
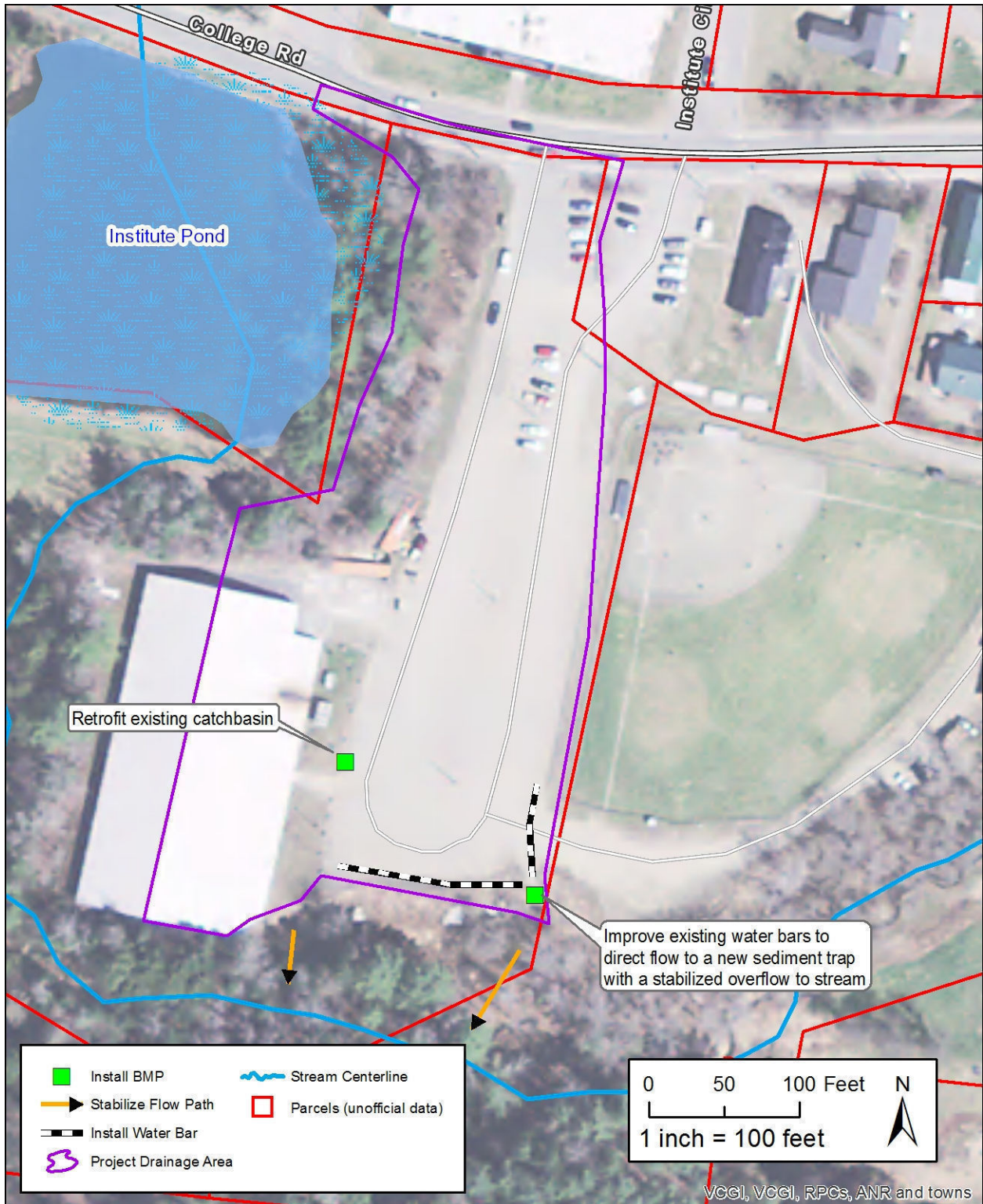



APPENDIX E:

Site Restoration Plans for High Priority Stormwater Mitigation Sites

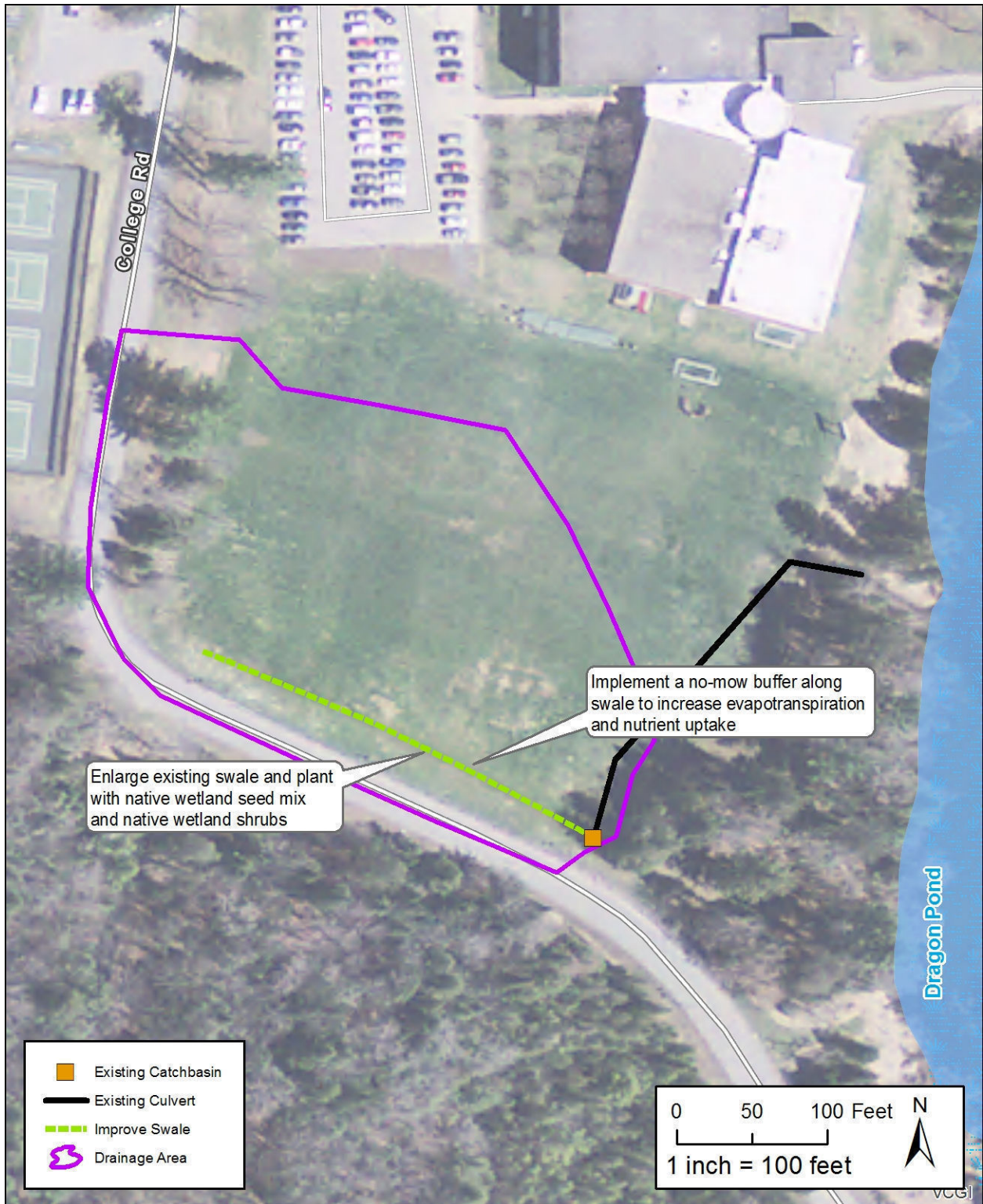
Project: LI-6 & LI-7		Site Restoration Plan
Location:	Parking area for the Fenton Chester Arena	
Latitude:	44.5363 N	
Longitude:	-72.0157 W	
Land Ownership:	Town (Maintained by Lyndon Institute)	
Drainage Area (acres)	2.4	
Impervious (acres)	1.6	
<p>Site Description: Runoff from the large gravel parking lot drains south and is collected by a water bar and directed to a small buffer strip on top of a steep bank leading down to a stream. Deep rills are visible on the parking surface in concentrated flow areas, and several small gullies have formed along the steep bank. The buffer strip provides some potential for sediment removal, however the sediment loading to the stream channel is extremely high. A catchbasin by the arena entrance collects runoff from a portion of the parking lot (0.5 acres), and the outlet is piped directly to the stream.</p>		
<p>Proposed Scope of Work</p>		
Install BMP	<ul style="list-style-type: none"> • Install sediment trap along edge of parking lot along existing flow path. • Retrofit the existing catch basin to include a small BMP with a water level control structure as necessary. 	
Improve Site Drainage	<ul style="list-style-type: none"> • Install water bars to collect flow along the southern edge of the parking lot and direct all runoff to the BMP installations. 	
Stabilize Flow Path	<ul style="list-style-type: none"> • Stabilize the overflow from the BMP with a rock lined swale extending to ordinary high water (OHW) along the stream. 	
Improve Winter Maintenance	<ul style="list-style-type: none"> • Work with the Town and Lyndon Institute to create a snow plowing and snow stockpiling plan that will protect the drainage and BMP features and reduce sediment loading to the stream. 	
<p>Additional Design/Permitting Requirements: Some additional survey and modeling is required to correctly size the catch basin BMP and the water bars along the parking lot. VTANR should be notified of this project that will require work within 100ft of a stream channel, however we do not expect any additional permitting requirements. We estimate that design and permitting efforts will cost \$1,500 - \$2,500 to cover a design-build arrangement similar to the LI and LSC projects completed by North Woods.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support from the Town and from Lyndon Institute • Confirm all project implementation tasks can be completed by the Town Highway Department • We recommend 1 day of technical field oversight during construction to assist with BMP sizing, location, layout, grading, and outlet structure configuration. 		
<p>Project Benefits: This project is primarily designed to mitigate a significant sediment source to the adjacent stream. Installation of a sediment trap treating runoff from the primary flow path and the proposed BMP retrofit at the catchbasin inlet will significantly reduce sediment transport from the arena parking lot.</p>		

