,LISF	62	$28,505
30 Wilmington	0.03	FALSE					CWIP,SRF,LISF	14	$6,285
31 Wilmington	0.14	FALSE					CWIP,SRF,LISF	68	$31,389
32 Wilmington	0.08	FALSE					CWIP,SRF,LISF	39	$17,755
33 Wilmington	0.27	FALSE					CWIP,SRF,LISF	134	$61,853
34 Wilmington	0.05	FALSE					CWIP,SRF,LISF	24	$11,199
35 Wilmington	0.02	FALSE					CWIP,SRF,LISF	11	$4,908
36 Wilmington	0.03	FALSE					CWIP,SRF,LISF	17	$7,722
37 Wilmington	0.02	FALSE					CWIP,SRF,LISF	9	$4,011
38 Wilmington	0.01	FALSE					CWIP,SRF,LISF	5	$2,323
39 Wilmington	0.18	FALSE					CWIP,SRF,LISF	90	$41,253
40 Wilmington	0.17	FALSE					CWIP,SRF,LISF	87	$39,838
42 Wilmington	0.09	FALSE					CWIP,SRF,LISF	46	$21,114
43 Wilmington	0.39	FALSE					CWIP,SRF,LISF	194	$89,458
44 Wilmington	0.60	FALSE					CWIP,SRF,LISF	300	$137,820
45 Wilmington	0.14	FALSE					CWIP,SRF,LISF	68	$31,243
46 Wilmington	0.05	FALSE					CWIP,SRF,LISF	27	$12,344
47 Wilmington	0.07	FALSE					CWIP,SRF,LISF	34	$15,743
48 Wilmington	0.02	FALSE					CWIP,SRF,LISF	12	$5,427
49 Wilmington	0.05	FALSE					CWIP,SRF,LISF	26	$11,857
50 Wilmington	0.11	0.13					CWIP,SRF,LISF	53	$24,371

Wilmington - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
51 Wilmington			OF/GS		17.8	2.2	1246	1246	10.39	10.39
52 Wilmington			OF/GS		21.5	2.4	1522	1522	12.68	12.68
53 Wilmington			GS		3.4	36.3	1102	1102	9.18	9.18
54 Wilmington			CB/GS		1.8	80.5	1662	1662	13.85	13.85
55 Wilmington			CB		4.5	27.3	1065	1065	8.88	8.88
56 Wilmington			CB		1.8	39.9	655	655	5.46	5.46
57 Wilmington			CB		1.1	20.1	193	193	1.61	1.61
58 Wilmington			OF/WP		11.1	12.9	686	686	7.62	7.62
59 Wilmington			GS		15.5	11.8	1779	1779	14.83	14.83
60 Wilmington			CB/GS	4301-9010	72.9	7.8	3582	3582	39.80	39.80
61 Wilmington	2	Infiltration basin or Extended Detention Pond in southeast corner below outfall at 23 Haystack Road	EDPMP/CB		1.5	79.6	1380	138	11.50	1.15
62 Wilmington			OF/GS		5.9	30.6	1571	1571	13.09	13.09
63 Wilmington	1	Infiltration basin on east side behind 211 VT Route 9 West	IB/EDP/GS		10.2	35.6	2288	229	23.15	2.32
64 Wilmington			GS		38.6	9.4	3886	3886	32.38	32.38
65 Wilmington			GS		14.1	6.3	1203	1203	10.02	10.02
66 Wilmington			GS		6.3	8.8	612	612	5.10	5.10
67 Wilmington			GS		22.6	7.4	2047	2047	17.06	17.06
68 Wilmington			GS		3.9	9.5	397	397	3.31	3.31
69 Wilmington			GS		15.0	10.4	1597	1597	13.31	13.31
70 Wilmington			CB/GS		10.8	6.7	934	934	7.78	7.78
71 Wilmington			GS/WP		18.3	6.6	571	571	8.32	8.32
72 Wilmington			CB/OF/GS		23.5	8.8	2280	2280	19.00	19.00
73 Wilmington			OF/GS		78.5	2.6	5585	5585	46.54	46.54
74 Wilmington			GS		39.5	5.6	3254	3254	27.11	27.11
75 Wilmington			OF/CB	4301-9010	29.2	5.8	1328	1328	11.06	11.06
76 Wilmington			OF/CB	4301-9010	448.7	1.4	18067	18067	200.74	200.74
77 Wilmington			OF/CB	4301-9010	93.2	2.1	3797	3797	42.19	42.19
78 Wilmington			OF/CB	4301-9010	34.5	4.4	1495	1495	16.61	16.61
79 Wilmington			OF/CB	4301-9010	57.1	6.0	2612	2612	29.02	29.02
80 Wilmington			OF/CB	4301-9010	8.4	21.9	792	792	8.80	8.80
81 Wilmington			OF/GS		99.3	3.9	7506	7506	62.55	62.55
82 Wilmington			GS		8.0	18.6	1302	1302	10.85	10.85
83 Wilmington			GS		18.3	12.8	2204	2204	18.37	18.37
84 Wilmington			GS		20.0	9.8	2059	2059	17.16	17.16
85 Wilmington			GS		7.3	8.1	689	689	5.74	5.74
86 Wilmington			GS		35.5	8.2	3357	3357	27.98	27.98
87 Wilmington			GS		36.8	8.1	3458	3458	28.81	28.81
88 Wilmington			GS		19.1	5.4	1555	1555	12.95	12.95
89 Wilmington			GS		19.0	10.7	2054	2054	17.12	17.12
90 Wilmington			GS		8.1	9.3	804	804	6.70	6.70
91 Wilmington			GS		30.3	14.3	3955	3955	32.96	32.96
92 Wilmington			GS		6.6	11.1	733	733	6.11	6.11
93 Wilmington			GS		10.3	4.7	810	810	6.75	6.75
94 Wilmington			GS/EDMP(2)	4245-9015, 7377-9015	152.5	4.1	11622	11622	96.85	96.85
95 Wilmington			GS/WP		29.2	7.7	1426	1426	15.84	15.84
96 Wilmington			GS		21.0	5.4	1706	1706	14.21	14.21
97 Wilmington			GS		20.9	6.6	1804	1804	15.03	15.03
98 Wilmington			GS		29.1	2.5	2068	2068	17.23	17.23

