

# Dothan Brook, Hartford & Norwich, Vermont

Dothan Brook in Hartford and Norwich Vermont has been found to be stressed by stormwater runoff as measured by the chemistry of the stream. The stream will be measured in 2021 for macroinvertebrates and fish. There is a large breached dam blocking fish passage shown on the watershed map as site A. There are at least 28 significant discharges to the stream from the developed lands of Hartford and Norwich. The largest discharge to the stream is drainage area #32 which drains a large section of the central watershed. The recommended course of action for stormwater impacted streams is to install a treatment structure that controls both the water quality volume and the channel protection volume from these discharges near the outfall. A map showing the location of the discharges and a possible retrofit location is provided. A cost estimate (excluding land costs) is provided.

Addressing the large discharges of stormwater to the brook will reduce contamination and stream channel erosion and will help prevent the stream from becoming declared stormwater impaired on the state of Vermont's 303d list of impaired waters. It will also reduce nitrogen currently being discharged to the Connecticut River and Long Island Sound.

# Stormwater Discharges to Dothan Brook





## Monitoring Site Summary - River/Stream

# Dothan Brook

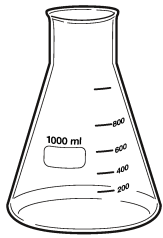
River Mile: 0.2

Public parking off of Rte 5 at Maanawaka Conservation Area. 2020 WQ sample collected downstream of double culvert.

Hartford, VT (43.68055, -72.31152)

## Water Quality Measurements

Chemical and physical parameters provide a “snapshot” of current conditions and are used to detect changes in water quality and to make determinations about a waterbody and its watershed. (For More Details)



Characteristic	Description	Trend	Max	Mean	Min
Chloride (mg/L)	At elevated values mostly from deicing	●	76.8	76.8	76.8
Conductivity (umho/cm)		●	453.8	453.8	453.8
Nitrogen (mg/L)	Nutrient that may fuel algae blooms	●	0.3	0.3	0.3
pH	Acidity	●	7.7	7.7	7.7
Phosphorus (ug/L)	Nutrient that may fuel algae blooms	●	10.5	10.5	10.5
Turbidity (NTU)	Measure of suspended sediment	●	0.0	0.0	0.0

## Habitat Observations

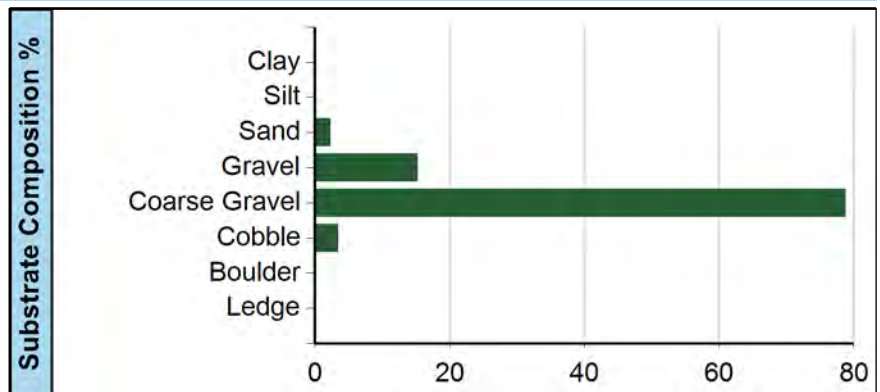
Observations on the physical condition of the waterbody can be useful in determining the habitat type present and if watershed stressors have degraded its ability to support a healthy community of aquatic biota. (For More Details)

Observation Date: 10/7/2021

Habitat Type: Riffle

Embeddedness Estimated %: 10

Canopy %: 70





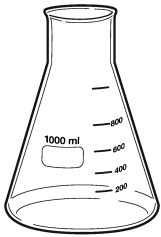
## Monitoring Site Summary - River/Stream

# Dothan Brook

Between Jericho St and Dothan Brook Rd  
Hartford, VT (43.69712, -72.34616)

