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MEMORANDUM

REVISED DATE: October 14, 2013

TO: Dan Albrecht; Megan Moir; Tom DiPietro; Jennifer Callahan and Craig DiGiammarino; Bill Nedde, Derick Read, Linda Seavey and Lani Ravin; and Jeff Padgett and Andrew Mills

FROM: Horsley Witten Group, Inc

RE: Centennial Brook Watershed: Retrofit Field Findings Summary

This Memorandum was revised from its original version (dated June 13, 2013) based on adjustments to retrofit concepts made during subsequent modeling efforts and per MS4 input. An errata summary sheet is included on page 8 to summarize the changes between the current and original document versions.

This memorandum provides a preliminary summary of the sites visited during field work on May 15-17, 2013. It includes a brief description of assessment activities, tables summarizing potential retrofit locations and sites that have been eliminated or reserved, as well as a list of watershed boundary revisions. A watershed map of potential retrofit sites and their drainage areas is provided for reference. Attached are 2-page summaries of each potential retrofit listed in the summary table. Each "Retrofit Summary Sheet" includes a site photo, concept description, site information, and a map showing the drainage area and practice footprint. (The retrofit drainage areas identified in the Summary Sheets are estimates based on field observations and may differ slightly from those presented in Table 1). PlanGIS shape files created for the potential retrofits can be provided upon request (e.g., retrofit point, drainage area polygons, practice footprint, and impervious cover captured).

The purpose of this memo is to give you a basic understanding of the potential projects identified/verified in the field and allow for some initial feedback from the MS4s. The next step in the process is for us to refine the potential concepts to a level where practice sizing and HydroCAD modeling can be completed and entered into a revised VTBMPDSS model run. Before refining any of the concepts, however, the MS4s should review the potential retrofits presented here and consider the following:

1. Are there any retrofits in Table 1 that you do not want us to pursue further? If so, should we exclude them completely from any further consideration, or keep them in reserve if

additional flow reduction is needed? For example, Site #17 was recently identified by UVM as a location for future development.

2. Are there any retrofits in Table 2 that you think we should keep in reserve?
3. Is there additional information on any of these sites that was discussed in the field, but we still need to collect from you? Tom DiPietro has provided a map of parcels open to Airport purchase, as well as White Street repair plans showing the depth of sewer and water lines, for example. UVM and VTrans have provided some additional plans/data, as well.
4. Are there additional retrofit options that we may have missed?
5. For sites where test pits would be helpful to refining retrofit concepts, how do you want to coordinate? The following sites were identified as being important locations to gather subsurface conditions information, if possible: #21 Dumont Ave., #15 Jaycee Park, #14 Chamberlain School, #25 Picard Circle, and #18 A Pine St. (So. Burlington); #20 Grove Street Parking Lot (Bur.); and #M7B Open area east of Case Parkway (UVM).
6. For sites where there may be wetland issues (e.g., #24 behind the Sheraton, #13 I-89 Kettle Hole, and #16 I-89 outfall), should we proceed with preliminary inquiries to the permitting authorities?

Please send us any comments you have by **June 28th**, at which time we will move forward with initial refinement of the concepts listed, or schedule a meeting to discuss further with the full team. Ideally, we would like to have a sense of how each retrofit contributes to flow restoration in the VTBMPDSS model prior to scheduling a face-to-face meeting. This meeting would be used to go through each retrofit in detail and decide which concepts should be further advanced for inclusion in the FRP.

Field Assessment

The field assessment was conducted May 15-17, 2013. A candidate site list was developed in advance based on a desktop analysis (see Memo dated April 17, 2013) and input from the MS4s. These sites (and a handful of others) were evaluated by one of three teams consisting of Horsley Witten, Trudell, and MS4 representatives. The primary purpose of the field investigation was to determine the feasibility of implementing drainage retrofits to promote stormwater attenuation and recharge in the Centennial Brook watershed, as well as identify green infrastructure opportunities. The participation of MS4 representatives was critical during the assessment, as they provided valuable insight and information on how runoff is currently managed or conveyed at many of the sites, historical and future site plans, and initial input on retrofit feasibility.

Nearly 50 sites were field evaluated. The field assessment for each site typically involved confirmation of the following items, crucial in developing retrofit concepts and in determining feasibility: contributing drainage area; land availability for practice; existing drainage infrastructure; adequate gradient for drainage improvements; site constraints; property ownership; and soil conditions.

Potential Retrofits

Table 1 summarizes the potential retrofit opportunities identified. Individual summaries and site maps of each proposed retrofit are attached to this memo. Organized by site ID and name, Table 1 includes information on the type of practice proposed, the estimated drainage area and impervious cover captured, and the MS4 jurisdiction. Area estimates provided here are more accurate than estimates included on attached field summary sheets. Each site is classified as a primary or secondary retrofit.

Primary retrofits typically include practices like detention ponds, large infiltration basins or underground recharge/storage chambers proposed to manage "off-site" drainage, and proposed retrofits of existing facilities. Smaller "on-site" facilities such as green infrastructure practices are also primary if they are not within the drainage boundary of another BMP.

Secondary sites fall within the drainage area to primary retrofits or are within areas currently controlled by existing stormwater facilities. The rationale behind these proposed retrofits is to identify opportunities to: 1) free up existing basin capacity for future development or currently unmanaged areas; and 2) manage non-UVM areas that are currently draining to UVM facilities.

Table 1. Potential Retrofit Site Summary

Site ID	Name	Type of Practice	Retrofit DA (acres)	Impervious (acres)	Practice Rank	Comments	MS4 Contact
12A	University soccer field	Basin (inf)	1.40	0.33	Existing	Practice currently under construction by UVM	UVM
13	Patchen Rd. kettle hole	Basin (inf)	14.06	5.06	Primary	Private ownership	So. Bur.
14A/B	Chamberlin School (east)	URC (inf)	31.49	10.04	Primary	Fill soils, possible to collect offsite drainage	So. Bur.
15	Jaycee Park (S. Burlington)	URC (inf)	15.73	5.81	Primary	Underground recharge beneath ex. ballfield	So. Bur.
16	I-89 outfall	Basin (det)	52.25	18.88	Primary	Public and Private ownership; FHA approval required.	VTrans
16B	I-89 cloverleaf (northeast)	Basin (det)	39.17	16.14	Secondary	Alt. location to #16; Existing basin retrofit; add outlet structure	VTrans
17	"Jug handle" at Spear & Main St. (east)	UDC (det)	22.01	7.28	Secondary	Site currently identified as a UVM development zone; in DA to #M5A/24	UVM
18	Fielding Lane Condos	Basin (inf)	17.17	5.27	Primary	Privately-owned, intercept pipe at outfall	So. Bur.
18A	Lot at corner of Patchen Rd. & Pine St.	URC (inf)	20.42	6.02	Primary	Private ownership; requires diversion structure	So. Bur.
20	Grove St Parking Lot	URC (inf)	8.82	2.54	Primary	Publicly-owned parking lot	Bur.
20A	SD Ireland Property	--	4.66	3.82	--	Assume proposed development will fully managed runoff on-site	Bur.

Site ID	Name	Type of Practice	Retrofit DA (acres)	Impervious (acres)	Practice Rank	Comments	MS4 Contact
21	Dumont Ave. (south)	URC (inf)	3.92	1.19	Primary	Airport-owned property.. Test pit required.	So. Bur.
21A	Airport basin (existing)	Basin (inf)	1.18	0.28	Existing	Abandoned basin; Potential option for expansion/outlet for #21	So. Bur.
22	Best Western Windjammer Inn (north)	Basin (inf)	29.25	21.53	Primary	Intercept existing drain lines above outfall; repair severely eroding channel	So. Bur.
22A	Best Western Windjammer Inn (west)	Basin (inf)	3.86	1.09	Primary	Locate at existing gully; not as much drainage as #22	So. Bur.
22B	Best Western Windjammer (south)/ Gulf	Bio	0.23	0.15	Secondary	Existing depression now infiltrates	So. Bur.
23A	Staples Plaza	UDC (det)	1.38	1.31	Secondary	Privately-owned; easily directed to #24/M5A	So. Bur.
23B	Staples Plaza roof	Blue Roof (det)	1.10	1.10	Secondary	Investigate structural capacity of building; easily directed to #24/M5	So. Bur.
24	Back of Sheraton Hotel	Basin (det)	6.11	2.08	Primary	Combine with Main St. Pond #M5A; consider wetland permitting issues	UVM
25	Picard Circle	URC (inf)	51.84	16.70	Primary	Decommissioned buildings; lots purchased by airport	So. Bur.
25A	White St. ROW	URC (inf)	0.27	0.11	Secondary	Small project in road ROW; fix localized flooding; drains to #25	So. Bur.
26	Duval St.	GI/URC	3.57	1.18	Primary	Wide residential streets	So. Bur.
27	Clover St.	URC (inf)	3.83	1.43	Primary	Wide residential streets	So. Bur.
M1A	Centennial Crt. Apartments (existing basin)	Basin (inf)	6.54	2.87	Secondary	Existing basin retrofit; add outlet structure; drains to East Campus Pond (M1B)	UVM
M1B	East Campus Pond (existing)	Basin (det)	69.80	43.67	Primary	Existing basin retrofit; modify outlet structure to maximize detention	UVM
M3A	Queensbury Pond (existing)	Basin (det)	7.60	3.05	Primary	Existing basin retrofit, increased drainage area captured	So. Bur.
M5A & M5A2	Main St Pond (existing)	Basin (det)	67.93	29.04	Primary	Outlet needs repair. M5A: modify basin as forebay for #24. M5A2: expand facility for additional attenuation. Ledge removal required.	UVM
M7A	North Campus Pond (existing)	Basin (det)	83.84	47.43	Primary	Proposed 3' additional berm height. Overhead high-tension electric.	UVM

Site ID	Name	Type of Practice	Retrofit DA (acres)	Impervious (acres)	Practice Rank	Comments	MS4 Contact
M7A2	North Campus Pond (existing)	Basin (det)	2.28	1.36	Primary	Proposed 6' additional berm height. Elevate overhead electric.	UVM
M7B	Open area east of Case Pkwy.	URC (inf)	8.52	4.04	Secondary	Site on UVM land. Existing trees in poor health	Bur./ UVM
M7C	Case Pkwy. center island	Bio	0.86	0.50	Secondary	Bio in ROW center island. Utility conflicts likely.	Bio
M7D	140 East Ave. residence	Bio	0.63	0.36	Secondary	Bio in ROW & private property. Possible utility conflicts in roadway.	Bio
200	N. Henry Court	Bio/ URC	1.04	0.45	Primary	Direct discharge from steep slope to creek at dead end road.	So. Bur.
201	Lynn St./Barber Tr. (north)	Bio/ URC	0.67	0.24	Secondary	In road ROW at entrance to small park; in DA to #25	So. Bur.
202	Lynn St./Barber Tr. (south)	Bio/ URC	0.47	0.15	Secondary	Private; at entrance to small park; in DA to #25	So. Bur.
203	Suburban Sq. Neighborhood	Various GI	7.11	2.97	Secondary	Neighborhood options for dry wells, rain gardens, & street bump outs; in DA to #14	So. Bur.
204	Greers at Dorset St /Williston Rd	Bio/ UDC	0.43	0.37	Secondary	Capture roof & parking lot runoff at private commercial property; drains to #16	So. Bur.
205	Vermont Gift Barn	Bio	0.16	0.12	Secondary	Divert roof drainage to existing at private commercial property; in DA to #16 or #22A	So. Bur.
206	Northfield Savings Bank	Bio	0.34	0.30	Secondary	Small retrofit at private commercial property; In DA to #22	So. Bur.
207	Fletcher Allen green space	Bio	0.89	0.85	Secondary	Existing trench drains capture roadway; in DA to North Campus Pond (M7)	Bur.
208	Fletcher Allen parking lot	Bio	0.83	0.53	Secondary	Existing drainage feature upgrade; in DA to East Campus Pond (M1)	Bur.

Bio=bioretention; DA= Drainage area; Det= detention; GI= Green Infrastructure; Inf= infiltration; UDC= Underground Detention Chambers; URC = Underground Recharge Chambers

Table 2 summarizes candidate sites considered infeasible that are not likely to be pursued further are summarized in.

Table 2. Candidate Sites Removed from Further Retrofit Consideration

Site ID	Name	Type of Practice	Comment	MS4 Contact
5B	UVM wind turbine area	Basin	Area slated for development. Drainage area managed by a down-gradient practice (#M5A).	UVM
12	Open area east of UVM soccer field	URC (inf)	Insufficient drainage area. Impervious will be managed by an alternate practice (# 12A).	UVM
15A	Green space behind Starbucks parking lot	Basin	Drainage area to be managed by an alternate practice (# 22).	So. Bur.
15B	Green space behind Higher Ground parking lot	Basin	Drainage area to be managed by an alternate practice (# 22).	So. Bur.
16A	I-89 on-ramp (west)	Basin	Secondary site. Drainage area managed by 16 or 16B. FHA approval required.	VTrans
16D	Front of Sheraton	UC (det)	Low priority, drains to #16 and #16B	So. Bur.
17A	Open area at Spear & Main St. (west)	Basin	Area slated for development. Drainage area to be managed by a down-gradient practice (#17 and/or #M5A/24).	UVM
19	Bilodeau Court	URC (inf)	Low feasibility; high impacts to abutters	Bur.
21B	Dumont Ave. lot (north)	URC	Better option on lot on the south-side of the road (#21)	So. Bur.
21C	Maryland St. lot	URC (inf)	Privately-owned lot. Deep drainage lines makes difficult; could be routed to retrofit #21 or #25	So. Bur.

Adjustments to Centennial Brook Watershed Boundaries

The Centennial Brook watershed boundary should be revised at the following locations based on field observations:

1. Burlington, near the baseball field. University Road and the adjacent UVM parking lot should be included within the watershed. Thibault Parkway, Latham Court, and the properties on East Ave. north of University Road should be excluded from the watershed. Thibault Parkway and Latham Court are currently on a combined sewer-drainage system.

2. Burlington, in the northern-most portion of the watershed. There are minor boundary adjustments required along Grove Street, in relation to the drainage area for Proposed Retrofit #20.

3. UVM. A minor adjustment to be made at the southern boundary of the watershed near the UVM campus, between Spear Street and East Terrace.

4. UVM, western corner of watershed. A major adjustment is proposed by UVM to redirect existing area outside of watershed to North Campus Pond (#M7).

