# Town of Charlotte

# Champlain Valley Co-housing Trail Easement Refinement

*Submitted by:*

## Broadreach Planning & Design

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## TABLE OF CONTENTS

TABLES



FIGURES



APPENDICES

# I. INTRODUCTION

## A. Overview

The Town of Charlotte is working to develop a viable trail system throughout the Town. The Town Plan includes an overall Trails Vision Plan which the Planning Commission has been using to secure trail easements in locations that help advance the vision. As part of the approval of the Champlain Valley Co-housing project (CVC) the Planning Commission secured a trail easement across the property linking Route 7 with Greenbush Road. **Figure 1** shows the location of the CVC common lot in Charlotte and the approximate location of the existing trail easement.

The Town now mows the trail between Route 7 and the residential units on the site. This mowed trail does not currently lie entirely within the designated trail easement. The Town wants to establish the trail on a more permanent basis and would like to finalize the most appropriate location for the trail on the property. The location would be based on a comprehensive analysis of environmental and cultural resources, the preferences of the CVC residents, and the overall needs and requirements of the Town's emerging trail system. **Appendix A** includes more information on the process used to complete this analysis.

This report summarizes the results of the analysis and records the recommendations of the most appropriate alignment. It is organized into six additional sections after this Introduction:

- Recommendations,
- Existing Conditions,
- Potential Alignments
- Analysis,
- Initial Estimates of Probable Construction Costs, and
- Implementation.

The recommendations for the path alignment are presented first so that those just interested in the conclusions can find what information they need quickly and easily.

Those that are interested in the more detailed aspects of the project can then continue reading. The report continues by describing the existing conditions, the various alternatives that were considered, the analysis of the alternatives, and the review of the potential impacts of the preferred alignment.

The remaining portions of this introduction are meant to provide an overview of the issues so that the recommendations can be more clearly understood. If the recommendations are to be implemented, it may be necessary to change the location of the Town's trail easement on the CVC common lot.

## B. Purpose and Need

The purpose of the CVC Trail is to provide an off-road way for pedestrians, bicyclist, runners, skiers, and other non-motorized travelers to move between Route 7 and Greenbush Road. The CVC trail is also meant eventually to become a portion of a larger trail that links Mt. Philo State Park to the east of the site, with the West Charlotte Village to the north of the site and the residential neighborhoods to the south of the site. It links with a trail easement on the Hinsdale parcel to the south ("Big Oak Trail").

The trail is needed because existing pedestrian and bicycle travel within the Town of Charlotte is negatively impacted by a combination of gravel surfaces and the high volume and/or speed of automobile and truck traffic present on many roads within Town. Route 7, in particular, is not suited for pedestrian and/or bicycle travel by children and less experienced bicyclists. The trail also provides for non-motorized access (with proposed easements on an adjoining property) to the Charlotte Little League fields.

## C. Projected Users

The existing trail is now used by walkers and runners of all ages, and more skilled bicyclists with wide tires; in the winter it is also used by skiers and snowshoers. When the initial grass/mineral soil trail is completed and stabilized, it is expected that mountain bikers of beginning to moderate ability may also use the trail. As the trail is more heavily used and/or the surface is upgraded to crushed gravel, it is anticipated that more bicyclists, including those with skinnier tires, will begin to use the trail. These additional users are expected to be mostly children or beginner to intermediate skill bicyclists. There is also the potential for equestrians to use the path if Town Selectboard opens the Town trails to them.

## D. Recommended Cross Section

The recommended cross section for the trail is expected to change as use of the trail increases.

Initially, the cross section can be a closely mowed path that is approximately five feet wide. Extreme bumps may be smoothed and the area reseeded. The small drainages that flow across the path may remain as they are. The trail through the forested areas should be augmented so that the surface consists of mineral soils, preferable those existing on site beneath the organic layer. In those forested areas with wetland soils, some additional tight, crushed gravel can also be added to the cross section to create a more stable and less erodible surface.

There is little information on how much foot or bicycle traffic a trail surface can take before it needs to be upgraded to a more stable condition. Lacking such information at this time, BRPD has used information from observations of other trails in the area to suggest that the trail can remain as a grass trail until there are more than 100 people using the trail in a week's time. When the use of the trail exceeds this amount, the Town should consider upgrading to the second recommended cross section.

The recommended cross section for a more heavily used trail includes, at a minimum, an eight-foot wide crushed gravel path with an adequate sub-base. It may be constructed to lie partially or completely above grade, so as not to disturb archeological resources where necessary or cut off groundwater flow in wetland areas. If installed above grade, the sides need to be stabilized with soil, vegetation, or some other means that will hold the edge firm and eliminate an abrupt change in elevation at the edges of the path. Whether or not federal or state funds are used to help construct the trail, construction should follow Vermont State Standards where ever possible, which include two foot gravel shoulders on either side of the path. Where this is not possible, there should be, at a minimum, a two-foot area along each side of the path cleared of trees, shrubs and other obstacles, for user safety. **Figure 2** provides a graphic representation of this recommended cross section.

The cross section should include coarse gravel/stone pockets or small drainage culverts under the path where needed to maintain water movement through wetland areas and to convey stormwater runoff from the high side of the path to the lower side. Culverts should only be used in those areas where the existing runoff is concentrated enough that the culvert will not further concentrate the flow.

If the Town opens the trail to equestrians, a slight modification to the cross section may be warranted. For example, the trail surface may be modified to be more appropriate for horses, the base course may be slighter thicker, and the clearing heights over the trail will need to be up to three feet higher. The details of the trail cross section, if used by horses, should be reviewed by local equestrians for suitability.

## II. ALIGNMENT RECOMMENDATIONS

**Figure 3** shows the preferred alignment of the CVC Trail. Going from east to west, the trail lies in the easement as it heads west from Route 7 at the proposed underpass. It remains within the easement until it turns to the northwest to cross the dam and spillway for the pond. It leaves the easement so that the trail can move gradually downhill towards the spillway. At the spillway, the trail will leave the CVC property and enter the Charlotte Berry Farm property, run on top of the dam on the existing farm road and remain on the farm road to move upward to the higher field area to the north. Once back up to level ground north of the dam, the trail turns to the west again and re-enters the CVC property. The Charlotte Berry Farm owners have indicated their willingness to grant an easement to allow the trail to cross their property in this location.

Once the trail begins to move west, it remains close to but not directly against, the edge of the woods to the south and the west. It remains in this location around the perimeter of this southern field until it reaches a small un-named stream leaving the Berry Farm and heading across the CVC property to the southwest. This portion of the trail lies outside of the easement, which runs along the northern and eastern property line in this area. Running the trail along the outer edge of the fields keeps the larger field, even though under two different ownerships, as a single unit, undivided by a trail. It also avoids a large wet meadow in the center of the field.

The trail then crosses the stream via a recommended small wooden foot bridge be installed here. North of the new footbridge, the trail cuts diagonally across the small field north of the stream. At the north end of this field, the trail follows an existing path and enters the wide tree row dividing the south fields from the large central field on the CVC property where the residences are located. The trail stays on the existing path as it moves through the tree row and enters the central fields. This small section of trail also lies outside of the existing easement.

Once in the central fields, the trail heads west again along the southern edge of the field, turning to the north at the western end of the fields. After heading north for a short distance, the trail moves to the west again, entering the woods to the west of the residential units. Prior to entering the woods, the trail lies intermittently within the easement but remains within the easement area just inside the edge of the woods as it heads north. The trail emerges from the woods close to the location where Common Way splits into the two sides of the ring road around the residences.

A cross walk at the existing stop sign at the split takes northbound bicyclists and southbound pedestrians across Common Way. From this point north and then west, the trail uses both sides of the existing pavement of Common way to get to Greenbush Road. North/west bound bicyclist and east/southbound pedestrians will use the north and east side of the road and those traveling in the opposite direction will use the other side of the road. The road will remain at its current width. The existing volume and speed of existing and expected future traffic do not call for adding any additional pavement to the roadway in order to accommodate the pedestrian and bicycle traffic. Another crosswalk on Greenbush Road will take pedestrians and bicyclists to the proper side of the road to continue their trip.

Three links are also part of the preferred alignment:

- One to join with the Little League parking lot on the adjacent property to the north, which will need to cross the Charlotte Berry Farm property,
- One to join with the Big Oak Trail easement on the adjacent property to the south to provide access to East Thompson's Point Road, and
- One to lead eventually to the adjacent property to the north of the CVC property as the trail is extended towards the Town Offices.

# III. EXISTING CONDITIONS

## A. Transportation Facilities

1. Route 7 – The eastern end of the proposed CVC Trail lies adjacent to the Route 7 right-of-way. Route 7 at this location is a two lane highway with posted speeds of 50 miles per hour. The relatively straight and uncongested condition of the road encourages automobile and truck drivers to travel faster than the posted limit. The travel lanes are approximately 12-feet wide each, with paved shoulders of 1-foot or less on either side of the travel lane. A gravel shoulder of variable width is adjacent to the pavement. **Figure 4** shows the location of Route 7. Route 7 is the primary north

south roadway on the western side of Vermont, extending the entire length of the State from Canada to Massachusetts.

The Vermont Agency of Transportation (VTrans) is currently working on plans to reconstruct this portion of Route 7. The improvement plans include an underpass to allow users of the CVC Trail to safely cross Route 7 towards the Melissa & Trevor Mack Trail. The reconstruction is expected to occur in FY12 & FY13, and will increase the lane and shoulder width as well as change some geometries of the road.

2. Melissa and Trevor Mack Trail – The Melissa and Trevor Mack Trail links Lower Old Town Trail with State Park Road. It is a gravel path approximately 10 feet wide and engineering and construction were funded by an Enhancement Grant from VTrans. It is intended to be part of a larger trail, which also includes the CVC Trail, planned to link Mt. Philo State Park with the West Charlotte Village and ultimately the Charlotte Town Beach on Lake Road. **Figure 4** shows the location of the Melissa and Trevor Mack Trail (MTMT).

3. Lower Old Town Trail – Lower Old Town Trail is a private road that extends east from Route 7 approximately across from the eastern end of the CVC Trail. It is a hard packed gravel road that is approximately 12-feet wide. In addition to providing vehicular access to several private residences, it provides non-motorized access to the Melissa and Trevor Mack Trail, which begins at the edge of Lower Old Town Trail approximately 100 feet east of the road's intersection with Route 7. **Figure 4** shows the location of Lower Old Town Trail.

4. Greenbush Road – Greenbush Road lies at the western end of the existing CVC Trail easement. It is 20-feet wide with a center stripe and no side stripes defining a shoulder area. Greenbush Road runs from the Town's southern boundary with Ferrisburgh to the northern boundary with Shelburne. The Town of Charlotte owns and maintains Greenbush Road. **Figures 1** & **4** show the location and alignment of Greenbush Road. The Town of Charlotte has designated Greenbush in the vicinity of the CVC site as a Most Scenic Road.

5. Common Way – Common Way is the internal access road for the CVC site. It is 18 feet wide and is paved as it moves east away from Greenbush Road down a steep hillside. At the bottom of the hill, Common Way levels and changes to an 18-foot wide hard packed gravel road. Further into the site, the road dips into and back out of the Thorp Brook valley and then turns south. Shortly after the turn it splits into a loop road that provides access to the residences in CVC. There are stop signs on all three approaches to the split. **Figure 4** shows the location of Common Way.

## B. Utilities

Electricity and telephone utilities serving the CVC development extend underground from Greenbush Road to the housing area of the site. The development has its own water and community septic system. The community septic system is located north of the housing area. The septic pipes linking the units to the system pass under the north side of the ring road.

The Bloomfield Farm, a community supported agricultural operation located on the CVC parcel, has its own power and water supply.

There are no overhead utility lines on the CVC property, but there are overhead power lines on the west side of Greenbush Road near the intersection with Common Way.

**Figure 4** shows the location of known utilities in the vicinity of the site.

## C. Natural Resources

1. Water Bodies – A small fire pond lies on the north side of Common Way northwest of the existing housing units. A pond has developed within the course of Thorp Brook at the north end of the culvert that carries Thorp Brook under Common Way. The CVC shares ownership of a farm pond on the eastern side of their property with the adjacent Charlotte Berry Farm and the Charlotte Little League fields. **Figure 4** shows the location of these ponds.

2. Water Courses – Thorp Brook passes north south through the western portion of the CVC property. A culvert carries the Brook under Common Way. Smaller tributaries to Thorp Brook pass through the eastern portion of the property to the south of the housing units, but they actually join with the Brook off the CVC property. **Figure 4** shows the location of Thorp Brook and the tributaries.

3. Wetlands – The CVC site contains numerous wetlands. The Federal Wetland Inventory maps (FWI) shows several of these wetlands, but the majority of the wetlands on the site do not appear on the FWI maps. The wetlands near the areas disturbed as part of the development of the CVC residences were delineated several years ago and are included on the CVC site plans. The wetlands on the southern/eastern portion of the site have not been delineated and therefore are labeled "unmapped wetlands" in the accompanying figures. **Figure 4** shows the location of the wetlands included on the FWI maps; note that these wetland limits are created from large scale aerial photos and the exact limits of the wetlands may be slightly off when applied at the more detail scale of the plans for this project. **Figure 4** also shows the approximate location of the unmapped wetlands on the site.

The majority of the wetlands on the site that are of concern to this project are wet meadows, or drainage ways leading out of the wet meadow. These wetlands provide important stormwater retention functions, as well as specialized wet meadow habitats. There are also several small forested wetlands that are relevant to this analysis.

4. Floodplains – There are no mapped floodplains on the property, although there may be unmapped floodplains associated with Thorp Brook and its tributaries.

5. Topography – After a significant drop from Greenbush Road, the CVC site is generally level. The only other significant natural changes in elevation are associated with Thorp Brook and its tributaries. As part of the development of the site, a large, long berm, approximately 25 feet high was created to the north of the north portion of the ring road from excess cut material.

6. Soils – Most of the soils on the site are rated as very limited for trail development, according to soils data from the Chittenden County Soil Survey. "Very limited," according to the Soil Survey, indicates that the soils have one or more features that are unfavorable for trail development; the limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. The soils are also rated as poorly suited for roadway construction, but have only slight potential for erosion hazards. **Appendix D** contains a copy of the full soils report.

6. Flora – Several healthy forest stands cover approximately half of the CVC site. **Figure 4** shows their locations. The western portion of the site is currently farmed with either row crops or pastures. The remaining areas of the site are either part of the developed area close to the housing units or currently supporting meadows, some of which are considered wetlands.

A double row of tall white pines, planted some time ago, separates the field east of the housing units from the adjacent Charlotte Berry Farm. An old existing tree row partially divides this field as well, and continues between the two lines of residential units.

The far eastern section of the property supports larger individual deciduous and evergreen trees in a meadow environment.

There are no known rare, threatened, or endangered species on or near the site. **Appendix B** contains a copy of correspondence from the Vermont Non-game and Natural Heritage Program.

7. Fauna – The site is likely to be occupied by wildlife species typical for Charlotte, including deer, turkey, bobcat, fox, raccoons, and skunk, based on resident observations and the types of vegetation on the site. Vermont Agency of Natural Resources (ANR) personnel saw a Northern Harrier hawk with young in the meadows on the site in 2001. There is also the potential that Indiana Bats may use the forests as nesting sites according to ANR staff.

There are no other known rare, threatened, or endangered species on the site.

## D. Cultural Resources

1. Historic – There are no visible historic resources on the site.

2. Archeological – The University of Vermont Consulting Archeological Program (CAP) identified several areas on the site that are sensitive for archeological resources. **Figure 4** highlights these areas, which are adjacent to tributaries of Thorp Brook. These areas have a high probability of containing archeological resources and should be tested further before trail development occurs. CAP indicated that these areas should be examined in more detail, even if the trails are developed without disturbing the underlying soils. **Appendix C** contains a copy of the complete CAP archeological Resource Assessment report.

## E. Local Plans

1. Charlotte Town Plan – The Town Plan indicates that the Town supports the creation of trails for recreational purposes and for non-automotive transportation and that the Town encourages the expansion of the trail network by obtaining easements over private property both during and outside of the development review process.

The Plan calls for trails to be designed and managed to be low-impact and to avoid undue negative environmental impacts. It goes on to indicate that the network of trails and public by-ways should follow and/or incorporate the natural features of the landscape in their design. (Section 5.8.7 Culture and Recreation Policies and Strategies)

The Charlotte Trails Vision Map from 1998 shows a general link between Mount Philo State Park and the West Charlotte Village. The large arrow linking these destinations passes partially over the CVC site. This map was to show the overall destinations that the Town planned to link with trails, without specifying a specific route. The CVC Trail is a partial implementation of this link in the overall trails vision.

2. Charlotte Trails Vision Plan (2008) – The CVC Trail is included in the updated Town of Charlotte Trails Vision Plan. This plan is a working document developed in 2008 by the Charlotte Trails Committee after a series of public discussions about what an updated vision plan should include. The updated Trails Vision Plan has not yet been incorporated into the Charlotte Town Plan. This plan shows the existing trail easement on the CVC property. It also includes an arrow, partially lying over the CVC property, showing the goal of providing a trail running south from the West Charlotte Village linking with a trail heading west from Mount Philo State Park and another trail goal heading northeast from Williams Woods further south on Greenbush Road.

## F. Regional Plans

Chittenden County Regional Bicycle Pedestrian Plan Update (2008) – The regional plan shows Route 7 in Charlotte as part of the on-road regional bicycle system. It also shows it as part of an on-road link between the Melissa and Trevor Mack Trail that heads towards Mt Philo State Park and the proposed regional shared use path along the railroad right of way west of Route 7 that extends from Charlotte to Burlington. The Co-Housing trail would provide an alternate linkage between these two trails, eliminating the need for bicyclist or pedestrian to use Route 7.

# IV. POTENTIAL ALIGNMENTS

As part of the process of defining a preferred alignment, BRPD examined several different options, including:

- Two alternate alignments for Section 2, the portion of the property from just to the southeast of the dam to just south of the meadow containing the housing units:
- Four alternate alignments for Section 3, the area around the residential units;

- Three alternate alignments for Section 4, the portion of the trail between the split for the ring road and Greenbush Road;
- Five links, small sections of trails that could be used to link different portions of the alternate alignments or as spurs from the main alignment to provide connections to different trails or destinations; and
- An additional linkage to the Little League parking lot located on adjacent property to the north.

There were no alternatives to using the existing easement examined for Segment 1, the portion of the trail running from just southeast of the dam to Route 7.

**Figure 5** shows the location of the different alternate alignments and links.

**Appendix E** provides descriptions of each alternate alignment and link.

## V. FACTORS INFLUENCING THE SELECTION OF THE PREFERRED ALIGNMENT

### A. Overview

As part of the analysis of alternative, the Town, the CVC residents, and BRPD examined numerous different factors, including the privacy of CVC residents, the suitability for the intended users, potential positive and negative impacts, and required permits. **Table 1** summarizes the results of the analysis.

Based on a review of the alternatives analysis and the ways in which the various alternatives addressed the concerns of the CVC residents, BRPD generated the recommended alignment for the trail, and flagged in the field the portion that went through the Thorp Brook forest area.

### B. Trail Section 1

There were really no options for the layout of the trail in the very eastern most section. The trail follows the easement in this location.

### C. Trail Section 2

The existing easement makes a 90 degree turn as it nears the dam from the south side. Following this alignment would take the trail up and then down a small rise and then down into the spillway for the dam, which it would cross at an angle. The existing trail easement then proceeds partially up the dam, back down into the stream channel at the base of the dam, finally heading back up a steep forested slope to reach the larger southern field of the CVC property. A more appropriate alignment of the trail follows the existing farm road, which moves downgrade gradually to the dam spillway and then up onto the dam itself, across the dam and into the southern field. Portions of this alignment lie on the Charlotte Berry Farm, but the steep slopes, wetlands crossing and the

presence of an existing trail led to the recommendation to move the trail off the CVC property and onto the Berry Farm property. Additionally, it would most likely not be possible to obtain either a State or federal wetland permit to route the trail on the existing easement given the presence of the existing farm road on top of the dam.

The east-west running end of the easement may still be used to provide a link to an existing trail easement on the property to the south. Efforts are under way to possibly shift the alignment of that trail easement so that it can link with the CVC trail about 100 feet further to the east, close to the area where it begins to head downhill and out of the easement.

Once in the southern fields, the trail hugs the edge of the woods in order to keep the field undivided and available for future agricultural use. The presence of the wet meadow in the middle of the field, straddling the north south property line between the Berry Farm and CVC reinforces the decision to move the trail out of the easement and to the edge of the field.

At the north end of the southern field, the path crosses the small stream within the easement. This particular location has historically been used as an agricultural crossing point for the steam and is the most appropriate location on the CVC property to have the trail cross the stream with small wooden foot bridge. Using this location eliminates the need to cut trees or shrubs to establish the more permanent trail crossing elsewhere.

The wide tree row dividing the southern fields from the central fields is primarily a forested wetland area. Using an existing path through this tree row eliminates the need to remove additional trees or disturb new soil areas. There is no way to link the southern and central fields without crossing this wetland area. The trail could potentially be outside of the 50 foot wide easement at this point, which can be determined when the actually alignment is surveyed and compared to the existing easement.

## D. Trail Section 3

The greatest number of trail alignment options existed in the central fields around the existing residences. The extensive wetland areas along the eastern edge of the CVC property eliminated Alternative B3 in this location. Both the State Wetland Division and the Army Corps of Engineer representatives indicated that this alternative would not be able to get a wetland permit since other viable options existed that would not impact wetlands as extensively as this alignment would.

Using either side of the ring road for the trail alignment, Alternatives B1 and B2, would provide an acceptable alignment but would route the trail close to one or the other row of residences lining these roads. The CVC residents decided that they did not want to have the potentially steady stream of trail users passing their homes.

The alignment within the existing easement alignment just inside the edge of the forest west of the west side ring road eliminated the presence of trail users close to the residences while minimizing the impacts on the forest itself. There was some concern from ANR staff that there could be impacts to potential Indiana Bat habitat, but the ANR staff person in charge of the Indiana Bat work said the trail would not be a problem, as long as it stayed near the edge and didn't take down mature trees,

especially shag bark hickories. The trail alignment flagged through the forest does not follow a straight line, but meanders just a bit to take advantage of natural openings between trees and to avoid removing trees as much as possible. As such, it may shift outside of the 50-foot wide easement, which would need to be verified as the alignment is surveyed. At its south end, the trail enters the forest to the south of the southernmost individual lot. At its northern end, the trail enters the forest on a gradual slope down from the intersection, cutting across the grade to minimize the slope of the trail.

If the Town opens the trail to equestrians, they may be able to separately use alternative B3 with no improvements, to keep horse as far from the residences as possible, as the wish of the residents themselves.

## E. Trail Section 4

Because Common Way already exists and provides an acceptable link between the northern end of the central fields and Greenbush Road, the additional disturbance and construction, along with a new crossing of Thorp Brook associated with a new off-road trail did not make sense. The speed and traffic on Common Way, both now and projected into the future, make the use of the roadway acceptable for all levels of walking and bicycling experience. Additionally, the Charlotte Trails Vision Map envisions an off-road trail continuing north on the CVC property to the adjacent property as part of the completed larger trail. When this larger trail is in place, the portion of the trail that uses Common Way will cease to be the primary route and will become a side spur linking the central larger trail to Greenbush Road. **Figure 5** shows the location of the future trail to the north.

## F. Linkages

1. Little League Parking Lot – The link with the Little League parking lot would provide access to a convenient parking area with direct access to Route 7 close to the area where the trail may cross the road via a small underpass. The parking could be used by those coming from a distance that wish to access Mt Philo State Park or eventually the Town Beach via bicycle or on foot or those from distant locations in the Town that want to use the path.

A parking easement would be needed from the Little League property owners before the parking area could be an official parking area, but the Town assists with the maintenance of the fields, so obtaining an easement may be possible. A trail to reach the parking area would be approximately 275 feet long. It would come off the CVC trail at the point where the trail left the Charlotte Berry Farm road across the irrigation pond dam and turned to the west to re-enter the CVC property. The trail would need to follow the Charlotte Berry Farm road further to the north before bending to the northeast to descend a small rise and cross into the Little League property. From there it would connect to the southern end of the parking lot. Trail easements would be needed from the Charlotte Berry Farm and the Little League.

2. Big Oak Trail – The Town holds a trail easement on the adjacent property to the south of the CVC property which links the CVC property to Thompson's Point Road. The easement's location

has been set and, except for minor rerouting at the northern end, its location is appropriate and can be implemented now. The rerouting at the north end is to provide a direct link to the CVC trail, which will most likely be moved from its current easement location in the area where the Big Oak Trail is meant to join.

The link would provide a means to access Thompson's Point Road and points west without the need to use Route 7. Additionally, the Big Oak subdivision currently has one house constructed on the new lots created during the subdivision process. It may be wise to have the trail in place and usable prior to additional houses being developed in the subdivision.

3. Future Northern Link – The overall trails plan for the Town shows that the trail on the CVC property would ideally continue north towards the Town Offices. When completed, this trail would allow non-motorized traffic to travel off road for almost the entire way between Mt. Philo State Park and the Town Offices. The on-road connection on Common Way would still be used to provide a link to Greenbush Road if and when the trail to the north is completed.

## VI. POTENTIAL IMPACTS OF THE PREFERRED ALTERNATIVE

### A. Transportation Facilities

1. Route 7 – The CVC trail should have no impact on Route 7, other than to reinforce the need to keep the proposed underpass that will link the CVC trail with the MTMT in the plans for upgrading Route 7.

2. Melissa and Trevor Mack Trail – The CVC trail could potentially increase the use of the Melissa and Trevor Mack Trail. This is considered to be a positive, rather than a negative impact on the trail.

3. Lower Old Town Trail – The addition of the CVC trail could increase the presence of bicyclists and pedestrian on the western portions of Lower Old Town Trail. Due to the low volume and speed of the traffic on Lower Old Town Trail, this is not considered to be a significant impact.

4. Greenbush Road – The addition of the CVC trail could increase the presence of bicyclists and pedestrian on Greenbush Road. Due to the current width, pavement condition and alignment of Greenbush Road, combined with the relatively low volume, this is not considered to be a significant impact.

### B. Utilities

Due to the limited excavation necessary to construct even the more substantial crushed gravel surface of the trail and the known location of the utilities, no impacts are anticipated.

### C. Natural Resources

1. Water Bodies – No impacts to water bodes is anticipated as part of this project.

2. Water Courses – No impacts are anticipated to either Thorp Brook or the tributaries draining into it. The CVC trail will use the existing Common Way culvert on Thorp Brook; no new construction crossings of Thorp Brook are planned. The smaller wooden bridge over the unnamed stream will be long enough to keep the ends out of the range of higher spring flows. The access points will be far enough from the edges of the stream that there should be no impact either during or after construction.

3. Wetlands – The proposed alignment crosses over ten small wetland drainage ways exiting the large wet meadow in the middle of the southern field. These wetland corridors will remain unchanged as long as the trail continues to be a mowed grass surface. When the trail is developed further to have a crushed gravel surface, minimal impacts to the wetlands are anticipated. The trail will use culvert, or porous fill to allow ground and intermittent surface water to continue to flow downhill through the drainage ways. Sheet flow will be re-established on the downslope side of the trail if needed to reinstate such flow if it exists on the uphill side of the trail.