## Water Quality Measurements

Chemical and physical parameters provide a “snapshot” of current conditions and are used to detect changes in water quality and to make determinations about a waterbody and its watershed. (For More Details)



Characteristic	Description	Trend	Max	Mean	Min
<b>E. Coli Bacteria (#/100ml)</b>	Indicator of pathogens		548.0	191.2	22.0

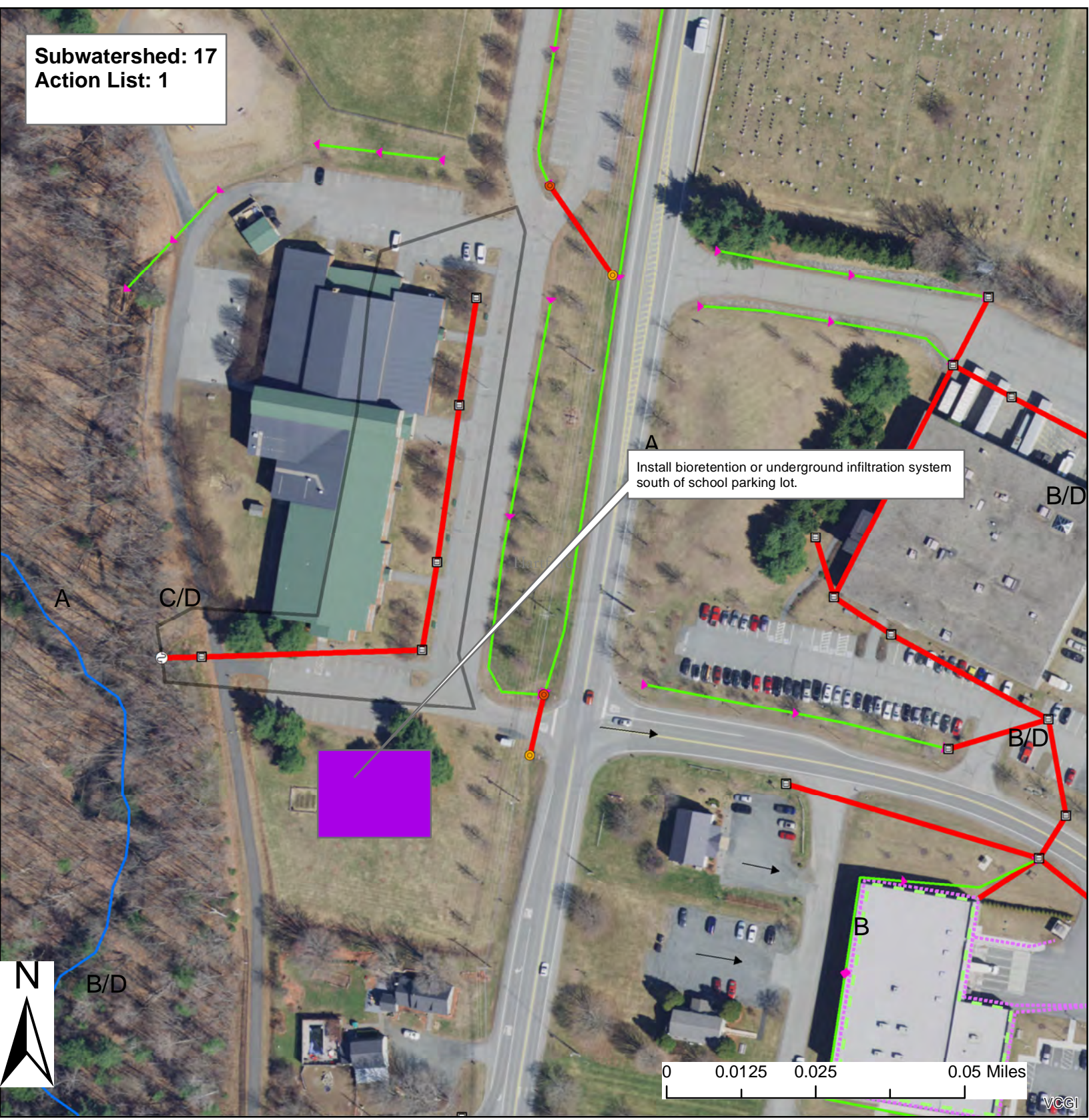
Watershed Number	Action List #	Proposed Action	Proposed or Existing Stormwater Treatment Practice	Permit Number	Watershed Area (Acres)	Current BMP Sediment Reduction Credit	Sediment Load with Current Reductions (lbs.)	Priority Action Sediment Reduction Credit	Sediment Load with Priority Action (lbs.)	Projected Nitrogen Load (lbs.)	Nitrogen Load with Current Reductions (lbs.)	Priority Action Nitrogen Reduction Credit	Nitrogen Load with Priority Action (lbs.)	Water Quality Volume (ft <sup>3</sup> )	Channel Protection Volume (ft <sup>3</sup> )	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
1 Hartford			CB/EDP/GS	5489-9015	4.3	80%	83	0%	83	3.48	2	0%	2	1028	3327					CWIP,SRF,LISF
2 Hartford			CB/SB/GS	3691-9010	3.6	40%	710	0%	710	9.86	8	0%	8	2915	7078					CWIP,SRF,LISF
3 Hartford			CB/GS/OF	3696-9010	1.4	40%	446	0%	446	6.20	5	0%	5	1833	3836					CWIP,SRF,LISF