5. So. Burlington, southeast side of watershed. Portion of Lynn St. and Barber Terrace and open space appears to drain north towards White St.

6. So. Burlington. Small area north of Patchen Rd. at Landfill Rd. drains outside the watershed. Edge of pavement should be the watershed boundary.

7. VTrans. Northern-most point of I-89 that is currently shown just outside the watershed appears to have a catch basin and drainage pipe in the median draining to Centennial Brook.

Field Findings Memorandum Errata Sheet (10/7/2013)

1. Table 1: Revised for consistency with tables produced as part of the "Flow Restoration Memorandum" (dated October, 2013). Table 1 drainage areas, impervious areas, and practice ranking were updated. Additional clarification regarding the Retrofit facility provided under the "Comments" column.
2. Adjusted definition of "primary" and "secondary" classification of potential retrofits.
3. Table 2: Removed Retrofits M7C and M7D from table; added back to Table 1.
4. Revised Retrofit Summary Sheet for Retrofit 16 I-89 Outfall.
5. Revised Retrofit Summary Sheet for Retrofit 17 "Jug Handle" site.
6. Revised Retrofit Summary Sheet for Retrofit 18A Patchen Rd.
7. Revised Retrofit Summary Sheet for Retrofit 24 behind the Sheraton, which is linked with the M5A Main St. Pond.
8. Added Retrofit Summary Sheet for Retrofit M1B East Campus Pond.
9. Revised Retrofit Summary Sheet for Retrofit M3A Queensbury Pond.
10. Revised Retrofit Summary Sheet for Retrofit M5A Main St. Pond to include retrofit M5A2, which is an alternative concept provided by UVM. Provided sketch for Retrofit M5A2.
11. Revised Retrofit Summary Sheet for Retrofit M7A North Campus Pond to include retrofit M7A2, which has a higher proposed berm.

With the exception of the concept summary sheets listed here, drainage area and impervious area estimates shown on remaining concept summary sheets were <u>not</u> updated and may not be wholly consistent with estimates summarized in Tables 1 and 2.

Attachment:

Centennial Brook
Retrofit Concept Summaries

ID#: Retrofit 12A

Name: **University Rd. soccer field**

Concept Description:
UVM proposed a dry swale along the western edge of the soccer field to capture a poriton of University Road. The site has been designed (K&L) and is currently under construction.

Notes/Feasibility:
The portion of the soccer field that does not flow to practice drains and infiltrates under bleachers. University Rd. was recently paved. West side of University Rd. is the drainage/watershed boundary.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: UVM	**Project Candidate:** Ok
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Institutional	**Proposed Retrofit Practice 1:** Dry Swale
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** -None Selected-
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Nutrients / Organics	**Maintenance Burden:** Low
Sources/pollutants 2: Sediment	**Benefits:** Storage: NO Water Quality: YES Recharge: YES Demo: YES Repair: NO Reuse: NO **Other:** None
Soils: Good Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: NO Polluted: NO High WT: NO Wetlands: NO **Other:** None
Use in Retrofit DA: Street and field	
SIZING INFO	
Drainage Area (ac): 1.16	
Impervious Area (ac): 0.31	
Practice Area Available (ft^2): 3,200	
Existing Head Available? --	

Date Assessed: May 16, 2013, 2:07 PM **Assessed by:** KMH/AGM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

80

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Retrofit #12A: University Soccer Field

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 13

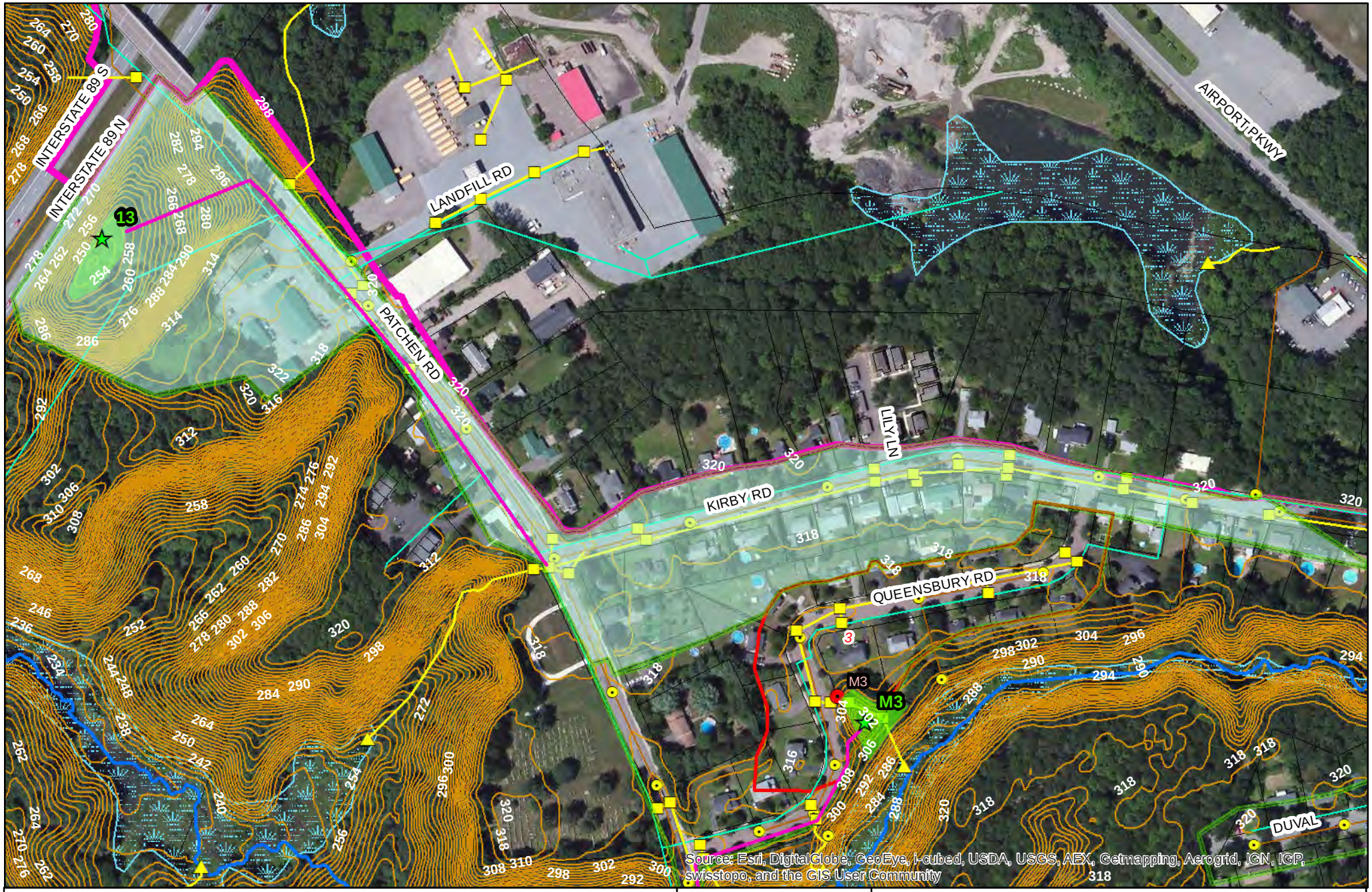
Name: **I-89 Kettle Hole**

Concept Description:
Detention Pond (or infiltration basin-if soils are acceptabe). Directly convey runoff from contributing area off Patchen Road down slope to sediment forebay. Modify existing 30" culvert headwall (under I-89) to achieve required flow control. Could pick up Kirby Rd.

Notes/Feasibility:
Good site; final feasibility will require verification of wetland limits (small area of wetland vegetation, but soils generally upland), assessment of impacts to existing water main (runs through parcel, see blow-off valve in photo), and coordination with VTrans for ponding against I-98 R/W.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: VTrans and private owner	**Project Candidate:** Yep, Love It
Ownership: Public and Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Forest	**Proposed Retrofit Practice 1:** Pond
Land Use 2: waterline ROW	**Proposed Retrofit Practice 2:** Infiltration if feasible possible HW issues with water line
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** -Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: NO Recharge: YES Demo: NO Repair: NO Reuse: NO **Other:** None
Soils: Good Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: YES Polluted: NO High WT: NO Wetlands: YES **Other:** Small wetland pockets
Use in Retrofit DA: Street, SF Res	
SIZING INFO	
Drainage Area (ac): 14.06	
Impervious Area (ac): 5.05	
Practice Area Available (ft^2): 10,160	
Existing Head Available? n/a	

Date Assessed: May 16, 2013, 8:56 AM **Assessed by:** RAC, NBP, SMM



Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

250

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Retrofit #13 Kettle Hole at I-89

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 14A

Name: **Chamberlain School (east)**

Concept Description:
Underground detention in open space of school property. It seems possible to collect drainage off of White Street (and upgradient residential neighborhood) and connect to existing system via school entrance. Underground chambers could be designed as infiltration pending results of soils testpitting. (note HSG – D on east side of school property).

Notes/Feasibility:
Existing drainage system (12" cmp) drains parking lot. Would need to verify capacity to add addition upgradient lands – only need to be sized for 1- YR. Cp_v.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: School	**Project Candidate:** Undecided
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: School	**Proposed Retrofit Practice 1:** Pre-treament chambers
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** Underground storage, no infiltration
Existing BMP on site? No	**Non-Structural Controls:** Educational signage for school
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: NO Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** -None Selected-
Soils: Poor (HSG D, according to soils mapping)	
Use in Retrofit DA: streets, single family res	
SIZING INFO	
Drainage Area (ac): 31.56 (with #14B)	
Impervious Area (ac): 10.08 (with #14B)	
Practice Area Available (ft^2): 9,220	
Existing Head Available? n/a	

Conflicts:
Soils: YES
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: YES
Wetlands: NO

Other: -None Selected-

Date Assessed: May 16, 2013, 3:52 PM **Assessed by:** RAC, NBP, SMM

ID#: Retrofit 14B

Name: **Chamberlain School (west)**

Concept Description:
Underground detention in open space of school property. It seems possible to collect drainage off of White Street (and upgradient residential neighborhood) and connect to existing system via school entrance. Underground chambers could be designed as infiltration pending results of soils testpitting. (note HSG – B on west side of school property). Would be in addition to Site 14A as its unlikely to be able to manage all area on one locations.

Notes/Feasibility:
Existing drainage system (12" cmp) drains Bldg and parking lot. Would need to verify capacity to add addition upgradient lands – only need to be sized for 1- YR. Cp_v.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: School	**Project Candidate:** Ok
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: School	**Proposed Retrofit Practice 1:** Infiltration
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** Requires pretreatment
Existing BMP on site? No	**Non-Structural Controls:** Educational signage
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: YES Demo: NO Repair: NO Reuse: **Other:** -None Selected-
Soils: Unknown, presumed OK (HSG B)	
Use in Retrofit DA: school, streets, single family res.	
SIZING INFO	
Drainage Area (ac): 31.56 (with #14A)	
Impervious Area (ac): 10.08 (with #14A)	
Practice Area Available (ft^2): 23,780	
Existing Head Available? n/a	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: POSSIBLE
Wetlands: NO

Other: -None Selected-

Date Assessed: May 16, 2013, 4:31 PM **Assessed by:** RAC, NBP, SMM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

200 Feet

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Retrofit #14: Chamberlain School

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 15

Name: Jaycee Park

Concept Description:
Pretreatment tank to underground infiltration chambers. Pretreatment could be proprietary device (e.g, StormCeptor or equal) before underground chambers. Access would need to be coordinated with playing fields. Flow diversion structure would be in Patchen Road, with depth to drain pipe at approx 6.5 feet.

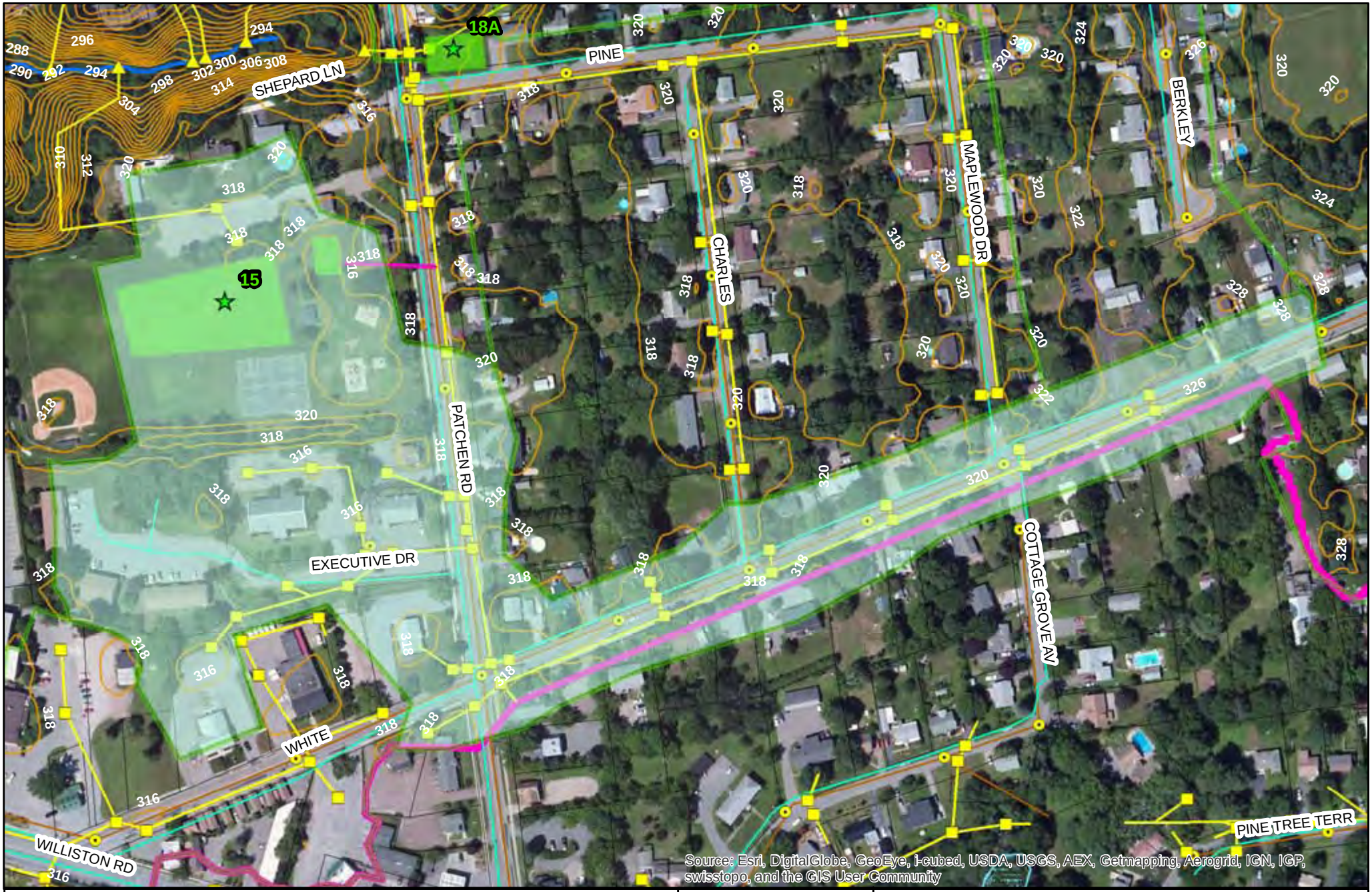
Notes/Feasibility:
Flow diversion from Patchen Road drives depth of inflow approx 10.5 feet below grade (bottom of chambers 12-13 feet). Existing trees in park, reconstruction of fields
Soils at design depth, unknown.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: South Burlington Parks and Rec.	**Project Candidate:** Yes.
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Park	**Proposed Retrofit Practice 1:** Underground infiltration
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** Pretreatment structure
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: YES Demo: NO Repair: NO Reuse: NO **Other:** -None Selected-
Soils: Good Infiltration	
Use in Retrofit DA: streets, SF res, some commercial	
SIZING INFO	
Drainage Area (ac): 15.74	
Impervious Area (ac): 5.81	
Practice Area Available (ft^2): 32,220 + 2,530 (pretreatment area)	
Existing Head Available? Yes (12- 13 ft depth, overflow ok)	

