



To: GMP Kingdom Community Wind -
Level Spreader Relocation Project
Folder

Date: August 11, 2020

Memorandum

Project #: 57346.11

From: Robert Wildey, PE, CPESC

Re: Non-Native Invasive Species Management

On behalf of Green Mountain Power ("GMP"), VHB has prepared this Non-Native Invasive Species ("NNIS") management plan ("Plan") for the Kingdom Community Wind ("KCW") level spreader relocation project ("Project"). The Project involves the replacement/relocation of four existing stormwater level spreaders that are proposed to be relocated so that they are outside of the mitigation parcels associated with the construction of the KCW wind farm. The proposed Plan for the limited level spreader relocation Project is based on site specific data collected as part of the on-going NNIS monitoring at KCW and incorporates appropriate best management practices based on experience managing NNIS populations there.

This Plan consists of three elements: pre-construction, during construction and post-construction. The post-construction component is intended to be done as part of the ongoing NNIS monitoring pursuant to the requirements of the Project's Certificate of Public Good ("CPG") issued by the Vermont Public Service Board, Docket No. 7628, and in accordance with the Project's approved *Kingdom Community Wind Invasive Species Monitoring and Control Plan* ("Overall Plan").¹ This Overall Plan has been implemented by GMP at KCW, with assistance in the form of monitoring and reporting by VHB since the start of construction of the KCW wind farm in 2011. The principal elements of the Overall Plan include:

- Monitoring is conducted in all areas of the site where soil disturbance occurred, including revegetated rock fill slopes, rock cut slopes, crane path surfaces, access road surfaces, turbine pad surfaces, and any other construction site areas within the limits of the wind farm component only, including 100 feet into the forest from the edge of disturbance.²
- The most recently revised versions of the Vermont Agency of Agriculture Quarantine Rule (VAAFQ, 2002, revised 2012)³ and the Vermont Invasive Exotic Plant Committee watch list (VIEPC, revised 2017)⁴ are used to identify those species known to be invasive and noxious species in Vermont.

¹ VHB. June 2011. Kingdom Community Wind Invasive Species Monitoring and Control Plan.

² The Overall Plan was subsequently employed for post-restoration/restoration monitoring in Parcels 1, 2, and 3 and along the Northern Logging Road

³ Vermont Agency of Agriculture, Farms and Markets. Quarantine #3 - Noxious Weeds. Division of Agricultural Resource Management and Environmental Stewardship, April 22, 2002 (most recently revised March 2012). Available online at:
https://agriculture.vermont.gov/sites/agriculture/files/documents/PHARM/Plant_Pest/NoxiousWeedsQuarantine1.pdf

⁴ Vermont Invasive Exotic Plant Committee (VIEPC), Watch List (most recently revised November 2017). Available online at:
https://fpr.vermont.gov/sites/fpr/files/Quarantine_WatchListUpdate-2017_November.pdf



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- Field personnel perform an annual pedestrian reconnaissance-level survey to identify occurrences of invasive species for all areas of disturbed soils in the wind farm component of the KCW project area.
- Individual plants or small groupings of plants are noted and mapped using GPS. Any individual or small grouping of invasive plants identified during the course of the monitoring process is removed by manual extraction and disposed of offsite.
- GMP controls larger colonies by manual removal when possible or using approved herbicides in strict accordance with State regulations for handling and application. Application of herbicides is performed only by State-certified pesticide applicators. No application of herbicides is carried out within 50 feet of wetlands or streams without prior consultation and approval from ANR.
- Site monitoring and control will be carried out in the manner described above for a minimum of five consecutive years and not to exceed ten consecutive growing seasons following post-construction revegetation. Monitoring and control activities will continue until there are three consecutive years with no invasive species detected.
- Annual reports presenting an analysis of the monitoring results and a summary of the remedial actions performed are submitted to the ANR no later than 31 December of the monitoring year or as specified by any forthcoming permit.