4 Hartford			OF/GS	5947-9010	3.7	40%	398	0%	398	5.53	4	0%	4	1636	4422					CWIP,SRF,LISF
5 Hartford			OF/CB/GS/ SWPPP	3068-9010, 3020-9010, 5113-9003	8.4	40%	2188	0%	2188	30.39	24	0%	24	8988	20063					CWIP,SRF,LISF
6 Hartford			OF/GS/DW/CB/ SWPPP	3853-9010, 3406-9010, 3406-INDS, 4895-9010, 4072-9003	39.2	40%	3175	0%	3175	44.09	35	0%	35	13041	34941					CWIP,SRF,LISF
9 Hartford			GS/CB/OF		39.5	0%	3061	0%	3061	25.51	26	0%	26	7544	8458					CWIP,SRF,LISF
10 Hartford			CB/URB/SF	3601-9010	2.8	80%	235	0%	235	9.78	6	0%	6	2892	7274					CWIP,SRF,LISF
12 Hartford			GS/OF/WP	3082-9010	30.6	80%	499	0%	499	20.78	12	0%	12	6145	16579					CWIP,SRF,LISF
13 Hartford			CB/GS/EDP	3082-9010	10.8	40%	2536	0%	2536	35.23	28	0%	28	10419	24003					CWIP,SRF,LISF
14 Hartford			GS/OF		5.9	0%	538	0%	538	4.48	4	0%	4	1325	2130					CWIP,SRF,LISF
15 Hartford			OF/CB		14.6	0%	2740	0%	2740	22.83	23	0%	23	6753	15248					CWIP,SRF,LISF
16 Hartford			OF/GS		5.2	0%	2661	0%	2661	22.17	22	0%	22	6558	12919					CWIP,SRF,LISF
17 Hartford	1	Bioretention or infiltration basin at school	BRA/OF/GS	3228-9010	1.4	40%	638	90%	64	8.86	7	90%	1	2619	4915	\$98,080		2,778	\$12,038	CWIP,SRF,LISF
18 Hartford	1	Upgrade pond to infiltration basin.	MOD/CB/GS/WP	4760-9003, 5146-9003, 3150-9010, 3150-9015, 6533-9003	22.9	40%	5895	55%	2653	81.88	66	60%	26	24216	54348		\$75,000	\$23	\$1,347	CWIP,SRF,LISF