Conflicts:
Soils: NO
Access: NO
Land Use: YES
Utilities: YES
Polluted: NO
High WT: NO
Wetlands: NO

Other: -None Selected-

Date Assessed: May 17, 2013, 10:42 AM **Assessed by:** RAC, SMM



Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

200

TRUDELL CONSULTING ENGINEERS

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Sustainable Environmental Solutions

Retrofit #15: Jaycee Park

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 16 (revised)

Name: **I-89 Outfall**

Concept Description:
Detention storage facility. Location is flexible depending on evaluation of constraints. Most downstream location would be across from drainage outlet, below water main (best location for embankment – maximizes storage), but impact to water main R/W likely and partially on private property. Alternative is to move embankment upgradient to limit of I-89 R/W – would reduce available storage, but keep all work within VTrans jurisdiction.

Notes/Feasibility:
Feasible, but contraints need to be quantified, including property ownership, wetlands impacts (see Phrag in photo), water main. Construction and maintenance access good, via water main R/W. Vtrans noted that prior riprap work was NOT a permitting issues with COE or DEC.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: VTrans, unknown private owner	**Project Candidate:** Yes
Ownership: Public and private (depending on option)	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Highway R/W	**Proposed Retrofit Practice 1:** Detention Pond
Land Use 2: Open space next to interstate	**Proposed Retrofit Practice 2:** Could be a const wetland
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** -None Selected-
Soils: Poor Infiltration	**Conflicts:** Soils: YES Access: NO Land Use: YES Utilities: YES Polluted: NO High WT: NO Wetlands: YES **Other:** -None Selected-
Use in Retrofit DA: Street, Interstate highway	
SIZING INFO	
Drainage Area (ac): 52.25	
Impervious Area (ac): 18.88	
Practice Area Available (ft^2): 23,550	
Existing Head Available? n/a	

Date Assessed: May 16, 2013, 1:52 PM **Assessed by:** RAC, NBP, SMM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

300

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Retrofit #16: I-89 Outfall

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 16A

Name: **I-89 on-ramp (west)**

Concept Description:
Depression bounded by eastern on-ramp, eastern off-ramp and northbound lanes of I-89. Not an ideal site because the 6' pipe runs under this area at a depth of approx. 8 feet – would have to daylight pipe.

Notes/Feasibility:
Feasible, but would require daylighting 8 ft deep pipe and addressing safely issues off or highway.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: VTrans	**Project Candidate:** No
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Road	**Proposed Retrofit Practice 1:** Detention Pond
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** Dry detention basin
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: NO Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** -None Selected-
Soils: Poor Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: YES Polluted: NO High WT: NO Wetlands: NO **Other:** Fed highway approval
Use in Retrofit DA: Highway interchange	
SIZING INFO	
Drainage Area (ac): --	
Impervious Area (ac): --	
Practice Area Available (ft^2): 8,700	
Existing Head Available? n/a	

Date Assessed: May 16, 2013, 2:09 PM **Assessed by:** RAC, NBP, SMM

ID#: Retrofit 16B

Name: **I-89 cloverleaf (northeast)**

Concept Description:
Detention structure bounded by northbound lanes and off-ramp (directing traffic to westbound Williston Rd). Existing culvert drains all upgradient area from interchange and Williston Rd. Modify outlet to install new control structure for Cp_v storage.

Notes/Feasibility:
Good location for detention retrofit. Existing outlet pipe (48" CMP) easily accessable for constructin and maintenance. Contraints include safety considerations from highway and existing wetlands (though mapped- all areas appear to be phrag dominated and isolated). Approx 14 of grade from invert to low point on off-ramp.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Jennifer Callahan- VTrans	**Project Candidate:** Yes, possibly combined with Site #16
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Road	**Proposed Retrofit Practice 1:** Extended Detention
Land Use 2: Highway interchange	**Proposed Retrofit Practice 2:** Const Wetland options
Existing BMP on site? No	**Non-Structural Controls:** limit highway turf
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** Moderate
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** -None Selected-
Soils: Unknown	
Use in Retrofit DA: Highway Interchange	
SIZING INFO	
Drainage Area (ac): 39.23	
Impervious Area (ac): 15.65	
Practice Area Available (ft^2): 62,650	
Existing Head Available? n/a	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: YES

Other: -None Selected-

Date Assessed: May 16, 2013, 2:21 PM **Assessed by:** RAC, NBP, SMM

ID#: Retrofit 16D

Name: **Sheraton (in front)**

Concept Description:
Underground detention structure, possibly infiltration – flow diversion from drainage inlets in Williston Road.

Notes/Feasibility:
Feasibly but not terrible cost effective. Small drainage area, private ownership (Sheraton) + coordination with VTrans required (drains to I-89 internchange), depth of pipe (~7.5 ft) require 6 – 8 ft deep facility, daylight to pipe system within I-89 R/W just barely works.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Sheraton	**Project Candidate:** No, suggest #16 or #16B
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial	**Proposed Retrofit Practice 1:** Underground Detention
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** Pretreatment structure needed
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? Yes	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: Metals	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** -None Selected-
Soils: Poor – HSG D	
Use in Retrofit DA: Williston Rd	
SIZING INFO	
Drainage Area (ac): 1.6 ac	
Impervious Area (ac): ~ 0.7	
Practice Area Available (ft^2): ~11,500	
Existing Head Available? Yes, but only about 2-3 ft.	

Conflicts:
Soils: YES
Access: YES
Land Use: YES
Utilities: YES
Polluted: 0
High WT: NO
Wetlands: NO

Other: -None Selected-

Date Assessed: May 15, 2013 **Assessed by:** RAC, SMM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

300

TRUDELL CONSULTING ENGINEERS

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Sustainable Environmental Solutions

Retrofit #16B: I-89 Cloverleaf (northeast)

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 17 (revised)

Name: **"Jug handle" at Spear & Main St. (east)**

Concept Description:
Underground detention chambers (UDC) at existing green space to capture drainage from Spear Street and East Terrace. Modify existing drainage inlets to divert flows into basin. Drainage area is currently unmanaged and could be routed to Main St. Pond retrofit #M5A/24 or M5A2, alternatively. Retrofit includes the option of adding paved flumes from the roadways and risers to the outlet structures for the existing swales that run the perimeter of green space. Alternative option for an above ground detention basin may be considered for a reduced construction cost.

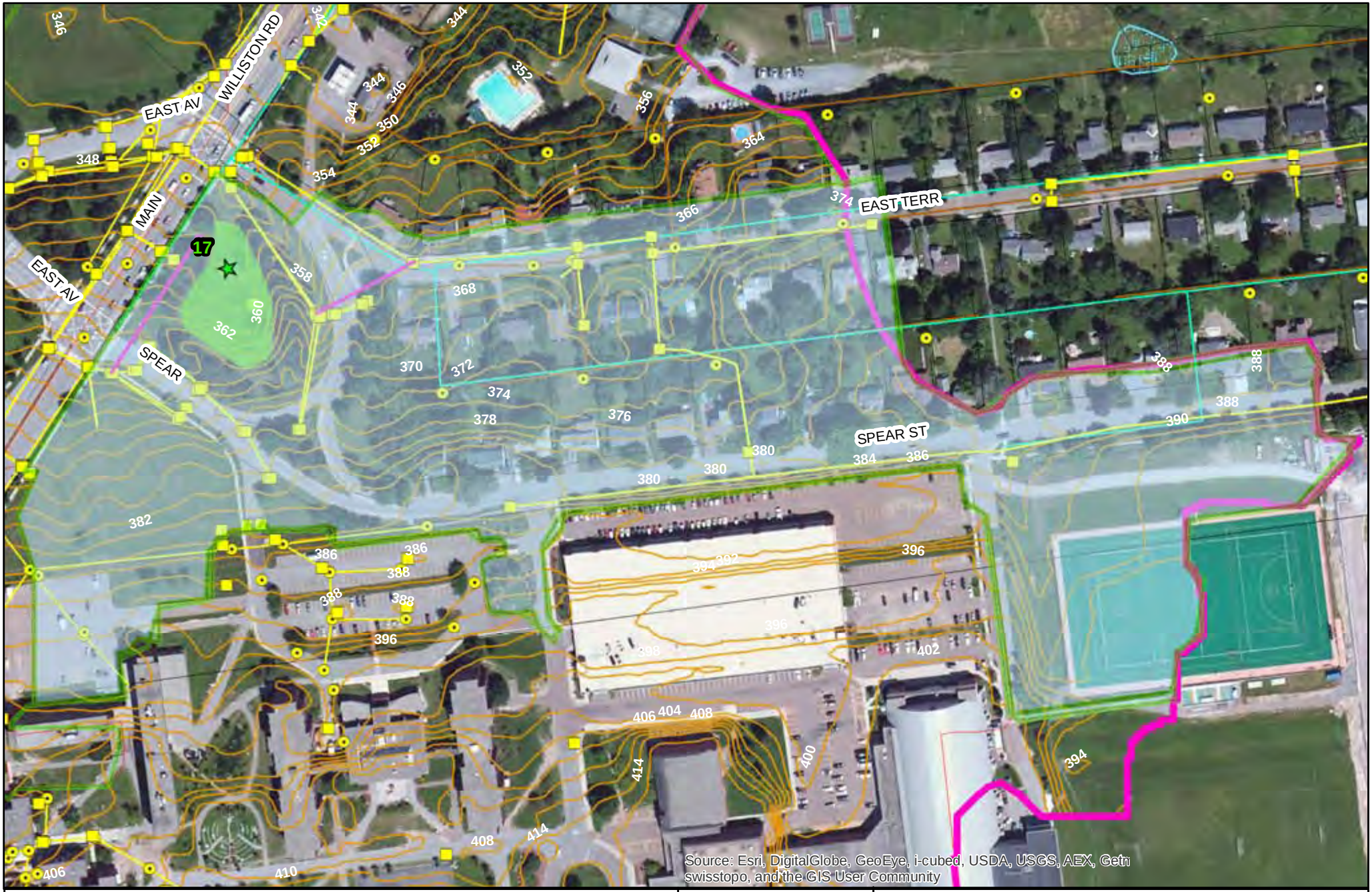
Notes/Feasibility:
Original concept was for a surface detention feature, which UVM was not interested in (K&L email dated 6/5/13) due to aesthetics.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: UVM	**Project Candidate:** Ok
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Institutional	**Proposed Retrofit Practice 1:** UDC or Dry Pond
Land Use 2: Landscaped green space	**Proposed Retrofit Practice 2:** Surface swale w/ riser
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: YES Demo: NO Repair: NO Reuse: NO **Other:** None
Soils: Poor Infiltration	
Use in Retrofit DA: Street	
SIZING INFO	
Drainage Area (ac): 22.01	
Impervious Area (ac): 7.28	
Practice Area Available (ft^2): 21,600	
Existing Head Available? Yes	

Conflicts:
Soils: YES
Access: NO
Land Use: YES
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: NO

Other: None

Date Assessed: May 16, 2013, 11:36 AM **Assessed by:** KMH/AGM



Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

200

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Retrofit #17: "Jug handle" at Spear & Main St.

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 18

Name: Fielding Lane Condos – Clover Street

Concept Description:
Detention-retention facility. Open parcel adjacent to Fielding Lane Condos – seems to be owned by Fielding Lane Condos, existing surface storage available below outfall pipe. Would require access from Fielding Lane

Notes/Feasibility:
Likely private land -
Major constraint is construction and maintenance access.
Homeowners on Clover Street most impacted.
Downgradient wetlands/stream below outfall pipe.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Tom DiPietro – S. Burl.	**Project Candidate:** Yes
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Single Family Residential	**Proposed Retrofit Practice 1:** Detention Pond
Land Use 2: Adjacent Fielding Lane condos	**Proposed Retrofit Practice 2:** -None Selected-
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? -No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: Leaf dumping area	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** -None Selected-
Soils: Good Infiltration	
Use in Retrofit DA: streets, single family res.	
SIZING INFO	
Drainage Area (ac): 17.11	
Impervious Area (ac): 5.24	
Practice Area Available (ft^2): 6,950	
Existing Head Available? N/A	

Conflicts:
Soils: NO Access: YES Land Use: YES Utilities: NO Polluted: NO High WT: YES Wetlands: YES **Other:** -None Selected-

Date Assessed: May 17, 2013, 8:39 AM **Assessed by:** RAC, SMM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

250

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Retrofit #18: Fielding Ln Condos

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 18A (revised)

Name: **Lot at corner of Patchen & Pine St.**

Concept Description:
Underground recharge chambers. Diversion of flows from Patchen Road feasible, incoming pipe from open space/low point behind lots too deep to capture. Single lot also contains SF house (see photo). Would require diversion structure and pretreatement tank/structure.