Wilmington - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Nitrogen or Phosphorus Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
51 Wilmington	0.07	0.04					CWIP,SRF,LISF	35	$16,217
52 Wilmington	0.09	0.06					CWIP,SRF,LISF	43	$19,802
53 Wilmington	0.06	FALSE					CWIP,SRF,LISF	31	$14,341
54 Wilmington	0.09	FALSE					CWIP,SRF,LISF	47	$21,624
55 Wilmington	0.06	FALSE					CWIP,SRF,LISF	30	$13,862
56 Wilmington	0.04	FALSE					CWIP,SRF,LISF	19	$8,524
57 Wilmington	0.01	FALSE					CWIP,SRF,LISF	5	$2,517
58 Wilmington	0.06	FALSE					CWIP,SRF,LISF	32	$14,874
59 Wilmington	0.10	0.20					CWIP,SRF,LISF	50	$23,151
60 Wilmington	0.34	FALSE					CWIP,SRF,LISF	169	$77,689
61 Wilmington	0.08	0.13	$71,420		$58	$6,901	CWIP,SRF,LISF	39	$17,957
62 Wilmington	0.09	0.20					CWIP,SRF,LISF	44	$20,439
63 Wilmington	0.18	0.40	$169,162		$82	$8,119	CWIP,SRF,LISF	92	$42,532
64 Wilmington	0.22	0.40					CWIP,SRF,LISF	110	$50,566
65 Wilmington	0.07	0.10					CWIP,SRF,LISF	34	$15,652
66 Wilmington	0.03	0.06					CWIP,SRF,LISF	17	$7,965
67 Wilmington	0.12	0.18					CWIP,SRF,LISF	58	$26,637
68 Wilmington	0.02	0.04					CWIP,SRF,LISF	11	$5,162
69 Wilmington	0.09	0.17					CWIP,SRF,LISF	45	$20,777
70 Wilmington	0.05	0.08					CWIP,SRF,LISF	26	$12,152
71 Wilmington	0.08	0.13					CWIP,SRF,LISF	40	$18,565
72 Wilmington	0.13	0.23					CWIP,SRF,LISF	64	$29,664
73 Wilmington	0.32	0.22					CWIP,SRF,LISF	158	$72,676
74 Wilmington	0.18	0.25					CWIP,SRF,LISF	92	$42,340
75 Wilmington	0.13	FALSE					CWIP,SRF,LISF	63	$28,797
76 Wilmington	1.70	FALSE					CWIP,SRF,LISF	852	$391,836
77 Wilmington	0.36	FALSE					CWIP,SRF,LISF	179	$82,343
78 Wilmington	0.14	FALSE					CWIP,SRF,LISF	70	$32,427
79 Wilmington	0.25	FALSE					CWIP,SRF,LISF	123	$56,648
80 Wilmington	0.07	FALSE					CWIP,SRF,LISF	37	$17,175
81 Wilmington	0.42	0.43					CWIP,SRF,LISF	212	$97,673
82 Wilmington	0.07	0.16					CWIP,SRF,LISF	37	$16,948
83 Wilmington	0.12	0.26					CWIP,SRF,LISF	62	$28,682
84 Wilmington	0.12	0.22					CWIP,SRF,LISF	58	$26,795
85 Wilmington	0.04	0.07					CWIP,SRF,LISF	19	$8,962
86 Wilmington	0.19	0.32					CWIP,SRF,LISF	95	$43,685
87 Wilmington	0.20	0.33					CWIP,SRF,LISF	98	$44,996
88 Wilmington	0.09	0.11					CWIP,SRF,LISF	44	$20,229
89 Wilmington	0.12	0.22					CWIP,SRF,LISF	58	$26,734
90 Wilmington	0.05	0.08					CWIP,SRF,LISF	23	$10,467
91 Wilmington	0.22	0.48					CWIP,SRF,LISF	112	$51,471
92 Wilmington	0.04	0.08					CWIP,SRF,LISF	21	$9,534
93 Wilmington	0.05	0.05					CWIP,SRF,LISF	23	$10,545
94 Wilmington	0.66	0.69					CWIP,SRF,LISF	329	$151,241
95 Wilmington	0.13	0.25					CWIP,SRF,LISF	67	$30,928
96 Wilmington	0.10	0.12					CWIP,SRF,LISF	48	$22,196
97 Wilmington	0.10	0.15					CWIP,SRF,LISF	51	$23,470
98 Wilmington	0.12	0.08					CWIP,SRF,LISF	58	$26,906

Wilmington - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
99 Wilmington			GS		37.7	5.2	3028	3028	25.23	25.23
100 Wilmington			GS		9.1	9.7	932	932	7.77	7.77
101 Wilmington			GS		41.4	8.6	3996	3996	33.30	33.30
102 Wilmington			GS		80.8	6.9	7091	7091	59.09	59.09
103 Wilmington			GS		20.4	8.4	1945	1945	16.21	16.21
104 Wilmington			GS		31.8	8.0	2969	2969	24.74	24.74
105 Wilmington			GS		25.1	8.2	2359	2359	19.66	19.66
106 Wilmington			GS		80.3	3.6	5981	5981	49.84	49.84
107 Wilmington			GS		13.1	6.9	1148	1148	9.56	9.56
108 Wilmington			GS		28.1	5.9	2351	2351	19.59	19.59
109 Wilmington			GS		3.5	5.5	288	288	2.40	2.40
110 Wilmington			GS/CB/OF		157.6	8.3	14933	14933	124.44	124.44
111 Wilmington			GS		34.2	8.8	3340	3340	27.83	27.83
112 Wilmington			GS/WP		45.8	13.6	2923	2923	32.48	32.48
113 Wilmington			EDPMP/GS	7377-9015	13.2	4.2	1010	1010	8.41	8.41
114 Wilmington			GS		26.5	4.1	2018	2018	16.82	16.82
115 Wilmington			GS		18.1	9.1	1784	1784	14.86	14.86
116 Wilmington			GS		11.3	9.9	1170	1170	9.75	9.75
117 Wilmington			GS		15.1	7.0	1334	1334	11.12	11.12
118 Wilmington			GS		8.9	6.9	781	781	6.51	6.51
119 Wilmington			GS		12.8	6.7	1108	1108	9.23	9.23
120 Wilmington			GS		8.1	4.5	633	633	5.28	5.28
121 Wilmington			GS	6906-9010	13.2	24.1	1373	824	15.26	12.21
122 Wilmington			WP/SB/CB/GS		14.8	19.4	1247	1247	13.85	13.85
123 Wilmington			GS		3.2	29.6	838	838	6.99	6.99
124 Wilmington	1	Infiltration Basin in front of 434 Rte 100 North	IB/GS/CB		19.2	26.4	4365	437	36.38	3.64
125 Wilmington			GS	7377-9015, 4735-9010	30.2	10.3	1913	1913	21.26	21.26
126 Wilmington			GS/WP		1.2	25.5	101	101	1.12	1.12
127 Wilmington			EDPMP/GS	3087-9015	1.8	61.1	186	186	4.65	4.65
128 Wilmington			EDPMP/GS/LS	3087-9016	8.4	23.9	225	225	5.63	5.63
129 Wilmington			WP/GS	3087-9010	3.8	47.3	926	926	10.29	10.29
130 Wilmington			EDPMP/CB	4245-9015	6.6	17.5	136	136	3.39	3.39
131 Wilmington			EDPMP/CB/GS	3702-INDS	4.3	33.0	167	167	4.17	4.17
132 Wilmington			EDPMP/CB/GS	3702-INDS	9.1	16.3	178	178	4.46	4.46
133 Wilmington			GS/WP		12.2	5.2	587	587	6.52	6.52
134 Wilmington			CB/GS/EDPMP	4245-9015.1	8.2	39.4	411	411	10.28	10.28
135 Wilmington			CB/GS/PP/CR	4245-9015.1	2.3	40.1	120	120	2.99	2.99
136 Wilmington			CB/GS/PP/CR	4245-9015.1	20.1	11.1	325	325	8.13	8.13
137 Wilmington			CB/GS/PP/CR	4245-9015.1	29.1	3.6	394	394	9.85	9.85
138 Wilmington			CB/GS/PP/CR	4245-9015.1	6.6	24.2	181	181	4.51	4.51
139 Wilmington			CB/GS/PP/CR	4245-9015.1	1.8	20.8	44	44	1.09	1.09
140 Wilmington			CB/GS/PP/CR	4245-9015.1	2.6	34.2	108	108	2.69	2.69

