

City of Newport

Stormwater Infrastructure Mapping Project

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***VTDEC – ECOSYSTEM RESTORATION SECTION
WATERSHED MANAGEMENT DIVISION***

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Overview

This stormwater infrastructure mapping project was completed for the municipality by the Agency of Natural Resources Ecosystems Restoration 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 of the connectivity or connectedness of the storm system on both public and private properties in order to raise the public's awareness of the impact of stormwater runoff and the need for regular drainage system maintenance. The generation and transport of nonpoint source pollution increases with increasing connectivity of a drainage system. Having an understanding of the connectedness of the system is also a valuable tool for hazardous material spill planning and prevention. Knowledge of the extent of the system is also essential for the detection and elimination of illicit wastewater discharges than can be found in the stormwater system. Outfall locations and system connectedness data are used as a basis for locating illicit or illegal discharges of non-stormwater to the municipal storm system and tracing them up to the source. Knowledge of which areas of the sewer service area have combined stormwater and sewer systems can better assist the municipality in planning and implementing combined sewer separation projects. Knowledge of the layout and extent of the stormwater system can inform options for cleaning up existing polluted stormwater discharges. This project provides information and guidance for potential retrofit treatment locations and opportunities. Knowledge of where storm drains are located can also assist municipalities and residents with emergency preparedness for large rainfall events (i.e. Tropical Storms or Hurricanes) or spring snowmelt runoff events. By keeping storm drains clean and clear a great deal of localized flooding can be prevented. Finally, by providing a more thorough understanding of the system this project could be the basis for a local stormwater ordinance or be used to help create or enhance a municipal 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 from the National Agricultural Imagery Program (NAIP) 08 orthophotos. 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 inch storm) and Channel Protection Volume (CPv – the volume of storage that is needed to hold and slowly release stormwater for a 2.1 inch 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.

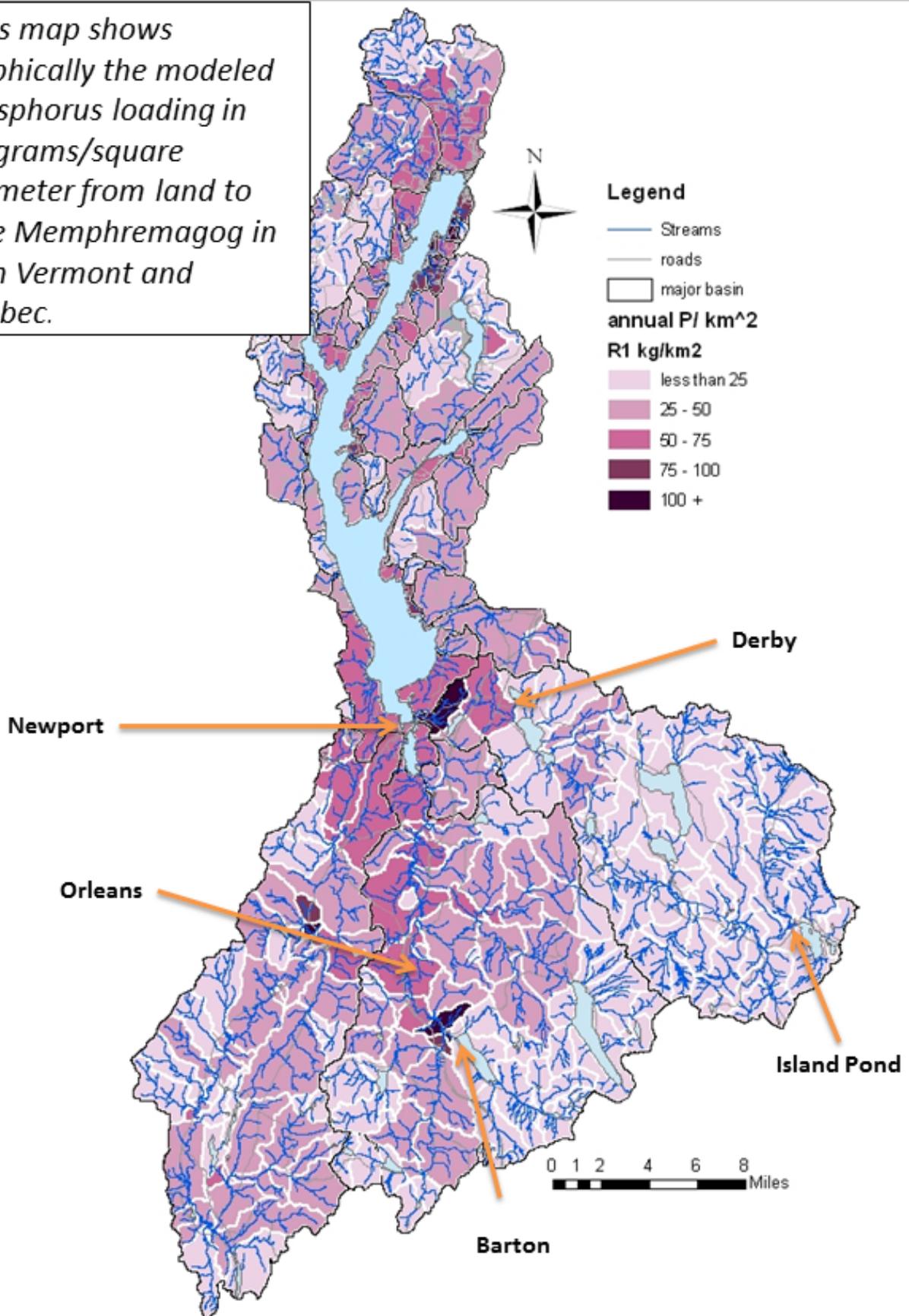
Schueler, T. et.al., 2007. Urban Stormwater Retrofit Practices, Version 1.0. Manual 3, Center for Watershed Protection, August 2007.

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.**

Lake Memphremagog Phosphorus Overview

- This map shows graphically the modeled phosphorus loading in kilograms/square kilometer from land to Lake Memphremagog in both Vermont and Quebec.



Subwatershed Data

*Tables showing calculations and
Priority drainage area retrofit possibilities*

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
BR	Bioretention Area (aka Bioretention Filter)
BS	Buffer Strip (25' Min.)
CB	Catch Basin
CBI	Catch Basin Insert
CD	Check Dam
DG	Detention Gallery
DI	Drop Inlet
DP	Dry Pond
DS	Dry Swale
DW	Drywell
EDPMP	Extended Detention Pond with Micropool (aka Micropool Extended Detention Basin)
GS	Grass Swale (aka Open Channel)
IB	Infiltration Basin
IG	Infiltration Gallery
IP	Infiltration Pipe
OF	Overland Flow
OGF	Organic Filter
POP	Pocket Pond
PP	Perforated Pipe
RDD	Roof Drain Disconnect
RR	Rock Riprap
RS	Riprap Swale
SB	Sediment Basin
SF	Sand Filter (aka Surface Sand Filter)
SS-SF	Swirl Separator – Sand Filter
ST	Septic Tank
SWPPP	Stormwater Pollution Prevention Plan
TT	Treatment Tank
WL	Wetland (Constructed)
WP	Wet Pond (Retention)
WS	Wet Swale