Pre-Construction

The following steps will be taken in advance of construction in order to prepare the Project Areas for construction of the level spreader relocation project:

- Review of 2020 NNIS mapping of these areas to identify the targeted plant removal that is required. Maps documenting current occurrences of NNIS within the Project Area are included in the Attachment.
- Remove and properly dispose of any NNIS plants within the limits of disturbance and 100 feet into the adjacent undisturbed forest (if present) for each relocation work areas.
 - Treatment of NNIS will occur via herbicide application and/or hand removal as appropriate; where feasible, the entire plant will be removed, including roots, to prevent re-emergence of the plant.
 - Hand tools such as weed wrenches or spade-shooters can be used to loosen the soil and root mass or tap root, before removing.
 - Removed plant matter will be managed to minimize the risk of re-introducing seeds or live vegetative fragments into the environment. Such measures may include composting, drying, or off-site disposal.
- Provide documentation to ANR of work performed.



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- Location-specific mapping of the observed NNIS plants/ populations within the construction area for each level spreader will be prepared and provided to ANR.
- Before and after photographic documentation will be collected and provided to ANR within 60 days after Project completion.

During Construction

Spread of NNIS will be minimized during construction of the Project through the following methods:

- Construction equipment will be pressure-washed offsite prior to being delivered to the Project in order to limit the introduction of NNIS seed material to the site. Confirmation that such cleaning has occurred will be required from the contractor.
- No offsite topsoil will be used during the construction of the proposed level spreaders or during the removal of the existing level spreaders. Crushed stone and other inert materials may be brought to the site as necessary for pipe bedding or for construction of compacted level lips.
- Weed-free straw will be used for mulching disturbed areas following completion of construction.
- Conservation seed mix consistent with the original specifications in DEC Permit 6216-INDC that was issued for KCW Project construction will be applied at a rate of 35 lbs/acre following earth disturbance. Areas will be reseeded as necessary with this seed mix or equivalent until vegetative stabilization is achieved.
- Qualified personnel will conduct weekly inspections during construction to observe/document EPSC and NNIS avoidance measures.
 - The construction inspector will be trained to recognize emerging NNIS species so any occurrences that are observed during the initial re-vegetation can be removed.

Post-Construction

- Following completion of construction, a brief technical memorandum will be prepared for submittal to ANR that reports on practices implemented during construction to prevent NNIS colonization. The memorandum will include the following components:
 - Description of methodology for NNIS identification and treatment or removal.
 - List of NNIS that were identified within the relocation project monitoring area.
 - Mapping showing the locations of NNIS that were identified.
 - Photographic documentation of NNIS treated or removed.
 - Discussion of issues encountered or potential concerns.

