TOWN HINESBURG, VERMONT

Water Source Feasibility Study

June 2013

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SECTION 1

EXECUTIVE SUMMARY

SECTION 1: EXECUTIVE SUMMARY

The Town of Hinesburg retained Aldrich + Elliott (A+E) to perform a water source feasibility study to evaluate possible alternatives for supplying additional water to the Town's water system. In September 2012, the State of Vermont, Department of Environmental Conservation, Drinking Water and Groundwater Protection Division, conducted a Sanitary Survey of the Town's water system and identified a capacity deficiency they referred to as "Diminished Well(s) Yield Capability". Because of these findings, the State issued a letter to the Town restricting further water system expansions until such time as the water source quantity issues have been resolved.

The Town currently has two (2) existing groundwater well sources that, when first constructed, had a combined permitted capacity of 185 gpm. Over time the well sources have diminished in capacity to a combined 120 gpm. Based on the Sanitary Survey referenced above, the Town is currently permitted to pump 172,800 gpd of water to its users. Based on Town records, the current average day demand for the water system is 125,000 gpd. The Town does not record the maximum day demand; however, the State estimates the Town's current maximum day demand to be between 163,000 and 195,000 gpd. Since the water system is pumping over 90% of its recalculated permitted capacity (based on the diminished wells), the Town is required to commence plans for additional capacity. Based on these findings, the Town set a goal for this Study to locate a water source that can provide an additional 100 gpm (preferably 200 gpm) of water supply for the Town's system.

Two (2) big picture alternatives were evaluated as part of this Study. They included either constructing an additional groundwater well source within Town or connecting to the Champlain Water District (CWD) water system in a nearby Town. Regarding the CWD connection option, two (2) different waterline routes were evaluated to connect the Town's water system to nearby CWD infrastructure on Dorset Street in South Burlington (refer to Figure 4 in Appendix A). The two different routes, namely Shelburne Falls Road to Dorset Street, and VT Route 116 to Dorset Street, ranged from 8.9 to 9.4 miles in length, respectively. Due to anticipated ledge along Shelburne Falls Road, the overall Total Project costs, in March 2013 (ENR 9480) values, for the two alignments were relatively similar, at $10.7M and $10.8M, respectively. Considering this cost in addition to the CWD wholesale rate of $1.84 per 1,000 gallons to purchase water and water system O&M costs, the end user rate resulting from this project would not likely be economically feasible.

The second big picture alternative was to construct an additional well source somewhere within Town, preferably close to existing water system infrastructure. A+E retained Sprague GeoScience, LLC to conduct a preliminary hydrogeological investigation of several potential well site locations, refer to Appendix C for their technical report. As part of this investigation, Sprague GeoScience identified existing hazardous waste sites and potential sources of contamination (PSOCs), as well as researched existing well yield records of nearby wells. Surficial and hydrogeological information of bedrock formations and gravel/sand deposits within Town were also researched to determine where the ideal well sites could be located.

The Sprague GeoScience report identified seven (7) different existing well sites and four (4) different individual parcels to investigate. Based on their findings at each of these sites, the following four (4) potential well sites were identified for further evaluation:

1. Munson Property
2. Russell Property
3. Geprags Park
4. Bissonette Property

Each of these potential well sites requires additional investigation before any preliminary design should be undertaken.

Hydrogeologically the Munson site is the most preferred well location, however it is the most expensive due to the likely purchase price of the land, and the construction of both water and sewer infrastructure to the site. Recent zoning changes made by the Town have resulted in a land value increase to this property. Given these zoning changes, the current land value estimate for purchasing a well site at the Munson property is approximately $375,000. This in addition to constructing a new groundwater well head and necessary water and sewer infrastructure result in an estimated March 2013 (ENR 9480) construction cost of $1.275M. The Total Project Cost estimate for a new well on this site is approximately $2.0M. It is recommended that preliminary two-year time of travel calculations should be conducted on the upgradient septic systems at the Munson site.

After review of the 90% draft report, the Town expressed an interest in the Russell property, which is located just to the north of the Munson property. Many of the same pros and cons noted for the Munson property would likely apply to the Russell property given its close proximity. Therefore, it is recommended that an investigation for a new well site be conducted on this property as well.

The Geprags Park well site is located on Town property off of Shelburne Falls Road and has two (2) relatively high yielding wells onsite. The property is also relatively close to a nearby 8" diameter water main. The main concern with these wells has to do with whether or not they are influenced by groundwater, and whether or not they are hydraulically connected to each other. Recommendations for this site involve the Town gathering all existing water quality tests on these wells and performing additional tests to determine whether one or both of these wells are adequate as a new water source for the Town. If neither well is determined to be adequate, there may be a possibility of drilling a new well onsite, given the favorable well yield history of the two existing wells.

If one of the Geprags wells is adequate for reuse as the new water supply, then the construction cost estimate, in March 2013 (ENR 9480) dollars, would be approximately $400,000. The Total Project Cost estimate for reusing one of these wells as a new Town well source is $600,000. If neither of the wells are adequate for reuse and a new well is necessary, the estimated construction cost, in March 2013 (ENR 9480) values, is $540,000. The corresponding Total Project Cost would be $810,000.

In addition to further testing, the Town would need to conduct initial discussions with VELCO to coordinate the new water system infrastructure with the electric company's existing 100 foot wide right-of-way currently on the Geprags property.

Since completion of the 90% draft report, the Town has requested that the Bissonette property be considered for a potential well site. This land is located off the south side of Shelburne Falls Road, south of Geprags Park. The land is being donated to the Town for use as a recreational facility. It is recommended that this parcel be assessed for its well siting potential including the ability to meet well setback criteria.

While the Munson and Russell properties may have the highest potential in terms of initial water quality, the Geprags Park site or Bissonette site could end up as a better economical option if further investigations result in favorable test results. Based on the uncertainties at each site, the recommendation moving forward is that the Town should begin pursuing all four sites concurrently since any one of them could result in being the best overall option in the end.

SECTION 2

EXISTING CONDITIONS AND NEED

SECTION 2 EXISTING CONDITIONS AND NEED

2.1 PURPOSE AND OBJECTIVES

The Town of Hinesburg (Town) retained Aldrich + Elliott, PC (A+E) in September of 2012 to conduct a water source feasibility study to investigate different alternatives for supplying additional water to the Town's water system. On September 14, 2012, the State of Vermont, Department of Environmental Conservation, Drinking Water and Groundwater Protection Division, conducted a sanitary survey of the Town's water system and identified several system deficiencies. The major deficiency identified, for which this study is solely based, was with regards to "Diminished Well(s) Yield Capability". Based on these findings, the State issued a letter on October 10, 2012 restricting further water system expansions until such time as the water source quantity issues have been resolved. Refer to Appendix D for a copy of the State's Sanitary Survey letter.

The purpose of this Water Source Feasibility Study is to:

- Evaluate alternative water supplies
- Identify possible water well sites based on hydrogeologic information
- Prepare preliminary cost estimates

2.2 EXISTING INFORMATION

The Town of Hinesburg is located within Chittenden County, Vermont. It borders the Towns of Charlotte on the west, Huntington on the east, South Burlington, St. George, Williston, and Richmond on the north, and Monkton and Starksboro on the south (see Figure 1 in Appendix A).

The Town has a municipal water system that extends as far north as Rocky Mountain Lane on Route 116, as far east as Garvey Farm Road, as far south as Friendship Lane, and as far west as #377 Charlotte Road. The water system is supplied by two (2) existing groundwater well sources located off of Charlotte Road. The wells were initially permitted at a combined capacity of 185 gpm when first constructed, but have diminished to a combined capacity of roughly 120 gpm. Water is pumped up to an existing 500,000 gallon water storage reservoir located on Piette Road through a series of 6", 8", and 12" diameter asbestos cement (AC) and polyvinylchloride (PVC) watermains.

Based on Google Earth imagery, the elevations of the well site and water storage reservoir are 330 feet and 855 feet above mean sea level, respectively. Due to the significant topography within Town, the water system is divided into three (3) pressure zones. Pressure Zones 1 and 2 encompass the majority of the water system, and are created through the use of a booster pump station with integral pressure reducing valve (PRV) on Mechanicsville Road, and a PRV vault on CVU Road. Pressure Zone 3 includes about a dozen properties located up-gradient of the water storage reservoir on Piette Road. The Town's water system is shown on Figure 2 in Appendix A.

2.3 WATER SOURCE DEFICIENCY AND NEED

Based on the Sanitary Survey referenced above, the Town is currently permitted to pump 172,800 gallons per day (gpd) of water to its users. Using information provided by the Town, the water system's metered average day demand is 125,000 gpd. The Town does not currently record the maximum day demand however, the State estimates the current maximum day demand to be between 163,000 gpd and 195,000 gpd. The Vermont Water Supply Rules state that when a water system reaches 90% of its treatment and/or pumping system capacity, it shall commence plans for additional capacity. When pumping or treatment reaches 100%, the water system shall initiate construction of these facilities. Source yields are to be compared against the maximum demand of the water system in order to determine the adequacy of the source(s). The source's ability to meet the average day demand is based on pumping 12 hours per day. Given the estimated maximum day demand and the currently permitted pumping capacity, the Town's water system is currently operating at over 90% capacity. Table 2.1 shows the Monthly Average Daily Flows for the Town's water system.

Table 2.1
Monthly Average Daily Flows

	2011 (gallons)	**2012 (gallons)**
January	119,145	142,890
February	114,772	134,155
March	131,374	135,177
April	121,323	126,720
May	105,774	138,987
June	109,487	143,141
July	110,800	140,265
August	108,087	131,965
September	117,982	118,771
October	122,132	122,006
November	123,171	107,314
December	117,903	128,900
Average (gpd)	**116,829**	**130,858**
Minimum Required Pumping Rate (gpm)	**162**	**182**

Notes:
1. Source's ability to meet the average day demand is based on pumping 12 hours per day.
2. Town's water system is permitted at 172,800 gpd.

Taking into consideration current and future uses/growth, the Town's goal for this study is to identify a potential water supply source that can add at least 100 gpm (preferably 200 gpm) of water supply to its system.

SECTION 3

SOURCE ALTERNATIVES

SECTION 3 SOURCE ALTERNATIVES

3.1 GENERAL

Source alternatives evaluated as part of this study included potential well site locations throughout Town as well as possible connection to the Champlain Water District (CWD) water system. These alternatives are discussed in detail below.

3.2 POTENTIAL WELL SITE LOCATIONS

Several potential well site locations were evaluated based on a hydrogeological investigation conducted by Sprague GeoScience, LLC, (refer to Appendix C) in addition to engineering feasibility with regards to infrastructure improvements, and land acquisition. Seven (7) locations were identified as follows:

- Lyman Meadows Well
- Town Wells
- Former Saputo Cheese Well
- Munson Property
- Russell Property
- Norris Property
- Champlain Valley Union High School
- Geprags Park
- Bissonette Property
- Galiga Property

3.2.1 Lyman Meadows Well

The Lyman Meadows well is located in the Lyman Meadows condominium complex off of VT Route 116, northeast of the Hinesburg Elementary School. Based on information gathered by Sprague GeoScience, LLC, the existing well has a driller's yield of 75 gpm and an approved yield of 32 gpm. The current metered maximum day demand for this system is 12,149 gpd, or 8.4 gpm, which means that there's approximately 23.6 gpm of permitted unused capacity. Heindel and Noyes, Inc. estimated that this well may have approximately 20-50 gpm additional capacity; however, the current use is limited to 32 gpm due to interference with existing wells.

The Lyman Meadows well is roughly 700 linear feet away from the 8" diameter municipal watermain located on VT Route 116. Connecting to this well would require several permanent easements. Given the limited permitted unused capacity, this site is not considered a viable option.

3.2.2 Town Wells

The land where the two (2) Town wells (Well #1 and Well #2) are located, off of Charlotte Road, has limited opportunity for additional well expansion due to low levels of MTBE (methyl tert-butyl ether), a fuel additive for motor gasoline, in the groundwater. In addition, there is concern of being in relative close proximity to other potential sources of contamination, and the potential drawdown from the existing wells. Given these factors in addition to not wanting to have all of the Town's water sources "in one basket", expansion of the Town wells is not a viable option.

3.2.3 Former Saputo Cheese Well

The former Saputo Cheese (aka International Cheese) well is reported to have a driller's yield of 150 gpm. Unfortunately, this well is also documented as being contaminated with MTBE (discussed above), and is therefore, not suitable as a potable water supply source.

3.2.4 Munson Property

The Munson property well, located southeast of the Buck Hill Road / VT Route 116 intersection on George Munson's property, has a documented well driller's yield of 200 gpm. Records also show that the property is underlain by 40 feet of clay and 180 feet of sand and gravel, providing favorable hydrogeologic conditions as a potential water source.

The municipal wastewater collection system does not extend to this area of Hinesburg, so the Munson property and the surrounding properties all currently have on-site septic systems. Given the State's required 200 foot isolation distance between septic systems and drinking water wells, the location of the new well would need to be situated relatively central to Mr. Munson's property.

Recent zoning changes made by the Town of Hinesburg have revised the zoning requirements for this property to "Residential 2", reducing the minimum lot size requirement to 6,000 sf. This change now gives the Munson's the opportunity to subdivide this parcel, which they weren't able to do before the zoning change. Given this and the probable siting location of the new well central to this property, it will likely result in a fairly significant purchase price for the site. Additionally, the property would likely need to be serviced by municipal sewer in order to meet the required 200 foot well head protection area requirement.

This well site is approximately 1,350 linear feet from the nearest 8" diameter municipal water main and roughly 1,300 linear feet from the municipal sewermain. Construction costs for these utilities in addition to land value estimates are discussed further in the next section.

3.2.5 Russell Property

After review of the 90% draft report, the Town expressed an interest in the Russell property, which is located just to the north of the Munson property. Many of the same pros and cons

noted for the Munson property would likely apply to the Russell property given its close proximity. Therefore, it is recommended that an investigation for a new well site be conducted on this property as well.

3.2.6 Norris Property

The Norris property, which borders Friendship Lane and VT Route 116, was also investigated as a possible Town well site. As discussed in the Sprague GeoScience report, most of the western portion of this parcel is mapped as a Class Two wetland. The remaining portion of this property is currently slated for a 25 unit residential subdivision serviced by municipal water and sewer. In order for this parcel to utilize municipal sewer, a new wastewater pump station would need to be constructed. Given the size of this parcel and its usable land being planned for such activities, it is not a favorable location for a new Town water supply well.

3.2.7 Champlain Valley Union High School (CVU)

The CVU property was also investigated as a possible site for locating a new Town well source. There are currently two (2) wells on this property, one with a well yield of zero, and the other with a driller's yield of 25 gpm. The School currently uses the operating well to water their ball field, and is not interested in turning this well over to the Town.

Based on the surficial geology of this site, it appears that the ground is underlain by silt and clay which provides a potential barrier from shallow sources of contamination. This is good news since the property is documented as having two (2) hazardous waste site locations and two (2) underground storage tanks on the property. Additional investigation would need to be done of the two hazardous waste sites to thoroughly evaluate whether they pose a high risk for potential contamination. The two underground storage tanks also pose a concern due to their increased chance for contamination from leaking petroleum. Information regarding the a preliminary review of the two hazardous waste sites can be found in the Spague GeoScience, LLC report in Appendix C. Preliminary information gathered for this property identifies the sites as being of either low or medium priority due to the effect of contaminates on sensitive receptors.

Taking into consideration the possible sources of contamination described above, there is still potential for siting a water well source on this property given its large lot size and favorable surficial geology. One plausible well site location would be west of the pond since it likely meets the State's required 200 foot isolation distance. Additional investigation will need to be done to confirm the suitability at this location. This would include sampling and testing of the monitoring wells currently located at the hazardous waste sites to identify any potential contamination.

The proximity of this well site is also favorable given its relative location to the municipal system. Construction, however, would need to include the installation of a new transmission main from the new well to the existing booster pump station on Mechanicsville Road, roughly 3,800 linear feet away. There is an 8" diameter watermain closer to the site however it is fed through a pressure reducing valve (PRV) vault from the high pressure zone and does not connect to the

main Low Service Area. Supply from a new well at this location would need to tie into the main Low Service Area on the inlet side of the booster pump station. Alternatively the new well could tie into the Low Service Area via a new main extension west along CVU Road across Route 116 to the 8" main on Shelburne Falls Road.

Although the CVU property appears to have potential as a well site, the Town does not wish to pursue a new well on this parcel at this time given the concerns over the two hazardous waste sites on the property.

3.2.8 Geprags Park

The Town currently owns three (3) wells at the Geprags Park property, located on Shelburne Falls Road, west of the Hinesburg Public Library. Two of the wells, Well #2 and Well #3, have substantial well yields in the range of 75 gpm to 225 gpm, respectively. Well #1 has a negligible yield of 3 gpm and has been abandoned. Preliminary tests of Well #2 and a pump drawdown test of Well #3 suggest that they may be under the influence of surface water and shallow groundwater. In addition, a water sample taken from Well #2 contained a significant amount of sediment, and the discharge water from Well #3 was observed to have surface debris. Lastly, during a pump test of Well #3, drawdown was observed in Well #2, suggesting that the two wells may be hydraulically connected to each other. These factors raise concerns about possible contamination.

Based on the promising well yield potential at this site, as an initial step, it is recommended that the Town attempt to obtain copies of all previous testing that has been conducted on the three wells on this parcel. If, after review of these documents, the conditions are consistent with the current understanding, then the following is recommended.

The primary strategy for Well #3 is to eliminate its connection with surface water. This is important in order to potentially use Well #3 by itself, as well as to minimize the potential impact that it may have on Well #2. According to the driller's log, two water bearing zones were encountered in Well #3. The upper zone is from 60 to 165 feet, and the lower zone is from 233 to 235 feet. It is unknown if both or only one of these water bearing zones is under the direct influence of surface water.

Two potential options are recommended to seal the well off from surface water contamination. The first option would be to extend the casing below the water bearing fracture(s) that are influenced by surface water. A down-hole camera survey may be helpful in understanding the flow of water into the well. If both fracture zones are cased, then the well could be drilled deeper. If only the upper zone is cased and there is still adequate yield, then the well could be tested as is. Also, in this scenario, the option to drill deeper in hopes of further increasing the yield in Well #3 would also be available at a later date. A preliminary algae sample followed by MPA testing would then need to be conducted to determine if casing the fractures has been successful. The second option would be to fill the well bore with cement to the bottom of the casing, with the option to drill deeper at a later date.

Once the potential influence with surface water has been addressed in Well #3, it is recommended that a short term pump test be conducted on Well #2 to try and clear up the water and to collect an algae sample. Testing for algae is an inexpensive method to determine if the well is likely under the influence of surface water. If the algae test fails, then the well should be abandoned. If it passes, then additional GWUI testing should be conducted to verify that it is not under the influence of surface water, and a pump test should be conducted to determine its long term yield.

Another option for this property is to drill an additional well on this site and perform the necessary water quality tests and pump drawdown tests. Since the land is currently owned by the Town, no additional land acquisition would be necessary.

The closest municipal water system infrastructure that is of significant size is an 8" diameter main located nearby on Shelburne Falls Road, approximately 2,100 linear feet away from the Geprags well site. In order for the Town to use this site as a secondary well source, a minimum 8" diameter watermain would need to be constructed for transmission from the wells to this existing 8" watermain.

Additional consideration must also be taken to account for the existence of a 100 foot wide VELCO right-of-way currently on this land. If it is determined that new wells need to be installed in order to use this site as a water source, the wells will need to be located outside of this 100 foot wide VELCO right-of-way. Preliminary discussion should take place with VELCO to determine whether siting a well within their right-of-way is acceptable under certain conditions.

3.2.9 Bissonette Property

Since completion of the 90% draft report, the Town has requested that the Bissonette property be considered for a potential well site. This land is located off the south side of Shelburne Falls Road, south of Geprags Park. The land is being donated to the Town for use as a recreational facility. It is recommended that this parcel be assessed for its well siting potential including the ability to meet well setback criteria.

3.2.10 Galiga Property

The Galiga property is located at 119 Lowmeadow Road and is owned by Ann Janda and Philip Galiga. According to the well completion report, the well was drilled on 10/22/1993 by Spafford and Sons of Williston, Vermont, and has a driller's yield of 100 gpm.

Ms. Janda stated that their well has been tested for radionuclides and was reported to contain elevated levels of Gross alpha and slightly elevated levels of combined Radium 226 and 228. According to the VDH, the radionuclides are from naturally occurring sources. Ms. Janda also stated that the well was tested for TCE but that this compound was not detected. TCE was a concern in this vicinity due to a release at the Iroquois Manufacturing Building.

A review of the ANR data base for this area indicates that the Iroquois Manufacturing Company (IMC) Facility is listed as Hazardous Waste Site # 951795. Ongoing site work includes quarterly water quality monitoring for TCE in the IMC well and one residential well. TCE is reported above the GWES in the residential well, although levels show slight decline. The owner of the residential well was not identified in the site summary.

This parcel appears to have the necessary set back requirements for a town well to be drilled on this parcel. However the Janda/Galiga house and other nearby properties currently equipped with on-site septic systems would likely have to be connected to the town sewer. According to the Surficial Geology Map, this property is underlain by kame terrace deposits, which would not likely provide adequate protection to the bedrock aquifer. A well in this area may also be a risk of TCE contamination, and may require treatment for radionuclides. According to the VT ANR database, the Galiga well is the only high yielding well in the general vicinity, so a high yielding well is not guaranteed. The bedrock underlying the property is mapped as being the Fairfield Pond formation, which tends to have lower yielding wells. The owners are currently open to the idea of a Town well on their property, but are also looking into the possibility of subdividing their lot.

Given the potential for hazardous waste impact, the Galiga property is not considered a favorable location for a new Town water supply well.

3.3 CONNECTION TO THE CWD WATER SYSTEM

CWD currently provides water to the nearby Town of Shelburne and City of South Burlington. The closest CWD infrastructure relative to the Town of Hinesburg's water system is located in Shelburne on Irish Hill Road near the intersection of Spear Street, roughly 5 miles away. The existing infrastructure at this intersection, however, is 8" diameter and is not adequately sized to supply water to the Town of Hinesburg's water system. In addition, the majority of CWD's capacity is in its High Service Area and the Shelburne water system is located within CWD's Main Service Area, where capacity for expansion is somewhat limited. In order for CWD to approve expansion to a new community, connection would likely need to be made within the High Service Area and the transmission main supplying water would need to be larger than 8" in diameter. Given these requirements, connecting to the CWD system at the Irish Hill Road / Spear Street location would not be feasible.

The closest viable High Service Area connection with an adequately sized watermain is located at the City of South Burlington's Dorset Street water storage reservoir, roughly 8.9 miles away. The Dorset Street Tank has a high water elevation of 618 feet above mean sea level, which is adequate to serve the Town of Hinesburg's Low Service Area. The water transmission main at the Dorset Street location is 16" in diameter and would provide the best interconnection into CWD's system. The shortest alignment for this transmission main extension is 8.9 miles long and would begin at the existing 8" diameter waterline on Shelburne Falls Road (near the Hinesburg Public Library) and extend north on Shelburne Falls Road to Dorset Street, then

north on Dorset Street to Park Road, where the Dorset Street Tank is located. Vermont Gas recently completed a gas line expansion within the vicinity of this route and encountered a significant amount of ledge during construction. Taking into consideration the added cost of ledge removal, the March 2013 (ENR 9480) linear foot cost of waterline installation is $152 per linear foot. The resulting construction cost is approximately $7.1M. The Total Project Cost for a project of this type is typically 1.5 times the construction cost. This includes the construction cost, 10% construction contingency, preliminary engineering, final design engineering, construction engineering, a typical construction engineering contingency of 5%, and other administrative, fiscal, legal, and short term interest costs. The Total Project Cost estimate for the Shelburne Falls / Dorset Street waterline alignment is roughly $10.7M.

The next shortest option is 9.4 miles long and would involve construction along Vermont Route 116 north to Cheese Factory Road, then along Cheese Factory Road to Dorset Street, then north to the storage reservoir. This alignment would involve a large portion being constructed along VT Route 116. Given the Vermont Agency of Transportation (VTrans) requirements discouraging pavement disturbance and the traffic speeds along this route, the linear foot construction costs may be increased with this alignment. Taking this into consideration, the March 2013 (ENR 9480) linear foot cost of waterline installation for this route is $146 per linear foot. The resulting construction cost is approximately $7.2M. The Total Project Cost for a project of this type is typically 1.5 times the construction cost. This includes the construction cost, 10% construction contingency, preliminary engineering, final design engineering, construction engineering, a typical construction engineering contingency of 5%, and other administrative, fiscal, legal, and short term interest costs. The Total Project Cost estimate for the VT Route 116 / Dorset Street waterline alignment is roughly $10.8M.