Newport City - 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)	Phosphorus Load with Current Reductions (lbs)	Phosphorus Load with Priority Action (lbs)	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)
86 Newport Cit	1	Bioretention on east side of parking lot	BRA/SWPPP/CB/OF	5372-9003	10.4	67.3	6,790	5,432	19.9	17.9	0.43	FALSE
16 Newport Cit	1	Bioretention at corner of Sloan St and Indian Pt	BRA/SWPPP/CB	5315-9003	15.7	41.8	6,090	4,263	11.8	8.3	0.34	0.72
54 Newport Cit	1	Bioretention along lakeshore side of parking	BRA/CB/OF		6.4	71.2	5,572	3,343	15.5	12.4	0.32	FALSE
13 Newport Cit	1	Infiltration or bioretention basin in Fernwood Circle, combine with 11	IB/BRA/CB/GS	3662-9010	23.2	25.9	5,191	1,557	14.4	4.3	0.29	0.66
11 Newport Cit	1	Infiltration or bioretention basin in Fernwood Circle, combine with 13	IB/BRA/CB/GS		25.9	18.7	4,216	422	11.7	1.2	0.24	0.53
68 Newport Cit	1	Bioretention or infiltration basins around municipal garage	BRA/IB/CB/WP/GS/OF	3984, 5039 & 6790-9015	94.6	13.4	3,316	2,985	16.1	14.5	0.47	1.39
72 Newport Cit	2	Treatment tank above	TT/CB		8.6	82.1	9,027	3,611	25.1	17.6	0.51	FALSE
64 Newport Cit	2	Infiltration basin at Indian Pt Street, combine with 6,9,10	IB/CB/GS/OF		27.3	29.7	7,097	7,097	19.7	19.7	0.40	0.89
10 Newport Cit	2	Infiltration basin at Indian Pt Street, combine with 6,9,64	IB/CB/GS		21.4	32.3	6,102	610	16.9	1.7	0.35	0.76
38 Newport Cit	2	Bioretention at outfall below shopping center at Indian Pt	BRA/CB/GS	5417-9010	6.4	58.9	3,881	776	10.8	6.5	0.22	FALSE
9 Newport Cit	2	Infiltration basin at Indian Pt Street, combine with 6,10,64	IB/CB/GS		10.1	32.8	2,923	292	8.1	0.8	0.17	0.36
81 Newport Cit	2	Extended detention pond behind 344 West Main St	EDP/WP/GS/CB	6953-9015, 6543-INDS	25.8	20.6	2,294	1,376	8.5	6.8	0.22	FALSE
6 Newport Cit	2	Extended detention pond behind 344 West Main St Street, combine with 9,10,64	IB/CB/GS		8.2	8.2	776	78	2.2	0.2	0.04	0.07
84 Newport Cit	3	Extended detention pond behind 84 Farrant St	EDP/GS/OF/CB	5793-9015	64.5	18.4	6,907	2,763	21.6	15.1	0.49	FALSE
37 Newport Cit	3	Wet Pond at outfall at park	WP/CB		5.1	69.9	3,928	786	10.9	6.5	0.22	FALSE
77 Newport Cit	3	Swirl separator at park above outfall	VS/CB		3.4	81.0	3,518	704	9.8	5.9	0.20	FALSE
34 Newport Cit	3	Wet Pond at outfall on south side of stream	WP/CB		2.7	46.6	1,186	237	3.3	2.0	0.07	FALSE
76 Newport Cit			CB		39.4	50.6	26,406	26,406	73.4	73.4	1.49	FALSE
74 Newport Cit			CB		12.8	76.6	12,575	12,575	34.9	34.9	0.71	FALSE
75 Newport Cit			CB		14.5	45.5	8,840	8,840	24.6	24.6	0.50	FALSE
96 Newport Cit			OF/GS/CB		55.8	14.3	7,288	7,288	20.2	20.2	0.41	0.88
88 Newport Cit			SWPPP/OF/CB	4719-9003	12.3	57.3	7,161	7,161	19.9	19.9	0.41	FALSE
95 Newport Cit			OF/DW/GS	3295-9015 & 3295 & 5854-	100.7	8.3	6,743	6,743	18.7	18.7	0.48	FALSE
70 Newport Cit			DW/CB		62.9	19.3	6,136	6,136	24.4	17.0	0.50	1.33
79 Newport Cit			CB		18.9	24.0	5,332	5,332	14.8	14.8	0.30	FALSE

Newport City - Subwatershed Prioritization and Recommendations (Cont.)										
Watershed Number	Action List #	Proposed or Existing Stormwater Treatment Practice	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus Removal Per Pound (based on annual phosphorus load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Land Use	Raingarden Cost
86	Newport C 1	BRA/SWPPP/CB/OF		\$20,000	\$15	\$10,046	ERP Section	213	Commercial	\$98,171
16	Newport C 1	BRA/SWPPP/CB	79,250		\$43	\$22,308	ERP Section	172	Residential	\$79,250
54	Newport C 1	BRA/CB/OF	72,507		\$33	\$23,423	ERP Section	158	Commercial	\$72,507
13	Newport C 1	IB/BRA/CB/GS					ERP Section	147	Residential	\$67,551
11	Newport C 1	IB/BRA/CB/GS	172,322		\$19	\$9,541	ERP Section	119	Residential	\$54,859
68	Newport C 1	BRA/IB/CB/WP/GS/OF		\$5,000	\$15	\$3,102	ERP Section	235	Commercial	\$107,884
72	Newport C 2	TT/CB	117,462		\$22	\$15,615	ERP Section	255	Commercial	\$117,462
64	Newport C 2	IB/CB/GS/OF					ERP Section	201	Commercial	\$92,349
10	Newport C 2	IB/CB/GS					ERP Section	173	Commercial	\$79,401
38	Newport C 2	BRA/CB/GS	50,508		\$16	\$11,712	ERP Section	110	Commercial	\$50,508
9	Newport C 2	IB/CB/GS					ERP Section	83	Residential	\$38,043
81	Newport C 2	EDP/WP/GS/CB			\$0	\$0	ERP Section	108	Residential	\$49,749
6	Newport C 2	IB/CB/GS	352,900		\$79	\$49,255	ERP Section	22	Residential	\$10,092
84	Newport C 3	EDP/GS/OF/CB	148,957		\$36	\$23,003	ERP Section	244	Residential	\$112,356
37	Newport C 3	WP/CB	67,760		\$22	\$15,527	ERP Section	111	Commercial	\$51,110
77	Newport C 3	VS/CB		\$75,000	\$27	\$19,188	ERP Section	100	Residential	\$45,776
34	Newport C 3	WP/CB	20,455		\$22	\$15,527	ERP Section	34	Residential	\$15,429
76	Newport City	CB					ERP Section	747	Residential	\$343,618
74	Newport City	CB					ERP Section	356	Residential	\$163,631
75	Newport City	CB					ERP Section	250	Residential	\$115,037
96	Newport City	OF/GS/CB					ERP Section	206	Commercial	\$94,842
88	Newport City	SWPPP/OF/CB					ERP Section	203	Commercial	\$93,189
95	Newport City	OF/DW/GS					ERP Section	238	Residential	\$109,678
70	Newport City	DW/CB					ERP Section	248	Residential	\$114,075
79	Newport City	CB					ERP Section	151	Residential	\$69,382