Wilmington - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Nitrogen or Phosphorus Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
99 Wilmington	0.17	0.21					CWIP,SRF,LISF	86	$39,401
100 Wilmington	0.05	0.10					CWIP,SRF,LISF	26	$12,129
101 Wilmington	0.23	0.39					CWIP,SRF,LISF	113	$52,002
102 Wilmington	0.40	0.61					CWIP,SRF,LISF	201	$92,275
103 Wilmington	0.11	0.19					CWIP,SRF,LISF	55	$25,306
104 Wilmington	0.17	0.28					CWIP,SRF,LISF	84	$38,631
105 Wilmington	0.13	0.23					CWIP,SRF,LISF	67	$30,704
106 Wilmington	0.34	0.32					CWIP,SRF,LISF	169	$77,834
107 Wilmington	0.06	0.10					CWIP,SRF,LISF	32	$14,933
108 Wilmington	0.13	0.18					CWIP,SRF,LISF	67	$30,596
109 Wilmington	0.02	0.02					CWIP,SRF,LISF	8	$3,749
110 Wilmington	0.84	1.44					CWIP,SRF,LISF	422	$194,316
111 Wilmington	0.19	0.33					CWIP,SRF,LISF	94	$43,465
112 Wilmington	0.28	0.68					CWIP,SRF,LISF	138	$63,395
113 Wilmington	0.06	0.06					CWIP,SRF,LISF	29	$13,137
114 Wilmington	0.11	0.12					CWIP,SRF,LISF	57	$26,262
115 Wilmington	0.10	FALSE					CWIP,SRF,LISF	50	$23,211
116 Wilmington	0.07	FALSE					CWIP,SRF,LISF	33	$15,229
117 Wilmington	0.08	FALSE					CWIP,SRF,LISF	38	$17,359
118 Wilmington	0.04	0.07					CWIP,SRF,LISF	22	$10,160
119 Wilmington	0.06	FALSE					CWIP,SRF,LISF	31	$14,421
120 Wilmington	0.04	FALSE					CWIP,SRF,LISF	18	$8,244
121 Wilmington	0.13	FALSE		$50,000	$91	$7,282	CWIP,SRF,LISF	65	$29,781
122 Wilmington	0.12	0.32					CWIP,SRF,LISF	59	$27,036
123 Wilmington	0.05	FALSE					CWIP,SRF,LISF	24	$10,911
124 Wilmington	0.25	FALSE	$75,307		$19	$2,300	CWIP,SRF,LISF	123	$56,803
125 Wilmington	0.18	0.34					CWIP,SRF,LISF	90	$41,490
126 Wilmington	0.01	0.03					CWIP,SRF,LISF	5	$2,181
127 Wilmington	0.05	0.12					CWIP,SRF,LISF	26	$12,108
128 Wilmington	0.06	0.22					CWIP,SRF,LISF	32	$14,663
129 Wilmington	0.09	0.20					CWIP,SRF,LISF	44	$20,091
130 Wilmington	0.04	0.13					CWIP,SRF,LISF	19	$8,829
131 Wilmington	0.05	0.15					CWIP,SRF,LISF	24	$10,853
132 Wilmington	0.05	0.16					CWIP,SRF,LISF	25	$11,595
133 Wilmington	0.06	FALSE					CWIP,SRF,LISF	28	$12,728
134 Wilmington	0.12	0.35					CWIP,SRF,LISF	58	$26,767
135 Wilmington	0.03	0.10					CWIP,SRF,LISF	17	$7,779
136 Wilmington	0.09	0.24					CWIP,SRF,LISF	46	$21,165
137 Wilmington	0.11	0.11					CWIP,SRF,LISF	56	$25,633
138 Wilmington	0.05	0.18					CWIP,SRF,LISF	26	$11,747
139 Wilmington	0.01	0.04					CWIP,SRF,LISF	6	$2,832
140 Wilmington	0.03	0.10					CWIP,SRF,LISF	15	$7,014

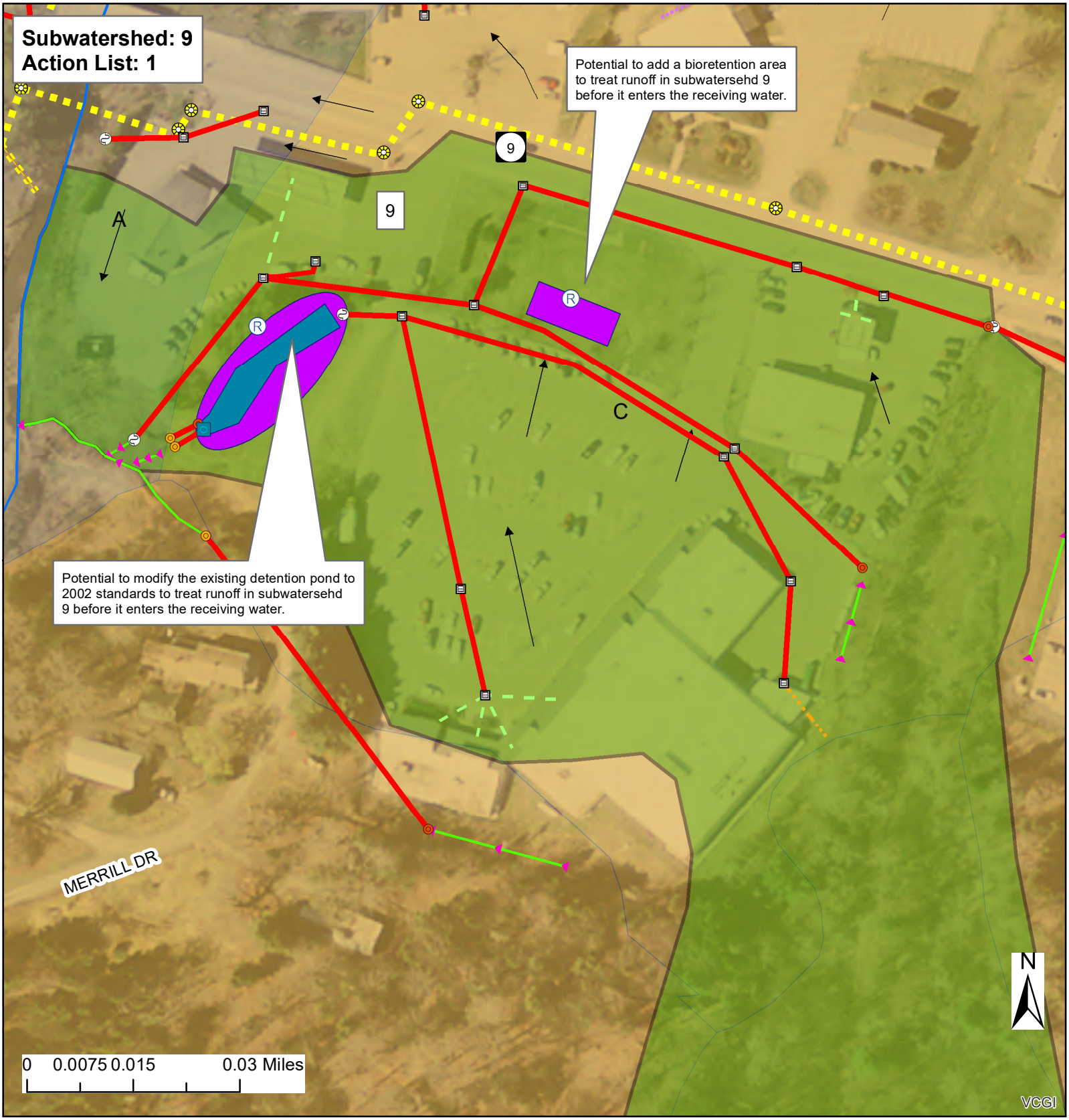
Wilmington - Subwatershed Prioritization and Recommendations										
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Impervious Area (MIA)	Sediment Load with Current Reductions (lbs.)	Sediment Load with Priority Action (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Nitrogen Load with Priority Action (lbs.)
141 Wilmington			CB/WP	4245-9015.1	38.8	4.9	536	536	13.41	13.41
142 Wilmington			CB/PP	4245-9015.1	0.9	63.6	99	99	2.47	2.47
143 Wilmington			GS	4245-9015.1	25.0	5.5	350	350	8.74	8.74
144 Wilmington			GS		11.7	14.3	1535	1535	12.79	12.79
145 Wilmington			PP/IG/GS/CB/GS	4245-9015.2, 6049-9015, 4245-9015.1A4	78.2	6.7	1121	1121	28.02	28.02
146 Wilmington			GS/EDPMP/WP		11.0	13.0	189	189	4.74	4.74
147 Wilmington			GS/CB		29.6	20.6	5266	5266	43.89	43.89
148 Wilmington			GS		7.6	13.7	959	959	7.99	7.99
149 Wilmington			GS		3.7	11.8	428	428	3.56	3.56
150 Wilmington			GS		12.0	13.2	1488	1488	12.40	12.40
151 Wilmington			GS		3.3	11.1	368	368	3.07	3.07
152 Wilmington			GS		111.4	6.7	9710	9710	80.92	80.92
153 Wilmington			GS		47.5	4.7	3726	3726	31.05	31.05
154 Wilmington			GS	3331-9010	75.0	8.9	5863	5863	54.97	54.97
155 Wilmington			WP/GS/CB	3331-9010	89.8	5.9	6006	6006	56.31	56.31
156 Wilmington			GS/WP		49.9	1.5	2050	2050	22.78	22.78
157 Wilmington			GS		22.9	5.9	1904	1904	15.87	15.87
158 Wilmington			GS		9.1	9.1	895	895	7.46	7.46
159 Wilmington			GS		17.1	6.3	1452	1452	12.10	12.10
160 Wilmington			GS		12.1	11.2	1350	1350	11.25	11.25
161 Wilmington			GS		7.7	12.4	909	909	7.58	7.58
162 Wilmington			GS		37.1	5.7	3064	3064	25.53	25.53
163 Wilmington			GS		11.7	2.0	813	813	6.78	6.78
164 Wilmington			CB/GS		10.1	3.6	755	755	6.30	6.30
165 Wilmington			GS		57.6	6.2	4879	4879	40.65	40.65
166 Wilmington			GS		55.2	4.1	4201	4201	35.01	35.01
167 Wilmington			CB/GS		2.0	20.1	354	354	2.95	2.95
168 Wilmington			GS		1.1	19.8	183	183	1.53	1.53
169 Wilmington			CB		1.3	60.1	802	802	6.68	6.68
170 Wilmington	1	Infiltration or bioretention area in island in front of 247 VT Rte 9 East	BRA/CB		1.9	60.0	1186	475	9.89	6.92
171 Wilmington			GS		0.6	42.6	233	233	1.94	1.94
172 Wilmington			CB		5.3	20.8	948	948	7.90	7.90
173 Wilmington			CB		18.9	10.9	2060	2060	17.16	17.16

