



To: Lyndon IM 091-3(53)
Project File

Date: September 14, 2022
Revised April 11, 2023
Project #: 58752.00

Memorandum

Samantha Alger, PhD
Environmental Scientist;
From: Ryan Scott, CPESC, PWS
Senior Ecologist; & Brad Ketterling,
Director of Env. Services - VT

Re: Natural Resources Summary Memorandum

On behalf of the Vermont Agency of Transportation ("VTrans"), VHB prepared this memorandum to summarize the results of a natural resources desktop assessment, wetland and waters field delineation, and targeted rare, threatened, and endangered ("RTE") species assessment (together, "natural resources assessments") conducted for the VTrans project having Federal aid Lyndon IM 091-3(53) ("Project") located in Lyndon, Vermont. The Project proposes the replacement of Bridges 96-3N and 96-3S on Interstate 91 ("I-91") in Lyndon, Vermont. Both bridges are corrugated galvanized metal plate pipe culverts under the northbound and southbound interstate lanes, respectively. The Project would also require temporary lane crossovers for traffic management, as two-way traffic would have to be maintained while each of the culverts are replaced. In addition to the area of the proposed bridge replacements and lane crossovers, VHB also reviewed an area west of the southbound lane that could provide an equipment staging area and access to the Project from Vermont Route 122.

The current land use in the Study Area consists of I-91 and associated rights-of-way as well as forested areas and agrarian fields adjacent to I-91. The Study Area for the natural resources assessment consists of three discrete areas along an approximately 3.56 mile stretch of I-91 centered at 44.57024° N, -72.03984° W. The three Study Area components are referred to as (from south to north): Southern Lane Crossover, Bridge Replacement, and Northern Lane Crossover (see Natural Resources Map series, **Attachment 1**). Originally, the Study Area was approximately 108 acres in size and the Bridge Replacement component included a portion of the farm field and access thereto south of the southbound lane (see Original Limits of Bridge Replacement Study Area, **Attachment 2**). These areas were subsequently removed from consideration based on a determination by the University of Vermont Consulting Archaeology Program ("UVM CAP") that the farm fields are archaeologically sensitive (UVM CAP 2023). The limits of disturbance ("LOD") associated with the final Base Technical Concept ("BTC") for the Project are shown on **Attachment 1** as red linework and does not intersect these sensitive areas. The revised total acreage for the Study Area is approximately 99 acres. Note that natural resources mapped for the original Study Area remain on this map for reference purposes only. Additionally, the proposed grading in the final BTC to install construction access roads on the I-91 embankments resulted in a slight expansion of the LOD beyond the limits of the Study Area, as labeled on Sheet 3 of **Attachment 1**. However, based on an evaluation of aerial photography and LiDAR topography, it appears this area is located entirely within the I-91 embankment and thus is unlikely to have any resources of concern therein.

The natural resources assessment for the Project included reviews of public and restricted-access databases and field surveys and was designed to include an evaluation for the presence/absence, and potential impacts to streams, wetlands, and RTE species. This memorandum was written to inform the planning and design of the Conceptual Plans for the Project.



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EXISTING CONDITIONS

The Study Area is located within the Northern Vermont Piedmont Biophysical Region of Vermont and falls within the Millers Run-Passumpsic River watershed (HUC10 #0108010203) and Millers Run subwatershed (HU12 #010801020301). An unnamed tributary¹ to Millers Run flows northeast to southwest through the center of the Study Area, making confluence approximately 560 feet south of the Project Area. Though this stream is not on the 303(d) List of Impaired Streams and Rivers, Miller Run is on the 2016 Stressed Waters List due to stream bank erosion, physical alternation sediments, and proximity to agricultural land with no buffers. There are no Outstanding Resource Waters, Class A waters, Surface Water Source Protection Areas ("SPAs"), or Groundwater SPAs mapped in the Study Area. The Study Area is not located within U.S Department of Agriculture ("USDA") Forest Service lands.

The Study Area does not contain any wetland features mapped in the Vermont Significant Wetland Inventory ("VSWI"). The underlining surficial geology is Glaciofluvial deposit, Glacial deposit, and Glaciolacustrine deposit. The Natural Resources Conservation Service ("NRCS") has mapped the dominant soils within the Study Area as Adams loamy fine sand, 3 to 8 percent slopes, Charles silt loam, 0 to 2 percent slopes, Colton-Duxbury complex, 3 to 8 percent slopes, Nicholville very fine sandy loam, 10 to 25 percent slopes, Salmon very fine sandy loam, 25 to 50 percent slopes, Vershire-Lombard complex, 15 to 25 percent slopes, Vershire-Lombard complex, 15 to 35 percent slopes, and Vershire-Lombard 35 to 60 percent slopes. The Adams, Charles and Colton series are considered Statewide(b). On-site elevations range from approximately 730 to 920 feet above mean sea level with the highest elevation occurring in the Northern Lane Crossover Study Area. Representative photographs of the on-site conditions and identified natural resources are included in **Attachment 3**.

METHODOLOGY AND ASSESSMENT RESULTS

Streams

VHB Environmental Scientists conducted stream delineation and assessment work within the Study Area on June 2, 4, and 17, 2022, to map any onsite stream channels. Stream determinations and Ordinary High Water ("OHW") width assessments follow guidance provided in the United States Army Corps of Engineers ("USACE") *Regulatory Guidance Letter: Subject-Ordinary High Water Identification*. Stream OHW is flagged on larger channels (generally streams greater than six feet wide) and stream center-line ("SC") is flagged for smaller channels (less than six feet wide). Streams are identified in the field with blue flagging, and features are mapped in the field using GPS-enabled and sub-meter capable mobile mapping technology. Flagging is hung within the State Right-of-Way ("ROW") only (*i.e.*, not on private property). Stream ID's include the year, stream delineation type identification (OHW or SC), and stream ID number. Stream flow regimes are classified as ephemeral, intermittent, or perennial and are determined based on qualitative observations of instream hydrologic indicators at the time of observation, as well as geomorphic characteristics, and are subject to professional judgment. Riparian buffers are applied to streams and rivers in the natural resource mapping when applicable, and are consistent with the Vermont Agency of Natural Resources ("ANR") Riparian Buffer Guidance, which are designated for any natural perennial and intermittent stream channels. Additional information can be found in the Summary of Delineated Wetlands and Streams (**Attachment 4**).

¹ This stream is referred to as Squabble Hollow Creek in the Archaeological Resources Assessment prepared by UVM CAP, though no such name is assigned in the ANR Natural Resources Atlas or on USGS topographic maps.



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Southern Lane Crossover

VHB delineated two stream features in the Southern Lane Crossover Study Area consisting of one perennial stream (2022-SC-100) and one intermittent stream (2022-SC-1). Stream 2022-SC-100 is located along the eastern boundary of the Study Area and is associated with a wetland complex. Stream 2022-SC-1 is located within the median and was observed to flow into and out of culverts.

Bridge Replacements

The prominent feature within the Bridge Replacements Study Area consists of a larger perennial feature delineated as 2022-OHW-2. This feature is an unnamed tributary to Miller's Run (aka Squabble Hollow Creek) and flows through the two culverts proposed for replacement. This perennial stream feature is characterized by steep bedrock to the east of I-91 with a more meandering channel characterized by cobble substrate west of I-91. VHB mapped several smaller intermittent stream features within this Study Area which are generally associated with culverts. The streams generally flow east to west, except where they have been channelized within the median.

Northern Lane Crossover

VHB delineated two intermittent features (2022-SC-113 and 2022-SC-111) in the Northern Lane Crossover Study Area, both of which are associated with culverts. Both streams daylight at the boundary of the Study Area.

All intermittent streams receive a 50-foot riparian buffer which is measured from the bank, or the upgradient boundary of adjacent wetlands. In addition, a 50-foot river corridor is assigned to perennial stream features if a state-mapped river corridor is not present. Feature 2022-OHW-2 is associated with a state-mapped river corridor. Additional technical information for all delineated streams is provided as **Attachment 4**.

By superimposing the LOD for the BTC on mapped stream features, VHB has determined that temporary and permanent impacts to mapped stream features would occur. See **Table 1** for a summary of the potential impacts and **Attachment 5** for the impacts as depicted on the BTC. It should be noted that the contractor awarded the Project could alter the BTC and therefore these impacts may change.

Depending on the degree of activity, Project activities within the OHW of perennial 2022-OHW-2 would be subject to the Vermont Stream Alteration Rules set forth by the Vermont Department of Environmental Conservation ("DEC") Rivers Management Section, necessitating Title 19 consultation. Additionally, the USACE would also regulate the discharge of dredge or fill material below the OHW mark of 2022-OHW-2 and other affected streams under Section 404 of the Clean Water Act. Based on the proposed replacement of the bridges on alignment and because no mapped FEMA floodway or floodplain are present in the Study Area, it is anticipated that approval of the Project under the Vermont Flood Hazard Area and River Corridor Rule would not be required.



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Table 1. Approximate Stream Impacts Associated with the BTC

Stream Feature	Permanent Impact (SF)	Temporary Impact (SF)	Activity Resulting in Impact	Mitigation for Impact
Bridge Replacement Study Area				
2022-SC-3 (I)	120	26	Median Access Road	For temporary impacts, remove debris / fill, reshape channel as needed.
2022-SC-5 (I)	532	471	Inlet, Median, and Outlet Access Roads	
2022-SC-6 (I)	249	12	Inlet Construction	
2022-SC-104 (I)	293	32	Culvert Realignment in Median	
Squabble Hollow Creek:	2,248	554	Inlet and Outlet Construction, Culvert Realignment in Median	
2022-OHW-2 (P)	5,563	-	Abandonment of Culverts NB: 3,015 sf / SB: 2,548 sf	
Total	9,005	1,095		

Wetlands

The Vermont Wetland Rules ("VWR") regulates activities within significant wetlands (Class I and Class II wetlands, as defined by the VWR) and their associated 50-foot buffers for Class II wetlands and 100-ft buffer for Class I wetlands. Additionally, the USACE regulates the discharge of fill or dredging in wetlands under Section 404 of the Clean Water Act.

Wetland delineations are made pursuant to applicable methodologies described in *the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region Routine Determination Method* ("Regional Supplement"). Field notes are recorded to document conditions in the wetland including vegetation, soils, and evidence of hydrology, potential wetland functions, wetland classifications, general characteristics of the wetland, any unique qualities observed during the site assessment, along with other considerations relevant to support site findings. Wetland functions are evaluated using the field notes and observations and is based on the functional criteria described in Section 5 of the VWR. Wetlands are identified in the field with pink flagging (within the ROW only) and are mapped in the field using mobile data collection technology capable of sub-meter accuracy.

VHB Environmental Scientists conducted wetland delineation fieldwork within the Study Area on June 2, 4, and 17, 2022. A site visit with DEC Wetland Ecologists Elijah Schumacher and Ken Johnston was conducted on August 4, 2022 to review wetland boundaries and confirm proposed classifications. The USACE did not respond to a request for a site visit.

Southern Lane Crossover

VHB delineated three Class II wetland features within the Southern Lane Crossover Study Area consisting of Wetlands 2022-100, 2022-101 and 2022-102. Wetlands 2022-100 and 2022-101 are riparian features that meet presumption to be considered Class II under the VWR. Wetland 2022-102 is not riparian but still meets a presumption of significance to be considered Class II under the VWR. Additional information, including associated wetland functions and values, are provided in **Attachment 4**.



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Bridge Replacements

VHB delineated a number of smaller features within the Bridge Replacements Study Area consisting of Class II and Class III wetlands. Features 2022-10, 2022-11, 2022-106, 2022-107 and 2022-109 are considered Class II based on meeting at least one presumption of significance under the VWR. Wetland 2022-109 is a small wetland feature that was identified to contain a potential vernal pool ("PVP"). Because wetland delineations occurred outside of the vernal pool survey window, presence/absence of breeding amphibians could not be confirmed. All other wetlands delineated within the culvert replacement Study Area are considered Class III. Additional information, including associated wetland functions and values are provided in **Attachment 4**.

Northern Lane Crossover

VHB delineated two wetland features within the median on the Northern Lane Crossover Study Area. Both are considered to be Class III features as they do not meet any presumptions of significance under the VWR, and they provide functions and values at a low level. Additional information, including associated wetland functions and values are provided in **Attachment 4**.

By superimposing the LOD for the BTC on mapped wetland and buffer features, VHB has determined that temporary and permanent impacts that would occur. See **Table 2** for a summary of the potential impacts and **Attachment 5** for the impacts as depicted on the BTC. It should be noted that the contractor awarded the Project could alter the BTC and therefore these impacts are subject to change.