Newport City - 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)	Phosphorus Load with Current Reductions (lbs)	Phosphorus Load with Priority Action (lbs)	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)
45	Newport City		Proposed or Existing Stormwater Treatment Practice BRA/GS/CB	3597-9015	88.5	8.1	4,398	4,398	16.3	16.3	0.41	FALSE
46	Newport City		GS/CB/OF		44.2	9.0	4,365	4,365	12.1	12.1	0.25	FALSE
78	Newport City		CB		12.2	29.9	4,244	4,244	11.8	11.8	0.24	FALSE
61	Newport City		CB/OF		24.2	19.5	4,091	4,091	11.4	11.4	0.23	FALSE
7	Newport City		SF/CB/GS	4471-9015	5.3	76.0	4,076	4,076	12.0	12.0	0.26	FALSE
65	Newport City		OF		21.5	21.4	3,961	3,961	11.0	11.0	0.22	0.51
8	Newport City		CB		9.4	43.8	3,863	3,863	10.7	10.7	0.22	0.45
21	Newport City		SWPPP/DW/CB	4349-9003	5.9	69.7	3,838	3,838	10.7	10.7	0.22	0.46
43	Newport City		CB/OF		41.9	7.3	3,764	3,764	10.5	10.5	0.21	FALSE
66	Newport City		CB/OF		10.7	38.0	3,706	3,706	10.3	10.3	0.21	0.45
53	Newport City		CB		10.6	37.6	3,628	3,628	10.1	10.1	0.21	FALSE
12	Newport City		CB/GS		38.3	7.5	3,481	3,481	9.7	9.7	0.20	0.32
3	Newport City		CB		3.3	79.9	3,238	3,238	9.0	9.0	0.18	0.29
33	Newport City		CB/SB		6.4	54.7	3,167	3,167	9.3	9.3	0.20	0.39
57	Newport City		SWPPP/DW/CB/	4671-9003	12.5	32.0	3,159	3,159	9.3	9.3	0.20	FALSE
40	Newport City		CB/GS/OF		28.6	11.0	3,134	3,134	8.7	8.7	0.18	FALSE
60	Newport City		OF		18.0	19.4	3,027	3,027	8.4	8.4	0.17	FALSE
91	Newport City		OF/GS		15.3	21.4	2,811	2,811	7.8	7.8	0.16	FALSE
89	Newport City		CB/OF		11.3	28.4	2,785	2,785	7.7	7.7	0.16	FALSE
22	Newport City		SWPPP/RS/PS/SB	4349-9003	5.7	83.8	2,579	2,579	7.2	7.2	0.29	0.53
32	Newport City		CB		2.5	83.0	2,420	2,420	6.7	6.7	0.14	FALSE
94	Newport City		OF/GS/IB	5048-9015	27.6	14.0	2,397	2,397	6.7	6.7	0.17	0.42
98	Newport City		CB/OF		17.3	15.3	2,383	2,383	6.6	6.6	0.13	FALSE
55	Newport City		GS/CB	5031-9015	4.3	64.3	2,356	2,356	6.5	6.5	0.17	FALSE
67	Newport City		CB/OF		16.3	16.1	2,335	2,335	6.5	6.5	0.13	0.29
20	Newport City		CB/GS		12.1	21.9	2,275	2,275	6.3	6.3	0.13	0.29
15	Newport City		CB/GS		8.0	31.3	2,211	2,211	6.1	6.1	0.13	0.28
49	Newport City		CB/OF	3232-9010	3.5	63.6	2,203	2,203	6.1	6.1	0.12	FALSE
2	Newport City		GS/CB/EDP	3048-9010	10.7	33.7	2,159	2,159	6.0	6.0	0.12	0.40
73	Newport City		CB/GS		2.7	61.9	2,158	2,158	6.0	6.0	0.12	FALSE
90	Newport City		CB/OF		4.5	48.8	2,115	2,115	5.9	5.9	0.12	FALSE
44	Newport City		EDP/GS/CB	3915-9015	34.4	12.2	2,062	2,062	7.6	7.6	0.19	FALSE
39	Newport City		GS		10.8	20.9	1,955	1,955	5.4	5.4	0.11	FALSE
5	Newport City		CB/GS		16.0	12.8	1,945	1,945	5.4	5.4	0.11	FALSE
92	Newport City		OF/GS		17.2	10.6	1,849	1,849	5.1	5.1	0.10	0.20
80	Newport City		CB/GS/OF	6543-INDS, 3708	16.9	24.7	1,798	1,798	6.7	6.7	0.17	FALSE
19	Newport City		CB/GS		2.0	76.3	1,753	1,753	4.9	4.9	0.10	0.17
83	Newport City		CB		6.3	31.0	1,727	1,727	4.8	4.8	0.10	FALSE
47	Newport City		CB/OF	3232-9010	3.2	55.9	1,644	1,644	4.6	4.6	0.09	FALSE
58	Newport City		GS/OF		8.8	20.4	1,553	1,553	4.3	4.3	0.09	FALSE
24	Newport City		CB		4.9	33.9	1,479	1,479	4.1	4.1	0.08	0.18
41	Newport City		CB		2.1	65.9	1,472	1,472	4.1	4.1	0.08	FALSE
25	Newport City		CB/GS		1.9	69.5	1,454	1,454	4.0	4.0	0.08	FALSE
56	Newport City		OF		9.6	16.8	1,427	1,427	4.0	4.0	0.08	FALSE

Newport City - Subwatershed Prioritization and Recommendations (Cont.)										
Watershed Number	Action List #	Proposed or Existing Stormwater Treatment Practice	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus Removal Per Pound (based on annual phosphorus load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Landuse	Raingarden Cost
45	Newport City	BRN/GS/CB					ERP, Section	207	Residential	\$95,379
46	Newport City	GS/CB/OF					ERP, Section	123	Residential	\$56,799
78	Newport City	CB					ERP, Section	120	Residential	\$55,223
61	Newport City	CB/OF					ERP, Section	116	Commercial	\$53,232
7	Newport City	SF/CB/GS					ERP, Section	128	Commercial	\$58,941
65	Newport City	OF					ERP, Section	112	Residential	\$51,547
8	Newport City	CB					ERP, Section	109	Residential	\$50,262
21	Newport City	SWPPP/DW/CB					ERP, Section	109	Industrial	\$49,938
43	Newport City	CB/OF					ERP, Section	106	Residential	\$48,979
66	Newport City	CB/OF					ERP, Section	105	Residential	\$48,221
53	Newport City	CB					ERP, Section	103	Residential	\$47,205
12	Newport City	CB/GS					ERP, Section	98	Residential	\$45,296
3	Newport City	CB					ERP, Section	92	Commercial	\$42,137
33	Newport City	CB/SB					ERP, Section	100	Commercial	\$45,793
57	Newport City	SWPPP/DW/CB/ GS					ERP, Section	99	Commercial	\$45,673
40	Newport City	CB/GS/OF					ERP, Section	89	Residential	\$40,788
60	Newport City	OF					ERP, Section	86	Commercial	\$39,386
91	Newport City	OF/GS					ERP, Section	80	Commercial	\$36,577
89	Newport City	CB/OF					ERP, Section	79	Residential	\$36,235
22	Newport City	SWPPP/RS/PS/SB					ERP, Section	146	Industrial	\$67,117
32	Newport City	CB					ERP, Section	68	Commercial	\$31,486
94	Newport City	OF/GS/IB					ERP, Section	85	Commercial	\$38,985
98	Newport City	CB/OF					ERP, Section	67	Commercial	\$31,010
55	Newport City	GS/CB					ERP, Section	83	Transportation	\$38,315
67	Newport City	CB/OF					ERP, Section	66	Residential	\$30,388
20	Newport City	CB/GS					ERP, Section	64	Commercial	\$29,603
15	Newport City	CB/GS					ERP, Section	63	Residential	\$28,769
49	Newport City	CB/OF					ERP, Section	62	Commercial	\$28,662
2	Newport City	GS/CB/EDP					ERP, Section	61	Commercial	\$28,091
73	Newport City	CB/GS					ERP, Section	61	Commercial	\$28,079
90	Newport City	CB/OF					ERP, Section	60	Commercial	\$27,519
44	Newport City	EDP/GS/CB					ERP, Section	97	Residential	\$44,726
39	Newport City	GS					ERP, Section	55	Residential	\$25,445
5	Newport City	CB/GS					ERP, Section	55	Residential	\$25,310
92	Newport City	OF/GS					ERP, Section	52	Residential	\$24,064
80	Newport City	CB/GS/OF					ERP, Section	85	Residential	\$39,005
19	Newport City	CB/GS					ERP, Section	50	Commercial	\$22,815
83	Newport City	CB					ERP, Section	49	Residential	\$22,475
47	Newport City	CB/OF					ERP, Section	47	Commercial	\$21,391
58	Newport City	GS/OF					ERP, Section	44	Commercial	\$20,212
24	Newport City	CB					ERP, Section	42	Residential	\$19,240
41	Newport City	CB					ERP, Section	42	Transportation	\$19,161
25	Newport City	CB/GS					ERP, Section	41	Commercial	\$18,926
56	Newport City	OF					ERP, Section	40	Commercial	\$18,571

Newport City - Subwatershed Prioritization and Recommendations

Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Percent Mapped Imperivous Area (MIA)	Sediment Load with Current Reductions (lbs)	Sediment Load with Priority Action (lbs)	Phosphorus Load with Current Reductions (lbs)	Phosphorus Load with Priority Action (lbs)	Water Quality Volume (Acre-Feet)	Channel Protection (Acre-Feet)
93	Newport City		OF/GS		11.6	13.0	1,411	1,411	3.9	3.9	0.08	0.17
42	Newport City		GS		7.9	19.5	1,340	1,340	3.7	3.7	0.08	FALSE
82	Newport City		CB/GS		5.5	27.5	1,302	1,302	3.6	3.6	0.07	FALSE
62	Newport City		OF		6.0	22.6	1,175	1,175	3.3	3.3	0.07	FALSE
71	Newport City		CB		1.3	69.8	1,122	1,122	3.1	3.1	0.06	FALSE
85	Newport City		CB		1.7	55.2	1,109	1,109	3.1	3.1	0.06	FALSE
1	Newport City		GS/CB/WP		2.4	75.1	1,062	1,062	3.9	3.9	0.10	0.20
18	Newport City		CB/GS		1.6	64.0	1,051	1,051	2.9	2.9	0.06	0.11
87	Newport City		OF		2.2	46.5	958	958	2.7	2.7	0.05	FALSE
27	Newport City		CB/WP		3.8	53.4	932	932	3.5	3.5	0.09	FALSE
4	Newport City		CB		1.2	61.2	899	899	2.5	2.5	0.05	0.08
36	Newport City		GS/CB/OF	5156-9015	5.0	43.8	888	888	3.3	3.3	0.08	FALSE
14	Newport City		CB/GS		1.8	51.1	885	885	2.5	2.5	0.05	0.10
63	Newport City		OF		9.6	6.8	835	835	2.3	2.3	0.05	FALSE
51	Newport City		OF/GS	3232-9010	3.8	20.0	555	555	1.5	1.5	0.03	FALSE
52	Newport City		OF/GS	3232-9010	3.3	23.0	545	545	1.5	1.5	0.03	FALSE
23	Newport City		SW/PP/CB	4349-9003	0.5	90.0	517	517	1.5	1.5	0.03	0.05
31	Newport City		CB		1.7	31.7	484	484	1.3	1.3	0.03	FALSE
48	Newport City		CB/WP	3232-9015	3.0	67.8	374	374	3.1	3.1	0.11	FALSE
59	Newport City		OF		2.5	16.6	370	370	1.0	1.0	0.02	FALSE
28	Newport City		GS/OF/CB	5854-9010	0.6	68.1	360	360	1.0	1.0	0.02	FALSE
17	Newport City		GS/OF/CB	5043-INDS	9.5	50.3	351	351	1.0	1.0	0.20	FALSE
50	Newport City		WP/GS	3232-9015.1	20.0	3.3	270	270	2.3	2.3	0.08	FALSE
26	Newport City		BRA/GS/CB	5854-9015.1	3.1	47.5	206	206	1.7	1.7	0.06	FALSE
35	Newport City		CB		0.1	60.8	68	68	0.2	0.2	0.00	FALSE
30	Newport City		GS/CB/BRA	5854-9015.1	2.6	2.6	34	34	0.3	0.3	0.01	0.01
29	Newport City		GS/CB/BRA	5854-9015.1	2.1	7.7	31	31	0.3	0.3	0.01	0.02