So even though the Shelburne Falls / Dorset Street waterline route is a shorter distance than the VT Route 116 route, the ledge costs will likely result in a relatively similar overall cost as the VT Route 116 route. Additional effort may be needed with the VT Route 116 alignment as easements will likely become necessary given VTrans constraints regarding pavement cut. On the other hand, less pavement disturbance will reduce the overall cost per linear foot, so a preliminary discussion with VTrans and a walk through of the alignment route would need to take place before the particular alignment is selected.

In addition to the Total Project Cost for constructing a waterline connection with the CWD water system, CWD wholesale rates should also be considered as it adds to the end user cost. The current CWD wholesale rate is $1.84 per 1,000 gallons of metered usage. This, as well as the debt service costs for the overall project, in addition to the Town's water system O&M costs, would need to be included in the end user rate. Given this information, connecting to the CWD water system is not likely the most economically feasible option, assuming additional source capacity can be found within the vicinity of the existing Hinesburg water system.

3.4 CONCLUSION

After analyzing each of the possible well sites above, as compared to connecting to the CWD water system, the recommended course of action would be to pursue the well sites. Of the well sites identified, the following four (4) sites are recommended for further investigation (refer to Figure No. 3 in Appendix A):

- Munson Property
- Russell Property
- Geprags Park
- Bissonette Property

SECTION 4

RECOMMENDED PLAN

SECTION 4 RECOMMENDED PLAN

4.1 PRIMARY RECOMMENDATION

Based on the evaluation done by Sprague GeoScience, LLC, in Appendix C, the highest priority well site locations are the Munson property, Russell property, Geprags Park, and Bissonette property. Each of these sites will require additional investigation before moving forward with a preliminary design. The primary recommendation is for the Town to pursue these specific sites in the following order of priority; however, the Town may also consider pursuing them concurrently:

1. Geprags Park
2. Munson Property
3. Russell Property
4. Bissonette Property

4.1.1 Geprags Park

Several factors make the Geprags site favorable for siting a new Town water source. Based on the facts that this is a Town-owned property that is relatively close to an 8" diameter municipal water main and has existing wells with fairly significant well driller's yields, it is recommended that the Town further pursue this site as a potential location for a new water well source. Initial concerns regarding the feasibility of this site include whether or not the existing wells (Well #2 and Well #3) are influenced by surface water; and whether the two wells are hydraulically connected to each other. Since the Town already owns this site, they have the ability to, fairly easily and inexpensively, do additional testing of these wells to confirm the feasibility of either reusing them as a well source, or else abandoning them and drilling additional wells on site. Preliminary cost estimates for performing the necessary water supply and pump drawdown tests are roughly $20,000.

If the tests determine that either of the wells are suitable for use, additional costs to the Town would involve constructing approximately 2,100 linear feet of 8" diameter transmission main to interconnect with the newly installed 8" diameter water main located just east of Pleasant View Lane. The estimated construction cost in March 2013 (ENR 9480) values, assuming that one of the existing wells is suitable for use, is $400,000. Refer to Appendix B for a detailed breakdown of the construction cost estimate.

If the existing wells are determined to be inadequate for use as a Town water supply source, then an additional well(s) would need to be drilled. The construction cost for a new well would not only include the 2,100 linear foot 8" diameter waterline construction, but also the well head construction cost, for a total estimated construction cost, in March 2013 (ENR 9480) values, of $540,000.

The Total Project Cost for a project of this type is typically 1.5 times the construction cost. This includes the construction cost, 10% construction contingency, preliminary engineering, final design engineering, construction engineering, a typical construction engineering contingency of 5%, and other administrative, fiscal, legal, and short term interest costs. The Total Project Cost estimate, using March 2013 (ENR 9480) values, for the proposed water system without a new well, or with a new well, is roughly $600,000 and $810,000, respectively.

4.1.2 Munson Property

Given the favorable hydrogeological conditions at this site as well as the documented well driller's yield of 200 gpm of the existing well, it is recommended that the Town pursue the Munson property for its water supply well site. Initial discussions with the landowner, George Munson, should involve the purchase price of the land as well as the need for the extension of municipal sewer to connect the existing buildings on his property to provide an adequate source protection area for the new well. One of the concerns with this site is the isolation distance and the two-year time of travel criteria regarding neighboring on-site septic systems. If after additional investigation, it is determined that isolation distance and two-year time of travel requirements are not met, extending municipal sewer to the neighboring properties may be necessary for the Town to locate their water supply well on this site.

Preliminary land value estimates for a property of this size and location could be anywhere between $25,000 and $50,000 per ½ acre. Based on the size of Mr. Munson's property, initial estimates indicate the potential for between seven and ten ½ acre lots. Assuming an average price of $37,500 per lot for ten lots, the resulting purchase price could likely be about $375,000.

Construction costs for drilling a new Town well on this site, including well head installation costs, equipment costs, testing, and permitting, are estimated to be between $120,000 and $150,000.

In addition to the land purchase and well head installation costs, this site would also require approximately 1,350 linear feet of minimum 8" diameter water main, a new wastewater pump station, and approximately 1,300 linear feet of 4" diameter sewer forcemain. Based on these factors the estimated construction cost, using March 2013 (ENR 9480) values, for locating a new Town well on the Munson site would be $1.275M. Refer to Appendix B for a detailed breakdown of the construction cost estimate.

The Total Project Cost for a project of this type is typically 1.5 times the construction cost. This includes the construction cost, 10% construction contingency, preliminary engineering, final design engineering, construction engineering, a typical construction engineering contingency of 5%, and other administrative, fiscal, legal, and short term interest costs. The Total Project Cost estimate for the proposed water system, using March 2013 (ENR 9480) values, is roughly $2.0M.

4.1.3 Russell Property

After review of the 90% draft report, the Town expressed an interest in the Russell property, which is located just to the north of the Munson property. Many of the same pros and cons noted for the Munson property would likely apply to the Russell property given its close proximity. Therefore, it is recommended that an investigation for a new well site be conducted on this property as well.

4.1.4 Bissonette Property

Since completion of the 90% draft report, the Town has requested that the Bissonette property be considered for a potential well site. This land is located off the south side of Shelburne Falls Road, south of Geprags Park. The land is being donated to the Town for use as a recreational facility. It is recommended that this parcel be assessed for its well siting potential including the ability to meet well setback criteria.

4.2 SECONDARY RECOMMENDATIONS

If additional investigation determines that the well sites listed above are not suitable for a new Town water well source, then the following site locations should be further investigated:

- CVU
- Norris Property
- Lyman Meadows
- North of Geprags Park
- North Road/Beecher Hill
- Silver Street
- Lands south of the Hinesburg Elementary School

These are discussed in further detail in the Sprague GeoScience report in Appendix C.

4.3 NEXT STEPS

Based on the primary recommendations discussed above, the following next steps should be considered by the Town in moving forward with locating their new water supply well:

Geprags Park

- As an initial step the Town should attempt to obtain copies of all previous testing that has been conducted on the three wells on this parcel.
- If, after review of these documents, the conditions are consistent with our current understanding, then additional testing of Well #3 and #2 should be conducted.
- Another option for this property is to drill an additional well on this site and perform the necessary water quality tests and pump drawdown tests.

Munson Property

- The should have discussions with the Munson's regarding drilling a test well on their property and obtaining control of the well isolation zone to determine if this lot is financially feasible.
- Preliminary two-year time of travel calculations should be conducted on upgradient septic systems.

Russell Property

- Begin an investigation for a new well site on this property.

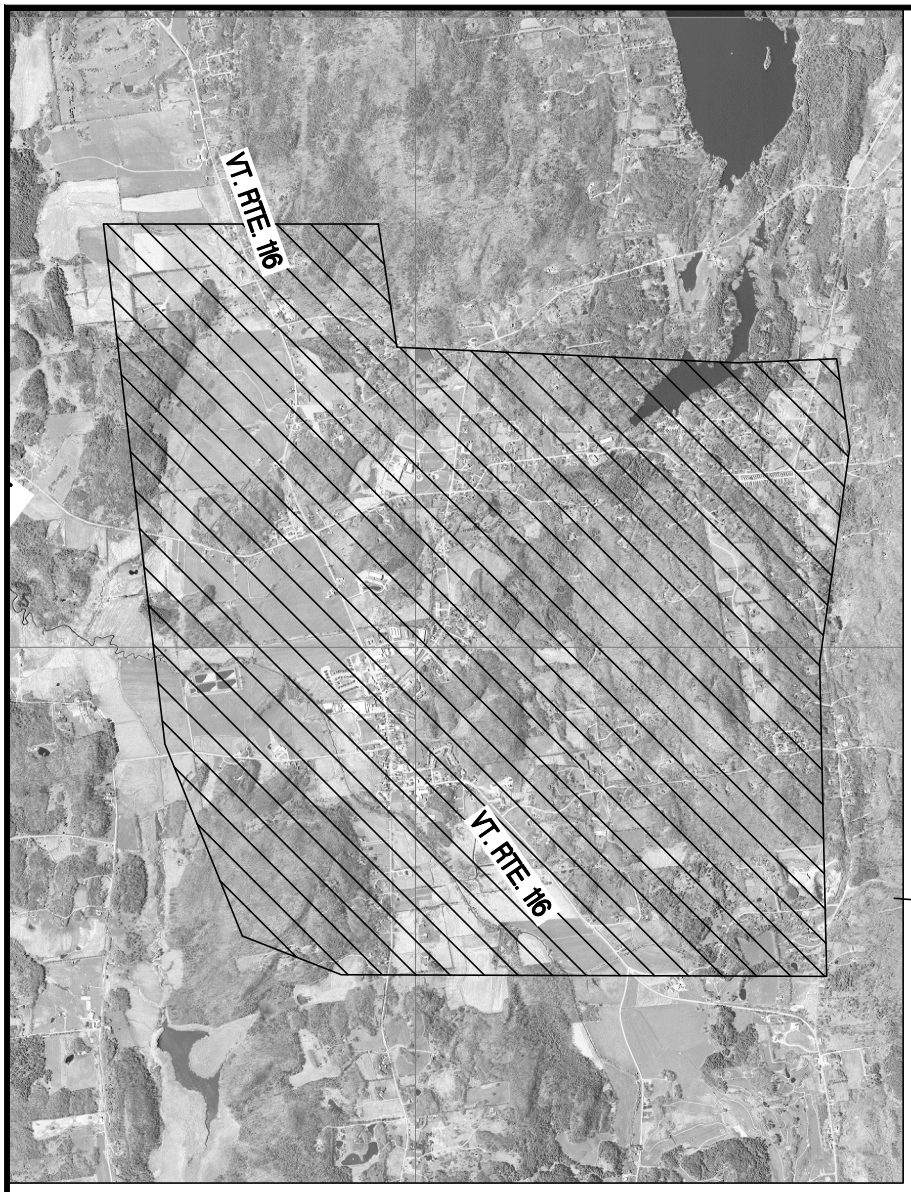
Bissonette Property

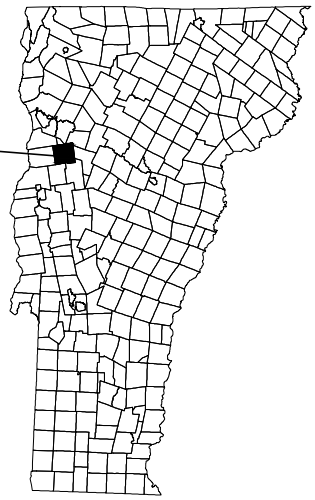
- Assess this property for its well siting potential including the ability to meet well setback criteria.

APPENDICES

APPENDIX A

FIGURES





N

PROJECT LOCATION MAP

SCALE: 1"=4000'

GRAPHIC SCALE

4000 0 2000 4000 8000 16000

(IN FEET)

Aldrich + Elliott
WATER RESOURCE ENGINEERS

6 Market Place, Suite 2
Essex Jct., VT 05452

P: 802.879.7733
AEengineers.com

PROJECT LOCATION MAP	DESIGNED RM	PROJECT NO.	
	DRAWN JEB	12079	
	CHECKED (PM) JJD		
WATER SOURCE FEASIBILITY STUDY	CHECKED (PE) JJD	FIGURE NO.	
	SCALE AS SHOWN	1	
TOWN OF HINESBURG			
HINESBURG VERMONT	DATE JUNE, 2013		

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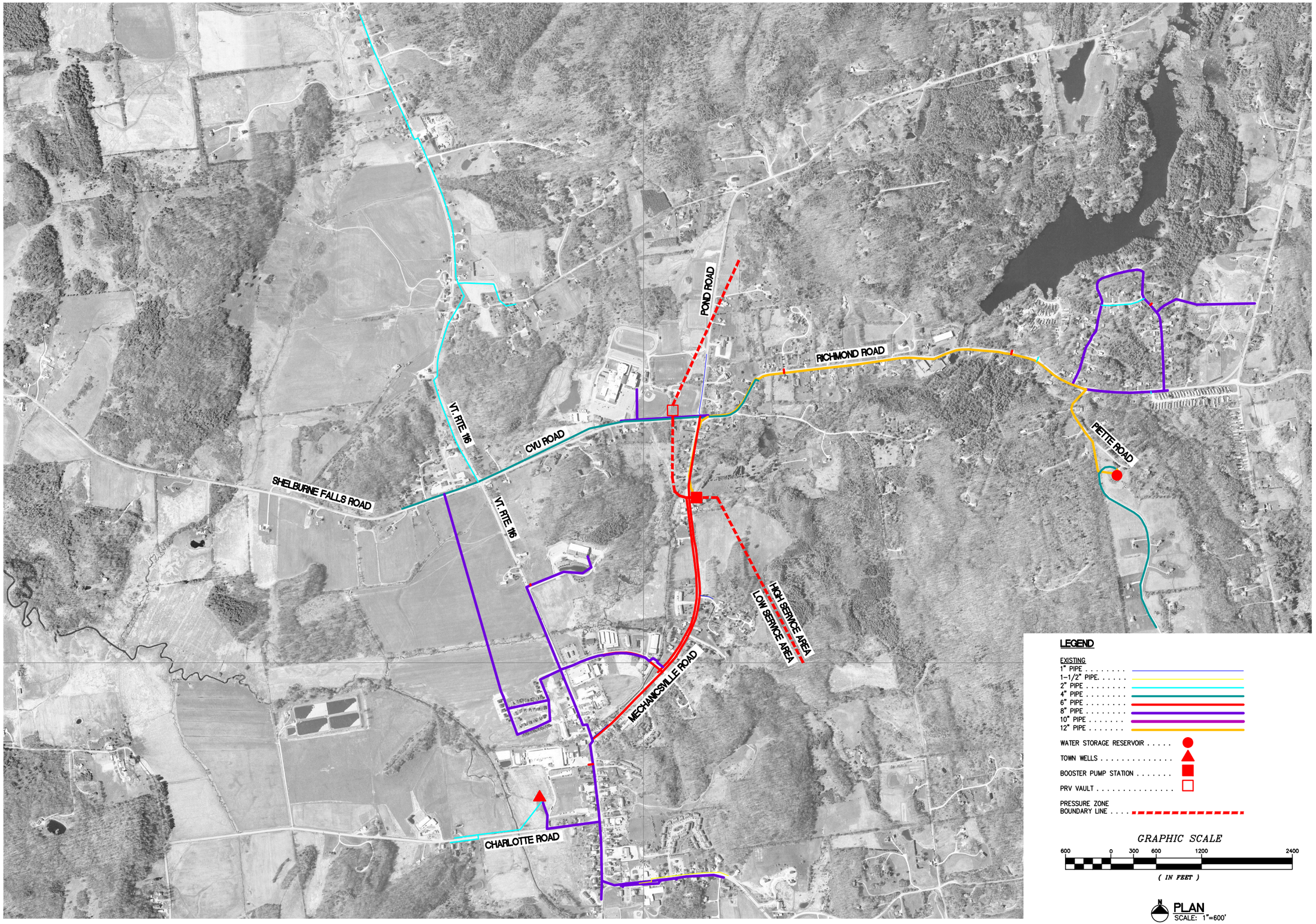

Aldrich + Elliott
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6 Market Place, Suite 2
Essex Jct., VT 05452
P: 802.879.7733
AEengineers.com

No.	DATE	DESCRIPTION	CHECKED

TOWN OF HINESBURG, VERMONT

WATER SOURCE FEASIBILITY STUDY

WATER SYSTEM MAP

DESIGNED RM	PROJECT NO. 12079
DRAWN JEN	FIGURE 2
CHECKED JJD	
DATE JUNE, 2013	

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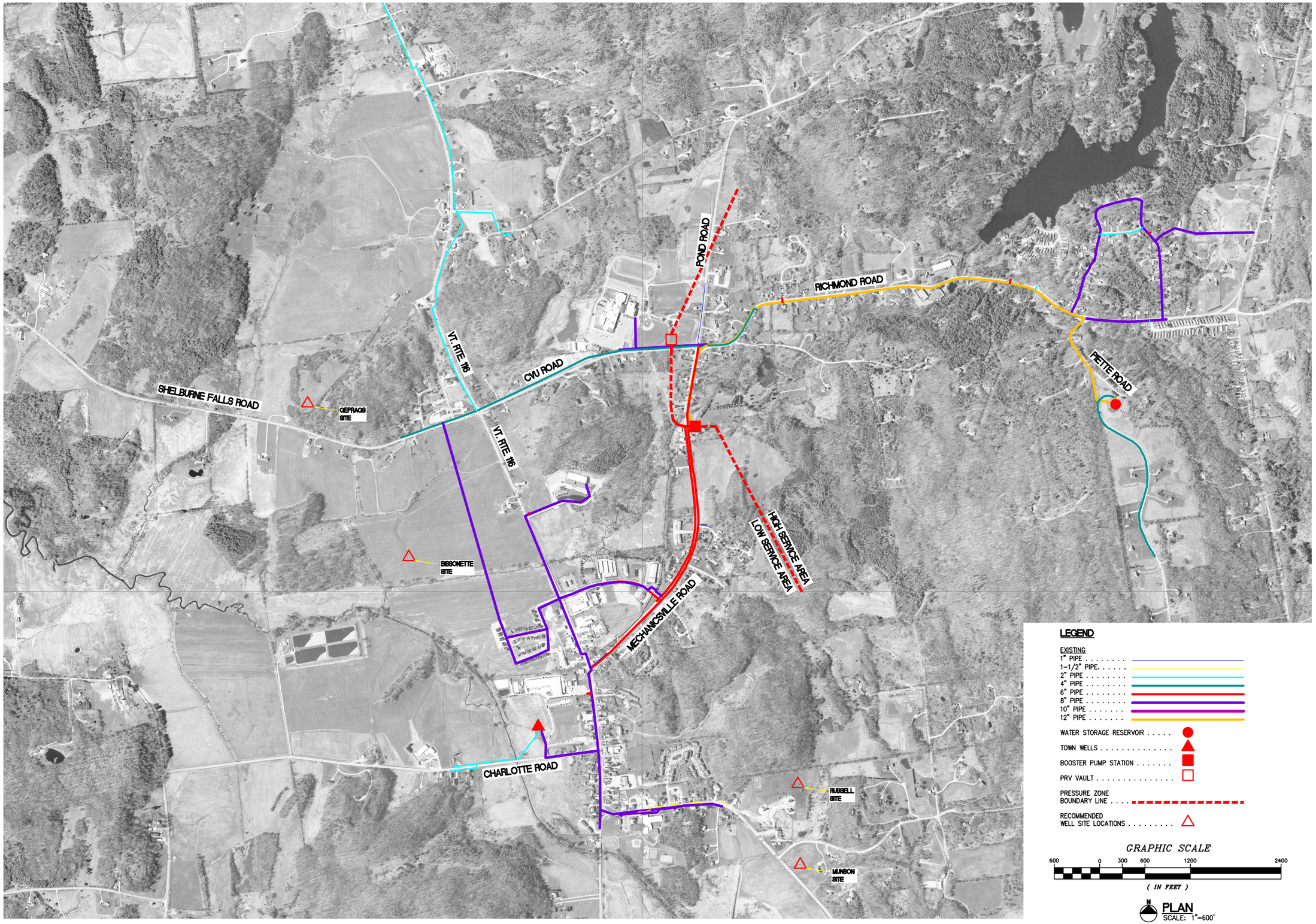

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AEengineers.com

No.	DATE	DESCRIPTION	CHECKED

TOWN OF HINESBURG, VERMONT

WATER SOURCE FEASIBILITY STUDY

POSSIBLE WELL SITE LOCATION

DESIGNED RM	PROJECT NO. 12079
DRAWN JEN	FIGURE 3
CHECKED JJD	
DATE JUNE, 2013	

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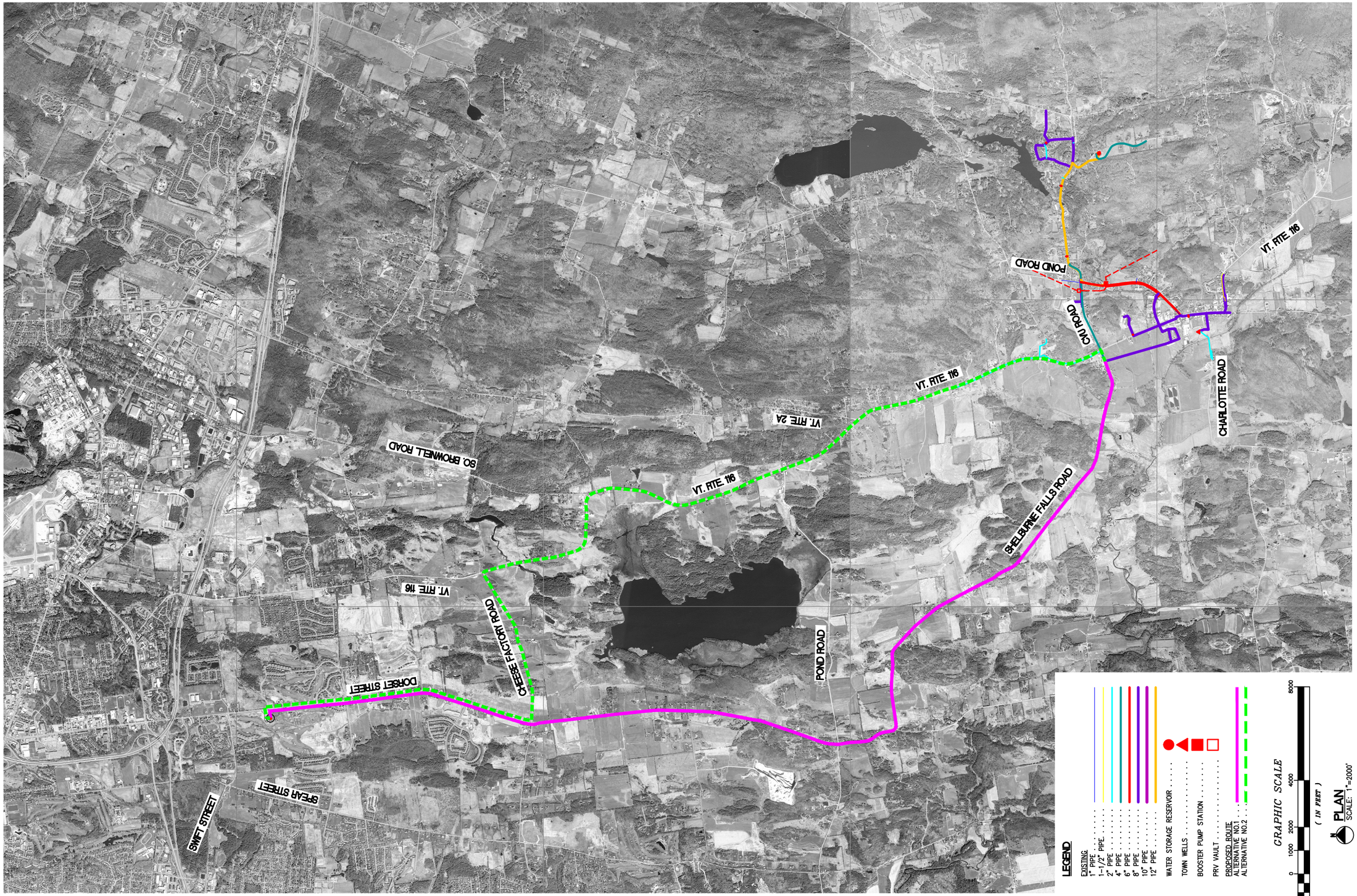

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AEengineers.com

No.	DATE	DESCRIPTION	CHECKED

TOWN OF HINESBURG, VERMONT

WATER SOURCE FEASIBILITY STUDY

CWD CONNECTIONS ALTERNATIVES

DESIGNED RM	PROJECT NO. 12079
DRAWN JEN	FIGURE 4
CHECKED JJD	
DATE JUNE, 2013	

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APPENDIX B

CONSTRUCTION COSTS ESTIMATES

TOWN OF HINESBURG, VERMONT
WATER SOURCE FEASIBILITY STUDY

OPINION OF PROBABLE CONSTRUCTION COST - LINEAR FOOT PRICE OF TRANSMISSION WATERLINE
CWD WATERLINE INSTALLATION - SHELBURNE FALLS ROAD TO DORSET STREET
As of March 1, 2013