Table 2. Approximate Wetland and Buffer Impacts Associated with the BTC

Wetland Feature	Class	Permanent Wetland Impact (SF)	Temporary Wetland Impact (SF)	Permanent Buffer Impact (SF)	Temporary Buffer Impact (SF)	Activity Resulting in Impact	Potential Mitigation for Impact
Bridge Replacement Study Area							
2022-10	II	-	-	152	490	Outlet Access Road	Restore temporarily affected wetlands and buffer via reseeded.
2022-11	II	6	149	4,712	1,088	Median Access Road	
2022-105	II	40	379	6,041	1,328	Outlet Access Road	
2022-106	II	-	-	513	744	Outlet Reconstruction	
2022-107	II	4,514	427	15,173	2,447	Median Access Road and Culvert Realignment in Median	
2022-108	III	-	44	N/A	N/A	Inlet Construction	
2022-109 (PVP)	II	-	6	2,050	2,165	Inlet Access Road	
Northern Crossover Study Area							
2022-112	III	-	2,951	N/A	N/A	Crossover Lane	Place geofabric before fill for temporary crossover and remove after construction. Reseed with native mix as necessary.
	Total	4,560	3,956	28,641	8,262		



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Project activities within Class II wetlands and/or their buffer areas would be regulated under the VWR and would require an authorization from the DEC Wetlands Program. All delineated wetlands are also subject to jurisdiction under Section 404 of the Clean Water Act. Therefore, Project activities that impact wetland features would require authorization from the USACE.

Rare, Threatened and Endangered Species

Vermont statute 10 V.S.A. Chapter 123: Protection of Endangered Species applies to both endangered and threatened species. Protected endangered and/or threatened species include those listed under the chapter as well as those protected under the federal Endangered Species Act. The list of Vermont's rare and uncommon species is produced by the Vermont Natural Heritage Inventory ("NHI"), a unit of the Vermont Fish & Wildlife Department ("FWD"). Such species are considered by VTrans when reviewing projects for compliance with the National Environmental Policy Act ("NEPA"), by the Natural Resources Board for projects subject to Act 250 jurisdiction, and by the ANR when reviewing projects subject to various state regulatory review processes.

To identify the potential occurrence of RTE species and to assess available on-site habitat conditions relative to each, VHB queried the NHI database for the presence of known element occurrences ("EO") of RTE species within and adjacent to the Study Area (**Attachment 6**). VHB used a two-mile search radius and found the Study Area should be assessed for habitat for the following species:

- Ground-fir (*Diphasiastrum sabinifolium*), S2 (Rare);
- Makasin's Yellow Lady's Slipper (*Cyperipedium parviflorum* var. *makasin*) S2 (Rare); and
- Woodland cudweed (*Omalotheca sylvatica*), S2? (State-Endangered);

On July 14, 2022 VHB conducted a partial floristic inventory with the above-listed species as targets (see **Attachment 7**). While none of these species were observed, VHB did identify the following:

- Cutleaf toothwort (*Cardamine concatenata* (Michx.) Sw.), (Uncommon);
- American plum (*Prunus americana* Marshall) SH (Threatened); and
- Fragrant sumac (*Rhus aromatica* Aiton) S3 (Uncommon).

The occurrences of American plum occur east of the northbound lane near the existing pull-off within the Northern Lane Crossover Study Area. The individuals were observed after flower and could not be conclusively identified. VHB presumes these occurrences are located outside of potential Project activities, however, VHB recommends the occurrences be reviewed during the flowering season to confirm presence/absence if they cannot be avoided. If it can be conclusively determined that the occurrences were purposefully planted, they are not considered protected plants.

Non-Native and Invasive Species

Non-native and invasive species ("NNIS") were observed within the Study Area during the completion of the partial floristic inventory. See the species list in **Attachment 7**.

Terrestrial Wildlife Habitat and Connectivity

VHB identified no necessary wildlife habitat during field work, though the portions of the Study Area are mapped by the Vermont Conservation Design BioFinder as Highest Priority for:



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- Surface Water and Riparian Areas;
- Physical Landscape Diversity;
- Riparian and Wildlife Connectivity;
- Physical Landscape Diversity; and
- Physical Landscape Blocks.

The Study Area may provide important connections for wildlife passage and continuity between forest blocks that are otherwise disconnected by I-91. The surrounding landscapes are sparsely developed, though much of the landscape is used for agricultural purposes.

VHB reviewed the U.S. Fish and Wildlife Service ("USFWS") Information for Planning and Consultation System ("IPaC") database for a list of federally listed Endangered and Threatened species within the Study Area. From the IPaC database review (conducted April 10, 2023) the Study Area is within the known summer range of the state and federally-listed endangered northern long-eared bat (*Myotis septentrionalis* or "MYSE"), a forest-dwelling bat (see **Attachment 8**). From the NHI database review, there are no known MYSE occurrences within a one-mile radius of the Study Area. The IPaC database review also identified the Study Area within the range of the Monarch Butterfly (*Danaus plexippus*), a candidate species not yet listed or proposed for listing.

CONCLUSIONS

Based on VHB's database reviews and subsequent field assessments described above, there are a number of natural resources present within the Study Area that will need to be considered during any further refinement of the BTC. Unavoidable impacts to state and federally regulated resources would occur based on the BTC and would require consultation with and authorization from the relevant agencies. Title 19 consultation with the DEC Rivers Program would be required for the proposed work in the unnamed tributary (aka Squabble Hollow Creek) and potentially with the Town of Lyndon for work within municipally-regulated river corridors.² VHB also recommends coordination with the USACE to review proposed wetland or water impacts regulated under Section 404 of the Clean Water Act and with the DEC Wetlands Program for proposed impacts to Class II wetlands or buffers regulated under the VWR.

Given that the Study Area is mapped as Highest Priority for several categories of wildlife connectivity, the evaluation of culvert replacement alternatives should consider opportunities to maintain and improve wildlife passage for aquatic organisms.

² This project is exempt from FHARC review as it is reviewed under the Town of Lyndon, Article XI, Zoning Bylaws.



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ATTACHMENTS

1. Natural Resources Map
2. Original Limits of Bridge Replacement Study Area
3. Representative Site Photographs
4. Summary of Delineated Wetlands and Streams
5. Wetland and Waters Impact Exhibits
6. Element Occurrence Summary
7. Partial Floristic Survey
8. USFWS IPaC Official Species List

REFERENCES AND RESOURCES

Cowardin, L.M., Carter, V., Golet, F.C., and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitat of the United States*. U.S. Fish and Wildlife Service. FWS/OBD-79/31.

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U.S. Army Corps of Engineers (USACE). 2005. *Regulatory Guidance Letter. Subject: Ordinary High Water Mark Identification. No. 05-05*. Available online at:
<https://usace.contentdm.oclc.org/utis/getfile/collection/p16021coll9/id/1253>

_____. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeastern Region (Version 2.0), Final Report*.

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_____. 2017. *Regulatory Review Guidance for Protecting Northern Long-eared Bats and Their Habitats*. Fish and Wildlife Department. Effective February 2017.

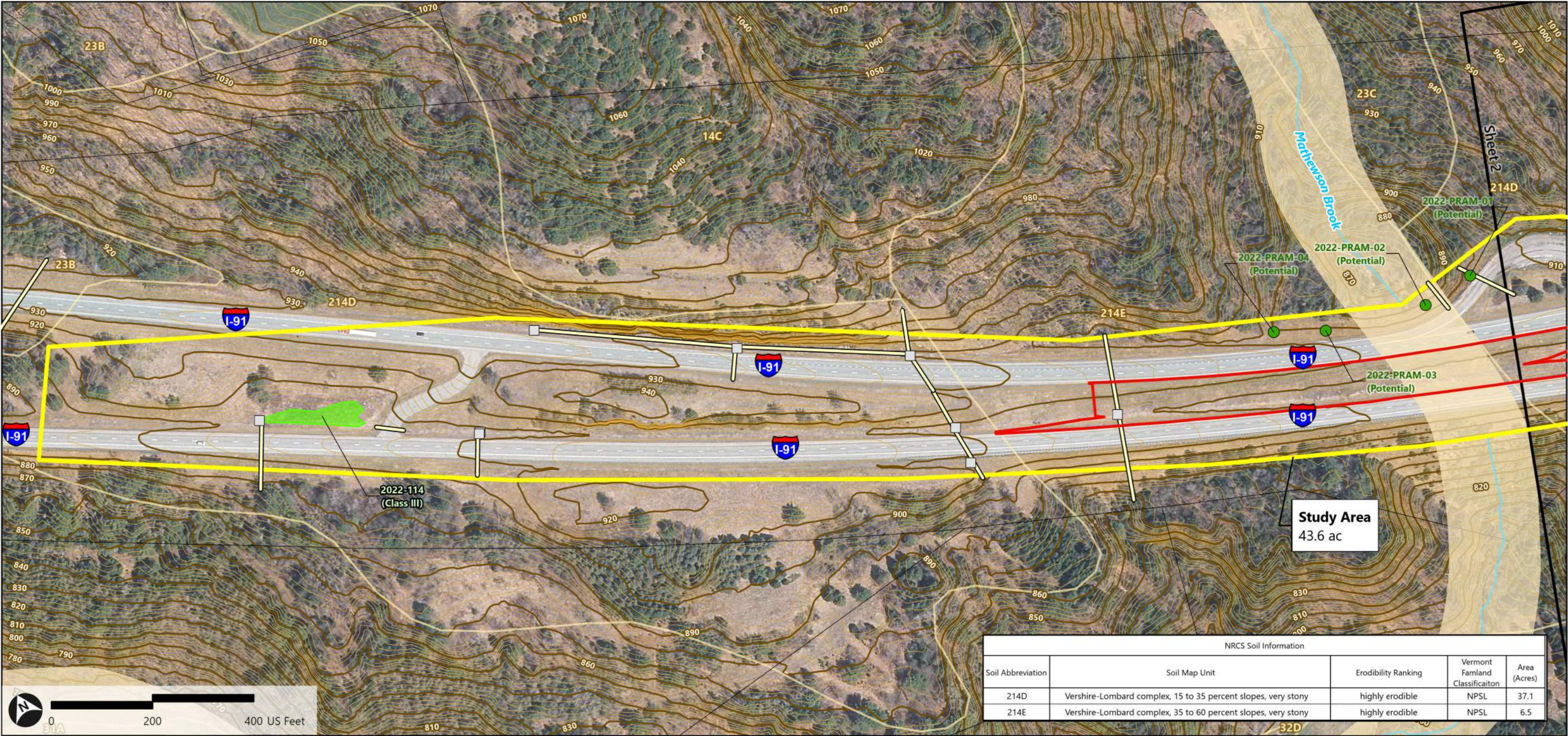
ATTACHMENT 1

Natural Resources Map - Sheet 1 of 4

Lyndon IM 091-3(53) | Lyndon, Vermont



April 06, 2023



- Sheet Outline (VHB)

Study Area (VHB)

Culvert (VTrans)

Observed Culvert (VHB)

Observed Potential RTE (VHB)

Delineation Data Point (VHB)

Observed Water Supply (VHB)

Potential Vernal Pool (VHB)

Delineated Stream (VHB)

River Corridor (Approx.) (VHB)

Delineated Wetland (VHB)

Class II Wetland Buffer - 50 Ft (VHB)

Riparian Buffer - 50 Ft (VHB)

Limits of Disturbance - Base Technical Concept (VHB)

Private Well (ANR)

Public Water Source (ANR)*

VSWI Wetland (ANR)

VT Uncommon Species

VNHI Element Occurrence (FWD)

Ground Water SPA (ANR)*

Deer Wintering Areas (ANR)*

Surface Water SPA (ANR)*

VHD Stream (VCGI)

VHD Waterbody (VCGI)

River Corridor (ANR)

FEMA Floodway**

FEMA 100 Year Flood Zone**

Soil Map Unit (VCGI)

Parcel Boundary (VCGI)

Town Boundary (VCGI)

10 ft Contour (VCGI)

2 ft Contour (VCGI)

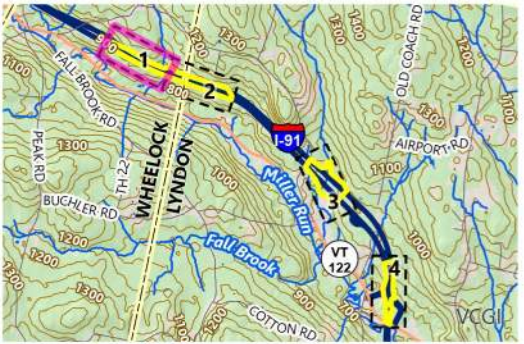
Note: Natural resource investigation performed by VHB (B. Galligan and L. Keszei) on June 2, 4, and 17, 2022.

On Map Sheet 3, the natural resources shown outside of the project limits are present based on a prior (now abandoned) Study Area.

*Layer does not occur within map extent

**Floodway and Special Flood Hazard Areas have not yet been digitized.

Refer to FIRM Community-Panel Numbers 5000280 020 B and 500028 0015 B.