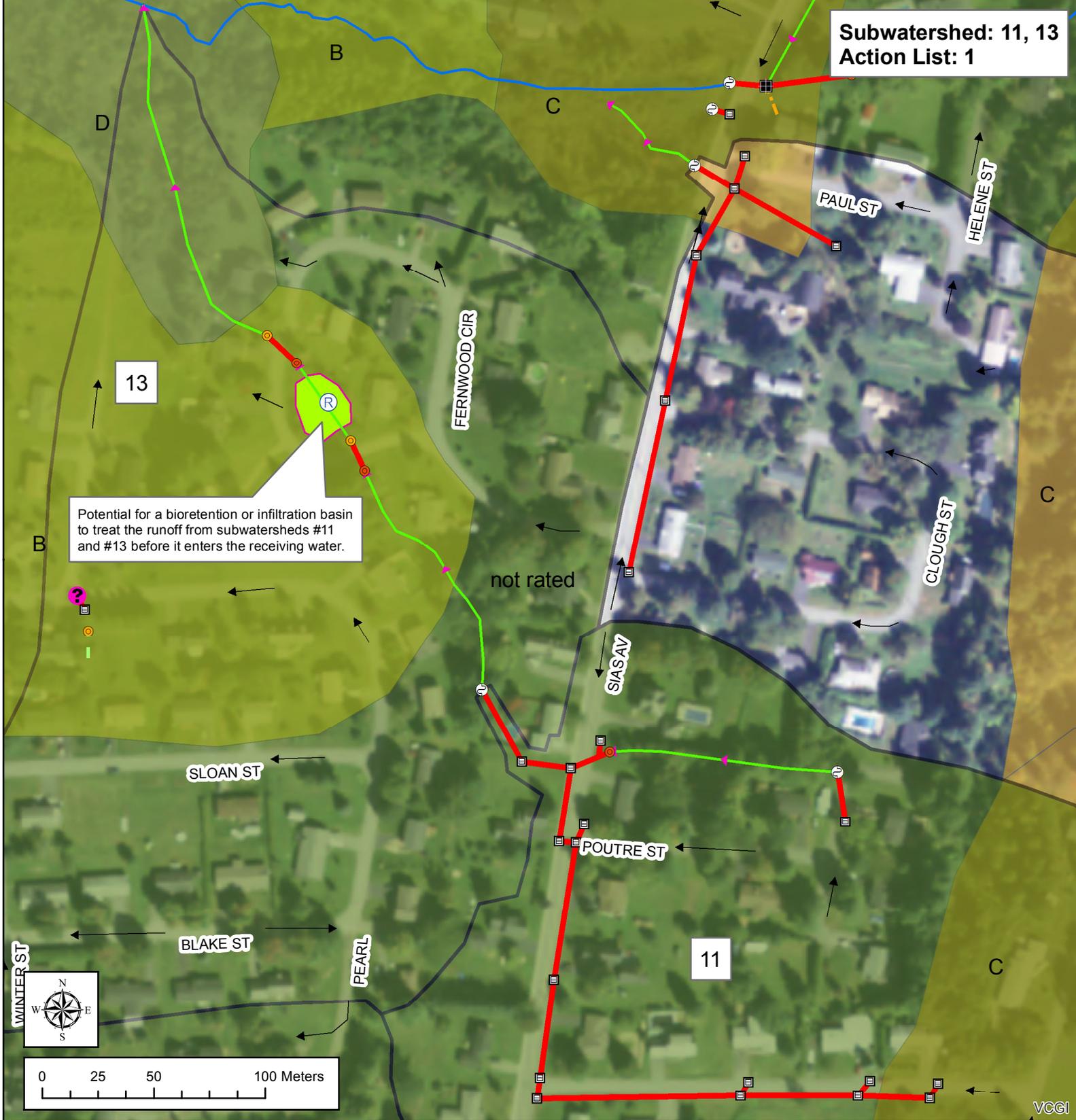
Newport City - Subwatershed Prioritization and Recommendations (Cont.)										
Watershed Number	Action List #	Proposed or Existing Stormwater Treatment Practice	Estimated Basin Construction Cost	Estimated Other BMP Construction Cost	Cost of Sediment Removal Per Pound (based on annual sediment load)	Cost of Phosphorus Removal Per Pound (based on annual phosphorus load)	Assistance Program	# LID-Roof Raingardens to Treat Water Quality Volume	Landuse	Raingarden Cost
93	Newport City	OF/GS					ERP Section	40	Residential	\$18,358
42	Newport City	GS					ERP Section	38	Transportation	\$17,432
82	Newport City	CB/GS					ERP Section	37	Residential	\$16,939
62	Newport City	OF					ERP Section	33	Residential	\$15,286
71	Newport City	CB					ERP Section	32	Commercial	\$14,601
85	Newport City	CB					ERP Section	31	Transportation	\$14,427
1	Newport City	GS/CB/WP					ERP Section	50	Commercial	\$23,032
18	Newport City	CB/GS					ERP Section	30	Commercial	\$13,681
87	Newport City	OF					ERP Section	27	Commercial	\$12,471
27	Newport City	CB/WP					ERP Section	44	Commercial	\$20,223
4	Newport City	CB					ERP Section	25	Residential	\$11,696
36	Newport City	GS/CB/OF					ERP Section	25	Commercial	\$19,256
14	Newport City	CB/GS					ERP Section	42	Commercial	\$19,256
63	Newport City	OF					ERP Section	25	Residential	\$11,514
51	Newport City	OF/GS					ERP Section	24	Residential	\$10,867
52	Newport City	OF/GS					ERP Section	16	Commercial	\$7,220
23	Newport City	SWPPP/CB					ERP Section	15	Commercial	\$7,098
31	Newport City	CB					ERP Section	16	Industrial	\$7,480
48	Newport City	CB/WP					ERP Section	14	Transportation	\$6,298
59	Newport City	OF					ERP Section	53	Commercial	\$24,343
28	Newport City	GS/OF/CB					ERP Section	10	Commercial	\$4,815
17	Newport City	GS/OF/CB					ERP Section	10	Commercial	\$4,815
50	Newport City	WP/GS					ERP Section	99	Commercial	\$45,719
26	Newport City	BRA/GS/CB					ERP Section	38	Commercial	\$17,593
35	Newport City	CB					ERP Section	29	Commercial	\$13,387
30	Newport City	GS/CB/BRA					ERP Section	2	Residential	\$886
29	Newport City	GS/CB/BRA					ERP Section	5	Commercial	\$2,228
							ERP Section	4	Commercial	\$2,000

Target Maps

*Showing Priority Action List
Drainage Areas*

And Potential Retrofit Locations

Subwatershed: 11, 13
Action List: 1



Newport City, 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.