Estimated Total Project Cost: \$10,000 - \$15,000



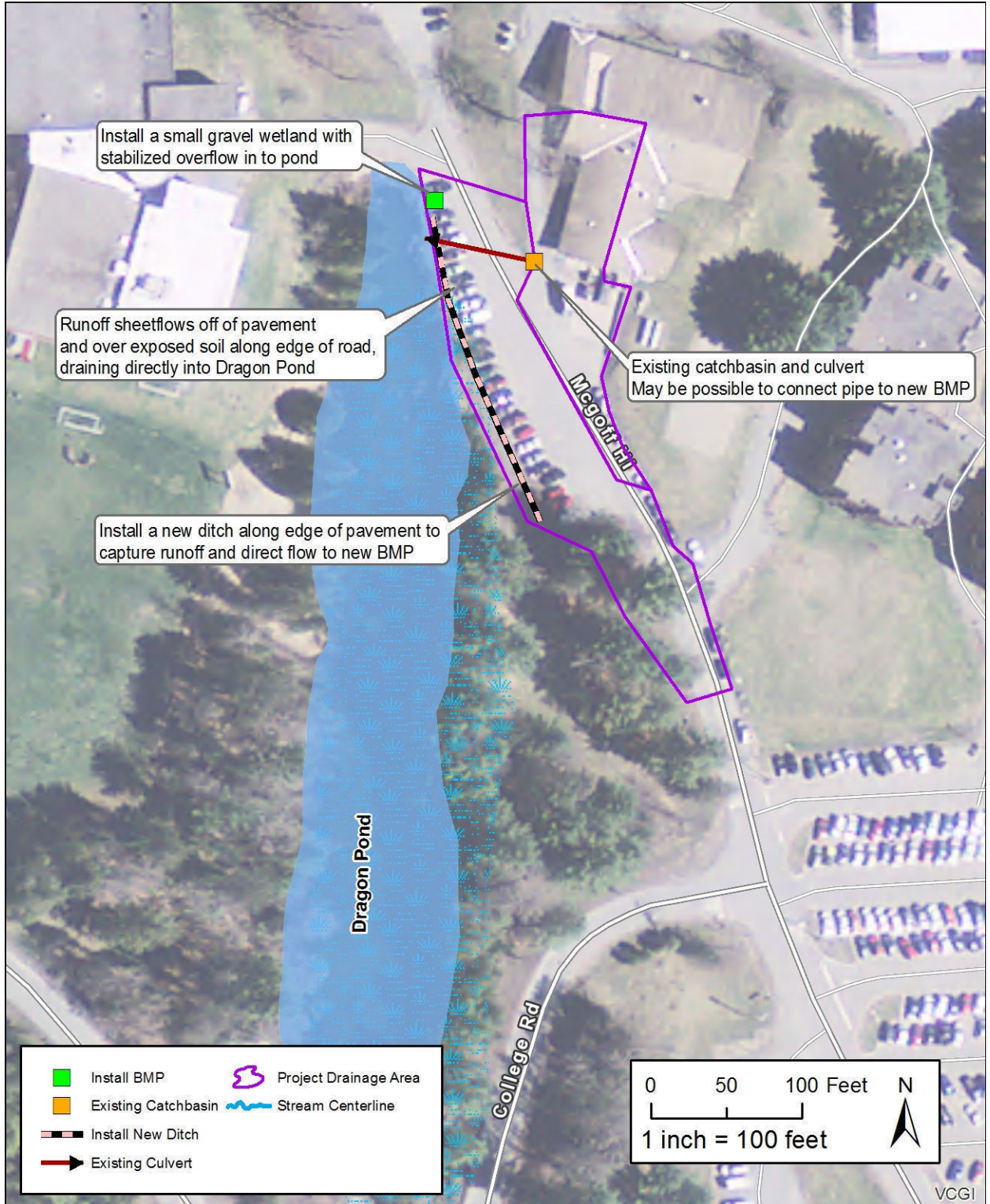
Project: LSC-2		Site Restoration Plan
Location:	LSC Varsity Field	
Latitude:	44.5324N	
Longitude:	-72.0256 W	
Land Ownership:	Lyndon State College	
Drainage Area (acres)	2.5	
Impervious (acres)	0.25	
<p>Site Description: A mowed grass swale along the south edge of the varsity field collects runoff from the field and a small portion of College Road. The swale drains to a catchbasin which flows directly to Dragon Pond. The underlying soils are very heavy and wet and portions of the field close to the swale are problematic for field maintenance. Fertilizer application to the field likely results in excess nutrient loading to the pond. LSC Public Safety is interested in adding a pedestrian footpath along College Road through this area, and the swale restoration will not interfere with this potential project.</p>		
<p>Proposed Scope of Work</p>		
Install Bio-swale BMP	<ul style="list-style-type: none"> • Widen and deepen the existing swale to increase water retention and improve field drainage • Wetland seed mix and shrub plantings within swale 	
Site Maintenance	<ul style="list-style-type: none"> • Mowing along the swale only under dry soil conditions • Bio-swale may require intermittent weeding and cleanout 	
<p>Additional Design/Permitting Requirements: The site has hydric soils and was likely a historic wetland; however, the site is not currently functioning as a wetland and should not require any additional permits, however VTANR wetland ecologist Julie Follensbee should be notified of the project to confirm this assumption. A site visit should be completed to better inform swale layout and grading. We anticipate that design efforts will cost less than \$1,000.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support with Lyndon State College • Determine available footprint for project (discuss with athletic coordinator) • No technical oversight is necessary during project implementation 		
<p>Project Benefits: This project is designed to improve drainage along the playing field and enhance the existing grassed swale to improve nutrient retention. The site is likely a significant nutrient source to Dragon Pond.</p>		