ITEM NO.	DESCRIPTION OF ITEM	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST (ENR 9300)	COST (ENR 9480)
A-WATERLINES						
A- 1	8" DI CL52 Waterline	46,992	L.F.	$77	$3,619,550	$3,689,606
B-WATERLINE APPURTENCANCES						
B- 1	New Hydrant Branch Connection	46.992	EA	$2,500	$117,480	$119,754
B- 2	8" Gate Valves	46.992	EA	$1,200	$56,390	$57,482
C-EARTHWORK						
C- 1	Rock Excavation	3,000	C.Y.	$125	$375,000	$382,258
C- 2	Boulder Excavation	500	C.Y.	$50	$25,000	$25,484
C- 3	Miscellaneous Extra and Below Grade	500	C.Y.	$30	$15,000	$15,290
C- 4	Excavation and Replacement of Unsuitable Material	1,000	C.Y.	$30	$30,000	$30,581
D-ROADWORK						
D- 1	Permanent Bituminous pavement Repair -Street	31,328	S.Y.	$65	$2,036,320	$2,075,733
D- 2	Concrete Sidewalk	1,000	L.F.	$50	$50,000	$50,968
E-INCIDENTAL WORK						
E- 1	Calcium Chloride	25	TON	$500	$12,500	$12,742
E- 2	Silt Fence	1000	L.F.	$3	$3,000	$3,058
E- 3	Uniformed Traffic Officers	500	HRS	$60	$30,000	$30,581
E- 4	Rigid Trench Insulation	1000	L.F.	$5	$5,000	$5,097
F-LUMP SUM						
F- 1	Preparation of Site and Miscellaneous Work (8%)	1	L.S.	$510,019	$510,019	$519,891
F- 2	Bonds	1	L.S.	$103,279	$103,279	$105,278
				TOTAL COST BASE BID:	**$6,988,539**	**$7,123,801**
				USE:	**$6,989,000**	**$7,124,000**

Notes:
1. ENR 9300 = September 2012, ENR 9480 = March 2013

UNIT COST PER LF
$152.00 per LF

TOWN OF HINESBURG, VERMONT
WATER SOURCE FEASIBILITY STUDY

OPINION OF PROBABLE CONSTRUCTION COST - LINEAR FOOT PRICE OF TRANSMISSION WATERLINE
CWD WATERLINE INSTALLATION - VT ROUTE 116 TO DORSET STREET
As of March 1, 2013

ITEM NO.	DESCRIPTION OF ITEM	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST (ENR 9300)	COST (ENR 9480)
A-WATERLINES						
A- 1	8" DI CL52 Waterline	49,632	L.F.	$77	$3,822,896	$3,896,887
B-WATERLINE APPURTENCANCES						
B- 1	New Hydrant Branch Connection	49.632	EA	$2,500	$124,080	$126,482
B- 2	8" Gate Valves	49.632	EA	$1,200	$59,558	$60,711
C-EARTHWORK						
C- 1	Rock Excavation	1,000	C.Y.	$125	$125,000	$127,419
C- 2	Boulder Excavation	500	C.Y.	$50	$25,000	$25,484
C- 3	Miscellaneous Extra and Below Grade	500	C.Y.	$30	$15,000	$15,290
C- 4	Excavation and Replacement of Unsuitable Material	1,000	C.Y.	$30	$30,000	$30,581
D-ROADWORK						
D- 1	Permanent Bituminous pavement Repair -Street	33,088	S.Y.	$65	$2,150,720	$2,192,347
D- 2	Concrete Sidewalk	1,000	L.F.	$50	$50,000	$50,968
E-INCIDENTAL WORK						
E- 1	Calcium Chloride	25	TON	$500	$12,500	$12,742
E- 2	Silt Fence	1000	L.F.	$3	$3,000	$3,058
E- 3	Uniformed Traffic Officers	500	HRS	$60	$30,000	$30,581
E- 4	Rigid Trench Insulation	1000	L.F.	$5	$5,000	$5,097
F-LUMP SUM						
F- 1	Preparation of Site and Miscellaneous Work (8%)	1	L.S.	$516,220	$516,220	$526,212
F- 2	Bonds	1	L.S.	$104,535	$104,535	$106,558
				TOTAL COST BASE BID:	**$7,073,509**	**$7,210,416**
				USE:	**$7,074,000**	**$7,211,000**

Notes:
1. ENR 9300 = September 2012, ENR 9480 = March 2013

UNIT COST PER LF
$146.00 per LF

TOWN OF HINESBURG, VERMONT
WATER SOURCE FEASIBILITY STUDY

OPINION OF PROBABLE CONSTRUCTION COST - GEPRAGS PARK WELL SITE

As of March 1, 2013

ITEM NO.	DESCRIPTION OF ITEM	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST (ENR 9300)	COST (ENR 9480)
A-WATERLINES & SEWERLINES						
A- 1	8" DI CL52 Waterline	2,100	L.F.	$77	$161,752	$164,883
B-WATERLINE APPURTENCANCES						
B- 1	New Hydrant Branch Connection	4.2	EA	$2,500	$10,500	$10,703
B- 2	8" Gate Valves	5	EA	$1,200	$6,000	$6,116
C-EARTHWORK						
C- 1	Rock Excavation	250	C.Y.	$125	$31,250	$31,855
C- 2	Boulder Excavation	50	C.Y.	$50	$2,500	$2,548
C- 3	Miscellaneous Extra and Below Grade	50	C.Y.	$30	$1,500	$1,529
C- 4	Excavation and Replacement of Unsuitable Material	50	C.Y.	$30	$1,500	$1,529
D-ROADWORK						
D- 1	Permanent Bituminous pavement Repair -Street	1,400	S.Y.	$65	$91,000	$92,761
D- 2	Concrete Sidewalk	100	L.F.	$50	$5,000	$5,097
E-INCIDENTAL WORK						
E- 1	Calcium Chloride	25	TON	$500	$12,500	$12,742
E- 2	Silt Fence	150	L.F.	$3	$450	$459
E- 3	Uniformed Traffic Officers	100	HRS	$60	$6,000	$6,116
E- 4	Rigid Trench Insulation	100	L.F.	$5	$500	$510
F-LUMP SUM						
F- 1	Preparation of Site and Miscellaneous Work (8%)	1	L.S.	$26,436	$26,436	$26,948
F- 2	Bonds	1	L.S.	$5,353	$5,353	$5,457
				TOTAL COST BASE BID:	**$362,242**	**$369,253**
				USE:	**$370,000**	**$370,000**

Notes:
1. ENR 9300 = September 2012, ENR 9480 = March 2013

OVERALL COST FOR GEPRAGS WELL SITE		
	Use Existing Well	**Use New Well**
Sampling and Pump Drawdown Tests	$10,000	$10,000
Grout Existing Wells	$10,000	$10,000
Redrill Existing Well	$10,000	--
Waterline Construction	$370,000	$370,000
Well Head Construction	--	$150,000
TOTAL	**$400,000**	**$540,000**

TOWN OF HINESBURG, VERMONT
WATER SOURCE FEASIBILITY STUDY

OPINION OF PROBABLE CONSTRUCTION COST - MUNSON WELL SITE

As of March 1, 2013

ITEM NO.	DESCRIPTION OF ITEM	ESTIMATED QUANTITY	UNIT	UNIT PRICE	COST (ENR 9300)	COST (ENR 9480)
A-WATERLINES & SEWERLINES						
A- 1	8" DI CL52 Waterline	1,350	L.F.	$77	$103,984	$105,996
A- 2	8" SDR 35 Gravity Sewerline	600	L.F.	$85	$51,000	$51,987
A- 3	4" PVC C900 Forcemain	1,300	L.F.	$55	$71,500	$72,884
B-WATERLINE APPURTENCANCES						
B- 1	New Hydrant Branch Connection	2	EA	$2,500	$5,000	$5,097
B- 2	8" Gate Valves	3	EA	$1,200	$3,600	$3,670
B- 3	4' Diameter Precast Concrete Manhole	16	V.F	$450	$7,200	$7,339
C-EARTHWORK						
C- 1	Rock Excavation	100	C.Y.	$125	$12,500	$12,742
C- 2	Boulder Excavation	50	C.Y.	$50	$2,500	$2,548
C- 3	Miscellaneous Extra and Below Grade	50	C.Y.	$30	$1,500	$1,529
C- 4	Excavation and Replacement of Unsuitable Material	50	C.Y.	$30	$1,500	$1,529
D-ROADWORK						
D- 1	Permanent Bituminous pavement Repair -Street	2,167	S.Y.	$65	$140,833	$143,559
D- 2	Concrete Sidewalk	0	L.F.	$50	$0	$0
E-INCIDENTAL WORK						
E- 1	Calcium Chloride	25	TON	$500	$12,500	$12,742
E- 2	Silt Fence	150	L.F.	$3	$450	$459
E- 3	Uniformed Traffic Officers	100	HRS	$60	$6,000	$6,116
E- 4	Rigid Trench Insulation	100	L.F.	$5	$500	$510
F-LUMP SUM						
F- 1	Above-ground Wastewater Pump Station	1	L.S.	$250,000	$250,000	$254,839
F- 2	Preparation of Site and Miscellaneous Work (8%)	1	L.S.	$53,645	$53,645	$54,684
F- 3	Bonds	1	L.S.	$10,863	$10,863	$11,073
				TOTAL COST BASE BID:	**$735,075**	**$749,303**
				USE:	**$740,000**	**$750,000**

Notes:

1. ENR 9300 = September 2012, ENR 9480 = March 2013

OVERALL COST FOR MUNSON SITE	
Water/Sewer Construction	$750,000
Well Head Construction	$150,000
Land Purchase Price	$375,000
TOTAL	**$1,275,000**

APPENDIX C

SPRAGUE GEOSCIENCE, LLC REPORT

Town of Hinesburg
Water Source Feasibility Study

May 2013

Prepared for:

Aldrich and Elliott
6 Market Place, Suite 2
Essex Junction, Vermont 05452

Sprague GeoScience

Prepared by:

Sprague GeoScience, LLC
480 Salvas Road
Huntington, Vermont 05462

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1.0 INTRODUCTION

The Town of Hinesburg has contracted Aldrich & Elliott to conduct a feasibility study to identify potential water source options for providing additional capacity to their town water system. Aldrich & Elliott has hired Sprague GeoScience LLC to assist with the hydrogeological portions of this investigation. The following report summarizes the results of this investigation.

The Town of Hinesburg public community water system is currently serviced by three bedrock supply wells, namely Well 1, Well 3 and the Lyman Meadows Well. Well #2 is not in use at this time and is no longer connected to the system. The Town also owns three wells located on the Geprags Park property, but these have not been utilized or permitted. The location of the wells currently in use are presented on Figure 1A, and the location of the Geprags wells are shown on Figure 1B.

This study evaluated: the potential for additional utilization of the existing Town wells and other nearby permitted public water supply wells; identifying areas with high well yield potential; and evaluating individual parcels for potential well sites.

Sprague GeoScience LLC has reviewed existing information including the Town of Hinesburg water system files, public utility system maps, ANR GIS mapping data including: private well locations and reports; geologic information; and potential sources of contamination. SGS has met with Jon Kim of the Vermont Geological Survey, Rob Frost of Vermont Well and Pump, and Brian Mattison, Town of Hinesburg WSO. Site visits and/or reconnaissance surveys were conducted at Geprags Park, CVU, the Galiga property and the Munson Property.

2.0 EXISTING FACILITIES, ZONING INFORMATION & REGULATIONS

Appendix A provides background information that pertains to the selection and cost considerations for siting a new public community well site. This includes: a map prepared by the Town of Hinesburg (Map 11) that shows the location of the existing Town water and sewer lines, as well as conserved lands; the Town of Hinesburg Zoning map, and page 8 of the zoning regulations, that summarize lot size information for the various zoning districts; and the rules that pertain to siting criteria and well isolation zones for a public community well. This evaluation considered all of these factors and more, when making the initial recommendations.

3.0 SITE GEOLOGY

3.1 Bedrock Geology

Figure 2 presents the bedrock geology map of the Hinesburg Quadrangle. In the western portion of the Hinesburg area, the bedrock consists of a sequence of carbonate rocks composed of limestone, dolostone and marble, with some quartzite layers as well. Rock units include Monkton Quartzite, Winooski Dolomite, and the Danby and Clarendon Springs Formations among others. The Hinesburg thrust fault, is located to the east of these units. East of the thrust fault, on the upper plate, the rock formations are composed of phyllite and schist. The bedrock units of the upper plate consist of the Pinnacle and Fairfield Pond Formations among

others. Descriptions of the lithologic units are presented in the legend of the map. In general, the higher yielding bedrock wells are located in the carbonate rocks, and the lower yielding wells are completed in the rock formations of the upper plate. In addition, according to the Vermont Geological Survey, wells completed in the upper plate formations tend to have an increased risk of containing radionuclides in the water.

3.2 Surficial Geology

Figure 3 presents a surficial geology map of the Hinesburg area. As shown on this map, much of the western portion of the town is underlain by silt and clay, with several areas of exposed bedrock, and a few areas with glacial till. The eastern portion of the town is underlain primarily by glacial till with numerous bedrock outcrops, with a couple areas underlain by a kame terrace. The areas underlain by silt and clay will tend to provide some natural protection from shallow sources of contamination. Glacial till may also provide some protection, but would depend on the thickness of the till and if the till is fractured.

4.0 POTENTIAL SOURCES OF CONTAMINATION

Appendix B presents both maps and summary tables of the potential sources of contamination (PSOC) managed by the Vermont DEC Waste Management Division. This includes landfills, hazardous waste sites, hazardous waste generators, brownfields, and underground storage tanks (working). As shown on Map 1B, nineteen of the PSOCs are located near the center of the Village, as outlined by the red rectangle. Map 2B presents and enlargement of this area. The summary tables include all the PSOCs located in this Village center area. This includes ten (10) hazardous waste sites (both open and closed), eight (8) working underground storage tanks, and one (1) hazardous waste generator. Given the numerous PSOCs, (as well as known sources of contamination) in this area, and the high development density, this area is not recommended for future well sites.

On-site septic systems also represent a potential source of contamination. All residences and businesses not located on the Town Sewer system, are considered a PSOC.

As noted previously, naturally occurring radionuclides are present in the groundwater in some areas. They are thought to be more prominent in wells completed in the bedrock formations located on the upper plate, but can also occur in other formations as well.

5.0 PRELIMINARY FOCUS AREAS

An assessment of private well yields was conducted to identify areas that have a grouping of wells with relatively high yields. The State of Vermont Natural Resources database was utilized to conduct this analysis, along with local knowledge about wells not included in the database. It should be noted that the locations of some of the wells in this database, are not always accurate, especially those that were screen digitized. Those wells with a GIS location or based on an E911 address tend to be more reliable. A field visit would be necessary to verify the location of individual wells.

Four areas were identified that contain a grouping of high yielding wells. These areas are shown on Figure 4 entitled “Focus Areas”. The areas are referred to as Village North, Village, North

Road/Beecher Hill and Silver Street. Appendix C presents a map of each focus area along with a summary table of the wells located in each area.

The North Village area includes two of the Town wells located in Geprags Park, two Ballard wells, and the Patillio and Emmons wells. Well yields in this area range from 60 – 225 gpm. This area is thought to contain the potential for future well development, but existing data (Geprags Well 3) suggests that in the Geprags park area, there is a risk of wells being under the influence of surface water.

The Village area contains six high yielding wells including the two existing Town wells, the Lyman Meadows well, Mead Well, and two of the three International Cheese wells. This area is not considered favorable for development of a new water source due to numerous potential and existing sources of contamination, and high development density.

The North Road/Beecher Hill focus area contains a total of thirteen private wells. Twelve of these wells have yields ranging from 50 – 100 gpm. A new well in this area appears to have potential, but the water line would need to be extended and an evaluation would have to be conducted of the possible impacts from the nearby closed landfill.

There are two high yielding wells located off Silver Street. These are the Terry Wilson Well which has a drillers yield of 200 gpm and the Alternative Building Systems well with a drillers yield of 100 gpm. This area is also thought to have potential for future well development, but is not located near the existing water line, and therefore would be costly to develop.

6.0 EVALUATION

6.1 Existing Permitted Wells

- *Town Wells (WSID 5070)*
  There is limited opportunity to deepen the two existing Town wells (Well #1 and Well #3) or to drill new wells in this area due to: low levels of MTBE in the water; the presence of several nearby potential sources of contamination; and, potential drawdown from the existing wells. The Town has stated that they are not interested in pursuing this area further for future well development.

- *Saputo Well (WSID 20368)*
  The former International Cheese well (tag 56-KF) is reported to have a drillers yield of 150 gpm. This well is reported to be contaminated with MTBE and has not been in use since the fire at the facility in 2008. The well had been used as a recovery well for MTBE contamination, and is thought to have diverted the MTBE contamination away from the two existing town wells. This well is not suitable for the Town of Hinesburg supply well due to MTBE contamination issues.

- *Lyman Meadows Well (WSID 20000)*
  The Lyman Meadows well (Well Report # 263) has a driller's yield of 75 gpm. The well is currently in use by the Town of Hinesburg as a separate water system that only services the Lyman Meadows condominiums. According to a Green Mountain

Engineering's "Small Water System Facility Improvement Plan" dated September 2006, the well has an approved yield of 32 gpm. The metered maximum day demand of the system is 12,149 gpd or about 8.4 gpm. Therefore there is approximately 23.6 gallons of permitted unused capacity available in this well.

Heindel and Noyes Inc. estimated that this well may have approximately 20 – 50 gpm additional capacity, however, the current use is limited to 32 gpm due to interference with the Dunshee and Chickering wells. A copy of the pump test for this well was not readily available and therefore could not be reviewed for this evaluation. A copy of the report may be available from the WSD archives.

- *Orchard Commons (WSID 20098)*
  This well has a driller's yield of 20 gpm, and an approved capacity of 6.9 gpm. There is likely little or no additional capacity in this well.

- *Quinn Well (Town of Hinesburg Well #2)*
  There was limited information available about this well from the Town files. However, according to Mr. Brian Mattison, Town of Hinesburg Water System Operator, the well is currently not in use by the Town, the property owner is uncooperative, and it is not likely a good source.

- *Cedar Knoll Country Club Well (WSID 20592)*
  Little research was conducted on this well. The town of Hinesburg stated that they are not interested in a well in this area because it is too far away from their existing water line.

6.2 Existing Wells Not in Use

- *Geprags Park Wells*
  The Town of Hinesburg owns three wells on the Geprags Park property. A summary is given below. A map showing the well locations as well as a copy of the well completion reports are presented in **Appendix D**.

Table 6-1 Summary of Geprags Park Wells

Well #	Yield (gpm)	Depth (ft)	Casing (ft)	Static WL (ft)	Tag #	Comments
Well 1	3	600'	62	50	8-608	Low yield
Well 2	75-100	580	63.5	2	8-609	Possible GWUI
Well 3	225	300	60	Over flows	7-797	Surface water debris in discharge water.

Well #1 has a low yield and is 600 feet deep; therefore, it is not promising. In addition, a document prepared by Phelps Engineering, Inc entitled "Town of Hinesburg, Water System Improvements, Source Development" stated that Well #1 has been abandoned. Well #2 has a relatively high yield, but a preliminary micro particulate analysis (MPA) suggests that it may be at risk of being under the influence of surface water. There was too much sediment in the

laboratory sample submitted for the MPA test, therefore, the results were inconclusive. During a pumping test of Well 3 by Heindel and Noyes Inc., drawdown was observed in Well 2, which suggests there is a hydraulic connection between at least some of the fractures in these two wells.

Well 3 has a very high yield but the well water was found to contain large amounts of surface debris. A nearby spring dried up during a short term pump test of Well #3, suggesting a hydraulic connection with surface water/shallow groundwater.

6.3 Individual Parcels

- *Munson*
  The Munson Parcel is located just south of the village, south of Buck Hill Road, and east of Route 116. **A site map is presented in Appendix E**. The property is owned by Mr. George Munson and contains a house serviced by a drilled well and an on-site septic system. The Munson well has Well Tag #30872. This well was not in the ANR database, but according to the Well Completion Report provided by Vermont Well and Pump, the well was completed in December 2005, is 580 feet deep, and has a driller's yield of 200 gpm. In addition, the report states that the property is underlain by 40 feet of clay and 180 feet of sand and gravel. A copy of the well completion report is presented in **Appendix E**. The parcel appears to have a potential well site in the middle of the large field located northwest of the house that meets the 200 foot isolation criteria. Given the thick layer of clay in the site vicinity, the two year time of travel criteria from the existing on–site septic system may be met, but other houses with septic systems upgradient of the well site would also need to be evaluated.

  This site appears favorable given the high well yield of the Munson Well, lack of nearby hazardous waste sites, location in a favorable bedrock formation, and the potential for upgradient septic systems to be connected to the town sewer, if septic system travel time calculations do not meet the necessary two year criteria.

- *Norris*
  The Norris parcel is located just south of the village on the west side of Route 116, across from Buck Hill Road. A copy of the Sketch Plan for the property is presented in **Appendix F**. Most of the western portion of the parcel consists of Class Two wetlands, and cannot be developed. The sketch plan for the remaining area shows a 25 unit residential development serviced by municipal water and sewer. There is not an obvious suitable location for a PCWS well on this parcel, due to lack of the required 200 foot setback distance.

- *CVU*
  A map of the CVU property is located in **Appendix G**. This map shows the location of two hazardous waste sites, and two underground storage tanks located on the property. Based on well site isolation criteria, it appears that a suitable well location may be possible west of the pond. An area that meets the 200 foot isolation distance from the property boundary and 150 from surface water is shown on the map as a potential area for a well. Potential contamination from the bus garage site (Site # 972248), and from Site# 941618 would need to be evaluated more thoroughly to determine if they would likely represent a potential

source of contamination. A preliminary review of the bus garage site indicates that it is a low priority site. As of May 2012, soils and/or groundwater have been contaminated with petroleum, but there has been no effect on sensitive receptors. Preliminary information dated April 2011 regarding Site # 941618, state that it is a medium priority and that sensitive receptors are threatened by contamination from a petroleum release from an UST. The last round of bi-annual supply well sampling was conducted in September 1995, so site work is long overdue. A summary of the status of both sites is presented in **Appendix G**.

According to the surficial geology map, the CVU parcels are underlain by silt and clay, so it appears that there would be some protection from shallow sources of contamination. According to the information available on the Vermont ANR website, there were two wells drilled for the school. One well (WR# 452) was reported to have a well yield of zero. The other well located on the CVU property (Well Report #451, Tag #9114) is reported to have a drillers yield of 25 gpm. However, according to Heindel and Noyes, the well was pump tested at 50 gpm, and additional capacity may be available. Copies of the well completion reports for these well are presented in **Appendix G**. Although CVU is connected to the Town water system, they utilize their existing well for watering their ball fields, and are not interested in letting the Town take over their well.

- *Galiga*

  This parcel is located at 119 Lowmeadow Road and is owned by Ann Janda and Philip Galiga. A map of the parcel is presented in **Appendix H**. According to Ms Janda, their well has well tag #510. According to the well completion report, the well was drilled on 10/22/1993 by Spafford and Sons of Williston, Vermont, and has a driller's yield of 100 gpm.

  Ms Janda stated that their well has been tested for radionuclides and was reported to contain elevated levels of Gross alpha and slightly elevated levels of combined Radium 226 and 228. According to the VDH, the radionuclides are from naturally occurring sources. Ms. Janda also stated that the well was tested for TCE but that this compound was not detected. TCE was a concern in this vicinity due to a release at the Iroquis Manufacturing Building.

  A summary table of the radionuclide water quality results is presented below.

Table 6-2 - Galiga Well Water Quality Summary

Constituent	Sample 1 (pCi/l)	Sample 2 (pCi/l)	MCL
Gross Alpha	30.3	2.2	15 pCi/l
Radium 226	5.1	-	5 pCi/l total for 226 and 228
Radium 228	BDL	-	
Uranium	8	14	20 pCi/l

Notes: pCi/L = picocuries per liter
MCL: Maximum Contaminant Level

A review of the ANR data base for this area, indicates that the Iroquois Manufacturing Company (IMC) Facility is listed as Hazardous Waste Site # 951795 (see **Appendix H**).

Ongoing site work includes quarterly water quality monitoring for TCE in the IMC well and one residential well. TCE is reported above the GWES in the residential well, although levels show slight decline. The owner of the residential well was not identified in the site summary.