Point Features

- Catchbasin
- Dry Well
- Drop Inlet
- Stormwater Manhole
- Yard drain
- Outfall
- Culvert inlet
- Culvert outlet
- Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

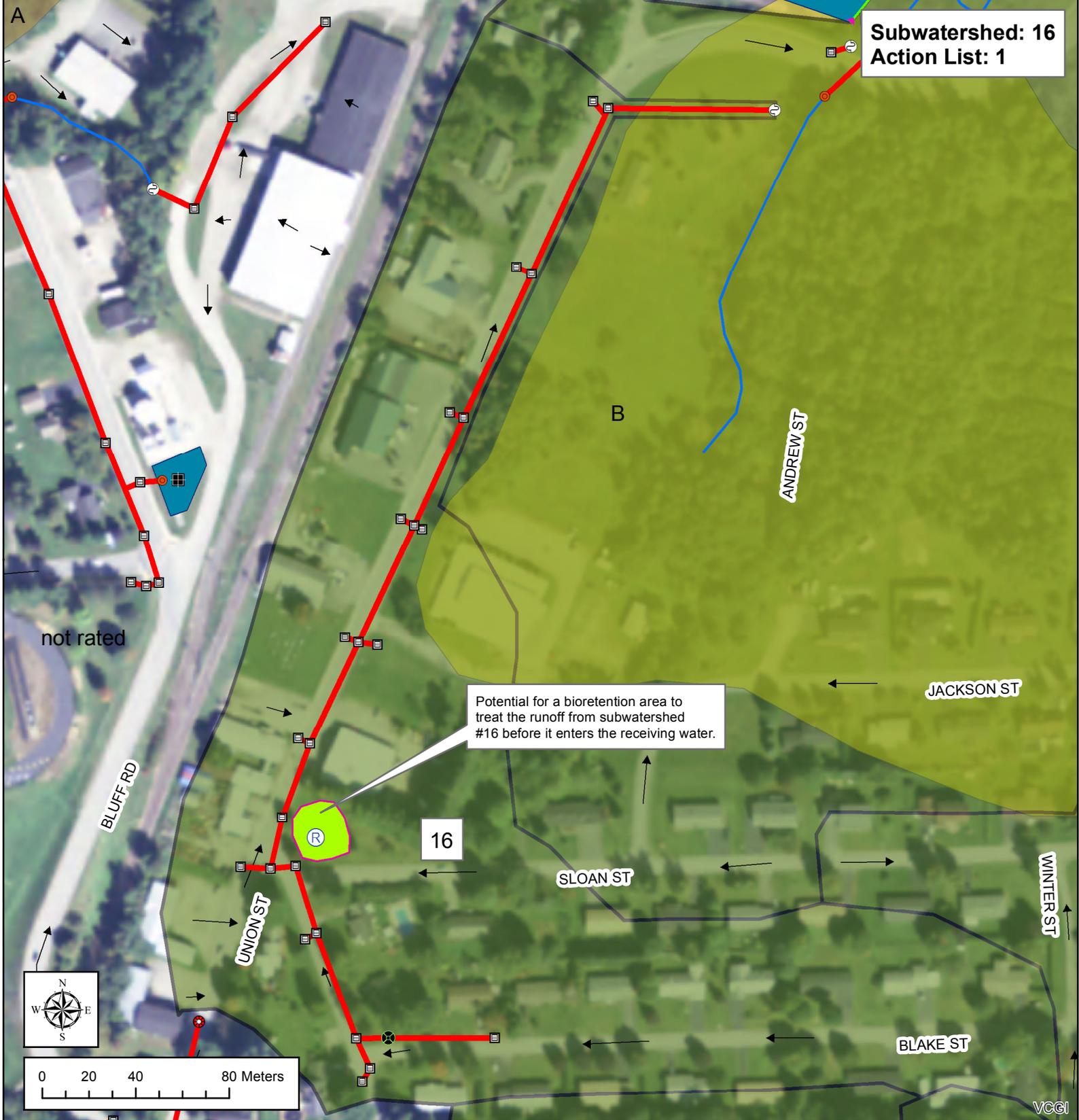
NRCS - Soils

- A
- B
- C
- D

SubwatershedID

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

Creator: Jim Pease, David Ainley
DEC - WSMD - Ecosystem Restoration Program
Plotted Date: 3/12/2014
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
Imagery Source: VCGI, NAIP 2011



Subwatershed: 16
Action List: 1

Potential for a bioretention area to treat the runoff from subwatershed #16 before it enters the receiving water.

not rated

16

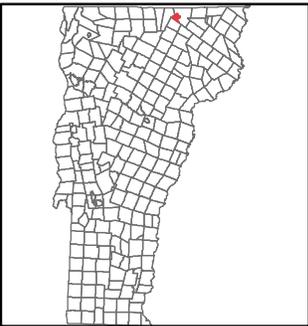


Newport City, VT

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.

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Point Features

- Catchbasin
- Dry Well
- Drop Inlet
- Stormwater Manhole
- Yard drain
- Outfall
- Culvert inlet
- Culvert outlet
- Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

NRCS - Soils

- A
- B
- C
- D

SubwatershedID

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

Creator: Jim Pease, David Ainley
DEC - WSMD - Ecosystem Restoration Program
Plotted Date: 3/12/2014
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
Imagery Source: VCGI, NAIP 2011



Subwatershed: 34
Action List: 3



Newport City, 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.



- | Point Features | Line Features |
|----------------------------|--------------------|
| Catchbasin | Storm line |
| Dry Well | Swale |
| Drop Inlet | Stream |
| Stormwater Manhole | Footing drain |
| Yard drain | Under drain |
| Outfall | Roof drain |
| Culvert inlet | Trench drain |
| Culvert outlet | Tunnel (storm) |
| Retrofit | Emergency spillway |
| Pipe Cross (not connected) | |

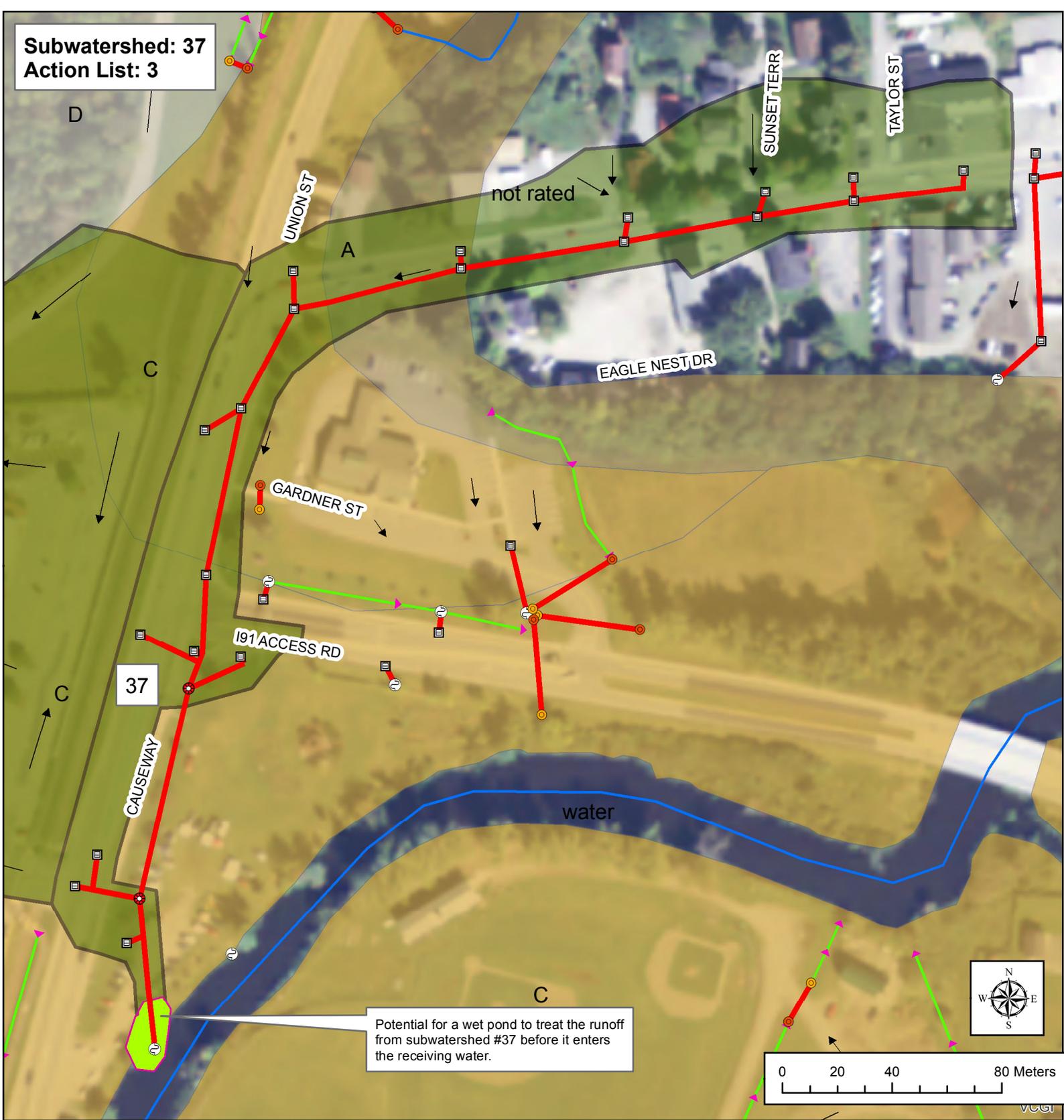
- NRCS - Soils**
- A
 - B
 - C
 - D

- SubwatershedID**
- Priority Subwatershed
 - Stormwater Treatment Area
 - Potential Stormwater Treatment Area

Creator: Jim Pease, David Ainley
 DEC - WSMD - Ecosystem Restoration Program
 Plotted Date: 3/12/2014
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
 Imagery Source: VCGI, NAIP 2011



Subwatershed: 37
Action List: 3



Newport City, 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.



