

## **Original Alteration of Terrain Permit Application**



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# C196 & Q171 TRANSMISSION LINE STRUCTURE REPLACEMENT PROJECT

## EVERSOURCE ENERGY

### Goffstown, Dunbarton, and Bow, New Hampshire

NHDES Alteration of Terrain Permit Application

July 7, 2022

GZA File No. 04.0191410.18



#### PREPARED FOR:

Eversource Energy  
Hooksett, New Hampshire

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July 7, 2022  
GZA File No. 04.0191410.18

Mr. Ridgely Mauck, P.E.  
Program Supervisor - Permitting  
NHDES Land Resources Management  
Alteration of Terrain Bureau  
29 Hazen Drive, P.O. Box 95  
Concord, New Hampshire 03302

Re: Alteration of Terrain Permit  
C196 & Q171 Transmission Line Structure Replacement Project  
Goffstown, Dunbarton, and Bow, New Hampshire

Dear Mr. Mauck:

On behalf of Public Service Company of New Hampshire dba Eversource Energy (Eversource), GZA GeoEnvironmental, Inc. (GZA) is submitting this Alteration of Terrain (AoT) Permit Application for the proposed C196 and Q171 Transmission Line Structure Replacement Project in accordance with Terrain Alteration Law (RSA 485-A:17), Administrative Rules (Env-Wq 1500), and discussions between the New Hampshire Department of Environmental Services (NHDES) AoT Bureau and Eversource.

The proposed project includes the replacement of 90 existing utility structures, including 46 structures along the C196 Transmission Line and 44 structures along the Q171 Transmission Line that exceed AoT impact thresholds. The proposed project crosses through portions of Goffstown, Dunbarton, and Bow for approximately 11 miles. Additionally, optical ground wire (OPGW) is proposed to be installed on the Q171 Transmission Line to replace existing static wire, which will improve the transmission line by serving to shield conductor wires below it from lightning. Replacement of the existing utility structures is necessary to maintain the safety and reliability of the system. To more efficiently conduct routine maintenance of the existing C196 and Q171 Transmission Lines, work pad grading, and access road improvements are proposed as part of this project in upland areas. The proposed project will require disturbance subject to AoT permitting through the NHDES as a result of impact areas cumulatively exceeding 100,000 square feet of contiguous disturbance in the project area or 50,000 square feet of contiguous disturbance within the protected shoreland as defined in RSA 483-B (i.e., the shared C196 and Q171 Utility Line Corridor).

Included with this submittal is a copy of the application fee check, a completed AoT Permit Application Form, a detailed project overview narrative, required plans and figures, and additional supporting materials. In addition, a waiver request for the preparation of a stormwater drainage report, drainage area plans, and hydrologic soil group plans and from amendment requirements for shifting of access roads greater



than 20 ft is enclosed as required by Env- Wq 1509.04. The proposed project is scheduled to start in October 2022 and continue through May 2023. Eversource appreciates the efforts of the Alteration of Terrain Bureau in helping to maintain the anticipated construction schedule, which is dependent on scheduled outages dictated by regional outage planning.

Please feel free to contact Ms. Lindsey White at 603-232-8753 or [lindsey.white@gza.com](mailto:lindsey.white@gza.com) if you have any questions.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in cursive script that reads "Lindsey White".

Lindsey White, CPSS  
Project Manager

A handwritten signature in cursive script that reads "Deborah M. Zarta Gier".

Deborah M. Zarta Gier, CNRP  
Consultant/Reviewer

A handwritten signature in cursive script that reads "Tracy Tarr".

Tracy Tarr, CWS, CWB, CESSWI  
Associate Principal

LEW/TLT/DMZ: Ojkm

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Attachments: Alteration of Terrain Permit Application

cc: Town of Goffstown, New Hampshire  
Town of Dunbarton, New Hampshire  
Town of Bow, New Hampshire  
Piscataquog River Local Advisory Committee



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**1.0 PROJECT BACKGROUND AND PURPOSE**

The proposed project involves the replacement of 90 existing utility structures, including 46 structures along the C196 Transmission Line and 44 structures along the Q171 Transmission Line in portions of Goffstown, Dunbarton, and Bow, New Hampshire. The proposed replacement structures are old and worn and must be replaced in order for the transmission lines to continue to function safely and reliably. Impacts have been minimized and avoided to the greatest extent practicable through Site evaluations of access routes and work pad placements. Where possible, existing gravel roads are utilized for access.