19 Hartford			CB/GS/EDP	3362-9010	10.9	30%	3037	0%	3037	36.15	31	0%	31	10692	24563					CWIP,SRF,LISF
20 Hartford			CB/EDP	3113-9010	12.8	30%	2780	0%	2780	33.10	28	0%	28	9788	24068					CWIP,SRF,LISF
21 Hartford			CB		2.2	0%	742	0%	742	6.18	6	0%	6	1828	3920					CWIP,SRF,LISF
22 Hartford			OF/GS		4.3	0%	1281	0%	1281	10.67	11	0%	11	3156	6903					CWIP,SRF,LISF
23 Hartford			CB/OF		1.9	0%	1125	0%	1125	9.38	9	0%	9	2773	5249					CWIP,SRF,LISF
24 Hartford			GS/OF	3529-9010	25.2	40%	2304	0%	2304	32.00	26	0%	26	9463	25652					CWIP,SRF,LISF
31 Hartford			GS/IB/DW		3.7	95%	17	0%	17	2.90	1	0%	1	857	2695					CWIP,SRF,LISF
32 Hartford	1	Bioretention in cul de sac of Perkins Place	BRA/OF/CB/	3294-9010, 3563-9010	147.4	0%	21429	10%	19286	178.57	179	5%	170	52812	115702		\$15,000	\$7	\$1,680	CWIP,SRF,LISF
33 Hartford			CB/OF		90.0	0%	8970	0%	8970	74.75	75	0%	75	22108	39745					CWIP,SRF,LISF
34 Hartford			OF/CB		112.4	0%	9629	0%	9629	80.24	80	0%	80	23730	34578					CWIP,SRF,LISF
37 Hartford			CB/DW/GS		46.5	0%	7478	0%	7478	62.32	62	0%	62	18431	41106					CWIP,SRF,LISF
18 Norwich	2	Modify pooling area to bioretention basin at baseball field	BRA/CB/GS													\$21,807		\$36	\$4,696	CWIP,SRF,LISF
24 Norwich			CB/WP/GS/OF	4910 & 3435 & 5968 & 3696-9010	26.8	40%	2758	0%	2758	38.31	31	0%	31	11329	704					CWIP,SRF,LISF