Point Features

- ☐ Catchbasin
- ☐ Dry Well
- ☐ Drop Inlet
- ☐ Stormwater Manhole
- Yard drain
- ☐ Outfall
- Culvert inlet
- Culvert outlet
- ⊕ Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

NRCS - Soils

- A
- B
- C
- D

SubwatershedID

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

Creator: Jim Pease, David Ainley
DEC - WSMD - Ecosystem Restoration Program
Plotted Date: 3/12/2014
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
Imagery Source: VCGI, NAIP 2011

Subwatershed: 38
Action List: 2



Potential for a bioretention area to treat the runoff from subwatershed #38 before it enters the receiving water.

Newport City, 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.



Point Features

- ☐ Catchbasin
- ☐ Dry Well
- ☐ Drop Inlet
- Stormwater Manhole
- Yard drain
- ☉ Outfall
- Culvert inlet
- Culvert outlet
- ⊕ Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

NRCS - Soils

- A
- B
- C
- D

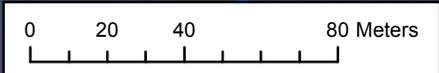
SubwatershedID

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

Creator: Jim Pease, David Ainley
 DEC - WSMD - Ecosystem Restoration Program
 Plotted Date: 3/12/2014
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
 Imagery Source: VCGI, NAIP 2011

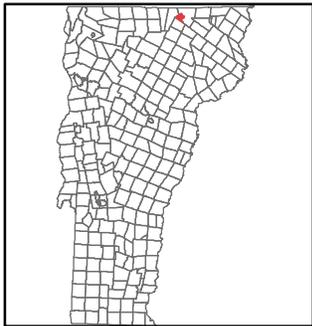
Subwatershed: 54
Action List: 1

Potential for a bioretention area to treat the runoff from subwatershed #54 before it enters the receiving water.



Newport City, VT

DEC Stormwater Infrastructure Mapping Project



Point Features

- Catchbasin
- Dry Well
- Drop Inlet
- Stormwater Manhole
- Yard drain
- Outfall
- Culvert inlet
- Culvert outlet
- Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

NRCS - Soils

- A
- B
- C
- D

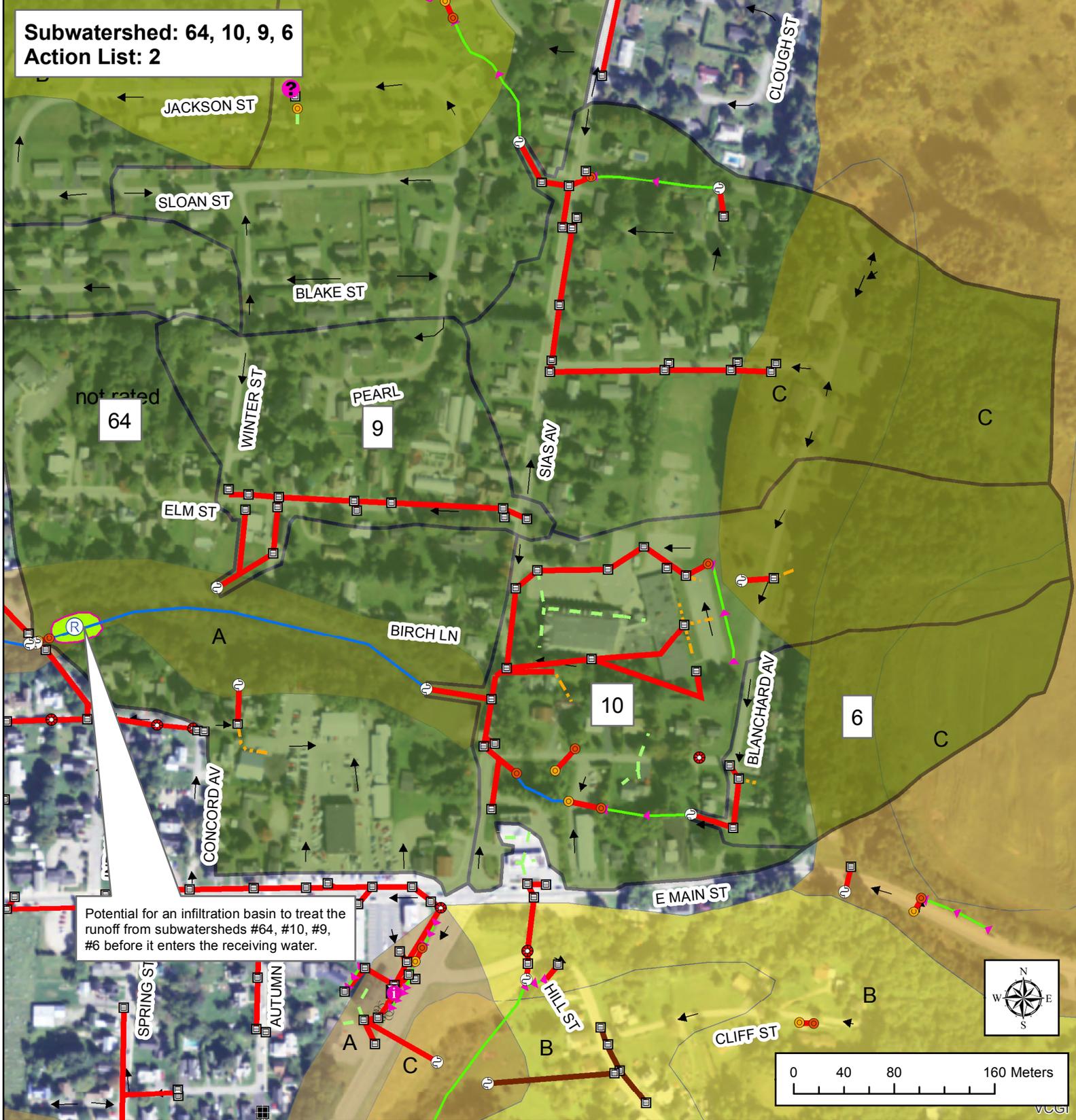
SubwatershedID

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

Creator: Jim Pease, David Ainley
 DEC - WSMD - Ecosystem Restoration Program
 Plotted Date: 3/12/2014
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
 Imagery Source: VCGI, NAIP 2011



Subwatershed: 64, 10, 9, 6
Action List: 2

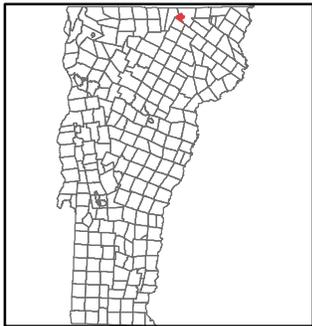


Newport City, VT

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.



- | | |
|--|---|
| Point Features | Line Features |
| <ul style="list-style-type: none"> □ Catchbasin □ Dry Well □ Drop Inlet ● Stormwater Manhole ● Yard drain ○ Outfall ● Culvert inlet ● Culvert outlet ○ Retrofit ● Pipe Cross (not connected) | <ul style="list-style-type: none"> — Storm line — Swale — Stream — Footing drain — Under drain — Roof drain — Trench drain — Tunnel (storm) — Emergency spillway |

- NRCS - Soils**
- A
 - B
 - C
 - D

- SubwatershedID**
- Priority Subwatershed
 - Stormwater Treatment Area
 - Potential Stormwater Treatment Area

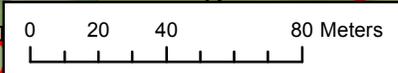
Creator: Jim Pease, David Ainley
 DEC - WSMD - Ecosystem Restoration Program
 Plotted Date: 3/12/2014
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
 Imagery Source: VCGI, NAIP 2011





not rated

68

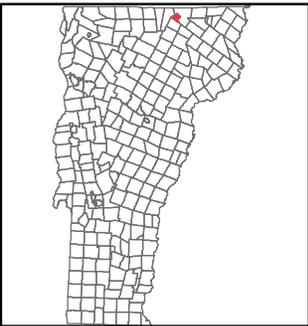


Newport City, VT

DEC Stormwater Infrastructure Mapping Project

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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.