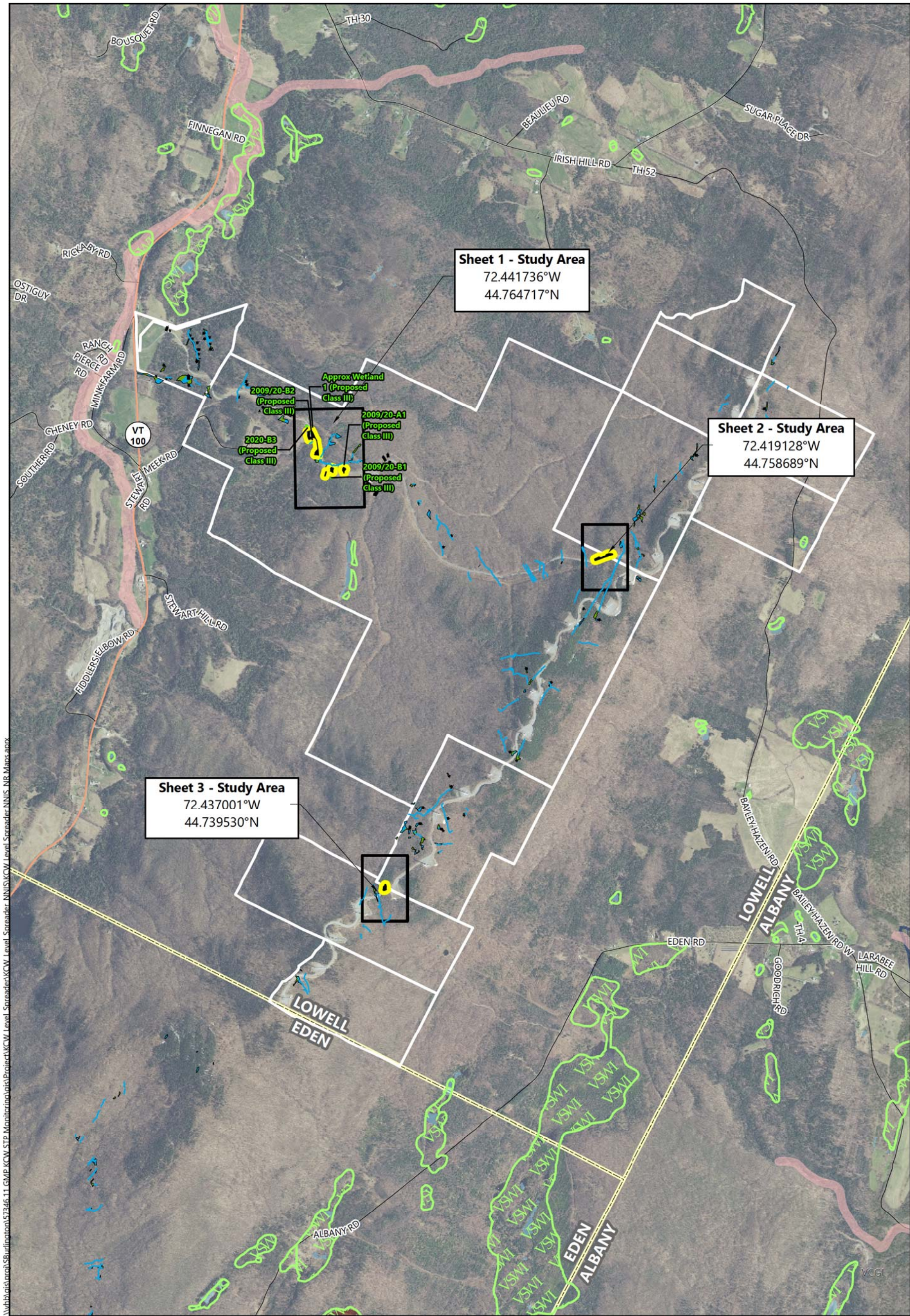


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- Site inspection within the level spreader relocation project areas for NNIS colonization will be completed at the beginning and end of the 2021 growing season.
 - The site inspections that will be conducted during the 2021 growing season will be reported on separately from the on-going annual NNIS monitoring activities.
 - Removal would be completed via appropriate hand removal or herbicide application methods.
- Site monitoring and control within the Project limits and 100 feet into the adjacent undisturbed forest will be carried out in the manner described above for a minimum of five consecutive years and not to exceed ten consecutive growing seasons following post-construction revegetation, with Year 1 being the first growing season after that during which the level spreader relocations were completed. Should invasive species monitoring determine that no such plants are present within the study area during the final three consecutive growing seasons of the initial five-year period (Years 3, 4, and 5), ANR will release GMP from further monitoring obligations. Monitoring and control activities will continue until there are three consecutive years with no invasive species detected. However, GMP will not be required to perform any further invasive species monitoring or management beyond Year 10.

The measures identified above will serve to minimize the potential expansion of NNIS populations as the result of the proposed level spreader relocations.