Notes/Feasibility:
Pipe inverts in Patchen Rd. feasible to divert to underground storage, except west side of road would require crossing water and sewer. Depth of construction ~ 8 to 10 ft. Site owned by Yellow Dog Real Estate, LLC. Existing 20' wide drainage easement in the project area.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Century 21 "Jack"	**Project Candidate:** Yes
Ownership: Public/Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Multi-family Residential	**Proposed Retrofit Practice 1:** Pre-treatment Str
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** Underground recharge
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: NO Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** -None Selected-
Soils: Unknown – HSG A on maps	
Use in Retrofit DA: street, SF residential	
SIZING INFO	
Drainage Area (ac): 20.42	
Impervious Area (ac): 6.02	
Practice Area Available (ft^2): 5,180	
Existing Head Available? n/a	

Conflicts: Soils: YES Access: YES Land Use: YES Utilities: YES Polluted: NO High WT: NO Wetlands: NO **Other:** -None Selected-	

Date Assessed: May 17, 2013, 11:19 AM **Assessed by:** RAC, SMM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

220

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Retrofit # 18A Lot at corner of Patchen & Pine St.

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 19

Name: **Bilodeau Court**

Concept Description:
Divert flow from existing catchbasins to proposed underground infiltration behind Bilodeau Parkway residential properties. Residential drainage currently discharges directly to the stream corridor. Larger events would bypass to existing outfall.

Notes/Feasibility:
Low feasibility due to ownership & use issues; existing garden and backyard.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Megan Moir, Burlington	**Project Candidate:** No
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Single Family Residential	**Proposed Retrofit Practice 1:** Infiltration
Land Use 2: Backyard/Garden	**Proposed Retrofit Practice 2:** Underground infiltration or detention system
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: YES Demo: YES Repair: NO Reuse: **Other:** None
Soils: Good Infiltration	**Conflicts:** Soils: NO Access: YES Land Use: NO Utilities: NO Polluted: NO High WT: NO Wetlands: NO **Other:** None
Use in Retrofit DA: Street	
SIZING INFO	
Drainage Area (ac): 0.81	
Impervious Area (ac): 0.52	
Practice Area Available (ft^2): 9,340	
Existing Head Available? --	

Date Assessed: May 17, 2013, 10:42 AM **Assessed by:** KMH/AGM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

80

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Retrofit #19: Bilodeau Court

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 20

Name: **Grove St. City Parking Lot**

Concept Description:
Divert existing drainage network and capture runoff from parking lot and direct to proposed underground recharge system. Low point in road drainage area is immediately south of the City parking lot. Consider replacing parking lot with permeable pavement.

Notes/Feasibility:
High feasibility since parking lot is currently in poor condition. Adequate head to capture roadway drainage. Test pits or borings needed to confirm soils and depth to groundwater.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Megan Moir, Burlington	**Project Candidate:** Yep, Love It
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Road	**Proposed Retrofit Practice 1:** Infiltration
Land Use 2: Parking lot	**Proposed Retrofit Practice 2:** Permeable pavements
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: No	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: YES Demo: NO Repair: NO Reuse: NO **Other:** None
Soils: Good Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: NO Polluted: NO High WT: NO Wetlands: NO **Other:** None
Use in Retrofit DA: Street and public park	
SIZING INFO	
Drainage Area (ac): 8.39	
Impervious Area (ac): 2.29	
Practice Area Available (ft^2): 8,850	
Existing Head Available? --	

Date Assessed: May 16, 2013, 3:13 PM **Assessed by:** KMH/AGM

ID#: Retrofit 20A

Name: **SD Ireland Property**

Concept Description:
SD Ireland proposed redevelopment to a housing complex. Site will reportedly be required to manage runoff on-site. Site currently drains to city drainage system in Grove St. Plans should address severe bank erosion at Centennial Brook culvert under SD Ireland driveway.

Notes/Feasibility:
Centennial Brook runs between property and Grove St.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Megan Moir, Burlington	**Project Candidate:** Undecided
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial/Industrial	**Proposed Retrofit Practice 1:** -None Selected-
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** -None Selected-
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? Yes	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Low
Sources/pollutants 2: Concrete plant	**Benefits:** Storage: NO Water Quality: NO Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** None
Soils: Unknown	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: NO Polluted: NO High WT: NO Wetlands: NO **Other:**
Use in Retrofit DA: -None Selected-	
SIZING INFO	
Drainage Area (ac): 4.67	
Impervious Area (ac): 3.82	
Practice Area Available (ft^2): --	
Existing Head Available? --	

Date Assessed: May 16, 2013, 4:00 PM **Assessed by:** KMH/AGM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

180

TRUDELL CONSULTING ENGINEERS

Horsley Witten Group
Sustainable Environmental Solutions

Retrofit #20/20A: Grove St. Parking Lot/ Ireland Property

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 21

Name: **Dumont Ave. lot**

Concept Description:
Divert flows from existing catch basin on southeast corner of White St. and Delaware across White St. and convey down Dumont Ave. via pipe or swale to underground recharge chambers on empty lot. Options exist for practice type, siting and conveyance mechansim depending on depth to groundwater, existing inverts, and future use by Airport (e.g., there are other open parcels, could daylight into dry swale, consider surface filtering options). Discharge to existing pipe outlet at Airport basin.

Notes/Feasibility:
Invert at White St. 321.40. Distance to vacant lot on corner – approx. 580' @ .005 slope; pipe outlets at 318.5'. Storage would need to be below grade. Depth to GW could be an issue and eliminate infiltration option (i.e., system would be detention only). For an above grade system inverts at White/Delaware would need to be raised. This may be possible by resetting pipe inverts starting at the intersection of Delaware and Maryland. Possible to create sand filter on top of underground chambers or a large shallow infiltration basin, but can't have standing water due to airport proximity. We have copy of White St. repair plans with sewer line and water lines (both are deep).

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Airport	**Project Candidate:** Yep, Love It
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Single Family Residential	**Proposed Retrofit Practice 1:** Infiltration
Land Use 2: None Selected	**Proposed Retrofit Practice 2:** Dry swale
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? -No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: YES Demo: NO Repair: NO Reuse: **Other:** -None Selected-
Soils: Good Infiltration	
Use in Retrofit DA: streets, driveways	
SIZING INFO	
Drainage Area (ac): 13.88	
Impervious Area (ac): 4.90	
Practice Area Available (ft^2): 15,000	
Existing Head Available? n/a	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: YES
Polluted: NO
High WT: YES
Wetlands: NO

Other: Need a test pit to find clay layer and water table. Sewer line elevation on White St.

Date Assessed: May 16, 2013, 9:00 AM **Assessed by:** ACK, BK, TD

ID#: Retrofit 21A

Name: **Dumont/Existing Airport basin**

Concept Description:
Abandoned detention basin on airport property could be a location for discharge from the proposed underground chambers (retrofit #21), be an area for expanded storage capacity if needed, or designed to provide for extra water quality "polishing."

Notes/Feasibility:
Not likely that this can be used for surface storage due to FAA standing water restrictions.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Airport	**Project Candidate:** Undecided
Ownership: Public / Airport Authority	**Retrofit of new or existing BMP:** -None Selected-
Land Use 1: Industrial	**Proposed Retrofit Practice 1:** -None Selected-
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** 0
Existing BMP on site? -Yes, abandoned	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: MAYBE Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** -None Selected-
Soils: -None Selected-	
Use in Retrofit DA: -None Selected-	
SIZING INFO	
Drainage Area (ac): 1.16	
Impervious Area (ac): 0.10	
Practice Area Available (ft^2): 7,600	
Existing Head Available? N/A	

Conflicts:
Soils: NO
Access: YES
Land Use: YES
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: MAYBE

Other: -None Selected-

Date Assessed: May 16, 2013, 11 AM **Assessed by:** ACK, BK

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

200

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Horsley Witten Group
Sustainable Environmental Solutions

Retrofit #21: Dumont Ave.

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 21C

Name: **Maryland St. lot**

Concept Description:
Underground recharge chambers under grassed lot. Expensive and high hanging fruit, since lot is currently privately owned and existing neighborhood drainage inlets are deep.

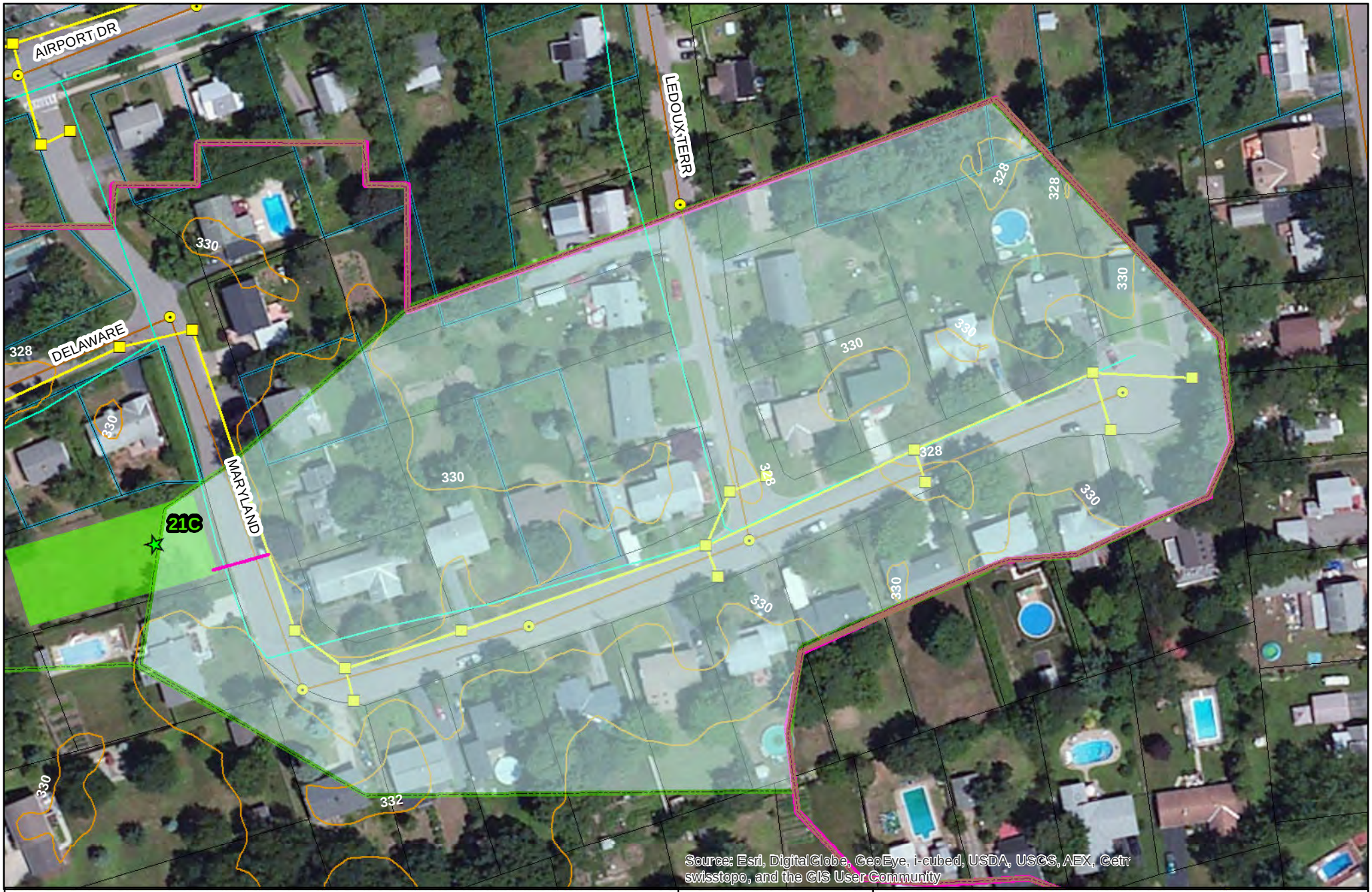
Notes/Feasibility:
Would have to re-plumb drainage network to get it here.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Unknown	**Project Candidate:** Undecided
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Single Family Residential	**Proposed Retrofit Practice 1:** Infiltration
Land Use 2: None Selected-	**Proposed Retrofit Practice 2:** None Selected-
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: None Selected-	**Benefits:** Storage: YES Water Quality: NO Recharge: YES Demo: NO Repair: NO Reuse: **Other:** None Selected-
Soils: Good Infiltration	
Use in Retrofit DA: Street	
SIZING INFO	
Drainage Area (ac): 6.51	
Impervious Area (ac): 2.46	
Practice Area Available (ft^2): 9,800	
Existing Head Available? N/A	

Conflicts:
Soils: NO
Access: NO
Land Use: YES
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: NO

Other: None Selected-

Date Assessed: May 20, 2013, 12:19 AM **Assessed by:** ACK, BK



Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

100

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Retrofit #21C: Maryland St. lot

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 22

Name: **Best Western/Windjammer Inn (north)**

Concept Description:
Outfall is located north of Best Western. Site drainage area currently includes only the Best Western property. Outfall is severely eroded and is headcutting to the east and may soon reach the paved access road. Concept includes stabilizing the outfall and constructing a detention basin within the existing gully. Expand the current drainage area to intercept runoff from the Williston Road drainage network and redirect drainage from abutting commercial properties.

The proposed drainage network is depicted by the mangenta lines in the concept drainage area map.

Notes/Feasibility:
Priority project. The proposed site could manage a large drainage area that is currently unmanaged and unstable. Since the outfall is in need of immediate repair, feasibility is high. Planning considerations include the redirection of flow from abutting commercial properties.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Tom Dipietro, S. Burlington	**Project Candidate:** Yep, Love It
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial/Industrial	**Proposed Retrofit Practice 1:** Pond
Land Use 2: Woods	**Proposed Retrofit Practice 2:** Possible infiltration
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: No	**Maintenance Burden:** Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: NO Recharge: YES Demo: NO Repair: YES Reuse: NO **Other:** None
Soils: Good Infiltration	
Use in Retrofit DA: Parking Lot	
SIZING INFO	
Drainage Area (ac): 29.39	
Impervious Area (ac): 21.70	
Practice Area Available (ft^2): 10,900	
Existing Head Available? --	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: YES

Other: Possible wetland conflicts

Date Assessed: May 15, 2013, 1:07 PM **Assessed by:** KMH/AGM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

250

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Retrofit #22: Best Western Windjammer Inn (north)

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 22A

Name: **Best Western/Windjammer Inn (west/south)**

Concept Description:
Outfall is located west of Best Western. Site drainage area currently includes only the Best Western property. Moderate erosion has occurred. Concept includes stabilizing outfalls and constructing a detention basin within the existing gully. Expand the current drainage area to intercept runoff from the Williston Road drainage network. A portion of this drainage area could be directed to Retrofit 22, if necessary.