Point Features

- Catchbasin
- Dry Well
- Drop Inlet
- Stormwater Manhole
- Yard drain
- Outfall
- Culvert inlet
- Culvert outlet
- ⊕ Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

NRCS - Soils

- A
- B
- C
- D

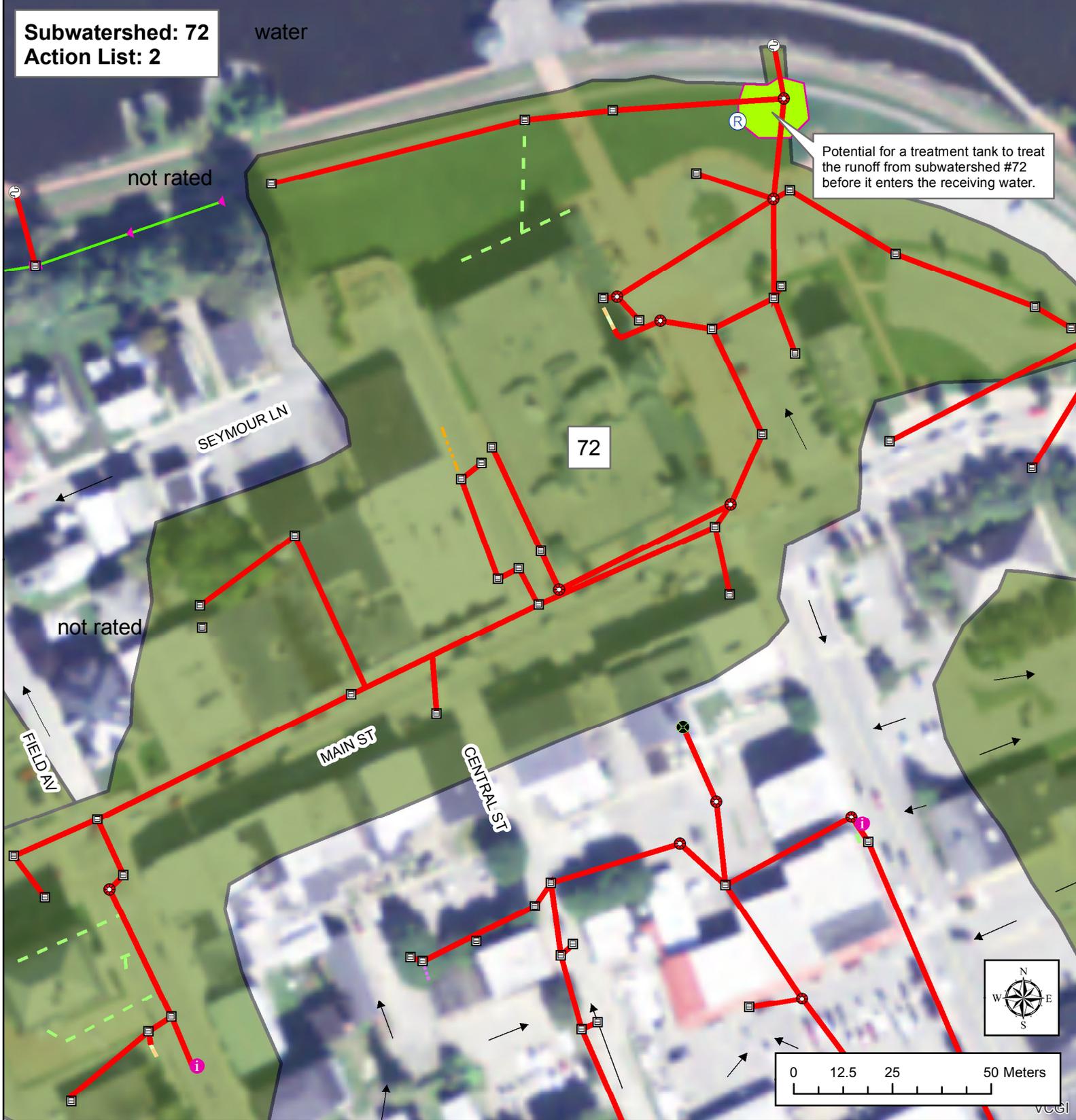
SubwatershedID

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

Creator: Jim Pease, David Ainley
DEC - WSMD - Ecosystem Restoration Program
Plotted Date: 3/12/2014
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
Imagery Source: VCGI, NAIP 2011



Subwatershed: 72
Action List: 2



Newport City, 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.



Point Features

- Catchbasin
- Dry Well
- Drop Inlet
- Stormwater Manhole
- Yard drain
- Outfall
- Culvert inlet
- Culvert outlet
- ⊕ Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

NRCS - Soils

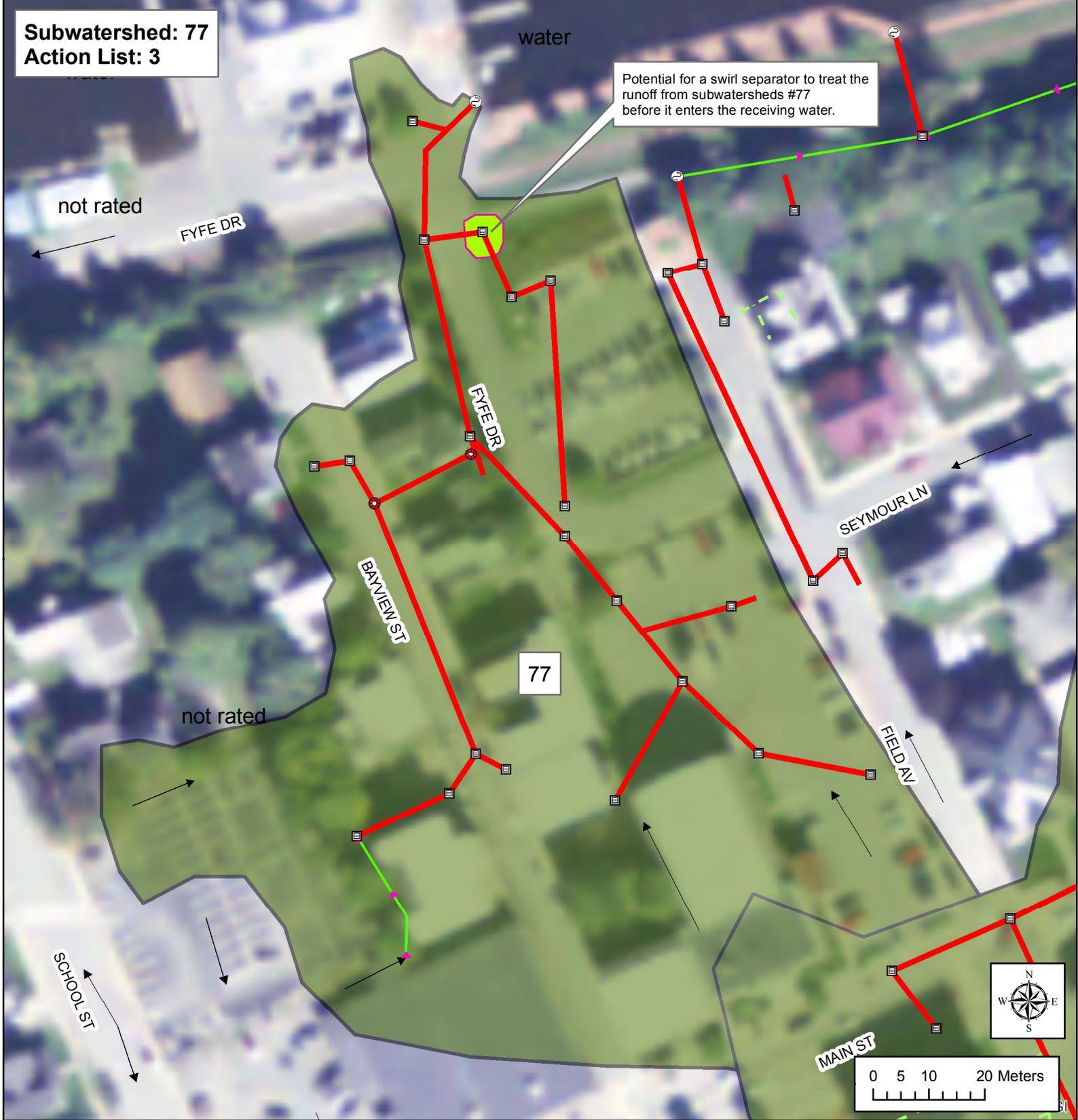
- A
- B
- C
- D

SubwatershedID

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

Creator: Jim Pease, David Ainley
 DEC - WSMD - Ecosystem Restoration Program
 Plotted Date: 3/12/2014
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
 Imagery Source: VCGI, NAIP 2011

Subwatershed: 77
Action List: 3



Newport City, VT

DEC Stormwater Infrastructure Mapping Project

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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.