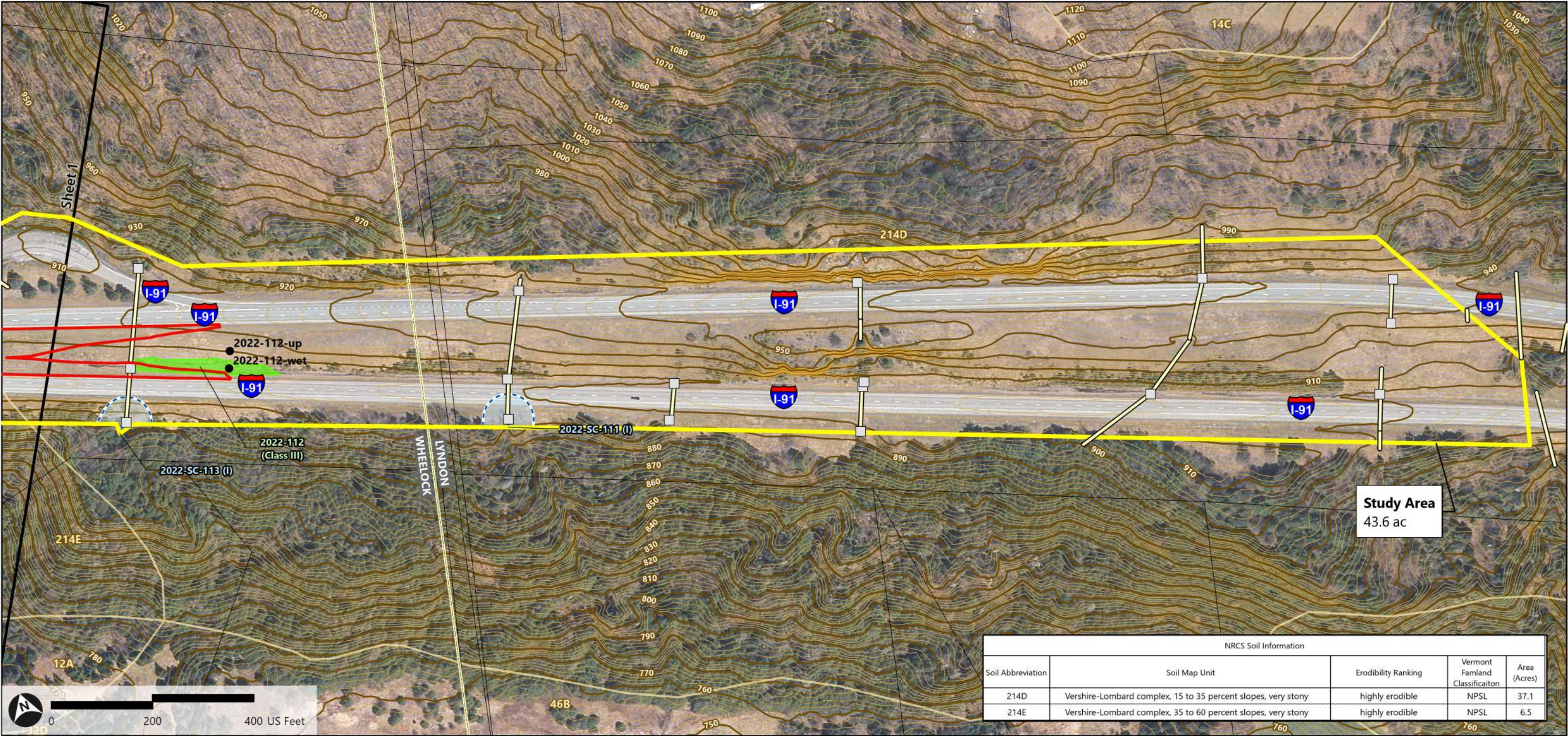
Sources: Background imagery by VCGI (Collected in 2021); ANR (Vermont Agency of Natural Resources - Various Dates); VCGI (Vermont Center for Geographic Information - Various Dates); VTrans (Vermont Agency of Transportation - Hosted Feature Service); VHB - 2022

Natural Resources Map - Sheet 2 of 4

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NRCS Soil Information				
Soil Abbreviation	Soil Map Unit	Erodibility Ranking	Vermont Farmland Classification	Area (Acres)
214D	Vershire-Lombard complex, 15 to 35 percent slopes, very stony	highly erodible	NPSL	37.1
214E	Vershire-Lombard complex, 35 to 60 percent slopes, very stony	highly erodible	NPSL	6.5

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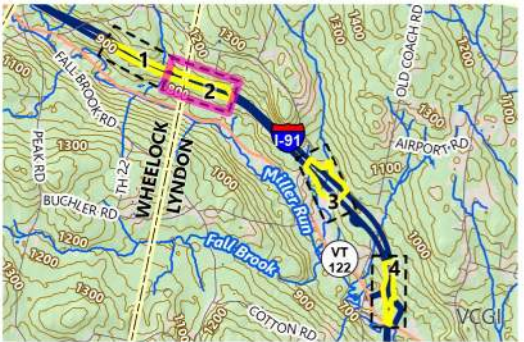
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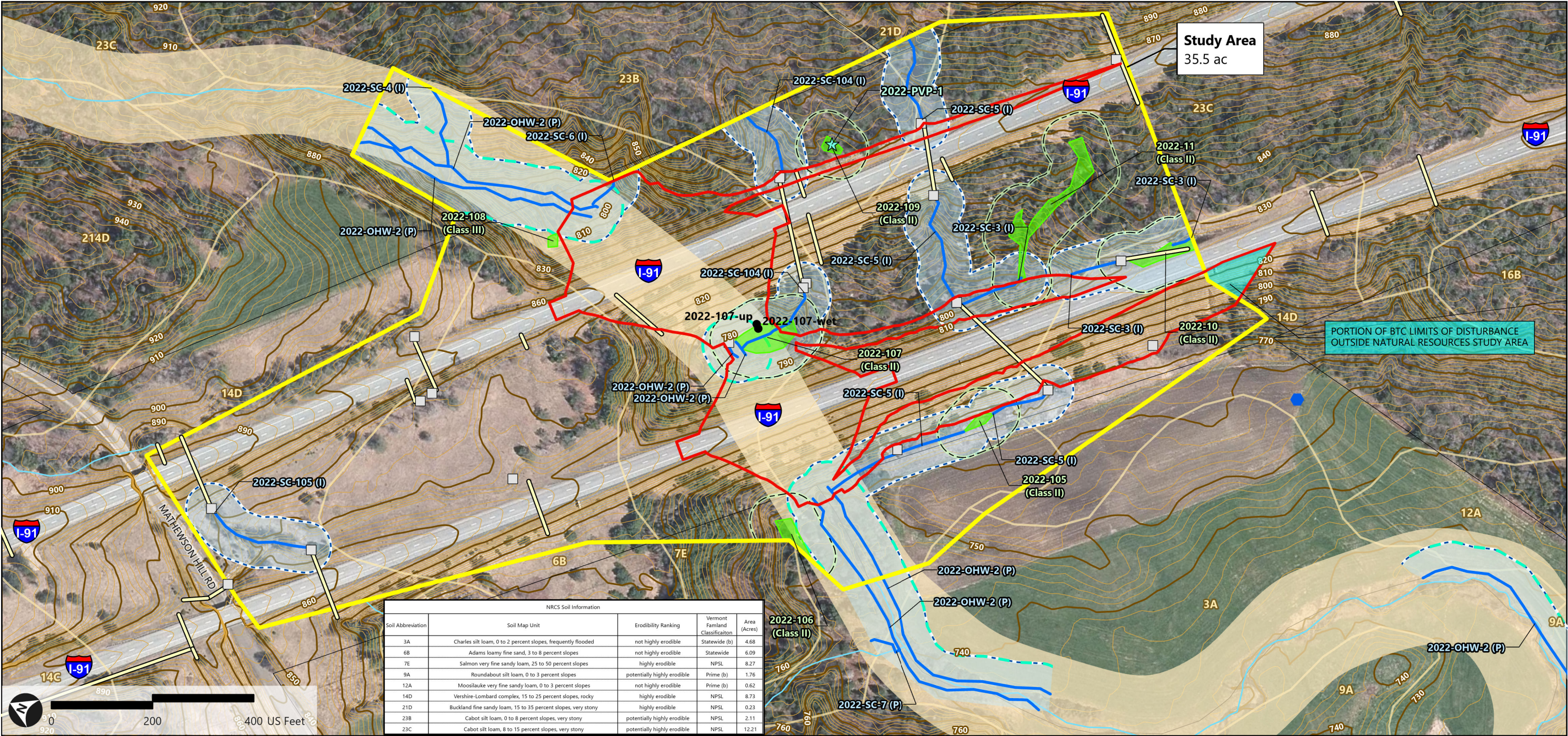
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Natural Resources Map - Sheet 3 of 4

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April 06, 2023



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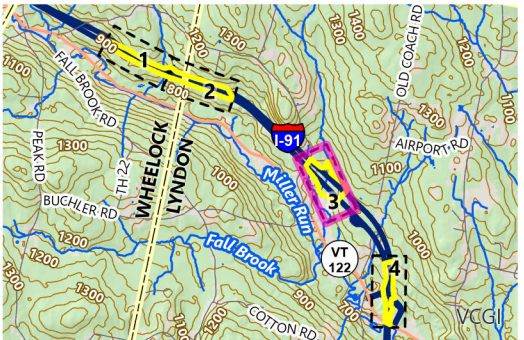
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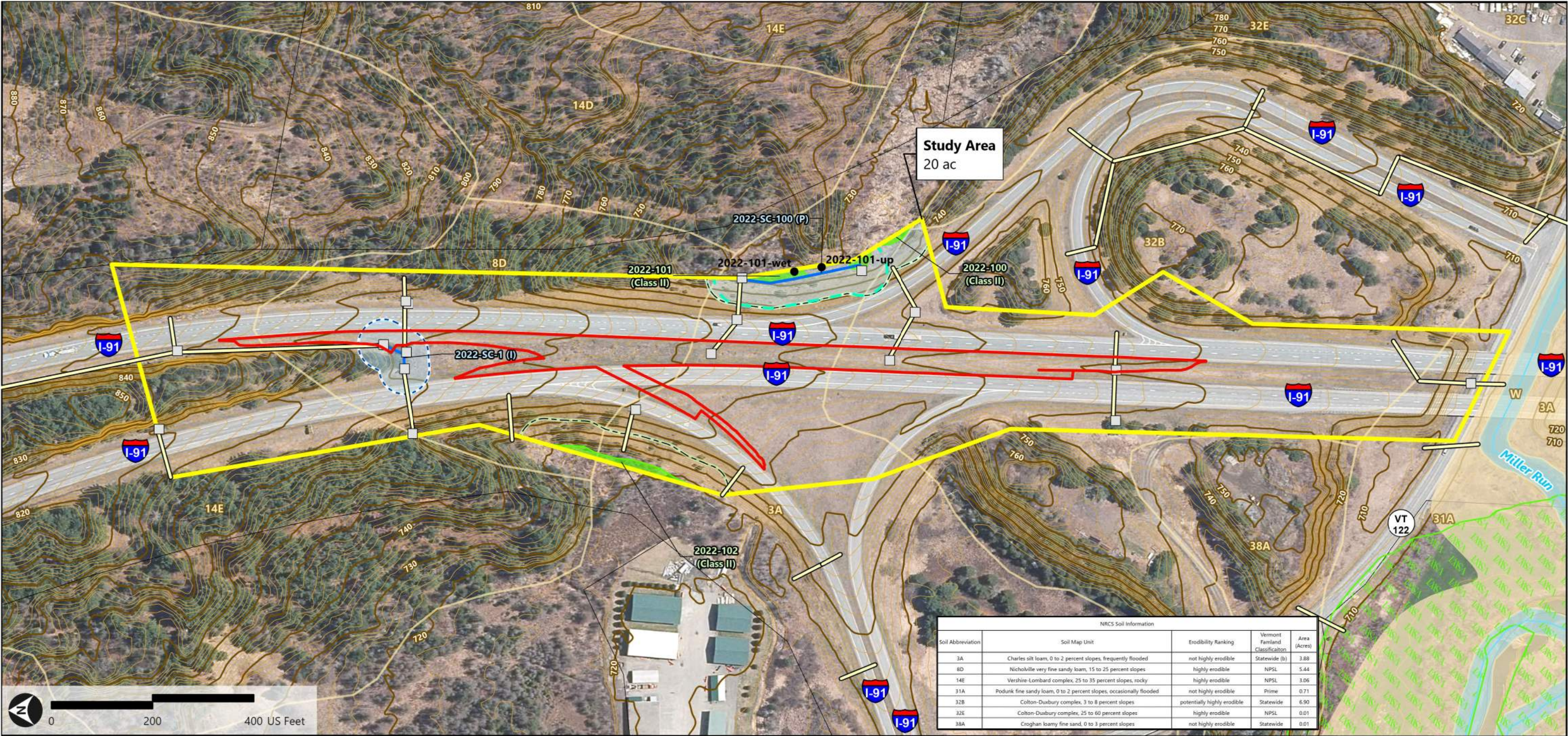
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*Layer does not occur within map extent