ATTACHMENT



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Kingdom Community Wind

Lowell, Vermont

Non-Native Invasive Species (NNIS)
Index Map
Level Spreader Relocation

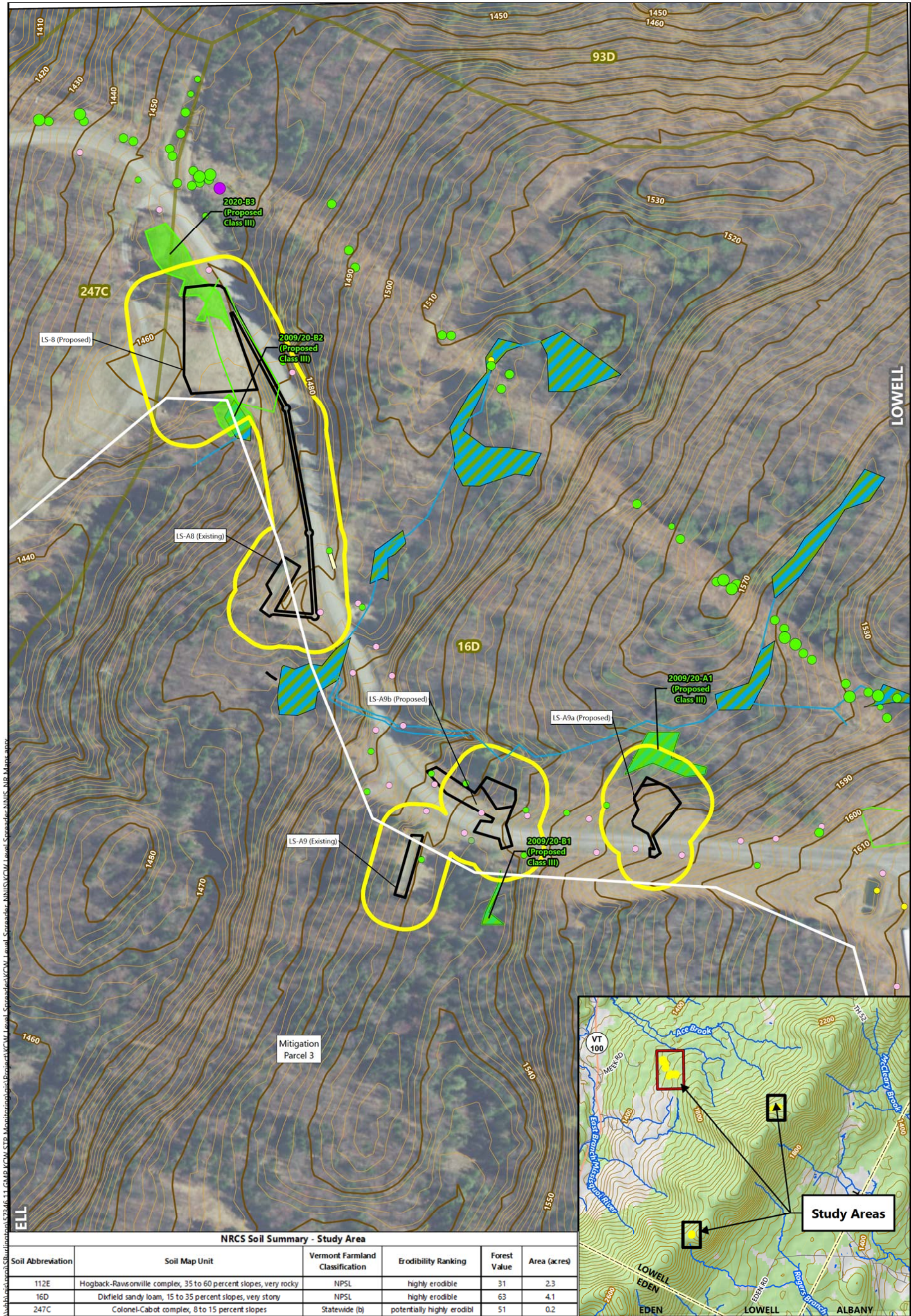
Sources:
Background Imagery by VCGI (Collected in 2017)
VCGI (Vermont Center for Geographic Information - Various Dates)
ANR (Vermont Agency of Natural Resources - Various Dates)
FEMA - Federal Emergency Management Agency
FWD (Vermont Fish and Wildlife Department - Various Dates)
VTrans (Vermont Agency of Transportation - 2017)
VHB - 2020

Wetlands/Waters conducted by M. Jackman, L. Keszey, A. Crary,
and R. Scott April/May, 2020.