Wilmington - Subwatershed Prioritization and Recommendations									
Watershed Number	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Nitrogen or Phosphorus Removal Per Pound (based on annual nutrient load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Raingarden Cost
141 Wilmington	0.15	0.21					CWIP,SRF,LISF	76	$34,899
142 Wilmington	0.03	0.06					CWIP,SRF,LISF	14	$6,437
143 Wilmington	0.10	0.15					CWIP,SRF,LISF	49	$22,752
144 Wilmington	0.09	0.18					CWIP,SRF,LISF	43	$19,972
145 Wilmington	0.32	0.58					CWIP,SRF,LISF	159	$72,918
146 Wilmington	0.05	FALSE					CWIP,SRF,LISF	27	$12,328
147 Wilmington	0.30	FALSE					CWIP,SRF,LISF	149	$68,531
148 Wilmington	0.05	0.11					CWIP,SRF,LISF	27	$12,477
149 Wilmington	0.02	0.05					CWIP,SRF,LISF	12	$5,566
150 Wilmington	0.08	0.18					CWIP,SRF,LISF	42	$19,357
151 Wilmington	0.02	0.04					CWIP,SRF,LISF	10	$4,791
152 Wilmington	0.55	0.83					CWIP,SRF,LISF	275	$126,355
153 Wilmington	0.21	0.25					CWIP,SRF,LISF	105	$48,482
154 Wilmington	0.41	FALSE					CWIP,SRF,LISF	207	$95,372
155 Wilmington	0.42	FALSE					CWIP,SRF,LISF	212	$97,692
156 Wilmington	0.19	0.08					CWIP,SRF,LISF	97	$44,460
157 Wilmington	0.11	0.15					CWIP,SRF,LISF	54	$24,780
158 Wilmington	0.05	0.09					CWIP,SRF,LISF	25	$11,647
159 Wilmington	0.08	0.12					CWIP,SRF,LISF	41	$18,895
160 Wilmington	0.08	0.15					CWIP,SRF,LISF	38	$17,566
161 Wilmington	0.05	0.10					CWIP,SRF,LISF	26	$11,833
162 Wilmington	0.17	0.23					CWIP,SRF,LISF	87	$39,872
163 Wilmington	0.05	0.03					CWIP,SRF,LISF	23	$10,586
164 Wilmington	0.04	0.04					CWIP,SRF,LISF	21	$9,831
165 Wilmington	0.28	FALSE					CWIP,SRF,LISF	138	$63,484
166 Wilmington	0.24	FALSE					CWIP,SRF,LISF	119	$54,665
167 Wilmington	0.02	FALSE					CWIP,SRF,LISF	10	$4,605
168 Wilmington	0.01	FALSE					CWIP,SRF,LISF	5	$2,382
169 Wilmington	0.05	FALSE					CWIP,SRF,LISF	23	$10,435
170 Wilmington	0.07	FALSE	$86,400		$121	$29,128	CWIP,SRF,LISF	34	$15,440
171 Wilmington	0.01	FALSE					CWIP,SRF,LISF	7	$3,026
172 Wilmington	0.05	FALSE					CWIP,SRF,LISF	27	$12,332
173 Wilmington	0.12	FALSE					CWIP,SRF,LISF	58	$26,804

Target Maps

Showing Priority Action List Drainage Areas

And Potential Retrofit Locations



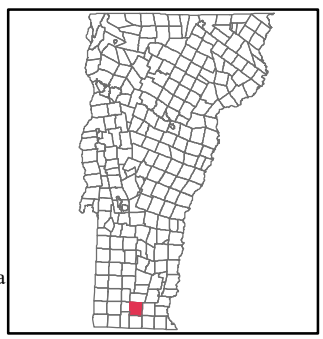
Wilmington, VT

DEC Stormwater Infrastructure Mapping Project

This map shows high priority subwatersheds which are ranked by connectedness, percent of impervious cover, field observations, and potential retrofit measures and locations.

The data shown on this map is only as accurate as the available sources and field observations allowed and should be used as a basic planning level tool only.

VERMONT



Stormwater points

- Pipe Cross (not connected)
- Catchbasin
- Dry Well
- Drop Inlet
- Grate/Curb Inlet
- Yard drain
- CB tied to sanitary sewer
- Junction Box
- Stormwater Manhole
- Outfall
- Culvert inlet
- Culvert outlet
- Pond outlet structure
- Treatment feature (see notes)
- Retrofit
- Unknown Point
- Information Point