The trail falls within the setback area of linear wetlands along the edge of the unnamed stream. This impact is also anticipated to be minimal because of the continuation of existing flow patterns.

The increase in runoff due to the crushed stone surface is also expected to be minimal. The path will be constructed so as to not collect runoff into concentrated flows. The path itself will be either slightly crowned or pitched to drain towards the down slope side. Frequent small undulations will eliminate long runs in one direction that can serve to increase stormwater concentrations and erosion rills on the crushed gravel surface. The existing meadow between the trail and the forest, as well as the existing vegetation in the forest will serve as a filter for the sheet flow runoff coming from the trail.

If there are certain sections of the trail where it is not possible to keep stormwater dispersed, it will be treated in grassed swales and/or level spreaders before being allowed to return to sheet flow.

The majority of the wetlands on the site that are of concern to this project are wet meadows, with a small portion of forested wetlands is also relevant to this analysis. These wetlands provide important stormwater retention functions, as well as specialized wet meadow habitats.

Overall, wetland impacts are anticipated to involve no more than 3,000 square feet (SF) of wetlands, or approximately 0.07 acres.

4. Floodplains – No construction in a mapped or unmapped floodplain is planned to be part of this project. No significant increases in the amount of stormwater runoff are anticipated. The construction and development of the crushed gravel trail will disturb approximately 66,300 SF of the site and create approximately 44,000 SF of new impervious surface (gravel is considered impervious). This is based on an estimated new trail distance of 5,525 feet with a trail width of eight feet and a total disturbance width of 12 feet. This amount of disturbance requires a general construction general permit; the amount of impervious surface would also require a state stormwater discharge permit.

5. Topography – The trail will be able to meet ADA standards over its entire length. **Appendix F** provides more information on ADA standards. Although the slope on Common Way close to Greenbush Road exceeds the regular sidewalk standards, it will be acceptable because it is an existing facility that will be used and there are no readily available alternatives. Depending on the final length of the sloping areas for the trail as it descends the hills associated with the existing dam and spillway, it may be necessary to provide intermittent landings on the trail to meet ADA standards.

6. Soils – No significant erosion impacts are anticipated, based on existing soil characteristics. The existing soils could necessitate the use of thicker subbase courses under the trail. Much of the trail lies on Vergennes Clay, which is rated as severally limited for trail construction because it is considered to be too clayey. While this may in general be a limitation to trail development, it is a more common situation in the Champlain Valley and is not considered to be a serious limiting factor, but the trail construction process will need to take this condition into account, for example, by providing an adequate base course and including provisions to drain stormwater off the trail.

7. Flora – No impacts to existing flora are anticipated, other than the removal of several common species and the cutting of several smaller declining elms trees or young ash trees in the Thorp Brook Forest. The construction of the trail will also result in the removal of some invasive woody species that lie in the proposed alignment.

8. Fauna –Vermont Agency of Natural Resources personnel do not anticipate that the addition of the CVC trail to the meadows on the CVC property will impact Northern Harrier Hawk habitat. **Appendix B** contains a copy of their review letter. No impacts to potential Indiana Bat habitat are anticipated as well, as explained by the ANR director of the Indiana Bat Program. **Appendix B** also includes a copy of his letter.

No significant impacts to wildlife are anticipated as a result of this trail.

## D. Cultural Resources

1. Historic – There are no visible historic resources on the site.

2. Archeological – The construction of the trail could potentially impacts archeological resources. In order to determine more specifically the presence of archeological resources in the trail alignment, the CAP recommends conducting a Phase 1 study of just those areas identified as having a high probability of containing archeological resources. If the resources are found, the trail will need to be be constructed so as to not disturb them by placing filter fabric on the soil surface and placing the necessary base and topping material on it. This type of construction will require special provisions for drainage, most likely requiring additional culverts, and swales to return the stormwater to sheet flow on the downhill side of the trail. **Appendix C** contains a copy of the complete CAP archeological Resource Assessment report which includes recommendations for the next steps.

## E. Local Plans

1. Charlotte Town Plan – The Town Plan indicates that the Town supports the creation of trails for recreational purposes and for non-automotive transportation and that the Town encourages the expansion of the trail network by obtaining easements over private property both during and outside of the development review process.

The Plan calls for trails to be designed and managed to be low-impact and to avoid undue negative environmental impacts. It goes on to indicate that the network of trails and public by-ways should follow and/or incorporate the natural features of the landscape in their design. (Section 5.8.7 Culture and Recreation Policies and Strategies)

The Charlotte Trails Vision Map from 1998 shows a general link between Mount Philo State Park and the West Charlotte Village. The large arrow linking these destinations passes partially over the CVC site. This map shows the overall destinations that the Town planned to link with trails, without specifying a specific route. The CVC Trail is a partial implementation of this link in the overall trails vision.

2. Charlotte Trails Vision Plan (2008) – The Champlain Co-housing Trail is included in the updated Town of Charlotte Trails Vision Plan. This plan is a working document developed in 2008 by the Charlotte Trails Committee after a series of public discussions about what an updated vision plan should include. The updated Trails Vision Plan has not yet been incorporated into the Charlotte Town Plan. This plan shows the existing trail easement on the Champlain Valley Co-housing property to be added to the overall trail system. It also includes an arrow showing the goal of providing a trail running south from the West Charlotte Village linking with a trail heading west from Mount Philo State Park.

## F. Regional Plans

Chittenden County Regional Bicycle Pedestrian Plan Update (2008) – The regional plan shows Route 7 in Charlotte as part of the on-road regional bicycle system. It also shows it as part of an on-road link between the Melissa and Trevor Mack Trail that heads towards Mt Philo State Park and the proposed regional shared use path along the railroad right of way west of Route 7 that extends from Charlotte to Burlington. The Co-Housing trail could provide an alternate linkage between these two trails, eliminating the need for bicyclist or pedestrian to use Route 7.

# VII. INITIAL ESTIMATES OF PROBABLE CONSTRUCTION COSTS

The State's most recent cost data is from 2006. In order to generate a reasonable estimate of probable construction cost for the Town, BRPD discussed the construction needs and process with the Town Road Commissioner. **Table 2** provides details of the estimate generated with his information. This estimate is based on the assumptions that the Road Commissioner and his company will do the work directly for the Town under its existing arrangement. Project management will be relative minor in this situation. Additionally, the Road Commissioner will not

require a complete set of engineering plans to undertake the work. Lastly, because he is already regularly working in the Town, there would be minimal additional set up or start up costs associated with the project.

**Table 2**
**Preliminary Estimate of Probable Construction Costs for the Champlain Valley Co-housing Trail Using Local Unit Costs**

| Item | Amount | Unit Cost | Cost |
|---|---|---|---|
| Shared Use Path | 5,525 LF | $30/ft | $165,750 |
| Foot Bridge | 1 | Lump Sum | $2,000 |
| Signs, Planting, Crosswalk, and Other Additional Features | 1 | Lump Sum | $10,000 |
| **Sub Total** | | | **$177,750** |
| Contingency | | 15%± | $26,665 |
| Engineering & Permits | | Lump Sum | $24,000 |
| **Total (in 2009 Dollars)** | | | **$228,415** |

The unit costs provided by the Road Commissioner are significantly less than those currently provided by VTrans. The VTrans unit costs are based on actual construction experience around the State, but the most recent data is for 2006. Since that time, construction costs rose even higher than 2006 levels, but since 2008 have begun to decrease. In order to provide a second viewpoint on what potential construction costs may be, BRPD has prepared an initial estimate of probably construction costs using VTrans data. This estimate also assumes that the Town Road Commissioner will not be doing the work, which will result in higher management costs for the construction process. This estimate also assumes that a full set of engineering drawings will be needed so that the project can be put out to bid. **Table 3** provides a cost estimate for the potential construction of the path following this option.

**Table 3**

**Preliminary Estimate of Probable Construction Costs for the Champlain Valley Co-housing Trail Using the VTrans Unit Costs and Assumptions**

| Item | Amount | Unit Cost | Cost |
|---|---|---|---|
| Shared Use Path | 5,525 LF | $100/ft | $552,500 |
| Foot Bridge | 1 | Lump Sum | $2,000 |
| Signs, Planting, Crosswalk, and Other Additional Features | 1 | Lump Sum | $10,000 |
| **Sub Total** | | | **$564,500** |
| Contingency | | 15%± | $84,675 |
| Engineering & Permits | | 10% | $56,450 |
| Municipal Manager | | 5% | $28,225 |
| Construction Services | | 5% | $28,225 |
| **Total (in 2009 Dollars)** | | | **$762,075** |

Typically, when applying for federal funds, the municipality needs to provide a 20 Percent match either in money or in-kind service. For this project, the Towns matching grant requirements would be approximately $152,500, assuming that the rest of the funding would come from other sources.

An alternate possible implementation scenario is that the Trail Section 1 and a portion of Trail Section 2 be constructed initially as the 8 foot gravel path along with the linkage to the Little League parking lot while the rest of Trail Section 2 and Trail Sections 3 and 4 be initially implemented as grass-surface trails. Table 4 includes BRPD's estimate for this scenario.

**Table 4**
**Preliminary Estimate of Probable Construction Costs for the First Portion of the Champlain Valley Co-housing Trail Linking to the Little League Parking Lot Using Local Unit Costs**

| Item | Amount | Unit Cost | Cost |
|---|---|---|---|
| Shared Use Path (8 ft gravel) | 1,425 LF | $30/ft | $42,750 |
| Grass Path | 4,575 LF | $2/ft | $9,150 |
| Foot Bridge | 1 | Lump Sum | $2,000 |
| Signs, Planting, Crosswalk, and Other Additional Features | 1 | Lump Sum | $10,000 |
| **Sub Total** | | | **$63,900** |
| Contingency | | 15%± | $9,585 |
| Engineering & Permits | | Lump Sum | $8,000 |
| **Total (in 2009 Dollars)** | | | **$81,485** |

**Table 5** shows the initial estimate of probable construction costs for the construction of only the link to the Little League parking lot, assuming the work is completed by the Town Highway Superintendent.

**Table 5**
**Preliminary Estimate of Probable Construction Costs for the Champlain Valley Co-housing Trail Link to the Little League Parking Lot Using Local Unit Costs**

| Item | Amount | Unit Cost | Cost |
|---|---|---|---|
| Shared Use Path | 475 LF | $30/ft | $14,250 |
| Signs, Planting, and Other Additional Items | 1 | Lump Sum | $1,000 |
| **Sub Total** | | | **$15,250** |
| Contingency | | 15%± | $2,290 |
| Engineering & Permits | | Lump Sum | $2,000 |
| **Total (in 2009 Dollars)** | | | **$19,540** |

# VII. IMPLEMENTATION

## A. Phasing

The CVC trail logically divides itself into three sections:

- The southern/eastern portion,
- The central portion through Thorp Brook woods, and
- The northern/western portion that uses Common Way.

Because the southern/eastern portion of the trail is already mowed, and the northern/western portion uses the existing road, the first phase of the implementation should be the establishment of the trail through the Thorp Brook woods that will link the two. This will create a complete path between Route 7 and Greenbush Road that does not need to use the CVC Ring Road.

Manual minor, upgrades by hand to the existing mowed path in the southern/eastern portion can follow.

The overall upgrading of the trail to a crushed gravel surface and be done using the same sections, with the phasing between the southern/eastern and Thorp Brook woods Portion made at the time based on the trail conditions and the volume of traffic on the two sections.

## B. Permitting

To implement the stone dust surface for the trail, it appears that the Town of Charlotte will need to obtain:

- A Condition Use Determination from the Agency of Natural Resources;
- Written Authorization from the Army Corp of Engineers for a Category 2 Activity under the Department of the Army State of Vermont General Permit;
- 401 Water Quality Certification from the Agency of Natural Resources;
- A Section 106(f) approval from the Agency of Transportation;
- A Construction General Permit and a State Stormwater Discharge Permit from the Agency of Natural Resources;
- Written acceptance of the easement change by the Vermont Land Trust, which is party to the open space agreement on the site;
- Categorical Exclusion approval from Federal Highway Administration; and
- A Subdivision Amendment from the Town of Charlotte Planning Commission, also for the easement relocation.

As part of obtaining these permits, it will be necessary to undertake the following additional planning or design process:

- The completion of additional archeological analysis, with completion of at least a Phase 1 study;
- The surveying of the centerline of the new alignment so that the new location of the easement can be added to the CVC plat;
- The delineation and surveying of the limits of the wetlands that will be affected by construction of the trail;
- The development of an erosion control plan for the trail; and
- The development of a stormwater management plan.

## C. Funding

There are various funding sources that could be used to help with the implementation of the plan, including:

- The federal Transportation Enhancement Grant Program administered by VTrans;
- The federal Land & Water Conservation Fund administered by the Vermont Department of Forests, Parks, and Recreation;
- The federal Recreational Trails Program, administered by the Vermont Department of Forests, Parks, and Recreation;
- Bikes Belong Grants;
- The national Scenic Byways Program grants;
- Potential health grants promoting healthy living;
- The Robert Wood Johnson Foundation;
- MCI/Worldcom Royalty Donation Program (For this and several subsequent ideas, see http://www.americantrails.org/resources/funding/TipsFund.html );
- Clif Bar Sponsorship;
- Trail sponsorships (and Naming Rights!); and
- RockShox's Grants.

Other potential sources exist. Some additional resources that may provide insight into additional funds include:

- http://www.americantrails.org/resources/funding/Funding.html,
- http://rlch.org/, and
- http://atfiles.org/files/pdf/bicentennialsourcebook.pdf.

## D. Construction

The construction process for this path will need to be carefully constructed so as to minimize construction disturbances beyond the width of the path or its adjacent clear zone. Most likely, the path itself will serve as the access to un-constructed segments. Erosion control will be necessary for those portions of the path that cross or are adjacent to wetlands or in other areas where there is the potential that erosion from the construction site could harm downstream environments.

If construction vehicles will need to cross the small stream, it may be necessary to install a temporary culvert that is removed when the vehicles are done moving through the area.

As the project moves forward, more detailed plans for the construction process will need to be developed.

## E. Maintenance

The level and type of trail maintenance depends on the trail surface and the number of users. The grass trail will require monthly mowing on a seasonal basis. The trail should be leveled and holes or bare earth patches repaired and seeded in the spring and fall and periodically throughout the summer if needed. The gravel trail will require occasional re-gravelling and grading.

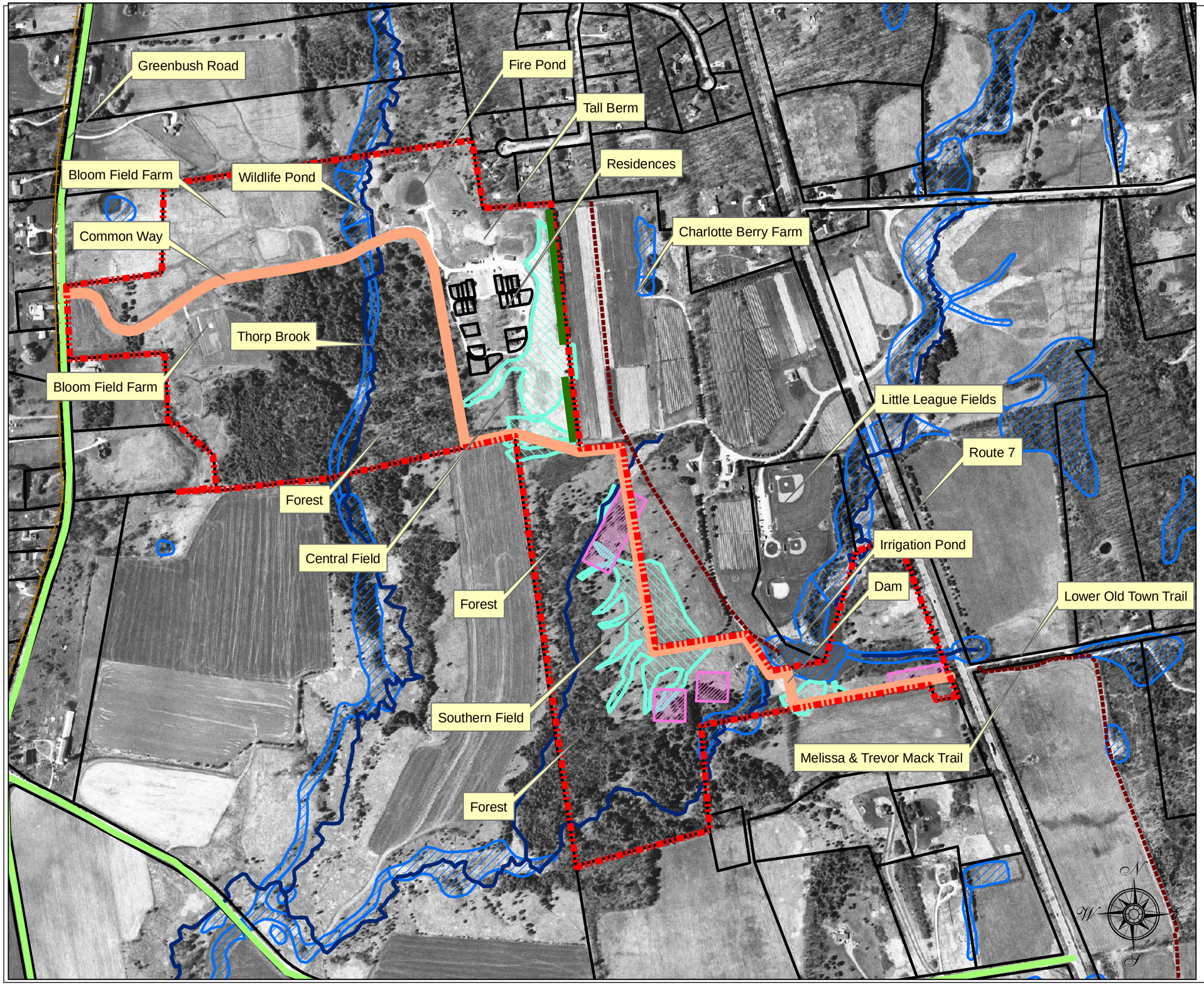
# TABLE 1
## Champlain Valley Co-housing Trail
## Central Section Alignment Analysis
### Oct-09

| | Beige | Green | Salmon Pink | Light Ornage |
|---|---|---|---|---|
| | Existing Easement | Alternative A1 | Alternative B1 | Alternative B2 |
| **Environmental/Cultural Constraints** | | | | |
| Forest Impact | Small Impact | No impact | No impact | No impact |
| Rare, threatened or endangered species | No impact | No impact | No impact | No impact |
| Approximate wetland disturbance | Minimal | Substantial | Minimal | Minimal |
| Archaelogical Resources | No impact | No impact | No impact | No impact |
| Historic Resources | No impact | No Impacts | no impact | no impact |
| **Project Attributes** | | | | |
| Meets Purpose and Need Statement | Yes | Yes | Yes | Yes |
| Provides direct links with future paths/sidewalks | Yes | Yes | Yes | Yes |
| Year Round Use | Yes | Yes | Yes | Yes |
| Topographic Changes in Path Steepness | Moderate | Moderate | None | None |
| Integrates with Regional Bike/Ped plan | Yes | Yes | Yes | Yes |
| Utilities | No interaction | No interaction | No interaction | No interaction |
| **Permits** | | | | |
| Water Quality Certification | Yes | Yes | Yes | Yes |
| Conditional Use Permit | Yes | Yes | Yes | Yes |
| Storm Water Runoff Permit | Yes | Yes | Yes | Yes |
| Act 250 Permit Updates | No | Yes | Yes | Yes |
| Qualifies for Categorical exclusion | Yes | Yes | Yes | Yes |
| ADA Compliance | Yes | Yes | Yes | Yes |
| Town Subdivision Modification | No | Yes | Yes | Yes |
| **Construction** | | | | |
| Ease of Implementation | Moderate - Construction Through Forest | Moderate - Construction Through Wetlands | Moderate - Construction Through Wetlands | Moderate - Construction Through Wetlands |
| Other Issues | **Preferred by Residence** | **Wetland Disturbance likely to not be permitted by ACOE** | **Brings Path Users Close to Residences** | **Brings Path Users Close to Residences** |

Positive Considerations
Negative Considerations

# Town of Charlotte Co-Housing Trail

# Existing Conditions




## Legend

- Overhead Utility Lines
- Pine Tree Row
- CVC Boundary
- Existing Trail Easement
- Most Scenic Roads
- Archeologically Sensitive
- CharlotteTrails Easements
- Property Lines
- Water Courses
- Other Wetlands (Approx.)
- Charlotte Wetland

0 50 100 200 300 400 Feet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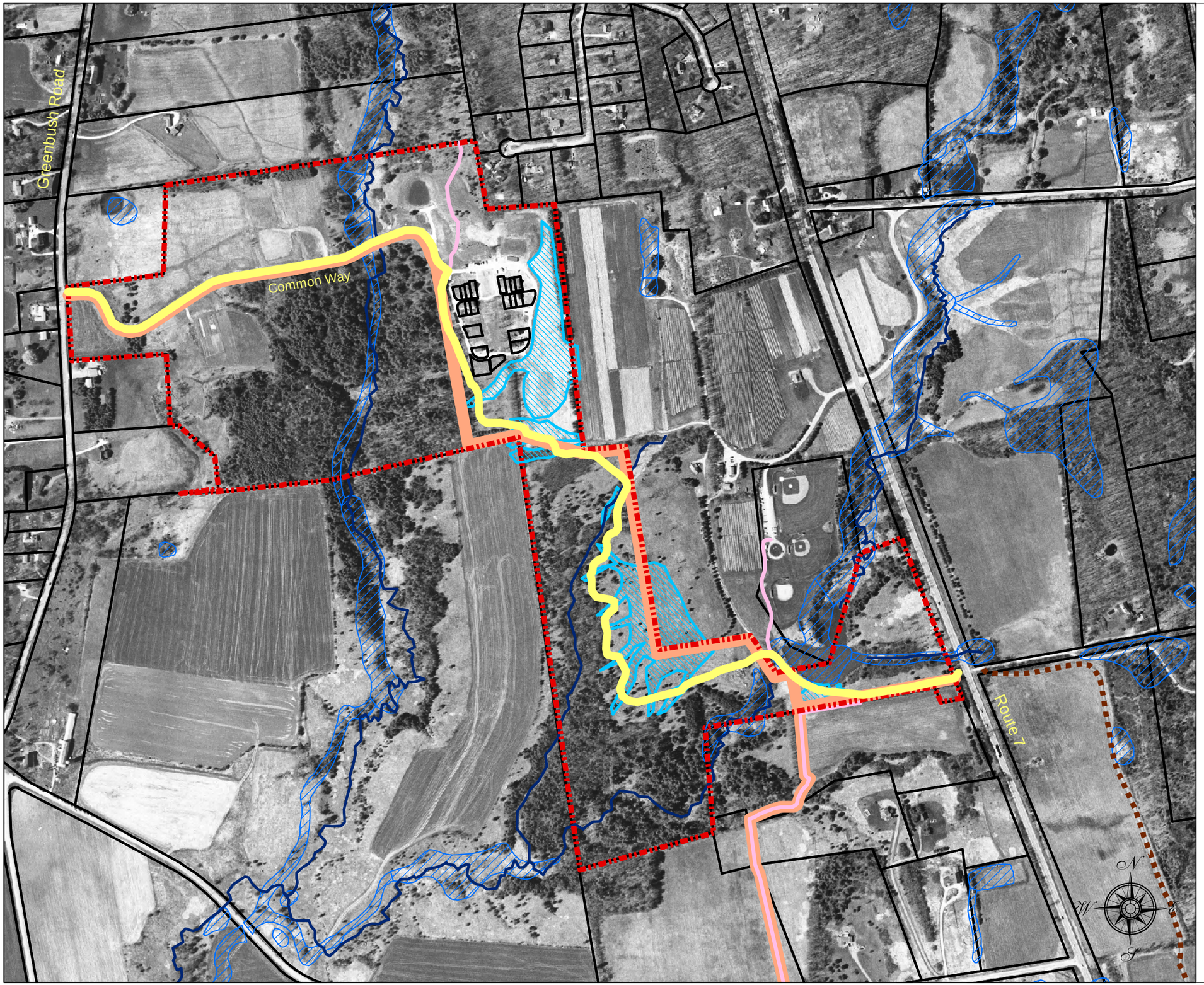
Charlotte, Vermont 05445
802-425-5061


**Figure 4**

# Town of Charlotte Co-Housing Trail **Preferred Alignment**




## Legend

- Preferred Alignment
- CVC Boundary
- Future Connection
- Existing Trail Easements
- Melissa & Trevor Mack Trail
- Water Courses
- Unmapped Wetlands
- Charlotte Wetland
- Property Lines

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Figure 3

# Town of Charlotte Co-Housing Trail

# Alternatives

## Legend

- Link A
- Link B
- Alternate A1
- Alternate B1
- Alternate B2
- Alternative B3
- Alternative C1
- Alternative C2
- Future Connection
- Existing Trail Easement
- Adjacent Prop'ty Easement
- Melissa & Trevor Mack Trail
- Water Courses
- Unmapped Wetlands
- CharlotteWetland
- CVC Boundary


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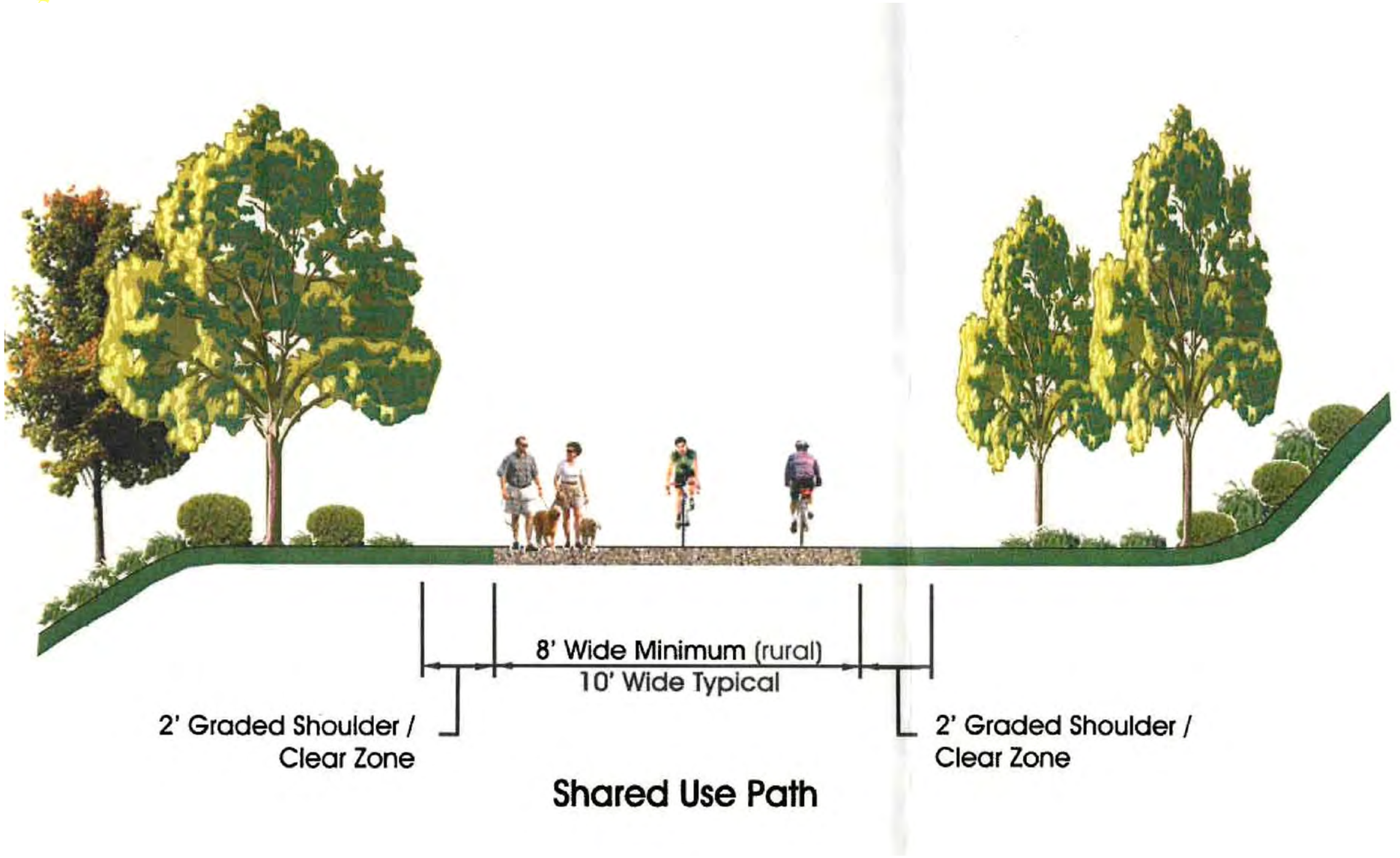
**Figure 5**