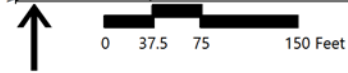
Index Map (VHB)	Water (ANR, FEMA, VHD)	Boundaries
Study Area (VHB)	VSWI Wetland (ANR) (54)	Town Boundary (VCGI) (3)
LOD (VHB) (116)	VHD Waterbody (VCGI) (57)	Wild Life (FWD)
Delineated Wetland (VHB) (5)	River Corridor (ANR) (2)	Project Parcel Boundary (VHB) (11)
Previously Delineated Wetland (VHB) (98)	GW Protection Area (ANR) (1)	Roads (VTrans)
Previously Delineated Streams (VHB) (107)	Wild Life (FWD)	State Highway (VTrans) (11)
Found Culvert (VHB) (1)	NHI Element Occurrence (FWD) (2)	Town Road (VTrans) (56)

(#) Indicated number of feature located within map extent

**Digital FEMA Flood Zones
not available for the map extent,
a review of FEMA FIRM panel
50002 0025 B found no 100 year
flood zones in the map extent.



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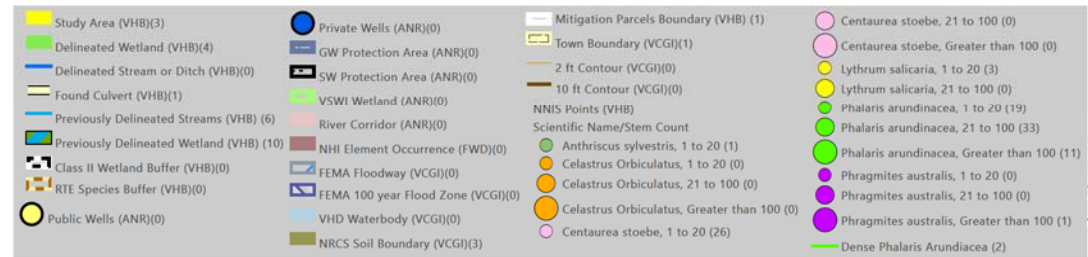
Kingdom Community Wind