Estimated Total Project Cost: \$3,000-\$5,000



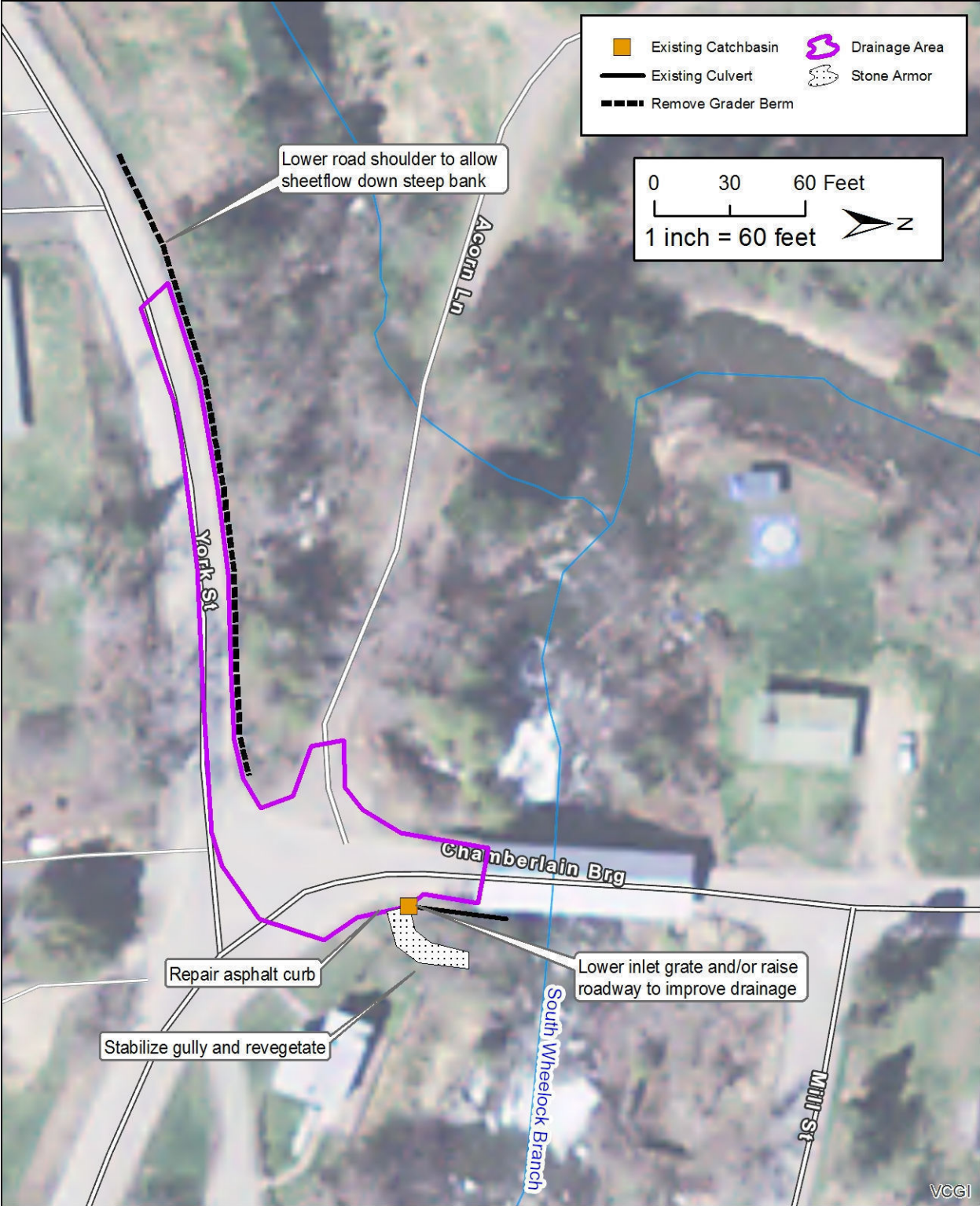
Project: LSC-4		Site Restoration Plan
Location:	McGoff Hill at Stevens Dining Hall	
Latitude:	44.5335 N	
Longitude:	-72.0243 W	
Land Ownership:	Lyndon State College	
Drainage Area (acres)	0.8	
Impervious (acres)	0.5	
<p>Site Description: Runoff from McGoff Hill is causing erosion along the road edges and flows directly in to Dragon Pond near the outlet. Winter plowing along the road and parking lot is likely a significant sediment source to the pond.</p>		
<p>Proposed Scope of Work</p>		
Install Ditch	<ul style="list-style-type: none"> • Install a grassed ditch between the edge of pavement and slope to the pond 	
Install BMP	<ul style="list-style-type: none"> • Install a gravel wetland or similar treatment feature with a sediment trap forebay at the bottom of the slope near the pond outlet <ul style="list-style-type: none"> ○ This will require the loss of up to 4 parking spaces 	
Drainage Retrofit	<ul style="list-style-type: none"> • May be possible to redirect pipe from catchbasin along road to new BMP 	
Improve Winter Maintenance	<ul style="list-style-type: none"> • Work with the LSC maintenance staff to create a snow management plan that will prevent plowing directly into the pond, protecting the ditch and BMP. 	
<p>Additional Design/Permitting Requirements: Additional survey and modeling is required to correctly size the treatment BMP and to work around the design constraints at the site. VTANR should be notified of this project that will require work within 100ft of a waterbody, however we do not expect any additional permitting requirements. We estimate that design and permitting efforts will cost \$3,000 - \$5,000.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support and site changes (loss of parking spaces) with Lyndon State College • Complete site survey and modeling • We recommend 2 days of technical field oversight during construction to assist with BMP sizing, location, layout, grading, and outlet structure configuration. 		
<p>Project Benefits: This project is designed to capture runoff from a paved road and parking area and prevent erosion along the flow path before spilling in to Dragon Pond. BMP installation will be able to treat runoff from small to moderate storms to further reduce nutrient and sediment loading to the pond. The highly visible site will present a valuable educational opportunity for the College.</p>		