This parcel appears to have the necessary set back requirements for a town well to be drilled on this parcel. However the Janda/Galiga house and other nearby properties currently equipped with on-site septic systems would likely have to be connected to the town sewer. According to the Surficial Geology Map, this property is underlain by kame terrace deposits, which would not likely provide adequate protection to the bedrock aquifer. A well in this area may also be a risk of TCE contamination, and may require treatment for radionuclides. According to the VT ANR database, the Galiga well is the only high yielding well in the general vicinity, so a high yielding well is not guaranteed. The bedrock underlying the property is mapped as being the Fairfield Pond formation, which tends to have lower yielding wells. The owners are currently open to the idea of a Town well on their property, but are also looking into the possibility of subdividing their lot.

7.0 INITIAL RECOMMENDATIONS

A discussion of the initial recommendations is presented below. A summary of the pros and cons of these initial recommendations is presented as Table 7-1 below. The most promising potential location for a new Town well appears to be the Munson Property. This parcel is near the existing water line, is mapped as having silt and/or clay overburden which provides protection from shallow sources of contamination, and is located in an area where there is a reasonable potential for a high yielding well. Unfortunately, the parcel is zoned as being Residential 2, which allows for minimum lot sizes of 6,000 square feet, therefore the cost for controlling this lot may be high. It is recommended that the Town of Hinesburg have discussions with the Munson's regarding costs for drilling a test well on their property and obtaining control of the well isolation zone to determine if this lot is financially feasible. Preliminary two-year time of travel calculations should be conducted on upgradient septic systems.

After review of the 90% draft report, the Town of Hinesburg Select Board expressed an interest in the Russell property, which is located just to the north of the Munson Property. Many of the same pros and cons noted for the Munson property would also likely apply to the Russell Property given its close proximity. Therefore, it is recommended that an investigation for a new well site be conducted on this property as well.

With respect to the Geprags property, as an initial step, it is recommended that the Town of Hinesburg attempt to obtain copies of all previous testing that has been conducted on the three wells on this parcel. If, after review of these documents, the conditions are consistent with our current understanding, then the following is recommended.

Well #3: The primary strategy for Well #3 is to eliminate its connection with surface water. This is important in order to potentially use Well #3 itself, as well as to minimize the potential impact that it may have on Well #2. According to the drillers log, two water bearing zones were encountered in Well #3. The upper zone is from 60 – 165 feet, and the lower zone is from 233-235 feet. It is unknown if both or only one of these water bearing zones is under the direct influence of surface water. Two potential options are recommended to seal the well off from surface water contamination.

The first option would be to extend the casing below the water bearing fracture(s) that are influenced by surface water. A down-hole camera survey may be helpful in understanding the flow of water into the well. If both fracture zones are cased, then the well could be drilled deeper. If only the upper zone is cased and there is still adequate yield, then the well could be tested as is. Also, in this scenario, the option to drill deeper in hopes of further increasing the yield in Well #3 would also be available at a later date. A preliminary algae sample followed by MPA testing would then need to be conducted to determine if casing the fractures has been successful. The second option would be to fill the well bore with cement to the bottom of the casing, with the option to drill deeper at a later date.

Well #2: Once the potential influence with surface water has been addressed in Well 3, it is recommended that a short term pump test be conducted on Well #2 to try and clear up the water and to collect an algae sample. Testing for algae is an inexpensive method to determine if the well is likely under the influence of surface water. If the algae test fails, then the well should be abandoned. If it passes, then additional GWUI testing should be conducted to verify that it is not under the influence of surface water, and a pump test should be conducted to determine its long term yield.

Other options for the Geprags property include drilling additional wells on the parcel.

Since completion of the 90% draft report, the select board has requested that the Bissonette property be considered for a potential well site. This land is located off the south side of Shelburne road, south of Geprags park (Appendix I). The land is being donated to the Town for use as a recreational facility. It is recommended that this parcel be assessed for its well siting potential including the ability to meet well setback criteria.

Although the CVU property appears to have potential as a well site, the select board does not want to pursue a new well on this parcel at this time, given concerns over the two hazardous waste sites on the property. Therefore, no further investigations are recommended at this time. However, the CVU parcel is still listed as a potential future site.

Table 7-1
Summary of Initial Recommended Sites - Pros and Cons

Location	Pros	Cons
Munson Property	• Near Village and existing water line and sewer line • Adequate isolation Area • Good potential for high yielding well • Surficial Material mapped as silt/clay which provides protection from shallow PSOCs	• In RR2 Zoning Area so land purchase/easements likely expensive • On-site septic systems upgradient of property require 2 Year TOT calculations. • May need to bring sewer service to this area. • Loss of tax revenue from parcel not being developed for residential use.
Russell Property	• Likely similar to Munson • Criteria need to be evaluated	• Likely similar to Munson • Criteria need to be evaluated

Geprags Park	• Conserved land • Existing wells • Close to adequate Water Line • High yielding wells • Relatively low cost to determine if Well 2 has potential. • May be able to utilize Well 3 if water bearing fracture(s) that are under the influence of surface water are either cased off or grouted. Afterwards, well could be deepened. • Land available for additional wells if results for Wells 2 and 3 are unsuccessful.	• Well 3 is considered to be groundwater under the direct influence of surface water (GWUDI). Would require surface water treatment to utilize well as it is now. • Well 3 would need to be grouted or have the casing extended to eliminate surface water influence. • Well 2 may be also be GWUDI. Microbiology testing required.
Bissonette Property/ Town Recreation Facility	• Close to adequate Water Line • Bedrock formation appears to be favorable • Other criteria need to be evaluated	• May be difficult to meet well setback criteria, given nearby wetlands, stream, FEMA Zone A floodplain, recreation fields, and property boundaries. • Other criteria need to be evaluated.

Table 7-2 presents the pros and cons of future options for other well sites if additional sources are needed after the initial recommendations are considered. This table is for planning purposes only, and the options are not listed in any specific order.

Table 7-2
Summary of Future Potential Sites - Pros and Cons

Location	Pros	Cons
CVU	• Available land that meets siting criteria and has drilling rig access • Moderate yielding well (CVU) on the property, so potential for good well. • Clay overburden – protection from shallow sources of PSOCs. • Cooperative property owners, easement reasonably priced?	• Nearby well on CVU property reported to have a drillers yield of zero, so also potential for low yielding well. • Close to existing water line, but water line would need to be upgraded • Two hazardous waste sites on the property, which may be PSOC. Evaluation needed. • On-site septic systems nearby

Norris Property	• Close to village and water & sewer lines. • Limited option for other land uses, so cost of land likely low.	• Does not meet well 200' well isolation criteria – would need reduction to approximately 125' • Would need CUD permit for construction in a wetland buffer • Would need to conduct MPA analysis to determine if well is GWUDI.
North of Geprags Park (Village North Focus Area)	• High yielding wells in the area • Area contains several large fields that appear to be suitable as a well site • Zoned RR1, so control of land may be reasonably priced	• Unknown development plans on parcels. • Moderate distance from existing adequate water line depending actual location
North Road/Beecher Hill Focus Area	• Very good potential for high yielding well • In RR1? Zoning Area so land prices likely reasonable • Several large fields in the area, so good potential for well site that meets setback criteria.	• No specific parcel identified • On-site septic systems in site vicinity • Surficial Material mapped primarily as kame terrace with area of till to east. Limited natural protection from shallow PSOCs. • Expensive to extend existing water line. • Closed landfill northeast of focus area, represents PSOC. Would need to be evaluated.
Silver Street Focus Area	• Appears to be good potential for high yielding well	• On-site septic systems • Expensive to extend water line
South of Elementary School	• Near Village and existing water and sewer lines. • School District Owns land	• Unknown potential for high yielding well • Unknown if site exists on property that meets well setback criteria

Figures

Figure 1A: Town of Hinesburg Wells In Use

Vermont Agency of Natural Resources

vermont.gov

LEGEND

Parcels (where available)

NOTES

Map created using ANR's Natural Resources Atlas

536.0 0 268.00 536.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 879 Ft. 1cm = 105 Meters

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Figure 1B: Geprags Park Wells

Vermont Agency of Natural Resources

vermont.gov

LEGEND

Parcels (where available)

NOTES

Map created using ANR's Natural Resources Atlas

536.0 0 268.00 536.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 879 Ft. 1cm = 105 Meters

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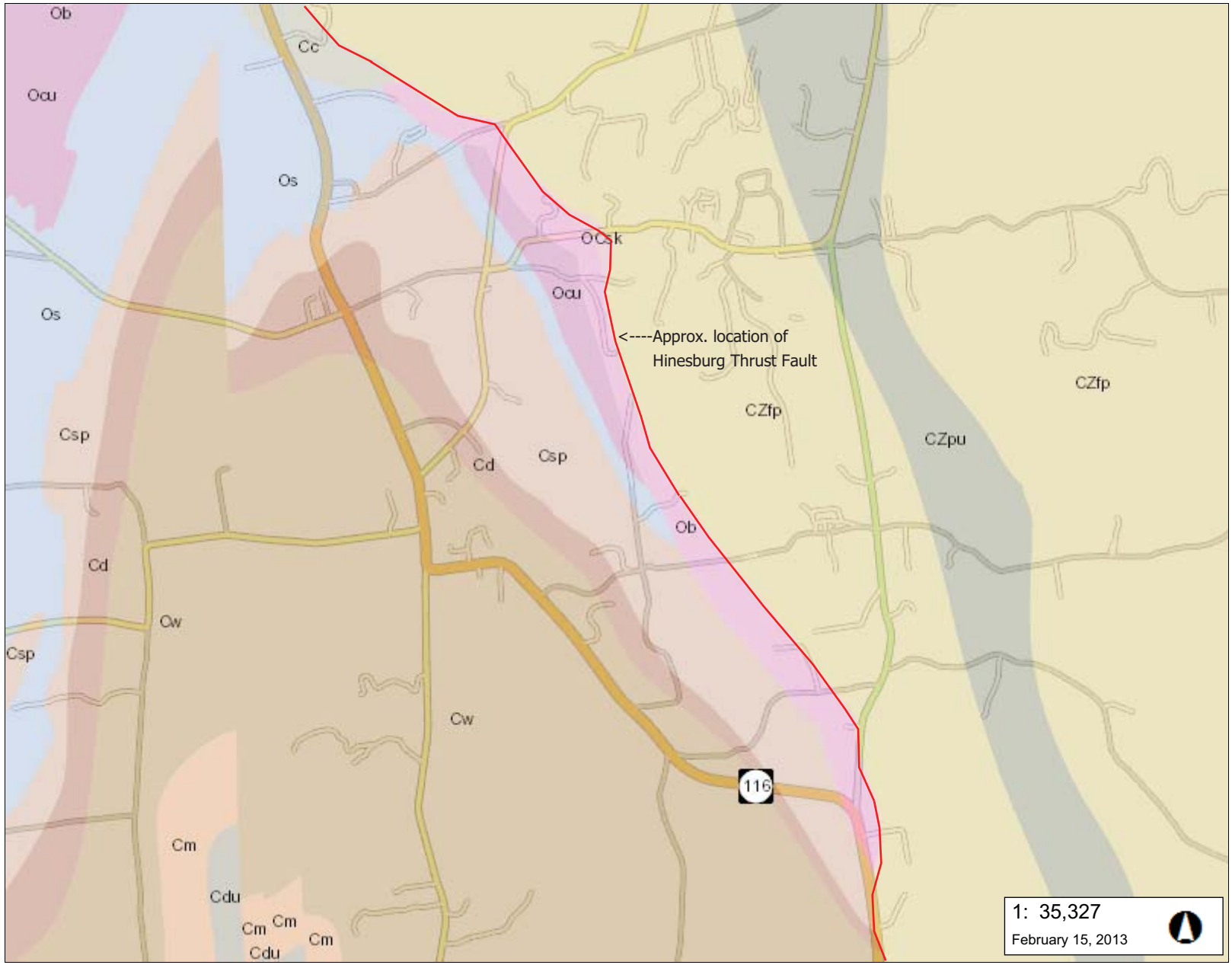
Bedrock Geology Map FIGURE 2

Vermont Agency of Natural Resources

vermont.gov



LEGEND

Roads

- Principal Arterial
- Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Urban Collector
- Local
- Not part of the Functional Classifica

Light Gray Canvas Base

NOTES

Map created using ANR's Natural Resources Atlas

1,795.0 0 898.00 1,795.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 2944 Ft. 1cm = 353 Meters

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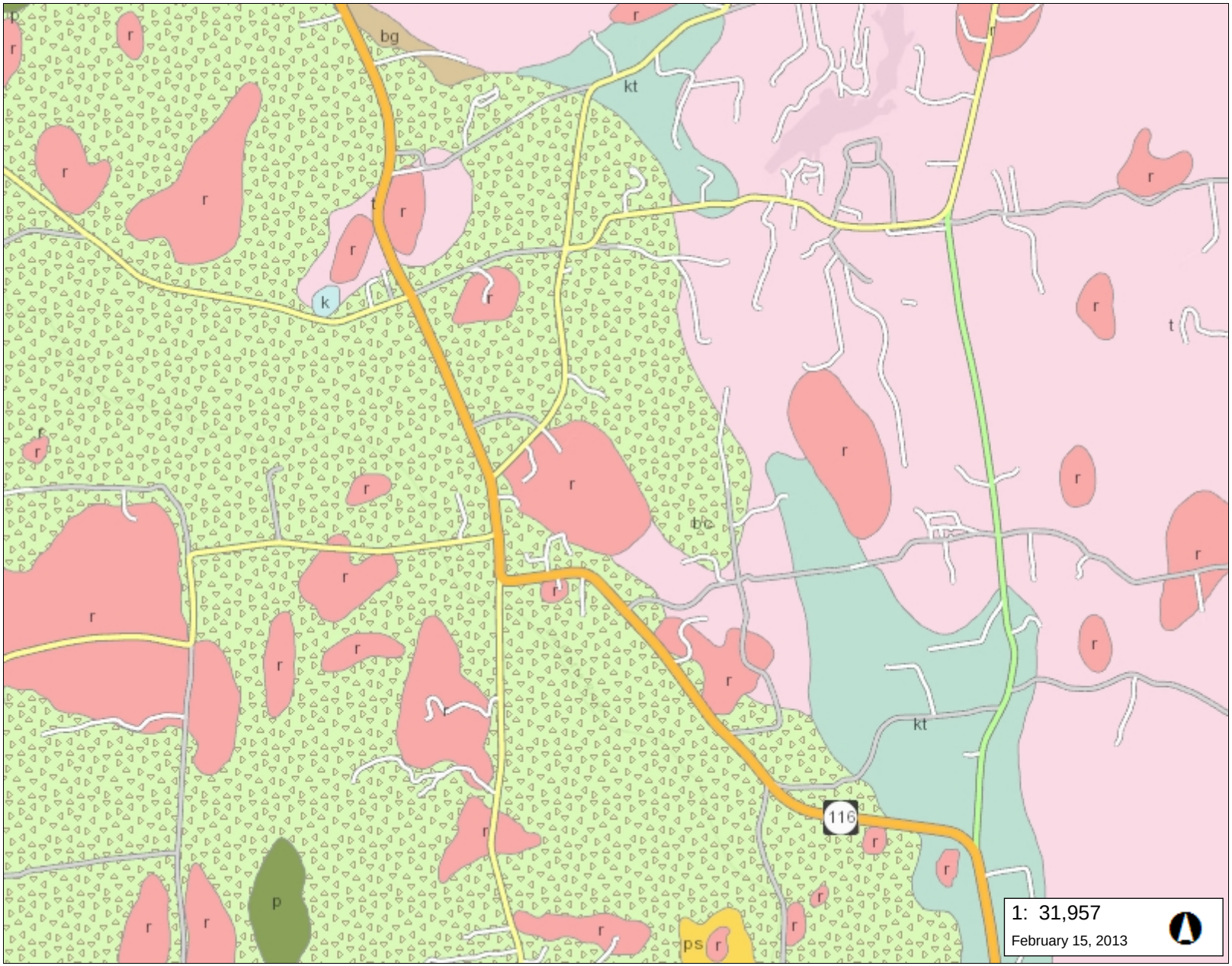
Legend for Figure 2: Bedrock Map

Symbol	FORMATION
Cc	Cheshire Quartzite
Cd	Danby Formation
Cdu	Dunham Dolostone
Cm	Monkton Quartzite
Csp	Clarendon Springs Formation
Cw	Winooski Dolostone
CZfp	Fairfield Pond Formation
CZpu	Pinnacle Formation
CZpva	Pinnacle Formation
CZun	Underhill Formation
Ob	Bascom Formation
OCsk	Skeels Corners Slate
Ocu	Cutting Dolostone
Os	Shelburne Marble

Surficial Geology Figure 3

Vermont Agency of Natural Resources

vermont.gov



LEGEND

Roads

- Principal Arterial
- Minor Arterial
- Rural Major Collector
- Rural Minor Collector
- Urban Collector
- Local
- Not part of the Functional Classifica

Surficial Geology (Lithology)

- till
- terminal moraine
- moraine
- isolated kame
- kame terrace
- kame moraine
- outwash
- esker
- eolian sand
- lake gravel
- beach gravel
- delta gravel
- delta
- lake sand
- pebbly sand
- boulders in sand
- delta sand
- silt, silty clay, and clay

NOTES

Map created using ANR's Natural Resources Atlas

1,623.0 0 812.00 1,623.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 2663 Ft. 1cm = 320 Meters

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Figure 4: Focus Areas

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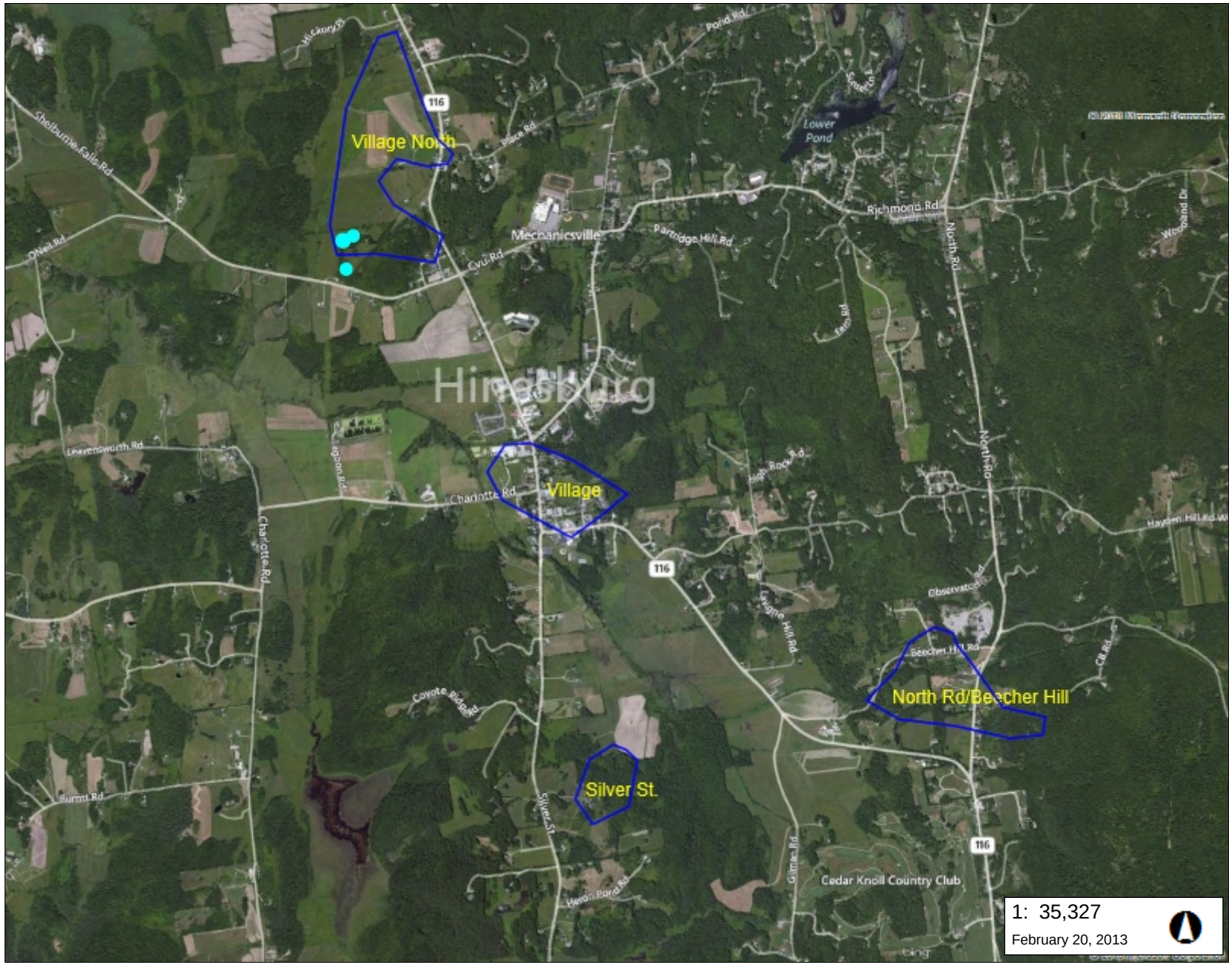

LEGEND

NOTES

Map created using ANR's Natural Resources Atlas

1,795.0 0 898.00 1,795.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 2944 Ft. 1cm = 353 Meters

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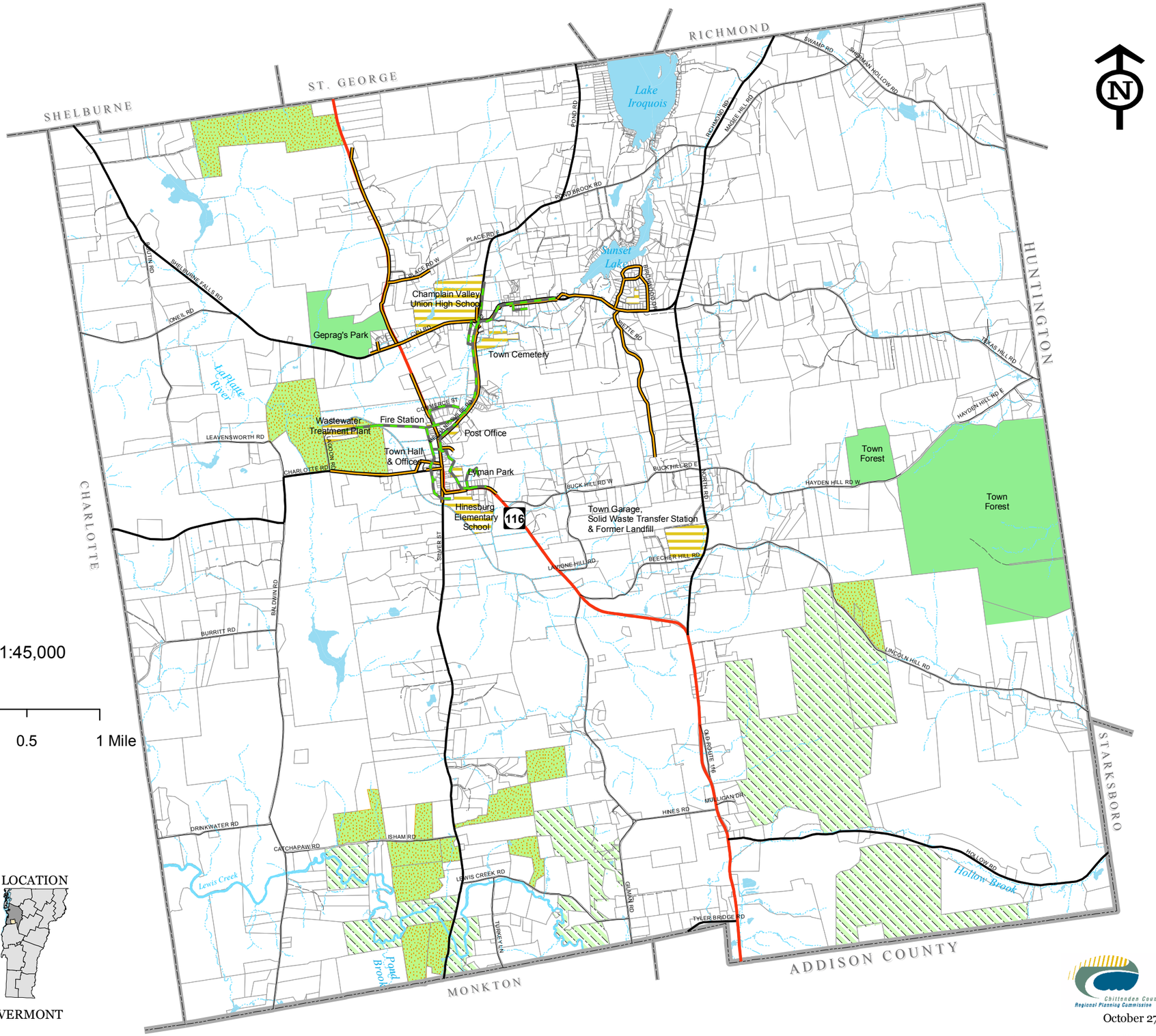
Appendix A

Town Facilities, Conserved Land, Zoning Information and Well Siting Criteria

Map 11: Town Facilities and Conserved Lands Town of Hinesburg



Legend

- Sewer Line
- Water Line
- Town and Other Public Properties

Conserved Land

- Town
- State
- Private*
- River
- Stream Centerline
- Lake, Pond or River
- Parcel Boundary

*Does not include some smaller common land parcels owned by homeowner associations.