**Floodway and Special Flood Hazard Areas have not yet been digitized.

Refer to FIRM Community-Panel Numbers 5000280 020 B and 500028 0015 B.
-
- Sources: Background imagery by VCGI (Collected in 2021); ANR (Vermont Agency of Natural Resources - Various Dates); VCGI (Vermont Center for Geographic Information - Various Dates); VTrans (Vermont Agency of Transportation - Hosted Feature Service); VHB - 2022
- Path: \\vhb.com\gis\proj\SBurlington\58752.00 Lyndon Design-Build\Project\NR_Map_Lyndon\NR_Map_Lyndon.aprx (User: JTherrien, Date: 4/6/2023)

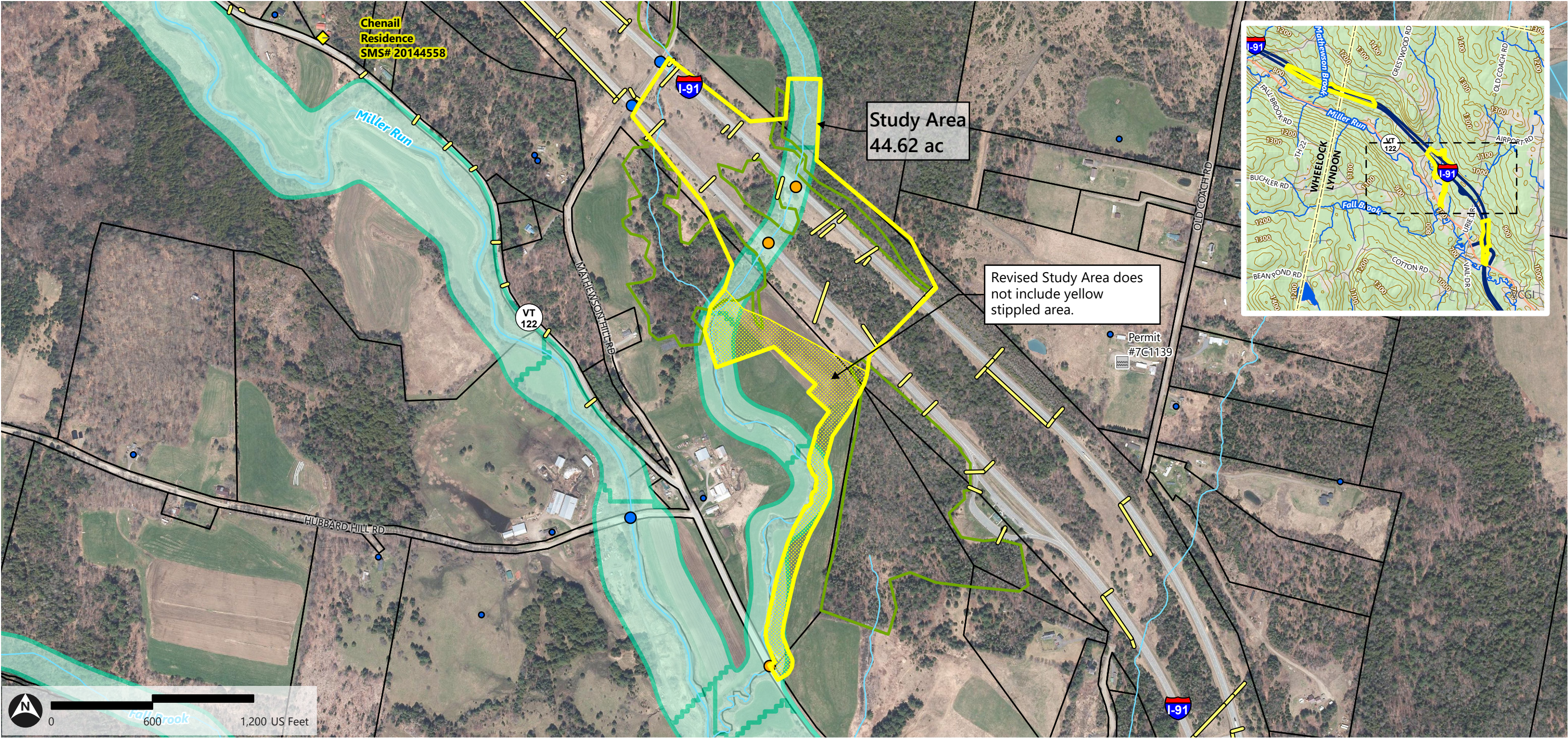
ATTACHMENT 2

Original Limits of Bridge Replacement Study Area

Lyndon IM 091-3(53) | Lyndon, Vermont



April 7, 2023



- | | | | | |
|-----------------------------------|-----------------------------|--------------------|------------------------------------|------------------------|
| Study Area (VHB) | Culvert (VTrans) | Public Well (ANR) | VSWI Advisory Wetlands Layer (ANR) | Town Boundary (VCGI) |
| Short Structure (6-20 ft; VTrans) | Hazardous Waste Sites (ANR) | Private Well (ANR) | River Corridor (ANR) | Parcel Boundary (VCGI) |
| Long Structure (>20 ft; VTrans) | Act 250 Permit (ANR) | VHD Stream (VCGI) | VHD Waterbody (VCGI) | |

Data Evaluated for Map Series: The creation of this map series included an analysis of the publicly available data sets required by the VTrans Environmental Specialists Resource ID Guidance. For presentation purposes, only those features from those data sets that occur within the current map extent are displayed in the legend.

ATTACHMENT 3



Lyndon IM 091-3(53)

Photographs

PROJECT NUMBER

58750.00

I-91

Lyndon, VT 05851

Vermont Agency of Transportation
219 North Main Street
Barre, VT 05641



NO. 1 / 5.27.22

DESCRIPTION

A representative photo of the upland median in the Bridge Replacements Study Area.



NO. 2 / 5.27.22

DESCRIPTION

A representative photo of the upland access for the Bridge Replacements Study Area.



NO. 3 / 5.27.22

DESCRIPTION

Class II palustrine scrub-shrub ("PSS") wetland 2022-100 in the Southern Lane Crossover Study Area east of the highway.



NO. 4 / 5.27.22

DESCRIPTION

Class II palustrine forested ("PFO") wetland 2022-102 in the Southern Lane Crossover Study Area west of the highway.



NO. 5 / 6.3.22

DESCRIPTION

Class II palustrine emergent ("PEM") wetland 2022-10 in the Bridge Replacements Study Area in the median of the highway.



NO. 6 / 6.3.22

DESCRIPTION

Class II PFO wetland 2022-11 in the Bridge Replacements Study Area in the median of the highway.



NO. 7 / 6.3.22

DESCRIPTION

Class II PEM wetland 2022-107 in the Bridge Replacements Study Area in the median of the highway.



NO. 8 / 6.3.22

DESCRIPTION

Class II PFO wetland 2022-109 in the Bridge Replacements Study Area north of the highway. A potential vernal pool is associated with this wetland.



NO. 9 / 6.3.22

DESCRIPTION

Class II PEM wetland 2022-112 in the Northern Lane Crossover Study Area in the median of the highway.



NO. 10 / 6.3.22

DESCRIPTION

Class III PEM wetland 2022-114 in the Northern Lane Crossover Study Area in the median of the highway adjacent to recent fill.



NO. 11 / 5.27.22

DESCRIPTION

Perennial stream 2022-SC-100 in the Southern Lane Crossover Study Area east of the highway within wetland 2022-100.



NO. 12 / 6.3.22

DESCRIPTION

Perennial stream 2022-OHW-2 in the Bridge Replacements Study Area taken south of the highway.



NO. 13 / 6.3.22

DESCRIPTION

Intermittent stream 2022-SC-5 in the Bridge Replacements Study Area taken in the median of the highway.



NO. 14 / 6.3.22

DESCRIPTION

Intermittent stream 2022-SC-104 in the Bridge Replacements Study Area taken in the median of the highway.



NO. 15 / 6.3.22

DESCRIPTION

Intermittent stream 2022-SC-111 in the Northern Lane Crossover Study Area taken west of the highway.

ATTACHMENT 4

Summary of On-Site Wetlands

Project: Lyndon IM 091-3(53)
Client: Vermont Agency of Transportation
Location: Lyndon, VT
Delineated By: L. Keszey, B. Galligan, L. Amerine
Delineation Date(s): 5/27/22, 6/3/22
Prepared By: B. Galligan



VHB Delineated Wetlands												
Wetland ID	Delineated Area (Square Feet) ¹	Cowardin Classification ²	Hydrology Indicator	Hydric Soil Indicator	Vermont Wetland Rules Classification						Typical Vegetation / NNIS Occurrences (bold)	Comments
					Contiguous to a VSWI-mapped Wetland?	Riparian Wetland Contiguous to Stream Channel? (Flow Regime) ³	VWR Section 4.6 Presumptions ⁴	VWR Section 5 Functional Criteria Presence / Significance		VHB-Proposed VWR Classification ⁶		
								Type ⁵	VHB-Presumed Significant?			
Bridges 68-1 and 68-1 (South Burlington)												
2022-10	2597.57	PEM	Surface Water (A1), Saturation (A3), Drainage Patterns (B10)	Depleted Matrix (F3)	No	Yes	4.6a, b, c	5.1(P)5.2(P)	Yes	II	<i>Spiraea alba, Salix bebbiana</i>	Wide seepy swale adjacent to interstate
2022-11	7033.65	PFO	Surface Water (A1), Saturation (A3), Water- Stained Leaves (B9), Drainage Patterns (B10)	Depleted Matrix (F3), Histosol (A1)	No	Yes	4.6a, b	5.1(P)5.2(P)	Yes	II	<i>Onoclea sensibilis, Betula alleghaniensis, Impatiens capensis</i>	Seepy swale fed by groundwater discharge from softwood slope
2022-100	959.30	PEM, PSS	Saturation (A3), High Water Table (A2), Water- Stained Leaves (B9)	Histic Epipedon (A2)	No	Yes	4.6a, b, c	5.1(P), 5.2(P), 5.4(P), 5.10(P)	Yes	II	<i>Phragmites australis, Salix bebbiana, Onoclea sensibilis</i>	Seepy wetland at toe of slope
2022-101	1836.73	PEM, PSS	Saturation (A3), High Water Table (A2), Water- Stained Leaves (B9)	Histic Epipedon (A2)	No	Yes	4.6a, b, c	5.1(P), 5.2(P). 5.4(P), 5.10(P)	Yes	II	<i>Phragmites australis, Salix bebbiana, Onoclea sensibilis</i>	Softwood swamp bisected by interstate
2022-102	3452.82	PEM, PFO	Oxidized Rhizospheres on Living Roots (C3), Saturation (A3), Microtopographic Relief (D4)	Depleted Matrix (F3)	No	No	4.6a	5.1(P), 5.2(P), 5.4(P)	Yes	II	<i>Phragmites australis, Larix laricina, Populus balsamifera</i>	Softwood swamp bisected by interstate
2022-105	804.23	PEM	Saturation (A3), Sediment Deposits (B2), Drainage Patterns (B10)	Sandy Redox (S5)	No	No	-	5.1(L) 5.2(L)	No	III	<i>Equisetum arvense, Salix bebbiana, Phalaris arundinacea</i>	Wider portion of ditch where three parameters present
2022-106	1922.24	PFO	Water-Stained Leaves (B9), Geomorphic Position (D2)	Redox Dark Surface (F6)	No	yes	4.6a, b	5.1(P), 5.2(P), 5.10(P)	Yes	II	<i>Onoclea sensibilis, Abies balsamea, Matteuccia struthiopteris</i>	Wet fern glade in softwood forest
2022-107	5259.01	PEM	High Water Table (A2), Saturation (A3), Oxidized Rhizospheres on Living Roots (C3)	Redox Dark Surface (F6), Depleted Matrix (F3)	No	yes	4.6b	5.1(P), 5.2(P), 5.10(P)	Yes	II	<i>Salix bebbiana, Equisetum arvense, Solidago gigantea</i>	Wet low topography with small stream throughflow, adjacent to river
2022-108	442.64	PEM	Oxidized Rhizospheres on Living Roots (C3), Saturation (A3)	Histic Epipedon (A2), Redox Dark Surface (F6)	No	No	-	5.1(L), 5.2(L)	No	III	<i>Solidago gigantea, Thelypteris palustris, Equisetum arvense</i>	Seepy hillside/fill slope between interstate and river
2022-109	803.16	PFO	Surface Water (A1), Saturation (A3), Oxidized Rhizospheres on Living Roots (C3)	Histic Epipedon (A2), Redox Dark Surface (F6)	No	No	d	5.1(L), 5.2(L), 5.4(P)	Yes	II	<i>Fraxinus pennsylvanica, Onoclea sensibilis</i>	Disconnected wet depression northeast of the interstate with PVP
2022-112	6955.96	PEM	Saturation (A3), Water- Stained Leaves (B9)	Histic Epipedon (A2)	No	No	-	5.1(P), 5.2(P), 5.10(P)	No	III	<i>Solidago gigantea, Typha Latifolia</i>	Wide ditch within median of interstate, drains via culvert to the south
2022-114	5786.60	PEM	Iron Deposits (B5), Oxidized Rhizospheres on Living Roots (C3), Saturation (A3), High Water Table (A2)	Redox Dark Surface (F6)	No	No	-	5.1(L) 5.2(L)	No	III	<i>Salix bebbiana, Solidago gigantea, Thelypteris palustris</i>	Depression within median of interstate, drains via culvert to the south