Estimated Total Project Cost: \$15,000 - \$25,000



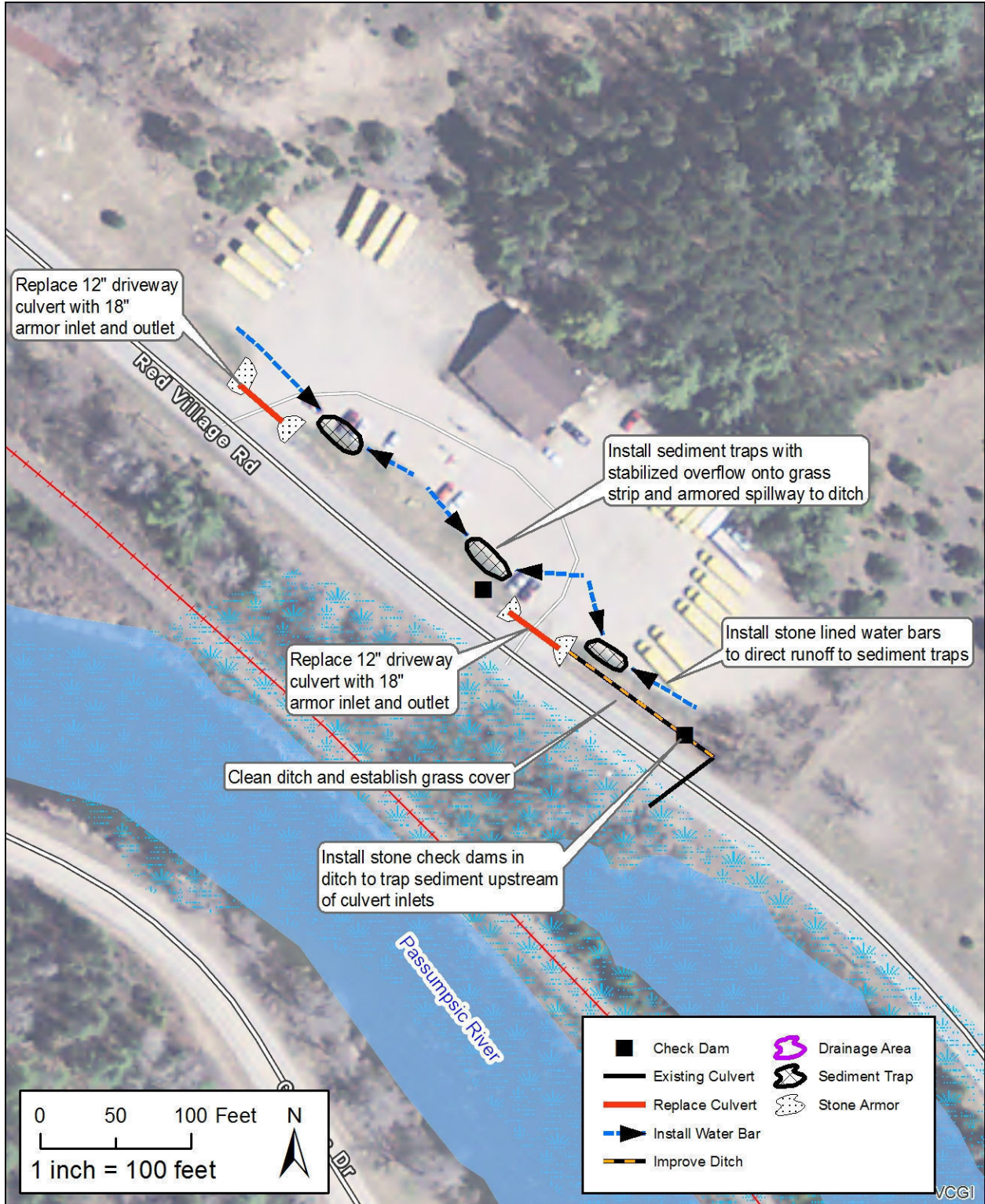
Project: LY-4		Site Restoration Plan
Location:	Chamberlain Bridge	
Latitude:	44.5163N	
Longitude:	-72.0166 W	
Land Ownership:	Town/Private	
Drainage Area (acres)	0.25	
Impervious (acres)	0.25	
<p>Site Description: A small drop inlet grate on the southeast approach to the covered bridge is not situated at the low point along the road edge. Runoff is flowing off of the road approximately 10ft south of the inlet and has eroded a large gully down the embankment and through the lawn of the adjacent house. The gully is actively eroding and is contributing sediment and nutrients directly into South Wheelock Branch. Previous attempts to reconfigure the inlet and to add an asphalt curb along the road edge have failed to address the issue.</p>		
<p>Proposed Scope of Work</p>		
Reconfigure Drop Inlet	<ul style="list-style-type: none"> • Lower the drop inlet approximately 6 inches and/or raise the adjacent roadway elevation and rebuild the asphalt curb to protect the gully area <ul style="list-style-type: none"> ○ It may be feasible to move the drop inlet to the current low point at the head of the gully. 	
Reduce Runoff Volume	<ul style="list-style-type: none"> • Lower the grassed strip along the north edge of York St to allow for sheetflow down the steep forested bank, reducing runoff to the drop inlet 	
Site Maintenance	<ul style="list-style-type: none"> • Ensure that drop inlet is cleaned on a regular basis • Protect curb during plowing 	
<p>Additional Design/Permitting Requirements: Additional site assessment is required to inform design options. We expect that a design-build approach with the Town Highway Department will be appropriate for this project. We estimate that additional assessment and design efforts will cost \$1,000 to \$2,000.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support with private landowner • Assess the size and location of existing drop inlet • Limited technical oversight may be necessary depending on the preferred alternative 		
<p>Project Benefits: This project is designed to address an ongoing erosion issue that also threatens the long-term stability of a Town road shoulder. The gully drains directly in to the South Wheelock Branch and is likely a significant sediment and nutrient source. The project should be relatively simple to implement and will not require increased maintenance.</p>		


Estimated Total Project Cost: \$5,000-\$15,000



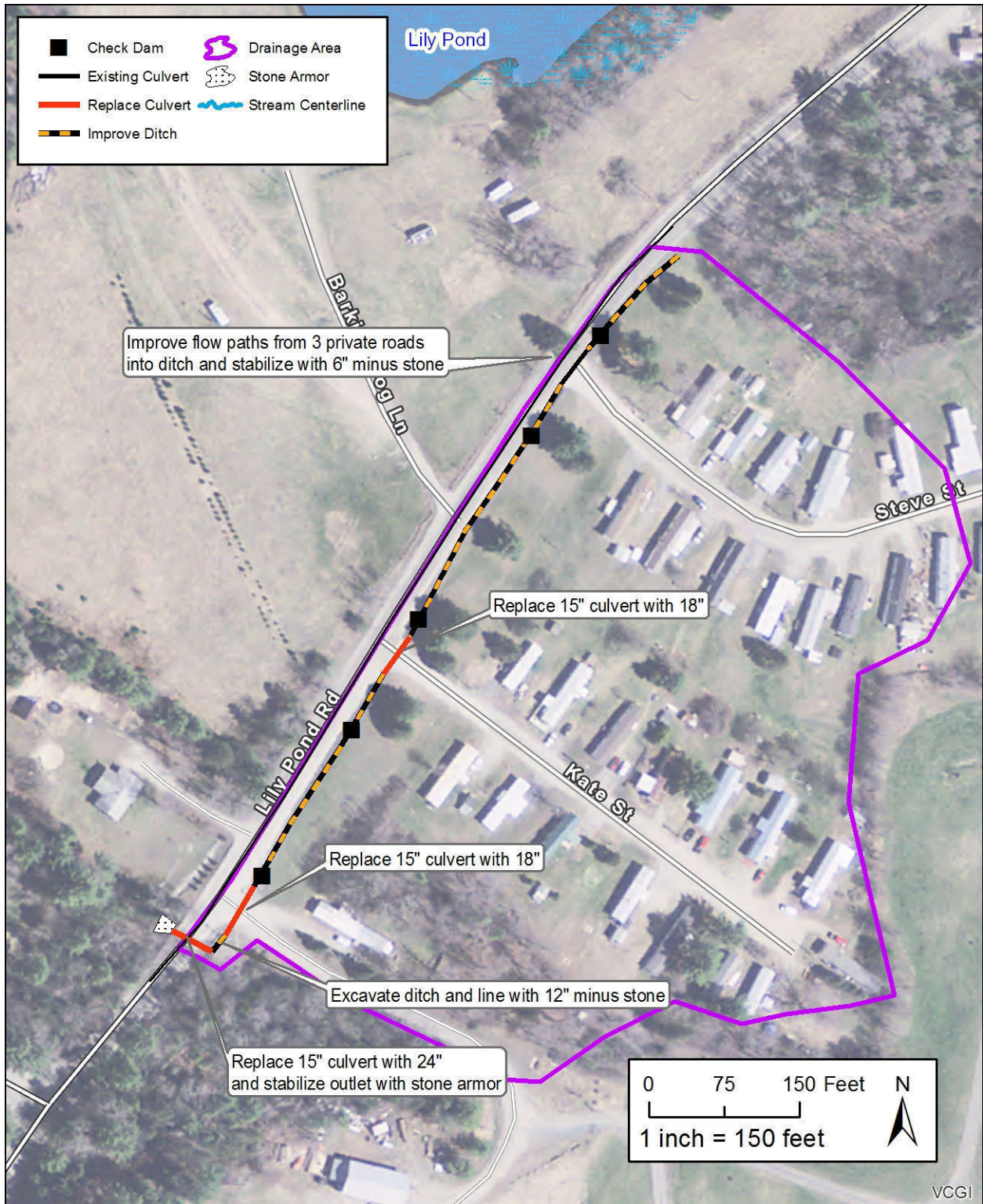
Project: LY-6		Site Restoration Plan
Location:	Butlers Bus Service (Red Village Rd)	
Latitude:	44.5437 N	
Longitude:	-71.9856 W	
Land Ownership:	Town and Private	
Drainage Area (acres)	2.0	
Impervious (acres)	1.6	
<p>Site Description: A large gravel parking area and rooftop drain to a roadside ditch with severe gullying along several flow paths. The ditch is filled with sediment and drains directly into a side channel of the Passumpsic River.</p>		
<p>Proposed Scope of Work</p>		
Culvert Improvements	<ul style="list-style-type: none"> • Replace the two 12" driveway culverts with 18" culverts • Stabilize the embankment at the inlet and outlet of the driveway culverts 	
Install Check Dams	<ul style="list-style-type: none"> • Install stone check dams in the roadside ditch to trap sediment and facilitate cleanout 	
Improve Flow Paths	<ul style="list-style-type: none"> • Install water bars to direct runoff to new sediment traps 	
Install Sediment Traps	<ul style="list-style-type: none"> • Install sediment traps near each driveway culvert <ul style="list-style-type: none"> ○ Overflow from the sediment traps should be directed to the existing grassed filter strip ○ Provide a rock lined spillway to the ditch ○ Ensure that sediment traps are routinely inspected and cleaned 	
<p>Additional Design/Permitting Requirements: Some additional survey and design work is recommended to inform sediment trap location, design, and sizing. We estimate that design and permitting efforts will cost \$1,500 to \$2,500.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support with the private landowner • Complete site survey and drainage area mapping • Hydraulic analysis and sediment trap designs • We recommend 2 days of technical field oversight during construction to assist with sediment trap sizing, location, layout, grading, and overflow configuration. 		
<p>Project Benefits: This project is designed to address several areas of severe gully erosion and sediment loading to the Passumpsic River side channel. The site currently requires frequent maintenance; however, no long-term solutions have been implemented.</p>		