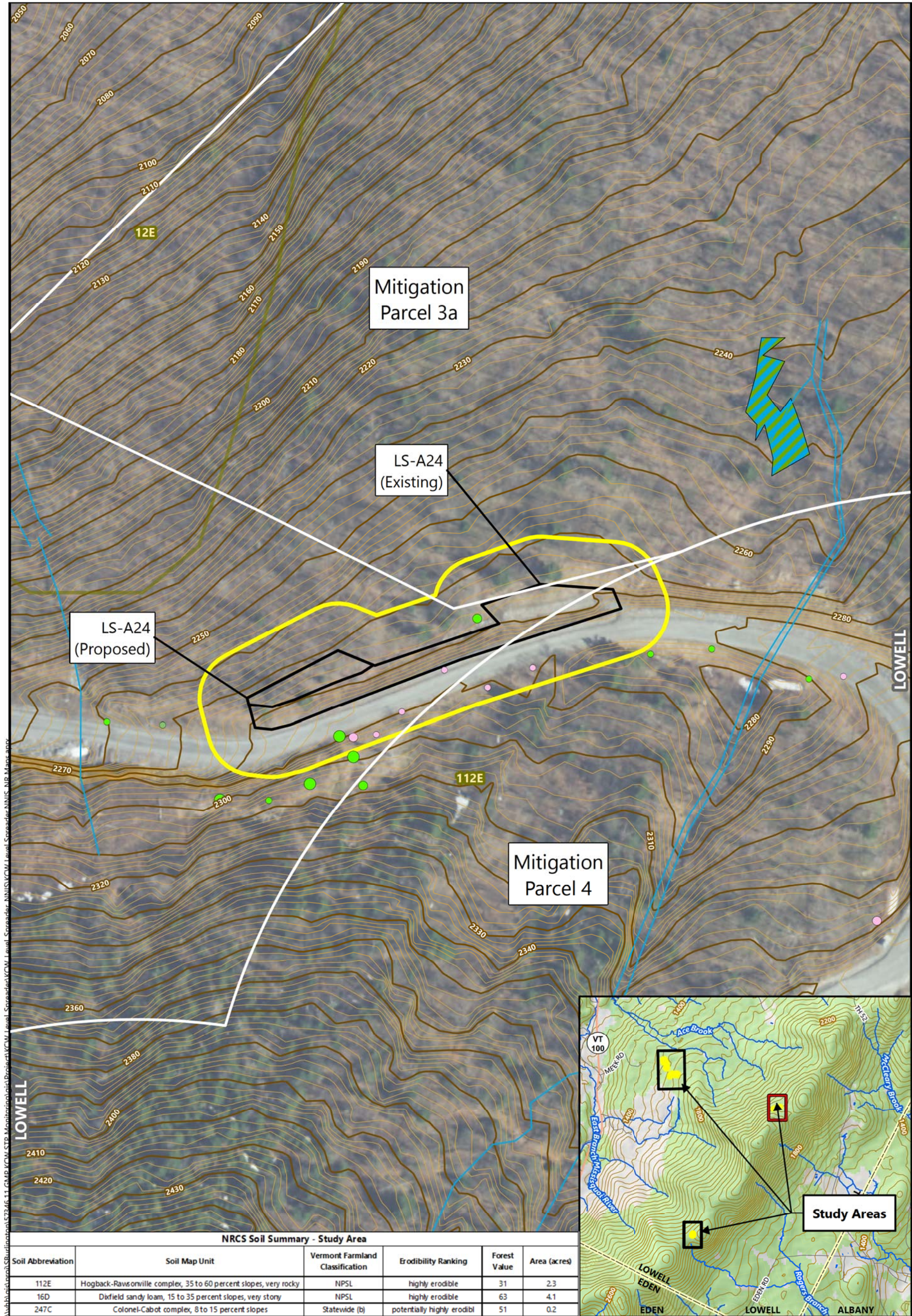
Lowell, Vermont

Non-Native Invasive Species (NNIS)
Map Series
Level Spreader Relocation

Sources:
Background Imagery by VCGI (Collected in 2017)
VCGI (Vermont Center for Geographic Information - Various Dates)
ANR (Vermont Agency of Natural Resources - Various Dates)
FEMA - Federal Emergency Management Agency
FWD (Vermont Fish and Wildlife Department - Various Dates)
VTrans (Vermont Agency of Transportation - 2017)
VHB - 2020

Wetlands/Waters conducted by M. Jackman, L. Keszey, A. Crary, and R. Scott April/May, 2020.





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Non-Native Invasive Species (NNIS) Map Series