Notes/Feasibility:
Good. May make economic sense to divert some or all of this area to Retrofit site #22.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Tom Dipietro, S. Burlington	**Project Candidate:** Yep, Love It
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial/Industrial	**Proposed Retrofit Practice 1:** Pond
Land Use 2: Woods	**Proposed Retrofit Practice 2:** Possible infiltration
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: No	**Maintenance Burden:** Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** None
Soils: Good Infiltration	
Use in Retrofit DA: Parking Lot	
SIZING INFO	
Drainage Area (ac): 6.45	
Impervious Area (ac): 2.88	
Practice Area Available (ft^2): 13,800	
Existing Head Available? --	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: YES

Other: Possible wetland conflicts

Date Assessed: May 15, 2013, 3:12 PM **Assessed by:** KMH/AGM

ID#: Retrofit 22B

Name: Best Western/Windjammer Inn (south)/Gulf Station

Concept Description:
Proposed bioretention in existing grass depression to manage sheet flow from the Gulf Station parking lot and roof. Overflow (if required) could connect to existing Best Western drainage system, or be directed to Retrofit 22.

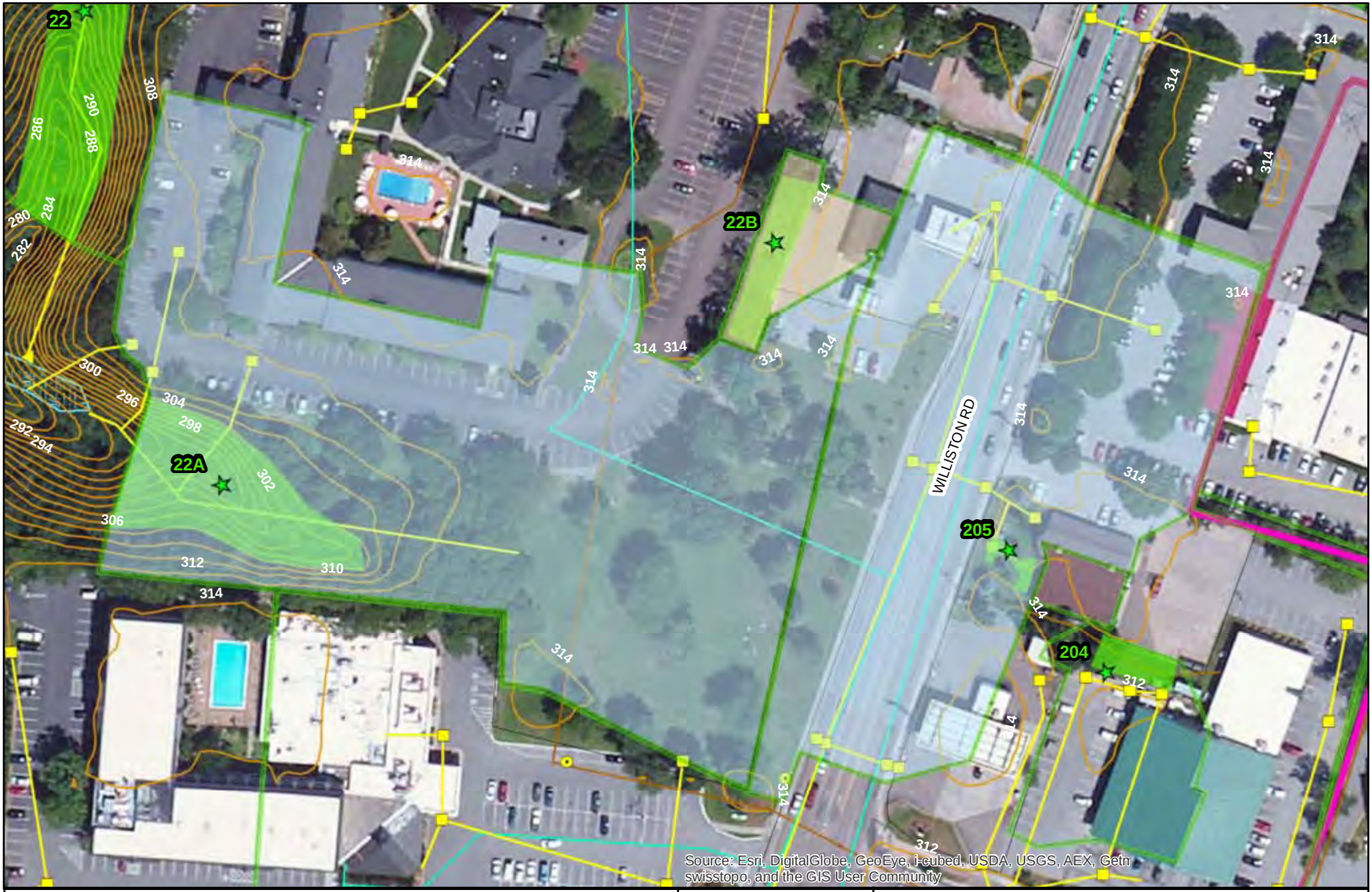
Notes/Feasibility:
Site is an existing depression that appears to already infiltrate. Retrofit would only enhance treatment. Small drainage area.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Tom Dipietro, S. Burlington	**Project Candidate:** Undecided
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial/Industrial	**Proposed Retrofit Practice 1:** Bioretention
Land Use 2: Grass island	**Proposed Retrofit Practice 2:** -None Selected-
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: NO Water Quality: YES Recharge: YES Demo: YES Repair: NO Reuse: NO **Other:** None
Soils: Good Infiltration	
Use in Retrofit DA: Parking Lot	
SIZING INFO	
Drainage Area (ac): 0.22	
Impervious Area (ac): 0.13	
Practice Area Available (ft^2): 3,670	
Existing Head Available? --	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: NO

Other: None

Date Assessed: May 15, 2013, 6:45 PM **Assessed by:** KMH/AGM



Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

100

tce TRUDELL CONSULTING ENGINEERS

Horsley Witten Group
Sustainable Environmental Solutions

Retrofit #22A/B: Best Western Windjammer Inn (west/south)

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 23A

Name: **Staples Plaza**

Concept Description:
Convert existing landscape island in front of PetCo into a bioswale with underground storage to manage runoff from parking lot and small roof area. Overflow into existing drain inlets. Add some trees for canopy cover, shading, and interception. Reduce existing one-way aisle width to allow for widening of proposed bioswale. This collects drainage from the parking area, as well as from the small awning roof. It appears that this area drains across Williston Rd. and is piped under the East Campus pond for a direct discharge to the stream.

Notes/Feasibility:
This area could be managed in a larger retrofit downstream (Site # 24_M5). Primary outlet in catch basin at lot entrance/exit. Rim to invert = 5.05'. Stalls are 18'x8', with a 27' drive aisle (60' and 57' curb to curb on the north and south side of island, respectively).

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Unknown	**Project Candidate:** Ok
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial/Industrial	**Proposed Retrofit Practice 1:** Bioretention
Land Use 2: None Selected-	**Proposed Retrofit Practice 2:** Underground storage chambers
Existing BMP on site? No	**Non-Structural Controls:** Impervious Cover Removal
Is site a hotspot? Possibly	**Non-Structural Other:** None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** Medium
Sources/pollutants 2: None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: **Other:** Aesthetics, tree canopy increase
Soils: Poor Infiltration	
Use in Retrofit DA: Parking Lot	
SIZING INFO	
Drainage Area (ac): 1.29	
Impervious Area (ac): 1.15	
Practice Area Available (ft^2): 6,530	
Existing Head Available? n/a	

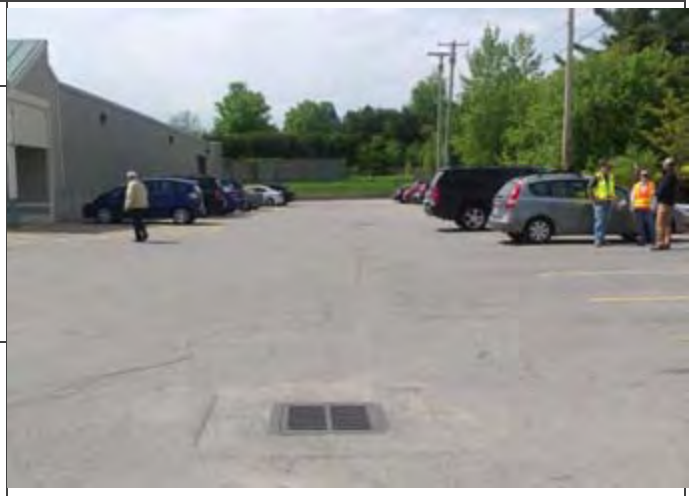
Conflicts:
Soils: YES
Access: NO
Land Use: NO
Utilities: YES
Polluted: NO
High WT: NO
Wetlands: NO

Other: None Selected-

Date Assessed: May 15, 2013, 11:40 AM **Assessed by:** ACK, BK, KH, AM

ID#: Retrofit 23B

Name: **Staples Plaza (roof)**



Concept Description:
Flat portion of roof drains internally and is discharged into drain inlet on the east side of the building. Modify internal roof drains, install trays, or use other blue roof design to provide temporary detention.

Notes/Feasibility:
May be able to manage all of this drainage downstream at Site #24 behind Sheraton /M5A Main St. Pond.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Unknown	**Project Candidate:** Ok
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial/Industrial	**Proposed Retrofit Practice 1:** -None Selected-
Land Use 2: Roof	**Proposed Retrofit Practice 2:** Blue roof
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: NO Recharge: NO Demo: NO Repair: NO Reuse: MAYBE **Other:** Not Selected
Soils: -None Selected-	
Use in Retrofit DA: Individual Rooftop	
SIZING INFO	
Drainage Area (ac): 1.06	
Impervious Area (ac): 1.06	
Practice Area Available (ft^2): 46,300	
Existing Head Available? n/a	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: YES
Polluted: NO
High WT: NO
Wetlands: NO

Other: Structural? Need to investigate drains and structural capacity.

Date Assessed: May 15, 2013, 10:51 AM **Assessed by:** ACK, NP, BK

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

100

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Retrofit #23 A/B: Staples Plaza

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 24 (revised)

Name: Sheraton Hotel (back)

Concept Description:
Install embankment and construct detention basin or constructed wetland to manage portion of Sheraton parking lot and other surrounding areas (e.g., Williston Rd., Staples plaza) as part of a regional stormwater complex in conjunction with Main St. Pond retrofit (M5A). The parking lot at Sheraton currently drains to three rip rap channels, and evidence of channelized flow and sedimentation from parking lot and eroding slope were observed into the open area and wetlands below. The Main St. Pond (M5A) would serve as a forebay to this facility, and rerouting of existing drain pipes from #23 and #17 could be feasible.

Notes/Feasibility:
Need to check in with DEC on potential impact to wetlands. If the Main St Pond was expanded (M5A2) then there would be minimal need for a facility at this location.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: UVM	**Project Candidate:** Yep, love it
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial/Industrial	**Proposed Retrofit Practice 1:** Pond
Land Use 2: Open field	**Proposed Retrofit Practice 2:** Constructed Wetland
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Low
Sources/pollutants 2: None Selected	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** Erosion down slide slopes, evidence of sediment in wetland area. New rip rap channels have been installed.
Soils: Unknown (A-D according to soils mapping)	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: NO Polluted: NO High WT: NO Wetlands: YES **Other:** -None Selected-
Use in Retrofit DA: parking lot	
SIZING INFO	
Drainage Area (ac): 74.04 (w. M5A) / 6.11	
Impervious Area (ac): 31.12 (w. M5A) / 2.08	
Practice Area Available (ft^2): 61,000 (not including M5A)	
Existing Head Available? n/a	

Date Assessed: May 15, 2013, 8:57 AM **Assessed by:** RAC, SM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

300

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Retrofit M5A/24: Main St. Pond and Sheraton (rear open space)

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 25

Name: **Picard Circle**

Concept Description:
Subsurface infiltration system. All houses within Picard Circle have been purchased by Airport and are now abandoned. Significant site area exists within yards and the road for major underground infilration/detention system. Constraints include depth of existing drainage pipe and depth above groundwater (adjacent brook approx 14 feet below existing ground).