Estimated Total Project Cost: \$7,500 - \$15,000



Project: LY-8		Site Restoration Plan
Location:	Lily Pond Road	
Latitude:	44.5198 N	
Longitude:	-71.9931 W	
Land Ownership:	Town	
Drainage Area (acres)	7.5	
Impervious (acres)	2.0	
<p>Site Description: The ditch along the east side of the road is badly eroded and is sending large volumes of sediment into the adjacent intermittent stream. Several areas of gully erosion along the road edge upslope. The cross-culvert outlet is unstable and has a large gully along the road edge.</p>		
<p>Proposed Scope of Work</p>		
Improve Ditch	<ul style="list-style-type: none"> • Excavate and enlarge the existing ditch and establish grass cover • Install a stone lined ditch for the short section upslope of the cross-culvert • Install rock to stabilize flow paths from Steve St., Kate St., and the driveway 	
Install BMP	<ul style="list-style-type: none"> • Install check dams to trap sediment for easier removal 	
Stabilize Culvert	<ul style="list-style-type: none"> • Install an outlet header and armor the steep bank with heavy stone armor 	
Improve Maintenance	<ul style="list-style-type: none"> • Work with the Highway Department to improve grading practices to minimize disturbance of the grass-lined ditch and ensure appropriate sediment cleanout. 	
<p>Additional Design/Permitting Requirements: We do not anticipate any additional design or permitting requirements.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Verify culvert sizes and contributing drainage area • Identify any additional erosion areas that require stabilization 		
<p>Project Benefits: This project is designed to address a major sediment source piped directly into an intermittent stream along Lily Pond Road. Improving the shape and capacity of the ditch and establishing grass will reduce erosion within the ditch. We also recommend installing a series of stone check dams to help trap additional sediment from the road and the neighborhoods. Check dams will concentrate sediment deposits and facilitate cleanup. Stabilizing the culvert outlet will further reduce sediment runoff and maintenance requirements.</p>		

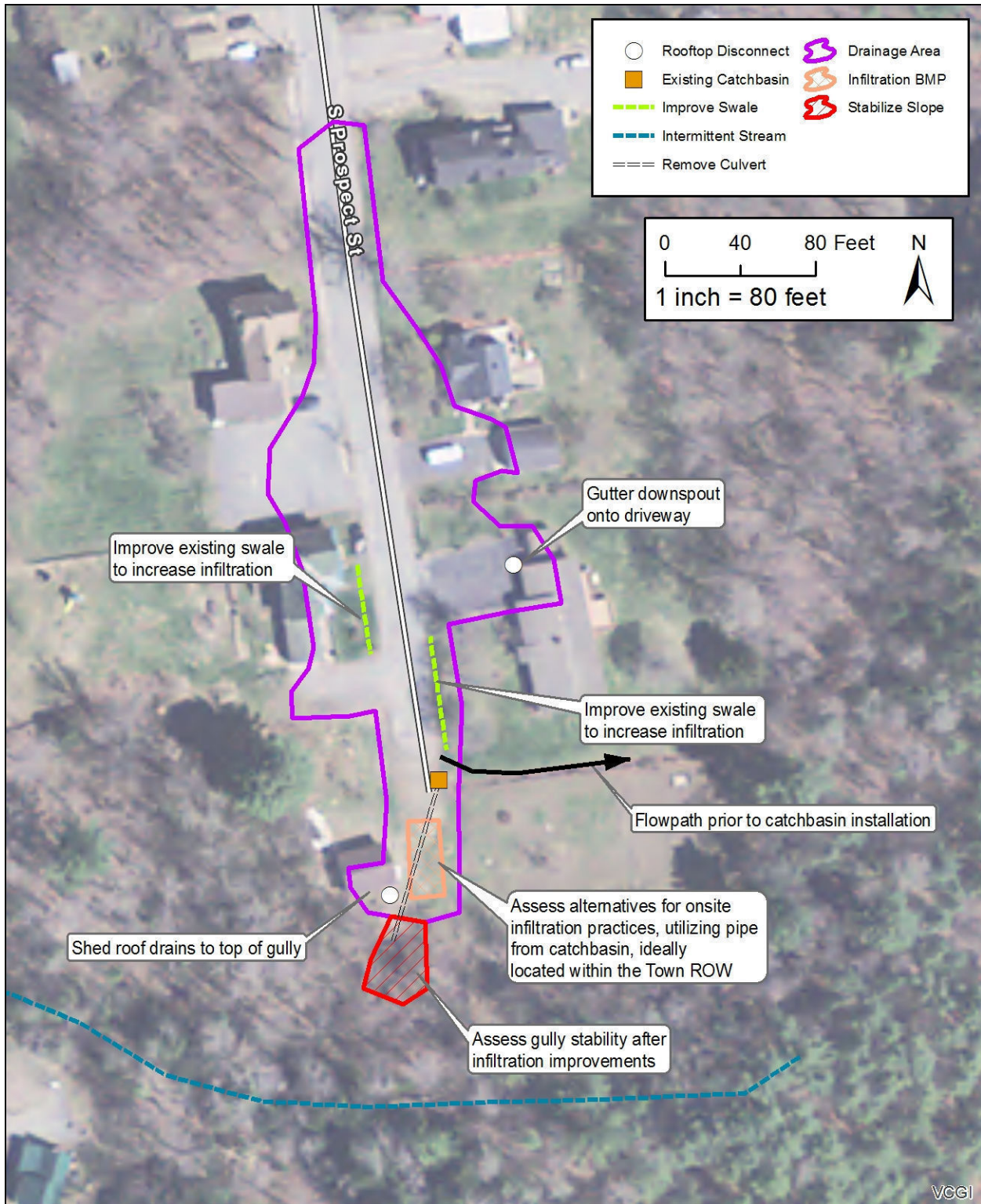
Estimated Total Project Cost: \$8,000 - \$12,000