The project requires approximately 1,267,668 square feet (sq. ft.) of total impact, including 263,196 sq. ft. of temporary wetland matting, 8,254 sq. ft. of temporary upland matting, and 996,218 sq. ft. of ground disturbance. The proposed project to replace a total of 90 existing utility poles is subject to the AoT disturbance threshold per Env-Wq 1500 and RSA 485-A:17 (See **Figure 4 – Alteration of Terrain Permitting Plans** and **Appendix A – Alteration of Terrain Application Form**). For purposes of presentation of details and consistency with other permitting efforts for this project, we have broken out project areas as follows:

TOWN	AREA ID	APPROXIMATE AOT IMPACT (SQ. FT.)	LINE	STRUCTURES
Goffstown	Area A	491,654	C196	91-96, 125-128, 130, 132-137, 141-143
			Q171	89-92, 104, 109-112, 117-124, 126, 128-130, 136, 137, 139
Dunbarton	Area B	226,707	C196	70-74, 88-90
			Q171	73, 74, 78, 79, 86-88
Bow	Area C	277,857	C196	1, 2, 4, 20-22, 37, 38, 47-49, 63-69
			Q171	1, 3-5, 12, 32-24, 39, 43, 44, 63, 66-68

**2.0 SITE INFORMATION**

**2.1 SITE LOCATION AND DESCRIPTION**

Area A includes several discrete sections of the shared C196 and Q171 Transmission Line Right of Way (ROW) as follows:

- The north and south sides of Elm Street from C196 Structure 143 to Q171 Structure 136 for a distance of approximately 0.2 miles with a ROW width of approximately 300-ft;
- The north and south sides of Locust Hill Road from C196 Structure 137 to C196 Structure 130 for a distance of approximately 0.4 miles and a ROW width of approximately 200 ft;
- The north and south sides of Kimberly Lane from C196 Structure 128 to Q171 Structure 117 for a distance of approximately 0.5 miles and a ROW width of approximately 200-ft;
- From Tibbets Hill Road to Q171 Structure 109 for a distance of approximately 0.5 miles and a ROW width of approximately 200 ft;
- From Q171 Structure 104 to Black Brook Road for a distance of approximately 250 ft and a ROW width of approximately 200 ft; and
- From Q171 Structure 96, across Montelona Road, to the Goffstown and Dunbarton Town Line for a distance of approximately 0.3 miles and a ROW width of approximately 200 ft.



The total work area in this portion of the ROW is approximately 2 miles in length.

Area B includes the portion of the shared C196 and Q171 Transmission Line ROW from the Goffstown/Dunbarton Town Line northerly to C196 Structure 89 for a distance of approximately 0.16 miles. The ROW in this portion is approximately 200- ft in width. Area B continues in the ROW continuously from C196 Structure 88 northerly to the Dunbarton/Bow Town Line for a distance of approximately 1.4 miles. This portion of the ROW has a variable width ranging from approximately 200 ft to 500-ft.

Area C includes several discrete sections of the shared C196 and Q171 Transmission Line Right of Way (ROW) as follows:

- The Dunbarton/Bow town line to South Bow Road for a distance of approximately 0.65 miles with a ROW width of approximately 500-ft;
- From Woodhill Hooksett Road to C196 Structure 49 for a distance of approximately 500-ft with a ROW width of approximately 500-ft;
- From C196 Structure 48, across Colby Lane to C196 Structure 47 for a distance of approximately 500-ft and a ROW width of approximately 500-ft;
- From C196 Structure 46, across Abbey Road to Bow Bog Road for a distance of approximately 1.3 miles and a ROW width of approximately 500-ft;
- From Morgan Drive to C196 Structure 20 for a distance of approximately 0.25 miles and a ROW width of approximately 500-ft;
- From the temporary work pad adjacent to Q171 Structure 12 to Q171 Structure 5 for a distance of approximately 0.6 miles and a ROW width of approximately 800-ft, and
- The north and south sides of River Road from Q171 Structure 4 to C196 Structure 1 for a distance of approximately 0.2 miles and a ROW width of approximately 800-ft.

The total work area in this portion of the ROW is approximately 3.2 miles in length.

Of the total 11 miles of existing ROW, the total project area is approximately 6.8 miles in length. The project area primarily crosses privately owned rural/residential properties (see **Figure 1 – USGS Topographic Map**). There are approximately 108 wetlands along the project route located in the towns of Goffstown, Dunbarton, and Bow. The majority of ground disturbance resulting from the project will be related to access and work pad preparations.