Notes/Feasibility:
Depth of existing drainage line in Airport Pkwy may preclude piping from existing infrastructure to new system. One option would be to install diversion structure and partially submerge existing piping system.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Airport, So. Burlington	**Project Candidate:** Undecided (allowable reuse ??)
Ownership: Public (Airport buyout program)	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Multi-family Residential	**Proposed Retrofit Practice 1:** Infiltration
Land Use 2: Decommissioned buildings bought by airport	**Proposed Retrofit Practice 2:** Underground detention
Existing BMP on site? No	**Non-Structural Controls:** Impervious Cover Removal
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: YES Demo: YES Repair: NO Reuse: NO **Other:** -None Selected-
Soils: Good Infiltration	
Use in Retrofit DA: Street, single family res	
SIZING INFO	
Drainage Area (ac): 51.88	
Impervious Area (ac): 16.71	
Practice Area Available (ft^2): 40,420	
Existing Head Available? n/a	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: YES
Polluted: NO
High WT: YES
Wetlands: NO

Other: Depth of existing trunk line may preclude piping from existing infrastructure to new system

Date Assessed: May 16, 2013, 11:30 AM **Assessed by:** RAC, NBP, SMM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

350

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Sustainable Environmental Solutions

Retrofit #25: Picard Circle

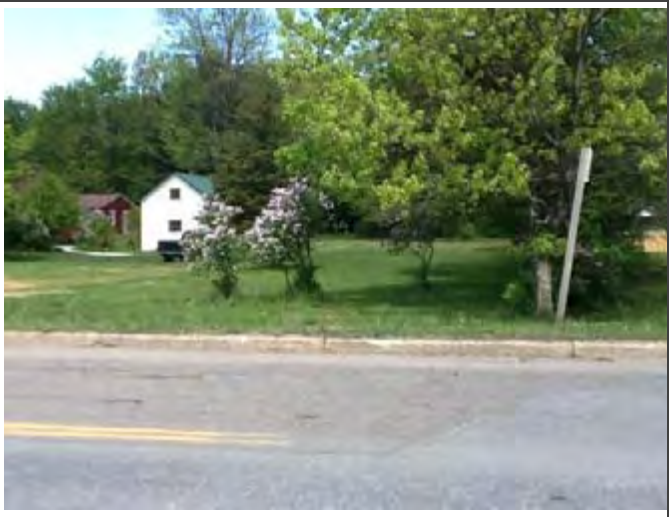
Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 25A

Name: **White St. ROW**

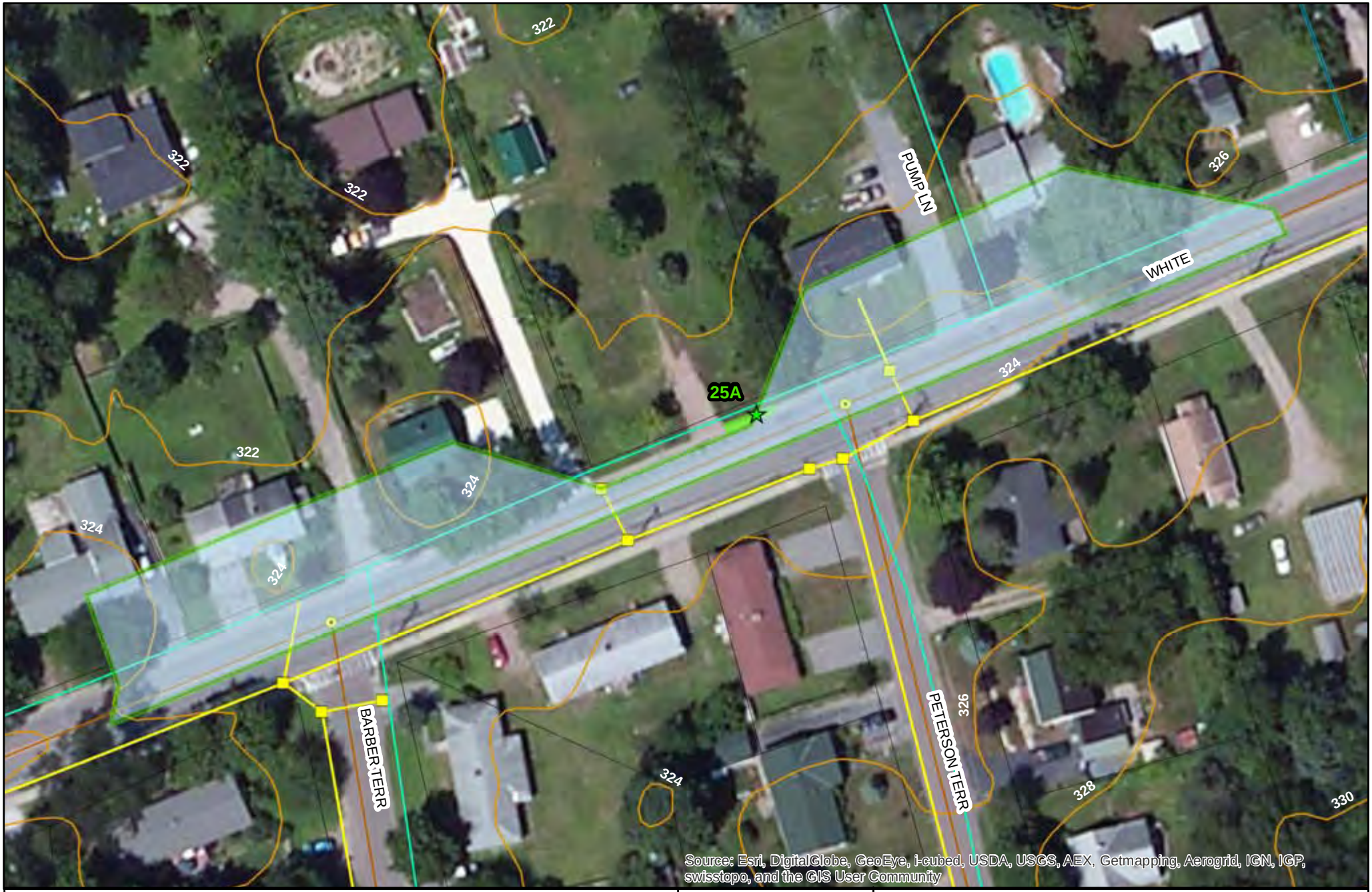
Concept Description:
Block or modify two existing drain inlets on White Rd. to direct flow through curb cuts/outlets into grass filter strip and infiltrating catchbasin. Localized flooding issue in front of property owners driveway that could be solved by this.

Notes/Feasibility:
Low. Depending on size of ROW, ability to modify drain inlets, property owner. Small green infrastructure project, but doesn't capture a lot of area, plus is within drainage area to #25.



GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: So. Burlington	**Project Candidate:** Probably not
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Road	**Proposed Retrofit Practice 1:** Infiltration
Land Use 2: None Selected-	**Proposed Retrofit Practice 2:** Pretreatment swale
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: None Selected-	**Benefits:** Storage: NO Water Quality: YES Recharge: YES Demo: NO Repair: YES Reuse:	**Conflicts:** Soils: NO Access: NO Land Use: YES Utilities: NO Polluted: NO High WT: NO Wetlands: NO
Soils: Good Infiltration	
Use in Retrofit DA: Street	
SIZING INFO	
Drainage Area (ac): 0.66	
Impervious Area (ac): 0.36	**Other:** Low point in road with signs of deterioration. Gavel Driveway entrance beamed up to prevent flooding/erosion.	**Other:** There could be more room here to do a larger practice if needed, but currently confined to ROW. May be issue with blocking of drain inlets.
Practice Area Available (ft^2): 130	
Existing Head Available? N/A	

Date Assessed: May 16, 2013, 1:15 PM **Assessed by:** ACK, BK



Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

60

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Sustainable Environmental Solutions

Retrofit #25A: White St. ROW

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 26 & 27

Name: **Duval St. & Clover St.**

Concept Description:
30-ft wide residential streets with direct outfalls to streams, flat terrain, and good soils offer green street and neighborhood-scale disconnection opportunities (e.g., dry wells, rain gardens, pervious driveways, bump outs).

Notes/Feasibility:
Small drainage area; requires participation by homeowners.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: So. Burlington and private owners	**Project Candidate:** OK, green infrastructure
Ownership: Public and Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Single Family Residential	**Proposed Retrofit Practice 1:** green streets
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** dry wells, rain gardens
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** -Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: NO Water Quality: YES Recharge: YES Demo: YES Repair: NO Reuse: NO **Other:** None Selected-
Soils: Good Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: YES Utilities: YES Polluted: NO High WT: NO Wetlands: NO **Other:** None Selected-
Use in Retrofit DA: Streets, driveways, and rooftops	
SIZING INFO	
Drainage Area (ac): 3.59 Duval St./ 3.81 Clover St.	
Impervious Area (ac): 1.19 / 1.4	
Practice Area Available (ft^2): --	
Existing Head Available? n/a	

Date Assessed: May 17, 2013 **Assessed by:** RAC, SMM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

150 Feet

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Horsley Witten Group
Sustainable Environmental Solutions

Retrofit # 26/27. Duval St. & Clover St.

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 200

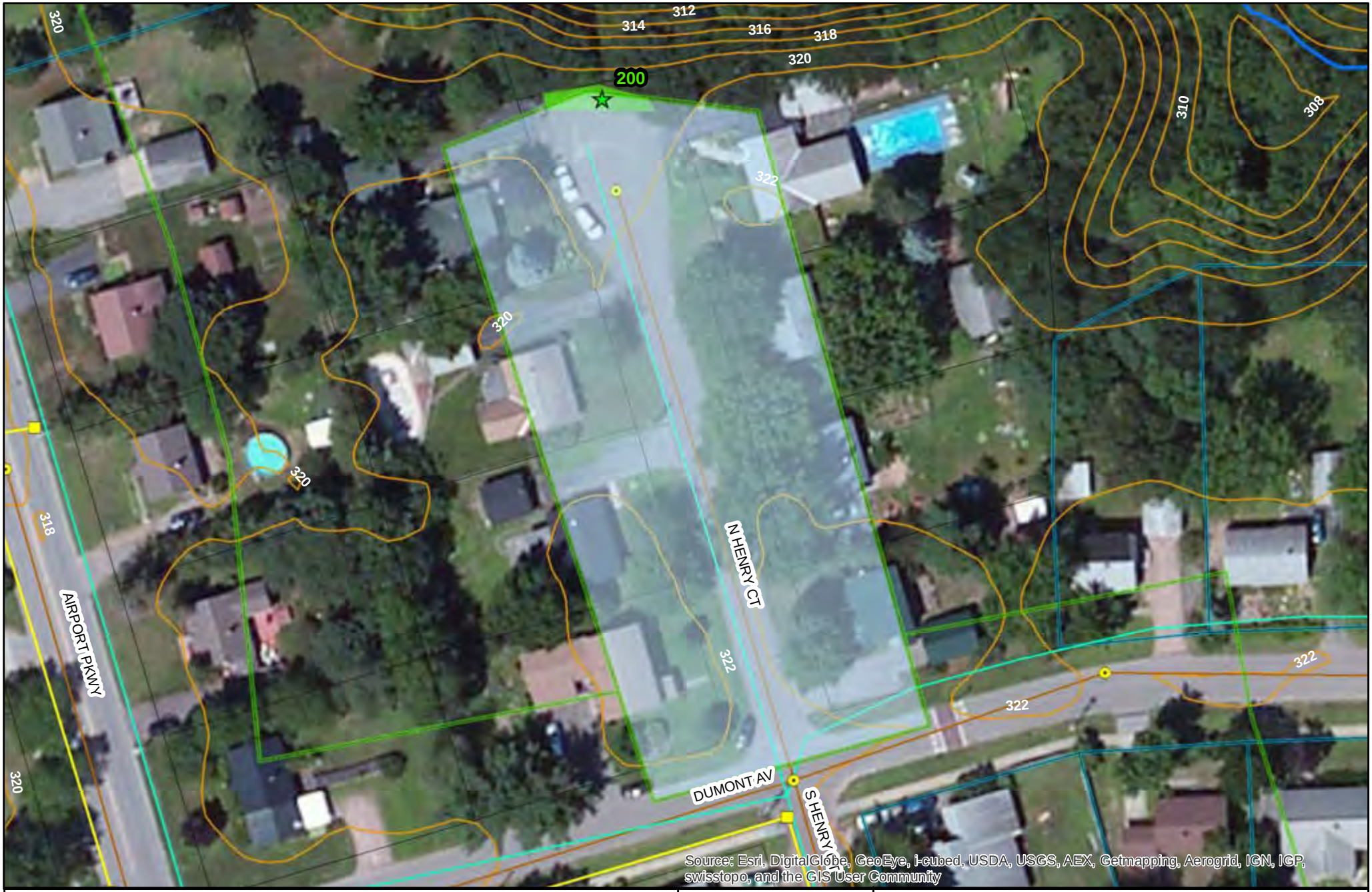
Name: **N. Henry Court**

Concept Description:
Dead-end road with excess impervious cover. Currently, drainage comes down the the road and flows directly down a steep slope to the stream/wetland area below. Install a rain garden/bio with an overflow to a leaching catch basin at end of road. Dumping of yard waste and debris was also observed down the slope. An old corrugated discharge pipe was found down in stream.

Notes/Feasibility:
Small project, but could be a good GI demonstration.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: So. Burlington	**Project Candidate:** Ok
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Single Family Residential	**Proposed Retrofit Practice 1:** Raingarden
Land Use 2: Road	**Proposed Retrofit Practice 2:** Infiltrating catchbasin
Existing BMP on site? No	**Non-Structural Controls:** Impervious Cover Removal
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: yard waste/debris	**Benefits:** Storage: NO Water Quality: YES Recharge: YES Demo: NO Repair: YES Reuse: **Other:** none
Soils: Good infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: NO Polluted: NO High WT: NO Wetlands: NO **Other:** Large oaks and ash
Use in Retrofit DA: -Street	
SIZING INFO	
Drainage Area (ac): 1.03	
Impervious Area (ac): 0.45	
Practice Area Available (ft^2): 490	
Existing Head Available? n/a	

Date Assessed: May 16, 2013, 10:38 AM **Assessed by:** ACK, BK



Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

60

TRUDELL CONSULTING ENGINEERS

Horsley Witten Group
Sustainable Environmental Solutions

Retrofit #200: N. Henry Court

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 201

Name: **Lynn St./Barber Tr. (north)**

Concept Description:
Small green infrastructure example for neighborhood application. Remove pavement at corner and install a curb "bump out" with vegetated pretreatment pretreatment bioretention with overflow into leaching catchbasin.

Notes/Feasibility:
In road ROW, however homeowner would be part of maintenance. Right at park, so high visibility.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: So. Burlington	**Project Candidate:** Ok
Ownership: -Public	**Retrofit of new or existing BMP:** -None Selected-
Land Use 1: -Single Family Residential	**Proposed Retrofit Practice 1:** bioretention
Land Use 2: None Selected-	**Proposed Retrofit Practice 2:** infiltrating catch basin
Existing BMP on site? -No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: NO Water Quality: YES Recharge: YES Demo: YES Repair: NO Reuse: NO **Other:** -None Selected-
Soils: -Good Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: YES Utilities: NO Polluted: NO High WT: NO Wetlands: NO **Other:** -None Selected-
Use in Retrofit DA: -Street	
SIZING INFO	
Drainage Area (ac): 0.67	
Impervious Area (ac): 0.11	
Practice Area Available (ft^2): 250	
Existing Head Available? N/A	

Date Assessed: May 16, 2013, 1:44 PM **Assessed by:** ACK, BK

ID#: Retrofit 202

Name: **Lynn St./Barber ter. (south)**

Concept Description:
Replace existing catch basin at corner of driveway with an infiltrating catch basin. Provide pretreatment grass swale, or simple rain garden between the park entrance and adjacent residence.