Project: LY-12		Site Restoration Plan
Location:	South Prospect St	
Latitude:	44.5167 N	
Longitude:	-72.0100 W	
Land Ownership:	Town and Private	
Drainage Area (acres)	1.0	
Impervious (acres)	0.5	
<p>Site Description: A very large and steep gully has formed along the steep valley wall leading down to an intermittent stream. The gully is actively advancing into the slope and is threatening a large shed. A stormwater pipe from a recently installed catchbasin at the end of South Prospect St is likely contributing to erosion along the toe of the gully. We did not observe any significant surface flow paths to the gully.</p>		
<p>Proposed Scope of Work</p>		
Non-Structural BMP Implementation	<ul style="list-style-type: none"> • Assess opportunities for rooftop disconnection • Improve existing swales to increase infiltration <ul style="list-style-type: none"> ○ May require some grading and/or excavation of compacted soils 	
Install Infiltration BMP	<ul style="list-style-type: none"> • Tie in to existing pipe from catchbasin • Utilize existing catchbasin as pre-treatment sediment trap • Assess BMP options for underground infiltration • BMP within Town ROW 	
Stabilize Gully	<ul style="list-style-type: none"> • Slope stability should be assessed following infiltration improvements <ul style="list-style-type: none"> ○ Assess alternatives for stabilization ○ May require moving the shed 	
<p>Additional Design/Permitting Requirements: Professional survey is required to determine drainage area to the site. Hydrologic modeling and soil infiltration testing will be required to inform BMP selection and sizing. We do not anticipate any additional permitting requirements for the infiltration practices. We estimate that design and permitting efforts will cost \$3,000 to \$5,000.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm parcel boundaries • Confirm project support with adjacent private landowners • Complete site survey and drainage area mapping • Assess opportunities for non-structural BMP implementation • Hydrologic analysis and BMP selection/design • We recommend 2 days of technical field oversight during project implementation to assist with structural and non-structural BMP layout and implementation. Significant additional design and engineering time will be required for any slope stabilization considerations. 		
<p>Project Benefits: This project is designed to address the causes of a very large and active gully along a steep embankment to an intermittent stream. Implementation of a range of structural and non-structural BMPs will allow for complete infiltration of stormwater, potentially mitigating the ongoing gully erosion.</p>		

Estimated Total Project Cost: \$10,000 - \$25,000*


*Estimated costs do not include slope stabilization



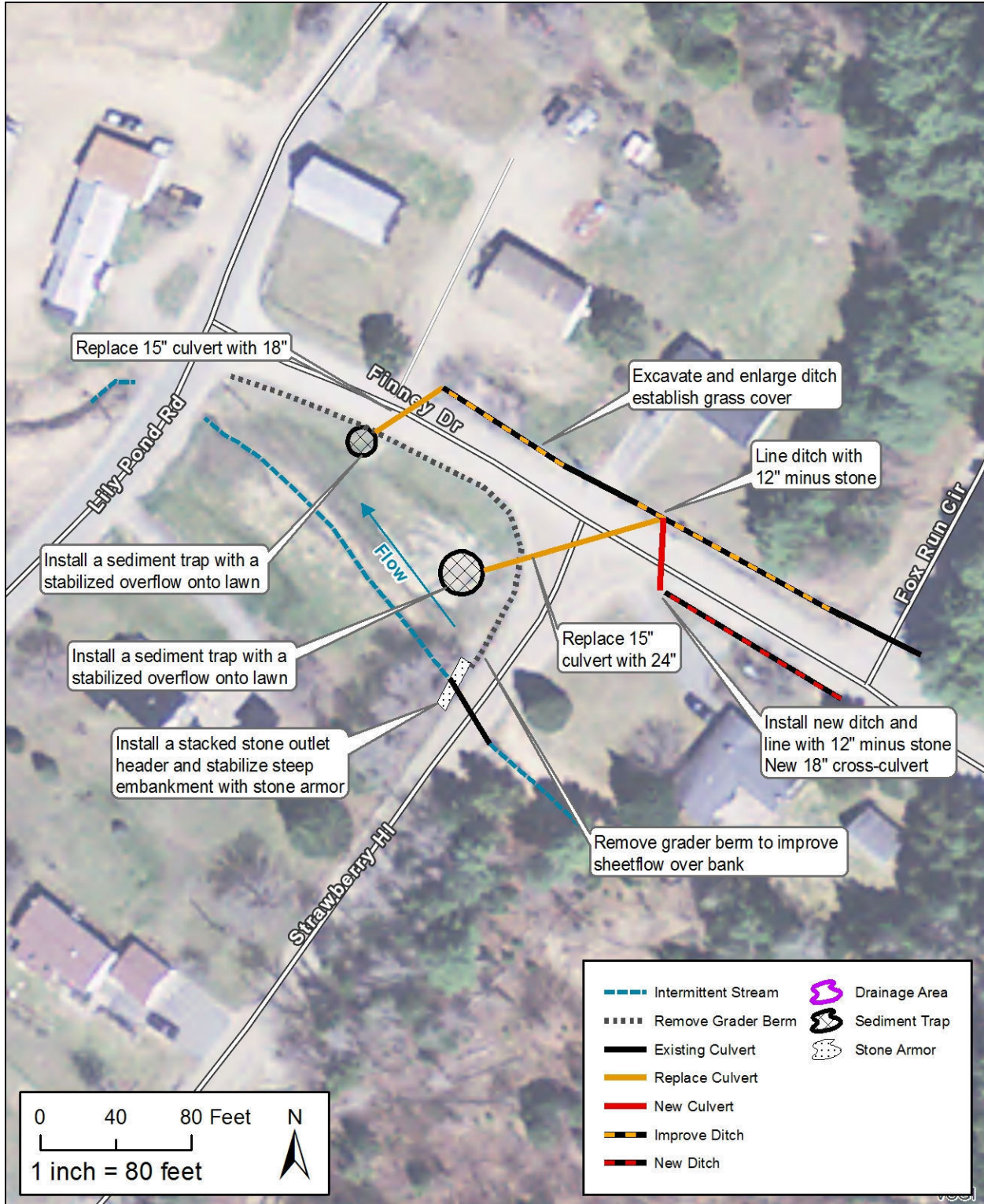
Project: LY-15		Site Restoration Plan
Location:	Commercial Complex on Raymond St	
Latitude:	44.5360N	
Longitude:	-72.0011 W	
Land Ownership:	Private	
Drainage Area (acres)	2.5	
Impervious (acres)	2.5	
<p>Site Description: A large industrial/commercial complex with large dirt parking areas partially drains to the southwest corner of the property along the railroad tracks. Drainage infrastructure is not mapped for this area and all catchbasins on the site appear to be filled with sediment and non-functioning. The high sediment load and frequent heavy vehicle traffic will require special design and maintenance considerations. We expect that runoff from this site currently flows across Raymond St and into the stormwater pipes that drain into the Passumpsic River.</p>		
<p>Proposed Scope of Work</p>		
Install BMP	<ul style="list-style-type: none"> Assess BMP options based on site constraints, existing drainage infrastructure, and drainage area 	
Non-Structural BMP	<ul style="list-style-type: none"> Assess options for non-structural BMPs to treat rooftop runoff and driplines and reduce erosion of the gravel parking areas 	
Site Maintenance	<ul style="list-style-type: none"> Review snow management plan Ensure appropriate maintenance interval to preserve BMP effectiveness 	
<p>Additional Design/Permitting Requirements: Professional survey is recommended to determine site grading and the drainage area available for treatment. This information will be used to model the site and inform BMP selection sizing. Soil infiltration rates will likely need to be determined. The existing drainage area should be mapped, this may require a full cleanout of the filled basins and culverts. We do not anticipate any permitting requirements for this project. We estimate that survey and design efforts will cost \$3,000-\$5,000.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> Confirm project support with private landowners Determine snow management plan for site Complete site survey and drainage area mapping Determine soil infiltration rates and capacity Alternatives analysis for BMP options We recommend 2-3 days of technical field oversight during project implementation to assist with BMP layout and outlet configuration 		
<p>Project Benefits: This project is designed to reduce runoff volume and sediment loading from a large commercial/industrial complex. The very high sediment loads and inherent site constraints on the property will limit BMP options.</p>		