Stormwater line

- Storm line
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NRCS - Soils

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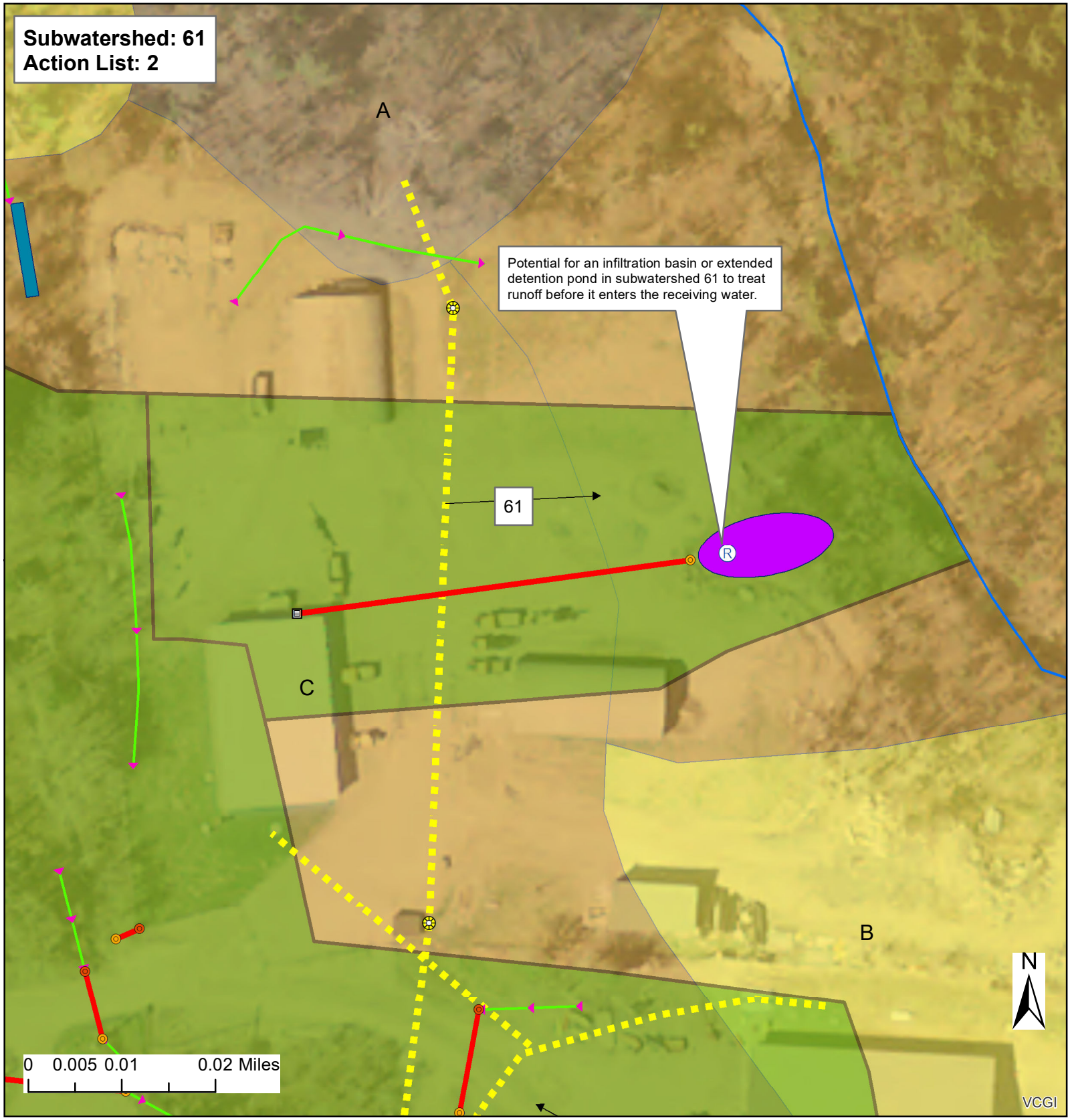
SubwatershedID

- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

Creator: Jim Pease, David Ainley
DEC - WSMD - Clean Water Initiative Program
Plotted Date: 5/20/2019
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survery
Imagery Source: VCGI Best Available



Wilmington, VT

DEC Stormwater Infrastructure Mapping Project

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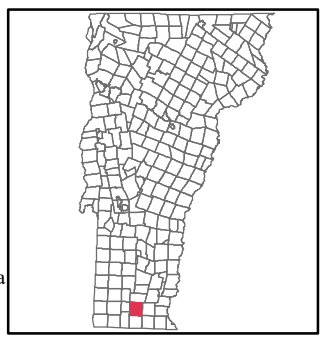

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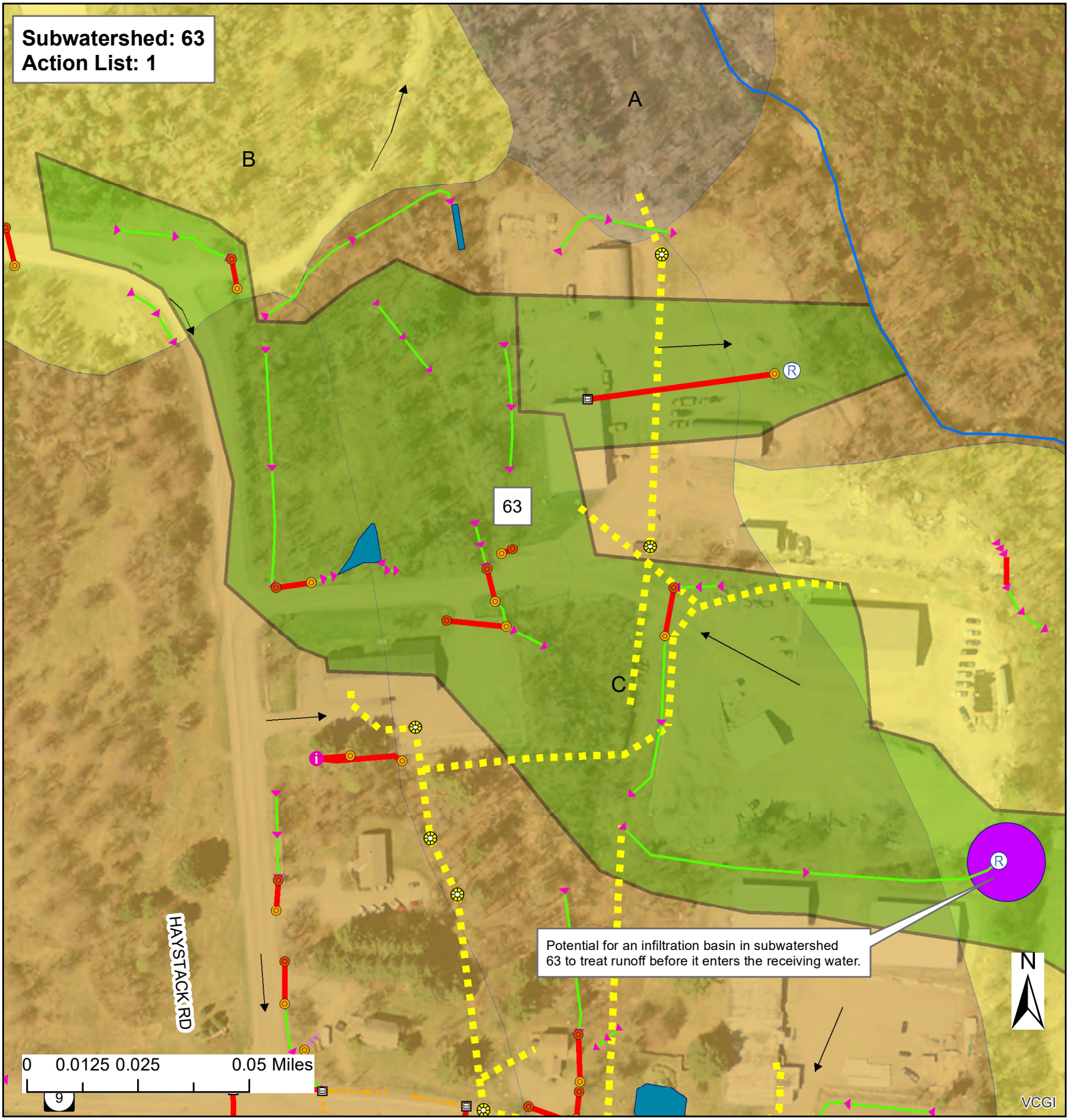

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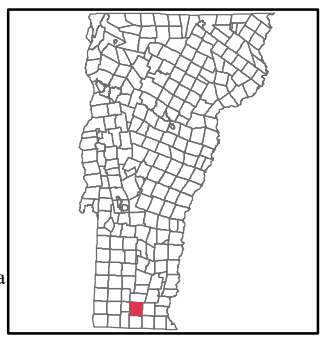