Sources:
sewer and water line - CCRPC 2000 and 2003.
roads - e911 road data, 2004
Parcel - 2004 - GrassRoots GIS
Conserved land - updated 2004.
surface water - VT Hydrography set - 2003.

Disclaimer:
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Chittenden County Regional Planning Commission is not responsible for these. Questions of on-the-ground location can be resolved by site inspections and/or surveys by a registered surveyor. This map is not sufficient for delineation of features on-the-ground. This map identifies the presence of features, and may indicate relationships between features, but is not a replacement for surveyed information or engineering studies.

Chittenden County Regional Planning Commission

October 27, 2004

c:\projects045\hinesburg\map11_facilities_conserved.mxd

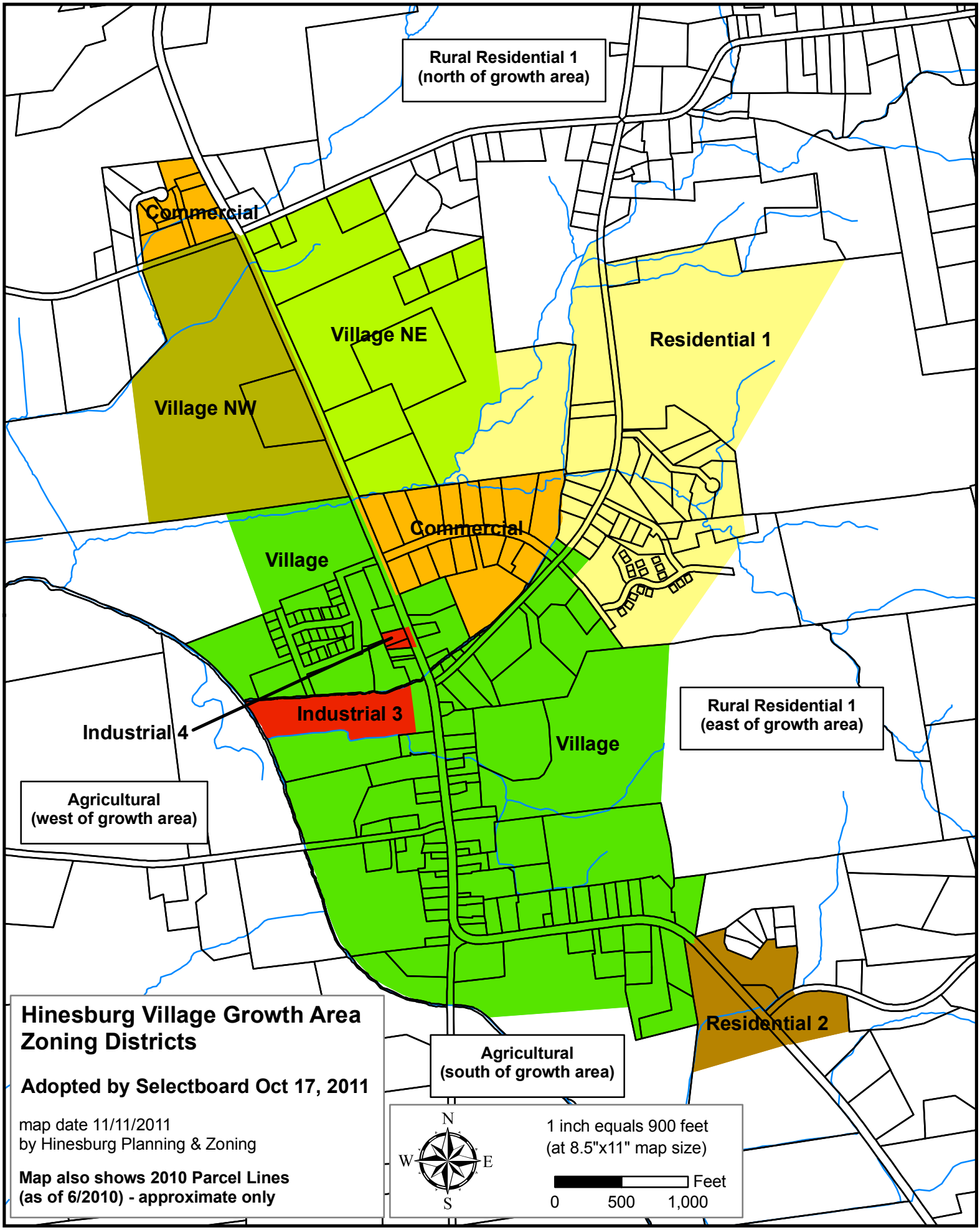

Rural Residential 1
(north of growth area)
Commercial
Village NE
Residential 1
Village NW
Commercial
Village
Industrial 3
Industrial 4
Village
Rural Residential 1
(east of growth area)
Agricultural
(west of growth area)
Residential 2
Agricultural
(south of growth area)
Hinesburg Village Growth Area
Zoning Districts
Adopted by Selectboard Oct 17, 2011
map date 11/11/2011
by Hinesburg Planning & Zoning
Map also shows 2010 Parcel Lines
(as of 6/2010) - approximate only
N
W
E
S
1 inch equals 900 feet
(at 8.5"x11" map size)
Feet
0
500
1,000

TABLE 1

District	Minimum Lot Size	Minimum Lot Frontage[1]	Minimum Lot Depth	Minimum Front[2,3]	Building Side[2,3]	Setbacks Rear[2,3]	Maximum Lot Coverage [4]
AG	2 acres	200 ft. 400 ft. if fronting on Rt. 116	200 ft.	60 ft. 80 ft. on Rt. 116	20 ft. (10 ft.)	30 ft. (10 ft.)	20%
RR 1	3 acres. 1 acre if on town sewer	200 ft. 400 ft. if fronting on Rt. 116	200 ft. 100 ft. if a 1 acre lot	60 ft. 80 ft on Rt. 116	20 ft. (10 ft.)	30 ft. (10 ft.)	20%[5]
RR 2	3 acres	250 ft. 400 ft. if fronting on Rt 116	200 ft.	60 ft. 80 ft. on Rt. 116	20 ft. (10 ft.)	30 ft. (10 ft.)	20%
VG	6,000 s.f.	60 ft.	100 ft.	10 ft.	10 ft.	10 ft.	75%
VG-NW	6,000 s.f.	60 ft.	100 ft.	10 ft. 50 ft. on Rt. 116	10 ft.	10 ft.	60%
VG-NE	6,000 s.f.	60 ft.	100 ft.	10 ft. 50 ft. on Rt. 116	10 ft.	10 ft.	60%
R-1	6,000 s.f.	60 ft.	100 ft.	10 ft.	10 ft.	10 ft.	60%
R-2	6,000 s.f.	60 ft.	100 ft.	10 ft.	10 ft.	10 ft.	60%
C	none	60 ft.	100 ft.	10 ft.	10 ft.	10 ft.	60%
I-1	40,000 s.f.	100 ft.	200 ft.	50 ft.[6]	10 ft. [6]	10 ft. [6]	75%
I-2	40,000 s.f.	150 ft.	250 ft.	75 ft.	25 ft.	50 ft.	60%
I-3[7]	TBD	TBD	TBD	TBD	TBD	TBD	80%
I-4	40,000 s.f.	75 ft.	100 ft.	50 ft.	25 ft.	25 ft.	80%
S	3 acres, 1acre if has >= 100 ft. lake frontage	100 ft.	100 ft.	60 ft.	20 ft. (10 ft.)	30 ft. (15 ft.)	10 %

(1) See "corner parcels," Section 2.6.

(2) Figures for accessory structures no larger than six hundred (600) square feet in floor area or no higher than twenty (20) feet in height are shown in parentheses if different from principal structures. See sections 2.5, 2.6.2, 5.22 for additional accessory structure setback provisions and requirements.

(3) In VG, VG-NW, VG-NE, C, R-1, R-2, I-3, I-4 districts, front yard setbacks are measured from the edge of the road right

A groundwater source includes all water obtained from dug, drilled, bored or driven wells, springs, and infiltration lines and galleries. The degree of treatment required for a groundwater source may be similar to that of surface water sources in cases where the groundwater source is under the direct influence of surface waters as determined in Subpart 3.4.

3.3.1 Source Site and Isolation Zone

3.3.1.1 General Information on Sites

Proposed source site locations shall be remote from all sources of contamination, hydraulically upgradient of major sources of contamination, and situated so as to minimize the impact from water quality threats. Proposed source sites will not be approved by the Secretary in areas which may create a public health hazard or unacceptable risk. Fencing or posting of source sites to restrict access may be required by the Secretary on a case-by-case basis. On site sewage disposal systems located within the recharge area shall be located a minimum of a two year travel time in saturated materials from proposed source sites.

3.3.1.2 Source Isolation Zones

The source isolation zone shall be a water system controlled 200' radius around the proposed source unless approved otherwise based on site specific considerations as follows.

(a) The isolation zone may be increased at the discretion of the Secretary to insure reasonable protection of water system sources.

(b) source isolation zone reductions to a minimum of 125', may be allowed if the following can be shown:

  (1) An impeding layer of soil is present and located at least 200' around the source, with no significant hydraulic connection to the proposed aquifer. Hydraulic connection, or lack thereof, between aquifers must be determined by standard pumping test methods including:

    i) stressing the production well or proposed aquifer,

    ii) monitoring the aquifer's response in multi-level piezometers, and

    iii) mapping areas of influence of the source in overlying unconfined aquifers.

    or:

  (2) Undevelopable land surrounds the source site such as rock cliffs.

(c) Spring isolation zones may be reduced in a down slope direction provided that the area down slope of the spring is below the bottom elevation of the spring. This area must be large enough to include space for maintenance of the spring. In no cases shall a spring isolation zone be reduced to less than 50 feet in the down slope direction.

(d) All proposed groundwater sources shall be evaluated for direct influence by surface water as per Appendix A Part 3.

(e) Permitted and prohibited land uses in the source isolation zone are as follows:

  (1) Permitted land uses will be restricted to:

    (i) source operation and maintenance;

    (ii) playgrounds, ball fields, tennis courts;

(iii) seasonal light duty roads;
(iv) conservation zones;
(v) controlled use of potassium and phosphorous fertilizers; and
(vi) other uses which have the approval of the Secretary.

(2) Prohibited land uses include:
(i) application of nitrogen, pesticides and herbicides;
(ii) buildings other than those required for the water system;
(iii) parking of motor vehicles;
(iv) chemical or fuel storage except natural gas or propane and other chemicals that are required by the water system;
(v) swimming pools;
(vi) salted or paved roads passing through the area;
(vii) septic tanks, subsurface disposal systems and sewer lines; and
(viii) any other activity which may contaminate the water source.

(f) Control of land use activities within the source isolation zone can be achieved by ownership of the land or through easements with restrictive covenants. The applicant's attorney must submit a written certification attesting that the applicant has the ability to control the isolation zone per Appendix A Subpart 3.3.1.2(e). The applicant shall provide documentation on request by the Secretary.

Legal control of land uses within the isolation zone by the water system must be tied to the land deeds for all parcels within the source isolation zone and run with the land regardless of future land ownership so long as the source is used for a **Public** water system.

3.3.2 Source Construction

Construction of **Public** water system drilled wells shall comply with the well construction standards in Part 12 of Appendix A.

All drilled or driven wells shall have a physical means of protecting the above grade well casing from collisions by installation of a permanent barrier, such as surrounding posts, a containing structure, or fencing.

3.3.2.1 Spring and Shallow Well Construction

Construction of springs and shallow wells shall only be permitted when drilled wells are not feasible or upon waiver by the Secretary. Specific reasons shall be submitted to the Secretary and may include results of test wells on the project site, results of existing well yields in the project area, or detailed hydrogeologic analysis.

3.3.2.1.1 Construction Materials

Acceptable materials include:

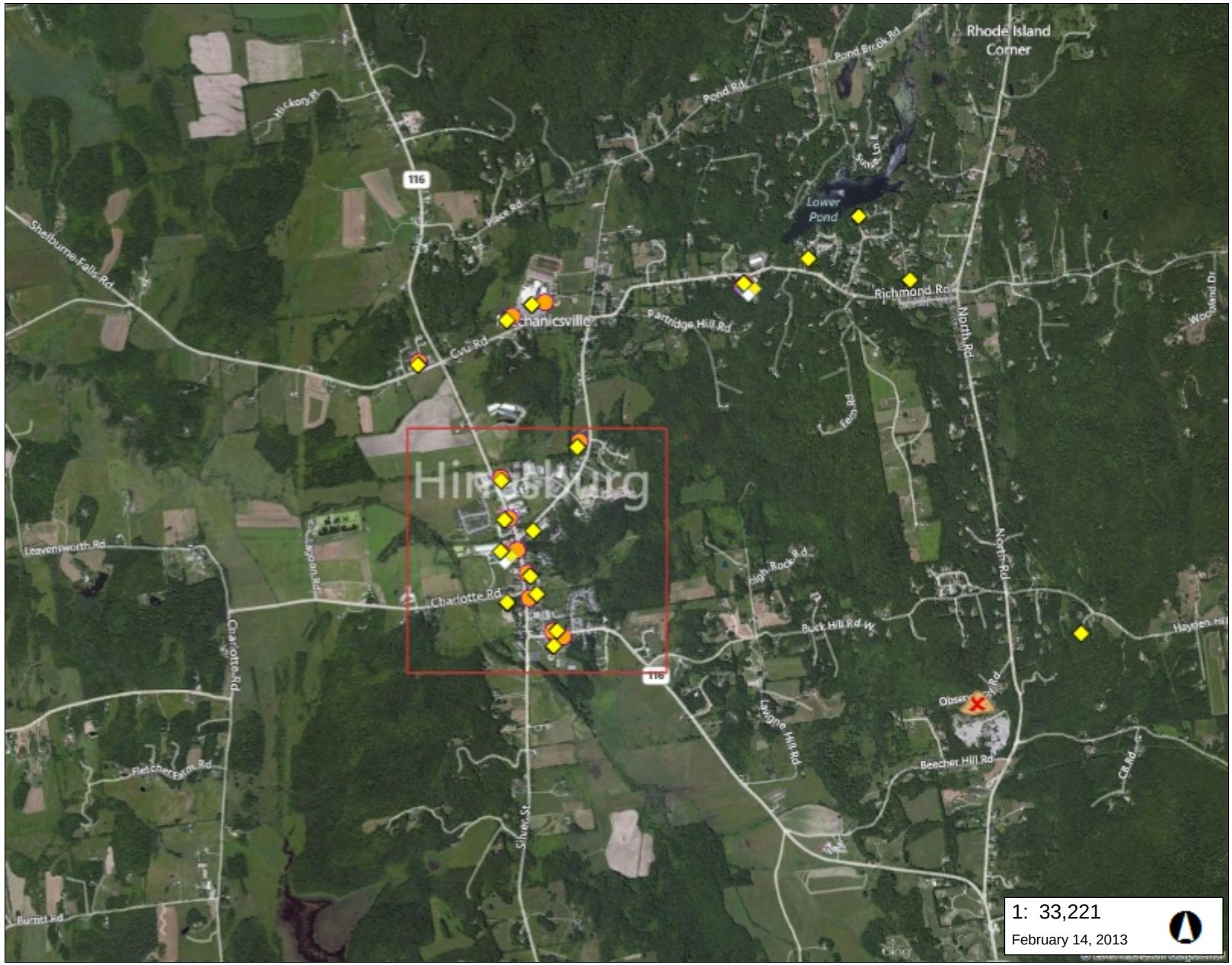
Appendix B

Potential Sources of Contamination

Potential Sources of Contamination

Vermont Agency of Natural Resources

vermont.gov



LEGEND

Landfills

- OPERATING
- CLOSED

- Hazardous Waste Site
- Hazardous Waste Generators
- Brownfields
- Underground Storage Tank (w

NOTES

Map created using ANR's Natural Resources Atlas

1,688.0 0 844.00 1,688.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 2768 Ft. 1cm = 332 Meters

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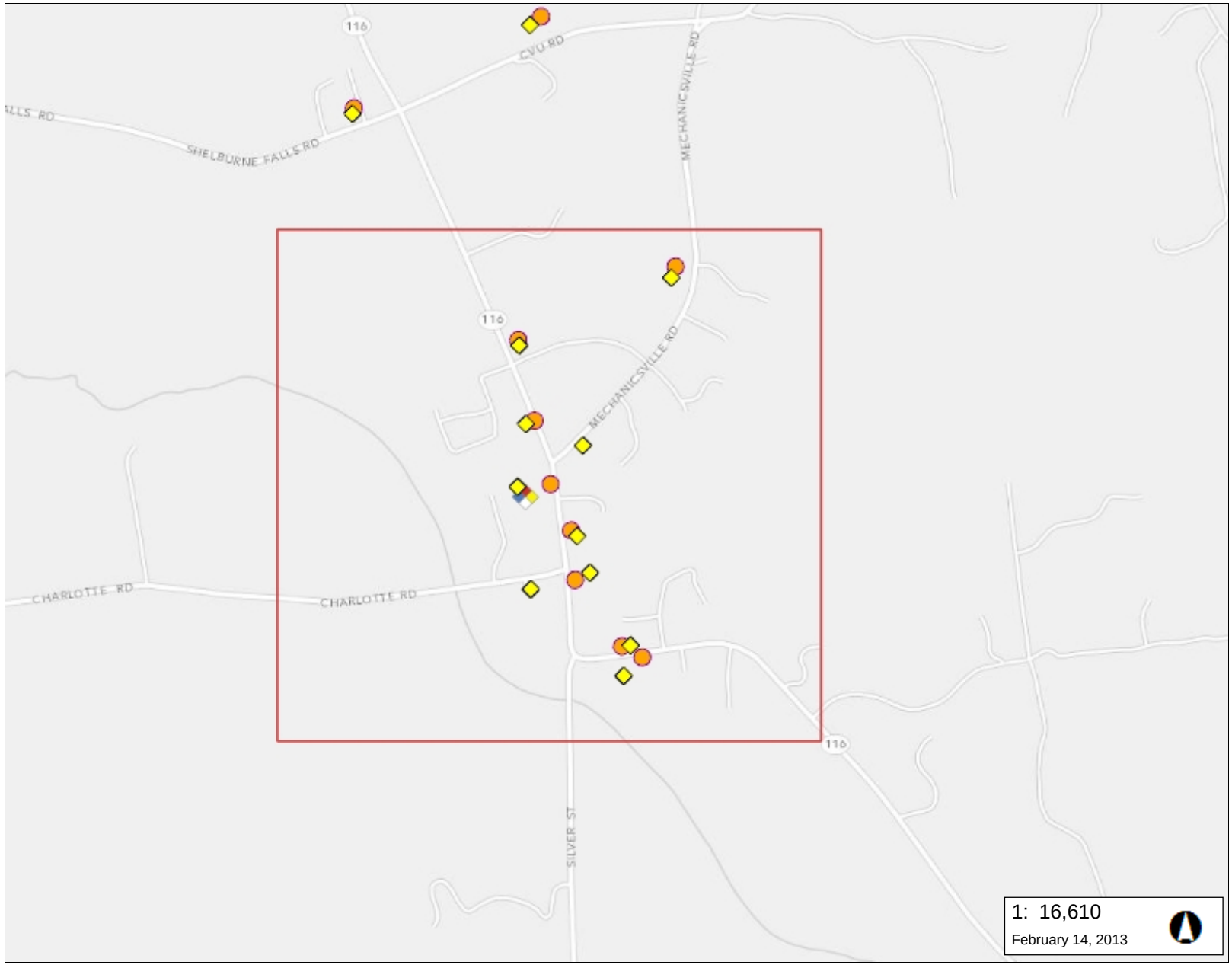
PSOC - Town Center

Vermont Agency of Natural Resources

vermont.gov



LEGEND

Landfills

- OPERATING
- CLOSED

Hazardous Waste Site

Hazardous Waste Generators

Brownfields

Underground Storage Tank (w

Light Gray Canvas Base

NOTES

Map created using ANR's Natural Resources Atlas

844.0 0 422.00 844.0 Meters

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Hinesburg Town Center - Underground Storage Tanks (working)

OBJECTID	FACILITY ID	SOURCE	FACILITY NAME	ADDRESS	SITE NUMBER	EXPIRATION DATE
283	1250	G	Eastwind Condominiums	Mechanicsville Rd	992669	Null
413	2486	G	Hinesburg Shortstop	Rt 116 and 21 Commerce Rd	20114243	9/1/2016
1605	1487	M	Hart and Mead Texaco	10919 Route 116	931486	7/1/2014
1606	242	M	Hinesburg Elementary School	10888 Route 116	982370	Null
1607	4822361	M	Lantman's IGA	Route 116	961988	Null
1608	1872	M	Contel of Vermont Inc	Route 116	931518	Null
1609	1213	M	Stella Foods - East	Hinesburg Road	911017	Null
1610	4822179	Q	Giroux Body Shop Inc	Route 116	982480	Null

Hinesburg Town Center - Hazardous Waste Sites

OBJECTID	WM ID	LONGITUDE	LATITUDE	SITE NUMBER	SITE NAME	ADDRESS	PRIORITY	CLOSURE DATE	LAND USE RESTRICTION
181	180	-73.11208	44.331154	911017	International Cheese (Saputo)	Route 116	SMAC	1/20/2012	Yes
530	528	-73.10639	44.336704	992669	Eastwind Condominiums	Mechanicsville Rd	SMAC	2/28/2000	No
1793	1790	-73.10989	44.329853	931518	G T E Hinesburg	Route 116	SMAC	2/2/2001	No
1842	1840	-73.10816	44.326137	982370	Hinesburg Elementary School	Rt 116	SMAC	2/24/2000	No
2043	2038	-73.10941	44.328878	961988	Lantman's IGA	Rt 116	HIGH	Null	Yes
2077	2072	-73.11178	44.332825	982480	Giroux Body Shop	Route 116	LOW	Null	No
2289	2282	-73.10791	44.326948	931486	Hart And Mead Texaco	Route 116	MED	Null	Yes
2855	2846	-73.10967	44.332252	20033159	Morgante Residence	56 Mechanicsville Rd	SMAC	7/11/2007	No
3814	3904	-73.11203	44.334908	20114243	Hinesburg Short Stop	21 Commerce St.	MED	Null	Yes
3850	3965	-73.1116	44.328441	20114211	Ben's Sandwiches	73 Charlotte Rd.	SMAC	6/25/2012	Yes

Hinesburg Town Center - Hazardous Waste Generators

OBJECTID	ID	STATUS	FILE NUMBER	EPA ID	NAME	ADDRESS	SOURCE	SHAPE	DDLONG	DDLAT
768	11804	C	04-07-007	VTD000842781	STELLA FOODS.	10516 RT 116	G	Point	-73.11179	44.330886