Estimated Total Project Cost: \$20,000 - \$40,000



Project: LY-22		Site Restoration Plan
Location:	Finney Hill Neighborhood	
Latitude:	44.5437 N	
Longitude:	-71.9856 W	
Land Ownership:	Town and Private	
Drainage Area (acres)	2.5	
Impervious (acres)	0.75	
<p>Site Description: Large volumes of gravel road material are deposited on the lawn adjacent to an intermittent stream channel. Sediment is coming from the outlets of two cross-culverts and from severe gully erosion where concentrated runoff from the road is carving into the steep embankment. Additional erosion was observed at the inlet and outlet of the 30" culvert under Strawberry Hill Road.</p>		
<p>Proposed Scope of Work</p>		
Culvert Improvements	<ul style="list-style-type: none"> • Replace the two 15" cross-culverts with larger structures (18" and 24") • Add a new 18" cross-culvert to carry ditch flow from new Finney Dr culvert • Stabilize the steep embankment at the inlet and outlet of the conveyance culvert <ul style="list-style-type: none"> ○ The outlet needs a stacked stone header and additional stone armor 	
Ditch Improvements	<ul style="list-style-type: none"> • Excavate and enlarge the existing ditch and establish grass cover or line with 12" minus stone where needed • Install a new ditch along Finney Dr. and line with 12" minus stone 	
Install BMP	<ul style="list-style-type: none"> • Install sediment traps at the cross-culvert outlets <ul style="list-style-type: none"> ○ Provide a level spreader outlet berm onto lawn area ○ Ensure that sediment traps are routinely inspected and cleaned 	
Remove Grader Berm	<ul style="list-style-type: none"> • Remove the grader berm to facilitate sheetflow onto grass area, stabilize any existing gully erosion locations 	
<p>Additional Design/Permitting Requirements: Some additional survey and design work is recommended to inform culvert sizing and sediment trap design and sizing. Sanitary Sewer lines are mapped near the sediment traps, these need to be located and may require design adjustments. We estimate that design and permitting efforts will cost \$1,000 to \$2,500.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support with the private landowner • Complete site survey and drainage area mapping • Locate sanitary sewer lines • Hydraulic analysis and sediment trap designs • We do not anticipate any field oversight requirements 		
<p>Project Benefits: This project is designed to address several areas of severe road erosion and sediment loading to an intermittent stream. The site currently requires frequent maintenance; however no long-term solutions have been implemented.</p>		

Estimated Total Project Cost: \$15,000 - \$25,000



Project: LY-23 & LY-24 **Site Restoration Plan**

Location:	Lily Pond Road at Lyndon Town School	
Latitude:	44.5457 N	
Longitude:	-71.9844 W	
Land Ownership:	Town and Private	
Drainage Area (acres)	8	
Impervious (acres)	1.75	

Site Description: The roadside ditch along Lily Pond Road drains a long stretch of the road and receives runoff from the southern portion of the School property. Portions of the runoff from the School are filtered by a forested wetland. The wetland is partially drained by a narrow ditch through the grassed area that drains into the roadside ditch. The roadside ditch crosses under Lily Pond Road and then flows through an asphalt lined swale for approximately 50' to a steep embankment down to the second order stream. Some erosion was visible along the steep embankment. Overall, we did not observe any significant sediment sources, however the drainage area does have close to 2 acres of impervious surfaces.

Proposed Scope of Work

Restore Wetland	<ul style="list-style-type: none"> • Fill/widen the ditch to create a sinuous swale • Implement a no-mow buffer and plant wetland vegetation/seed mix as needed
Install BMP	<ul style="list-style-type: none"> • Remove the asphalt swale and compacted underlying soils • Install a gravel lined infiltration trench • Install a rock lined forebay to dissipate flow and trap coarse sediment
Stabilize Flow Path	<ul style="list-style-type: none"> • Install rock armor along the flow path to the stream

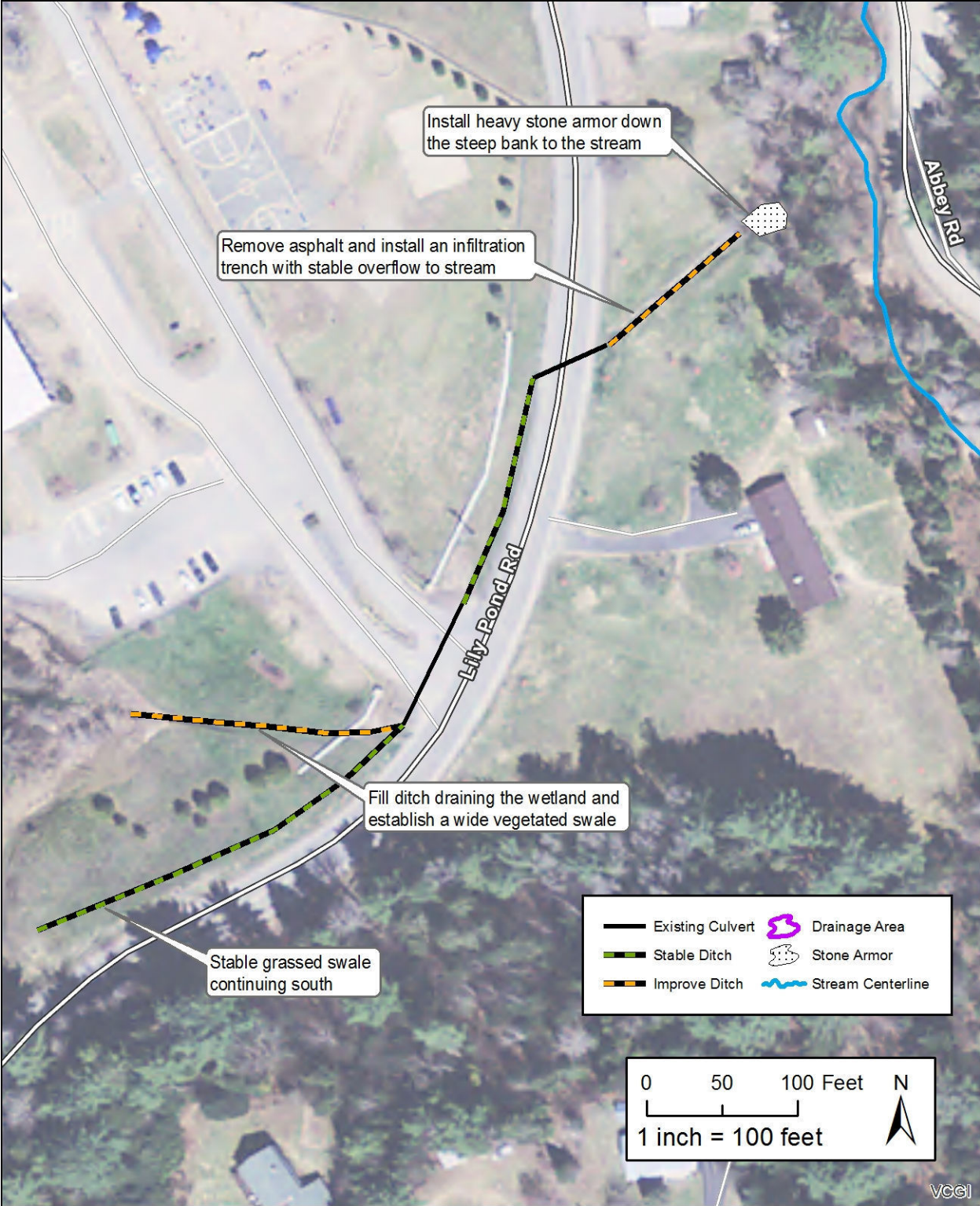
Additional Design/Permitting Requirements: Additional survey and modeling is required to correctly size the treatment BMP and to work around the design constraints at the site. The existing wetland south of the School is likely a Class II wetland and will require delineation and permits to work within the wetland buffer. VTANR should be notified of the asphalt ditch project that will require work within 100ft of a waterbody, however we do not expect any additional permitting requirements. **We estimate that design and permitting efforts will cost \$3,000 - \$5,000.**


Next Steps:

- Confirm project support with the Town School and the private landowner (asphalt ditch)
- Determine existing utilities and other potential site constraints
- Determine soil infiltration capacity
- Complete site assessment and modeling
- We recommend 2 days of technical field oversight during construction to assist with BMP sizing, location, layout, grading, and outlet structure configuration.