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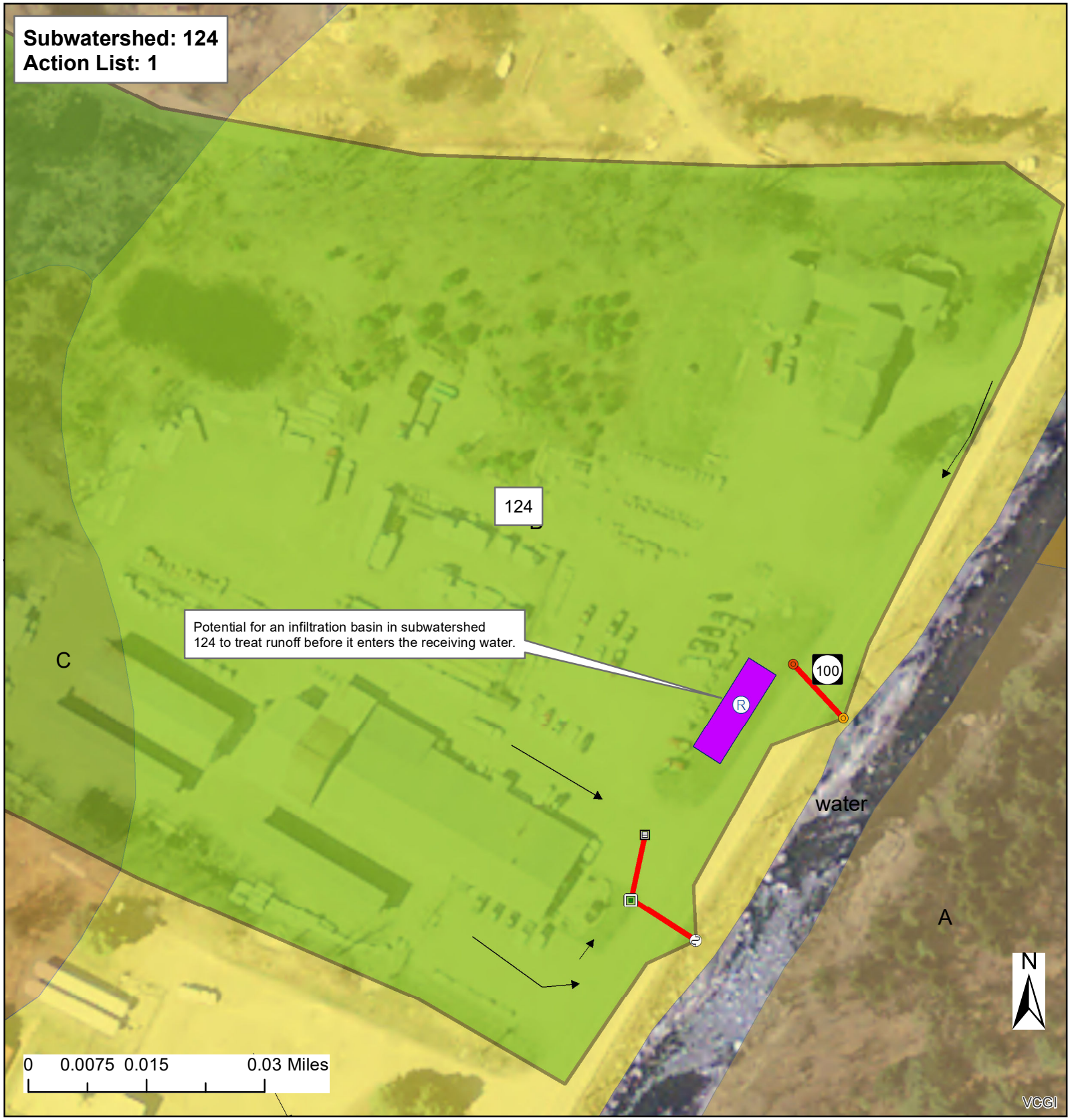

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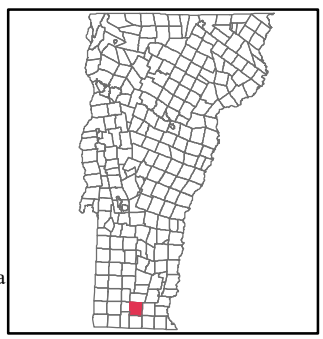

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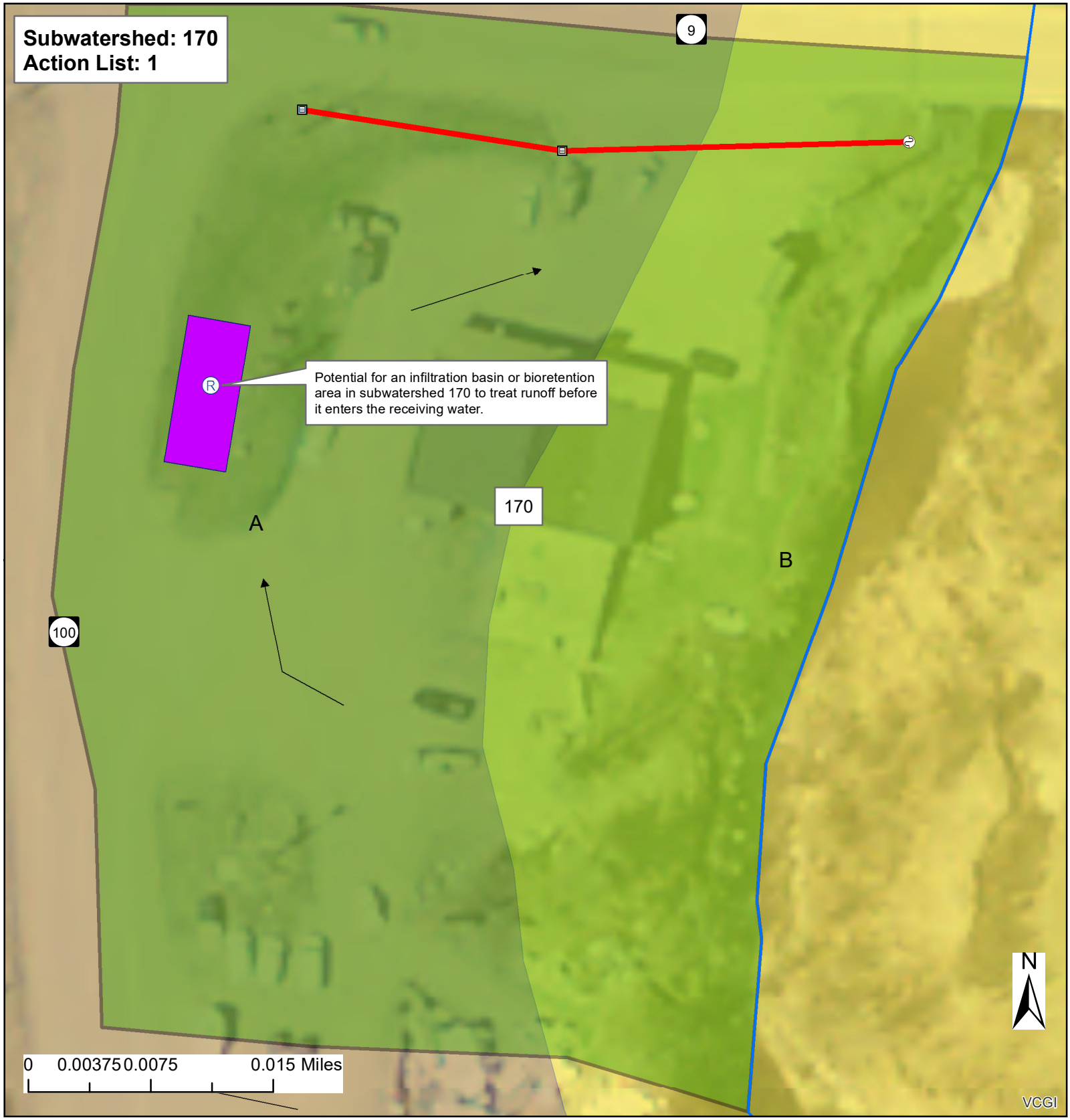

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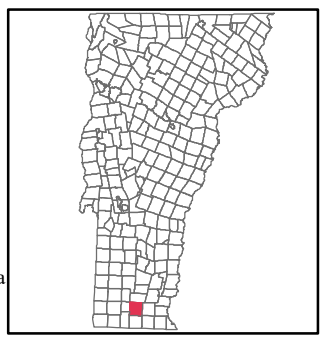

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Spill Control

and

Vermont Hazardous Waste Management Regulations

Have a spill control plan for accidental spills at municipal facilities and on municipal streets

These stormwater infrastructure maps show the connectivity of the stormwater system for the municipality as accurately as it could be determined with the collected and existing data. In the event of a spill this can be a valuable tool for controlling spills and in spill response.

Towns should be equipped with suitable equipment to contain and clean up spills of hazardous materials. Accidental spills of materials can be sources of runoff pollution if not addressed appropriately. If possible Towns should be prepared to address spills on municipal streets while at the same time contacting the state Waste Management Division. DPW managers should be aware of all applicable requirements and should contact regulatory authorities if requirements are not known.