Summary of On-Site Wetlands

Project: Lyndon IM 091-3(53)
Client: Vermont Agency of Transportation
Location: Lyndon, VT
Delineated By: L. Keszey, B. Galligan, L. Amerine
Delineation Date(s): 5/27/22, 6/3/22
Prepared By: B. Galligan



VHB Delineated Wetlands												
Wetland ID	Delineated Area (Square Feet) ¹	Cowardin Classification ²	Hydrology Indicator	Hydric Soil Indicator	Vermont Wetland Rules Classification						Typical Vegetation / NNIS Occurrences (bold)	Comments
					Contiguous to a VSWI-mapped Wetland?	Riparian Wetland Contiguous to Stream Channel? (Flow Regime) ³	VWR Section 4.6 Presumptions ⁴	VWR Section 5 Functional Criteria Presence / Significance		VHB-Proposed VWR Classification ⁶		
								Type ⁵	VHB-Presumed Significant?			

Notes:

¹ All delineated wetlands were field-delineated per the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northeast and North Central Region. U.S. Army Corps of Engineers. 2012.

² Classification follows Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitat of the United States. U.S. Fish and Wildlife Service. FWS/OBD-79/31. 103pp.

³ Wetland contiguity to streams as defined in the Vermont ANR 12/9/05 Guidance for Agency Act 250 and Section 248 Comments Regarding Riparian Buffers and confirmed if a delineated perennial or intermittent stream channel inflows, through flows, and outflows from a delineated wetland. The vegetative assemblage natural community type is used when determining riparian vegetation function. Flow regime determined based on qualitative observations of instream hydrology indicators and geomorphic characteristic and are subject to professional judgment (P=Perennial, I=Intermittent, E=Ephemeral).

⁴Alpha-numeric codes correspond with Section 4.6 Presumptions of the 2020 Vermont Wetland Rules.

⁵ VWR Section 5: Functional Criteria for Evaluating a Wetland's Significance: 5.1=Water Storage for Flood Water and Storm Runoff, 5.2=Surface and Groundwater Protection, 5.3=Fish Habitat, 5.4=Wildlife Habitat, 5.5=Exemplary Wetland Natural Community, 5.6=Rare, Threatened or Endangered Species Habitat, 5.7=Education and Research Natural Sciences, 5.8=Recreational Value and Economic Benefits, 5.9=Open Space and Aesthetics, 5.10=Erosion Control Through Binding and Stabilizing the Soil. (P)= Present, (H)=High, (L)=Low; Correspond to observed level of functionality.

⁶ Wetland classifications are proposed and have not been reviewed by Vermont Wetland Program or U.S. Army Corps of Engineers

Summary of Streams in Study Area

Project: Statewide Northwest STP CULV(92)

Client: Vermont Agency of Transportation

Location: South Burlington and Milton

Delineated By: B. Galligan, M. Poli, L. Amerine, M. Jackman

Delineation Date(s): 7/22/22, 7/26/22, 7/27/22, 8/9/22

Prepared By: B. Galligan



VHB Delineated Streams												
Stream ID	Stream Name	Associated Wetlands	Average Ordinary High Water Width (Feet) ¹	Dominant Substrate	Water Depth (Inches)	Bank Height (Feet)	Flow Regime (Ephemeral, Intermittent, or Perennial) ²	ANR-Mapped River Corridor? (Yes/No)	VHB-Proposed River Corridor? (Yes/No)	Watershed Size (Square Miles) ³	VWQS Classification (2017) ⁴	Comments
Bridges 68-1 and 68-1 (South Burlington)												
2022-SC-1	-	None	2.0	Sand	1	4.0	Intermittent	No	No	<.05	B	Stream is culverted off site and daylights in the median.
2022-OHW-2	-	2022-107	20.0	cobble	10	4.0	Perennial	Yes	Yes	3.09	B	A large perennial stream that crosses the central Study Area.
2022-SC-3	-	2022-11	1.0	silt	1	2.0	Intermittent	No	No	<.05	B	A broken up intermittent stream flowing from off site to connect with 2022-SC-5.
2022-SC-4	-	-	4.0	Cobble	1	1.0	Intermittent	No	No	<.05	B	An Intermittent stream in the northern part of the central Study Area that drains to 2022-TOB-2.
2022-SC-5	-	-	4.0	Sand	3	4.0	Intermittent	No	No	<.05	B	An intermittent stream that crosses the central Study Area and drains towards 2022-TOB-2
2022-SC-6	-	-	4.0	Cobble	1	1.0	Intermittent	No	No	<.05	B	An Intermittent stream in the northern part of the central Study Area that drains to 2022-TOB-2.
2022-SC-7	-	-	3.0	Sand	3	4.0	Perennial	No	No	<.05	B	A small perennial stream that drains to 2022-TOB-2 in the central Study Area.
2022-sc-100	-	2022-100, 101	3.0	Sand	1	1.0	Perennial	No	Yes	.18	B	A stream that connects wetlands 2022-100 and 101.
2022-SC-104	-	2022-107	3.0	Sand	1	2.0	Intermittent	No	No	<.05	B	An intermittent stream that drains to 2022-TOB-2 from the north in the central portion of the Study Area.
2022-SC-105	-	-	3.0	Sand	1	1.0	Intermittent	No	No	<.05	B	An intermittent stream that crosses the central Study Area.
2022-SC-111	-	-	4.0	Cobble	1	1.0	Intermittent	No	No	<.05	B	A small portion of an intermittent stream that leaves a culvert in the western Study Area.

Summary of Streams in Study Area

Project: Statewide Northwest STP CULV(92)

Client: Vermont Agency of Transportation

Location: South Burlington and Milton

Delineated By: B. Galligan, M. Poli, L. Amerine, M. Jackman

Delineation Date(s): 7/22/22, 7/26/22, 7/27/22, 8/9/22

Prepared By: B. Galligan



VHB Delineated Streams												
Stream ID	Stream Name	Associated Wetlands	Average Ordinary High Water Width (Feet) ¹	Dominant Substrate	Water Depth (Inches)	Bank Height (Feet)	Flow Regime (Ephemeral, Intermittent, or Perennial) ²	ANR-Mapped River Corridor? (Yes/No)	VHB-Proposed River Corridor? (Yes/No)	Watershed Size (Square Miles) ³	VWQS Classification (2017) ⁴	Comments
2022-SC-113	-	-	4.0	Cobble	1	1.0	Intermittent	No	No	<.05	B	A small portion of an intermittent stream that leaves a culvert in the western Study Area.

Notes:

¹ U.S. Army Corps of Engineers. 2005. *Regulatory Guidance Letter. Subject: Ordinary High Water Mark Identification. No. 05-05.*

² Stream flow regimes determined based on qualitative observations of in stream hydrology indicators and geomorphic characteristic and are subject to professional judgment.

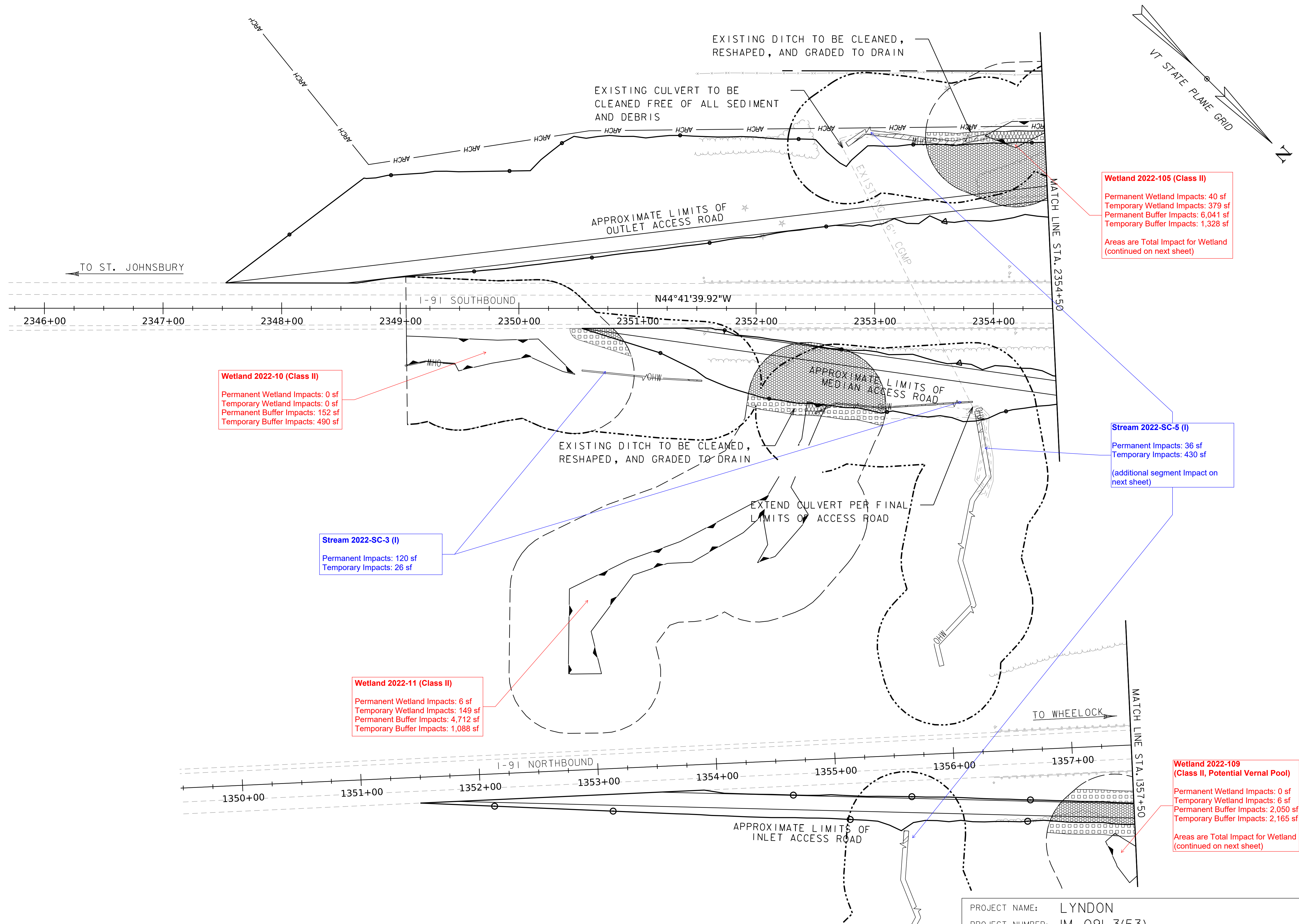
³ Watershed size determined from Vermont Agency of Natural Resources ("ANR") Stream Alteration Regulatory Program mapping.

⁴ ANR. 2017. *Vermont Water Quality Standards (Vt. Code R 12 004 052).*

⁵ List of streams from ANR. 2016. *303(d) Assessment of the Condition of Vermont Waters. Priority Listing of Vermont Waters.* Department of Environmental Conservation.

⁶ If no ANR mapped river corridor is present, VHB proposed river corridor is applied pursuant to ANR. 2017. *Flood Hazard Area and River Corridor Protection Procedure* , as applicable.