Notes/Feasibility:
Small green infrastructure example for neighborhood application.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: 0	**Project Candidate:** -Probably not
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Single Family Residential	**Proposed Retrofit Practice 1:** Infiltration
Land Use 2: Road	**Proposed Retrofit Practice 2:** Pretreatment swale
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: NO Water Quality: NO Recharge: YES Demo: NO Repair: NO Reuse: **Other:** -None Selected-
Soils: Good Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: NO Polluted: NO High WT: NO Wetlands: NO **Other:** -None Selected-
Use in Retrofit DA: street	
SIZING INFO	
Drainage Area (ac): 0.54	
Impervious Area (ac): 0.05	
Practice Area Available (ft^2): 150	
Existing Head Available? N/A	

Date Assessed: May 16, 2013, 1:44 PM **Assessed by:** ACK, BK

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

50

tce TRUDELL CONSULTING ENGINEERS

Horsley Witten Group
Sustainable Environmental Solutions

Retrofit #201/202: Lynn St./Barber Terrace

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 203

Name: **Suburban Sq. neighborhood**

Concept Description:
This neighborhood has 30ft road width and 90% of homes have potential for downspout disconnection. Green street options to include infiltrating catch basins, dry wells for individual roofs, and rain gardens for roofs and driveways are options here.

Notes/Feasibility:
Neighborhood is in area draining to Retrofit #14. Could be a good GI neighborhood for demonstration, if needed. 4.1' invert at drain inlet pictured here.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: So. Burlington; individual homeowners	**Project Candidate:** -Probably not
Ownership: public and private	**Retrofit of new or existing BMP:** -New BMP
Land Use 1: Single family residential	**Proposed Retrofit Practice 1:** -None Selected-
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** -None Selected-
Existing BMP on site? No	**Non-Structural Controls:** downspout disconnection
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** -None Selected-
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: NO Water Quality: NO Recharge: NO Demo: NO Repair: NO Reuse: **Other:** -None Selected-
Soils: Good for infiltration	
Use in Retrofit DA: -streets	
SIZING INFO	
Drainage Area (ac): 7.15	
Impervious Area (ac): 2.96	
Practice Area Available (ft^2): --	
Existing Head Available? 0	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: NO

Other: -None Selected-

Date Assessed: May 16, 2013 **Assessed by:** ACK, BK

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

100

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Horsley Witten Group
Sustainable Environmental Solutions

Retrofit 203: Suburban Ave Green Infrastructure

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 204

Name: **Greers at Dorset St./Williston Rd.**

Concept Description:
Install bioretention with underground storage in existing grassed area to capture roof and parking lot runoff. Runoff drains to this area already, but would need to divert from existing drain inlets and overflow back into existing drainage network.

Notes/Feasibility:
Could get roof area from VT Gift barn and upper lot if needed.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: unknown	**Project Candidate:** Ok
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial/Industrial	**Proposed Retrofit Practice 1:** Bioretention
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** Underground storage chambers
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: YES Repair: NO Reuse: **Other:** -None Selected-
Soils: Poor Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: NO Polluted: NO High WT: NO Wetlands: NO **Other:** -None Selected-
Use in Retrofit DA: small parking lot, roof	
SIZING INFO	
Drainage Area (ac): 0.45	
Impervious Area (ac): 0.38	
Practice Area Available (ft^2): 1,650	
Existing Head Available? N/A	

Date Assessed: May 16, 2013, 4:01 PM **Assessed by:** ACK, BK

ID#: Retrofit 205

Name: **Vermont Gift Barn**

Concept Description:
Disconnect rooftop drainage onto parking lot by diverting downspouts into a bioretention in the existing grassed area in front of store. Tie underdrain and overflow into existing drain inlet.

Notes/Feasibility:
Would be an easy retrofit since grassed area already depressed with a yard inlet. Disconnect rooftop runoff going onto parking lot. Area is currently mowed and is lush grass.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: 0	**Project Candidate:** Ok
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial/Industrial	**Proposed Retrofit Practice 1:** Bioretention
Land Use 2: None Selected-	**Proposed Retrofit Practice 2:** None Selected-
Existing BMP on site? No	**Non-Structural Controls:** Disconnection
Is site a hotspot? Possibly	**Non-Structural Other:** Dumpster and grease management
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: In rear lot, dumpsters and grease	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: YES Repair: NO Reuse: **Other:** None Selected-
Soils: Poor Infiltration	
Use in Retrofit DA: Individual Rooftop	
SIZING INFO	
Drainage Area (ac): 0.16	
Impervious Area (ac): 0.12	
Practice Area Available (ft^2): 660	
Existing Head Available? N/A	

Conflicts:
Soils: YES
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: NO

Other: Trees

Date Assessed: May 16, 2013, 4:10 PM **Assessed by:** ACK, BK

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

50

TRUDELL CONSULTING ENGINEERS

Horsley Witten Group
Sustainable Environmental Solutions

Retrofit #204/205: Greers/Vermont Gift Barn

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 206

Name: **Northfield Savings Bank**

Concept Description:
Convert existing landscape island into a bioretention facility, overflow into existing drain inlet.

Notes/Feasibility:
Low feasibility considering private property, however could be relatively easy since there is an existing drain line for overflow. Could be a good green infrastructure demonstation.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: 0	**Project Candidate:** Ok
Ownership: Private	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Commercial/Industrial	**Proposed Retrofit Practice 1:** Bioretention
Land Use 2: Bank	**Proposed Retrofit Practice 2:** None Selected-
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** None Selected-
Sources/pollutants 1: -None Selected-	**Maintenance Burden:** Medium
Sources/pollutants 2: None Selected-	**Benefits:** Storage: NO Water Quality: YES Recharge: NO Demo: YES Repair: NO Reuse: NO **Other:** None Selected-
Soils: Poor Infiltration	
Use in Retrofit DA: Parking Lot	
SIZING INFO	
Drainage Area (ac): 0.17	
Impervious Area (ac): 0.15	
Practice Area Available (ft^2): 950	
Existing Head Available? N/A	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: NO

Other: None Selected-

Date Assessed: May 16, 2013, 4:34 PM **Assessed by:** ACK, BK

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

20

TRUDELL CONSULTING ENGINEERS

Horsley Witten Group
Sustainable Environmental Solutions

Retrofit #206: Northfield Savings Bank

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 207

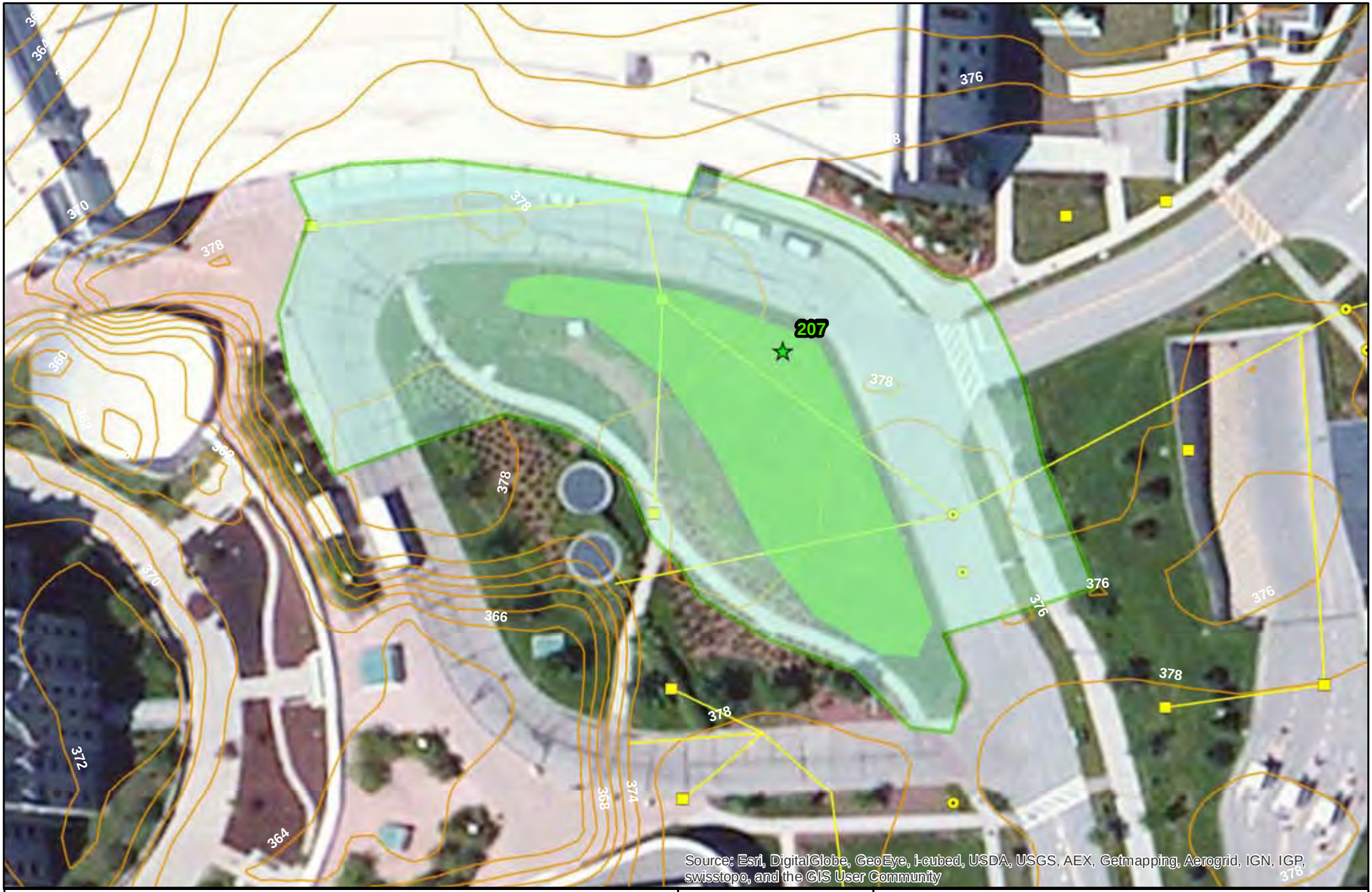
Name: **Fletcher Allen green space**

Concept Description:
Proposed bioretention area in green space near hospital entrance. Redirect existing roadway trench drains into practice. Site currently drains to the UVM East Campus Pond.

Notes/Feasibility:
Moderate feasibility. Trench drain outlets are shallow so daylighting is possible. Plenty of green space for practice area. High profile location.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: UVM/Burlington	**Project Candidate:** Ok
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Institutional	**Proposed Retrofit Practice 1:** Bioretention
Land Use 2: Street/Grass Landscape island	**Proposed Retrofit Practice 2:** -None Selected-
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: NO Water Quality: YES Recharge: NO Demo: YES Repair: NO Reuse: **Other:** None
Soils: Poor Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: YES Polluted: NO High WT: NO Wetlands: NO **Other:** Electric and irrigation in island.
Use in Retrofit DA: Street	
SIZING INFO	
Drainage Area (ac): 0.91	
Impervious Area (ac): 0.87	
Practice Area Available (ft^2): 8,700	
Existing Head Available? --	

Date Assessed: May 17, 2013, 11:28 AM **Assessed by:** KMH/AGM



Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

50 Feet

tce TRUDELL CONSULTING ENGINEERS

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Sustainable Environmental Solutions

Retrofit #207: Fletcher Allen Green Space

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit 208

Name: **Fletcher Allen parking lot**

Concept Description:
Proposed bioretention area in existing drainage feature. Site is currently managed by existing swales, curb cuts, and a drainage depression. Swales and depression are currently eroding. Raise existing catchbasin frame/grate to provide ponding for bioretention.

Notes/Feasibility:
Easy retrofit and aesthetic improvement. Parking lot already has features necessary directing drainage to the retrofit practice location.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: UVM/Burlington	**Project Candidate:** Ok
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Institutional	**Proposed Retrofit Practice 1:** Bioretention
Land Use 2: Parking Lot	**Proposed Retrofit Practice 2:** -None Selected-
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: NO Water Quality: YES Recharge: NO Demo: YES Repair: YES Reuse: NO **Other:** None
Soils: Poor Infiltration	
Use in Retrofit DA: Parking Lot	
SIZING INFO	
Drainage Area (ac): 0.85	
Impervious Area (ac): 0.53	
Practice Area Available (ft^2): 6,400	
Existing Head Available? --	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: NO

Other: None

Date Assessed: May 17, 2013, 11:48 AM **Assessed by:** KMH/AGM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

60 Feet

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Retrofit #208: Fletcher Allen Parking Lot

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit M1A

Name: **Centennial Court Apartments**

Concept Description:
Retrofit of existing dry basin to an infiltration basin. Increase contributing drainage area and add riser to outlet structure for improved flow control. Redirect road drainage from Centennial Court to basin. Site only takes runoff currently from a portion of the apartment roofs.

Notes/Feasibility:
Very good. Must adjust existing sewer manhole located with basin. This currently discharges to the UVM East Campus Pond.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: UVM / Art Shields (property manager)	**Project Candidate:** Yep, Love It
Ownership: Public	**Retrofit of new or existing BMP:** Existing BMP
Land Use 1: Multi-family Residential	**Proposed Retrofit Practice 1:** Pond
Land Use 2: Campus Apartments	**Proposed Retrofit Practice 2:** -None Selected-
Existing BMP on site? Yes	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: YES Demo: NO Repair: NO Reuse: **Other:** None
Soils: Good Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: YES Polluted: NO High WT: NO Wetlands: NO **Other:** Must raise frame/cover of sewer manhole near basin edge above ponding elevation.
Use in Retrofit DA: Roof	
SIZING INFO	
Drainage Area (ac): 6.45	
Impervious Area (ac): 2.85	
Practice Area Available (ft^2): 13,000	
Existing Head Available? --	

Date Assessed: May 17, 2013, 12:28 PM **Assessed by:** KMH/AGM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

120

TRUDELL CONSULTING ENGINEERS

Horsley Witten Group
Sustainable Environmental Solutions

Retrofit #M1A: Centennial Court

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit M1B (revised)

Name: **East Campus Pond**

Concept Description:
Retrofit of the existing East Campus Pond outlet structure to maximize storage and attenuation for to target design storm(s).