# *Target Maps*

*Showing Priority Action List  
Drainage Areas*

*And Potential Retrofit Locations*

**Subwatershed: 17**  
**Action List: 1**

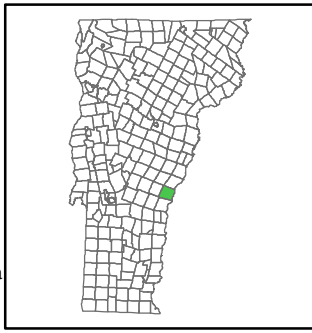


### Hartford, VT

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.



#### 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
- Control Structure
- Treatment feature (see notes)
- Retrofit
- Unknown Point
- Information Point

#### Stormwater line

- Storm line
- Storm line (old Sanitary line)
- Tunnel (storm)
- Combined sewer
- Sanitary line
- Swale
- Footing drain
- Under drain
- Roof drain
- Infiltration pipe
- French drain
- Trench drain
- Emergency spillway
- Stream
- Overland flow

#### NRCS Soils

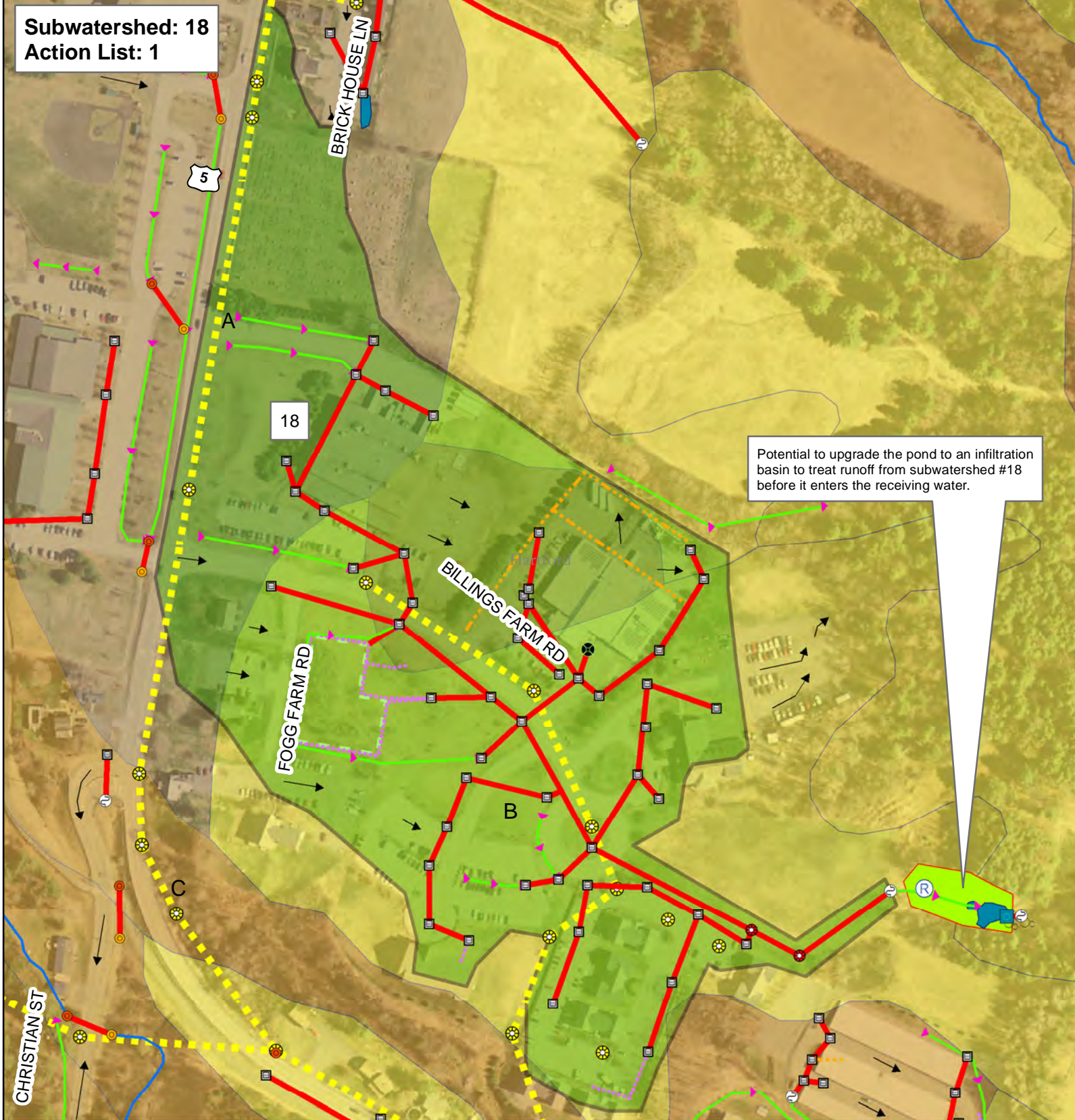
- A
- B
- B/D
- C/D

#### SubwatershedID

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

Creator: Jim Pease, David Ainley  
 DEC - WID - Clean Water Initiative Program  
 Plotted Date: 10/15/2021  
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survey  
 Imagery Source: VCGI Best Available Imagery

**Subwatershed: 18**  
**Action List: 1**



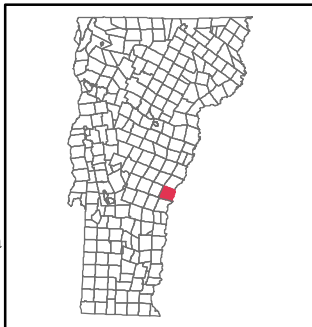
Potential to upgrade the pond to an infiltration basin to treat runoff from subwatershed #18 before it enters the receiving water.