ATTACHMENT 5



Wetland 2022-10 (Class II)
Permanent Wetland Impacts: 0 sf
Temporary Wetland Impacts: 0 sf
Permanent Buffer Impacts: 152 sf
Temporary Buffer Impacts: 490 sf

Stream 2022-SC-3 (I)
Permanent Impacts: 120 sf
Temporary Impacts: 26 sf

Wetland 2022-11 (Class II)
Permanent Wetland Impacts: 6 sf
Temporary Wetland Impacts: 149 sf
Permanent Buffer Impacts: 4,712 sf
Temporary Buffer Impacts: 1,088 sf

Wetland 2022-105 (Class II)
Permanent Wetland Impacts: 40 sf
Temporary Wetland Impacts: 379 sf
Permanent Buffer Impacts: 6,041 sf
Temporary Buffer Impacts: 1,328 sf

Areas are Total Impact for Wetland
(continued on next sheet)

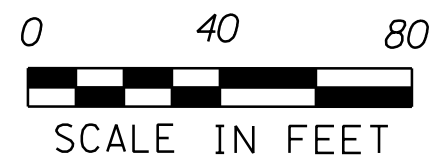
Stream 2022-SC-5 (I)
Permanent Impacts: 36 sf
Temporary Impacts: 430 sf

(additional segment Impact on
next sheet)

**Wetland 2022-109
(Class II, Potential Vernal Pool)**
Permanent Wetland Impacts: 0 sf
Temporary Wetland Impacts: 6 sf
Permanent Buffer Impacts: 2,050 sf
Temporary Buffer Impacts: 2,165 sf

Areas are Total Impact for Wetland
(continued on next sheet)

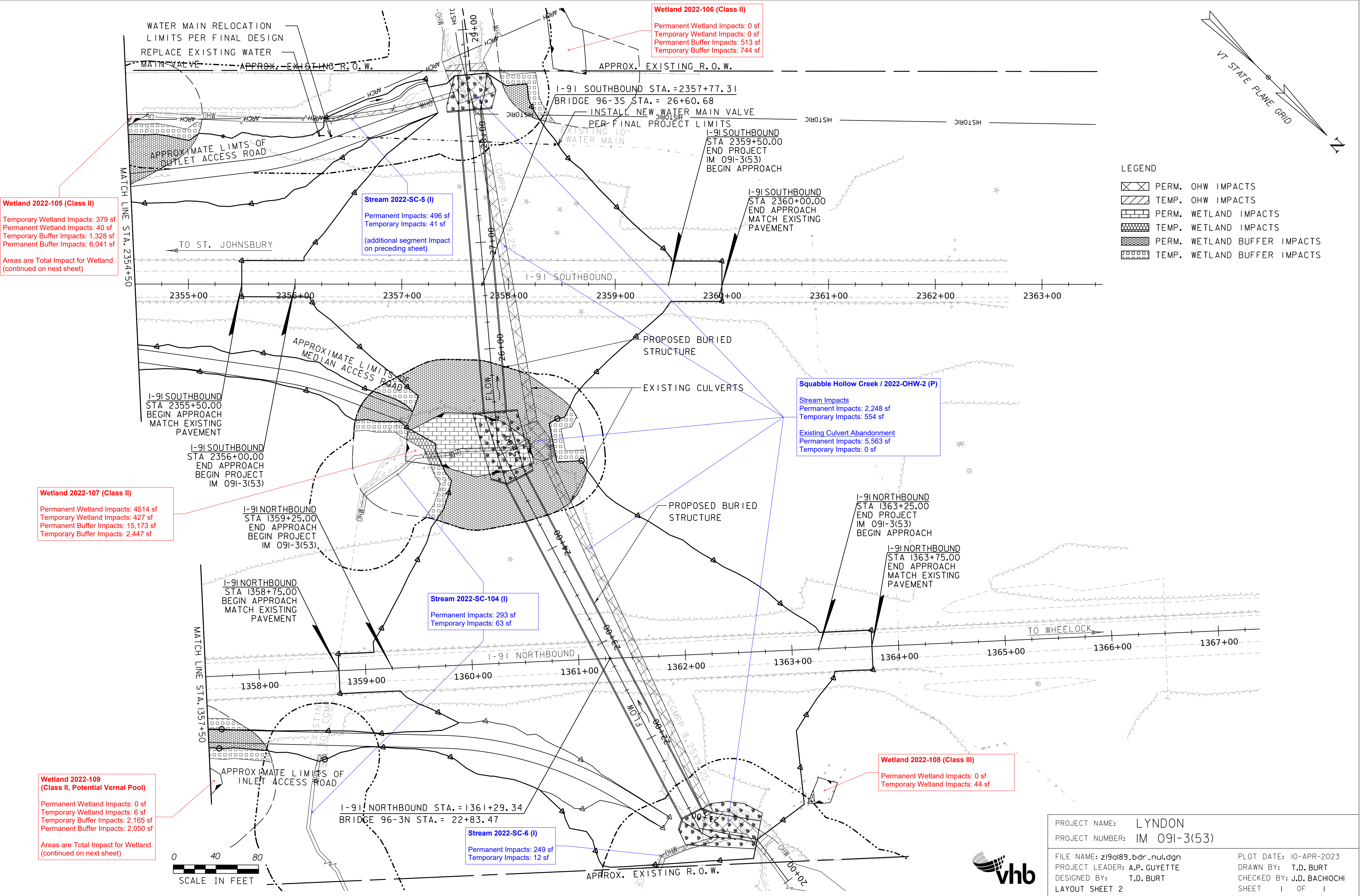
- LEGEND
- PERM. OHW IMPACTS
 - TEMP. OHW IMPACTS
 - PERM. WETLAND IMPACTS
 - TEMP. WETLAND IMPACTS
 - PERM. WETLAND BUFFER IMPACTS
 - TEMP. WETLAND BUFFER IMPACTS

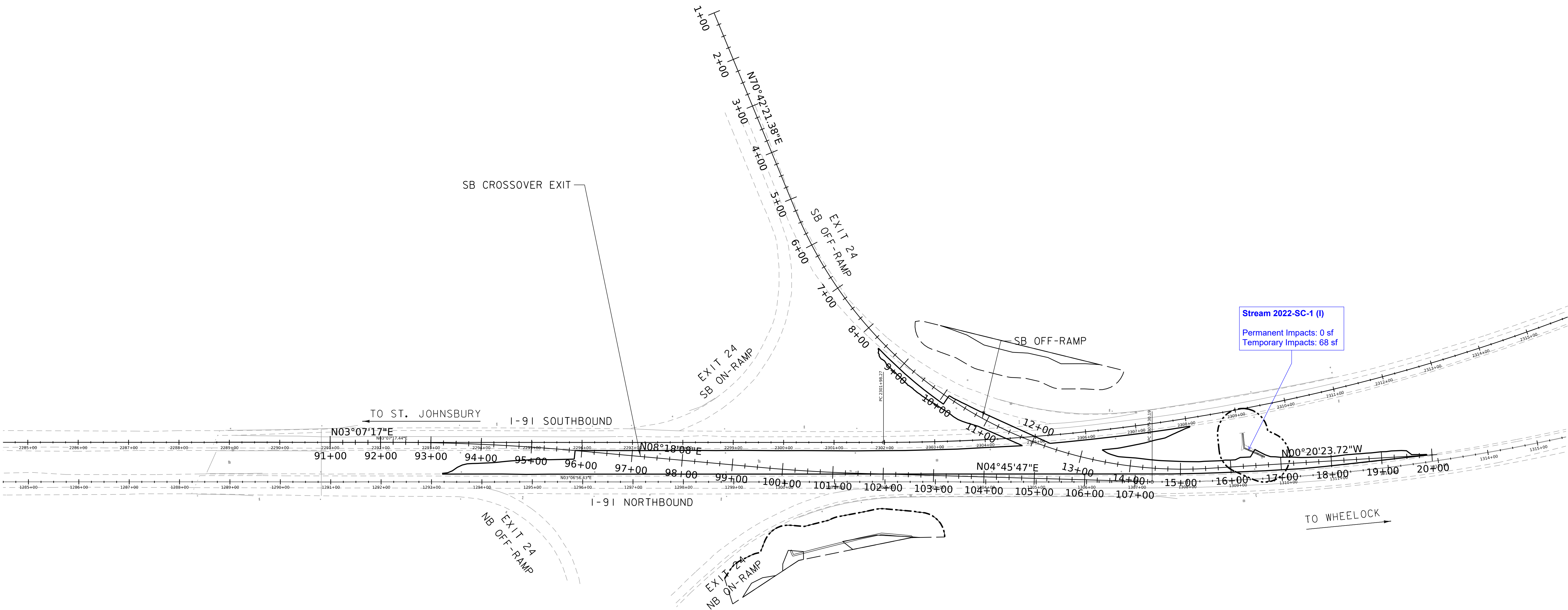
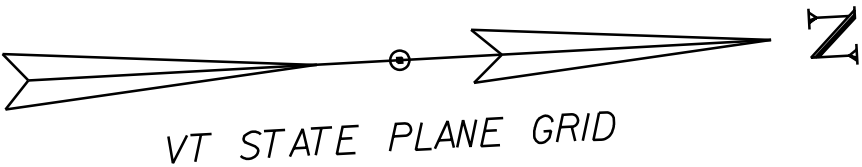


PROJECT NAME: LYNDON
PROJECT NUMBER: IM 09I-3(53)

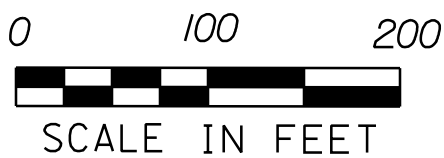
FILE NAME: z19a189_bdr_nul.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: T.D. BURT
LAYOUT SHEET I

PLOT DATE: 10-APR-2023
DRAWN BY: T.D. BURT
CHECKED BY: J.D. BACHIOCHI
SHEET I OF I

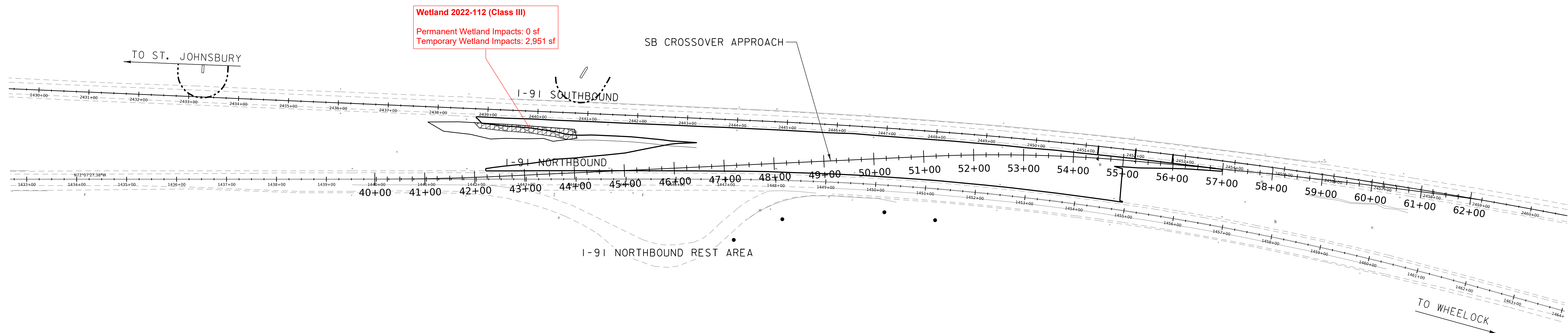
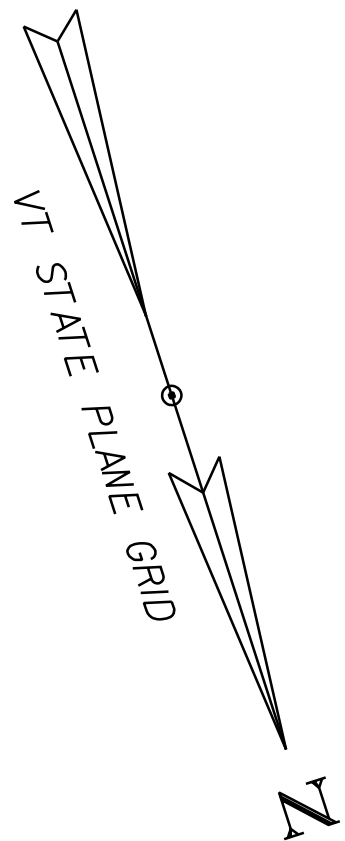




LEGEND
TEMP. STREAM IMPACTS

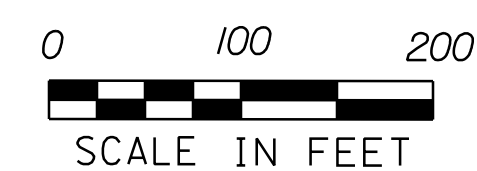


PROJECT NAME: LYNDON	
PROJECT NUMBER: IM 09I-3(53)	
FILE NAME: z19a180_bdr_alf_SB.dgn	PLOT DATE: 10-APR-2023
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: T.D. BURT
DESIGNED BY: T.D. BURT	CHECKED BY: J.D. BACHIOCHI
SB CROSSOVER ALIGNMENT SHEET 1	SHEET 1 OF 1