All spills should be cleaned up immediately after they occur. For municipal facilities the creation of a site specific spill control and response plan in combination with spill response training for designated on-site personnel can be effective in dealing with accidental spills and preventing the contamination of soil, water, and runoff. Preparation of a spill containment, control, and countermeasures (SPCC) plan might be required to meet regulatory requirements (e.g., requirements regarding storage of specified chemicals above certain volume thresholds).

Even if a formal plan is not required, preparing one is a good idea. In general, an SPCC plan should include guidance to site personnel on the following:

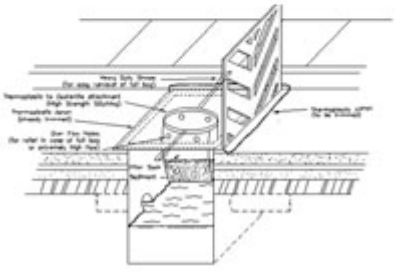
— Proper notification when a spill occurs;
— Site responsibility with respect to addressing the cleanup of a spill;
— Stopping the source of a spill;
— Cleaning up a spill;
— Proper disposal of materials contaminated by the spill;
— Location of spill response equipment programs; and
— Training for designated on-site personnel.

A periodic spill “fire drill” should be conducted to help prepare Town personnel in the event of a spill.

Spill Prevention and Response Measures

Catch Basin Inserts

Catch Basin Inserts (Drain Guards / Sediment Traps) protect our rivers and streams by capturing sediment, debris, oil and grease at storm water catch basins. Catch Basin Inserts are an economical and effective method to protect you from costly clean-up work.



The standard filter material is a non-woven geotextile with built-in overflow ports for cases of abnormally high water flow or over-filled filter bags. Catch Basin Inserts are available with a replaceable 5” x 15” oil absorbent boom that floats to absorb any oil, gas or diesel entering a storm water catch basin.

Urethane Drain Protector

Urethane Drain Protectors are positive sealing drain covers that ensure spills do not enter drains. Drain Protectors are environmentally safe and resistant to chemicals, solvents and hydrocarbons. After use, the Drain Protector can be washed and stored in its tube storage container.

Absorbent Socks

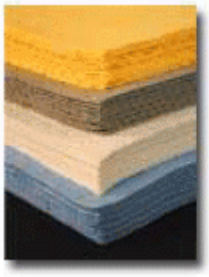
Absorbent socks are flexible tubes used to contain and clean-up spilled fluids. Socks are widely used in industrial applications and are ideal for Spill Kits. Fast spreading spills are quickly stopped with a sock.

Drums & Intermediate Bulk Containers (IBC's)

New and reconditioned steel drums are ideal for storing solid and liquid waste. Poly drums available for durable outdoor storage or for building your own spill kits. Steel and poly drums are available in both tight-head (TH) and full open-head styles (FOH).

Pads & Rolls

Absorbent pads and rolls made from polypropylene fibers are the most popular form of absorbents on the market. Various types of absorbent pads and rolls can be used for different liquids and site applications.



The most widely used absorbent pads and rolls are oil-only (white) and universal (grey). Pads and rolls are great for spills on land, easily absorbing 20 to 25 times their own weight in water or recovered liquid. Rolls can easily be cut to the exact size required.

Booms

Linkable Absorbent Booms

Absorbent booms are ideal for containing and cleaning up spills on water. Booms repel water and float even when completely saturated. Absorbent booms are constructed with a strong mesh outer skin encasing non-linting and highly absorbent polypropylene filler. Linkable booms come complete with end rings and clips attached to nylon rope running the length of the boom.

Collection basins
Collection basins are permanent structures in which large spills or contaminated storm water is contained and stored before cleanup or treatment. Collection basins are designed to receive spills, leaks, etc., and to prevent pollutants from being released into the environment. Unlike containment dikes, collection basins can receive and contain materials from many locations across a facility.

Containment diking
Containment dikes are temporary or permanent earth or concrete berms or retaining walls that are designed to hold spills. Diking can be used at any industrial facility, but is most common for controlling large spills or releases from liquid storage and transfer areas. Diking can provide one of the best protective measures against the contamination of storm water because it surrounds the area of concern and keeps spilled materials separated from the storm water outside of the diked area.

Curbing
Similar to containment diking, a curb is a barrier that surrounds an area of concern. Unlike diking, curbing is unable to contain large spills and is usually implemented on a small-scale basis. However, curbing is common at many facilities and in small areas where liquids are handled and transferred.

Granular Absorbents
A variety of granular and powdered absorbents are available for the effective clean-up of spills on streets, construction sites and in repair shops. These products absorb spilled liquids of various kinds to greatly lower the viscosity, aiding in the clean-up of the spill.

Sorbents, Gels, and Foams
Sorbents are compounds that immobilize materials by surface absorption or adsorption in the sorbent bulk. Gelling agents interact with the spilled chemical(s) by concentrating and congealing to form a rigid or viscous material more conducive to a mechanical cleanup. Foams are mixtures of air and aqueous solutions of proteins and surfactant-based foaming agents. The primary purpose of foams is to reduce the vapor concentration above the spill surface, thereby controlling the rate of evaporation.

§ **7-105** EMERGENCY AND CORRECTIVE ACTIONS
(a) Emergency actions
(1) In the event of a discharge of hazardous waste or a release of a hazardous material, the person in control of such waste or material shall:
(A) Take all appropriate immediate actions to protect human health and the environment including, but not limited to, emergency containment measures and notification as described below; and
(B) Take any further clean up actions as may be required and approved by federal, state, or local officials, or corrective actions as specified under **subsection (b)** of this section so that the discharged waste or released material and related contaminated materials no longer present a hazard to human health or the environment.
(2) Reporting
(A) All discharges and/or releases that meet any of the following criteria shall be immediately reported to the Secretary by the person or persons exercising control over such waste by calling the Waste Management Division at **(802) 241-3888**, Monday

through Friday, 7:45 a.m. to 4:30 p.m. or the Department of Public Safety, Emergency Management Division at **(800) 641-5005**, 24 hours/day:

(i) A discharge of hazardous waste, or release of hazardous material that exceeds 2 gallons;

(ii) A discharge of hazardous waste, or release of hazardous material that is less than or equal to 2 gallons and poses a potential or actual threat to human health or the environment; or

(iii) A discharge of hazardous waste, or release of hazardous material that equals or exceeds its corresponding reportable quantity under CERCLA as specified under **40 CFR § 302.4.**

Note: Under the Federal Water Pollution Control Act, certain spills of "oil" and/or "hazardous substances" are prohibited and must be reported pursuant to the requirements of **40 CFR Part 110** / Discharge of Oil. Certain spills of hazardous substances must also be reported pursuant to CERCLA. In both cases, the National Response Center must be notified at **(800) 424-8802**. Finally, in addition to federal and state spill reporting, EPCRA requires that spills are also reported to local authorities.

(B) A written report shall be submitted to the Secretary within ten (10) days following any discharge or release subject to **subsection (a)(1)** of this section. The report should be sent to: The Vermont Department of Environmental Conservation, Waste Management Division, 103 South Main Street, Waterbury, VT 05671-0404. The person responsible for submitting the written report may request that it not be submitted for small discharges and/or releases that were reported pursuant to subsection (a)(2)(A) of this section, and that have been entirely remediated within the ten (10) day period immediately following the discharge and/or release

(3) If the discharge or release occurred during transportation, the transporter shall, in addition to notifying the Secretary:

(A) Notify the National Response Center at (800) 424-8802 or (202) 426-2675, if required by **49 CFR § 171.15**; and

(B) Report in writing to the Director, Office of Hazardous Materials Regulations, Materials Transportation Bureau, Department of Transportation, Washington, D.C. 20590, if required by **49 CFR § 171.16**; and

(C) A water (bulk shipment) transporter who has discharged hazardous wastes must give the same notice as required by **33 CFR § 153.203** for oil and hazardous substances.