Notes/Feasibility:
Priority location with high feasibility. No significant space available for expansion of the facility. Low cost improvement.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: UVM	**Project Candidate:** Yep, Love It
Ownership: Public	**Retrofit of new or existing BMP:** Existing BMP
Land Use 1: Institutional	**Proposed Retrofit Practice 1:** Outlet structure modification
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** --
Existing BMP on site? Yes	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: No	**Maintenance Burden:** Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** None
Soils: Poor Infiltration	
Use in Retrofit DA: -None Selected-	
SIZING INFO	
Drainage Area (ac): 69.80	
Impervious Area (ac): 43.67	
Practice Area Available (ft^2): --	
Existing Head Available? --	

Conflicts:
Soils: YES
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: NO

Other:

Date Assessed: May 16, 2013, 11:15 AM **Assessed by:** KMH/AGM

ID#: Retrofit M3

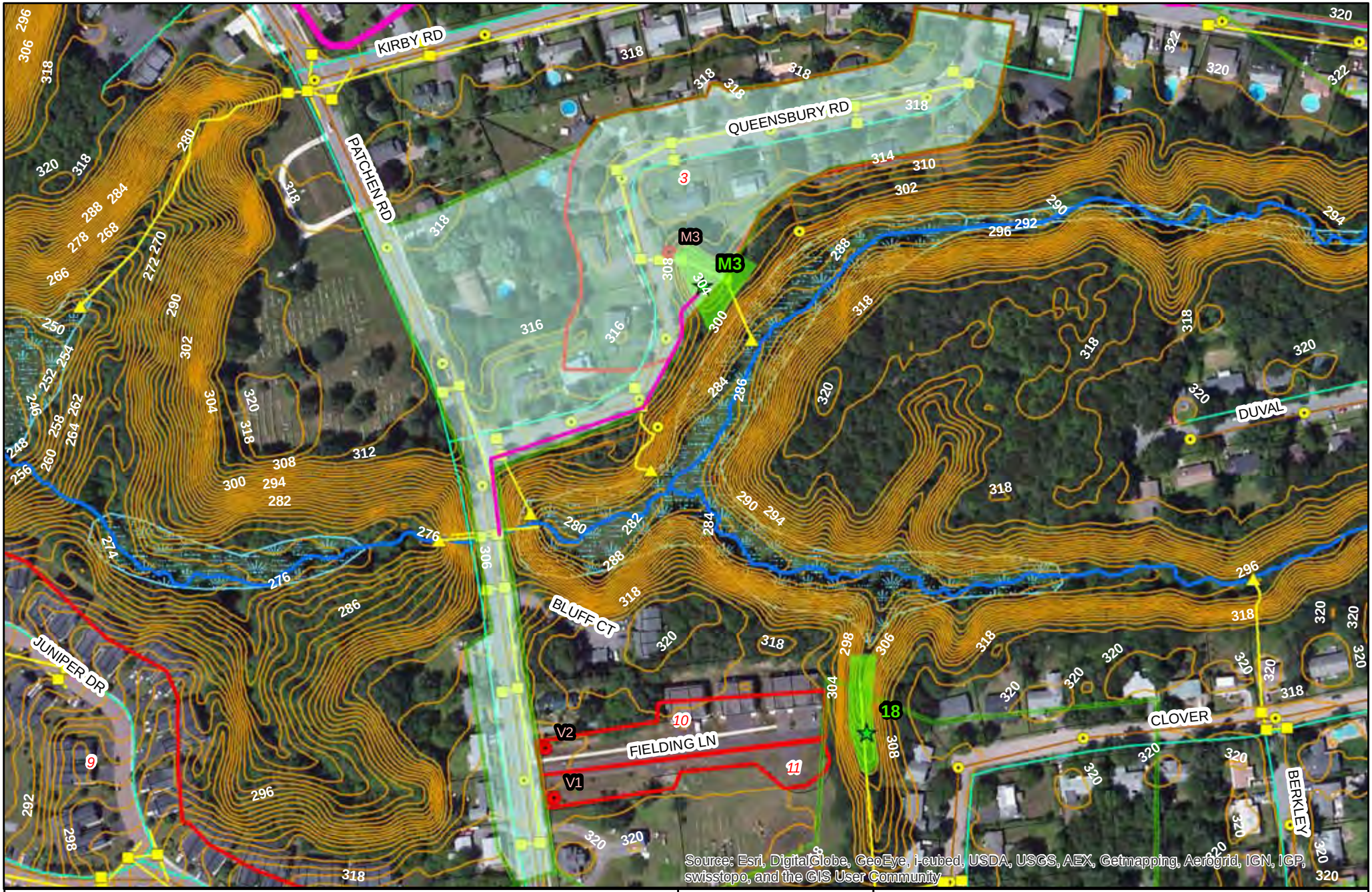
Name: **Queensbury Pond**

Concept Description:
Existing dry detention pond. Modifiy outlet to create an infiltration basin. Existing pond might predate subdivision (newer PVC outlet connects to older CMP barrel). Facility appears to have additional storage capacity to expand drainage area (level run confirmed this is feasible).

Notes/Feasibility:
Old CMP barrel
New 15" PVC outlet
Sink hole evidence – top of existing embankment
Scour hole at barrel outlet
Incoming 15" HDPE
Eroded inflow channel

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Queensbury HOA	**Project Candidate:** Yes.
Ownership: Private	**Retrofit of new or existing BMP:** Existing BMP
Land Use 1: Single Family Residential	**Proposed Retrofit Practice 1:** Infiltration Basin
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** 0
Existing BMP on site? Yes	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: YES Demo: NO Repair: NO Reuse: NO **Other:** 0
Soils: Good Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: YES Polluted: NO High WT: NO Wetlands: NO **Other:** 0
Use in Retrofit DA: Streets, single family res.	
SIZING INFO	
Drainage Area (ac): 7.67	
Impervious Area (ac): 3.05	
Practice Area Available (ft^2): 8,930	
Existing Head Available? n/a	

Date Assessed: May 16, 2013, 10:36 AM **Assessed by:** RAC, NBP, SMM



Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

200 Feet

TRUDELL CONSULTING ENGINEERS

Horsley Witten Group
Sustainable Environmental Solutions

Retrofit #M3: Queensbury Court

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

ID#: Retrofit M5A / M5A2 (revised)

Name: **Main St. Pond**

Concept Description:
The Main Street Pond outlet structure is currently not functioning properly and must be repaired. Two potential retrofit options include: **M5A** involves converting the existing basin to a forebay for proposed Retrofit #24; **M5A2** involves expanding the existing Main St. Pond southward toward Williston Rd. and excavating to a deeper depth (see attached sketch). HW expanded upon the proposed K&L design of this facility to include a modified outlet structure and a concrete wall for additional storage and attenuation. The parking lot to the north (currently draining to M1 East Campus Pond, was rerouted here in the model).

Notes/Feasibility:
Priority location with high feasibility. Retrofit **M5A2** will likely require significant ledge removal for the proposed construction activities. Ledge removal is not anticipated for the **M5A/24** retrofit scenario.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: UVM	**Project Candidate:** Yep, Love It
Ownership: Public	**Retrofit of new or existing BMP:** Existing BMP
Land Use 1: Institutional	**Proposed Retrofit Practice 1:** Forebay for Retrofit 24 (M5A)
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** Expand ex. basin (M5A2)
Existing BMP on site? Yes	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: No	**Maintenance Burden:** Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** None
Soils: Poor Infiltration	
Use in Retrofit DA: -None Selected-	
SIZING INFO	
Drainage Area (ac): M5A/24 74.04; M5A2 67.93	
Impervious Area (ac): M5A/24 31.12; M5A2 29.04	
Practice Area Available (ft^2): 61,000	
Existing Head Available? --	

Conflicts:
Soils: YES
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: NO

Other: Ledge at bottom of existing pond

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

300

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Retrofit M5/24: Main St. Pond and Sheraton (rear open space)

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd

Retrofit M5A2 – Proposed Main Street Pond Expansion (HW modified K&L design)

ID#: Retrofit M7A / M7A2 (revised)

Name: **North Campus Pond**

Concept Description:
This retrofit of the of existing North Campus Pond includes two proposed expansion options to over control existing runoff (**M7A**) and manage runoff from proposed future impervious cover (**M7A2**) . The retrofits include raising the existing embankment by either 3'+/- (**M7A**) or 6'+/- (**M7A2**) to provide additional attenuation capacity. May consider horizontal expansion to the north and/or south.

Notes/Feasibility:
UVM has provided an estimate of the additional proposed drainage area that will be redirected to the basin. UVM to complete a build-out analysis of the contributing drainage area for accommodation within the potential modified basin. An increased berm height of 6' may require elevating the existing high-tension electric lines.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: UVM	**Project Candidate:** Yep, Love It
Ownership: Public	**Retrofit of new or existing BMP:** Existing BMP
Land Use 1: Institutional	**Proposed Retrofit Practice 1:** 3' add. berm height (M7A)
Land Use 2: -None Selected-	**Proposed Retrofit Practice 2:** 6' add. berm height (M7A2)
Existing BMP on site? Yes	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: No	**Maintenance Burden:** Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: YES Water Quality: YES Recharge: NO Demo: NO Repair: NO Reuse: NO **Other:** None
Soils: Good Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: YES Polluted: NO High WT: NO Wetlands: NO **Other:** Overhead utility lines may limit berm height.
Use in Retrofit DA: Parking lots, streets, rooftop	
SIZING INFO	
Drainage Area (ac): 83.84 (M7A) / 2.28 (M7A2)	
Impervious Area (ac): 47.43 (M7A) / 1.36 (M7A2)	
Practice Area Available (ft^2): 66,000	
Existing Head Available? --	

Date Assessed: May 16, 2013, 1:21 PM **Assessed by:** KMH/AGM

ID#: Retrofit M7B

Name: **Open area east of Case Parkway**

Concept Description:
Proposed underground recharge system to capture drainage from Bilodeau Court and Case Parkway. Add additional drainage lines to direct existing drainage networks to retrofit. Drainage area could also include areas directed to Retrofit #M7C and M7D.

Notes/Feasibility:
Site is located on UVM property so an agreement between MS4s would be needed. Site is currently partially wooded but existing trees are in poor health.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Megan Moir, Burlington / UVM	**Project Candidate:** Ok
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Institutional	**Proposed Retrofit Practice 1:** Infiltration
Land Use 2: Green space east of Case Pkwy	**Proposed Retrofit Practice 2:** -None Selected-
Existing BMP on site? No	**Non-Structural Controls:** -None Selected-
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: No	**Maintenance Burden:** Medium
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: NO Water Quality: YES Recharge: YES Demo: NO Repair: NO Reuse: NO **Other:** None
Soils: Good Infiltration	
Use in Retrofit DA: -None Selected-	
SIZING INFO	
Drainage Area (ac): 7.05	
Impervious Area (ac): 3.24	
Practice Area Available (ft^2): 9,300	
Existing Head Available? --	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: NO
Polluted: NO
High WT: NO
Wetlands: NO

Other: Existing trees, many in poor health

Date Assessed: May 17, 2013, 9:56 AM **Assessed by:** KMH/AGM

ID#: Retrofit M7C

Name: **Case Parkway center island**

Concept Description:
Proposed bioretention area in center island on Case Parkway. Direct road drainage to bioretention using a speed bump across Case Parkway. The bioretention could underdrain/overflow to existing drainage system and outfall.

Notes/Feasibility:
Site currently is within the drainage area for the UVM North Campus Pond.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Megan Moir, Burlington	**Project Candidate:** Ok
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Single Family Residential	**Proposed Retrofit Practice 1:** Bioretention
Land Use 2: Grass island	**Proposed Retrofit Practice 2:** optional green street bumpouts along Case Pkwy
Existing BMP on site? No	**Non-Structural Controls:** Impervious Cover Removal
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Medium
Sources/pollutants 2: None	**Benefits:** Storage: NO Water Quality: YES Recharge: YES Demo: YES Repair: NO Reuse: **Other:** None
Soils: Good Infiltration	**Conflicts:** Soils: NO Access: NO Land Use: NO Utilities: YES Polluted: NO High WT: NO Wetlands: NO **Other:** Existing E/T/C in island along western edge
Use in Retrofit DA: Street	
SIZING INFO	
Drainage Area (ac): 0.90	
Impervious Area (ac): 0.51	
Practice Area Available (ft^2): 1,500	
Existing Head Available? --	

Date Assessed: May 17, 2013, 10:11 AM **Assessed by:** KMH/AGM

ID#: Retrofit M7D

Name: **140 East Ave. Residence**

Concept Description:
Construct a bioretention area in underutilized private green space. Divert drainage from existing drainage structure in Bilodeau Court. Alternative practice may include permeable pavement shoulders/parking lanes in the road ROW.

Notes/Feasibility:
Proposed site location is on private property. Utilities may present conflicts for retrofit opportunities.

GENERAL SITE INFORMATION	RETROFIT DETAILS
Site Contact Info: Megan Moir, Burlington	**Project Candidate:** Ok
Ownership: Public	**Retrofit of new or existing BMP:** New BMP
Land Use 1: Single Family Residential	**Proposed Retrofit Practice 1:** Bioretention
Land Use 2: Backyard/ROW	**Proposed Retrofit Practice 2:** Permeable parking lanes on Bilodeau Ct
Existing BMP on site? No	**Non-Structural Controls:** Other
Is site a hotspot? No	**Non-Structural Other:** -None Selected-
Sources/pollutants 1: Sediment	**Maintenance Burden:** Low
Sources/pollutants 2: -None Selected-	**Benefits:** Storage: NO Water Quality: YES Recharge: YES Demo: NO Repair: NO Reuse: NO **Other:** None
Soils: Good Infiltration	
Use in Retrofit DA: Street	
SIZING INFO	
Drainage Area (ac): 0.67	
Impervious Area (ac): 0.37	
Practice Area Available (ft^2): 2,240	
Existing Head Available? --	

Conflicts:
Soils: NO
Access: NO
Land Use: NO
Utilities: YES
Polluted: NO
High WT: NO
Wetlands: NO

Other: Gas, fiber optics, and above ground electric in ROW

Date Assessed: May 17, 2013, 11:29 AM **Assessed by:** KMH/AGM

Legend

- Retrofit
- Retrofit DA
- PracticeArea
- Outfalls
- Catch basins
- Manholes
- Existing BMP
- AirportProperties
- Watershed
- Wetlands_SoBu
- Parcels
- Existing BMP DA
- 2ft_Contours
- stream
- Storm
- Sanitary
- Combined
- Waterline

N

Feet

120

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Sustainable Environmental Solutions

Retrofit #M7B: Case Pkwy (east)/ #M7C: Case PKWY Center Island/ #M7D: 140 East Ave

Path: H:\Projects\2012\12106 Chittenden County-Centennial Brook WS\GIS\Maps\130610_iPad_Export_ack.mxd