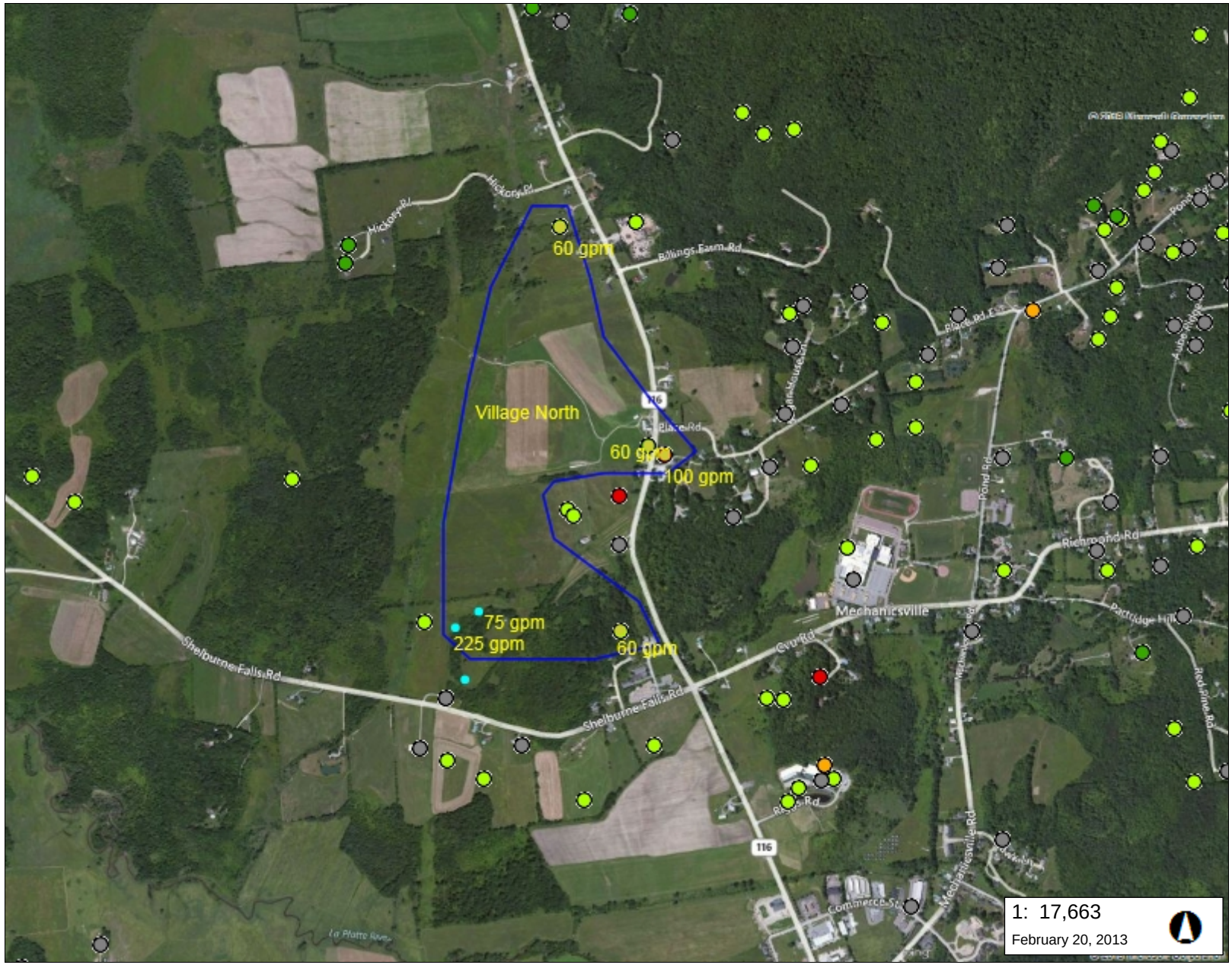
Appendix C

Focus Areas

Village North Focus Area

Vermont Agency of Natural Resources

vermont.gov



LEGEND

Private Wells

- E911 Address
- Screen Digitized
- GPS Location; Field Located with G
- Unknown
- Welldriller/Clarion

NOTES

Map created using ANR's Natural Resources Atlas

897.0 0 448.00 897.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 1472 Ft. 1cm = 177 Meters

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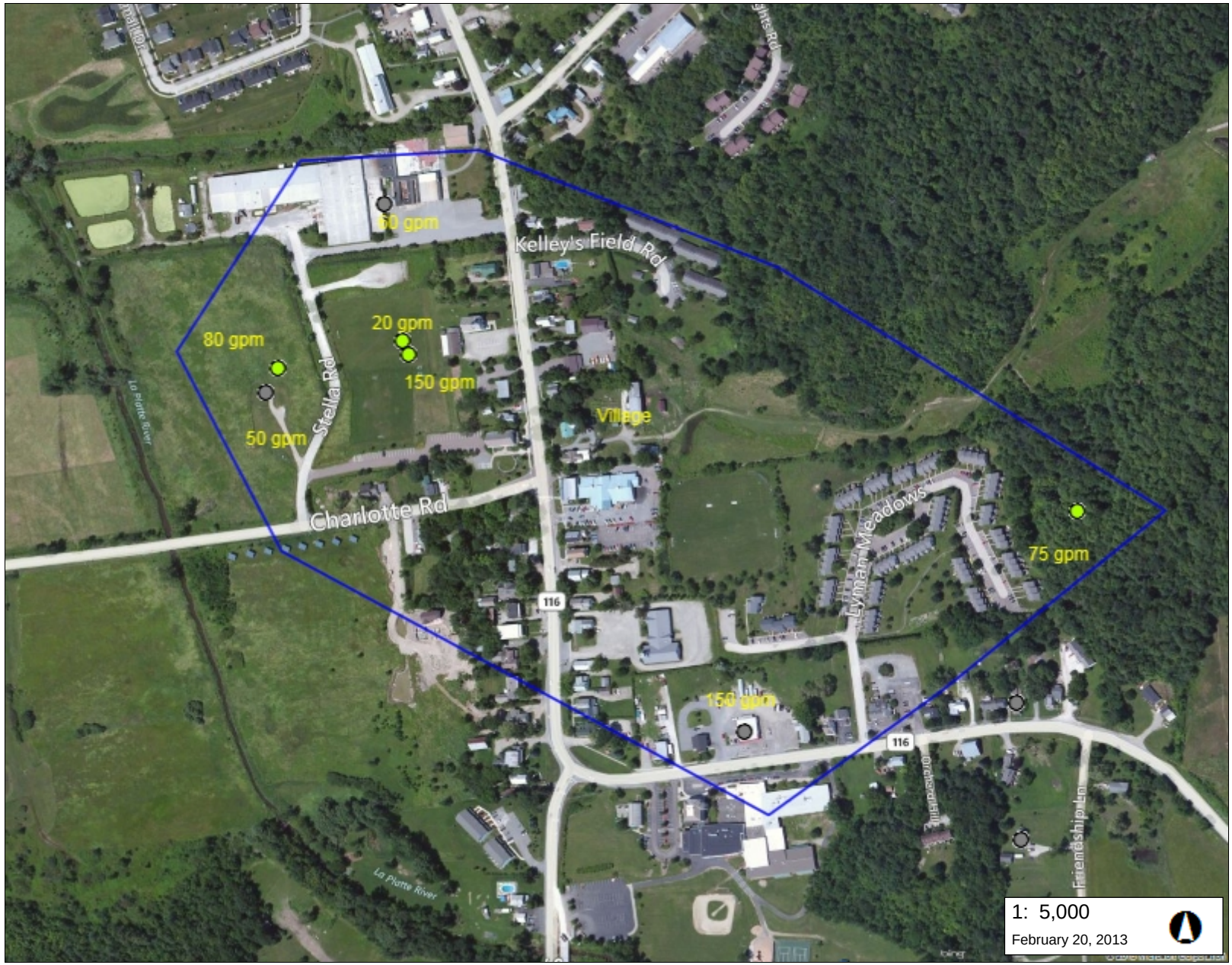
Well Summary Table
Village North Focus Area

WR#	TAG	FIRST NAME	LAST NAME	DATE	YIELD (GPM)	LOC METHOD	WELL TYPE	RECORD #	LATITUDE	LONGITUDE
126		KEITH	BALLARD	7/30/1980	60	screen digitized	Gravel	27514	44.342727	-73.119297
494	370	Dana/Kim	Patillio	8/4/1992	100	screen digitized		27877	44.3541	-73.121674
12982	12982	Tim & Kay	Ballard	3/31/2000	60	GPS location		82947	44.347943	-73.118172
22787	22787	Clinton	Emmons	4/9/2003	100	Welldriller/Clarion	Bedrock	92384	44.34767	-73.11753
1508	8-609	(Geprags Well 2)	Hinesburg Town	1/19/1996	75- 100	GPS (SGS)	Bedrock	27954	44.343122	-73.124865
579	7-797	(Geprags Well 3)	Hinesburg Town	2/9/1996	225	GPS (SGS)	Bedrock	27949	44.342897	-73.125811

Village Focus Area

Vermont Agency of Natural Resources

vermont.gov



LEGEND

Private Wells

- E911 Address
- Screen Digitized
- GPS Location; Field Located with G
- Unknown
- Welldriller/Clarion

NOTES

Map created using ANR's Natural Resources Atlas

254.0 0 127.00 254.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 417 Ft. 1cm = 50 Meters

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Well Summary Table
Village Focus Area

WR #	TAG	LAST NAME	DATE	DEPTH (FT)	YIELD (GPM)	WELL USE	LOC. METHOD	RECORD #	LATITUDE	LONGITUDE
69		HINESBURG TOWN	6/6/1978	323	50	Municipal	E911 Address	27459	44.329656	-73.113315
242	380B	International Cheese	8/12/1985	323	60	Industrial	E911 Address	27629	44.331165	-73.111992
250	56kF	International Cheese	5/13/1986	402	150	Industrial	screen digitized	27637	44.329965	-73.111712
263		Lyman Meadows	5/30/1986	40	75	Condo	screen digitized	27650	44.328708	-73.104249
474	621A	International Cheese	6/3/1992	652	20	Industrial	screen digitized	27857	44.330075	-73.111778
1755	7-826	HINESBURG TOWN	6/28/1996	700	80	OTHER	screen digitized	27967	44.329853	-73.11317
20680	20680	Mead	3/15/2002	965	150	OTHER	E911 Address	89377	44.326954	-73.107957

North Road/Beecher Hill Focus Area

Vermont Agency of Natural Resources

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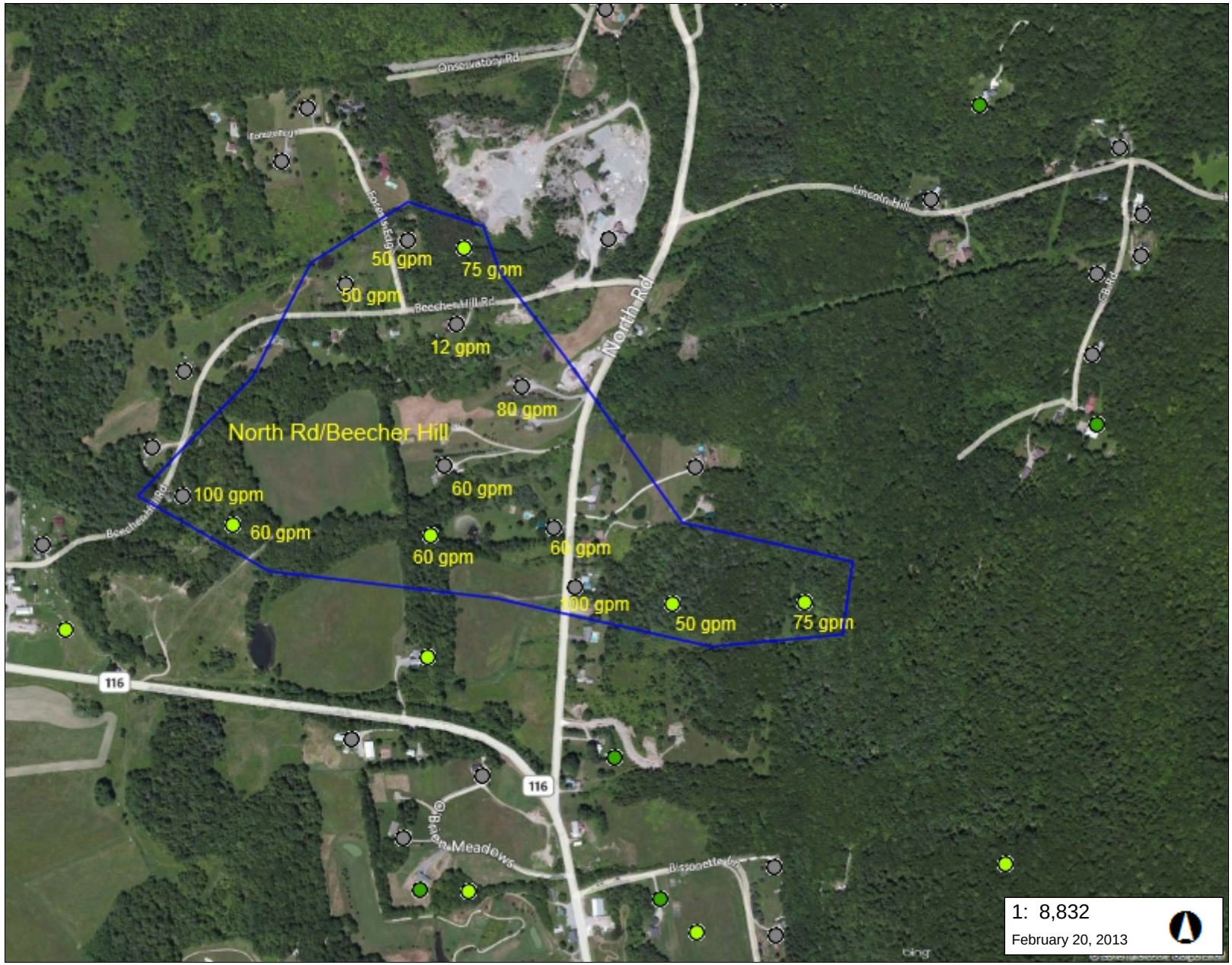

LEGEND

Private Wells

- E911 Address
- Screen Digitized
- GPS Location; Field Located with G
- Unknown
- Welldriller/Clarion

NOTES

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449.0 0 224.00 449.0 Meters

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Well Summary Table
North Road/Beecher Hill Focus Area

WR#	TAG	FIRST NAME	LAST NAME	Date	Depth (ft)	YIELD (GPM)	WELL USE	RECORD #	LATITUDE	LONGITUDE
120		ROBERT	BROWN	3/21/1980	230	75	Domestic	27508	44.32058	-73.077982
128		KIM	ROLFE	9/5/1980	123	12	Domestic	27516	44.3195	-73.07811
272	J-62	Tim	Parent	10/24/1986	225	80	Domestic	27659	44.318634	-73.076836
296	2-Apr	Charles	Powden	7/1/1987	245	60	Domestic	27683	44.317509	-73.078346
322	T-8	Charles	Powden	7/1/1987	245	60	Domestic	27706	44.316525	-73.078619
343	236273	Ken	Hurd	3/10/1988	220	50	Domestic	27727	44.320068	-73.080296
381	43A		Kuzins Construction	7/1/1988	360	60	Domestic	27765	44.316675	-73.082519
390	49	Dan	Driscoll	7/30/1988	165	60	Domestic	27774	44.316627	-73.076202
422	Aug-90	Mike	Hart	3/5/1990	270	50	Domestic	27806	44.315565	-73.073873
424	Aug-97	Don	Smallwood	4/16/1990	260	50	Domestic	27807	44.320682	-73.079088
560	8-501	Mike	Hart	12/2/1994	320	75	Agricultural	27939	44.315578	-73.071262
2155	790	JASON	CONWAY	Null	275	100	Domestic	27982	44.317089	-73.083504
18001	18001	John	Hunter	11/9/2001	390	100	Domestic	88576	44.315804	-73.075768

Appendix D

Geprags Park Wells

Geprags Park Wells

Vermont Agency of Natural Resources

vermont.gov

LEGEND

- Parcels (where available)

NOTES

Map created using ANR's Natural Resources Atlas

254.0 0 127.00 254.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 417 Ft. 1cm = 50 Meters

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Geprags Well #1

Well Details

Date Completed	01/10/1996
Date Received	06/20/1996
Driller	23 - Clyde (Jack) W Frost , Frost Inc
Well Report Number	1509
Tag	8-608
Comments	
Town	Hinesburg
Map Cell	13B7
Tax Map	
E911 Address	
Subdivision	
Lot Number	
Owners First Name	
Owners Last Name	HINESBURG, TOWN OF
Purchaser First Name	
Purchaser Last Name	
Well Use	OTHER
Well Reason	New Supply
Drilling Method	Rotary (AP)
Well Depth	600.00 feet
Yield Gallons Per Minute	3.00
Yield Test Tested For Hours	0.00
Static Water Level	50.00 feet
Over Flowing	no
Overburden Thickness	3 feet
Casing Length	62.00 feet
Casing Diameter	0.00 inches
Casing Length Below Land Surface	0.00 feet
Casing Length Exposed	0.00
Casing Material	
Casing Weight	0.00 lbs/foot
Casing Finish	Above ground, finished
Liner Length	0.00 feet
Liner Diameter	0.00 inches
Liner Material	
Liner Weight	0.00 lbs/foot
Grout Type	
Seal Type	
Diameter Drilled In Bedrock	0.00 inches
Depth Drilled in Bedrock	0.00 feet
Screen Make Type	
Screen Material	
Screen Length	0.00 feet
Screen Diameter	0.00 inches
Screen Slot Size	0.000 inches
Depth of Screen	0.00 feet
Gravel Size Type	
Casing Sealing Method	Shoe & grout bottom

Yield Test Method	
Well Development	
Not Steel Casing	no
Water Analysis	no
Well Screen	no
AW Partial	no
Unique GIS Name	HN1509
Lat Degree	44
Lat Minutes	20
Lat Seconds	26.9256
Long Degree	73
Long Minutes	7
Long Seconds	34.1199
Location Determination Method	E911 Address
Well Type	
Depth To Liner Top	0.00
Hydro Fractured	no
Hydro Fractured Resulting Flow	0.00
Well Location Submitted As A Dot On A Map	N

WellMainRecordNumber	StartingDepth	EndingDepth	WaterBearing	LithologyCode	LithologyDescription
27955	0.00	3.00		D	BROWN DIRT
27955	3.00	600.00		R	LIMESTONE-WATER

Geprags Well #2

Well Details

Date Completed	01/19/1996
Date Received	06/20/1996
Driller	23 - Clyde (Jack) W Frost , Frost Inc
Well Report Number	1508
Tag	8-609
Comments	
Town	Hinesburg
Map Cell	13B7
Tax Map	
E911 Address	
Subdivision	
Lot Number	
Owners First Name	
Owners Last Name	HINESBURG, TOWN OF
Purchaser First Name	
Purchaser Last Name	
Well Use	OTHER
Well Reason	New Supply
Drilling Method	Rotary (AP)
Well Depth	580.00 feet
Yield Gallons Per Minute	0.00 (Driller reports well yield is 75- 100 gpm) Note by CAS.
Yield Test Tested For Hours	0.00
Static Water Level	0.00 feet
Over Flowing	no
Overburden Thickness	23 feet
Casing Length	635.00 feet
Casing Diameter	8.00 inches
Casing Length Below Land Surface	0.00 feet
Casing Length Exposed	0.00
Casing Material	
Casing Weight	0.00 lbs/foot
Casing Finish	Above ground, finished
Liner Length	0.00 feet
Liner Diameter	0.00 inches
Liner Material	
Liner Weight	0.00 lbs/foot
Grout Type	
Seal Type	
Diameter Drilled In Bedrock	0.00 inches
Depth Drilled in Bedrock	0.00 feet
Screen Make Type	
Screen Material	
Screen Length	0.00 feet
Screen Diameter	0.00 inches
Screen Slot Size	0.000 inches
Depth of Screen	0.00 feet
Gravel Size Type	
Casing Sealing Method	Shoe & grout bottom

Yield Test Method	
Well Development	
Not Steel Casing	no
Water Analysis	no
Well Screen	no
AW Partial	no
Unique GIS Name	HN1508
Lat Degree	44
Lat Minutes	20
Lat Seconds	34.7100
Long Degree	73
Long Minutes	7
Long Seconds	37.3194
Location Determination Method	screen digitized
Well Type	
Depth To Liner Top	0.00
Hydro Fractured	no
Hydro Fractured Resulting Flow	0.00
Well Location Submitted As A Dot On A Map	N

WellMainRecordNumber	StartingDepth	EndingDepth	WaterBearing	LithologyCode	LithologyDescription
27954	0.00	19.00		C	BROWN CLAY
27954	19.00	23.00		G	FINE GRAVELS-WATER
27954	23.00	580.00		R	LIMESTONE-WATER

If you would like search for a well or wells in a specific area the following link will relocate you to the ANR GIS Internet Mapping Program.
http://www.anr.state.vt.us/site/html/maps.htm

- Critical Infrastructure Protection Information
- Permit, Certification & License Application Forms & Information
- Water System Capacity Development & DWSRF
- Well Driller & Well Location Program
- Source Water Protection
- Water System Operators
- Drinking Water Quality
- The TNC Handbook
- Rules and Regulations
- Staff Directory
- News
- Other Links of Interest
- Agency of Natural Resources GIS Internet Mapping

Well Details

Date Completed	02/09/1996
Date Received	03/26/1996
Driller	23 - Clyde (Jack) W Frost , Frost Inc
Well Report Number	579
Tag	7-797
Comments	
Town	Hinesburg
Map Cell	13B7
Tax Map	
E911 Address	
Subdivision	
Lot Number	
Owners First Name	
Owners Last Name	HINESBURG, TOWN OF
Purchaser First Name	
Purchaser Last Name	
Well Use	OTHER
Well Reason	Provide additional supply
Drilling Method	Rotary (AP)
Well Depth	300.00 feet
Yield Gallons Per Minute	225.00
Yield Test Tested For Hours	0.00
Static Water Level	5.00 feet
Over Flowing	no
Overburden Thickness	15 feet
Casing Length	60.00 feet
Casing Diameter	8.00 inches
Casing Length Below Land Surface	0.00 feet
Casing Length Exposed	0.00
Casing Material	
Casing Weight	0.00 lbs/foot
Casing Finish	Above ground, finished
Liner Length	0.00 feet
Liner Diameter	0.00 inches
Liner Material	
Liner Weight	0.00 lbs/foot
Grout Type	
Seal Type	
Diameter Drilled In Bedrock	0.00 inches
Depth Drilled in Bedrock	0.00 feet
Screen Make Type	
Screen Material	
Screen Length	0.00 feet
Screen Diameter	0.00 inches
Screen Slot Size	0.000 inches
Depth of Screen	0.00 feet
Gravel Size Type	
Casing Sealing Method	Shoe & grout bottom
Yield Test Method	
Well Development	
Not Steel Casing	no
Water Analysis	no
Well Screen	no
AW Partial	no
Unique GIS Name	HN579
Lat Degree	44
Lat Minutes	20
Lat Seconds	49.1160
Long Degree	73
Long Minutes	7
Long Seconds	56.0940
Location Determination Method	screen digitized

Quick Links

- List of Vermont Licensed Well Drillers
- Well Driller Licensing Rule PDF
- Well Driller License forms
- Current Nationwide Threat Level: Yellow

Well Type	
Depth To Liner Top	0.00
Hydro Fractured	no
Hydro Fractured Resulting Flow	0.00
Well Location Submitted As A Dot On A Map	N

WellMainRecordNumber	StartingDepth	EndingDepth	WaterBearing	LithologyCode	LithologyDescription
27949	0.00	15.00		C	GREY CLAY
27949	15.00	60.00		R	WHITE & GREY LIMESTONE
27949	60.00	165.00		R	BROKEN UP LIMESTONE-WATER
27949	165.00	233.00		R	WHITE LIMESTONE
27949	233.00	235.00		R	BROKEN UP LIMESTONE-WATER
27949	235.00	300.00		R	WHITE & GREY LIMESTONE

If you would like search for a well or wells in a specific area the following link will relocate you to the ANR GIS Internet Mapping Program.
http://www.anr.state.vt.us/site/html/maps.htm

www.VermontDrinkingWater.org
VT DEC ▪ Water Supply Division ▪ 103 South Main Street, Old Pantry Building ▪ Waterbury, VT 05671-0403
Telephone toll-free in VT: 800-823-6500 or call 802-241-3400 ▪ Fax: 802-241-3284

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VERMONT.gov

Appendix E

Munson Property

Munson Property

Vermont Agency of Natural Resources

vermont.gov

LEGEND

- Parcels (where available)

NOTES

Map created using ANR's Natural Resources Atlas

127.0 0 64.00 127.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 208 Ft. 1cm = 25 Meters

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THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

Munson Well

STATE OF VERMONT - DEPT. OF ENVIRONMENTAL CONSERVATION

Water Supply Division, 103 So. Main St., Waterbury, VT 05671-0403 Tel. (802) 241-3400

WELL COMPLETION REPORT

WELL TAG No. 30872 (Fill In Number from Tag)

WELL LOCATION

Well Owner or Purchaser: Town & Country Town: Hinesburg

E-911 Address: Buck Hill Road Subdivision Name:

Lot Number:

GEOGRAPHIC LOCATION (Complete A **OR** B, not both) **Date Well Drilled:** 12/29/05

A. GPS Location: _____ N (Latitude Rdg.) _____ W (Longitude Rdg) _____ (GPS Make/Model) _____ (# of Satellites Used (Min. 3))

(OR)

B. Attach a Town Map showing location of well marked with a clear dot.

WELL TYPE (Check One)
- ☑ Bedrock
- ☐ Gravel
- ☐ Monitoring
- ☐ Other:

WELL USE (Check one)
- ☑ Domestic
- ☐ Public
- ☐ Agricultural
- ☐ Industrial
- ☐ Other:

REASON FOR WELL (Check one)
- ☑ New Supply
- ☐ Replace Existing Supply
- ☐ Deepen Existing Supply
- ☐ Additional Supply
- ☐ Test/Exploration
- ☐ Other:

WELL CONSTRUCTION INFORMATION

DEPTHS
To Bedrock 220 ft
Total: 380 ft.