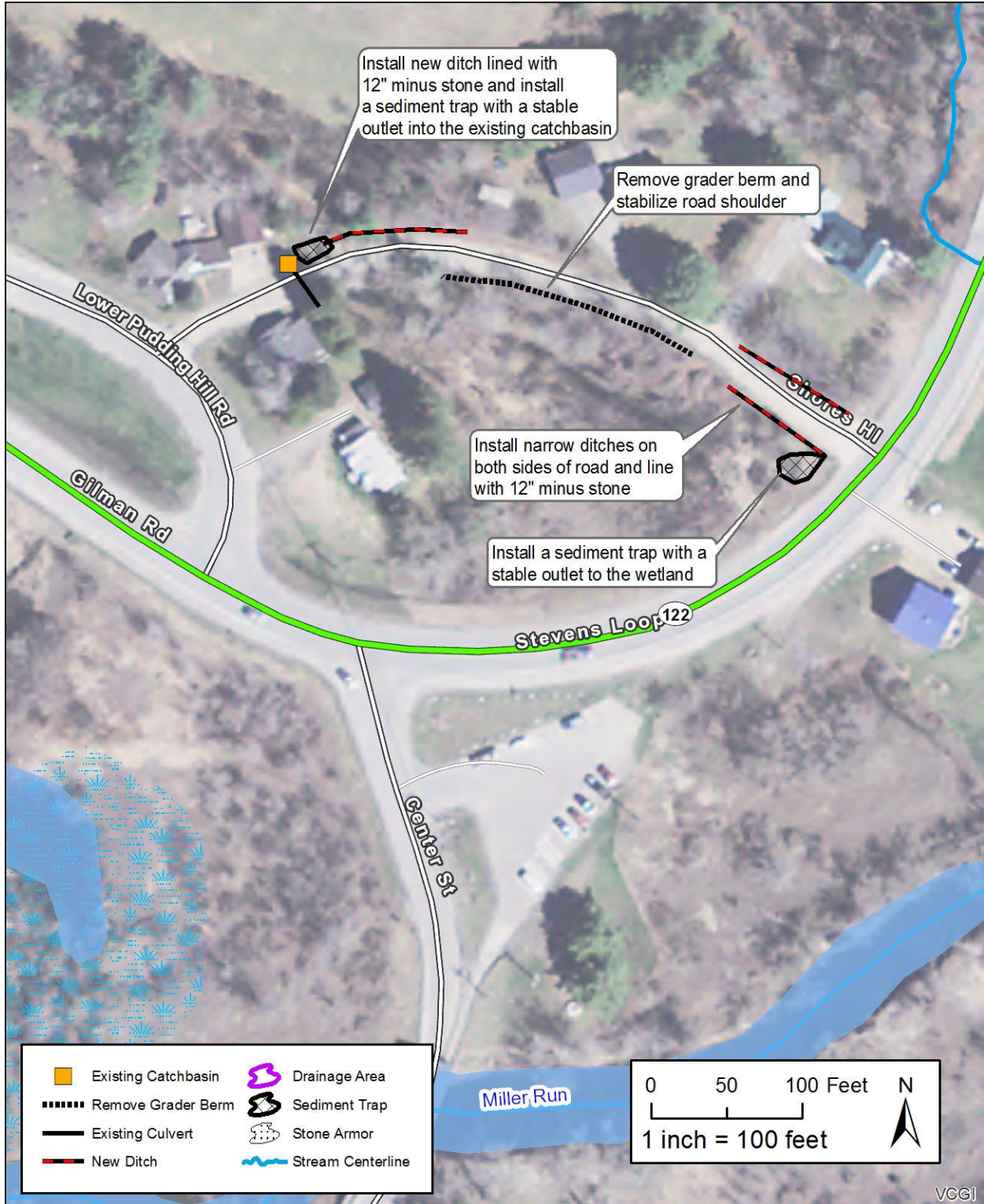
Project Benefits: This project is designed to reduce peak runoff rates from a relatively large watershed draining to a small stream through an asphalt lined swale. The wetland ditch restoration will also increase nutrient retention. Reducing peak runoff and stabilizing the steep outlet channel to the stream will address a sediment source that could worsen over time with ongoing erosion.


Estimated Total Project Cost: \$20,000 - \$30,000



Project: LY-34 & LY-35		Site Restoration Plan
Location:	Shores Hill	
Latitude:	44.5436N	
Longitude:	-72.0097 W	
Land Ownership:	Town	
Drainage Area (acres)	1.0	
Impervious (acres)	0.25	
<p>Site Description: Large volumes of sediment are washing off both sides of the approximately 500ft long road. The road does not have established ditches and the road bed is relatively soft and sandy. The eastern end of the road drains directly into a wetland with a poorly functioning sediment trap. The western end of the road drains directly into a catchbasin situated below the road grade and is piped into a dredged channel leading to the wetland. The middle portion of the road has limited areas for sheetflow down the forested bank. The road is narrow, and the adjacent banks are very steep.</p>		
<p>Proposed Scope of Work</p>		
Install Ditches	<ul style="list-style-type: none"> • Install narrow ditches and line with 12" minus stone 	
Remove Grader Berms	<ul style="list-style-type: none"> • Two areas of grader berms are limiting sheetflow to south side of the road down the forested slope to the wetland • Some areas of erosion are likely along the road shoulder and should be stabilized with rock 	
Install Sediment Traps	<ul style="list-style-type: none"> • Improve the existing sediment trap on the eastern end of the road • Install a sediment trap with a stable outlet to the existing catchbasin 	
<p>Additional Design/Permitting Requirements: The wetland along the south side of the road is likely Class II and may require permitting for the eastern sediment trap. No additional design is required for the project. If wetlands clearances are required, we estimate that wetland delineation and permitting efforts will cost \$1,000-\$2,000.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Contact VTDEC Wetlands Ecologist (Julie Follensbee) to discuss concept plan and needed clearances • Delineate wetland and review with VTANR staff (as necessary) • Assess feasibility and cost of paving the road • We do not anticipate the need for any technical field oversight during project implementation 		
<p>Project Benefits: This project is designed to address significant sediment loading into a wetland. No long-term road stabilization measures have been implemented and the erosion will continue. Paving the road is a possible solution, however this will likely cost upwards of \$75,000 (assuming roughly \$150/LF for a 20ft wide road).</p>		

Estimated Total Project Cost: \$5,000 - \$10,000



Project: Rt5-2		Site Restoration Plan
Location:	The White Market	
Latitude:	44.5196N	
Longitude:	-72.0036 W	
Land Ownership:	Private	
Drainage Area (acres)	1.25	
Impervious (acres)	1.25	
<p>Site Description: The large paved parking area for Whites Market partially drains to the west to a narrow vegetated area. Several small flow paths extend down the steep bank to the Passumpsic River. Much of the vegetated area has been compacted by parked vehicles off the edge of the parking lot. This area is also used for stockpiling snow. There is a large area available for potential treatment features.</p>		
<p>Proposed Scope of Work</p>		
Install BMP	<ul style="list-style-type: none"> • Assess BMP options based on site constraints and drainage area 	
Stabilize Flow Paths	<ul style="list-style-type: none"> • Identify and stabilize any concentrated flow paths with erosion on the river bank 	
Site Maintenance	<ul style="list-style-type: none"> • Construct a barrier (fence) to protect BMP from vehicle damage • Discuss winter maintenance requirements <ul style="list-style-type: none"> ○ Create a maintenance plan that will preserve BMP effectiveness 	
<p>Additional Design/Permitting Requirements: Professional survey is recommended to determine site grading and the drainage area available for treatment. This information will be used to model the site and inform BMP sizing. Soil infiltration rates will need to be determined. We do not anticipate any permitting requirements for this project. We estimate that survey and design efforts will cost \$3,000-\$5,000.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support with private landowner • Determine snow management plan for parking lot • Complete site survey and drainage area mapping • Determine soil infiltration rates and capacity • Alternatives analysis for BMP options • We recommend 2 days of technical field oversight during project implementation to assist with BMP layout and outlet configuration 		
<p>Project Benefits: This project is designed to reduce runoff volume and improve water quality for a large paved parking lot adjacent to the Passumpsic River. We anticipate that Water Quality Volume (WQv) and Channel Protection Volume (CPv) treatment is possible, given the large area available for BMP implementation.</p>		

Estimated Total Project Cost: \$20,000 - \$30,000