(4) If a discharge or release occurs and the Secretary determines that immediate removal of the waste is necessary to protect human health or the environment, the Secretary may authorize its removal by unpermitted transporters without the preparation of a manifest. Such hazardous waste may be transported to a site authorized by the Secretary under the provisions of **§ 7-503** to temporarily accept hazardous waste generated during an emergency cleanup of a discharge or release.

(5) In the case of an explosives or munitions emergency response, if a Federal, State, Tribal or local official acting within the scope of his or her official responsibilities, or an explosives or munitions emergency response specialist, determines that immediate removal of the material or waste is necessary to protect human health or the environment, that official or specialist may authorize the removal of the material or waste by transporters who do not have EPA identification numbers or hold Vermont hazardous waste transportation permits and without the preparation of a manifest. In the case of emergencies involving military munitions, the responding military emergency response specialist's organizational unit must retain records for three years identifying the dates of the response,

the responsible persons responding, the type and description of material addressed, and its disposition.

(6) All clean up debris and residues that are hazardous waste must be transported ultimately to either:

(A) A designated facility;

(B) A person authorized by the Secretary to use such waste if the waste has been delisted pursuant to **§ 7-218**;

(C) Some other location specified and authorized by the Secretary to receive clean up debris and residues if the waste has been delisted pursuant to **§ 7-218**; or

(D) For hazardous waste not defined as hazardous in 40 CFR Part 261 (i.e., waste regulated as hazardous by Vermont), to a facility, that is not a designated facility, located in a state other than Vermont provided the facility can receive such waste under applicable state and local laws, regulations and ordinances.

(b) Corrective actions

(1) If a discharge of hazardous waste, or a release of hazardous material has not been adequately addressed under **subsection (a)(1)(A)** of this section the Secretary may require that the person or persons responsible pursuant to **10 V.S.A. § 6615** complete the following:

(A) Engage the services of an environmental consultant experienced in the investigation and remediation of hazardous waste-contaminated sites; and

(B) Within thirty (30) days from either the date of the discharge/release or the date that the release was discovered if the date of discharge/release is not known, or within a period of time established by an alternative schedule approved by the Secretary, submit for approval by the Secretary a work plan for an investigation of the contaminated site (i.e., site investigation) prepared by the environmental consultant. The site investigation shall define the nature, degree and extent of the contamination; and shall assess potential impacts to human health and the environment (refer to the document titled: "Site Investigation Procedure" which is available from the Secretary upon request); and

(C) Perform the site investigation within either ninety (90) days of receiving written approval of the work plan by the Secretary, or a period of time established by an alternative schedule approved by the Secretary. A report detailing the findings of the site investigation shall be sent to the Secretary for review; and

(D) Within either thirty (30) days from the date of final acceptance of the site investigation report by the Secretary, or a period of time established by an alternative schedule approved by the Secretary, submit a corrective action plan prepared by the environmental consultant (refer to the document titled: "Corrective Action Guidance" which is available from the Secretary upon request); and

(E) Implement the corrective action plan within either ninety (90) days of receiving written approval of the plan by the Secretary, or a period of time established by an alternative schedule approved by the Secretary. The corrective action activity shall continue until the contamination is remediated to levels approved by the Secretary; and

(F) Submit to the Secretary all investigative, corrective action and monitoring reports, and all analytical results related to subsections (b)(1)(C) through (E) of this section, as they become available.

(2) A used or fired military munition is a waste and is potentially subject to corrective action authorities pursuant to 10 V.S.A. § 6615, and the process described by subsection (b)(1) of this section if the munition lands off-range and is not promptly rendered safe or retrieved. Any imminent and substantial threats associated with any remaining material must be addressed. If remedial action is infeasible, the operator of the range must maintain a record of the event for as long as any threat remains. The record must include the type of munition and its location (to the extent the location is known).

§ 7-106 LAND DISPOSAL RESTRICTIONS

(a) Certain hazardous wastes shall not be disposed of in or on the land. **40 CFR Part 268**, which is hereby incorporated by reference, except for 40 CFR §§ 268.5, 268.6, and 268.42(b), identifies those wastes which shall not be land disposed and describes the limited circumstances under which an otherwise prohibited waste may continue to be land disposed. The authority for implementing the CFR sections not incorporated by reference remains with the EPA.

Note: A copy of 40 CFR Part 268 (the Land Disposal Restrictions rule), as incorporated by these regulations, is available from the Secretary upon request.

(b) In addition to the prohibitions of **40 CFR Part 268**, the Secretary may restrict the land disposal of any hazardous waste in the State of Vermont:

(1) Which may present an undue risk to human health or the environment, immediately or over a period of time; or

(2) Which would be incompatible with the **groundwater protection rule and strategy** of chapter 12 of the environmental protection rules.

(c) Dilution of hazardous waste subject to the land disposal restrictions of **40 CFR Part 268** is prohibited pursuant to **40 CFR § 268.3.**

§ 7-107 ENFORCEMENT

(a) Information that the generation, transportation, treatment, storage or disposal of hazardous waste may present an actual or potential threat to human health or the environment, or is a violation of the 10 V.S.A. chapter 159, or these regulations, or any term or condition of certification, order, or assurance, may serve as grounds for an enforcement action by the Secretary, including, but not limited to:

(1) After notice and opportunity for hearing, issuing an order directing any person to take such steps as are necessary to:

(A) Immediately cease and desist any operation or practice;

(B) Correct or prevent environmental damage likely to result from any deficiency in operation or practice;

(C) Suspend or revoke any certification and require temporary or permanent cessation of the operation of such facility;

(2) A request that the Attorney General or appropriate State's Attorney commence an action for injunctive relief, the imposition of penalties and fines provided in **10 V.S.A. § 6612** and other relief as may be appropriate.

(3) An order for reimbursement to any agency of federal, state, or local government from any person whose act caused governmental expenditures under **10 V.S.A § 1283**.

(4) All other powers of enforcement available to the Secretary through **10 V.S.A., chapter 201**.

(b) The hearing by the Secretary identified under **subsection (a)(1)** of this section shall be conducted as a contested case. Pursuant to **10 V.S.A. § 6610(b)**, the Secretary may issue an emergency order without a prior hearing when an ongoing violation presents an immediate threat of substantial harm to the environment or an immediate threat to public health. An emergency order shall be effective upon actual notice to the person against whom the order is issued. Any person to whom an emergency order is issued shall be given the opportunity for a hearing within five (5) business days of the date the order is issued.

(c) Inspections, investigations, and property access **(10 V.S.A. § 8005)**

(1) Inspections and investigations

(A) An investigator may perform routine inspections to determine compliance.

(B) An investigator may investigate upon receipt or discovery of information that an activity is being or has been conducted that may constitute or cause a violation.

(C) An investigator, upon presentation of credentials, may seek permission to inspect or investigate any portion of the property, fixtures, or other appurtenances belonging to or used by a person whose activity is required to be in compliance. The investigator shall state the purpose of the inspection or investigation. An inspection or investigation may include monitoring, sampling, testing, and copying of any records, reports, or other documents relating to the purposes to be served by compliance.

(D) If permission for an inspection or investigation is refused, the investigator may seek an access order from the district or superior court in whose jurisdiction the property is located enabling the investigator to perform the inspection or investigation.

(2) Access orders

(A) If access has been refused, an access order may be sought pursuant to either **10 V.S.A. § 80**05 or **10 V.S.A. § 6609**.

(B) Issuance of an access order shall not negate the Secretary's authority to initiate criminal proceedings in the same matter by referring the matter to the office of the attorney general or a state's attorney.

(d) In an action to enforce these regulations, anyone raising a claim that a certain material is not a hazardous waste, or is exempt from regulation as hazardous waste, must demonstrate that there is a known market or disposition for the material, and that they meet the terms of the exclusion or exemption. Appropriate documentation (such as contracts showing that a second person uses the material as an ingredient in a production process) to demonstrate that the material is not a waste, or is exempt from regulation, must be provided. Owners and operators of facilities claiming that they are actually recycling materials must show that they have the necessary equipment to do so.