Point Features

- Catchbasin
- Dry Well
- Drop Inlet
- Stormwater Manhole
- Yard drain
- Outfall
- Culvert inlet
- Culvert outlet
- Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

NRCS - Soils

- A
- B
- C
- D

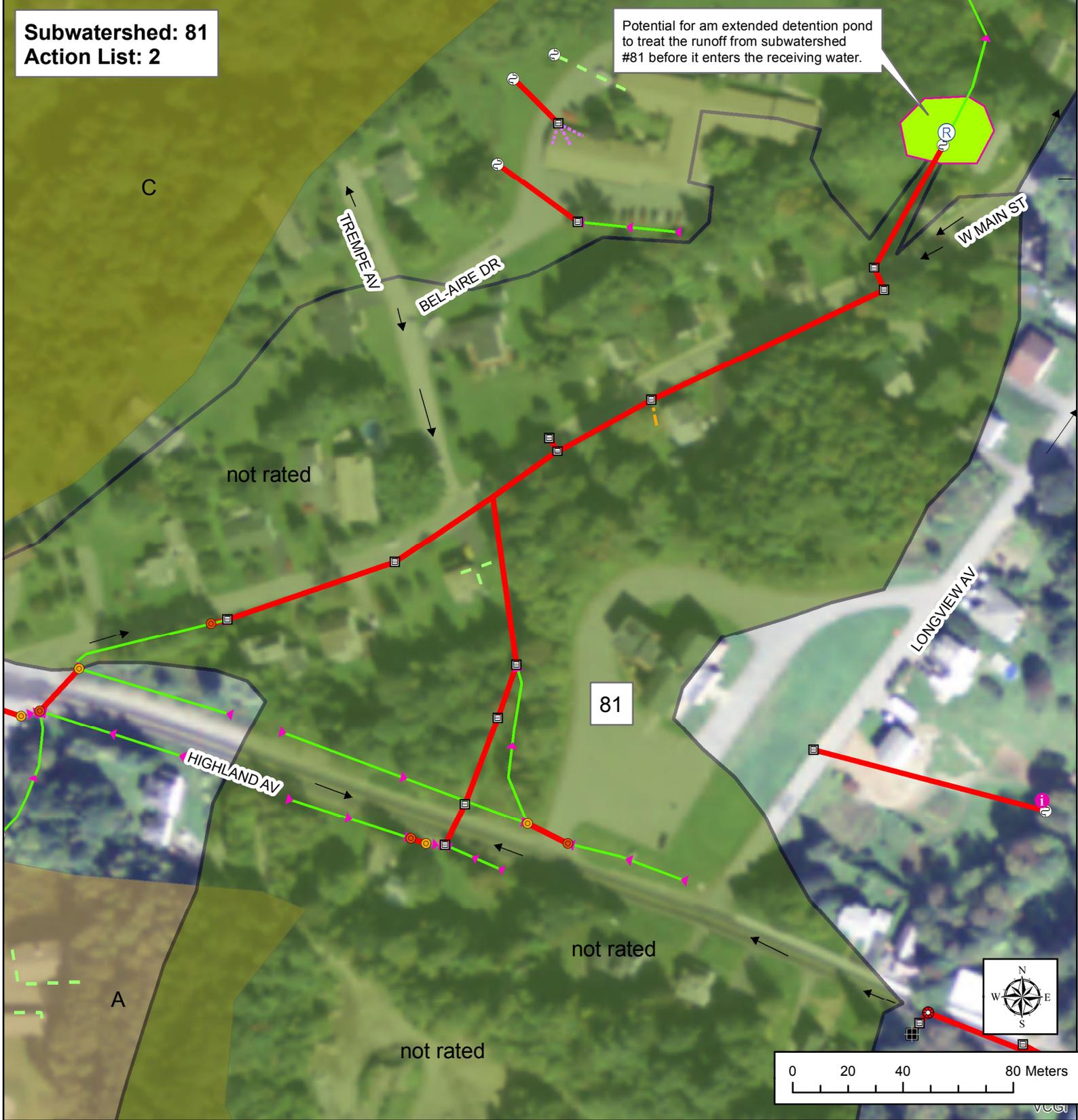
Creator: Jim Pease, David Ainley
 DEC - WSMDC - Ecosystem Restoration Program
 Plotted Date: 3/12/2014
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
 Imagery Source: VCGI, NAIP 2011

SubwatershedID

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

Subwatershed: 81
Action List: 2

Potential for an extended detention pond to treat the runoff from subwatershed #81 before it enters the receiving water.



Newport City, 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.



Point Features

- Catchbasin
- Dry Well
- Drop Inlet
- Stormwater Manhole
- Yard drain
- Outfall
- Culvert inlet
- Culvert outlet
- ⊕ Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

NRCS - Soils

- A
- B
- C
- D

SubwatershedID

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

Creator: Jim Pease, David Ainley
 DEC - WSMD - Ecosystem Restoration Program
 Plotted Date: 3/12/2014
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
 Imagery Source: VCGI, NAIP 2011

Subwatershed: 84
Action List: 3

Potential for an extended detention pond to treat the runoff from subwatershed #84 before it enters the receiving water.



Newport City, VT

DEC Stormwater Infrastructure Mapping Project

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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.



Point Features

- Catchbasin
- Dry Well
- Drop Inlet
- Stormwater Manhole
- Yard drain
- Outfall
- Culvert inlet
- Culvert outlet
- Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

NRCS - Soils

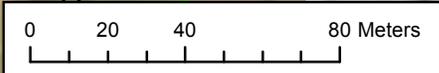
- A
- B
- C
- D

SubwatershedID

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

Creator: Jim Pease, David Ainley
 DEC - WSMD - Ecosystem Restoration Program
 Plotted Date: 3/12/2014
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
 Imagery Source: VCGI, NAIP 2011

Subwatershed: 86
Action List: 1

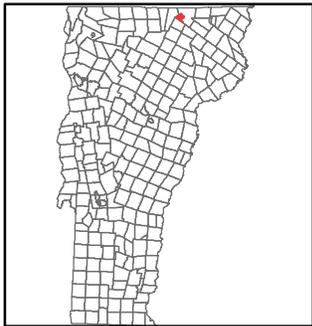


Newport City, VT

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.



Point Features

- Catchbasin
- Dry Well
- Drop Inlet
- Stormwater Manhole
- Yard drain
- Outfall
- Culvert inlet
- Culvert outlet
- Retrofit
- Pipe Cross (not connected)

Line Features

- Storm line
- Swale
- Stream
- Footing drain
- Under drain
- Roof drain
- Trench drain
- Tunnel (storm)
- Emergency spillway

NRCS - Soils

- A
- B
- C
- D

SubwatershedID

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

Creator: Jim Pease, David Ainley
DEC - WSMD - Ecosystem Restoration Program
Plotted Date: 3/12/2014
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database
Imagery Source: VCGI, NAIP 2011

VCGI



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.

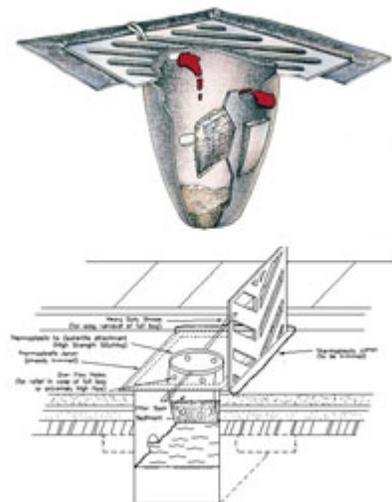
A periodic spill “fire drill” should be conducted to help prepare Town personnel in the event of a spill.

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 recovered liquid. Rolls can easily be cut to the exact size required.



water or

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. § 8005** 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.