### Hartford, VT

DEC Stormwater Infrastructure Mapping Project

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#### 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
- Storm line (old Sanitary line)
- Tunnel (storm)
- Combined sewer
- Sanitary line
- Swale
- Footing drain
- Under drain
- Roof drain
- Infiltration pipe
- French drain
- Trench drain
- Emergency spillway
- Stream
- Overland flow

#### NRCS - Soils

- A
- B
- C
- D

#### SubwatershedID

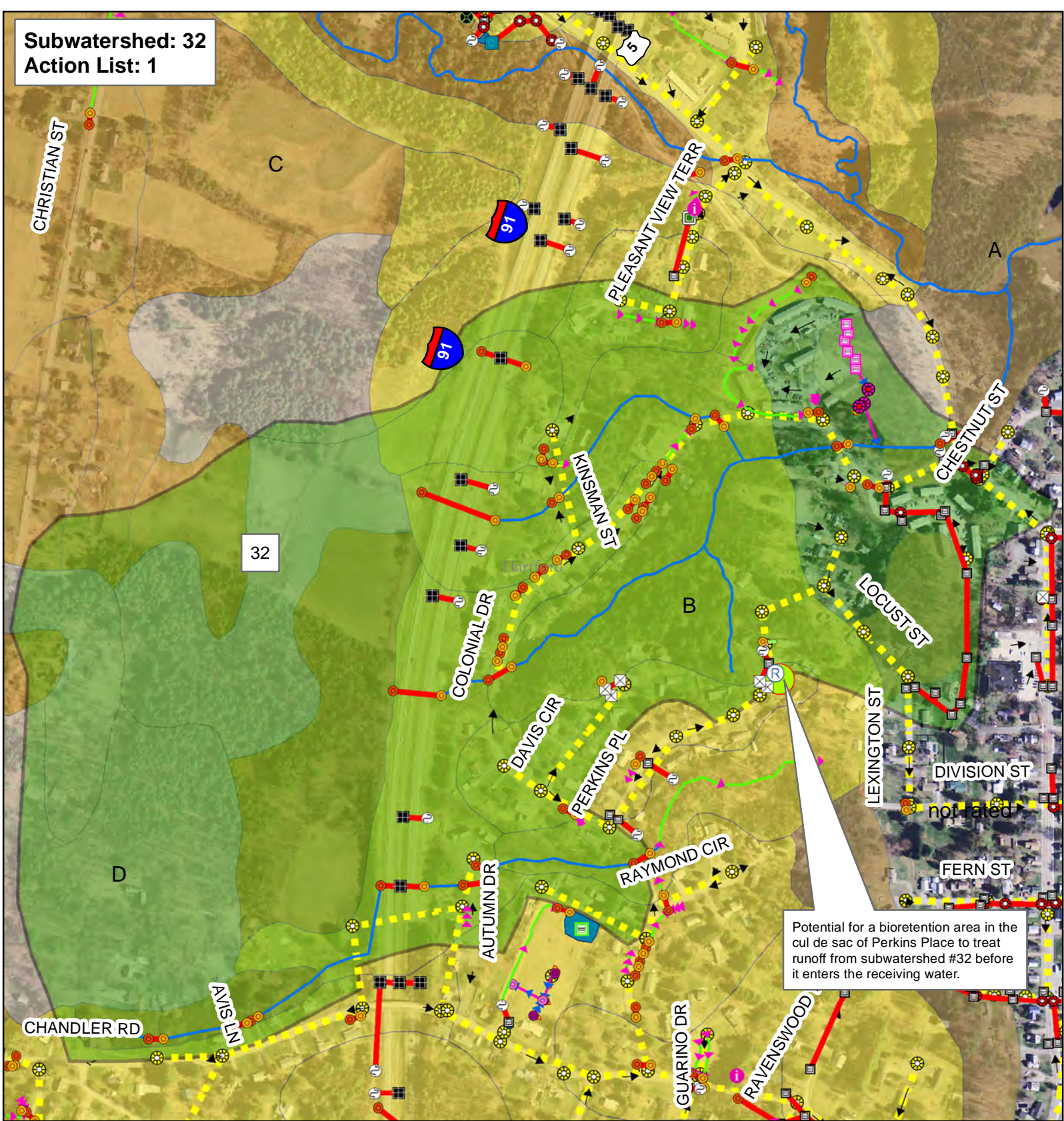
- Priority Subwatershed
- Stormwater Treatment Area
- Potential Stormwater Treatment Area