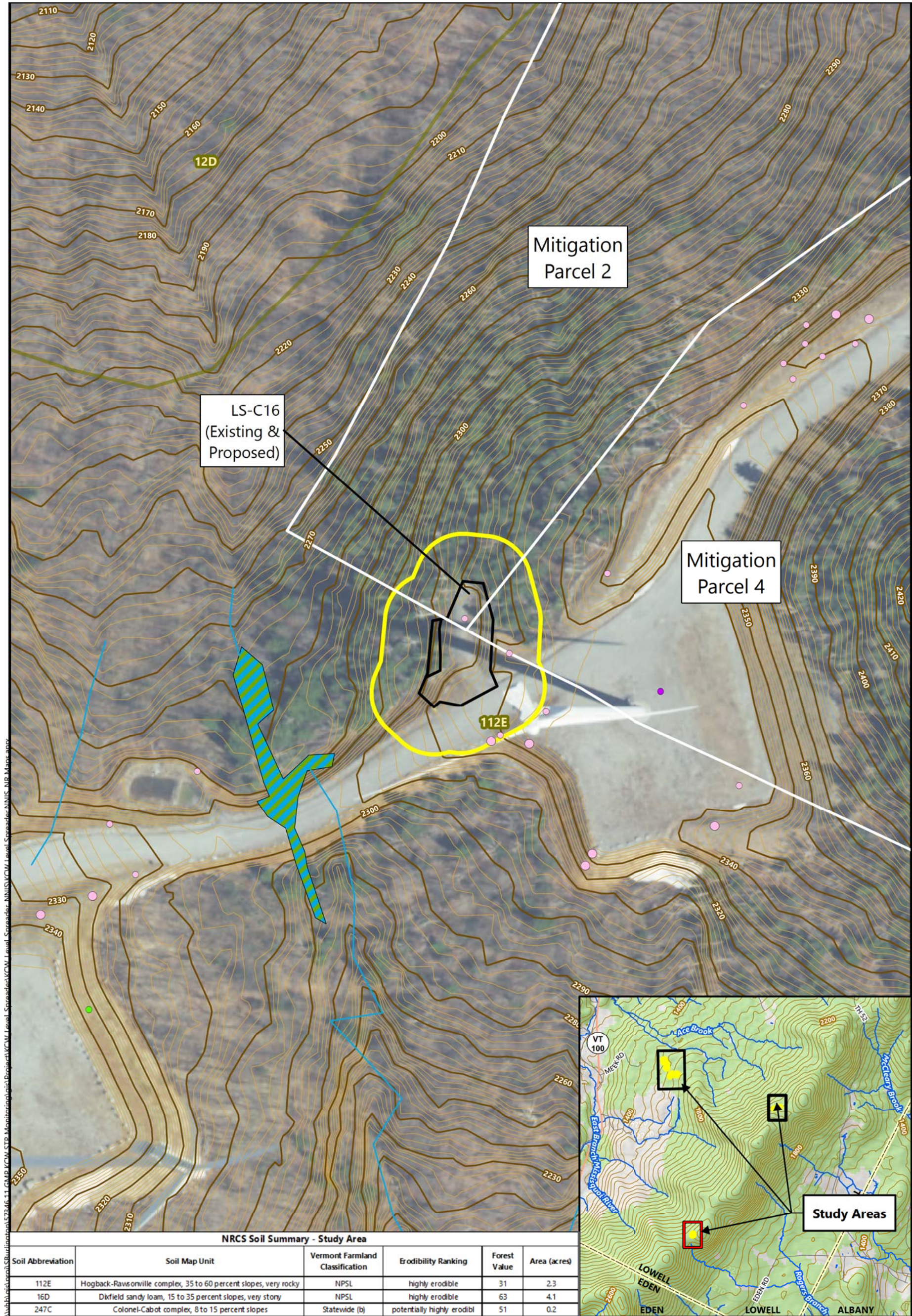
Level Spreader Relocation

Sources:
Background Imagery by VCGI (Collected in 2017)
VCGI (Vermont Center for Geographic Information - Various Dates)
ANR (Vermont Agency of Natural Resources - Various Dates)
FEMA - Federal Emergency Management Agency
FWD (Vermont Fish and Wildlife Department - Various Dates)
VTrans (Vermont Agency of Transportation - 2017)
VHB - 2020

Wetlands/Waters conducted by M. Jackman, L. Keszezy, A. Crary, and R. Scott April/May, 2020.