# Town of Charlotte Co-Housing Trail **Preferred Cross Section**

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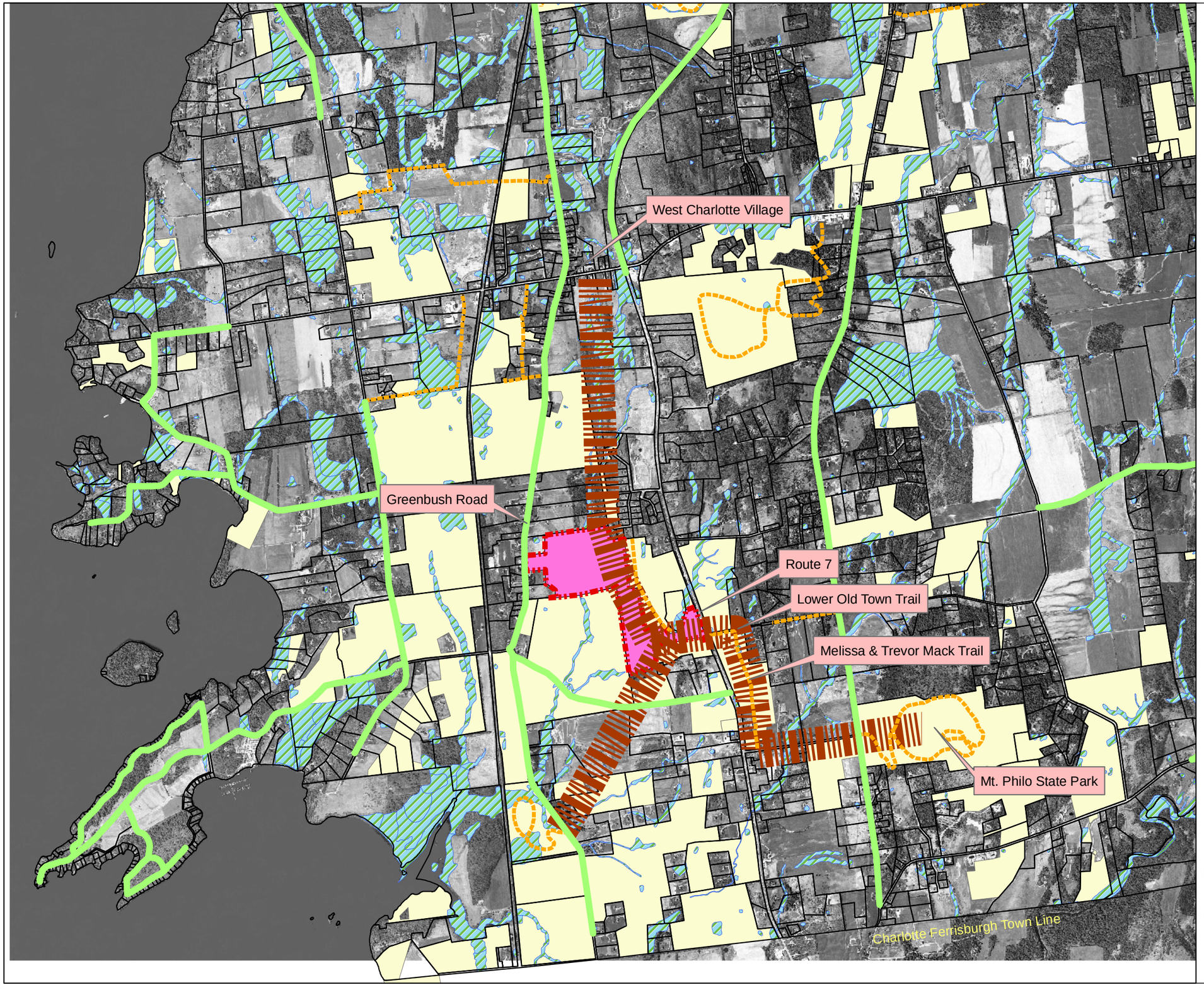
Drawing Courtesy of Wilbur Smith Associates

**Figure 2**

# Town of Charlotte Co-Housing Trail

## Site Location




**Legend**

- Most Scenic Roads
- Charlotte Trails Easements
- Envisioned Trail
- CV Co-Housing Property
- Property Lines
- Charlotte Wetland
- Conserved Open Space

N W E S

0 250 500 1,000 1,500 2,000 Feet

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Figure 1

# APPENDIX A

## Study Process

## STUDY PROCESS

To begin work on the Champlain Valley Co-housing Trail, the Chittenden County Regional Planning Commission contracted with Broadreach Planning & Design to assist in the work, after a solicitation from qualified consultants for a series of on-call projects. Broadreach Planning & Design (BRPD) began the study by reviewing information associated with the creation of the original easement, as well as undertaking an assessment of the existing conditions now on the site. . They also consulted with the Town of Charlotte Trail Committee and representatives of the Champlain Valley Co-housing (CVC) development to understand in more detail their concerns, questions and suggestions on where the trail could go.

After this initial work, BRPD developed a set of alternatives for different sections of the trail. He reviewed the potential for gaining necessary permits for the various alternatives with the Army Corps of Engineers, the State of Vermont Wetland Office and the other sections of the Vermont Agency of Natural Resources. After reviewing the alternatives with the CVC representatives, BRPD refined the alternatives and discussed them with the Charlotte Trails Committee and a larger meeting of the CVC residents, with the goal of selecting a preferred alternative.

After the CVC residents has selected a preferred alternative, BRPD completed work on a draft report describing the existing conditions, the alternatives, and the preferred alignment of the trail. He presented this work to the Town of Charlotte at a public work session to receive comments from the Selectboard and the public. After the meeting, BRPD refined the report and submitted a draft to the Town for final review and acceptance.

# APPENDIX B

# Correspondence

## Jim Donovan

**From:** Burke, Kevin [Kevin.Burke@state.vt.us]
**Sent:** Monday, April 27, 2009 1:19 PM
**To:** jdonovan@gmavt.net
**Cc:** Burke, Kevin
**Subject:** Charlotte Co-Housing Trail

Hi Jim,

Impervious surfaces are the jurisdictional trigger for a state stormwater discharge permit, generally 1 acre, unless the project is an expansion of an existing impervious surface, gravel, or paved. The other threshold is 1 acre of earth disturbance, which triggers the need for a construction general permit. Without knowing exact figures for impervious or disturbance, it is difficult to know whether permits will be required.

In your letter you mentioned that the surface of the trail is still not determined. If the trail is proposed to be a gravel surface, you should be aware that the surface would be considered impervious, so knowing the extent of proposed trail surface would be helpful in knowing whether a stormwater discharge permit would be required.

In terms of alignment, we can not offer recommendations or guidance on where the trail should or should not go. It's generally not the role of our program. However, maintaining water resource buffers and minimizing impervious surfaces would be preferable. Depending on the alignment, state wetland permits or Army Corps permits may be required. Any stream crossings should also consult with the Rivers Management Program to ensure no stream alteration permit is required. If you require contact information for any of these programs, let me know or try our website.

If I can be of further assistance, please let me know.

Thanks,

Kevin

---

Kevin Burke, CPESC, CPSWQ
Environmental Analyst
VT DEC - Stormwater Program
Chittenden County District Analyst
103 South Main Street - Building 10 North
Waterbury, VT 05671-0408
802.241.1418
www.vtwaterquality.org

VERMONT

Fish & Wildlife Department
Nongame & Natural Heritage Program
Waterbury, VT 05671-0501
www.VtFishandWildlife.com

[phone] 802-241-3700
[fax] 802-241-3295
[tdd] 802-828-3345

*Agency of Natural Resources*

28 April 2009

Jim Donovan
Broadreach Planning & Design
PO Box 321
Charlotte, VT 05445

Re: Charlotte Co-housing Trail

Dear Mr. Donovan:

I am responding to your request for our review of the above-referenced project. A search of our database reveals no known occurrences of significant natural communities or rare, threatened, or endangered animals or plants at this site. I would comment, however, that the alignment should be at least 50 feet, and preferably at least 100 feet, from wetlands and streams and should minimize stream crossings to the greatest extent possible.

For your information, our program has not conducted a field inventory of the site in response to your request. Everett Marshall and I did see a Northern Harrier with young at the site during a 2001 field visit. This rare grassland-nesting hawk has been identified as a High Priority Species of Greatest Conservation Need in Vermont's Wildlife Action Plan. I would not anticipate substantial permanent impacts to this species' habitat or breeding at the site from these minor changes to the path alignment, though they could be using the fields for nesting and there is some potential for disturbance. Timing path construction outside of the nesting season (late April-late July) would eliminate any potential direct mortality and disturbance associated with construction. Feel free to call me, or Everett Marshall (241-3715), if you have any questions.

Thank you for consulting with the Nongame and Natural Heritage Program.

Sincerely,

Jodi Shippee
Database Assistant
Tel: 802-241-4230
Email: Jodi.Shippee@state.vt.us

cc: Everett Marshall, Biologist/Data Manager

State of Vermont

AGENCY OF NATURAL RESOURCES

VERMONT

Vermont Department of Fish and Wildlife
111 West Street
Essex, Vermont 05452
TEL: (802) 878-1564
FAX: (802) 879-3871

April 29, 2009

Jim Donovan
Broadreach Planning and Design
PO Box 321
Charlotte, VT 05445

RE: Charlotte Co-Housing Trail

Dear Mr. Donovan:

This letter is in response to your request for review of the referenced project and its potential impacts on wildlife. Based on the information in a letter dated April 16, 2009 and site plans dated April 2009, it appears that the proposed re-routing of the trail easement is along the eastern boundary of the parcel as opposed to cutting through and along the edge of the wooded area. Due to the presence of the endangered Indiana Bat in Charlotte, the alternate alignment is preferred as this appears to minimize tree removal. However, department biologist Scott Darling may have other concerns related to Indiana Bat habitat. Please contact him at (802) 786-3862. Aside from Indiana Bat, there are no other known impacts to wildlife that could occur as a result of this project.

However, there may also be issues associated with impacts to the depicted wetland and its buffer. To address these concerns, please contact Julie Foley at (802) 879-5650 or Alan Quackenbush at (802) 241-3761. In addition, any stream crossings will need to be reviewed by fisheries biologist Bernie Pientka. He can be reached at (802) 879-5698.

Your effort to address issues related to wildlife for this project is appreciated. If you have any questions, please contact Amy Alfieri at (802) 479-4439.

Sincerely,

John Gobeille
Wildlife Biologist

Cc: Julie Foley-wetlands ecologist; Alan Quackenbush-wetlands coordinator; Bernie Pientka-fisheries biologist; Scott Darling-wildlife biologist

**BROADREACH**
Planning & Design

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802-425-5061

# MEMORANDUM

**Jim Donovan, FASLA, AICP**
Landscape Architect
jdonovan@gmavt.net
www.broadreachpd.com

Date: June 30, 2009

Subject: Army Corps of Engineer & State of Vermont Wetland Section Field Walk – June 19, 2009

Attendees: Martha Abair, United State Army Corps of Engineers
Alan Quackenbush, Vermont Wetland Section
Jim Donovan, Broadreach Plannin & Design

Jim outlined the various alternate path alignments that were currently under consideration:

- The eastern alignment adjacent to the pines to access the southern fields and alignment following the mowed path (Alignment 1), or
- The use of one of the two ring roads to link to a trail on the east side of the tree row dividing the residential area to access the southern fields (Alignment 2 East and 2 West).

He also briefed Marty and Alan on the the current easement, the Co-Housing owner concerns, and comments from other State agencies about the alignments. They then walked the alignments. Mary and Alan were in agreement about the following.

- The trail is feasible as long as it reduces wetland impacts to the maximum extent possible.
- Alignment 1 would most likely not get a permit; there are other viable alignment options that have fewer wetland impacts.
- Alignment 1 could serve as an equestrian trail as long it was only a mowed path with no other improvements.
- The alignment closer to the middle tree row south of the ring road would be preferrable to the western alignment that goes through the forest to miss the two southern most lots.

- The access to the trail along the middle tree row south of the rign road should be across the planned crossing/bridge into the active pasture from the ring road.
- The path from the active pasture to the southern fields appeasr to be best kept on its current alignment through the small woods, because alternate alignments appear to have the same amount of wetland impact; no new wetland impacts would be involved.
- The crossing of the small stream should be improved with a small bridge, even if the rest of the trail remains a mowed path.
- The alignment along the existing mowed path is preferreable to the current easement alignment along the eastern property line through the wet meadow that extends onto the Charlotte Berry Farm property.
- The numerous small wetland crossings in the far southern fields will need to be carefully planned and constructed as the trail is improved so that the wetlands on either side of the crossing are not impacted.
- Before the path can be improved, the wetlands, at least in the area of the crossings will need to be delineated and the wetland impacts calculated and State and federal permits will need to be obtained.

Based on the amount of cummulative impacts to wetlands of the improved trail, it may be possible to qualify for a general permit at the federal level.

## Jim Donovan

**From:** Abair, Martha A NAE [Martha.A.Abair@usace.army.mil]
**Sent:** Wednesday, July 01, 2009 10:01 AM
**To:** Jim Donovan; Quackenbush, Alan
**Subject:** RE: Charlotte Co-Housing Trail

Sounds OK to me Jim.

-----Original Message-----
From: Jim Donovan [mailto:jdonovan@gmavt.net]
Sent: Wednesday, July 01, 2009 9:39 AM
To: 'Quackenbush, Alan'; Abair, Martha A NAE
Cc: 'Jim Donovan'; 'Dean Bloch'
Subject: Charlotte Co-Housing Trail

Marty and Alan:

Sorry this memo took a bit longer than I anticipated to get out. Please let me know if you have any edits, disagreements or addition that you think should be made to the summary of the field visit to the Co-Housing site on Friday morning, June 19, 2009, so that the memo is as accurate as possible.

Thanks for your assistance.

Jim Donovan, FASLA
Broadreach Planning & Design
PO Box 321
Charlotte, Vermont 05445
802-425-5061

www.broadreachpd.com

## Jim Donovan

**From:** Quackenbush, Alan [Alan.Quackenbush@state.vt.us]
**Sent:** Monday, July 06, 2009 4:21 PM
**To:** 'Jim Donovan'
**Cc:** Abair, Martha A NAE
**Subject:** RE: Charlotte Co-Housing Trail

Jim,

Thanks. The memo is fine; no comments or corrections (except for one instance of "Mary" instead of "Marty") Picky picky. - AQ

Alan Quackenbush
State Wetlands Coordinator
Section Chief
Wetlands Management Section
Water Quality Division, DEC, ANR
802-241-3761

-----Original Message-----
From: Jim Donovan [mailto:jdonovan@gmavt.net]
Sent: Wednesday, July 01, 2009 9:39 AM
To: Quackenbush, Alan; 'Abair, Martha A NAE'
Cc: 'Jim Donovan'; 'Dean Bloch'
Subject: Charlotte Co-Housing Trail

Marty and Alan:

Sorry this memo took a bit longer than I anticipated to get out. Please let me know if you have any edits, disagreements or addition that you think should be made to the summary of the field visit to the Co-Housing site on Friday morning, June 19, 2009, so that the memo is as accurate as possible.

Thanks for your assistance.

Jim Donovan, FASLA
Broadreach Planning & Design
PO Box 321
Charlotte, Vermont 05445
802-425-5061

www.broadreachpd.com

State of Vermont

AGENCY OF NATURAL RESOURCES

Department of Fish and Wildlife
Department of Forest, Parks and Recreation
Department of Environmental Conservation
State Geologist
Natural Resources Conservation Council

Vermont Department of Fish and Wildlife
271 North Main St, Suite 215
Rutland, VT 05701-2423
Tel: (802) 786 - 3862
FAX: (802) 786 - 3870

September 8, 2009

Jim Donovan
Broadreach Planning and Design
PO Box 321
Charlotte, VT 05445

Subject: Co-Housing Trails and Indiana bats

Dear Mr. Donovan:

I am writing to acknowledge that I have reviewed the proposed pedestrian path associated with the Co-Housing trails in Charlotte. The walking path will be located and maintained in such a manner as to minimize impacts to state and federally endangered Indiana bats. It is recommended that the removal of any dead or dying trees that may serve as potential roosting habitat be avoided or, if necessary, felled during the period November 1 through April 1 to prevent the possibility that bats will be harmed.

Thank you for your patience in awaiting my review.

Sincerely,

Scott R. Darling
Wildlife Biologist

## Jim Donovan

**From:** Burke, Kevin [Kevin.Burke@state.vt.us]
**Sent:** Friday, October 09, 2009 8:45 AM
**To:** Jim Donovan
**Subject:** RE: Charlotte Co-Housing Trail

Hi Jim,

When looking at jurisdictional thresholds for a project, you need to look at the entire project. Because the project proposed will result in 1 acre or more of impervious surface, a state stormwater discharge permit would be required for prior to the construction of impervious surfaces. It would likely make the most sense to permit the entire trail at once, to avoid having to amend the permit each time a new segment is proposed, but that would be up to the town. The state stormwater discharge permit is something that is renewed for the life of the permit. The initial authorization will be valid for 10 years before having to be renewed.

Construction stormwater discharge permit coverage would also be required, however this could likely be permitted in segments for what construction is proposed. It would likely qualify as a "low risk" project under the Construction General Permit 3-9020 risk evaluation. A "low risk" authorization is only valid for 2 years, so there would be no point permitting more construction that is anticipated in that time period. Construction stormwater discharge permits are essentially temporary, and if construction is complete and the site is stabilized they are either terminated or simply left to expire.

Hope this helps some, if you have more questions let me know.

Kevin

---

Kevin Burke, CPESC, CPSWQ
Environmental Analyst
VT DEC - Stormwater Program
Chittenden County District Analyst
103 South Main Street - Building 10 North
Waterbury, VT 05671-0408
802.241.1418
www.vtwaterquality.org

---

**From:** Jim Donovan [mailto:jdonovan@gmavt.net]
**Sent:** Thursday, October 08, 2009 12:25 PM
**To:** Burke, Kevin
**Subject:** RE: Charlotte Co-Housing Trail

Kevin:

Thanks for your response to my initial inquiries last spring concerning the Charlotte Co-Housing Trail. I've finally worked through the analysis of a preferred alignment for the Trail with the Town and the neighbors and it looks like there will be about 1.5 acres of total disturbance to construct the trial and it will result in about 1 acre of new impervious surface. The Town will most likely construct the trail in segments. Even though the entire trail will trigger the need for general construction and discharge permit, none of the segments themselves will be long enough to trigger the need for permits by themselves. Would the Town need to get the permits for the entire trail before it starts construction, or should it go for them as it develops each phase? It may be several years between work on the various phases. Would a permit for the entire project have a deadline? If so, would it be relatively simple to extend the permits?

# APPENDIX C

## Archeological Resource Assessment

# Archaeological Resources Assessment for the Proposed Champlain Housing Path Project, Charlotte, Chittenden County, Vermont

**Submitted to:**
**Jim Donovan, FASLA**
**Broadreach Planning & Design**
**PO Box 321**
**Charlotte, Vermont 05445**

**Submitted by:**
**Consulting Archaeology Program**
**University of Vermont**
**111 Delehanty Hall**
**180 Colchester Avenue**
**Burlington, Vermont**
**05405**

**Report # 555**

**August 2009**

**Archaeological Resources Assessment for the Proposed Champlain Housing Path Project, Charlotte, Chittenden County, Vermont**

The Town of Charlotte proposes a pedestrian footpath that will ultimately be part of the Lake Champlain Byway. They will work with the landscape architectural firm of Broadreach Planning & Design to complete this project. The proposed path construction project will enhance an existing pedestrian path between VT Rte 7 and Greenbush Road in Charlotte, Vermont (see Figure 1). The path connects to segments of two future recreational paths to the east and west. The western portion of the path bisects the Champlain Co-housing subdivision, and runs parallel to the access drive to this residential community.

The University of Vermont Consulting Archaeology Program (UVM CAP) conducted an ARA of the proposed project as part of the Section 106 permitting process and identified four linear areas as sensitive for precontact Native American archaeological sites. Several documentary sources were used in compiling this report including historic maps, aerial photographs, and published town histories. Additionally, a search of the Vermont Archaeological Inventory (VAI), which is maintained by the Vermont Division of Historical Preservation, was conducted to locate previously identified precontact Native American and historic Euro-American sites within the general vicinity of the project area.

## Existing Conditions / Natural Setting

The general project area is situated on level to undulating or gently sloping ground ranging from about 49 to 61 m (160 to 200 ft) above sea level. As a point of comparison, the average level of Lake Champlain is 29.1 m (95.5 ft) above sea level. The proposed path will cross two un-named drainages associated with Thorp Brook (as represented on modern USGS maps), which drains to the southwest into Lake Champlain. The soils within the project are derived principally from lake bottom sediments and may include sediments that accumulated in Lake Vermont during the retreat of the last glacier, which began about 16,000 years ago, and marine sediments left by the Champlain Sea in the Champlain Lowland between 12,500 and 10,200 years ago. The Natural Resources Conservation Service indicates that Vergennes clay and Covington silty clay are most likely to be found within the current project area. These soils tend to be deep, clayey throughout, and range from moderately to poorly drained. They are relatively fertile soils and are particularly good for pasture and grass.

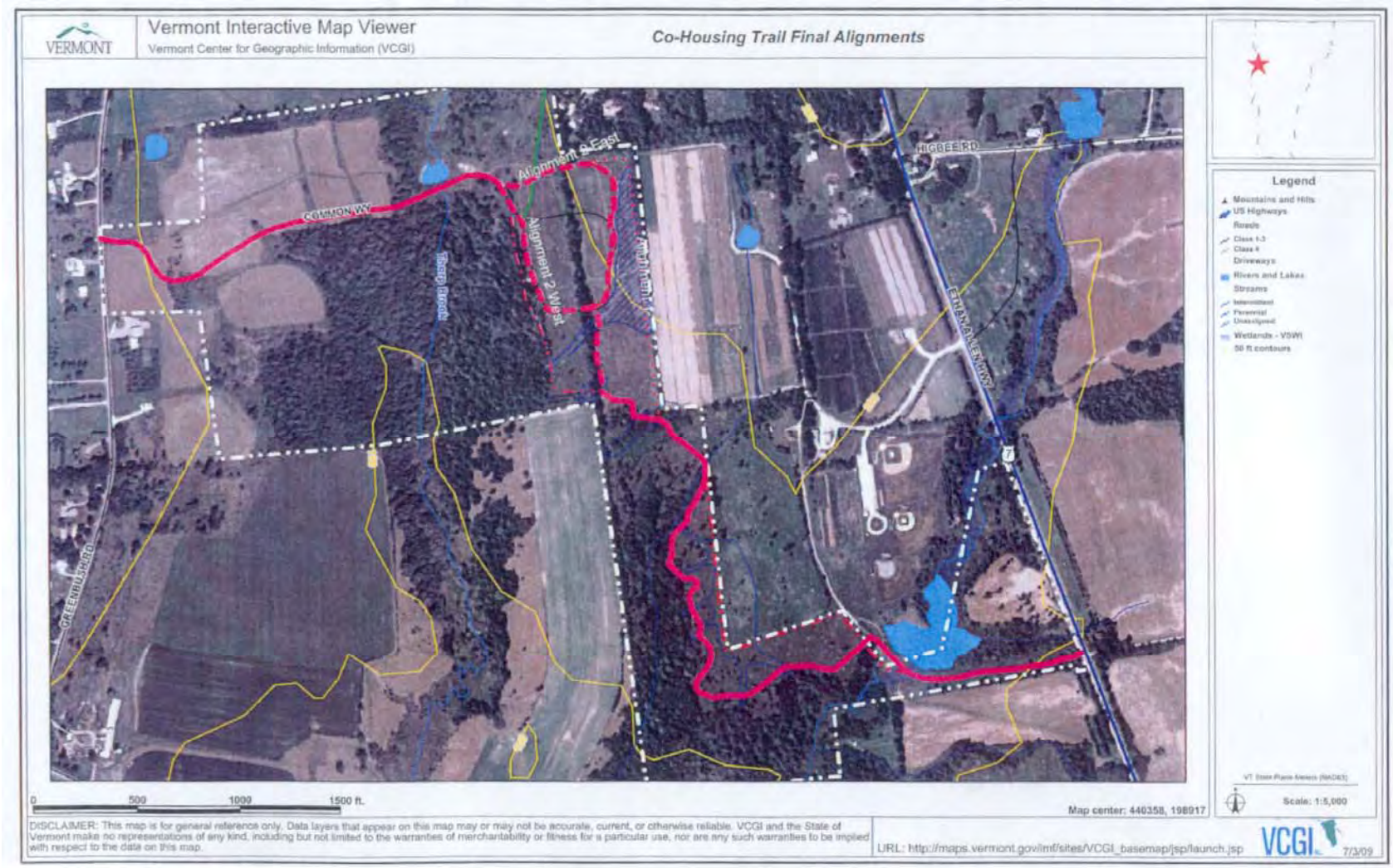


Figure 1. Map showing the location of the proposed Champlain Housing Path, Charlotte, Chittenden County, Vermont.

## Precontact Native American

Based on information from known archaeological sites in the region, prehistoric people likely inhabited the general area as early as 6,000 years ago. The archaeological sites they left behind tend to be focused along major and minor streams, brooks, and small tributaries and vary in size, artifact content, density, and function.