LEGEND

 TEMP. WETLAND IMPACTS



PROJECT NAME: LYNDON	
PROJECT NUMBER: IM 09I-3(53)	
FILE NAME: z19a180_bdr_alf_SB.dgn	PLOT DATE: 10-APR-2023
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: T.D. BURT
DESIGNED BY: T.D. BURT	CHECKED BY: J.D. BACHIOCHI
SB CROSSOVER ALIGNMENT SHEET 2	SHEET 1 OF 1

ATTACHMENT 6

Vermont Potential Rare, Threatened, and Endangered Species and Natural Communities in the Project Region and Onsite Habitats Summary (2-Mile Search Radius)

Project: Statewide Northwest STP CULV(92)

Client: Vermont Agency of Transportation

Location: South Burlington

Prepared By: B. Galligan

Date: August 8, 2022



Species / Natural Community	Common Name	EO ID# ²	EO #	Type	State Rank	Global Rank	Vermont Status	Federal Status	EO Last Observed	Habitat Description ¹	Occurrence Description ²	EO Mapped within Map Extent (Yes/ No)	Potential for Habitat to Occur within Study Area?	Survey Recommended?	
														(Yes/No)	Comments
PLANT AND ANIMAL SPECIES															
<i>Diphasiastrum sabinifolium</i>	Ground-fir	9355	23	Plant	S2	G4	-	-	6/16/1905	Dry-mesic to xeric, often acidic soils of woodlands, forests, edges, and openings.	West of Lyndon, in dry woodland openings in full sun, and in dry woodland bordering openings in shade.	No	Yes	Yes	Target species
<i>Cypripedium parviflorum</i> var. <i>makasin</i>	Makasin's Yellow Lady's-slipper	8098	2	Plant	S2S3	G4T4T5	-	-	6/12/1985	Evergreen swamps, deciduous forests, river banks, and river shore ledges.	Lyndon, cedar swamp northeast of a pond, and at an intersection of town highways.	No	No	Yes	Target species
<i>Omalothea sylvatica</i>	Woodland Cudweed	7975	5	Plant	S2?	G4G5	E	-	10/12/2005	Dry-mesic to wet-mesic soil of fields, roadsides, logging roads, clearings, and lake shores.	Pastured woodland with grasses very closely cropped between clumps of trees/forest edge. Somewhat open aspect. Slight erosional areas due to combination of slope, bedrock near surface, traffic/trampling. Plants in mesic loamy soil over shallow bedrock on southern aspect with 0-15 degree slope.	No	Yes	Yes	Target species
NATURAL COMMUNITIES															
Sugar Maple Floodplain Forest		3637	5	Nat-Com	S2	-	-	-	9/10/1997	Occurs where flooding is infrequent and short, often associated with higher energy and gradient streams. Underlain by well drained or moderately well drained sandy soils.	A riverine floodplain forest and vernal pool along a river. The river flows by to the west and north, but includes some cleared fields as well as additional smaller unmapped floodplain patches. To the east and southeast is Lyndonville.	No	No	No	Habitat not present

¹**Potential Sources for Habitat Description:**
DeGraaf, R.M. and M. Yamasaki. 2001. *New England Wildlife: Habitat, Natural History, and Distribution*. University Press of New England. Lebanon, NH.
Gilman, A.V. 2015. *New Flora of Vermont* . The New York Botanical Garden.
Gleason, H. A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeast United States and Adjacent Canada*. The New York Botanical Garden.
Haines, A. 2011. *Flora Novae Angliae* . New England Wildflower Society/Yale University Press, New Haven, CT.
Langdon, R.W., Ferguson, M.T., and K.M Cox. 2006. *Fishes of Vermont* . Vermont Department of Fish and Wildlife.
Magee, D.W., and H.E Ahles. 2007. *Flora of the Northeast: A Manual of the Vascular Flora of New England Adjacent New York*. University of Massachusetts Press. Amherst, MA.
Natural Resources Conservation Service. 2010. *Management Considerations for Grassland Birds in Northeastern Haylands and Pasturelands* . Wildlife Insight No. 88.
Newcomb, L. 1977. *Newcomb's Wildflower Guide* . Little, Brown, and Company, Boston, MA.
Pfeiffer, B., Blust, M., and K. McFarland. 2018. *Vermont Odonata Atlas*. Vermont Center for Ecostudies-Vermont Atlas of Life. Retrieved from <http://val.vtecostudies.org>
Seymour, F.C. 1982. *The Flora of New England* . Second Edition. Phytologia Memoirs 5. Plainfield, NJ: Harold N. Moldenke and Alma L. Moldenke.
Thompson, et. al. 2019. *Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont* . Vermont Department of Fish and Wildlife and The Nature Conservancy.
Vermont Atlas of Life. 2017. *The Vermont Freshwater Mussel Atlas*. Vermont Center for Ecostudies – Vermont Atlas of Life. Retrieved from <http://val.vtecostudies.org>.
Vermont Natural Resources Atlas. 2022. Element Occurrence Reports. Accessed April 2022.

²**Element Occurrence ("EO") Data Source:**
Vermont Natural Heritage Inventory - Vermont Fish & Wildlife Department - Element Occurrence Reports. Database query conducted in August 2022.

ATTACHMENT 7

Species Checklist - Partial Floristic Inventory

Project: Lyndon IM 091-3 (53)

Client: Vtrans

Location: Lyndon, VT

Survey Date: July 14, 2022

Prepared By: VHB - August 15, 2022

Scientific Name ¹	Common Name	Family	Vermont Rarity Rank ²	Non-Native Invasive Species ³
<i>Abies balsamea</i> (L.) Mill.	balsam fir	Pinaceae		
<i>Acer negundo</i> L.	boxelder	Aceraceae		
<i>Acer rubrum</i> L.	red maple	Aceraceae		
<i>Acer saccharum</i> Marshall	sugar maple	Aceraceae		
<i>Acer spicatum</i> Lam.	mountain maple	Aceraceae		
<i>Actaea pachypoda</i> Elliott	white baneberry	Ranunculaceae		
<i>Agrimonia striata</i> Michx.	roadside agrimony	Rosaceae		
<i>Agrostis capillaris</i> L.	colonial bentgrass	Poaceae		
<i>Alnus incana</i> (L.) Moench	gray alder	Betulaceae		
<i>Ambrosia artemisiifolia</i> L.	annual ragweed	Asteraceae		
<i>Anemone virginiana</i> L.	tall thimbleweed	Ranunculaceae		
<i>Anthoxanthum odoratum</i> L.	sweet vernalgrass	Poaceae		
<i>Apocynum cannabinum</i> L.	Indianhemp	Apocynaceae		
<i>Aquilegia vulgaris</i> L.	European columbine	Ranunculaceae		
<i>Aralia nudicaulis</i> L.	wild sarsaparilla	Araliaceae		
<i>Arctium lappa</i> L.	greater burdock	Asteraceae		
<i>Arisaema triphyllum</i> (L.) Schott	Jack in the pulpit	Araceae		
<i>Artemisia vulgaris</i> L.	common wormwood	Asteraceae		
<i>Asarum canadense</i> L.	Canadian wildginger	Aristolochiaceae		
<i>Asclepias syriaca</i> L.	common milkweed	Asclepiadaceae		
<i>Betula alleghaniensis</i> Britton	yellow birch	Betulaceae		
<i>Betula papyrifera</i> Marshall	paper birch	Betulaceae		
<i>Bromus inermis</i> Leyss.	smooth brome	Poaceae		
<i>Calystegia sepium</i> (L.) R. Br. ssp. <i>angulata</i> Brummitt	hedge false bindweed	Convolvulaceae		
<i>Cardamine concatenata</i> (Michx.) Sw.	cutleaf toothwort	Brassicaceae	S3	
<i>Carex flava</i> L.	yellow sedge	Cyperaceae		
<i>Carex intumescens</i> Rudge	greater bladder sedge	Cyperaceae		
<i>Carex lacustris</i> Willd.	hairy sedge	Cyperaceae		
<i>Carex lurida</i> Wahlenb.	shallow sedge	Cyperaceae		
<i>Carex plantaginea</i> Lam.	plantainleaf sedge	Cyperaceae		
<i>Carex vulpinoidea</i> Michx.	fox sedge	Cyperaceae		
<i>Caulophyllum thalictroides</i> (L.) Michx.	blue cohosh	Berberidaceae		
<i>Centaurea nigra</i> L.	lesser knapweed	Asteraceae		
<i>Cichorium intybus</i> L.	chicory	Asteraceae		
<i>Circaea ×intermedia</i> Ehrh. (pro sp.) [<i>alpina</i> × <i>lutetiana</i>]	enchanter's nightshade	Onagraceae		
<i>Cirsium arvense</i> (L.) Scop.	Canada thistle	Asteraceae		
<i>Clematis virginiana</i> L.	devil's darning needles	Ranunculaceae		
<i>Clintonia borealis</i> (Aiton) Raf.	bluebead	Liliaceae		
<i>Cornus alternifolia</i> L. f.	alternateleaf dogwood	Cornaceae		
<i>Cornus amomum</i> Mill.	silky dogwood	Cornaceae		
<i>Cornus sericea</i> L.	redosier dogwood	Cornaceae		
<i>Corylus cornuta</i> Marshall	beaked hazelnut	Betulaceae		
<i>Crataegus</i> L.	hawthorn	Rosaceae		
<i>Cystopteris bulbifera</i> (L.) Bernh.	bulblet bladderfern	Dryopteridaceae		
<i>Dactylis glomerata</i> L.	orchardgrass	Poaceae		
<i>Daucus carota</i> L.	Queen Anne's lace	Apiaceae		
<i>Dennstaedtia punctilobula</i> (Michx.) T. Moore	eastern hayscented fern	Dennstaedtiaceae		
<i>Deparia acrostichoides</i> (Sw.) M. Kato	silver false spleenwort	Dryopteridaceae		
<i>Dianthus armeria</i> L.	Deptford pink	Caryophyllaceae		
<i>Dirca palustris</i> L.	eastern leatherwood	Thymelaeaceae		
<i>Doellingeria umbellata</i> (Mill.) Nees	parasol whitetop	Asteraceae		
<i>Dryopteris campyloptera</i> Clarkson	mountain woodfern	Dryopteridaceae		
<i>Dryopteris cristata</i> (L.) A. Gray	crested woodfern	Dryopteridaceae		
<i>Dryopteris marginalis</i> (L.) A. Gray	marginal woodfern	Dryopteridaceae		
<i>Epipactis helleborine</i> (L.) Crantz	broadleaf helleborine	Orchidaceae		
<i>Equisetum arvense</i> L.	field horsetail	Equisetaceae		
<i>Equisetum hyemale</i> L.	scouringrush horsetail	Equisetaceae		
<i>Equisetum variegatum</i> Schleich. ex F. Weber & D. Mohr	variegated scouringrush	Equisetaceae		
<i>Erigeron annuus</i> (L.) Pers.	eastern daisy fleabane	Asteraceae		
<i>Erigeron pulchellus</i> Michx.	robin's plantain	Asteraceae		
<i>Eupatorium perfoliatum</i> L.	common boneset	Asteraceae		
<i>Euthamia graminifolia</i> (L.) Nutt.	flat-top goldentop	Asteraceae		
<i>Eutrochium maculatum</i> (L.) E.E. Lamont	spotted joe pye weed	Asteraceae		

Species Checklist - Partial Floristic Inventory

Project: Lyndon IM 091-3 (53)