(#) Indicated number of feature located within map extent

- Study Area (VHB)(1) - Delineated Wetland (VHB)(0) - Delineated Stream or Ditch (VHB)(0) - Found Culvert (VHB)(0) - Previously Delineated Streams (VHB) (4) - Class II Wetland Buffer (VHB)(0) - RTE Species Buffer (VHB)(0) - Public Wells (ANR)(0)	- Private Wells (ANR)(0) - GW Protection Area (ANR)(0) - SW Protection Area (ANR)(0) - VSWI Wetland (ANR)(0) - NHI Element Occurrence (FWD)(0) - FEMA Floodway (VCGI)(0) - FEMA 100 year Flood Zone (VCGI)(0) - VHD Waterbody (VCGI)(0) - NRCS Soil Boundary (VCGI)(2)	- Mitigation Parcels Boundary (VHB) (2) - Town Boundary (VCGI)(1) 2 ft Contour (VCGI)(0) 10 ft Contour (VCGI)(0) - NNIS Points (VHB) - Scientific Name/Stem Count - Anthriscus sylvestris, 1 to 20 (1) - Celastrus Orbiculatus, 1 to 20 (0) - Celastrus Orbiculatus, 21 to 100 (0) - Celastrus Orbiculatus, Greater than 100 (0) - Centaurea stoebe, 1 to 20 (7)	- Centaurea stoebe, 21 to 100 (3) - Centaurea stoebe, Greater than 100 (0) - Lythrum salicaria, 1 to 20 (0) - Lythrum salicaria, 21 to 100 (0) - Phalaris arundinacea, 1 to 20 (5) - Phalaris arundinacea, 21 to 100 (2) - Phalaris arundinacea, Greater than 100 (4) - Phragmites australis, 1 to 20 (0) - Phragmites australis, 21 to 100 (0) - Phragmites australis, Greater than 100 (0) - Dense Phalaris Arundinacea (0)
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Kingdom Community Wind | Lowell, Vermont

Non-Native Invasive Species (NNIS) Map Series

Level Spreader Relocation

Sources:
Background Imagery by VCGI (Collected in 2017)
VCGI (Vermont Center for Geographic Information - Various Dates)
ANR (Vermont Agency of Natural Resources - Various Dates)
FEMA - Federal Emergency Management Agency
FWD (Vermont Fish and Wildlife Department - Various Dates)
VTrans (Vermont Agency of Transportation - 2017)
VHB - 2020

Wetlands/Waters conducted by M. Jackman, L. Keszey, A. Crary, and R. Scott April/May, 2020.

Legend

- Study Area (VHB)(1)
- Delineated Wetland (VHB)(0)
- Delineated Stream or Ditch (VHB)(0)
- Found Culvert (VHB)(0)
- Previously Delineated Streams (VHB) (5)
- Class II Wetland Buffer (VHB)(0)
- RTE Species Buffer (VHB)(0)
- Public Wells (ANR)(0)
- Private Wells (ANR)(0)
- GW Protection Area (ANR)(0)
- SW Protection Area (ANR)(0)
- VSWI Wetland (ANR)(0)
- NHI Element Occurrence (FWD)(0)
- FEMA Floodway (VCGI)(0)
- FEMA 100 year Flood Zone (VCGI)(0)
- VHD Waterbody (VCGI)(0)
- NRCS Soil Boundary (VCGI)(3)
- Mitigation Parcels Boundary (VHB) (2)
- Town Boundary (VCGI)(1)
- 2 ft Contour (VCGI)(202)
- 10 ft Contour (VCGI)(51)
- NNIS Points (VHB)
- Scientific Name/Stem Count
- Anthriscus sylvestris, 1 to 20 (0)
- Celastrus Orbiculatus, 1 to 20 (0)
- Celastrus Orbiculatus, 21 to 100 (0)
- Celastrus Orbiculatus, Greater than 100 (0)
- Centaurea stoebe, 1 to 20 (16)
- Centaurea stoebe, 21 to 100 (9)
- Centaurea stoebe, Greater than 100 (0)
- Lythrum salicaria, 1 to 20 (0)
- Lythrum salicaria, 21 to 100 (0)
- Phalaris arundinacea, 1 to 20 (1)
- Phalaris arundinacea, 21 to 100 (0)
- Phalaris arundinacea, Greater than 100 (0)
- Phragmites australis, 1 to 20 (1)
- Phragmites australis, 21 to 100 (0)
- Phragmites australis, Greater than 100 (0)
- Dense Phalaris Arundinacea (0)

Map Series

Level Spreader Relocation

Study Areas

(#) Indicated number of feature located within map extent