According to the state archaeological site inventory at least 19 precontact Native American sites have been identified within approximately 5 km (3 mi) of the general project area, including sites along Kimball Brook, Thorp Brook and smaller watersheds, as well as along Town Farm Bay and Thompson's Point. Most of these sites consist of small scatters of lithic debris identified on the surface plowed fields and cannot be assigned to any specific time period. Within the Kimball Brook drainage, three sites occupy elevated terraces above the brook. VT-CH-53, located on the south side of the brook 0.4 km (0.25 mi) west of U.S. Route 7, is dateable to the Late Archaic period on the basis of broad blade projectile points recovered by a private collector. Other artifact types from this site include knives, bifaces and chert and quartzite flakes. VT-CH-538, ca. 304 m (1,000 ft) west and downstream of VT-CH-53 on the north side of Kimball Brook, is also dateable to the Late Archaic period. An Otter Creek projectile point and lithic debitage constituted the artifact assemblage. Close by, VT-CH-625, a site of unknown age containing quartzite bifaces, a scraper, and 202 quartzite flakes, were collected in a plowed field. Three sites of unknown age are reported on Thorp Brook near its mouth with Lake Champlain. Additionally Thompson's Point, a local source of lithic raw material, contains numerous sites, most of which are poorly documented or consist of small concentrations of lithic flakes.

The closest known precontact Native American site to the current project area, is located immediately south of the Greenbush Road and Common Way intersection. This site (VT-CH-906) was identified during archaeological testing undertaken prior to the construction of the Charlotte Co-Housing community and it consisted of a scatter of quartzite flakes (byproducts of stone tool manufacture) from an undetermined time period. Another site, VT-CH-311, which also consisted of a scatter of lithic material, is close to and may be associated with VT-CH-906. Both of these sites were located on higher ground at moderate distances from surface water. Also, it is noted that one quartzite flake was recovered from the Langworthy-Pease historic site (VT-CH-846), which is located on the west side of U.S. Route 7 north of the Old Town Trail intersection and a short distance north of an un-named drainage associated with Thorp Brook (see Figure 2). Furthermore, one chert flake was recovered at VT-CH-849, the Nathaniel Martin site, which is located on the west side of U.S. Route 7 just south of the Charlotte Berry Farm driveway.

There are undoubtedly more precontact Native American sites scattered across this general landscape. William Wallace Higbee, who lived on his family farm located not far from the current project area on U.S Route 7 wrote in the late 19th century:

> "there is no doubt the fine fishing along the lake and good trapping grounds in the cove and along the brooks and Lewis Creek made this a favorite camping ground for Indian tribes in an early day. There are several acres of

meadowland along the brook on the writer's farm, where it is no unusual thing to plow up flint arrowheads, and it has been said the Indians had a clearing and a cornfield at this point" (Higbee 1991:59)

Furthermore, a digital Geographic Information System (GIS) application of the Vermont Division of Historic Preservation's (VDHP) Environmental Predictive Model for Locating Precontact Archaeological Sites indicated that up to six key sensitivity factors may be found within the project area, including drainage proximity, water body proximity, wetlands, stream-water body confluence, head-of-draw, stream-stream confluence, and level terrain (Figure 2).

## Historic Background

The town of Charlotte, located in the southwest corner of Chittenden County on the eastern shore of Lake Champlain, was chartered by the governor of New Hampshire in 1762 to proprietors primarily from Connecticut and New York (Child 1883:167). The land included in the grant was level to gently rolling except for the three low hills (Mutton Hill, Pease Mountain, and Mt. Philo) running north-south through the center of the town. The two primary streams were and remain the LaPlatte in the northeastern corner and Lewis Creek in the southeastern corner. These streams, along with numerous other small watercourses (i.e. Bears Brook, Mud Hollow, Pringle Brook, Thorp Brook, Holmes Creek), drain the land but due to the relatively flat topography, they offered few mill sites (Child 1883:163).

The first attempt to settle Charlotte was made by a native of Germany, Derrick Webb, ca. 1776-1777. He was driven away by the events surrounding the Revolutionary War. In 1784, he returned to make the first permanent settlement. He was soon joined by Elijah Woolcut, James Hill, Dr. James Towner, John Hill, Solomon Squire, Moses Fall, Daniel Hosford and others (Rann 1886:536-537). Settlement progressed very quickly as more families from western Massachusetts and Connecticut arrived, enticed some of the best farmland in western Vermont and the excellent forests of hardwoods especially valuable oak, in the western part of town and the pine and hemlock stands in the eastern part of town (Thompson 1842:51). The town was organized in 1787 and by 1791, it had a population of 635. At the time, it was the most populous town in the north half of the State (Rann 1886:545). Over the next ten years, the population nearly doubled to 1,231 (Arnold 1980:18).

According to state grand lists, Charlotte quickly became and remained the most prosperous town in the county from the early 1800s into the mid-1820s (Hemenway 1868:735). A significant factor in Charlotte's early growth and prosperity, aside from its rich farmland, was its location midway between Vergennes and Burlington along one of the most important north-south transportation routes in western Vermont. The road, now mostly followed by the U.S. Route 7 corridor, was designated as a stage or post road in 1797 by the State Legislature (Higbee 1991:141). Travelers on this road could journey north to Burlington and then continue north towards Montreal or east to Montpelier and the interior of the state. They could also head south to Vergennes and then continue on to

Rutland or head west to Troy and Albany. They could also use the Charlotte ferry operated by the McNeil family to cross the lake to New York.

However, Charlotte was always primarily an agricultural town and therefore saw only limited village development. The population of Charlotte remained on farms and stayed very steady throughout the nineteenth and twentieth century. Charlotte averaged a population between 1200 and 1550 from 1800 through 1980, when suburban development led to an increase in population (Arnold 1980:18).

Early on families such as Root (ca. 1777), Thorp (ca. 1795), Barton (1796), Martin (ca. 1806), Pease (ca. 1809), and Higbee (or Higby ca. 1819) established prosperous farms and/or businesses (such as tanneries, blacksmith shops, and taverns) within this general district Charlotte along either Greenbush Road or U.S. Route 7 (Child 1883:175-177). However, there are no references within the published sources to indicate any residential settlement within the area lying between U.S. Route 7 and Greenbush Road. No structures are indicated as being within the proposed project area on either the Walling or Beers maps from the mid-19$^{th}$ century (Figures 3 and 4). Furthermore, no structures were indicated within the proposed project area on any of the available USGS maps (USGS 1895, 1906, 1941, 1948, and 1956). Therefore, the land within the current project APE was likely utilized as pasture, field, and/or woodlot throughout the historic period.

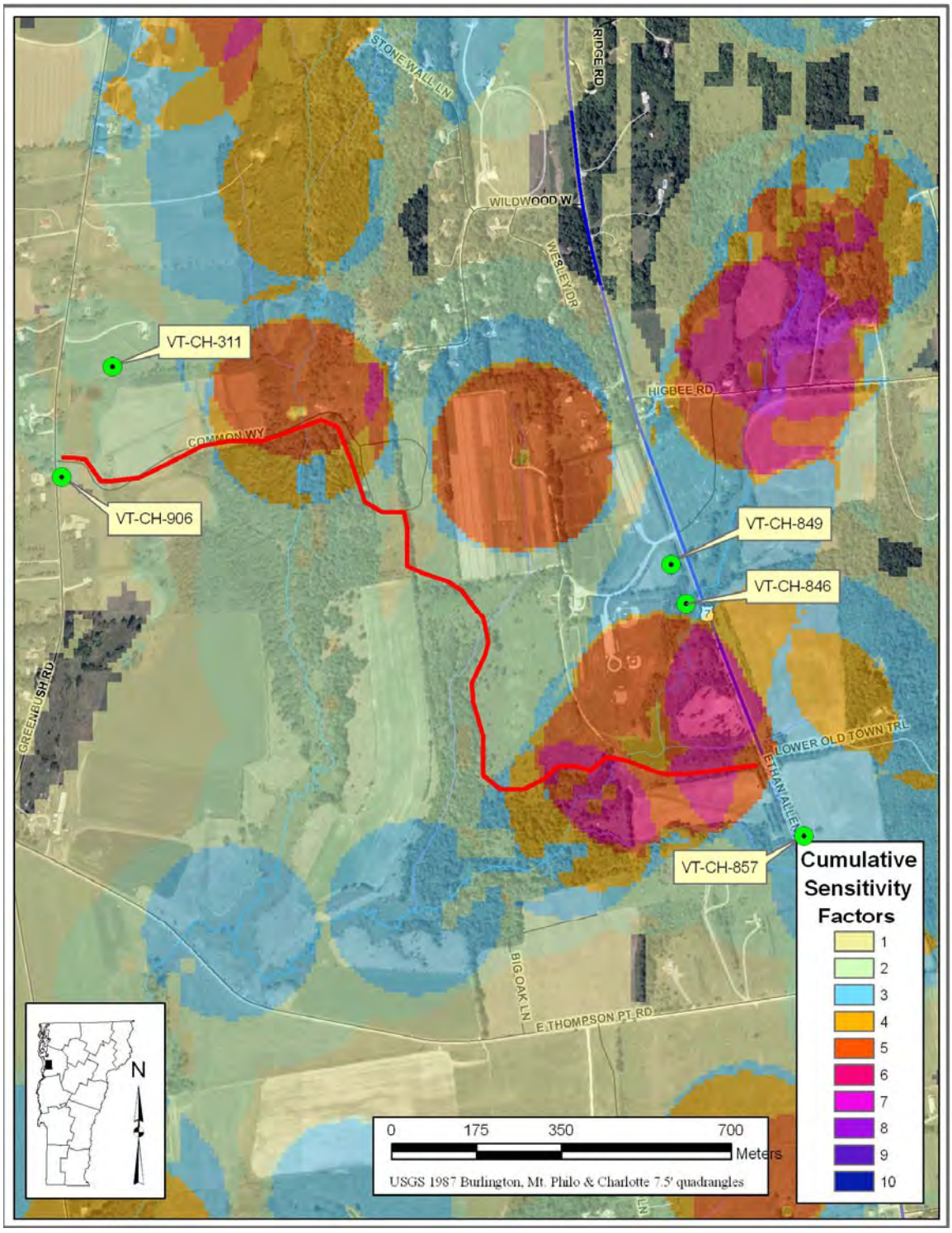


Figure 2. Map showing a possible alignment of the proposed Champlain Housing Path in relation to archaeological sensitivity factors, Charlotte, Chittenden County, Vermont.

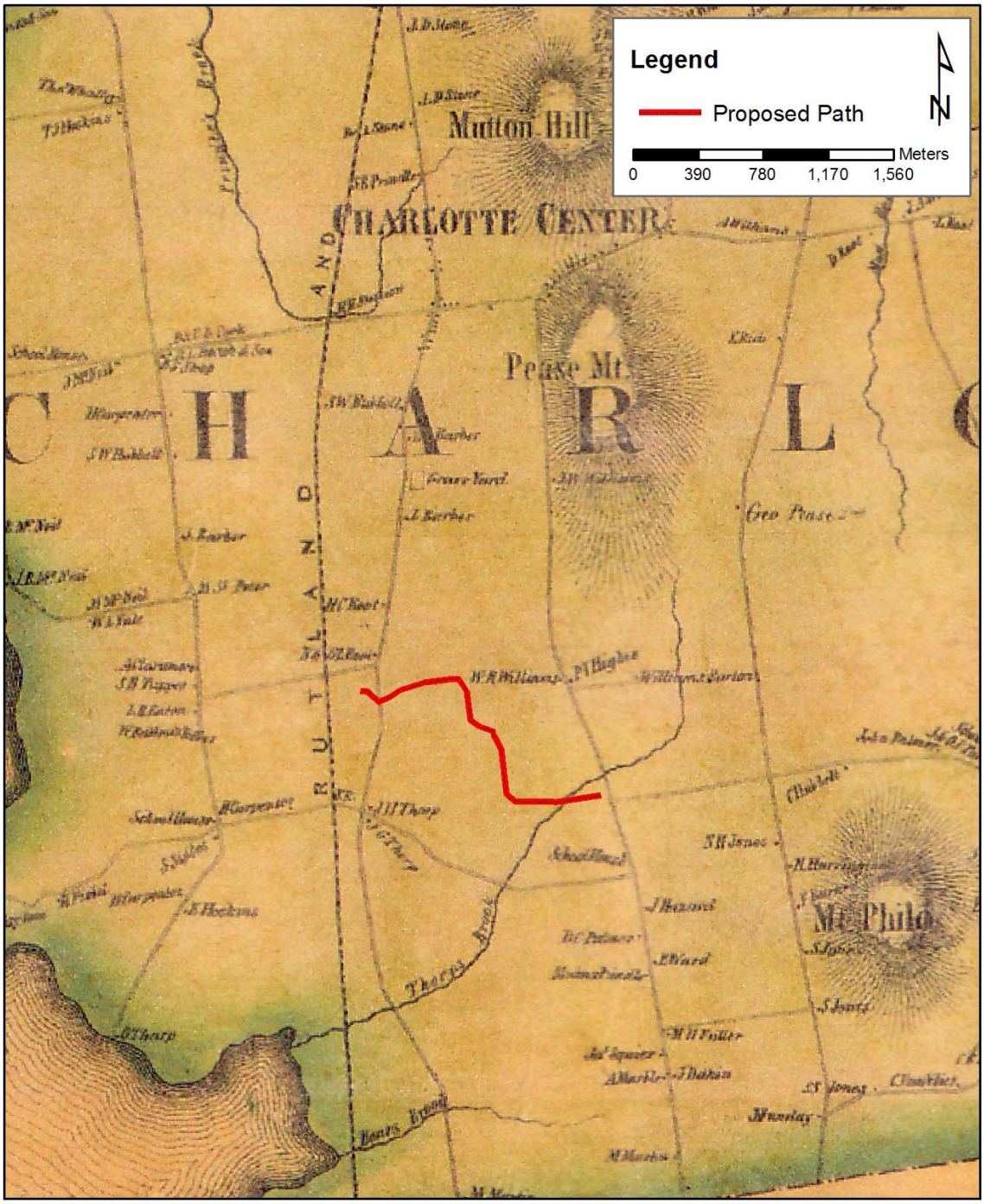


Figure 3. Detail of H.F. Walling's *Map of Chittenden County, Vermont* (1857) with the general project area projected on to it. U.S. Route 7 was opened in prior to 1797 and Greenbush Road was opened in 1802 (Higbee 1991:141).

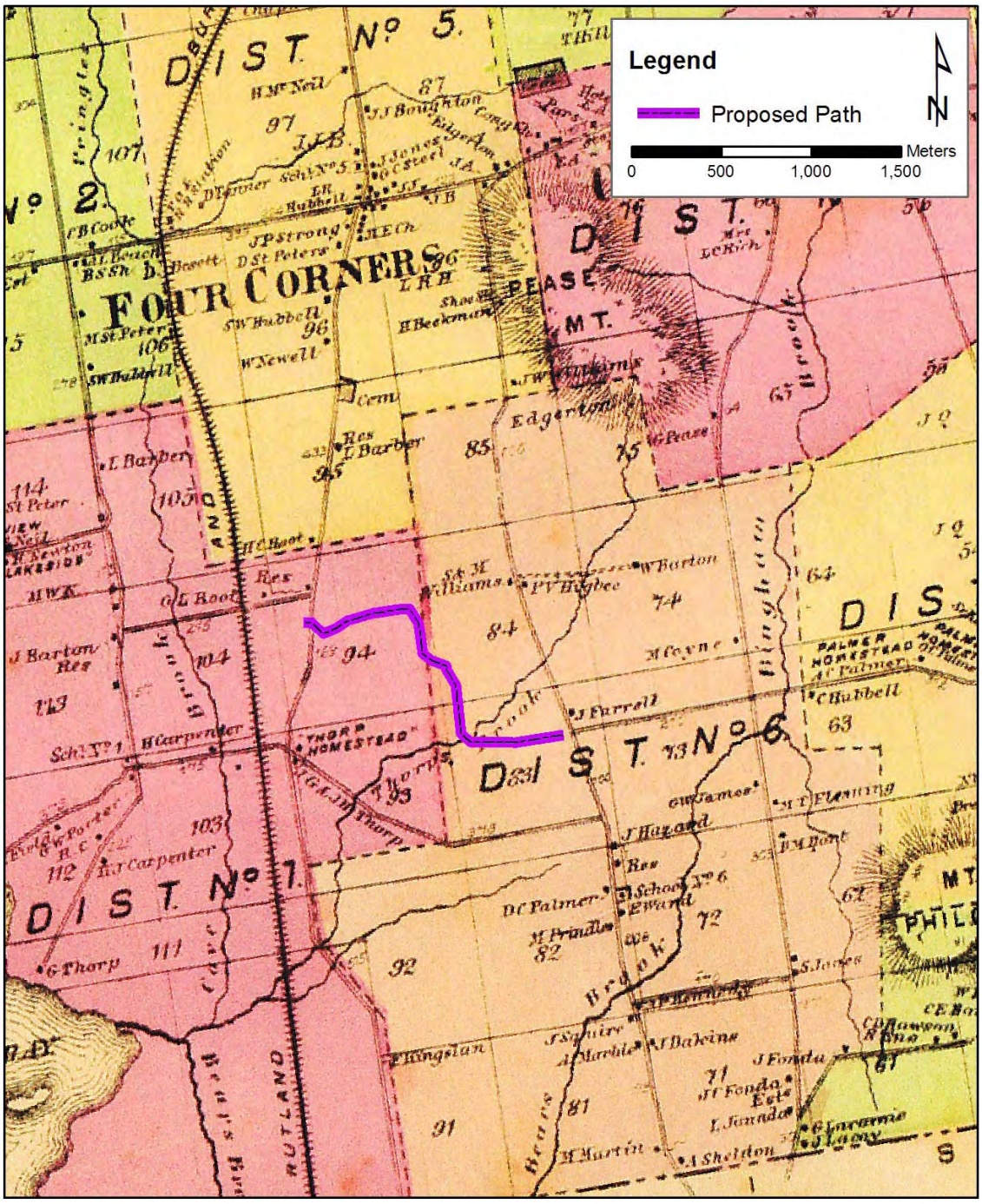


Figure 4. Detail of F.W. Beers' *Atlas of Chittenden County, Vermont* (1869) with the general project area projected on to it.

## Field Inspection

A field inspection of the proposed pedestrian path was conducted to identify specific locations within the current project's APE that have a significant potential for containing precontact Native American sites (Figure 5). The Vermont Division of Historic Preservation's predictive model of archaeological sensitivity was used as a guide for the field inspection, but is not a suitable substitute for the field inspection. A field inspection provides greater detail on an area's archaeological sensitivity, since many small landforms and other environmental details may be missed by the predictive model. Therefore, archaeologically sensitive areas may be identified during the field inspection that were not identified as such by the predictive model. As a result, the portion of the proposed path extending eastwards from Greenbush Road (along Common Way) and through the existing housing development is not considered archaeologically sensitive due to ground disturbances associated with road construction. However, after the path turns south and then southeast and crosses to the east side of an un-named drainage associated with Thorp Brook, the area paralleling the upper reaches of the un-named drainage (seen on cover) should be considered for limited Phase I testing because of its proximity to the drainage and relative high elevation. This sensitive area can be avoided however, by placing the alignment of the proposed path 20 m (65 ft) to the east. Further to the south, as the path swings eastwards, the area near the heads of the larger draws should also be considered for limited Phase I testing (Figure 6). The area around the man-made/enhanced pond towards the eastern end of the project area has been heavily disturbed and is not considered to be archaeologically sensitive (Figure 7). To the east the area situated on the sloping ground approaching U.S. Route 7, which lies just north of another drainage associated with Thorp Brook, could be considered for limited Phase I testing. However, portions of the easternmost section of this area may have been previously archaeologically tested for an unrelated project (see Appendix I). Depending on the exact location of the proposed path, some areas may have already been archaeologically tested, and therefore portions of the eastern-most section would not require additional archaeological testing. The need for testing in this area will be determined in the field once the exact path alignment is determined.

Soil probes taken in the areas of the current project's APE considered to be potentially sensitive indicated that the soil profiles are likely to consist of a dark grayish brown or dark brown plowzone (Ap) above a grayish brown subsoil (a weak B or BC). Since the land has remained fairly stable for the past 11,000 years (without significant sediment deposition), deep subsurface testing for prehistoric sites will not be required. Artifacts, if present, in this environment can be expected to be located between the surface and 50 cm (20 in) below the existing ground surface. Archaeological studies of agricultural plow zones have determined that plowing is not considered a deleterious disturbance to archaeological sites, since site artifacts are not destroyed or moved very far from their point of origin as a result of plowing. In fact, surface plowing usually churns up artifacts in one location creating surface artifact concentrations, facilitating site identification during surface survey of recently plowed fields.

No potentially significant Euro-American historic resources were expected within the APE of the proposed path and aside from a stone dump and a stone field boundary /

fence no structural remains (i.e. a cellar hole or well) were observed within the proposed corridor of the path.

## Conclusions and Recommendations

The Town of Charlotte proposes the Champlain Housing Path Project, Charlotte, Chittenden County, Vermont. The proposed path construction project will enhance an existing pedestrian path between VT Rte 7 and Greenbush Road in Charlotte, Vermont. The path connects to segments of two future recreational paths to the east and west. As part of the Section 106 permit review, the UVMCAP conducted a field inspection and background research and identified four general areas as archaeologically sensitive. The easternmost sensitive area may be smaller than originally identified, since portions of the area may have already been tested archaeologically for an unrelated project. Therefore, based on the final path alignment, some portion of the easternmost area may not require archaeological testing. Avoidance of archaeological sensitivity may be difficult, if the proposed path intends to cross the tributaries of Thorp Brook. While the currently identified archaeologically sensitive areas could be avoided by off-setting the proposed alignment by 20 m, new sensitive areas associated with the brook crossings would be disturbed. As a result, a Phase I site identification survey is recommended for each area to determine the presence or absence of precontact Native American and historic Euroamerican archaeological sites.

Charles Knight, Ph.D.
Assistant Director

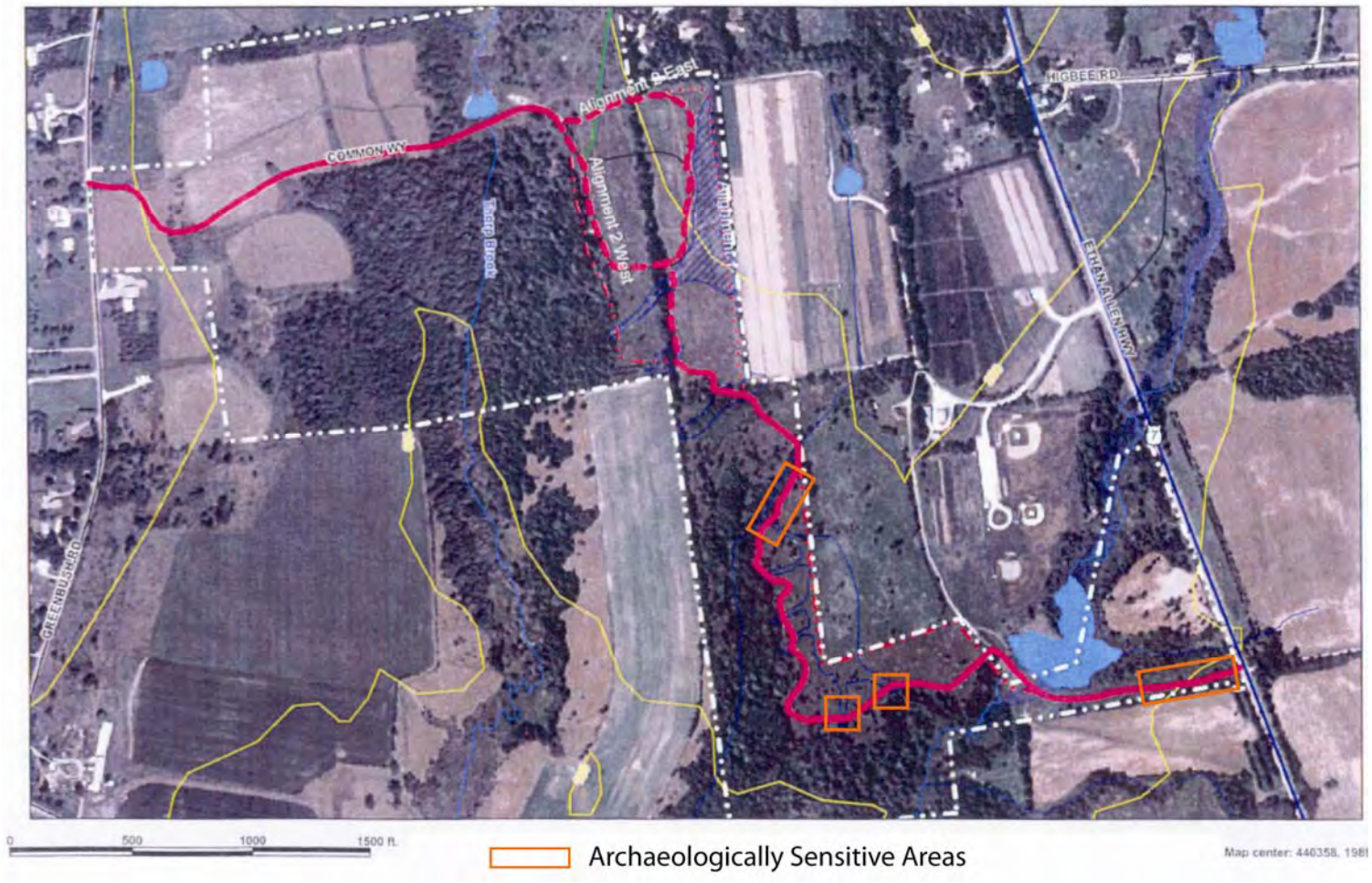


Figure 5. Map showing the location of the archaeologically sensitive areas of the proposed Champlain Housing Path in Charlotte, Chittenden County, Vermont.

Figure 6. Example of an archaeologically sensitive head of a draw along the proposed path, looking southwest. Image taken from the proposed path.

Figure 7. View of the area near the man made / enhanced pond along Thorp Brook in the eastern portion of the project area, looking southeast along the proposed path. This area is not considered archaeologically sensitive.

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1895 *Willsboro, NY-VT Quadrangle*. 15-Minute Series. Washington D.C. (Surveyed 1893).
1941 *Willsboro, NY-VT Quadrangle*. 15-Minute Series. Washington D.C. (Surveyed 1938).
1956 *Willsboro, NY-VT Quadrangle*. 15-Minute Series. Washington D.C.

Walling, H. F.
1857 *Map of Chittenden County, Vermont*. Baker & Tilden, Boston. Massachusetts.

## Appendix I

This area was previously tested as part of the archaeological investigations for VTAOT project Charlotte FEGC 019-4(20) as Area D (Stations 93+00-94+00).

Area D was located west of U.S. Route 7 between Sta. 93+00-94+00, on a roughly 10 m (32 ft) high terrace edge, above and south of a small westward flowing tributary /drainage of Thorp Brook (see Figure A-1). Area D encompasses 0.08 hectare (0.19 acre). The terrace top is generally level and the slope down to the drainage is at first is slight and then becomes steep. Tall grass/hay and several pine trees make up the vegetation in the area.

Two transects containing 12 test pits were placed parallel to the drainage along the terrace edge. Four additional test pits spaced at 4 m (13 ft) intervals were excavated around TR1, TP3 after four pieces of possible fire-cracked rock and one questionable chert debitage fragment were recovered from the plowzone in that test pit (see Figure A-2). These possible artifacts were later determined not to be cultural. The stratigraphy in Area D was characterized by a 13-25 cm (5-10 in) thick very dark grayish brown clayey loam plowzone, with a compact brown to dark olive brown clay to clayey loam beneath. After analysis, no precontact Native American or historic period sites were identified in Area D.