Creator: Jim Pease, David Ainley  
DEC - WSMD - Ecosystem Restoration Program  
Plotted Date: 2/18/2015  
Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survey  
Imagery Source: VCGI 2011 .5m





**Subwatershed: 32**  
**Action List: 1**



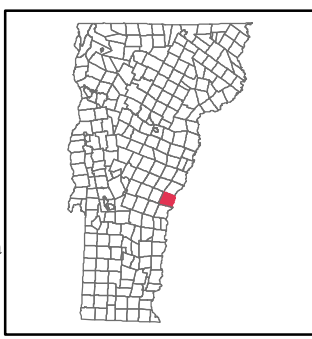
Potential for a bioretention area in the cul de sac of Perkins Place to treat runoff from subwatershed #32 before it enters the receiving water.

### Hartford, VT

DEC Stormwater Infrastructure Mapping Project

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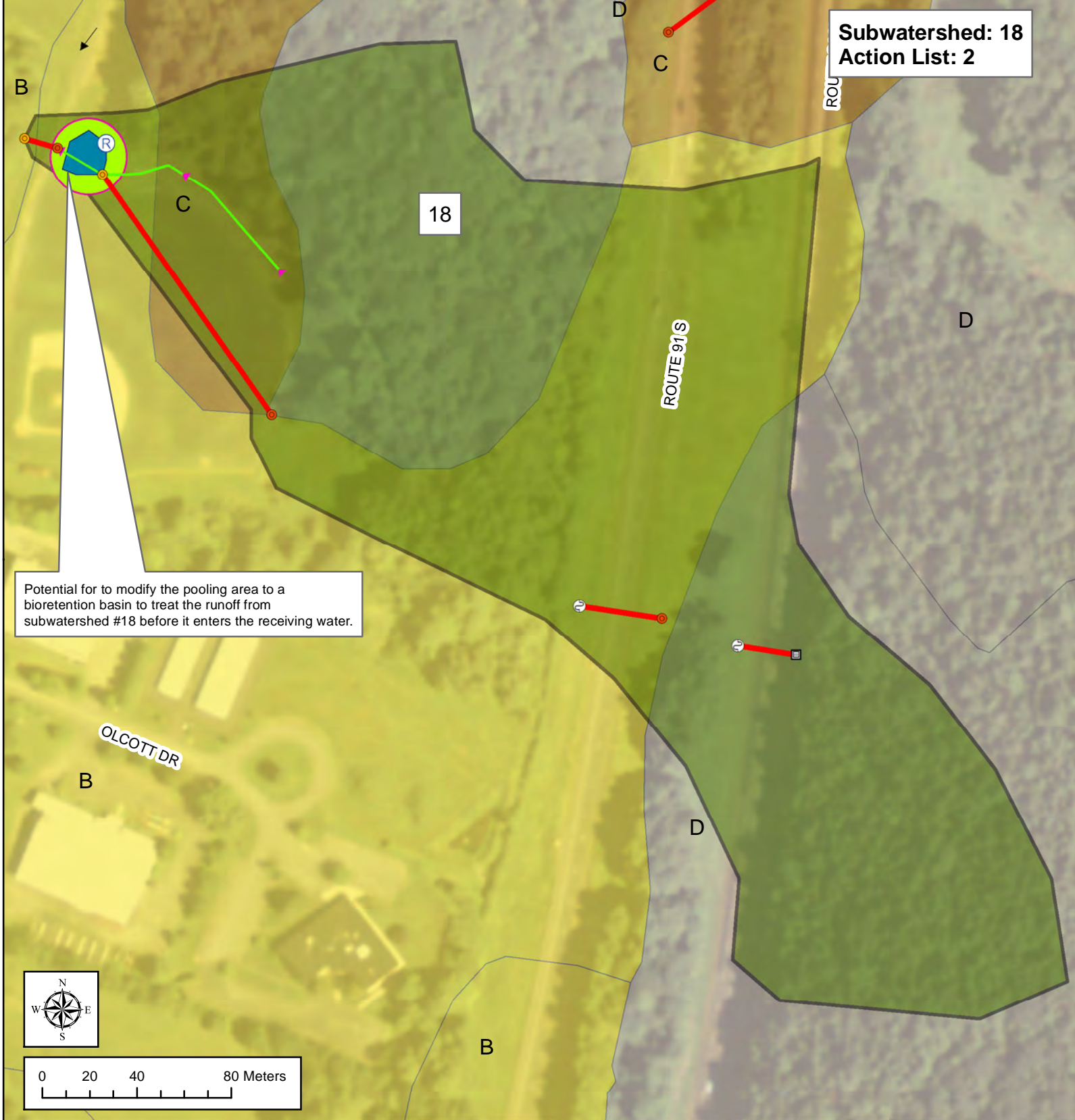