SEALING METHOD
- ☑ Drive Shoe
- ☐ Grouted

Grout Type:

CASING
Total Length: 235 ft
Casing Exposed: 30 in.
Diameter: 6 in.
Material: Steel
Weight: 17 lb/ft

LINER OR INNER CASING
Total Length : ____ ft.
Depth to Liner Top: ____ ft.
Diameter: ____ in.
Material:
Weight: ____ lb/ft
Seal Type:

SCREEN DETAILS
Make/Type:
Material:
Diameter: ____ in.
Depth to Screen Top: ____ ft.
Slot Size
Gravel Pack (Type & Size):

YIELD TEST
Tested for 1 hr. @ 200 GPM
Static Water Level 20 Ft. Below Land Surface
- ☐ (Check Here if Overflowing)
- ☐ Hydrofractured. Resulting flow= ____ GPM

WELL LOG

From	To	Formation Information and Water Bearing Fractures
0	40	Clay
40	220	SG
220	380	R-oker, brittle, red

WELL DRILLER INFORMATION

Drilled By: Chuck A. Steady

Company: VT Well & Pump Lic#: 222

Signature of Qualifying Individual

SITE SKETCH (Optional)

COMMENTS

16974-3 White Copy - WSD Yellow Copy - Owner Pink Copy - Driller 09/01/99

Appendix F

Norris Parcel

BURRITT N/F

WERNHOFF N/F

2252 ACRES (94%) TO REMAIN AS COMMON OPEN SPACE

BAPTIST SOCIETY OF HINESBURG N/F

CLASS TWO WETLANDS DELINEATED BY GILMAN + BRIGGS ENVIRONMENTAL

POTENTIAL STORMWATER TREATMENT + RETENTION AREA

COMMUNITY GARDENS

50' WETLAND BUFFER

AGRICULTURAL ZONING DISTRICT 15.74 ACRES)

RESIDENTIAL-2 ZONING DISTRICT 18.22 ACRES)

COMMUNITY GARDENS

50' WETLAND BUFFER

WILSON N/F

75' STREAM BUFFER

TYPICAL TOWN HOME BUILDING. END UNITS ARE 1 STORY + INTERIOR UNITS ARE 2 STORY

CLASS TWO WETLANDS DELINEATED BY GILMAN + BRIGGS ENVIRONMENTAL

GAZEBO, PLAYSET AREA + PICNIC TABLES

POTENTIAL STORMWATER TREATMENT + RETENTION AREA

50' WETLAND BUFFER

TYP. TURN-AROUND

CLASS TWO WETLANDS DELINEATED BY GILMAN + BRIGGS ENVIRONMENTAL

NEVIUS N/F

R: 20' (TYP.)

CULVERT (TO BE DESIGNED AT PRELIMINARY)

PROPOSED PRIVATE DRIVE

PROPOSED 5' WIDE CINDER PATH

APPROX. LOCATION OF END OF MUNICIPAL WATER MAIN

R: 25' (TYP.)

EXIST. 36" CULVERT

VT ROUTE 116

500'+

500'+

ROSS N/F

LIAN N/F

MUNSON N/F

BUCK HILL ROAD

VERMONT BUILDING RESOURCES, LLC N/F

NEW SOUTH FARM ROAD

VERMONT BUILDING RESOURCES, LLC N/F

APPROX. LOCATION OF END OF MUNICIPAL SEWER MAIN

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

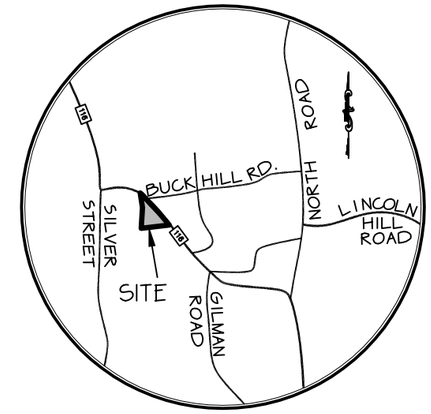
THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT 1-888-DIG-SAFE PRIOR TO ANY EXCAVATION.

Owner & Applicant

ALAN + NANCY NORRIS
P.O. BOX 368
HINESBURG, VT 05461

Notes:

-SLIGHT DISTANCE BASED ON
1.1x POSTED SPEED LIMIT:
SPEED LIMIT: 40 MPH:
REQUIRED SLIGHT DISTANCE: 440'



Location Plan

HINESBURG, VT N.T.S.

Legend

- PROJECT BOUNDARY
- PROPERTY LINE
- SETBACK
- 335 CONTOUR LINE (U.S.G.S. DATUM)
- UTILITY POLE
- SEWER LINE
- WATERLINE
- EXISTING/PROPOSED HYDRANT

Zoning Information

PARCEL ID#: 09-01-64.400 (23.96 ACRES)
ZONED: RESIDENTIAL-2 (R2) + AGRICULTURAL (A6)
DIMENSIONAL REQUIREMENTS (R2):
MINIMUM LOT AREA: 6,000 S.F.
MINIMUM LOT FRONTAGE: 60 FT: 1,137 FT PROPOSED
MINIMUM LOT DEPTH: 100 FT:

SETBACKS (R2):
FRONT: 10 FT
SIDE: 10 FT
REAR: 10 FT
STREAM: 75 FT
BUILDING COVERAGE: APPROX. 2.6% (26,800 S.F.) PROPOSED
TOTAL LOT COVERAGE: APPROX. 6.0% (1.44 ACRES) PROPOSED: 60% MAX

PARKING:
RESIDENTIAL: 2 SPACES/DWELLING UNIT: 50 REQUIRED:
62 SPACES PROVIDED (2/UNIT + 12 VISITOR)

DATE 11/14/12	REVISIONS PER 10/16/12 SKETCH HEARING + 10/23 STAFF E-MAIL		BY DWB
SURVEY OBCA	☐ RECORD DRAWING ☐ FINAL	☐ PRELIMINARY ■ SKETCH/CONCEPT	DATE 8/14/12
DESIGN OBCA	O'LEARY-BURKE CIVIL ASSOCIATES, PLC	NORRIS PARCEL ROUTE 116 HINESBURG, VT	JOB# 8073
DRAWN PFH	1 CORPORATE DRIVE, SUITE 1 ESSEX JCT., VT PHONE: 878-9990 FAX: 878-9989 E-MAIL: obca@olearyburke.com	SKETCH PLAN	FILE 8073-S3
CHECKED DWB			PLAN SHEET # 1
SCALE 1"=60'			

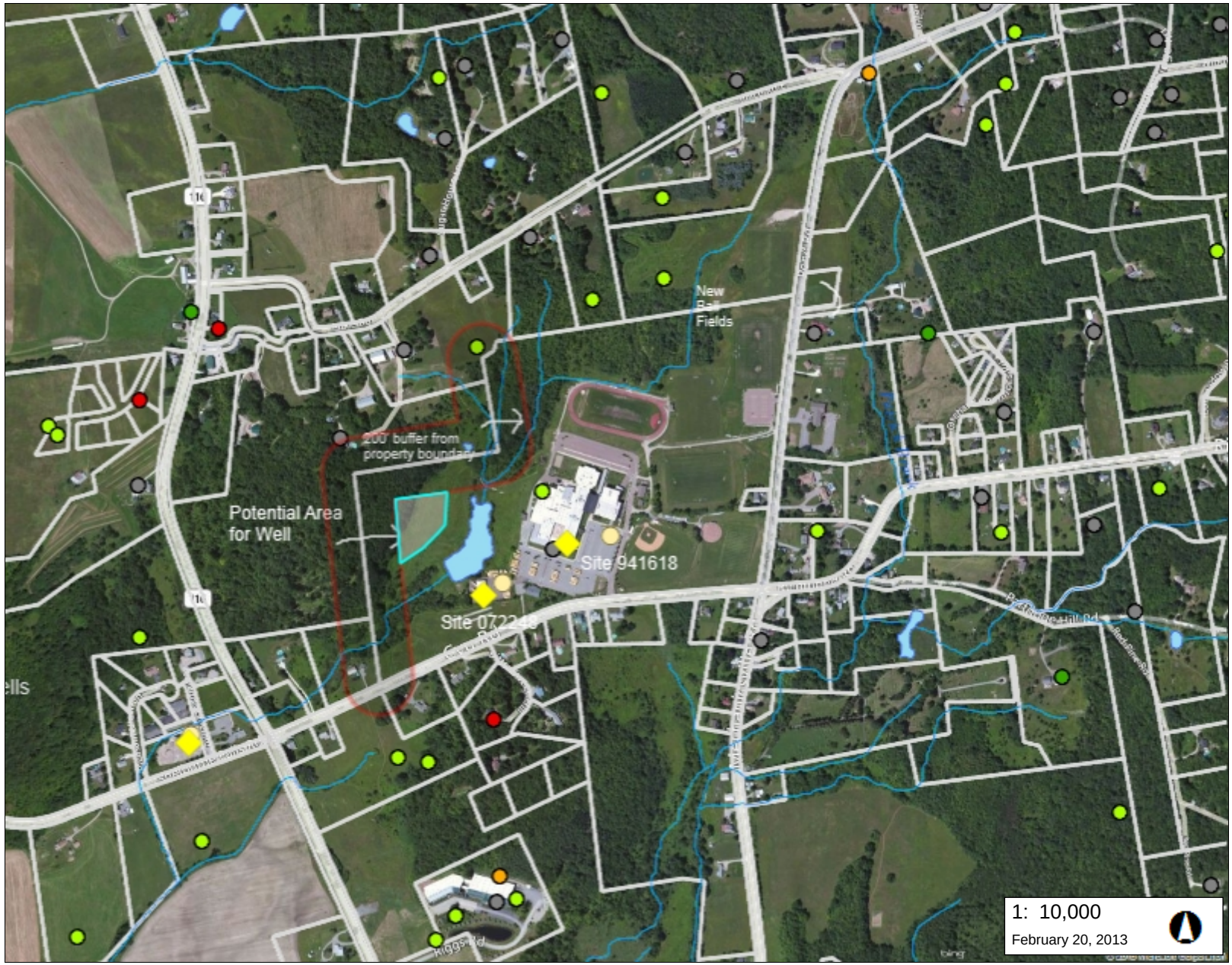
Appendix G

CVU Parcel

Vermont Agency of Natural Resources

Vermont Agency of Natural Resources

vermont.gov



LEGEND

- Hazardous Waste Site
- Underground Storage Tank (w
- Private Wells
  - E911 Address
  - Screen Digitized
  - GPS Location; Field Located with G
  - Unknown
  - Welldriller/Clarion
- Waterbody
- Stream
- Parcels (where available)

NOTES

Map created using ANR's Natural Resources Atlas

1,667.0 0 834.00 1,667.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 833 Ft. 1cm = 100 Meters

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VT DEC

Hazardous Site List

Help & Definitions

Enter the search criteria below and click the [Search] button when done. (Search will display a maximum of 500 results)

Site# 972248

Site Name

Site Town List Towns

Address

Primary Consultant List Consultants

All Sites Active Sites Inactive Sites

Priority All

Search Search Tips

Site Name	Chittenden South Supervisory District
Address	C V U Rd, School St
Town	Hinesburg
Site Use	Other
Site Number	972248
DEC Manager	Linda Elliott
Priority	LOW - Site with contamination to soils or groundwater, but no effect on sensitive receptors
Site Status	Voluntary Action
Project Status	1997: 4 USTs removed from the bus maintenance garage. Site monitoring reveals groundwater contaminated with petroleum above enforcement standards in several wells. Ongoing monitoring has shown stable concentrations. 10/09: 300 cubic yards of petroleum contaminated soils removed and stockpiled onsite in 2 piles. Approximately 70 cubic yards removed to Coventry Landfill as daily cover. Ongoing annual site monitoring to include groundwater. Next round of site monitoring Spring 2012.
Source of Contamination	Diesel, Heating Oil, UST-Gasoline, Waste Oil
Contaminant	Diesel, Gasoline, Heating Oil, Waste Oil
Institutional Control	
Site Closure Date	
DEC Contact Email Address	Linda.Elliott@state.vt.us
Record Last Updated	05-21-2012

VT DEC

Hazardous Site List

Help & Definitions

Enter the search criteria below and click the [Search] button when done. (Search will display a maximum of 500 results)

Site# 941618

Site Name

Site Town List Towns

Address

Primary Consultant List Consultants

Priority All

All Sites Active Sites Inactive Sites

Search Search Tips

Site Name	Champlain Union High School
Address	School St
Town	Hinesburg
Site Use	Other
Site Number	941618
DEC Manager	Matt Moran
Priority	MED - Site with sensitive receptors that are threatened by contamination
Site Status	
Project Status	Bi-annual supply well monitoring of supply well requested. Last round 9/95, results overdue. On 1/9/03, Kurt Proulx stated samples would be collected shortly. Petroleum contaminated soil thin spread in Spring '98.
Source of Contamination	UST-Gasoline
Contaminant	Heating Oil
Institutional Control	
Site Closure Date	
DEC Contact Email Address	Matt.Moran@state.vt.us
Record Last Updated	04-12-2011

Online Site Reports

Report
941618.first.pdf
941618.si.pdf

The documents listed above do not represent a comprehensive list of available site reports. To view additional site files, please schedule a file review by calling 802-241-3888.

Other Points of Interest

	Facility ID	UST Facility Name	State Program

- Critical Infrastructure Protection Information
- Permit, Certification & License Application Forms & Information
- Water System Capacity Development & DWSRF
- Well Driller & Well Location Program
- Source Water Protection
- Water System Operators
- Drinking Water Quality
- The TNC Handbook
- Rules and Regulations
- Staff Directory
- News
- Other Links of Interest
- Agency of Natural Resources GIS Internet Mapping

Well Details

Date Completed	04/27/1991
Date Received	07/05/1991
Driller	129 - Martin W Rabtoy , Rabtoy & Sons Inc
Well Report Number	451
Tag	9114
Comments	
Town	Hinesburg
Map Cell	13D1
Tax Map	
E911 Address	
SubDivision	
Lot Number	
Owners First Name	
Owners Last Name	Champlain Valley Union HS
Purchaser First Name	
Purchaser Last Name	
Well Use	School
Well Reason	Replace existing supply
Drilling Method	Rotary (AP)
Well Depth	530.00 feet
Yield Gallons Per Minute	25.00
Yield Test Tested For Hours	0.00
Static Water Level	65.00 feet
Over Flowing	no
OverBurden Thickness	85 feet
Casing Length	110.00 feet
Casing Diameter	8.00 inches
Casing Length Below Land Surface	0.00 feet
Casing Length Exposed	0.00
Casing Material	
Casing Weight	0.00 lbs/foot
Casing Finish	Above ground, finished
Liner Length	0.00 feet
Liner Diameter	0.00 inches
Liner Material	
Liner Weight	0.00 lbs/foot
Grout Type	
Seal Type	
Diameter Drilled In Bedrock	0.00 inches

Quick Links

- List of Vermont Licensed Well Drillers
- Well Driller Licensing Rule PDF
- Well Driller License forms
- Current Nationwide Threat Level: Yellow

Depth Drilled in Bedrock	0.00 feet
Screen Make Type	
Screen Material	
Screen Length	0.00 feet
Screen Diameter	0.00 inches
Screen Slot Size	0.000 inches
Depth of Screen	0.00 feet
Gravel Size Type	
Casing Sealing Method	Grout bottom only
Yield Test Method	
Well Development	
Not Steel Casing	no
Water Analysis	no
Well Screen	no
AW Partial	no
Unique GIS Name	HN451
Lat Degree	44
Lat Minutes	20
Lat Seconds	38.9282
Long Degree	73
Long Minutes	6
Long Seconds	36.3043
Location Determination Method	E911 Address
Well Type	
Depth To Liner Top	0.00
Hydro Fractured	no
Hydro Fractured Resulting Flow	0.00
Well Location Submitted As A Dot On A Map	N

Starting Depth	Ending Depth	Water Bearing	Lithology Code	Lithology Description
0.00	14.00		C	clay
14.00	70.00		G	gravel
70.00	85.00		BG	boulders/big gravel
85.00	95.00		R	broken ledge (rotten)
95.00	108.00		R	rock-gray
108.00	220.00		O	hit some water 2-3 gmp
220.00	490.00		O	hit more water 15-20 gpm
490.00	530.00		R	rock no change

If you would like search for a well or wells in a specific area the following link will relocate you to the ANR GIS Internet Mapping Program.
http://www.anr.state.vt.us/site/html/maps.htm

- Critical Infrastructure Protection Information
- Permit, Certification & License Application Forms & Information
- Water System Capacity Development & DWSRF
- Well Driller & Well Location Program
- Source Water Protection
- Water System Operators
- Drinking Water Quality
- The TNC Handbook
- Rules and Regulations
- Staff Directory
- News
- Other Links of Interest
- Agency of Natural Resources GIS Internet Mapping

Well Details

Date Completed	04/27/1991
Date Received	07/05/1991
Driller	129 - Martin W Rabtoy , Rabtoy & Sons Inc
Well Report Number	452
Tag	9115
Comments	
Town	Hinesburg
Map Cell	13D1
Tax Map	
E911 Address	
SubDivision	
Lot Number	
Owners First Name	
Owners Last Name	Champlain Valley Union HS
Purchaser First Name	
Purchaser Last Name	
Well Use	School
Well Reason	Replace existing supply
Drilling Method	Rotary (AP)
Well Depth	480.00 feet
Yield Gallons Per Minute	0.00
Yield Test Tested For Hours	0.00
Static Water Level	0.00 feet
Over Flowing	no
OverBurden Thickness	0 feet
Casing Length	0.00 feet
Casing Diameter	0.00 inches
Casing Length Below Land Surface	0.00 feet
Casing Length Exposed	0.00
Casing Material	
Casing Weight	0.00 lbs/foot
Casing Finish	
Liner Length	0.00 feet
Liner Diameter	0.00 inches
Liner Material	
Liner Weight	0.00 lbs/foot
Grout Type	
Seal Type	
Diameter Drilled In Bedrock	0.00 inches

Quick Links

- List of Vermont Licensed Well Drillers
- Well Driller Licensing Rule PDF
- Well Driller License forms
- Current Nationwide Threat Level: Yellow

Depth Drilled in Bedrock	0.00 feet
Screen Make Type	
Screen Material	
Screen Length	0.00 feet
Screen Diameter	0.00 inches
Screen Slot Size	0.000 inches
Depth of Screen	0.00 feet
Gravel Size Type	
Casing Sealing Method	
Yield Test Method	
Well Development	
Not Steel Casing	no
Water Analysis	no
Well Screen	no
AW Partial	no
Unique GIS Name	HN452
Lat Degree	44
Lat Minutes	20
Lat Seconds	42.2820
Long Degree	73
Long Minutes	6
Long Seconds	37.1778
Location Determination Method	screen digitized
Well Type	
Depth To Liner Top	0.00
Hydro Fractured	no
Hydro Fractured Resulting Flow	0.00
Well Location Submitted As A Dot On A Map	N

Starting Depth	Ending Depth	Water Bearing	Lithology Code	Lithology Description
0.00	480.00		O	filled with cement/abandoned

If you would like search for a well or wells in a specific area the following link will relocate you to the ANR GIS Internet Mapping Program.
http://www.anr.state.vt.us/site/html/maps.htm

www.VermontDrinkingWater.org
VT DEC ▪ Drinking Water and Groundwater Protection Division ▪ 1 National Life Drive, Main Building, 2nd Floor ▪ Montpelier, VT 05620-3521
Telephone toll-free in VT: 800-823-6500 or call 802-241-3400 ▪ Fax: 802-828-1541

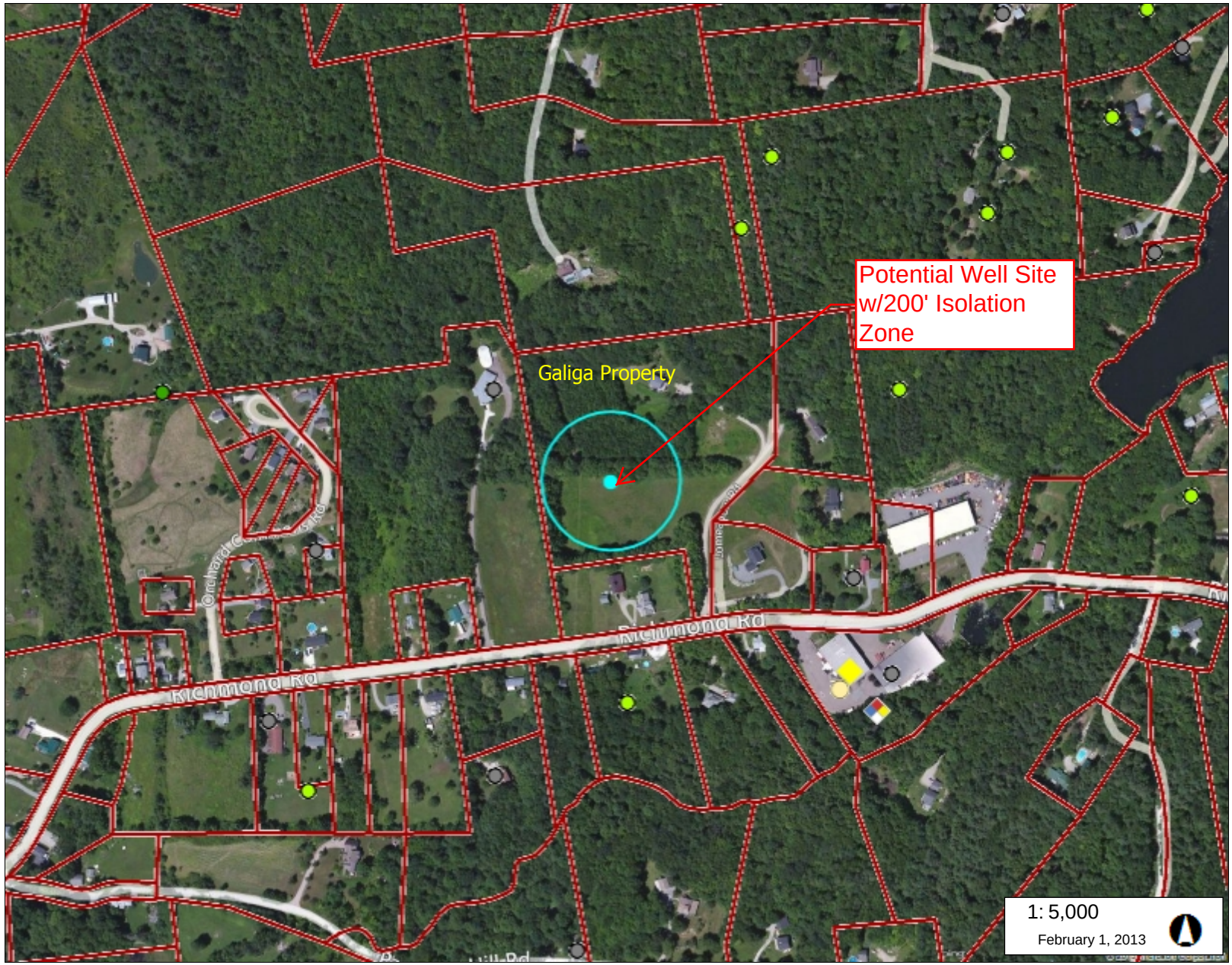
Appendix H

Galiga Property

Galiga Property

Vermont Agency of Natural Resources

vermont.gov



LEGEND

- Landfills
  - OPERATING
  - CLOSED
- Hazardous Waste Site
- Hazardous Waste Generators
- Brownfields
- Underground Storage Tank (w
- Private Wells
  - E911 Address
  - Screen Digitized
  - GPS Location; Field Located with G
  - Unknown
  - Welldriller/Clarion
- Parcels (where available)
- Elevation (FT)
  - 69 - 500
  - 500 - 1,000
  - 1,000 - 1,500
  - 1,500 - 2,500
  - 2,500 - 4,381

NOTES

Map created using ANR's Natural Resources Atlas

254.0 0 127.00 254.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

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VT DEC

Hazardous Site List

Help & Definitions

Enter the search criteria below and click the [Search] button when done. (Search will display a maximum of 500 results)

Site# 951795

Site Name

Site Town List Towns

Address

Primary Consultant List Consultants

Priority All

All Sites Active Sites Inactive Sites

Search Search Tips

Site Name	Iroquois Manufacturing Co
Address	Hinesburg-Richmond Rd
Town	Hinesburg
Site Use	Business
Site Number	951795
DEC Manager	Linda Elliott
Priority	MED - Site with sensitive receptors that are threatened by contamination
Site Status	
Project Status	Work being conducted under state contract. Quarterly drinking water supply sampling for TCE contamination from one residential well and IMC well. TCE above GWES in residential well. POET installed. Levels show slight decline in TCE concentrations.
Source of Contamination	Spill
Contaminant	Non-Petroleum
Institutional Control	
Site Closure Date	
DEC Contact Email Address	Linda.Elliott@state.vt.us
Record Last Updated	05-10-2012

Online Site Reports

Report
951795.first.pdf
951795.si.pdf

The documents listed above do not represent a comprehensive list of available site reports. To view additional site files, please schedule a file review by calling 802-241-3888.