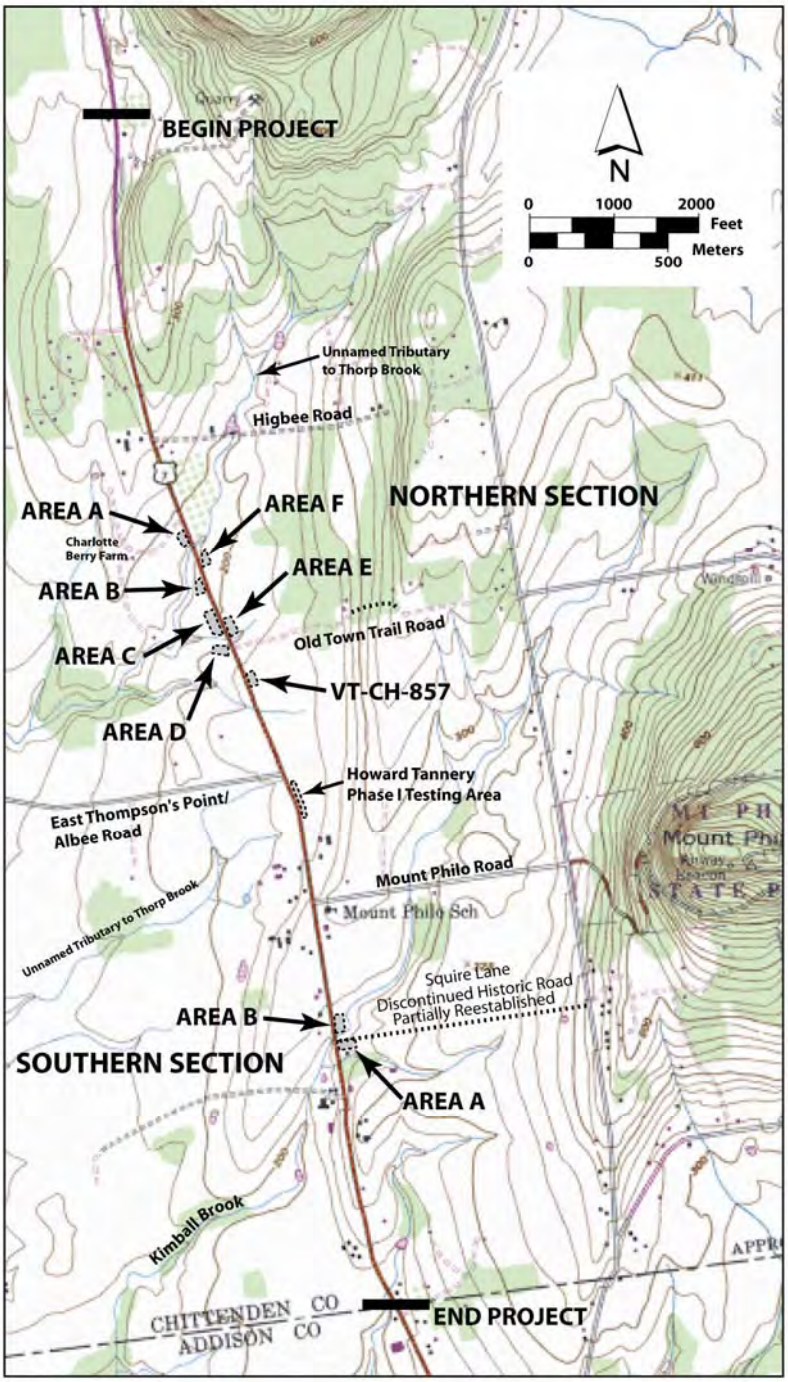



Figure A-1. General project area for the Charlotte FEGC 019-4(20) project.

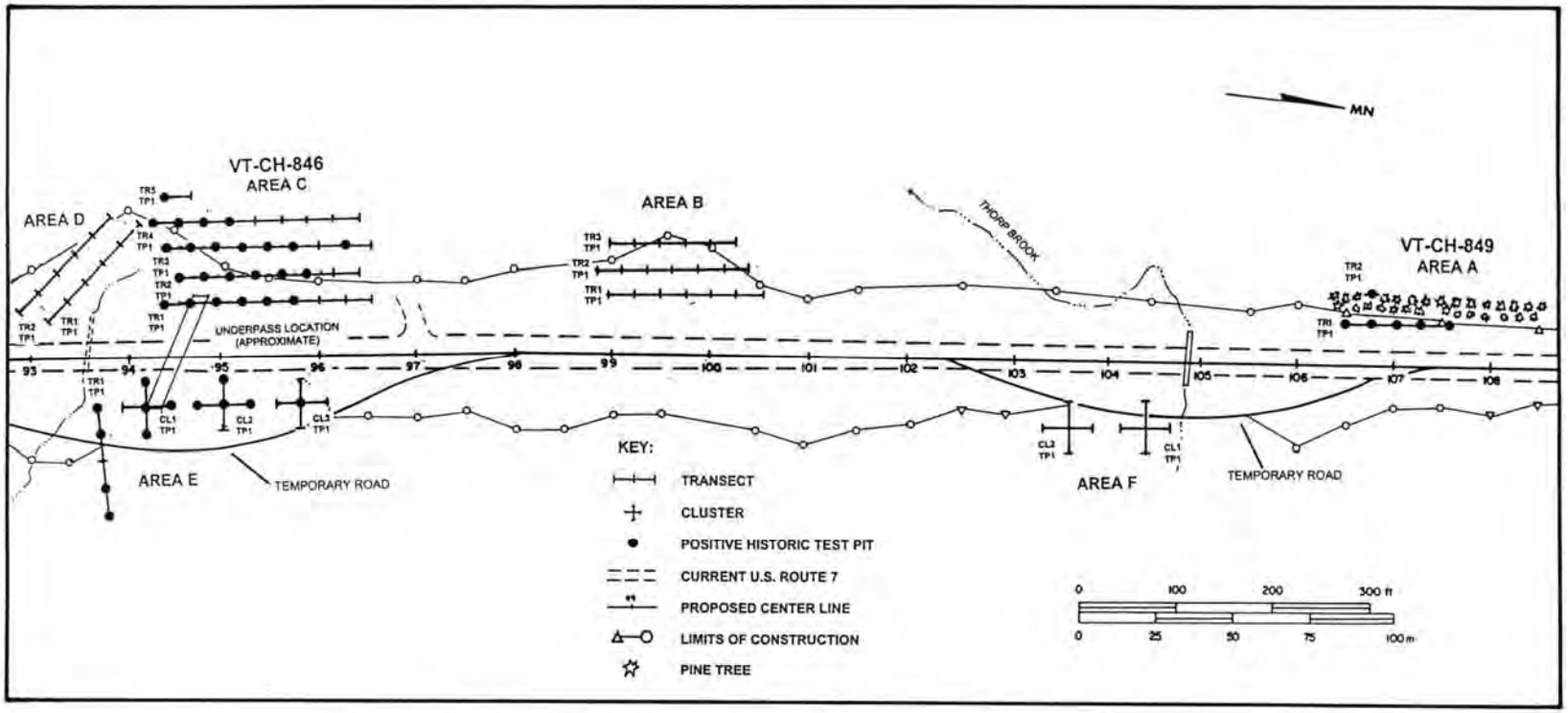



Figure A-2. Plan of Phase I archaeological testing in Areas A, B, C, D, E, and F in the northern section of the project Charlotte FEGC 019-4(20).

# APPENDIX D

## Soils Report

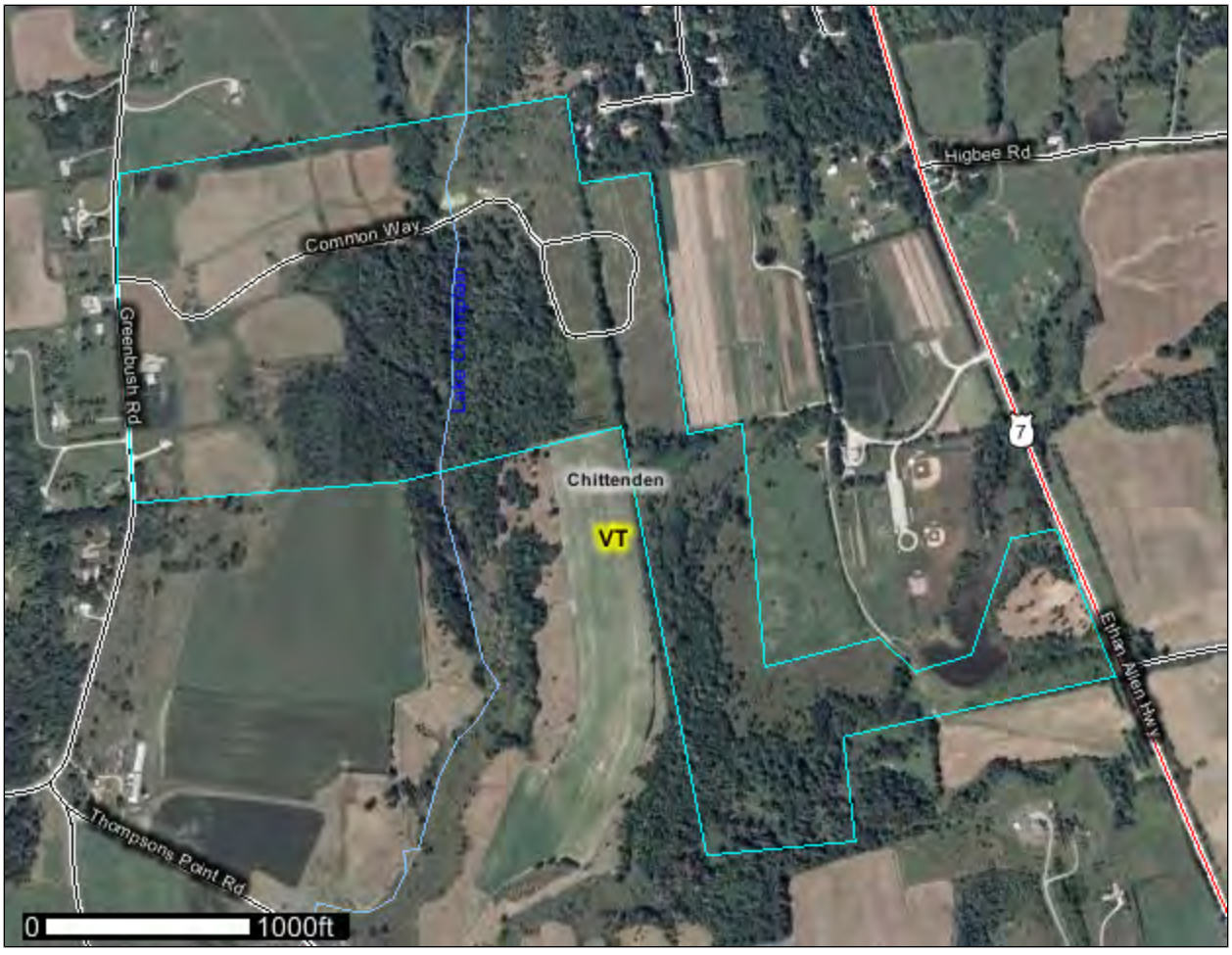
United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Chittenden County, Vermont

## Charlotte Co-Housing Trail



# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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# Contents

# How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

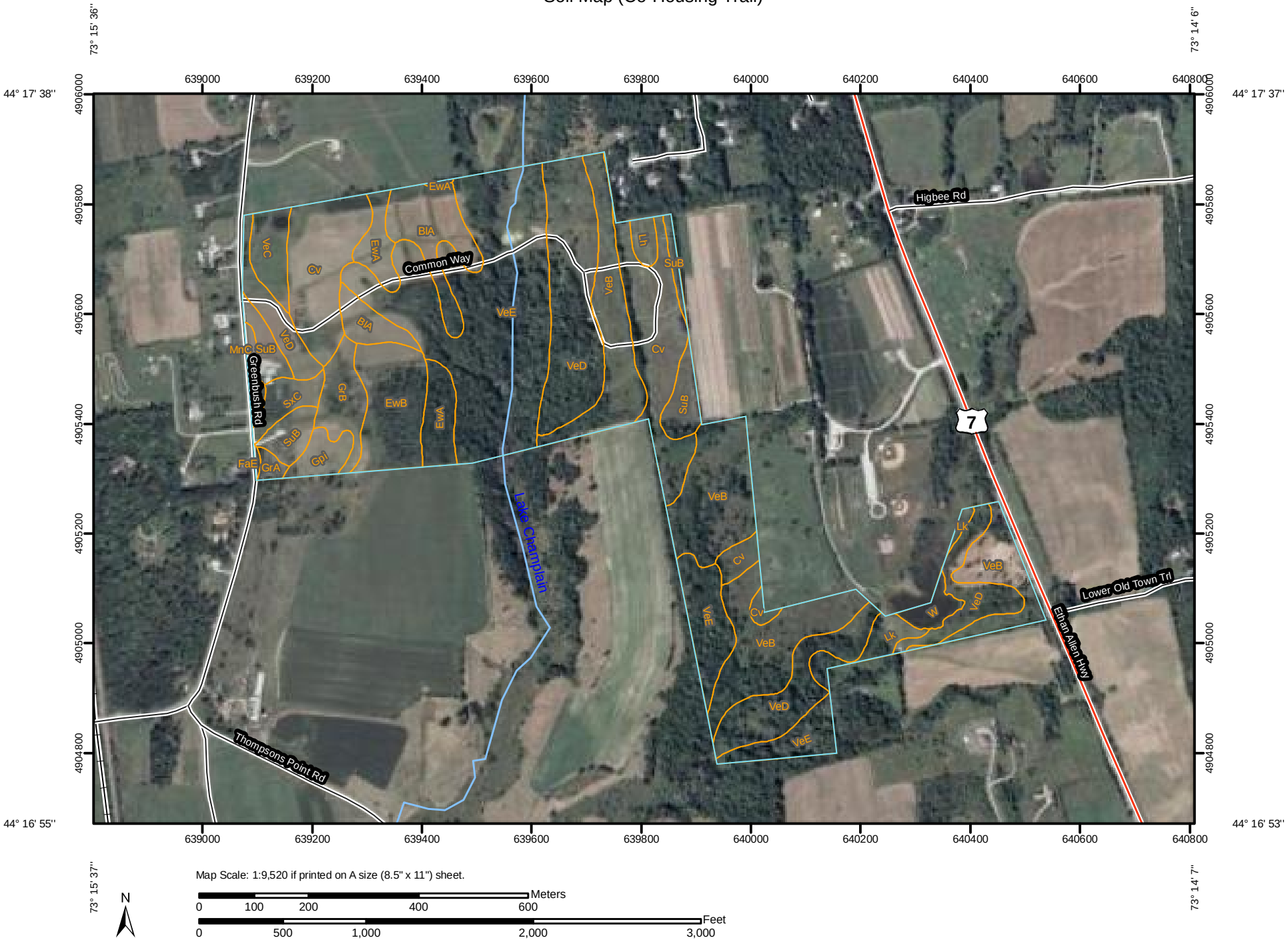
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report
## Soil Map (Co-Housing Trail)




Map Scale: 1:9,520 if printed on A size (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 500 1,000 2,000 3,000

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Units

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

**Special Line Features**
- Gully
- Short Steep Slope
- Other

**Political Features**
- Cities

**Water Features**
- Oceans
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

## MAP INFORMATION

Map Scale: 1:9,520 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chittenden County, Vermont
Survey Area Data: Version 12, Jul 10, 2008

Date(s) aerial images were photographed: 8/19/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend (Co-Housing Trail)

| Chittenden County, Vermont (VT007) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| BlA | Belgrade and Eldridge soils, 0 to 3 percent slopes | 7.1 | 5.1% |
| Cv | Covington silty clay | 17.5 | 12.6% |
| EwA | Enosburg and Whately soils, 0 to 3 percent slopes | 4.6 | 3.3% |
| EwB | Enosburg and Whately soils, 3 to 8 percent slopes | 6.5 | 4.7% |
| FaE | Farmington extremely rocky loam, 20 to 60 percent slopes | 0.1 | 0.1% |
| Gpi | Pits, sand and Pits, gravel | 1.7 | 1.2% |
| GrA | Groton gravelly fine sandy loam, 0 to 5 percent slopes | 0.5 | 0.4% |
| GrB | Groton gravelly fine sandy loam, 5 to 12 percent slopes | 3.2 | 2.3% |
| Lh | Livingston clay | 0.9 | 0.6% |
| Lk | Livingston silty clay, occasionally flooded | 2.2 | 1.6% |
| MnC | Massena stony silt loam, 0 to 15 percent slopes | 0.4 | 0.3% |
| MoC | Massena extremely stony silt loam, 0 to 15 percent slopes | 0.5 | 0.3% |
| SuB | Stockbridge and Nellis stony loams, 3 to 8 percent slopes | 5.6 | 4.1% |
| SxC | Stockbridge and Nellis extremely stony loams, 3 to 15 percent slopes | 1.9 | 1.3% |
| VeB | Vergennes clay, 2 to 6 percent slopes | 26.8 | 19.3% |
| VeC | Vergennes clay, 6 to 12 percent slopes | 2.5 | 1.8% |
| VeD | Vergennes clay, 12 to 25 percent slopes | 23.0 | 16.6% |
| VeE | Vergennes clay, 25 to 60 percent slopes | 32.6 | 23.4% |
| W | Water | 1.2 | 0.9% |
| **Totals for Area of Interest** | | **138.9** | **100.0%** |

# Map Unit Descriptions (Co-Housing Trail)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic

class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

# Chittenden County, Vermont

## BlA—Belgrade and Eldridge soils, 0 to 3 percent slopes

**Map Unit Setting**

*Elevation:* 90 to 1,000 feet
*Mean annual precipitation:* 30 to 50 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

**Map Unit Composition**

*Eldridge and similar soils:* 45 percent
*Belgrade and similar soils:* 45 percent
*Minor components:* 10 percent

**Description of Belgrade**

**Setting**

*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Coarse-silty glaciolacustrine deposits

**Properties and qualities**

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.06 to 2.00 in/hr)
*Depth to water table:* About 18 to 42 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* High (about 9.2 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 2w

**Typical profile**

*0 to 7 inches:* Very fine sandy loam
*7 to 23 inches:* Very fine sandy loam
*23 to 60 inches:* Very fine sandy loam

**Description of Eldridge**

**Setting**

*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Sandy glaciolacustrine deposits over loamy glaciolacustrine deposits

**Properties and qualities**

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)
*Depth to water table:* About 12 to 24 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* High (about 9.5 inches)

**Interpretive groups**
*Land capability (nonirrigated):* 2w

**Typical profile**
*0 to 9 inches:* Loamy fine sand
*9 to 27 inches:* Loamy fine sand
*27 to 60 inches:* Silt loam

**Minor Components**

**Enosburg**
*Percent of map unit:* 5 percent
*Landform:* Depressions

**Raynham**
*Percent of map unit:* 5 percent
*Landform:* Depressions

## Cv—Covington silty clay

**Map Unit Setting**
*Elevation:* 90 to 600 feet
*Mean annual precipitation:* 30 to 36 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

**Map Unit Composition**
*Covington and similar soils:* 90 percent
*Minor components:* 10 percent

**Description of Covington**

**Setting**
*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey glaciolacustrine deposits

**Properties and qualities**
*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 6 to 12 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 5.9 inches)

**Interpretive groups**
*Land capability (nonirrigated):* 4w

**Typical profile**
*0 to 8 inches:* Silty clay
*8 to 28 inches:* Clay
*28 to 65 inches:* Clay

**Minor Components**

**Livingston**
*Percent of map unit:* 10 percent
*Landform:* Depressions

## EwA—Enosburg and Whately soils, 0 to 3 percent slopes

**Map Unit Setting**
*Elevation:* 90 to 1,000 feet
*Mean annual precipitation:* 30 to 50 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

**Map Unit Composition**
*Whately and similar soils:* 43 percent
*Enosburg and similar soils:* 43 percent
*Minor components:* 14 percent

**Description of Enosburg**

**Setting**
*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Sandy glaciofluvial deposits over loamy glaciolacustrine deposits

**Properties and qualities**
*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)
*Depth to water table:* About 0 to 12 inches
*Frequency of flooding:* None

*Frequency of ponding:* None
*Available water capacity:* Moderate (about 7.5 inches)

**Interpretive groups**
*Land capability (nonirrigated):* 3w

**Typical profile**
*0 to 8 inches:* Loamy sand
*8 to 32 inches:* Coarse sand
*32 to 65 inches:* Silt

## Description of Whately

**Setting**
*Landform:* Depressions on terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Coarse-loamy glaciolacustrine deposits over clayey glaciolacustrine deposits

**Properties and qualities**
*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 0.20 in/hr)
*Depth to water table:* About 0 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Moderate (about 8.9 inches)

**Interpretive groups**
*Land capability (nonirrigated):* 4w

**Typical profile**
*0 to 8 inches:* Fine sandy loam
*8 to 15 inches:* Fine sandy loam
*15 to 65 inches:* Silty clay loam

## Minor Components

**Raynham**
*Percent of map unit:* 7 percent
*Landform:* Knolls

**Swanton**
*Percent of map unit:* 7 percent
*Landform:* Knolls

## EwB—Enosburg and Whately soils, 3 to 8 percent slopes

### Map Unit Setting

*Elevation:* 90 to 1,000 feet
*Mean annual precipitation:* 30 to 50 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

### Map Unit Composition

*Whately and similar soils:* 43 percent
*Enosburg and similar soils:* 43 percent
*Minor components:* 14 percent

### Description of Enosburg

#### Setting

*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Parent material:* Sandy glaciofluvial deposits over loamy glaciolacustrine deposits

#### Properties and qualities

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)
*Depth to water table:* About 0 to 12 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Moderate (about 7.5 inches)

#### Interpretive groups

*Land capability (nonirrigated):* 3w

#### Typical profile

*0 to 8 inches:* Loamy sand
*8 to 32 inches:* Coarse sand
*32 to 65 inches:* Silt

### Description of Whately

#### Setting

*Landform:* Depressions on terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave

*Parent material:* Coarse-loamy glaciolacustrine deposits over clayey glaciolacustrine deposits

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 0.20 in/hr)
*Depth to water table:* About 0 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Moderate (about 8.9 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 4w

**Typical profile**

*0 to 8 inches:* Fine sandy loam
*8 to 15 inches:* Fine sandy loam
*15 to 65 inches:* Silty clay loam

**Minor Components**

**Raynham**

*Percent of map unit:* 7 percent
*Landform:* Knolls

**Swanton**

*Percent of map unit:* 7 percent
*Landform:* Knolls

## FaE—Farmington extremely rocky loam, 20 to 60 percent slopes

**Map Unit Setting**

*Elevation:* 90 to 2,000 feet
*Mean annual precipitation:* 30 to 50 inches
*Mean annual air temperature:* 37 to 52 degrees F
*Frost-free period:* 90 to 180 days

**Map Unit Composition**

*Farmington and similar soils:* 80 percent
*Minor components:* 20 percent

**Description of Farmington**

**Setting**

*Landform:* Ridges
*Landform position (two-dimensional):* Shoulder, backslope, summit
*Down-slope shape:* Convex
*Across-slope shape:* Convex

*Parent material:* Coarse-loamy till

**Properties and qualities**

*Slope:* 20 to 60 percent
*Depth to restrictive feature:* 10 to 20 inches to lithic bedrock
*Drainage class:* Somewhat excessively drained
*Capacity of the most limiting layer to transmit water (Ksat):* Low to high (0.01 to 2.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 5 percent
*Available water capacity:* Very low (about 2.3 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 7e

**Typical profile**

*0 to 7 inches:* Loam
*7 to 17 inches:* Silt loam
*17 to 21 inches:* Unweathered bedrock

**Minor Components**

**Rock outcrop**

*Percent of map unit:* 5 percent

**Benson**

*Percent of map unit:* 3 percent

**Galoo**

*Percent of map unit:* 3 percent

**Galway**

*Percent of map unit:* 3 percent

**Palatine**

*Percent of map unit:* 3 percent

**Woodstock**

*Percent of map unit:* 3 percent

## Gpi—Pits, sand and Pits, gravel

**Map Unit Setting**

*Elevation:* 300 to 1,200 feet
*Mean annual precipitation:* 36 to 50 inches
*Mean annual air temperature:* 37 to 46 degrees F
*Frost-free period:* 90 to 135 days

**Map Unit Composition**

*Pits, gravel:* 50 percent
*Pits, sand:* 50 percent

**Description of Pits, Sand**

**Setting**
*Parent material:* Sandy glaciofluvial deposits

**Interpretive groups**
*Land capability (nonirrigated):* 8s

**Typical profile**
*0 to 10 inches:* Coarse sand
*10 to 60 inches:* Gravelly coarse sand

**Description of Pits, Gravel**

**Setting**
*Parent material:* Sandy and gravelly glaciofluvial deposits

**Interpretive groups**
*Land capability (nonirrigated):* 8s

**Typical profile**
*0 to 6 inches:* Very gravelly coarse sand
*6 to 60 inches:* Very gravelly coarse sand

## GrA—Groton gravelly fine sandy loam, 0 to 5 percent slopes

**Map Unit Setting**
*Elevation:* 90 to 1,200 feet
*Mean annual precipitation:* 30 to 50 inches
*Mean annual air temperature:* 37 to 52 degrees F
*Frost-free period:* 90 to 180 days

**Map Unit Composition**
*Groton and similar soils:* 85 percent
*Minor components:* 15 percent

**Description of Groton**

**Setting**
*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Parent material:* Sandy and gravelly glaciofluvial deposits

**Properties and qualities**
*Slope:* 0 to 5 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Excessively drained
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (2.00 to 20.00 in/hr)
*Depth to water table:* More than 80 inches

*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 3.4 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 3s

**Typical profile**

*0 to 9 inches:* Gravelly fine sandy loam
*9 to 15 inches:* Gravelly sandy loam
*15 to 24 inches:* Very gravelly loamy coarse sand
*24 to 65 inches:* Extremely gravelly coarse sand

**Minor Components**

**Agawam**

*Percent of map unit:* 8 percent

**Colton**

*Percent of map unit:* 7 percent
*Landform:* Terraces

## GrB—Groton gravelly fine sandy loam, 5 to 12 percent slopes

**Map Unit Setting**

*Elevation:* 90 to 1,200 feet
*Mean annual precipitation:* 30 to 50 inches
*Mean annual air temperature:* 37 to 52 degrees F
*Frost-free period:* 90 to 180 days

**Map Unit Composition**

*Groton and similar soils:* 85 percent
*Minor components:* 15 percent

**Description of Groton**

**Setting**

*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Concave, linear
*Across-slope shape:* Concave
*Parent material:* Sandy and gravelly glaciofluvial deposits

**Properties and qualities**

*Slope:* 5 to 12 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Excessively drained
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (2.00 to 20.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None

*Available water capacity:* Low (about 3.4 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 4s

**Typical profile**

*0 to 9 inches:* Gravelly fine sandy loam
*9 to 15 inches:* Gravelly sandy loam
*15 to 24 inches:* Very gravelly loamy coarse sand
*24 to 65 inches:* Extremely gravelly coarse sand