Client: Vtrans

Location: Lyndon, VT

Survey Date: July 14, 2022

Prepared By: VHB - August 15, 2022

Scientific Name ¹	Common Name	Family	Vermont Rarity Rank ²	Non-Native Invasive Species ³
<i>Fagus grandifolia</i> Ehrh.	American beech	Fagaceae		
<i>Fragaria virginiana</i> Duchesne	Virginia strawberry	Rosaceae		
<i>Fraxinus nigra</i> Marshall	black ash	Oleaceae		
<i>Fraxinus pennsylvanica</i> Marshall	green ash	Oleaceae		
<i>Galium mollugo</i> L.	false baby's breath	Rubiaceae		
<i>Galium palustre</i> L.	common marsh bedstraw	Rubiaceae		
<i>Geum aleppicum</i> Jacq.	yellow avens	Rosaceae		
<i>Glyceria melicaria</i> (Michx.) F.T. Hubbard	melic mannagrass	Poaceae		
<i>Glyceria striata</i> (Lam.) Hitchc.	fowl mannagrass	Poaceae		
<i>Hieracium aurantiacum</i> L.	orange hawkweed	Asteraceae		
<i>Hieracium pilosella</i> L.	mouseear hawkweed	Asteraceae		
<i>Hypericum punctatum</i> Lam.	spotted St. Johnswort	Clusiaceae		
<i>Impatiens capensis</i> Meerb.	jewelweed	Balsaminaceae		
<i>Juncus tenuis</i> Willd.	poverty rush	Juncaceae		
<i>Juniperus virginiana</i> L.	eastern redcedar	Cupressaceae		
<i>Lactuca biennis</i> (Moench) Fernald	tall blue lettuce	Asteraceae		
<i>Larix laricina</i> (Du Roi) K. Koch	tamarack	Pinaceae		
<i>Leucanthemum vulgare</i> Lam.	oxeye daisy	Asteraceae		
<i>Lobelia inflata</i> L.	Indian-tobacco	Campanulaceae		
<i>Lonicera morrowii</i> A. Gray	Morrow's honeysuckle	Caprifoliaceae		B
<i>Lonicera tatarica</i> L.	Tatarian honeysuckle	Caprifoliaceae		B
<i>Lotus corniculatus</i> L.	bird's-foot trefoil	Fabaceae		
<i>Lysimachia nummularia</i> L.	creeping jenny	Primulaceae		
<i>Lysimachia terrestris</i> (L.) Britton, Sterns & Poggenb.	earth loosestrife	Primulaceae		
<i>Lythrum salicaria</i> L.	purple loosestrife	Lythraceae		B
<i>Maianthemum canadense</i> Desf.	Canada mayflower	Liliaceae		
<i>Maianthemum racemosum</i> (L.) Link	feathery false lily of the valley	Liliaceae		
<i>Matteuccia struthiopteris</i> (L.) Todaro	ostrich fern	Dryopteridaceae		
<i>Medeola virginiana</i> L.	Indian cucumber	Liliaceae		
<i>Medicago sativa</i> L.	alfalfa	Fabaceae		
<i>Mellilotus albus</i> Medik.	white sweetclover	Fabaceae		
<i>Mentha arvensis</i> L.	wild mint	Lamiaceae		
<i>Mitchella repens</i> L.	partridgeberry	Rubiaceae		
<i>Mycelis muralis</i> (L.) Dumort.	wall-lettuce	Asteraceae		WL
<i>Oclemena acuminata</i> (Michx.) Greene	whorled wood aster	Asteraceae		
<i>Oenothera biennis</i> L.	common evening primrose	Onagraceae		
<i>Onoclea sensibilis</i> L.	sensitive fern	Dryopteridaceae		
<i>Osmunda cinnamomea</i> L.	cinnamon fern	Osmundaceae		
<i>Osmunda regalis</i> L.	royal fern	Osmundaceae		
<i>Oxalis montana</i> Raf.	mountain woodsorrel	Oxalidaceae		
<i>Oxalis stricta</i> L.	common yellow oxalis	Oxalidaceae		
<i>Parthenocissus quinquefolia</i> (L.) Planch.	Virginia creeper	Vitaceae		
<i>Pastinaca sativa</i> L.	wild parsnip	Apiaceae		WL
<i>Phalaris arundinacea</i> L.	reed canarygrass	Poaceae		WL
<i>Phegopteris connectilis</i> (Michx.) Watt	long beechfern	Thelypteridaceae		
<i>Phleum pratense</i> L.	timothy	Poaceae		
<i>Picea glauca</i> (Moench) Voss	white spruce	Pinaceae		
<i>Pinus strobus</i> L.	eastern white pine	Pinaceae		
<i>Plantago lanceolata</i> L.	narrowleaf plantain	Plantaginaceae		
<i>Platanthera aquilonis</i> Sheviak	northern green orchid	Orchidaceae		
<i>Platanthera lacera</i> (Michx.) G. Don	green fringed orchid	Orchidaceae		
<i>Polystichum acrostichoides</i> (Michx.) Schott	Christmas fern	Dryopteridaceae		
<i>Populus balsamifera</i> L.	balsam poplar	Salicaceae		
<i>Populus grandidentata</i> Michx.	bigtooth aspen	Salicaceae		
<i>Populus tremuloides</i> Michx.	quaking aspen	Salicaceae		
<i>Potentilla recta</i> L.	sulphur cinquefoil	Rosaceae		
<i>Prunella vulgaris</i> L.	common selfheal	Lamiaceae		
<i>Prunus americana</i> Marshall	American plum	Rosaceae	SH (T)	
<i>Prunus pensylvanica</i> L. f.	pin cherry	Rosaceae		
<i>Prunus serotina</i> Ehrh.	black cherry	Rosaceae		
<i>Prunus virginiana</i> L.	chokecherry	Rosaceae		
<i>Pteridium aquilinum</i> (L.) Kuhn	western brackenfern	Dennstaedtiaceae		
<i>Pyrola americana</i> Sweet	American wintergreen	Pyrolaceae		

Species Checklist - Partial Floristic Inventory

Project: Lyndon IM 091-3 (53)

Client: Vtrans

Location: Lyndon, VT

Survey Date: July 14, 2022

Prepared By: VHB - August 15, 2022

Scientific Name ¹	Common Name	Family	Vermont Rarity Rank ²	Non-Native Invasive Species ³
<i>Ranunculus recurvatus</i> Poir.	blisterwort	Ranunculaceae		
<i>Rhinanthus minor</i> L.	little yellow rattle	Scrophulariaceae		
<i>Rhus aromatica</i> Aiton	fragrant sumac	Anacardiaceae	S3	
<i>Rhus typhina</i> L.	staghorn sumac	Anacardiaceae		
<i>Robinia pseudoacacia</i> L.	black locust	Fabaceae		WL
<i>Rubus elegantulus</i> Blanch.	showy blackberry	Rosaceae		
<i>Rubus hispidus</i> L.	bristly dewberry	Rosaceae		
<i>Rubus idaeus</i> L.	American red raspberry	Rosaceae		
<i>Rudbeckia hirta</i> L.	blackeyed Susan	Asteraceae		
<i>Rumex acetosa</i> L.	garden sorrel	Polygonaceae		
<i>Rumex crispus</i> L.	curly dock	Polygonaceae		
<i>Salix bebbiana</i> Sarg.	Bebb willow	Salicaceae		
<i>Salix nigra</i> Marshall	black willow	Salicaceae		
<i>Sambucus nigra</i> L.	black elderberry	Caprifoliaceae		
<i>Scirpus atrovirens</i> Willd.	green bulrush	Cyperaceae		
<i>Scirpus cyperinus</i> (L.) Kunth	woolgrass	Cyperaceae		
<i>Securigera varia</i> (L.) Lassen	crownvetch	Fabaceae		
<i>Solanum carolinense</i> L.	Carolina horsenettle	Solanaceae		
<i>Solidago caesia</i> L.	wreath goldenrod	Asteraceae		
<i>Solidago canadensis</i> L.	Canada goldenrod	Asteraceae		
<i>Solidago flexicaulis</i> L.	zigzag goldenrod	Asteraceae		
<i>Solidago gigantea</i> Aiton	giant goldenrod	Asteraceae		
<i>Solidago juncea</i> Aiton	early goldenrod	Asteraceae		
<i>Solidago rugosa</i> Mill.	wrinkleleaf goldenrod	Asteraceae		
<i>Sonchus arvensis</i> L.	field sowthistle	Asteraceae		
<i>Spiraea alba</i> Du Roi	white meadowsweet	Rosaceae		
<i>Streptopus amplexifolius</i> (L.) DC.	claspleaf twistedstalk	Liliaceae		
<i>Symphyotrichum cordifolium</i> (L.) G.L. Nesom	common blue wood aster	Asteraceae		
<i>Symphyotrichum lanceolatum</i> (Willd.) G.L. Nesom	white panicle aster	Asteraceae		
<i>Symphyotrichum novae-angliae</i> (L.) G.L. Nesom	New England aster	Asteraceae		
<i>Symphyotrichum puniceum</i> (L.) Á. Löve & D. Löve	purplestem aster	Asteraceae		
<i>Taraxacum officinale</i> F.H. Wigg.	common dandelion	Asteraceae		
<i>Taxus canadensis</i> Marshall	Canada yew	Taxaceae		
<i>Thalictrum pubescens</i> Pursh	king of the meadow	Ranunculaceae		
<i>Thelypteris noveboracensis</i> (L.) Nieuwl.	New York fern	Thelypteridaceae		
<i>Thelypteris palustris</i> Schott	eastern marsh fern	Thelypteridaceae		
<i>Thuja occidentalis</i> L.	arborvitae	Cupressaceae		
<i>Tragopogon lamottei</i> Rouy	Jack-go-to-bed-at-noon	Asteraceae		
<i>Trichophorum alpinum</i> (L.) Pers.	alpine bulrush	Cyperaceae		
<i>Trientalis borealis</i> Raf.	starflower	Primulaceae		
<i>Trifolium pratense</i> L.	red clover	Fabaceae		
<i>Trifolium repens</i> L.	white clover	Fabaceae		
<i>Tsuga canadensis</i> (L.) Carrière	eastern hemlock	Pinaceae		
<i>Tussilago farfara</i> L.	coltsfoot	Asteraceae		
<i>Typha angustifolia</i> L.	narrowleaf cattail	Typhaceae		
<i>Ulmus americana</i> L.	American elm	Ulmaceae		
<i>Valeriana officinalis</i> L.	garden valerian	Valerianaceae		WL
<i>Verbascum thapsus</i> L.	common mullein	Scrophulariaceae		
<i>Veronica officinalis</i> L.	common gypsyweed	Scrophulariaceae		
<i>Viburnum acerifolium</i> L.	mapleleaf viburnum	Caprifoliaceae		
<i>Viburnum lantanoides</i> Michx.	hobblebush	Caprifoliaceae		
<i>Vicia cracca</i> L.	bird vetch	Fabaceae		

¹ Nomenclature follows USDA-NRCS PLANTS database (plants.usda.gov/) (2017).

² Vermont Rarity Rank from the Vermont Natural Heritage Inventory. 2022. *Rare and Uncommon Native Vascular Plants of Vermont*. Fish & Wildlife

³ Class B Noxious Weeds Species ("B") from: Vermont Agency of Agriculture, Food and Markets. 2012. *Quarantine #3 - Noxious Weeds*.

Watch List Species ("WL") from: Vermont Invasive Exotic Plant Committee. 2017. *Quarantine and Watch List Update*.

ATTACHMENT 8



United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104



In Reply Refer To:
Project Code: 2023-0067099
Project Name: VTrans Lyndon IM 091-3(53) Project

April 10, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Updated 3/8/2023 - Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the “**New England Field Office Endangered Species Project Review and Consultation**” website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

<https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Northern Long-eared Bat - (Updated 3/8/2023) The Service published a final rule to reclassify the northern long-eared bat (NLEB) as endangered on November 30, 2022. The final rule will go into effect on **March 31, 2023**. After that date, the current 4(d) rule for NLEB will be invalid, and the 4(d) determination key will no longer be available. New compliance tools will be available in March 2023, and information will be posted in this section on our website and on the northern long-eared bat species page, so please check this site often for updates.

Depending on the type of effects a project has on NLEB, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective. If your project may result in incidental take of NLEB after the new listing goes into effect, this will need to be addressed in an updated consultation that includes an Incidental Take Statement. Many of these situations will be addressed through the new compliance tools. If your project may require re-initiation of consultation, please wait for information on the new tools to appear on this site or contact our office for additional guidance.

Additional Info About Section 7 of the Act

Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/service/section-7-consultations>

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to

consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

PROJECT SUMMARY

Project Code: 2023-0067099

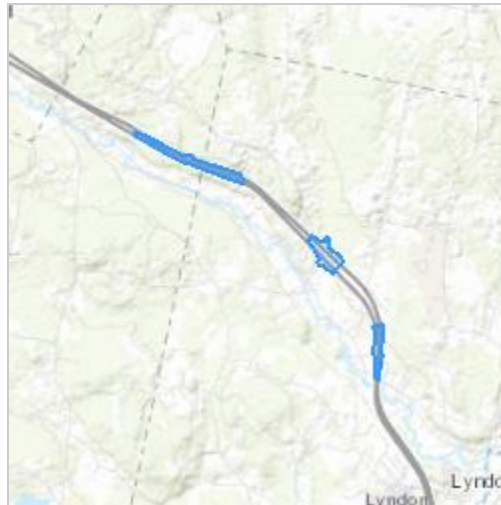
Project Name: VTrans Lyndon IM 091-3(53) Project

Project Type: Bridge - Replacement

Project Description: The Project proposes the replacement of Bridges 96-3N and 96-3S on Interstate 91 ("I-91") in Lyndon, Vermont.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@44.570165700000004,-72.03853490190241,14z>



Counties: Caledonia County, Vermont

ENDANGERED SPECIES ACT SPECIES

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPAC USER CONTACT INFORMATION

Agency: VHB
Name: Kaitlyn Maines
Address: 40 IDX Drive
Address Line 2: Building 100, Suite 200
City: South Burlington
State: VT
Zip: 05403
Email: kmaines@vhb.com
Phone: 8024976189