Invoices

Invoice Number	Review Date	Invoice Date	Claim Amount	Payment Amount	Comments
	05-10-2012	04-30-2012	$16.60	$16.60	
	01-30-2012	12-31-2011	$49.80	$49.80	
	12-23-2011	12-23-2011	$49.80	$49.80	
	11-16-2011	10-31-2011	$41.50	$41.50	
	10-17-2011	09-15-2011	$112.05	$112.05	
	09-29-2011	08-15-2011	$74.70	$74.70	
	08-25-2011	07-15-2011	$70.55	$70.55	

Galiga Well Completion Report

- Critical Infrastructure Protection Information
- Permit, Certification & License Application Forms & Information
- Water System Capacity Development & DWSRF
- Well Driller & Well Location Program
- Source Water Protection
- Water System Operators
- Drinking Water Quality
- The TNC Handbook
- Rules and Regulations
- Staff Directory
- News
- Other Links of Interest
- Agency of Natural Resources GIS Internet Mapping

Well Details

Date Completed	10/22/1993
Date Received	01/05/1994
Driller	198 - Thomas W Williams , Spafford & Sons of Williston VT Inc
Well Report Number	523
Tag	510
Comments	
Town	Hinesburg
Map Cell	13D1
Tax Map	
E911 Address	
Subdivision	
Lot Number	
Owners First Name	Steve
Owners Last Name	Orvis
Purchaser First Name	
Purchaser Last Name	
Well Use	Domestic
Well Reason	New Supply
Drilling Method	Rotary (AP)
Well Depth	335.00 feet
Yield Gallons Per Minute	100.00
Yield Test Tested For Hours	0.00
Static Water Level	0.00 feet
Over Flowing	no
Overburden Thickness	45 feet
Casing Length	60.00 feet
Casing Diameter	6.00 inches
Casing Length Below Land Surface	0.00 feet
Casing Length Exposed	0.00
Casing Material	
Casing Weight	0.00 lbs/foot
Casing Finish	Above ground, finished
Liner Length	0.00 feet
Liner Diameter	0.00 inches
Liner Material	
Liner Weight	0.00 lbs/foot
Grout Type	
Seal Type	
Diameter Drilled In Bedrock	0.00 inches
Depth Drilled in Bedrock	0.00 feet
Screen Make Type	
Screen Material	
Screen Length	0.00 feet
Screen Diameter	0.00 inches
Screen Slot Size	0.000 inches
Depth of Screen	0.00 feet
Gravel Size Type	
Casing Sealing Method	Drive shoe only
Yield Test Method	
Well Development	
Not Steel Casing	no
Water Analysis	no
Well Screen	no
AW Partial	no
Unique GIS Name	HN523
Lat Degree	44
Lat Minutes	20
Lat Seconds	51.4260
Long Degree	73
Long Minutes	5
Long Seconds	36.5100

Quick Links

- List of Vermont Licensed Well Drillers
- Well Driller Licensing Rule PDF
- Well Driller License forms
- Current Nationwide Threat Level: Yellow

Location Determination Method	screen digitized
Well Type	
Depth To Liner Top	0.00
Hydro Fractured	no
Hydro Fractured Resulting Flow	0.00
Well Location Submitted As A Dot On A Map	N

WellMainRecordNumber	StartingDepth	EndingDepth	WaterBearing	LithologyCode	LithologyDescription
27893	0.00	45.00		H	hardpan
27893	45.00	335.00		R	green schist

If you would like search for a well or wells in a specific area the following link will relocate you to the ANR GIS Internet Mapping Program.
http://www.anr.state.vt.us/site/html/maps.htm

www.VermontDrinkingWater.org
VT DEC ■ Water Supply Division ■ 103 South Main Street, Old Pantry Building ■ Waterbury, VT 05671-0403
Telephone toll-free in VT: 800-823-6500 or call 802-241-3400 ■ Fax: 802-241-3284

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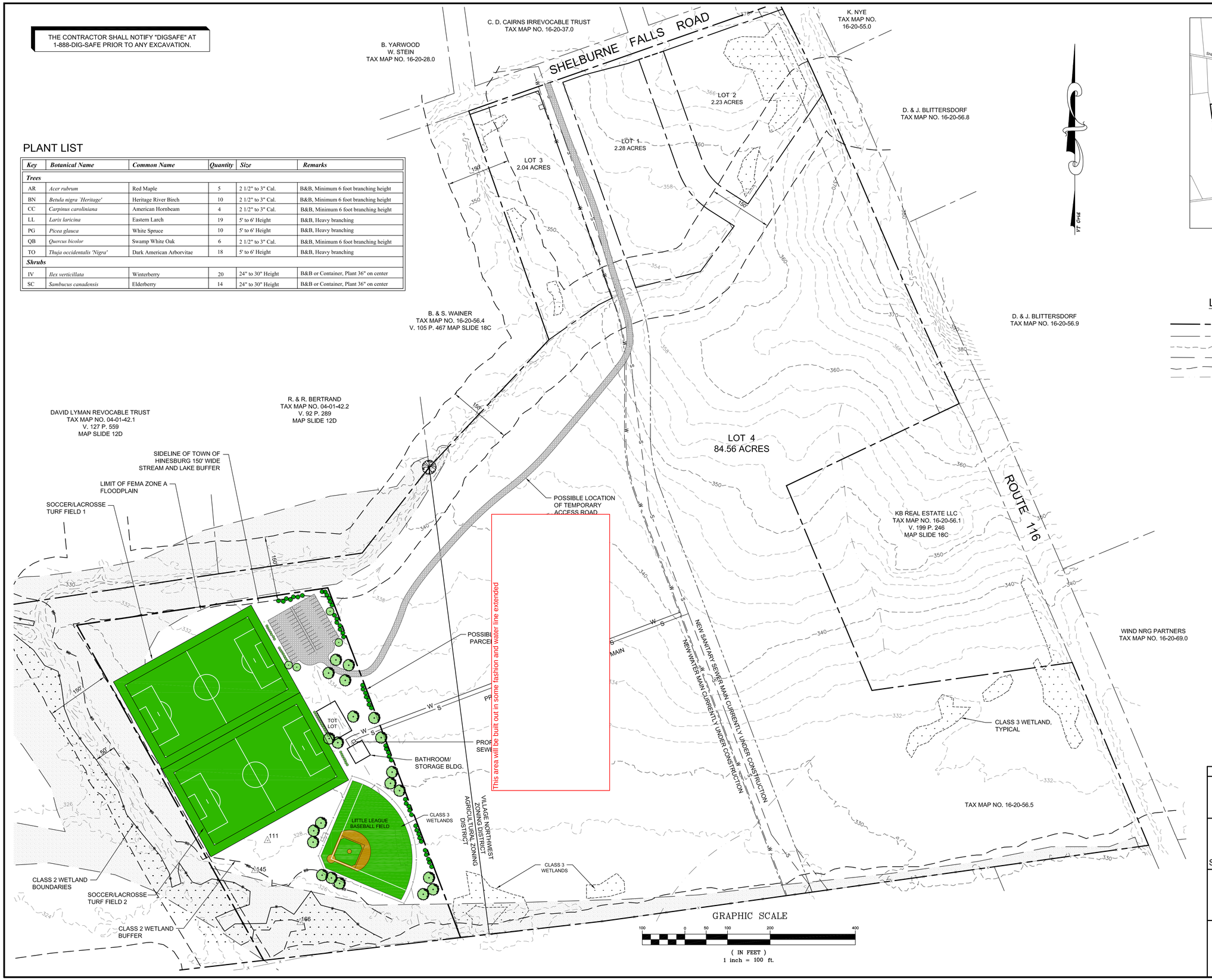
VERMONT.gov

Appendix I

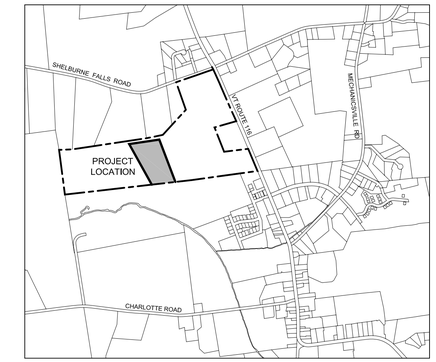
Bissonette Property

THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT 1-888-DIG-SAFE PRIOR TO ANY EXCAVATION.



PLANT LIST

Key	Botanical Name	Common Name	Quantity	Size	Remarks
Trees					
AR	*Acer rubrum*	Red Maple	5	2 1/2" to 3" Cal.	B&B, Minimum 6 foot branching height
BN	*Betula nigra 'Heritage'*	Heritage River Birch	10	2 1/2" to 3" Cal.	B&B, Minimum 6 foot branching height
CC	*Carpinus caroliniana*	American Hornbeam	4	2 1/2" to 3" Cal.	B&B, Minimum 6 foot branching height
LL	*Larix laricina*	Eastern Larch	19	5' to 6' Height	B&B, Heavy branching
PG	*Picea glauca*	White Spruce	10	5' to 6' Height	B&B, Heavy branching
QB	*Quercus bicolor*	Swamp White Oak	6	2 1/2" to 3" Cal.	B&B, Minimum 6 foot branching height
TO	*Thuja occidentalis 'Nigra'*	Dark American Arborvitae	18	5' to 6' Height	B&B, Heavy branching
Shrubs					
IV	*Ilex verticillata*	Winterberry	20	24" to 30" Height	B&B or Container, Plant 36" on center
SC	*Sambucus canadensis*	Elderberry	14	24" to 30" Height	B&B or Container, Plant 36" on center



LOCATION MAP

NTS

LEGEND

- PROJECT PROPERTY BOUNDARY
- ABUTTING PROPERTY BOUNDARY
- 340 EXISTING CONTOUR LINE
- SPECIAL FLOOD HAZARD AREA BOUNDARY
- STREAM BUFFER
- STREAM / DRAINAGE SWALE
- 111 ARCHEOLOGICAL ARTIFACT SITE

NOTES

1. MAPPING INFORMATION SHOWN ON THIS PLAN IS BASED UPON 2004 ORTHOPHOTOS, DIGITAL TERRAIN MODEL ELEVATION DATE OBTAINED THROUGH THE CHITTENDEN COUNTY REGIONAL PLANNING 2004 ORTHOIMAGERY PROGRAM.
2. PROJECT DATUMS ARE NAD 83 AND NAVD 88.
3. PROPERTY LINES SHOWN ARE BASED ON A PLAN ENTITLED "SUBDIVISION PLAT, BISSONNETTE REVOCABLE TRUST, SHELBURNE FALLS ROAD, HINESBURG, VT." DATED 2-8-10 AS PREPARED BY TRUDELL CONSULTING ENGINEERS.

Date	Revision	By

These plans shall only be used for the purpose shown below:

- ■ Sketch/Concept
- ☐ Preliminary
- ☐ Final Local Review
- ☐ Act 250 Review
- ☐ Construction
- ☐ Record Drawing

Town of Hinesburg
Proposed Recreational Facility

Shelburne Falls Rd / VT Route 116 Hinesburg, VT

CONCEPTUAL SITE PLAN

Lamoureux & Dickinson
Consulting Engineers, Inc.
14 Morse Drive, Essex, VT 05452
802-878-4450 www.LDengineering.com

Project No.	11092
Survey	-
Design	DH
Drawn	L&D
Checked	-
Date	JAN. 2012
Scale	1" = 100'
Sheet number	1B

P:\2011\11092\dwg\11092-01B - PHASE 2.dwg, 2/22/2012 3:38:31 PM, 1:1

APPENDIX D

STATE OF VERMONT, DEC, DRINKING WATER AND GROUNDWATER PROTECTION DIVISION, SANITARY SURVEY

VERMONT

Vermont Department of Environmental Conservation
Drinking Water and Groundwater Protection Division
One National Life Drive - Main 2
Montpelier, VT 05620-3521
www.vermontdrinkingwater.org

[phone] 802-241-3400
[in-state] 800-823-6500
[fax] 802-828-1541

Agency of Natural Resources

October 10, 2012

Rocky Martin
10632 Route 116
Hinesburg, VT 05461

Re: Sanitary Survey, Hinesburg Water Department Public Community Water System, Hinesburg, VT
WSID #5070

Dear Mr. Martin:

A sanitary survey of the Hinesburg Water Department Water System (the Water System) was conducted on September 14, 2012. Ben Montross and Tim Raymond represented the Vermont Department of Environmental Conservation, Drinking Water and Groundwater Protection Division (the Division); and Brian Mattison, the Water System's operator, represented the Water System. The Water System was issued a Permit to Operate (PTO) on March 15, 2005 which expired on March 31, 2011. The Division received a PTO renewal application on May 25, 2011. The Water System must respond to this letter by January 2, 2014 and identify that the Water System: 1) has corrected the deficiencies below; 2) agrees to the compliance dates which have been proposed; and/or 3) proposes an alternative compliance improvements schedule under which it will correct all deficiencies identified in this survey report. Upon receipt of an administratively and technically complete response from the Water System, the Division will consider the PTO application. The Town of Hinesburg is not authorized to expand the current water demand needs of the Water System without prior written approval by this Division.

The Water System is in need of an additional source of water to serve the Water System. New source development, or existing source redevelopment is necessary in order to ensure that a sufficient quantity of water remains available to its customers under all conditions of flow (average and maximum). In recent years the Town of Hinesburg has been expanding its user base and increasing the daily water demand needs of the Water System. As the permitted safe yield of the supply sources has diminished from 185 gallons per minute (gpm) to approximately 120 gpm, the Water System is not capable, nor is it permitted by this Division, to provide more than 172,800 gallons per day (gpd) of water to its users. As the Water System is currently pumping its two wells 12 hours, or more, each day to meet the average day demand needs of the system, the Water System must immediately implement plans to provide for additional source capacity. A sufficient supply of water must be demonstrated to exist in order to meet the current average and maximum demand requirements and the expected future demand needs of the Water System. The Division hereby restricts expansion of the Water System until such time as its source quantity issues have been accurately assessed by a qualified hydrogeologist and/or consulting professional engineer (*see Item 1, below)*. The Vermont Water Supply Rule (WSR), Appendix A, Part 2 specifies:

> "When a water system, expecting future growth, reaches 90% of the capacity of treatment or pumping systems capacity, it shall commence planning for the required additional capacity. When pumping or treatment capacities reach 100%, the water system shall initiate construction of these facilities…Source yields will be compared against the maximum demand of the water system to determine the adequacy of the source(s) to meet the expected demand"

During the sanitary survey and file review, the following significant deficiency was identified and must be addressed:

1. *Diminished Well(s) Yield Capability (affecting Water Systems ability to expand)*: In accordance with the WSR, Subchapter 21-7 and Appendix A, Part 2.0, a Public Water System shall provide an adequate supply of potable water during average and peak user demand periods on a sustained basis to all users. Source yields are to be compared against the maximum demands of the water systems to determine the adequacy of the source(s) to meet the expected demand needs of the Water System. The Water System is nearing and on occasion is exceeding the combined maximum day pumping capacity of well 1 (45 gpm) and well 3 (75 gpm), which is 120 gpm. The permitted combined capacity of well 1 and well 3 was 185 gpm; however, the safe yield pumping rate of well 3 has reportedly diminished by approximately 65 gpm, or an ADD reduction of 46,800 gpd. This significantly affects the Water Systems ability to expand or allocate water to new users that might be served by the Water System. It is important to note that well 1 is being pumped at 50gpm, but is only authorized to be pumped at 45 gpm. This too must be resolved. The Water System must be able to meet the Average Day Demand (ADD) needs of the Water System through utilizing its permitted well sources for 12 hours or less each day. The wells are permitted to pump for greater than 12 hours, but only in order to meet the Maximum Day Demand (MDD) needs of the Water System. The sources combined pumping capacity to meet the MDD of the Water System has been reduced by 93,600 gpd. The MDD period for the Water System typically occurs on weekends and holidays. Currently, when the wells are pumping at a combined rate of 120 gpm, for 12 hours per day to meet the ADD requirements of the Water System, they will yield 86,400 gpd. The Water System's current metered ADD is reported as being an average of 125,000 gpd. This quantity of water exceeds the sources' authorized pumping capabilities within a 12 hour period. The sources' combined pumping capability in a 24 hour period currently equates to 182,000 gpd. The operator reports that he believes the metered MDD of the system is about 136,000 gpd, but acknowledges that MDD of the Water System is really not known (see discussion of system demand below). The Division estimates that the current MDD of the water system is between 163,000 – 195,000 gpd which calculates to a combined well yield equal to 136 gpm. Thus, the Water System very likely has insufficient supply to meet the current MDD needs of the Water System. <u>The Water System is not authorized to expand without first receiving written approval or a permit from this Division</u>.

   The Water System must consult with a Hydrogeologist and/or Engineer in order to review and evaluate the current and expected future water demand needs of the Water System, and develop an improvements plan including a proposed schedule under which the sources' yield and Water System's water capacity issues will be corrected. Hydrogeologist Dennis Nealon of the Division may be contacted for assistance in developing a scope of work for assessing and reestablishing the authorized yields for well 1 and well 3. The Water System is to obtain permits for the provision of additional supply sources to serve the system as necessary to meet the current and expected future needs of the community. Dennis may be contacted at dennis.nealon@state.vt.us or by phone at 802-585-4909. The improvement plan and schedule must be submitted to Ben Montross (please copy Tim Raymond); if acceptable, the dates will be incorporated into a compliance schedule within a reissued Water System PTO. **The compliance date to submit the improvement plan and implementation schedule to the Division is <u>January 2, 2014</u>.**

The following minor deficiencies were identified at the time of the survey and must be corrected:

2. *Source Covers Need Improvement*: In accordance with the WSR, Chapter 21, Appendix A, Part 12, a Water System must meet certain requirements relative to the construction of their source wells. These requirements outline the technical standards for proper sanitary seals on wells. Both well 1 (WL001) and well 3 (WL003) had loose covers. The Water System reported that they are participating in groundwater quality monitoring for MTBE. The Water System must ensure that the consultants are replacing and tightening the well caps <u>every time</u> the wells are left unattended. This deficiency was also identified in a previous sanitary survey and was reported as having been corrected by the Water System. The cap gasket must be inspected and replaced if necessary and the bolts must be replaced and tightened. **The recommended compliance date for this deficiency is <u>November 1, 2012</u>.**

3. *Inadequate Source Drainage*: In accordance with the WSR, Chapter 21, Appendix A, Part 12, adequate isolation distances between wells and potential sources of contamination are required. There are 3 related deficiencies identified with respect to well 3 that must be corrected: 1) There is currently a depression near well 3 allowing surface water to collect and potentially contaminate the source. The area surrounding the well casing is to be filled with low permeability soil, compacted, and graded so that water runs away from the well casing to prevent the direct influence of surface water contamination; 2) There is a section of conduit installed in the ground next to the well that could serve as a direct source of infiltration and vehicle for contamination. This conduit must be filled in or capped to prevent source contamination; and 3)_Due to the ongoing improvement and analysis of well 3, there is a swale that was full of standing water within approximately 20 feet that must be filled in and appropriately graded. **The recommended compliance date for correction of these deficiencies is <u>December 1, 2012</u>.**

4. *Closure of Abandoned Wells (Fill or include in SPP)*: In accordance with the WSR, Chapter 21, Appendix A, Part 12, all abandoned wells shall be closed to prevent the contamination of ground or surface water resources, the migration of fluids, and risks to the health and safety of the public. Well abandonment shall be performed only by a Vermont licensed water well driller or monitoring well driller and in conformance with all Department of Environmental Conservation regulations. Well 2 (WL002) has been physically disconnected from the Water System but has not been properly abandoned in accordance with the WSR. If the well is not filled and abandoned as specified by the WSR, it must be identified and managed as part of the Public Water System's on-going Source Protection Plan in order to prevent the migration of potential contamination into the groundwater aquifer. Proper abandonment of well 2 was identified as a recommendation in the last sanitary survey and has yet to be addressed. This well must be properly abandoned or managed according to the standards established in the WSR. **The recommended compliance date to abandon well 2 is <u>May 1, 2013</u>**.

5. *Tank Inspection Overdue*: In accordance with the WSR, Subchapter 21-7, all water storage tanks shall be comprehensively inspected within 10 years of being placed in service and every 5 years thereafter. The inspection, findings, and servicing documentation shall be retained in the Water System's files for review upon request. The water storage tank (ST001) was activated in 1999 and has not been inspected since coming on line. The water storage tank must be comprehensively inspected and cleaned as necessary. The Water System must submit a maintenance report to the Division, identifying the impact that the manganese and/or other precipitates are having on the water storage facility, and if more-frequent inspections and cleaning is recommended. In addition to the water storage tank inspection and cleaning, the riser for the storage tank air vent must be examined and a proper sanitary seal must be reestablished. Routine tank inspection is to be addressed in the Water System's Operations & Maintenance Manual. **The recommended compliance date for this deficiency is <u>July 1, 2013</u>**.

6. *Chemical Feed Monitoring and Reporting:* In accordance with the WSR, Subchapter 21-9, all Public Water Systems providing treatment must submit a signed report to the Secretary at least once per month no later than ten (10) days following the end of the month that details the total amount of water produced for the Water System each day and the free chlorine, fluoride, and other residual chemical concentration(s) being introduced into <u>the distribution system</u>. The Water System is submitting monthly reports to the Division each month that include daily chlorine residuals as being measured <u>in the distribution system</u>, but not at the entry point of the Water System. A sample tap following the Contact Time piping and before the first service connection is not currently provided on the transmission main line. Until such time that an appropriate sample tap is provided for this monitoring, the Water System must conduct a daily free/total chlorine disinfectant residual monitoring at the first active service connection on the system. The Division requires that a signed report be submitted to the Secretary at least once per month no later than ten (10) days following the end of the month that details the total amount of water produced for the Water System that month, the daily free chlorine concentration being introduced to the distribution system, and any other chemical concentrations being provided to the drinking water. **The recommended**

compliance date for this deficiency is <u>December 10, 2012</u>; this will represent the November, 2012 reporting period.

The Water System is to provide a written response to item 1 by January 2, 2014 and items 2 through 7 within 30 days, or by November 10, 2012. The written responses are to indicate that the compliance dates above are acceptable or provide detailed alternative schedules for review and approval. All identified system deficiencies shall be corrected within 120 days of the date of this notification letter or in accordance with an alternate schedule that has been approved by the Division. The approved compliance dates will be incorporated into a Permit to Operate or other compliance improvements schedule developed and implemented by the Agency of Natural Resources. Please refer to the WSR, Subchapter 21-4, to determine if the required improvements, noted above, require a Permit to Construct from the Secretary.

In order to gather additional information to facilitate the system improvement/modification issues discussed in item 1 above, the Division strongly recommends the Water System provide for a comprehensive means of metering the water being consumed by users in order to identify system demand. Presently, the Water System has a means of measuring water <u>supplied to</u> the system; however, there is no means by which the Water System can accurately assess the <u>demand of</u> the system users.

At the time of the survey, the Water System was performing maintenance on the pressure reducing valve. It was reported that the valve had been serviced approximately one year ago as well. The Division requests that the Water System provide a maintenance report on this equipment and provide any possible explanation as to why the valve is in need of such frequent repair, such as impacts from manganese or iron precipitate accumulation.

The Water System is discharging water softener backwash water into the floor drain of the treatment building. This softener is used for dilution of the water treatment chemicals (Chlorine and Fluoride) only. This treatment system treats a relatively insignificant amount of water, and backwashes based on production; it is reported to backwash once every couple of months. This method of evacuating backwash water from the softener is unacceptable. As discussed during the survey, the Water System indicated that they would provide a properly sized storage vessel to capture the backwash, and then bring it to their Wastewater Treatment Plant for proper disposal. The Division is renewing its recommendation to provide an adequate storage vessel to capture and transport backwash for proper disposal.

I appreciate Brian's time while conducting the sanitary survey of the Hinesburg Water Department Water System. I look forward to working with you both in the future. If you have any questions or would like to discuss anything on the survey, please feel free to contact me at the address above, by email at ben.montross@state.vt.us, or by phone at 802-498-8981. Tim Raymond and I would be happy to meet with you to discuss the findings in this report or answer any additional questions you may have with respect to the Water System's source development.

Sincerely,

Benjamin L. Montross
System Operations Specialist

c. Tim Raymond, System Operations Manager, DWGWPD
Julie Hackbarth, Compliance and Certification Manager, DWGWP
Dennis Nealon, Hydrogeologist, Resource Management Section, DWGWP
Cindy Cook, P.E., Underground Injection Control Program, DWGWP
Matt Moran, Hazardous Materials Specialist, Waste Management Division, Waitsfield.
Greg Bostock, P.E., Engineering & Financial Services Section, DWGWP
Brian Mattison, Water System Operator WSID #5070
WSID File #5070