**Minor Components**

**Agawam**

*Percent of map unit:* 8 percent

**Colton**

*Percent of map unit:* 7 percent
*Landform:* Terraces

## Lh—Livingston clay

**Map Unit Setting**

*Elevation:* 90 to 600 feet
*Mean annual precipitation:* 30 to 36 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

**Map Unit Composition**

*Livingston and similar soils:* 85 percent
*Minor components:* 15 percent

**Description of Livingston**

**Setting**

*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Parent material:* Clayey glaciolacustrine deposits

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Very poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 0.20 in/hr)
*Depth to water table:* About 0 to 6 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Moderate (about 6.6 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 4w

**Typical profile**

*0 to 9 inches:* Clay
*9 to 27 inches:* Clay
*27 to 65 inches:* Clay

**Minor Components**

**Covington**

*Percent of map unit:* 8 percent
*Landform:* Knolls

**Whately**

*Percent of map unit:* 7 percent
*Landform:* Depressions

## Lk—Livingston silty clay, occasionally flooded

**Map Unit Setting**

*Elevation:* 90 to 600 feet
*Mean annual precipitation:* 30 to 36 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

**Map Unit Composition**

*Livingston and similar soils:* 85 percent
*Minor components:* 15 percent

**Description of Livingston**

**Setting**

*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear, concave
*Across-slope shape:* Concave
*Parent material:* Clayey glaciolacustrine deposits

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Very poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 0.20 in/hr)
*Depth to water table:* About 0 to 6 inches
*Frequency of flooding:* Occasional
*Frequency of ponding:* None
*Available water capacity:* Moderate (about 6.6 inches)

**Interpretive groups**
*Land capability (nonirrigated):* 5w

**Typical profile**
*0 to 9 inches:* Silty clay
*9 to 27 inches:* Clay
*27 to 65 inches:* Clay

**Minor Components**

**Vergennes**
*Percent of map unit:* 8 percent

**Whately**
*Percent of map unit:* 7 percent
*Landform:* Depressions

## MnC—Massena stony silt loam, 0 to 15 percent slopes

**Map Unit Setting**
*Elevation:* 90 to 2,000 feet
*Mean annual precipitation:* 30 to 50 inches
*Mean annual air temperature:* 37 to 52 degrees F
*Frost-free period:* 90 to 180 days

**Map Unit Composition**
*Massena and similar soils:* 90 percent
*Minor components:* 10 percent

**Description of Massena**

**Setting**
*Landform:* Depressions
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Coarse-loamy till

**Properties and qualities**
*Slope:* 0 to 15 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)
*Depth to water table:* About 12 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 20 percent
*Available water capacity:* Moderate (about 6.9 inches)

**Interpretive groups**
*Land capability (nonirrigated):* 3w

**Typical profile**

*0 to 9 inches:* Silt loam
*9 to 25 inches:* Silt loam
*25 to 65 inches:* Very fine sandy loam

**Minor Components**

**Georgia**

*Percent of map unit:* 5 percent

**Peacham, undrained**

*Percent of map unit:* 5 percent
*Landform:* Depressions

## MoC—Massena extremely stony silt loam, 0 to 15 percent slopes

**Map Unit Setting**

*Elevation:* 90 to 2,000 feet
*Mean annual precipitation:* 30 to 50 inches
*Mean annual air temperature:* 37 to 52 degrees F
*Frost-free period:* 90 to 180 days

**Map Unit Composition**

*Massena and similar soils:* 90 percent
*Minor components:* 10 percent

**Description of Massena**

**Setting**

*Landform:* Depressions
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Parent material:* Coarse-loamy till

**Properties and qualities**

*Slope:* 0 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 9.0 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)
*Depth to water table:* About 12 to 18 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 20 percent
*Available water capacity:* Moderate (about 6.5 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 7s

**Typical profile**

*0 to 9 inches:* Silt loam
*9 to 25 inches:* Silt loam
*25 to 65 inches:* Very fine sandy loam

**Minor Components**

**Georgia**

*Percent of map unit:* 5 percent

**Peacham, undrained**

*Percent of map unit:* 5 percent
*Landform:* Depressions

## SuB—Stockbridge and Nellis stony loams, 3 to 8 percent slopes

**Map Unit Setting**

*Elevation:* 90 to 600 feet
*Mean annual precipitation:* 30 to 36 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

**Map Unit Composition**

*Nellis and similar soils:* 43 percent
*Stockbridge and similar soils:* 43 percent
*Minor components:* 14 percent

**Description of Stockbridge**

**Setting**

*Landform:* Hills
*Landform position (two-dimensional):* Summit, backslope
*Landform position (three-dimensional):* Side slope, interfluve
*Down-slope shape:* Linear, convex
*Across-slope shape:* Convex
*Parent material:* Coarse-loamy till

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 20 percent
*Available water capacity:* Moderate (about 8.3 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 2e

**Typical profile**

*0 to 9 inches:* Loam
*9 to 17 inches:* Loam
*17 to 30 inches:* Fine sandy loam
*30 to 65 inches:* Gravelly loam

## Description of Nellis

**Setting**

*Landform:* Hills
*Landform position (two-dimensional):* Summit, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex, linear
*Across-slope shape:* Convex
*Parent material:* Coarse-loamy till

**Properties and qualities**

*Slope:* 3 to 8 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 2.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 25 percent
*Available water capacity:* Moderate (about 8.3 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 2e

**Typical profile**

*0 to 9 inches:* Loam
*9 to 14 inches:* Silt loam
*14 to 21 inches:* Silt loam
*21 to 65 inches:* Channery loam

## Minor Components

**Georgia**

*Percent of map unit:* 5 percent

**Massena**

*Percent of map unit:* 5 percent

**Palatine**

*Percent of map unit:* 4 percent

## SxC—Stockbridge and Nellis extremely stony loams, 3 to 15 percent slopes

### Map Unit Setting

*Elevation:* 90 to 600 feet
*Mean annual precipitation:* 30 to 36 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

### Map Unit Composition

*Nellis and similar soils:* 43 percent
*Stockbridge and similar soils:* 43 percent
*Minor components:* 14 percent

### Description of Stockbridge

#### Setting

*Landform:* Hills
*Landform position (two-dimensional):* Backslope, summit
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Coarse-loamy till

#### Properties and qualities

*Slope:* 3 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 9.0 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.60 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 20 percent
*Available water capacity:* Moderate (about 8.1 inches)

#### Interpretive groups

*Land capability (nonirrigated):* 7s

#### Typical profile

*0 to 9 inches:* Loam
*9 to 17 inches:* Loam
*17 to 30 inches:* Fine sandy loam
*30 to 65 inches:* Gravelly loam

### Description of Nellis

#### Setting

*Landform:* Hills
*Landform position (two-dimensional):* Summit, backslope
*Landform position (three-dimensional):* Interfluve, side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Coarse-loamy till

#### Properties and qualities

*Slope:* 3 to 15 percent
*Surface area covered with cobbles, stones or boulders:* 9.0 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.20 to 2.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 25 percent
*Available water capacity:* Moderate (about 8.1 inches)

#### Interpretive groups

*Land capability (nonirrigated):* 7s

#### Typical profile

*0 to 9 inches:* Loam
*9 to 14 inches:* Silt loam
*14 to 21 inches:* Silt loam
*21 to 65 inches:* Channery loam

### Minor Components

#### Georgia

*Percent of map unit:* 5 percent

#### Massena

*Percent of map unit:* 5 percent

#### Palatine

*Percent of map unit:* 4 percent

## VeB—Vergennes clay, 2 to 6 percent slopes

### Map Unit Setting

*Elevation:* 90 to 600 feet
*Mean annual precipitation:* 30 to 36 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

**Map Unit Composition**
*Vergennes and similar soils:* 85 percent
*Minor components:* 15 percent

**Description of Vergennes**

**Setting**
*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey glaciolacustrine deposits

**Properties and qualities**
*Slope:* 2 to 6 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 12 to 36 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 6.0 inches)

**Interpretive groups**
*Land capability (nonirrigated):* 2e

**Typical profile**
*0 to 6 inches:* Clay
*6 to 14 inches:* Clay
*14 to 25 inches:* Clay
*25 to 65 inches:* Clay

**Minor Components**

**Covington**
*Percent of map unit:* 5 percent
*Landform:* Depressions

**Kingsbury**
*Percent of map unit:* 5 percent

**Vergennes, moderately shallow variant**
*Percent of map unit:* 5 percent

## VeC—Vergennes clay, 6 to 12 percent slopes

**Map Unit Setting**
*Elevation:* 90 to 600 feet
*Mean annual precipitation:* 30 to 36 inches
*Mean annual air temperature:* 45 to 52 degrees F

*Frost-free period:* 120 to 180 days

**Map Unit Composition**

*Vergennes and similar soils:* 85 percent
*Minor components:* 15 percent

**Description of Vergennes**

**Setting**

*Landform:* Terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Parent material:* Clayey glaciolacustrine deposits

**Properties and qualities**

*Slope:* 6 to 12 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 12 to 36 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 6.0 inches)

**Interpretive groups**

*Land capability (nonirrigated):* 3e

**Typical profile**

*0 to 6 inches:* Clay
*6 to 14 inches:* Clay
*14 to 25 inches:* Clay
*25 to 65 inches:* Clay

**Minor Components**

**Covington**

*Percent of map unit:* 5 percent
*Landform:* Drainageways

**Kingsbury**

*Percent of map unit:* 5 percent

**Vergennes, moderately shallow variant**

*Percent of map unit:* 5 percent

## VeD—Vergennes clay, 12 to 25 percent slopes

**Map Unit Setting**

*Elevation:* 90 to 600 feet
*Mean annual precipitation:* 30 to 36 inches

*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

**Map Unit Composition**
*Vergennes and similar soils:* 90 percent
*Minor components:* 10 percent

**Description of Vergennes**

**Setting**
*Landform:* Terraces
*Landform position (three-dimensional):* Riser
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Clayey glaciolacustrine deposits

**Properties and qualities**
*Slope:* 12 to 25 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 12 to 36 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 6.0 inches)

**Interpretive groups**
*Land capability (nonirrigated):* 4e

**Typical profile**
*0 to 6 inches:* Clay
*6 to 14 inches:* Clay
*14 to 25 inches:* Clay
*25 to 65 inches:* Clay

**Minor Components**

**Kingsbury**
*Percent of map unit:* 5 percent

**Vergennes, moderately shallow variant**
*Percent of map unit:* 5 percent

## VeE—Vergennes clay, 25 to 60 percent slopes

**Map Unit Setting**
*Elevation:* 90 to 600 feet
*Mean annual precipitation:* 30 to 36 inches
*Mean annual air temperature:* 45 to 52 degrees F
*Frost-free period:* 120 to 180 days

**Map Unit Composition**
*Vergennes and similar soils:* 90 percent
*Minor components:* 10 percent

**Description of Vergennes**

**Setting**
*Landform:* Terraces
*Landform position (three-dimensional):* Riser
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Parent material:* Clayey glaciolacustrine deposits

**Properties and qualities**
*Slope:* 25 to 60 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 12 to 36 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water capacity:* Low (about 6.0 inches)

**Interpretive groups**
*Land capability (nonirrigated):* 7e

**Typical profile**
*0 to 6 inches:* Clay
*6 to 14 inches:* Clay
*14 to 25 inches:* Clay
*25 to 65 inches:* Clay

**Minor Components**

**Kingsbury**
*Percent of map unit:* 5 percent

**Vergennes, moderately shallow variant**
*Percent of map unit:* 5 percent

## W—Water

**Map Unit Composition**
*Water:* 100 percent

# Soil Information for All Uses

## Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

## Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

### Lawns, Landscaping, and Golf Fairways (Co-Housing Trail)

This interpretation rates soils for their use in establishing and maintaining turf for lawns and golf fairways and ornamental trees and shrubs for residential or commercial landscaping. Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required.

The ratings are based on the use of soil material at the site, which may have been altered by some land smoothing. Irrigation may or may not be needed and is not a criterion in rating. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. Soils that are subject to flooding are limited by the duration and intensity of flooding and the season when flooding occurs. In planning for lawns, landscaping, or golf fairways, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

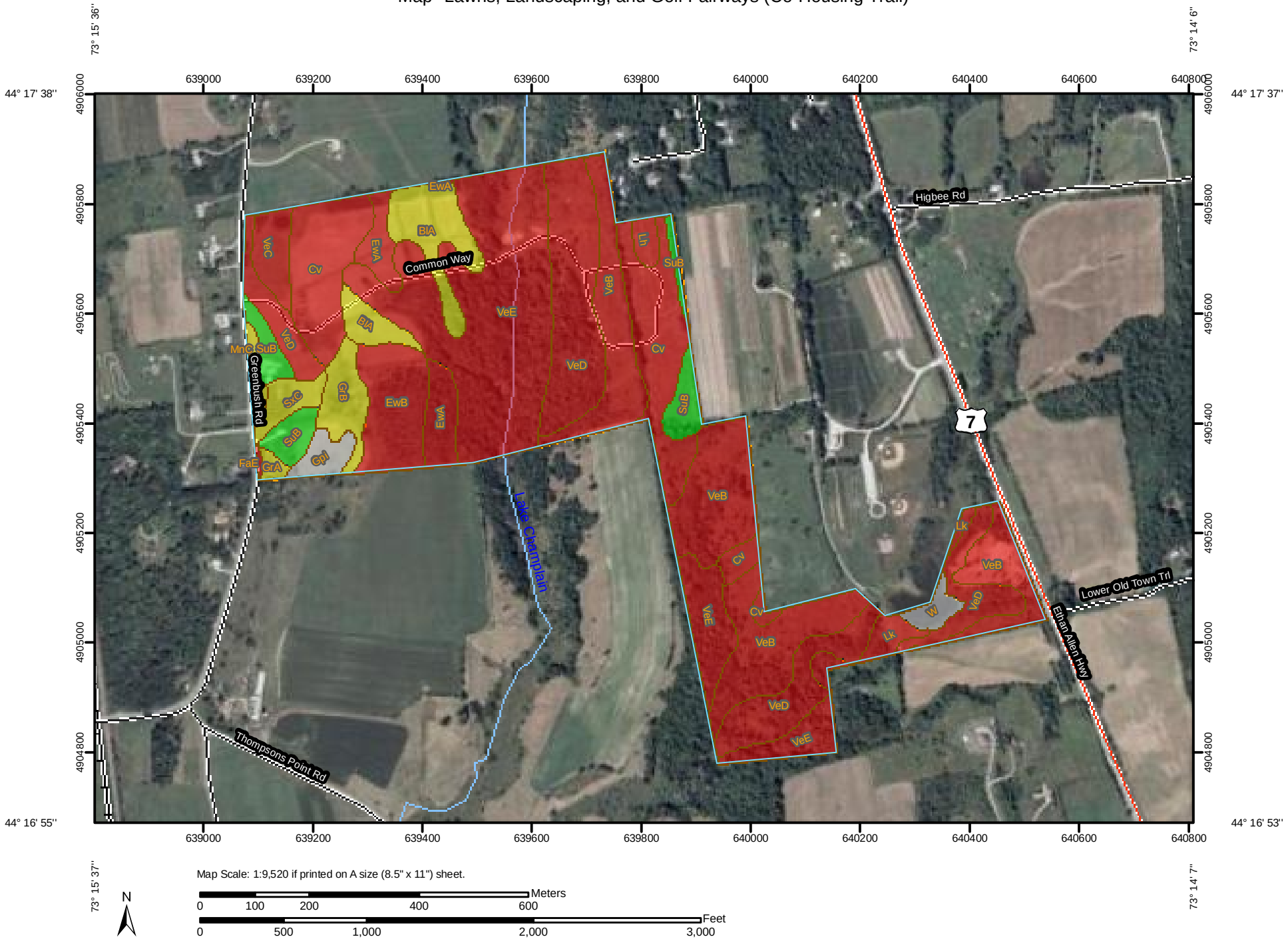
The ratinga are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

# Custom Soil Resource Report
## Map--Lawns, Landscaping, and Golf Fairways (Co-Housing Trail)



## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Units

**Soil Ratings**

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Political Features**

- Cities

**Water Features**

- Oceans
- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

## MAP INFORMATION

Map Scale: 1:9,520 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chittenden County, Vermont
Survey Area Data: Version 12, Jul 10, 2008

Date(s) aerial images were photographed: 8/19/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Tables—Lawns, Landscaping, and Golf Fairways (Co-Housing Trail)

| Lawns, Landscaping, and Golf Fairways— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| BlA | Belgrade and Eldridge soils, 0 to 3 percent slopes | Somewhat limited | Belgrade (45%) | Depth to saturated zone (0.35) | 7.1 | 5.1% |
| | | | Eldridge (45%) | Depth to saturated zone (0.83) | | |
| Cv | Covington silty clay | Very limited | Covington (90%) | Depth to saturated zone (1.00) | 17.5 | 12.6% |
| | | | | Too clayey (1.00) | | |
| | | | Livingston (10%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| EwA | Enosburg and Whately soils, 0 to 3 percent slopes | Very limited | Enosburg (43%) | Depth to saturated zone (1.00) | 4.6 | 3.3% |
| | | | Whately (43%) | Depth to saturated zone (1.00) | | |
| | | | Raynham (7%) | Depth to saturated zone (1.00) | | |
| | | | Swanton (7%) | Depth to saturated zone (1.00) | | |
| EwB | Enosburg and Whately soils, 3 to 8 percent slopes | Very limited | Enosburg (43%) | Depth to saturated zone (1.00) | 6.5 | 4.7% |
| | | | Whately (43%) | Depth to saturated zone (1.00) | | |
| | | | Raynham (7%) | Depth to saturated zone (1.00) | | |
| | | | Swanton (7%) | Depth to saturated zone (1.00) | | |

| Lawns, Landscaping, and Golf Fairways— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| FaE | Farmington extremely rocky loam, 20 to 60 percent slopes | Very limited | Farmington (80%) | Slope (1.00) | 0.1 | 0.1% |
| | | | | Depth to bedrock (1.00) | | |
| | | | | Droughty (0.93) | | |
| | | | Woodstock (3%) | Slope (1.00) | | |
| | | | | Depth to bedrock (1.00) | | |
| | | | | Droughty (1.00) | | |
| | | | Benson (3%) | Slope (1.00) | | |
| | | | | Depth to bedrock (1.00) | | |
| | | | | Droughty (1.00) | | |
| | | | | Large stones content (0.11) | | |
| | | | Galoo (3%) | Depth to bedrock (1.00) | | |
| | | | | Slope (1.00) | | |
| | | | | Droughty (1.00) | | |
| | | | | Large stones content (0.00) | | |
| | | | Galway (3%) | Slope (1.00) | | |
| | | | | Depth to bedrock (0.42) | | |
| | | | | Droughty (0.21) | | |
| | | | | Large stones content (0.00) | | |
| | | | Palatine (3%) | Slope (1.00) | | |
| | | | | Depth to bedrock (0.86) | | |
| | | | | Droughty (0.69) | | |
| Gpi | Pits, sand and Pits, gravel | Not rated | Pits, sand (50%) | | 1.7 | 1.2% |
| | | | Pits, gravel (50%) | | | |
| GrA | Groton gravelly fine sandy loam, 0 to 5 percent slopes | Somewhat limited | Groton (85%) | Droughty (0.78) | 0.5 | 0.4% |
| | | | | Gravel content (0.54) | | |
| | | | | Large stones content (0.00) | | |

| Lawns, Landscaping, and Golf Fairways— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| GrB | Groton gravelly fine sandy loam, 5 to 12 percent slopes | Somewhat limited | Groton (85%) | Droughty (0.78) | 3.2 | 2.3% |
| | | | | Gravel content (0.54) | | |
| | | | | Slope (0.04) | | |
| | | | | Large stones content (0.00) | | |
| | | | Agawam (8%) | Slope (0.04) | | |
| Lh | Livingston clay | Very limited | Livingston (85%) | Depth to saturated zone (1.00) | 0.9 | 0.6% |
| | | | | Too clayey (1.00) | | |
| | | | Covington (8%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Whately (7%) | Depth to saturated zone (1.00) | | |
| Lk | Livingston silty clay, occasionally flooded | Very limited | Livingston (85%) | Depth to saturated zone (1.00) | 2.2 | 1.6% |
| | | | | Too clayey (1.00) | | |
| | | | | Flooding (0.60) | | |
| | | | Vergennes (8%) | Too clayey (1.00) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | Whately (7%) | Depth to saturated zone (1.00) | | |
| MnC | Massena stony silt loam, 0 to 15 percent slopes | Somewhat limited | Massena (90%) | Depth to saturated zone (0.94) | 0.4 | 0.3% |
| | | | | Slope (0.04) | | |
| | | | Georgia (5%) | Slope (0.04) | | |
| | | | | Depth to saturated zone (0.03) | | |
| | | | | Large stones content (0.00) | | |
| MoC | Massena extremely stony silt loam, 0 to 15 percent slopes | Somewhat limited | Massena (90%) | Depth to saturated zone (0.94) | 0.5 | 0.3% |
| | | | | Large stones content (0.08) | | |
| | | | | Slope (0.04) | | |
| | | | Georgia (5%) | Large stones content (0.08) | | |
| | | | | Slope (0.04) | | |
| | | | | Depth to saturated zone (0.03) | | |
| SuB | Stockbridge and Nellis stony loams, 3 to 8 percent slopes | Not limited | Stockbridge (43%) | | 5.6 | 4.1% |
| | | | Nellis (43%) | | | |

| Lawns, Landscaping, and Golf Fairways— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| SxC | Stockbridge and Nellis extremely stony loams, 3 to 15 percent slopes | Somewhat limited | Stockbridge (43%) | Large stones content (0.32) | 1.9 | 1.3% |
| | | | | Slope (0.04) | | |
| | | | Nellis (43%) | Large stones content (0.08) | | |
| | | | | Slope (0.04) | | |
| | | | Georgia (5%) | Large stones content (0.08) | | |
| | | | | Slope (0.04) | | |
| | | | | Depth to saturated zone (0.03) | | |
| | | | Massena (5%) | Depth to saturated zone (0.94) | | |
| | | | | Large stones content (0.08) | | |
| | | | | Slope (0.04) | | |
| | | | Palatine (4%) | Depth to bedrock (0.86) | | |
| | | | | Droughty (0.69) | | |
| | | | | Slope (0.04) | | |
| VeB | Vergennes clay, 2 to 6 percent slopes | Very limited | Vergennes (85%) | Too clayey (1.00) | 26.8 | 19.3% |
| | | | | Depth to saturated zone (0.19) | | |
| | | | Covington (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Too clayey (1.00) | | |
| | | | | Depth to bedrock (0.42) | | |
| | | | | Depth to saturated zone (0.19) | | |

| Lawns, Landscaping, and Golf Fairways— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| VeC | Vergennes clay, 6 to 12 percent slopes | Very limited | Vergennes (85%) | Too clayey (1.00) | 2.5 | 1.8% |
| | | | | Depth to saturated zone (0.19) | | |
| | | | | Slope (0.04) | | |
| | | | Covington (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Too clayey (1.00) | | |
| | | | | Depth to bedrock (0.42) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | | Slope (0.04) | | |
| VeD | Vergennes clay, 12 to 25 percent slopes | Very limited | Vergennes (90%) | Slope (1.00) | 23.0 | 16.6% |
| | | | | Too clayey (1.00) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Slope (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | | Depth to bedrock (0.42) | | |
| | | | | Depth to saturated zone (0.19) | | |
| VeE | Vergennes clay, 25 to 60 percent slopes | Very limited | Vergennes (90%) | Slope (1.00) | 32.6 | 23.4% |
| | | | | Too clayey (1.00) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Slope (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | | Depth to bedrock (0.42) | | |
| | | | | Depth to saturated zone (0.19) | | |

| Lawns, Landscaping, and Golf Fairways— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
| W | Water | Not rated | Water (100%) | | 1.2 | 0.9% |
| **Totals for Area of Interest** | | | | | **138.9** | **100.0%** |

| Lawns, Landscaping, and Golf Fairways— Summary by Rating Value | | |
|---|---|---|
| Rating | Acres in AOI | Percent of AOI |
| Very limited | 116.7 | 84.0% |
| Somewhat limited | 13.6 | 9.8% |
| Not limited | 5.6 | 4.1% |
| Null or Not Rated | 2.9 | 2.1% |
| **Totals for Area of Interest** | **138.9** | **100.0%** |

### Rating Options—Lawns, Landscaping, and Golf Fairways (Co-Housing Trail)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

## Local Roads and Streets (Co-Housing Trail)

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

# Custom Soil Resource Report
## Map--Local Roads and Streets (Co-Housing Trail)

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Units

**Soil Ratings**

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Political Features**

- Cities

**Water Features**

- Oceans
- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

## MAP INFORMATION

Map Scale: 1:9,520 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chittenden County, Vermont
Survey Area Data: Version 12, Jul 10, 2008