<p><b>Stormwater points</b></p> <ul style="list-style-type: none"> <li> Pipe Cross (not connected)</li> <li> Catchbasin</li> <li> Dry Well</li> <li> Drop Inlet</li> <li> Grate/Curb Inlet</li> <li> Yard drain</li> <li> CB tied to sanitary sewer</li> <li> Junction Box</li> <li> Stormwater Manhole</li> <li> Outfall</li> <li> Culvert inlet</li> <li> Culvert outlet</li> <li> Pond outlet structure</li> <li> Treatment feature (see notes)</li> <li> Retrofit</li> <li> Unknown Point</li> <li> Information Point</li> </ul>	<p><b>Stormwater line</b></p> <ul style="list-style-type: none"> <li> Storm line</li> <li> Storm line (old Sanitary line)</li> <li> Tunnel (storm)</li> <li> Combined sewer</li> <li> Sanitary line</li> <li> Swale</li> <li> Footing drain</li> <li> Under drain</li> <li> Roof drain</li> <li> Infiltration pipe</li> <li> French drain</li> <li> Trench drain</li> <li> Emergency spillway</li> <li> Stream</li> <li> Overland flow</li> </ul>	<p><b>NRCS - Soils</b></p> <ul style="list-style-type: none"> <li> A</li> <li> B</li> <li> C</li> <li> D</li> </ul>	<p><b>SubwatershedID</b></p> <ul style="list-style-type: none"> <li> Priority Subwatershed</li> <li> Stormwater Treatment Area</li> <li> Potential Stormwater Treatment Area</li> </ul>
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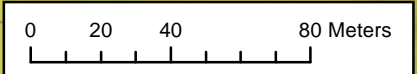
Creator: Jim Pease, David Ainley  
 DEC - WSMD - Ecosystem Restoration Program  
 Plotted Date: 2/18/2015  
 Data Sources: VTRANS Roads data, VT Hydrography data set, DEC Stormwater database, NRCS soils survey  
 Imagery Source: VCGI 2011 .5m



**Subwatershed: 18**  
**Action List: 2**



Potential for to modify the pooling area to a bioretention basin to treat the runoff from subwatershed #18 before it enters the receiving water.

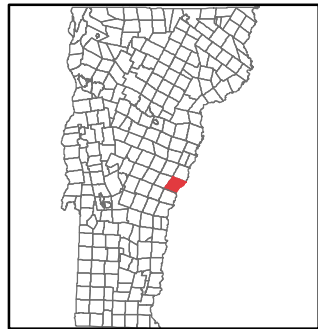


## Norwich, VT

DEC Stormwater Infrastructure Mapping Project

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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