Date(s) aerial images were photographed: 8/19/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Tables—Local Roads and Streets (Co-Housing Trail)

| Local Roads and Streets— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| BlA | Belgrade and Eldridge soils, 0 to 3 percent slopes | Very limited | Belgrade (45%) | Frost action (1.00) | 7.1 | 5.1% |
| | | | | Depth to saturated zone (0.35) | | |
| | | | Enosburg (5%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | Raynham (5%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| Cv | Covington silty clay | Very limited | Covington (90%) | Depth to saturated zone (1.00) | 17.5 | 12.6% |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | | Frost action (0.50) | | |
| | | | Livingston (10%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| EwA | Enosburg and Whately soils, 0 to 3 percent slopes | Very limited | Enosburg (43%) | Depth to saturated zone (1.00) | 4.6 | 3.3% |
| | | | | Frost action (1.00) | | |
| | | | Whately (43%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | Raynham (7%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | Swanton (7%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |

| Local Roads and Streets— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| EwB | Enosburg and Whately soils, 3 to 8 percent slopes | Very limited | Enosburg (43%) | Depth to saturated zone (1.00) | 6.5 | 4.7% |
| | | | | Frost action (1.00) | | |
| | | | Whately (43%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | Raynham (7%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | Swanton (7%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| FaE | Farmington extremely rocky loam, 20 to 60 percent slopes | Very limited | Farmington (80%) | Depth to hard bedrock (1.00) | 0.1 | 0.1% |
| | | | | Slope (1.00) | | |
| | | | | Frost action (0.50) | | |
| | | | Woodstock (3%) | Depth to hard bedrock (1.00) | | |
| | | | | Slope (1.00) | | |
| | | | Benson (3%) | Depth to hard bedrock (1.00) | | |
| | | | | Slope (1.00) | | |
| | | | | Frost action (0.50) | | |
| | | | Galoo (3%) | Depth to hard bedrock (1.00) | | |
| | | | | Slope (1.00) | | |
| | | | | Frost action (0.50) | | |
| | | | Galway (3%) | Slope (1.00) | | |
| | | | | Frost action (0.50) | | |
| | | | | Depth to hard bedrock (0.42) | | |
| | | | Palatine (3%) | Slope (1.00) | | |
| | | | | Frost action (0.50) | | |
| Gpi | Pits, sand and Pits, gravel | Not rated | Pits, sand (50%) | | 1.7 | 1.2% |
| | | | Pits, gravel (50%) | | | |
| GrA | Groton gravelly fine sandy loam, 0 to 5 percent slopes | Not limited | Groton (85%) | | 0.5 | 0.4% |
| | | | Agawam (8%) | | | |
| | | | Colton (7%) | | | |

| Local Roads and Streets— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| GrB | Groton gravelly fine sandy loam, 5 to 12 percent slopes | Somewhat limited | Groton (85%) | Slope (0.04) | 3.2 | 2.3% |
| | | | Agawam (8%) | Slope (0.04) | | |
| | | | Colton (7%) | Slope (0.04) | | |
| Lh | Livingston clay | Very limited | Livingston (85%) | Depth to saturated zone (1.00) | 0.9 | 0.6% |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | Covington (8%) | Depth to saturated zone (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | | Frost action (0.50) | | |
| | | | Whately (7%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| Lk | Livingston silty clay, occasionally flooded | Very limited | Livingston (85%) | Depth to saturated zone (1.00) | 2.2 | 1.6% |
| | | | | Frost action (1.00) | | |
| | | | | Flooding (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | Vergennes (8%) | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Frost action (0.50) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | Whately (7%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| MnC | Massena stony silt loam, 0 to 15 percent slopes | Very limited | Massena (90%) | Frost action (1.00) | 0.4 | 0.3% |
| | | | | Depth to saturated zone (0.94) | | |
| | | | | Slope (0.04) | | |
| | | | Peacham, undrained (5%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |

| Local Roads and Streets— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| MoC | Massena extremely stony silt loam, 0 to 15 percent slopes | Very limited | Massena (90%) | Frost action (1.00) | 0.5 | 0.3% |
| | | | | Depth to saturated zone (0.94) | | |
| | | | | Slope (0.04) | | |
| | | | Peacham, undrained (5%) | Ponding (1.00) | | |
| | | | | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| SuB | Stockbridge and Nellis stony loams, 3 to 8 percent slopes | Somewhat limited | Stockbridge (43%) | Frost action (0.50) | 5.6 | 4.1% |
| | | | Nellis (43%) | Frost action (0.50) | | |
| | | | Georgia (5%) | Frost action (0.50) | | |
| | | | | Depth to saturated zone (0.03) | | |
| | | | Palatine (4%) | Frost action (0.50) | | |
| SxC | Stockbridge and Nellis extremely stony loams, 3 to 15 percent slopes | Somewhat limited | Stockbridge (43%) | Frost action (0.50) | 1.9 | 1.3% |
| | | | | Slope (0.04) | | |
| | | | Nellis (43%) | Frost action (0.50) | | |
| | | | | Slope (0.04) | | |
| | | | Georgia (5%) | Frost action (0.50) | | |
| | | | | Slope (0.04) | | |
| | | | | Depth to saturated zone (0.03) | | |
| | | | Palatine (4%) | Frost action (0.50) | | |
| | | | | Slope (0.04) | | |

| Local Roads and Streets— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| VeB | Vergennes clay, 2 to 6 percent slopes | Very limited | Vergennes (85%) | Low strength (1.00) | 26.8 | 19.3% |
| | | | | Shrink-swell (0.50) | | |
| | | | | Frost action (0.50) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | Covington (5%) | Depth to saturated zone (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | | Frost action (0.50) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Frost action (0.50) | | |
| | | | | Depth to hard bedrock (0.42) | | |
| | | | | Depth to saturated zone (0.19) | | |

| Local Roads and Streets— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| VeC | Vergennes clay, 6 to 12 percent slopes | Very limited | Vergennes (85%) | Low strength (1.00) | 2.5 | 1.8% |
| | | | | Shrink-swell (0.50) | | |
| | | | | Frost action (0.50) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | | Slope (0.04) | | |
| | | | Covington (5%) | Depth to saturated zone (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | | Frost action (0.50) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Frost action (0.50) | | |
| | | | | Depth to hard bedrock (0.42) | | |
| | | | | Depth to saturated zone (0.19) | | |
| VeD | Vergennes clay, 12 to 25 percent slopes | Very limited | Vergennes (90%) | Low strength (1.00) | 23.0 | 16.6% |
| | | | | Slope (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Frost action (0.50) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Low strength (1.00) | | |
| | | | | Slope (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Frost action (0.50) | | |
| | | | | Depth to hard bedrock (0.42) | | |

| Local Roads and Streets— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| VeE | Vergennes clay, 25 to 60 percent slopes | Very limited | Vergennes (90%) | Slope (1.00) | 32.6 | 23.4% |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Frost action (0.50) | | |
| | | | | Depth to saturated zone (0.19) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Frost action (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Slope (1.00) | | |
| | | | | Low strength (1.00) | | |
| | | | | Shrink-swell (0.50) | | |
| | | | | Frost action (0.50) | | |
| | | | | Depth to hard bedrock (0.42) | | |
| W | Water | Not rated | Water (100%) | | 1.2 | 0.9% |
| **Totals for Area of Interest** | | | | | **138.9** | **100.0%** |

| Local Roads and Streets— Summary by Rating Value | | |
|---|---|---|
| **Rating** | **Acres in AOI** | **Percent of AOI** |
| Very limited | 124.7 | 89.8% |
| Somewhat limited | 10.7 | 7.7% |
| Not limited | 0.5 | 0.4% |
| Null or Not Rated | 2.9 | 2.1% |
| **Totals for Area of Interest** | **138.9** | **100.0%** |

### Rating Options—Local Roads and Streets (Co-Housing Trail)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site

classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

## Hydric Rating by Map Unit (Co-Housing Trail)

This rating indicates the proportion of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is designated as "all hydric," "partially hydric," "not hydric," or "unknown hydric," depending on the rating of its respective components.

"All hydric" means that all components listed for a given map unit are rated as being hydric, while "not hydric" means that all components are rated as not hydric. "Partially hydric" means that at least one component of the map unit is rated as hyric, and at least one component is rated as not hydric. "Unknown hydric" indicates that at least one component is not rated so a definitive rating for the map unit cannot be made.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

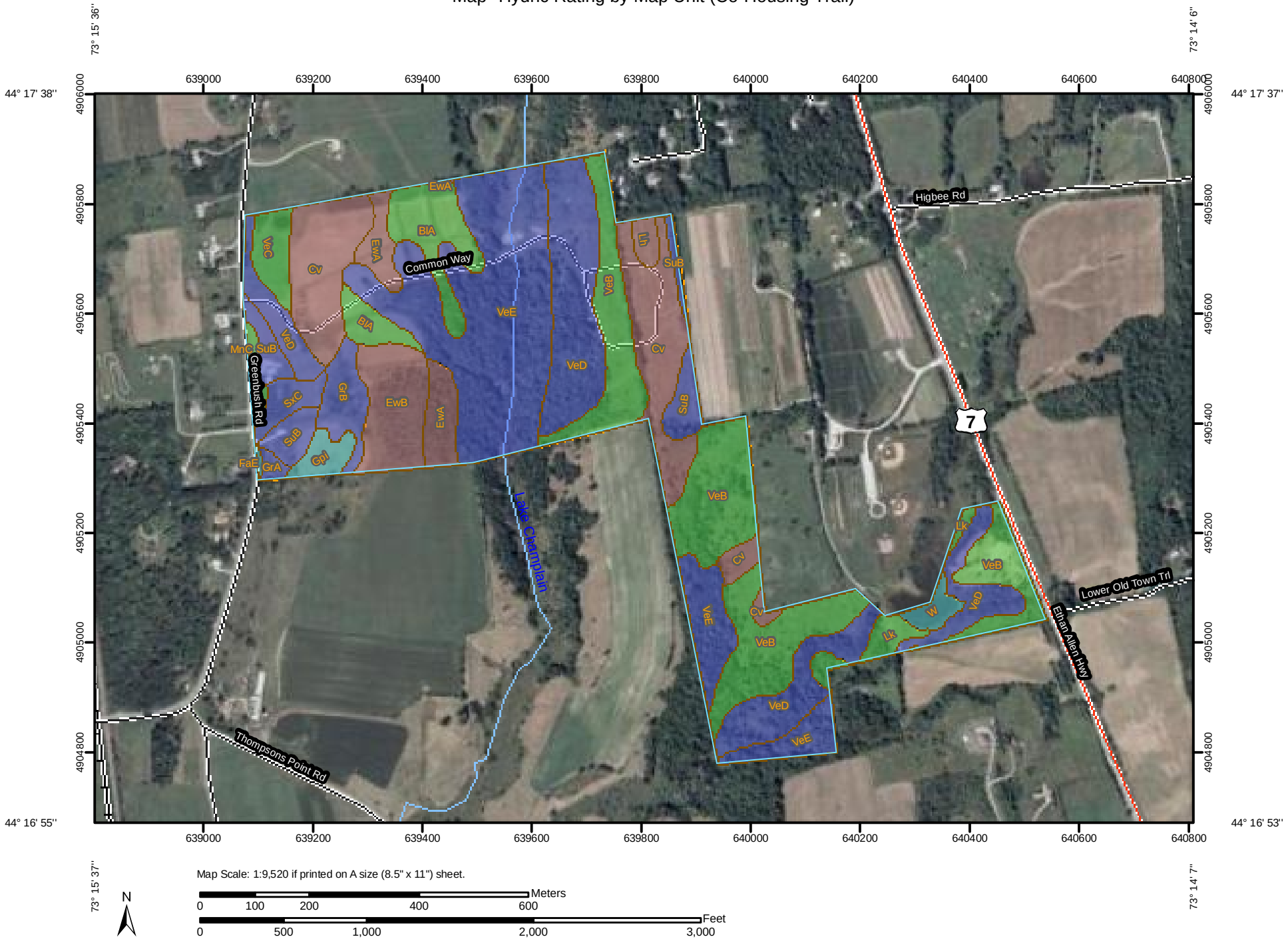
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

# Custom Soil Resource Report
## Map--Hydric Rating by Map Unit (Co-Housing Trail)




Map Scale: 1:9,520 if printed on A size (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 500 1,000 2,000 3,000

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Units

**Soil Ratings**

- All Hydric
- Partially Hydric
- Not Hydric
- Unknown Hydric
- Not rated or not available

**Political Features**

- Cities

**Water Features**

- Oceans
- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

## MAP INFORMATION

Map Scale: 1:9,520 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chittenden County, Vermont
Survey Area Data: Version 12, Jul 10, 2008

Date(s) aerial images were photographed: 8/19/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

### Table—Hydric Rating by Map Unit (Co-Housing Trail)

| Hydric Rating by Map Unit— Summary by Map Unit — Chittenden County, Vermont | | | | |
|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Acres in AOI** | **Percent of AOI** |
| BlA | Belgrade and Eldridge soils, 0 to 3 percent slopes | Partially Hydric | 7.1 | 5.1% |
| Cv | Covington silty clay | All Hydric | 17.5 | 12.6% |
| EwA | Enosburg and Whately soils, 0 to 3 percent slopes | All Hydric | 4.6 | 3.3% |
| EwB | Enosburg and Whately soils, 3 to 8 percent slopes | All Hydric | 6.5 | 4.7% |
| FaE | Farmington extremely rocky loam, 20 to 60 percent slopes | Unknown Hydric | 0.1 | 0.1% |
| Gpi | Pits, sand and Pits, gravel | Unknown Hydric | 1.7 | 1.2% |
| GrA | Groton gravelly fine sandy loam, 0 to 5 percent slopes | Not Hydric | 0.5 | 0.4% |
| GrB | Groton gravelly fine sandy loam, 5 to 12 percent slopes | Not Hydric | 3.2 | 2.3% |
| Lh | Livingston clay | All Hydric | 0.9 | 0.6% |
| Lk | Livingston silty clay, occasionally flooded | Partially Hydric | 2.2 | 1.6% |
| MnC | Massena stony silt loam, 0 to 15 percent slopes | Partially Hydric | 0.4 | 0.3% |
| MoC | Massena extremely stony silt loam, 0 to 15 percent slopes | Partially Hydric | 0.5 | 0.3% |
| SuB | Stockbridge and Nellis stony loams, 3 to 8 percent slopes | Not Hydric | 5.6 | 4.1% |
| SxC | Stockbridge and Nellis extremely stony loams, 3 to 15 percent slopes | Not Hydric | 1.9 | 1.3% |
| VeB | Vergennes clay, 2 to 6 percent slopes | Partially Hydric | 26.8 | 19.3% |
| VeC | Vergennes clay, 6 to 12 percent slopes | Partially Hydric | 2.5 | 1.8% |
| VeD | Vergennes clay, 12 to 25 percent slopes | Not Hydric | 23.0 | 16.6% |
| VeE | Vergennes clay, 25 to 60 percent slopes | Not Hydric | 32.6 | 23.4% |
| W | Water | Unknown Hydric | 1.2 | 0.9% |
| **Totals for Area of Interest** | | | **138.9** | **100.0%** |

### Rating Options—Hydric Rating by Map Unit (Co-Housing Trail)

*Aggregation Method:* Absence/Presence

*Tie-break Rule:* Lower

## Hydric Rating by Map Unit (Co-Housing Trail)

This rating indicates the proportion of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of

which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is designated as "all hydric," "partially hydric," "not hydric," or "unknown hydric," depending on the rating of its respective components.

"All hydric" means that all components listed for a given map unit are rated as being hydric, while "not hydric" means that all components are rated as not hydric. "Partially hydric" means that at least one component of the map unit is rated as hyric, and at least one component is rated as not hydric. "Unknown hydric" indicates that at least one component is not rated so a definitive rating for the map unit cannot be made.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

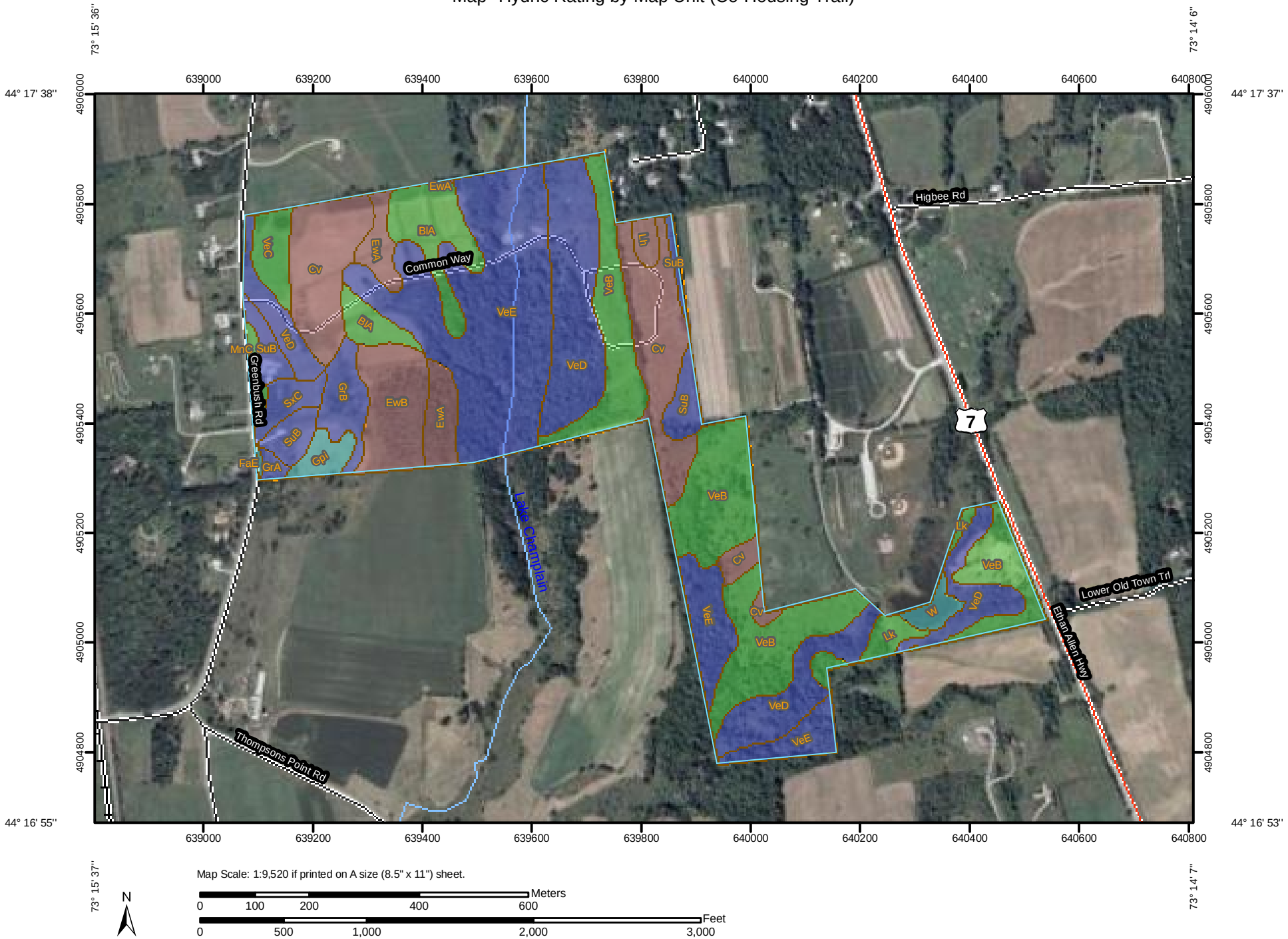
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

# Custom Soil Resource Report
## Map--Hydric Rating by Map Unit (Co-Housing Trail)




Map Scale: 1:9,520 if printed on A size (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 500 1,000 2,000 3,000

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Units

**Soil Ratings**

- All Hydric
- Partially Hydric
- Not Hydric
- Unknown Hydric
- Not rated or not available

**Political Features**

- Cities

**Water Features**

- Oceans
- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

## MAP INFORMATION

Map Scale: 1:9,520 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chittenden County, Vermont
Survey Area Data: Version 12, Jul 10, 2008

Date(s) aerial images were photographed: 8/19/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

### Table—Hydric Rating by Map Unit (Co-Housing Trail)

| Hydric Rating by Map Unit— Summary by Map Unit — Chittenden County, Vermont | | | | |
|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Acres in AOI** | **Percent of AOI** |
| BlA | Belgrade and Eldridge soils, 0 to 3 percent slopes | Partially Hydric | 7.1 | 5.1% |
| Cv | Covington silty clay | All Hydric | 17.5 | 12.6% |
| EwA | Enosburg and Whately soils, 0 to 3 percent slopes | All Hydric | 4.6 | 3.3% |
| EwB | Enosburg and Whately soils, 3 to 8 percent slopes | All Hydric | 6.5 | 4.7% |
| FaE | Farmington extremely rocky loam, 20 to 60 percent slopes | Unknown Hydric | 0.1 | 0.1% |
| Gpi | Pits, sand and Pits, gravel | Unknown Hydric | 1.7 | 1.2% |
| GrA | Groton gravelly fine sandy loam, 0 to 5 percent slopes | Not Hydric | 0.5 | 0.4% |
| GrB | Groton gravelly fine sandy loam, 5 to 12 percent slopes | Not Hydric | 3.2 | 2.3% |
| Lh | Livingston clay | All Hydric | 0.9 | 0.6% |
| Lk | Livingston silty clay, occasionally flooded | Partially Hydric | 2.2 | 1.6% |
| MnC | Massena stony silt loam, 0 to 15 percent slopes | Partially Hydric | 0.4 | 0.3% |
| MoC | Massena extremely stony silt loam, 0 to 15 percent slopes | Partially Hydric | 0.5 | 0.3% |
| SuB | Stockbridge and Nellis stony loams, 3 to 8 percent slopes | Not Hydric | 5.6 | 4.1% |
| SxC | Stockbridge and Nellis extremely stony loams, 3 to 15 percent slopes | Not Hydric | 1.9 | 1.3% |
| VeB | Vergennes clay, 2 to 6 percent slopes | Partially Hydric | 26.8 | 19.3% |
| VeC | Vergennes clay, 6 to 12 percent slopes | Partially Hydric | 2.5 | 1.8% |
| VeD | Vergennes clay, 12 to 25 percent slopes | Not Hydric | 23.0 | 16.6% |
| VeE | Vergennes clay, 25 to 60 percent slopes | Not Hydric | 32.6 | 23.4% |
| W | Water | Unknown Hydric | 1.2 | 0.9% |
| **Totals for Area of Interest** | | | **138.9** | **100.0%** |

### Rating Options—Hydric Rating by Map Unit (Co-Housing Trail)

*Aggregation Method:* Absence/Presence

*Tie-break Rule:* Lower

# Land Management

Land management interpretations are tools designed to guide the user in evaluating existing conditions in planning and predicting the soil response to various land

management practices, for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture, and rangeland. Example interpretations include suitability for a variety of irrigation practices, log landings, haul roads and major skid trails, equipment operability, site preparation, suitability for hand and mechanical planting, potential erosion hazard associated with various practices, and ratings for fencing and waterline installation.

## Erosion Hazard (Off-Road, Off-Trail) (Co-Housing Trail)

The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The ratings are based on slope and soil erosion factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance.

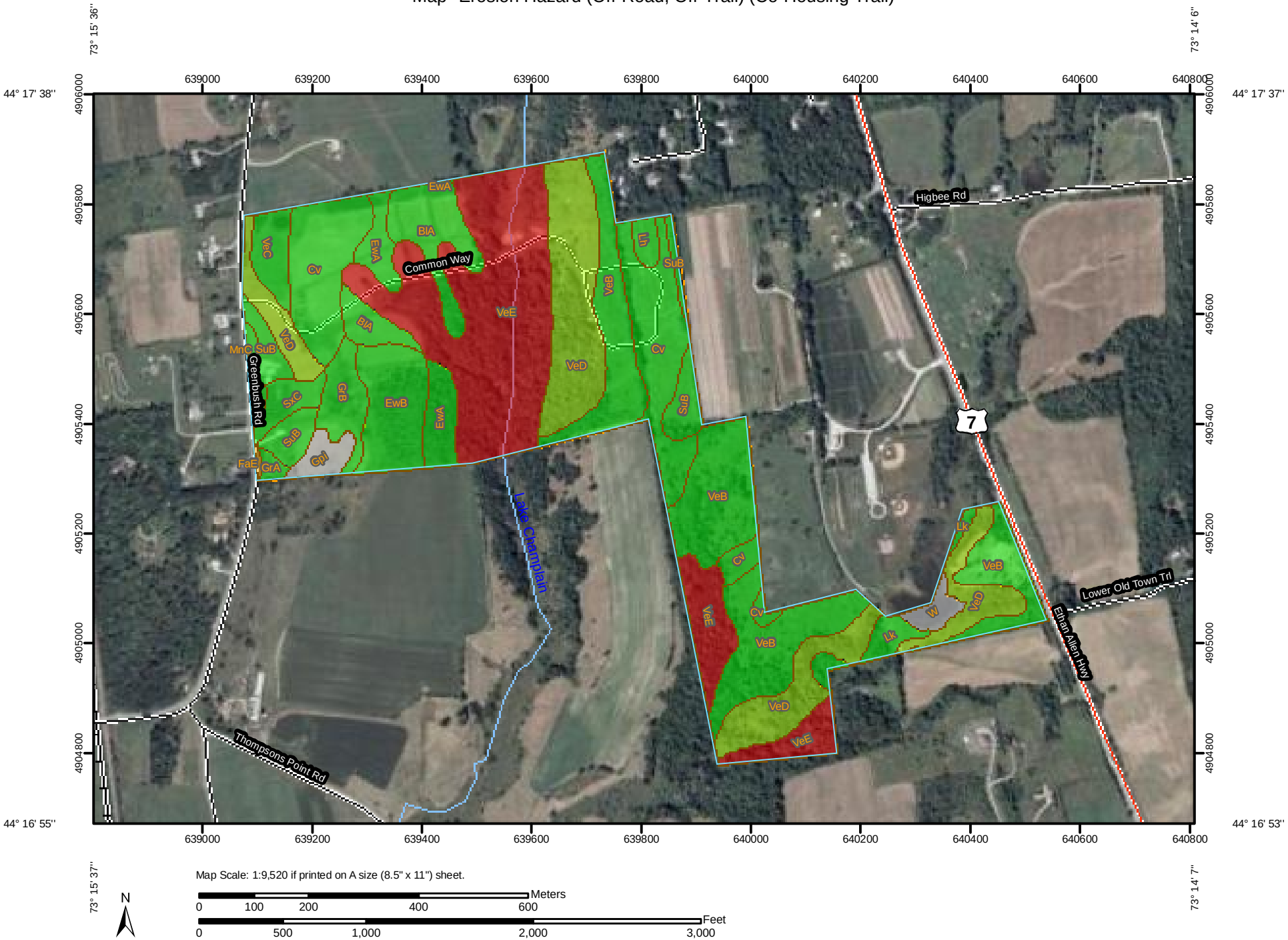
The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

# Custom Soil Resource Report
## Map--Erosion Hazard (Off-Road, Off-Trail) (Co-Housing Trail)



## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Units

**Soil Ratings**

- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

**Political Features**

- Cities

**Water Features**

- Oceans
- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

## MAP INFORMATION

Map Scale: 1:9,520 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chittenden County, Vermont
Survey Area Data: Version 12, Jul 10, 2008

Date(s) aerial images were photographed: 8/19/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Tables—Erosion Hazard (Off-Road, Off-Trail) (Co-Housing Trail)

| Erosion Hazard (Off-Road, Off-Trail)— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
| BlA | Belgrade and Eldridge soils, 0 to 3 percent slopes | Slight | Belgrade (45%) | | 7.1 | 5.1% |
| | | | Eldridge (45%) | | | |
| | | | Enosburg (5%) | | | |
| | | | Raynham (5%) | | | |
| Cv | Covington silty clay | Slight | Covington (90%) | | 17.5 | 12.6% |
| | | | Livingston (10%) | | | |
| EwA | Enosburg and Whately soils, 0 to 3 percent slopes | Slight | Enosburg (43%) | | 4.6 | 3.3% |
| | | | Whately (43%) | | | |
| | | | Raynham (7%) | | | |
| | | | Swanton (7%) | | | |
| EwB | Enosburg and Whately soils, 3 to 8 percent slopes | Slight | Enosburg (43%) | | 6.5 | 4.7% |
| | | | Whately (43%) | | | |
| | | | Raynham (7%) | | | |
| | | | Swanton (7%) | | | |
| FaE | Farmington extremely rocky loam, 20 to 60 percent slopes | Severe | Farmington (80%) | Slope/erodibility (0.75) | 0.1 | 0.1% |
| | | | Woodstock (3%) | Slope/erodibility (0.75) | | |
| | | | Benson (3%) | Slope/erodibility (0.75) | | |
| | | | Galoo (3%) | Slope/erodibility (0.75) | | |
| | | | Galway (3%) | Slope/erodibility (0.75) | | |
| | | | Palatine (3%) | Slope/erodibility (0.75) | | |
| Gpi | Pits, sand and Pits, gravel | Not rated | Pits, sand (50%) | | 1.7 | 1.2% |
| | | | Pits, gravel (50%) | | | |
| GrA | Groton gravelly fine sandy loam, 0 to 5 percent slopes | Slight | Groton (85%) | | 0.5 | 0.4% |
| | | | Agawam (8%) | | | |
| | | | Colton (7%) | | | |
| GrB | Groton gravelly fine sandy loam, 5 to 12 percent slopes | Slight | Groton (85%) | | 3.2 | 2.3% |
| | | | Agawam (8%) | | | |
| | | | Colton (7%) | | | |
| Lh | Livingston clay | Slight | Livingston (85%) | | 0.9 | 0.6% |
| | | | Covington (8%) | | | |
| | | | Whately (7%) | | | |
| Lk | Livingston silty clay, occasionally flooded | Slight | Livingston (85%) | | 2.2 | 1.6% |
| | | | Vergennes (8%) | | | |
| | | | Whately (7%) | | | |

| Erosion Hazard (Off-Road, Off-Trail)— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| MnC | Massena stony silt loam, 0 to 15 percent slopes | Slight | Massena (90%) | | 0.4 | 0.3% |
| | | | Georgia (5%) | | | |
| | | | Peacham, undrained (5%) | | | |
| MoC | Massena extremely stony silt loam, 0 to 15 percent slopes | Slight | Massena (90%) | | 0.5 | 0.3% |
| | | | Georgia (5%) | | | |
| | | | Peacham, undrained (5%) | | | |
| SuB | Stockbridge and Nellis stony loams, 3 to 8 percent slopes | Slight | Stockbridge (43%) | | 5.6 | 4.1% |
| | | | Nellis (43%) | | | |
| | | | Georgia (5%) | | | |
| | | | Massena (5%) | | | |
| | | | Palatine (4%) | | | |
| SxC | Stockbridge and Nellis extremely stony loams, 3 to 15 percent slopes | Slight | Stockbridge (43%) | | 1.9 | 1.3% |
| | | | Nellis (43%) | | | |
| | | | Georgia (5%) | | | |
| | | | Massena (5%) | | | |
| | | | Palatine (4%) | | | |
| VeB | Vergennes clay, 2 to 6 percent slopes | Slight | Vergennes (85%) | | 26.8 | 19.3% |
| | | | Covington (5%) | | | |
| | | | Kingsbury (5%) | | | |
| | | | Vergennes, moderately shallow variant (5%) | | | |
| VeC | Vergennes clay, 6 to 12 percent slopes | Slight | Vergennes (85%) | | 2.5 | 1.8% |
| | | | Covington (5%) | | | |
| | | | Kingsbury (5%) | | | |
| | | | Vergennes, moderately shallow variant (5%) | | | |
| VeD | Vergennes clay, 12 to 25 percent slopes | Moderate | Vergennes (90%) | Slope/erodibility (0.50) | 23.0 | 16.6% |
| | | | Vergennes, moderately shallow variant (5%) | Slope/erodibility (0.50) | | |
| VeE | Vergennes clay, 25 to 60 percent slopes | Very severe | Vergennes (90%) | Slope/erodibility (0.95) | 32.6 | 23.4% |
| | | | Vergennes, moderately shallow variant (5%) | Slope/erodibility (0.95) | | |
| W | Water | Not rated | Water (100%) | | 1.2 | 0.9% |
| **Totals for Area of Interest** | | | | | **138.9** | **100.0%** |

| Erosion Hazard (Off-Road, Off-Trail)— Summary by Rating Value | | |
|---|---|---|
| **Rating** | **Acres in AOI** | **Percent of AOI** |
| Slight | 80.3 | 57.8% |
| Very severe | 32.6 | 23.4% |
| Moderate | 23.0 | 16.6% |
| Severe | 0.1 | 0.1% |
| Null or Not Rated | 2.9 | 2.1% |
| **Totals for Area of Interest** | **138.9** | **100.0%** |

### Rating Options—Erosion Hazard (Off-Road, Off-Trail) (Co-Housing Trail)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

## Suitability for Roads (Natural Surface) (VT) (Co-Housing Trail)

The ratings in this interpretation indicate the suitability for using the natural surface of the soil for roads. The ratings are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification of the soil, depth to a water table, ponding, flooding, and the hazard of soil slippage.

The ratings are both verbal and numerical. The soils are described as "well suited," "moderately suited," or "poorly suited" to this use. "Well suited" indicates that the soil has features that are favorable for the specified kind of roads and has no limitations. Good performance can be expected, and little or no maintenance is needed. "Moderately suited" indicates that the soil has features that are moderately favorable for the specified kind of roads. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. "Poorly suited" indicates that the soil has one or more properties that are unfavorable for the specified kind of roads. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration.

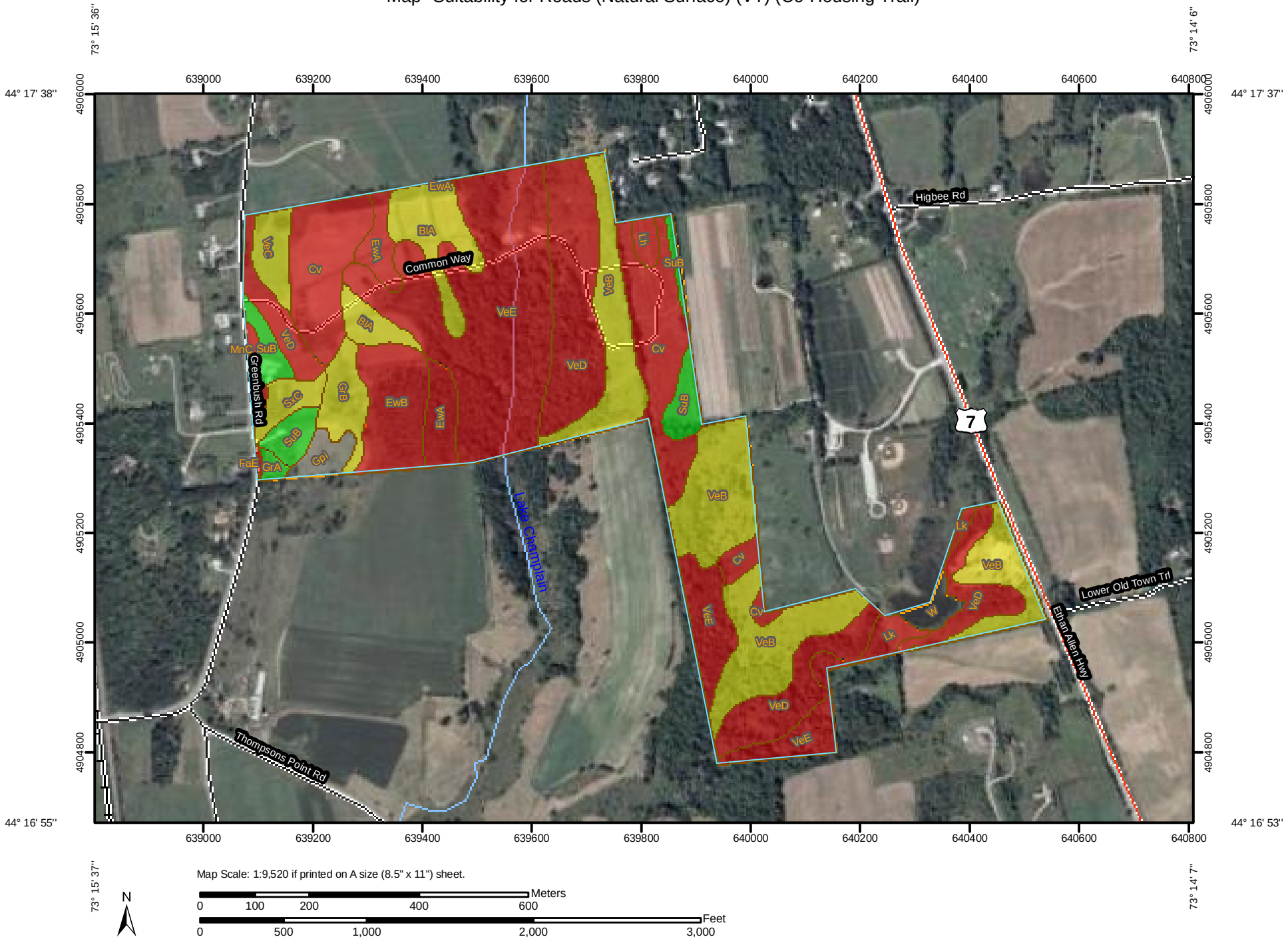
Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified aspect of forestland management (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The

percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the Selected Soil Interpretations report with this interpretation included from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

# Custom Soil Resource Report
## Map--Suitability for Roads (Natural Surface) (VT) (Co-Housing Trail)



## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Units

**Soil Ratings**

- Poorly suited
- Moderately suited
- Well suited
- not rated or not available

**Political Features**

- Cities

**Water Features**

- Oceans
- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

## MAP INFORMATION

Map Scale: 1:9,520 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chittenden County, Vermont
Survey Area Data: Version 12, Jul 10, 2008

Date(s) aerial images were photographed: 8/19/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Tables—Suitability for Roads (Natural Surface) (VT) (Co-Housing Trail)

| Suitability for Roads (Natural Surface) (VT)— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| BlA | Belgrade and Eldridge soils, 0 to 3 percent slopes | Moderately suited | Belgrade (45%) | Wetness (0.08) | 7.1 | 5.1% |
| | | | Eldridge (45%) | Wetness (0.96) | | |
| Cv | Covington silty clay | Poorly suited | Covington (90%) | Wetness (1.00) | 17.5 | 12.6% |
| | | | | Low strength (0.50) | | |
| | | | Livingston (10%) | Low strength (1.00) | | |
| | | | | Wetness (1.00) | | |
| EwA | Enosburg and Whately soils, 0 to 3 percent slopes | Poorly suited | Enosburg (43%) | Wetness (1.00) | 4.6 | 3.3% |
| | | | Whately (43%) | Wetness (1.00) | | |
| | | | Raynham (7%) | Wetness (1.00) | | |
| | | | | Low strength (0.50) | | |
| | | | Swanton (7%) | Wetness (1.00) | | |
| EwB | Enosburg and Whately soils, 3 to 8 percent slopes | Poorly suited | Enosburg (43%) | Wetness (1.00) | 6.5 | 4.7% |
| | | | Whately (43%) | Wetness (1.00) | | |
| | | | Raynham (7%) | Wetness (1.00) | | |
| | | | | Low strength (0.50) | | |
| | | | Swanton (7%) | Wetness (1.00) | | |
| FaE | Farmington extremely rocky loam, 20 to 60 percent slopes | Poorly suited | Farmington (80%) | Slope (1.00) | 0.1 | 0.1% |
| | | | Woodstock (3%) | Slope (1.00) | | |
| | | | Benson (3%) | Slope (1.00) | | |
| | | | Galoo (3%) | Slope (1.00) | | |
| | | | Galway (3%) | Slope (1.00) | | |
| | | | Palatine (3%) | Slope (1.00) | | |
| Gpi | Pits, sand and Pits, gravel | Not rated | Pits, sand (50%) | | 1.7 | 1.2% |
| | | | Pits, gravel (50%) | | | |
| GrA | Groton gravelly fine sandy loam, 0 to 5 percent slopes | Well suited | Groton (85%) | | 0.5 | 0.4% |
| | | | Agawam (8%) | | | |
| | | | Colton (7%) | | | |
| GrB | Groton gravelly fine sandy loam, 5 to 12 percent slopes | Moderately suited | Groton (85%) | Slope (0.50) | 3.2 | 2.3% |
| | | | Agawam (8%) | Slope (0.50) | | |
| | | | Colton (7%) | Slope (0.50) | | |

| Suitability for Roads (Natural Surface) (VT)— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| Lh | Livingston clay | Poorly suited | Livingston (85%) | Low strength (1.00) | 0.9 | 0.6% |
| | | | | Wetness (1.00) | | |
| | | | Covington (8%) | Wetness (1.00) | | |
| | | | | Low strength (0.50) | | |
| | | | Whately (7%) | Wetness (1.00) | | |
| Lk | Livingston silty clay, occasionally flooded | Poorly suited | Livingston (85%) | Flooding (1.00) | 2.2 | 1.6% |
| | | | | Low strength (1.00) | | |
| | | | | Wetness (1.00) | | |
| | | | Whately (7%) | Wetness (1.00) | | |
| MnC | Massena stony silt loam, 0 to 15 percent slopes | Poorly suited | Massena (90%) | Wetness (1.00) | 0.4 | 0.3% |
| | | | | Slope (0.50) | | |
| | | | Peacham, undrained (5%) | Ponding (1.00) | | |
| | | | | Wetness (1.00) | | |
| MoC | Massena extremely stony silt loam, 0 to 15 percent slopes | Poorly suited | Massena (90%) | Wetness (1.00) | 0.5 | 0.3% |
| | | | | Slope (0.50) | | |
| | | | | Rock fragments (0.50) | | |
| | | | Peacham, undrained (5%) | Ponding (1.00) | | |
| | | | | Wetness (1.00) | | |
| SuB | Stockbridge and Nellis stony loams, 3 to 8 percent slopes | Well suited | Stockbridge (43%) | | 5.6 | 4.1% |
| | | | Nellis (43%) | | | |
| | | | Georgia (5%) | | | |
| | | | Palatine (4%) | | | |
| SxC | Stockbridge and Nellis extremely stony loams, 3 to 15 percent slopes | Moderately suited | Stockbridge (43%) | Slope (0.50) | 1.9 | 1.3% |
| | | | | Rock fragments (0.50) | | |
| | | | Nellis (43%) | Slope (0.50) | | |
| | | | | Rock fragments (0.50) | | |
| | | | Georgia (5%) | Slope (0.50) | | |
| | | | | Rock fragments (0.50) | | |
| | | | Palatine (4%) | Slope (0.50) | | |
| VeB | Vergennes clay, 2 to 6 percent slopes | Moderately suited | Vergennes (85%) | Stickiness; high plasticity index (0.50) | 26.8 | 19.3% |
| | | | | Low strength (0.50) | | |
| | | | Vergennes, moderately shallow variant (5%) | Low strength (0.50) | | |
| | | | | Stickiness; high plasticity index (0.50) | | |

| Suitability for Roads (Natural Surface) (VT)— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| VeC | Vergennes clay, 6 to 12 percent slopes | Moderately suited | Vergennes (85%) | Slope (0.50) | 2.5 | 1.8% |
| | | | | Stickiness; high plasticity index (0.50) | | |
| | | | | Low strength (0.50) | | |
| | | | Vergennes, moderately shallow variant (5%) | Slope (0.50) | | |
| | | | | Low strength (0.50) | | |
| | | | | Stickiness; high plasticity index (0.50) | | |
| VeD | Vergennes clay, 12 to 25 percent slopes | Poorly suited | Vergennes (90%) | Slope (1.00) | 23.0 | 16.6% |
| | | | | Stickiness; high plasticity index (0.50) | | |
| | | | | Low strength (0.50) | | |
| | | | Kingsbury (5%) | Wetness (1.00) | | |
| | | | | Low strength (0.50) | | |
| | | | Vergennes, moderately shallow variant (5%) | Slope (1.00) | | |
| | | | | Low strength (0.50) | | |
| | | | | Stickiness; high plasticity index (0.50) | | |
| VeE | Vergennes clay, 25 to 60 percent slopes | Poorly suited | Vergennes (90%) | Slope (1.00) | 32.6 | 23.4% |
| | | | | Stickiness; high plasticity index (0.50) | | |
| | | | | Low strength (0.50) | | |
| | | | Kingsbury (5%) | Wetness (1.00) | | |
| | | | | Low strength (0.50) | | |
| | | | Vergennes, moderately shallow variant (5%) | Slope (1.00) | | |
| | | | | Low strength (0.50) | | |
| | | | | Stickiness; high plasticity index (0.50) | | |
| W | Water | Not rated | Water (100%) | | 1.2 | 0.9% |
| **Totals for Area of Interest** | | | | | **138.9** | **100.0%** |

| Suitability for Roads (Natural Surface) (VT)— Summary by Rating Value | | |
|---|---|---|
| **Rating** | **Acres in AOI** | **Percent of AOI** |
| Poorly suited | 88.4 | 63.6% |
| Moderately suited | 41.4 | 29.8% |
| Well suited | 6.2 | 4.4% |

| Suitability for Roads (Natural Surface) (VT)— Summary by Rating Value | | |
|---|---|---|
| Rating | Acres in AOI | Percent of AOI |
| Null or Not Rated | 2.9 | 2.1% |
| **Totals for Area of Interest** | **138.9** | **100.0%** |

### Rating Options—Suitability for Roads (Natural Surface) (VT) (Co-Housing Trail)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# Recreational Development

Recreational Development interpretations are tools designed to guide the user in identifying and evaluating the suitability of the soil for specific recreational uses. Example interpretations include camp areas, picnic areas, playgrounds, paths and trails, and off-road motorcycle trails.

## Paths and Trails (Co-Housing Trail)

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling.

The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

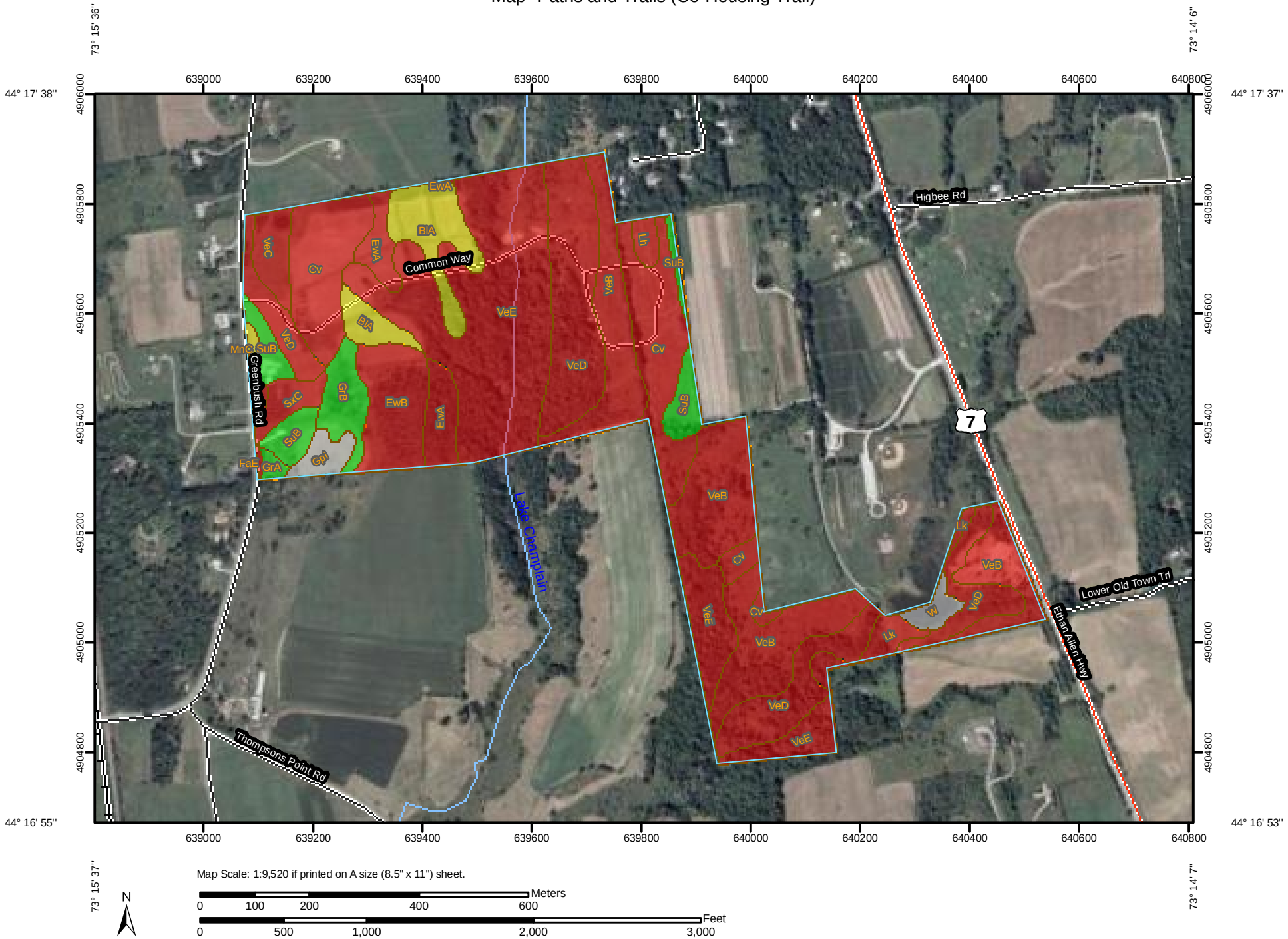
The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

# Custom Soil Resource Report
## Map--Paths and Trails (Co-Housing Trail)



## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

- Soil Map Units

**Soil Ratings**

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

**Political Features**

- Cities

**Water Features**

- Oceans
- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

## MAP INFORMATION

Map Scale: 1:9,520 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chittenden County, Vermont
Survey Area Data: Version 12, Jul 10, 2008

Date(s) aerial images were photographed: 8/19/2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Tables—Paths and Trails (Co-Housing Trail)

| Paths and Trails— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| BlA | Belgrade and Eldridge soils, 0 to 3 percent slopes | Somewhat limited | Belgrade (45%) | Depth to saturated zone (0.04) | 7.1 | 5.1% |
| | | | Eldridge (45%) | Depth to saturated zone (0.62) | | |
| | | | | Too sandy (0.53) | | |
| Cv | Covington silty clay | Very limited | Covington (90%) | Depth to saturated zone (1.00) | 17.5 | 12.6% |
| | | | | Too clayey (1.00) | | |
| | | | Livingston (10%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| EwA | Enosburg and Whately soils, 0 to 3 percent slopes | Very limited | Enosburg (43%) | Depth to saturated zone (1.00) | 4.6 | 3.3% |
| | | | | Too sandy (0.52) | | |
| | | | Whately (43%) | Depth to saturated zone (1.00) | | |
| | | | Raynham (7%) | Depth to saturated zone (1.00) | | |
| | | | Swanton (7%) | Depth to saturated zone (1.00) | | |
| EwB | Enosburg and Whately soils, 3 to 8 percent slopes | Very limited | Enosburg (43%) | Depth to saturated zone (1.00) | 6.5 | 4.7% |
| | | | | Too sandy (0.52) | | |
| | | | Whately (43%) | Depth to saturated zone (1.00) | | |
| | | | Raynham (7%) | Depth to saturated zone (1.00) | | |
| | | | Swanton (7%) | Depth to saturated zone (1.00) | | |
| FaE | Farmington extremely rocky loam, 20 to 60 percent slopes | Very limited | Farmington (80%) | Slope (1.00) | 0.1 | 0.1% |
| | | | Woodstock (3%) | Slope (1.00) | | |
| | | | | Too sandy (0.01) | | |
| | | | Benson (3%) | Slope (1.00) | | |
| | | | Galoo (3%) | Slope (1.00) | | |
| | | | Galway (3%) | Slope (1.00) | | |
| | | | | Large stones content (0.53) | | |
| | | | Palatine (3%) | Slope (1.00) | | |
| Gpi | Pits, sand and Pits, gravel | Not rated | Pits, sand (50%) | | 1.7 | 1.2% |
| | | | Pits, gravel (50%) | | | |

| Paths and Trails— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| GrA | Groton gravelly fine sandy loam, 0 to 5 percent slopes | Not limited | Groton (85%) | | 0.5 | 0.4% |
| | | | Agawam (8%) | | | |
| GrB | Groton gravelly fine sandy loam, 5 to 12 percent slopes | Not limited | Groton (85%) | | 3.2 | 2.3% |
| | | | Agawam (8%) | | | |
| Lh | Livingston clay | Very limited | Livingston (85%) | Depth to saturated zone (1.00) | 0.9 | 0.6% |
| | | | | Too clayey (1.00) | | |
| | | | Covington (8%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Whately (7%) | Depth to saturated zone (1.00) | | |
| Lk | Livingston silty clay, occasionally flooded | Very limited | Livingston (85%) | Depth to saturated zone (1.00) | 2.2 | 1.6% |
| | | | | Too clayey (1.00) | | |
| | | | Vergennes (8%) | Too clayey (1.00) | | |
| | | | Whately (7%) | Depth to saturated zone (1.00) | | |
| MnC | Massena stony silt loam, 0 to 15 percent slopes | Somewhat limited | Massena (90%) | Depth to saturated zone (0.86) | 0.4 | 0.3% |
| MoC | Massena extremely stony silt loam, 0 to 15 percent slopes | Very limited | Massena (90%) | Large stones content (1.00) | 0.5 | 0.3% |
| | | | | Depth to saturated zone (0.86) | | |
| | | | Georgia (5%) | Large stones content (1.00) | | |
| SuB | Stockbridge and Nellis stony loams, 3 to 8 percent slopes | Not limited | Stockbridge (43%) | | 5.6 | 4.1% |
| | | | Nellis (43%) | | | |
| | | | Georgia (5%) | | | |
| | | | Palatine (4%) | | | |
| SxC | Stockbridge and Nellis extremely stony loams, 3 to 15 percent slopes | Very limited | Stockbridge (43%) | Large stones content (1.00) | 1.9 | 1.3% |
| | | | Nellis (43%) | Large stones content (1.00) | | |
| | | | Georgia (5%) | Large stones content (1.00) | | |
| | | | Massena (5%) | Large stones content (1.00) | | |
| | | | | Depth to saturated zone (0.86) | | |

| Paths and Trails— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Component name (percent)** | **Rating reasons (numeric values)** | **Acres in AOI** | **Percent of AOI** |
| VeB | Vergennes clay, 2 to 6 percent slopes | Very limited | Vergennes (85%) | Too clayey (1.00) | 26.8 | 19.3% |
| | | | Covington (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Too clayey (1.00) | | |
| VeC | Vergennes clay, 6 to 12 percent slopes | Very limited | Vergennes (85%) | Too clayey (1.00) | 2.5 | 1.8% |
| | | | | Water erosion (1.00) | | |
| | | | Covington (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Too clayey (1.00) | | |
| | | | | Water erosion (1.00) | | |
| VeD | Vergennes clay, 12 to 25 percent slopes | Very limited | Vergennes (90%) | Water erosion (1.00) | 23.0 | 16.6% |
| | | | | Too clayey (1.00) | | |
| | | | | Slope (0.18) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Water erosion (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | | Slope (0.18) | | |
| VeE | Vergennes clay, 25 to 60 percent slopes | Very limited | Vergennes (90%) | Slope (1.00) | 32.6 | 23.4% |
| | | | | Water erosion (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Kingsbury (5%) | Depth to saturated zone (1.00) | | |
| | | | | Too clayey (1.00) | | |
| | | | Vergennes, moderately shallow variant (5%) | Slope (1.00) | | |
| | | | | Water erosion (1.00) | | |
| | | | | Too clayey (1.00) | | |

| Paths and Trails— Summary by Map Unit — Chittenden County, Vermont | | | | | | |
|---|---|---|---|---|---|---|
| Map unit symbol | Map unit name | Rating | Component name (percent) | Rating reasons (numeric values) | Acres in AOI | Percent of AOI |
| W | Water | Not rated | Water (100%) | | 1.2 | 0.9% |
| **Totals for Area of Interest** | | | | | **138.9** | **100.0%** |

| Paths and Trails— Summary by Rating Value | | |
|---|---|---|
| Rating | Acres in AOI | Percent of AOI |
| Very limited | 119.1 | 85.7% |
| Not limited | 9.4 | 6.8% |
| Somewhat limited | 7.5 | 5.4% |
| Null or Not Rated | 2.9 | 2.1% |
| **Totals for Area of Interest** | **138.9** | **100.0%** |

## Rating Options—Paths and Trails (Co-Housing Trail)

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

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