## 2.2 TAX MAP AND LOT(S)

Eversource either holds easements across parcels along the ROW or owns parcels in-fee (see **Figure 4**). There are approximately 56 abutting properties that contain existing Eversource easements for the ROW involved in the project, and Eversource owns three parcels. In those project locations, the easements are considered to be the “subject property” because Eversource is the applicant/owner and only has control over the easement. These abutting parcels have been identified and listed on the enclosed abutter’s list. See **Appendix B** for Abutter’s List.

## 2.3 IDENTIFICATION OF NATURAL AND CULTURAL RESOURCES

GZA GeoEnvironmental, Inc. (GZA) has been retained by Eversource to provide professional services on this project that relate to natural and cultural resources identification and assessment, as well as permit applications for natural resources and alteration of terrain impacts required to complete the project. GZA has conducted field evaluations and has corresponded with the appropriate agencies to identify natural and cultural resources present in the vicinity of the proposed project.



### 2.3.1 Identification of Jurisdictional Wetlands and Vernal Pools

Wetlands were originally delineated and classified by Normandeau Associates, Inc. in 2016 within this ROW. GZA confirmed wetland boundaries, photographed resources, completed additional wetland documentation, and recorded data relevant to functions and values provided by these natural resources within the ROW in May 2022. GZA delineated wetland boundaries in accordance with the United States Army Corps of Engineers (ACOE) Wetlands Delineation Manual using the Routine Determinations Method and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual as required by the New Hampshire Department of Environmental Services (NHDES) Wetlands Bureau and the ACOE.

GZA conducted a vernal pool evaluation in May 2022 while confirming wetland boundaries in accordance with "Identification and Documentation of Vernal Pools in New Hampshire," 2016, New Hampshire Fish and Game Department, Nongame and Endangered Wildlife Program. Vernal pool areas exist as confined basins and must exhibit vernal pool criteria outlined in the New Hampshire Code of Administrative Rules, Env-Wt 103.64, 104.15, and 104.44. One potential vernal pool (PVP) was identified in Goffstown within Wetland GW-38. Three PVPs were located in the Town of Dunbarton within Wetlands DW-4, DW-11, and DW-15, and one PVP was identified in the Town of Bow in Wetland BW-34. It is typical that all potential vernal pools are considered vernal pools for the purposes of impact avoidance and minimization for Eversource maintenance projects. Therefore, no temporary or permanent impacts are proposed to any potential vernal pools as a result of this project.

### 2.3.2 Identification of Surface Waters

Jurisdictional limits of surface waters of the State of New Hampshire were confirmed by GZA in May 2022 in accordance with their definition in RSA 485-A:2 XIV, 482-A:4 II and rule Env-Wt 104.33. Surface waters include wherever freshwater flows or stands and tidal waters. This includes, but is not limited to, rivers, perennial and intermittent streams, lakes, ponds, intertidal zones, and tidal waters. In addition, jurisdiction extends to the portion of any bank or shore which borders such surface waters and to any swamp or bog subject to periodic flooding by freshwater, including the surrounding shore. The limit of jurisdiction for surface water areas were confirmed as the top of bank, where a natural bank occurs, or its ordinary high-water mark where a natural bank is not present.

### 2.3.3 Identification of Rare, Threatened, and Endangered Species

In the Towns of Goffstown, Dunbarton, and Bow, the NHB and New Hampshire Fish and Game (NHFG) identified records of Blanding's turtle, wood turtle, eastern hognose snake, northern black racer, and smooth green snake in the vicinity of the C196 and Q171 shared Transmission Line ROW (See Appendix C for the NHB Reports). Typical of similar Eversource projects, rare species best management practices have been incorporated into the design. Construction personnel will be made aware of the potential presence of sensitive turtle and snake species. Species information will be incorporated into project plans. In addition, construction personnel will be made aware of the potential to encounter Blanding's turtle and wood turtle more frequently during turtle nesting season from late May through the beginning of July. However, construction work is proposed outside the typical turtle nesting season. GZA will notify the NHFG and NHB of any rare species observations for inclusion in the statewide database.

Correspondence is ongoing between Eversource and the NHFG. Eversource is proposing the following Protective Measures for the above-listed turtle and snake species:

- a. Eastern hognose, northern black racer, and smooth green snake:
  - 1) If work must occur during the active season (April 1 – October 30), contractors working within the ROW will be trained by a qualified biologist on the identification and response protocols for northern black racers.



- 2) Prior to the start of construction, trained contractors will search individual work areas. If an eastern hognose, northern black racer or smooth green snake is discovered, the snake shall be photographed and either removed or allowed to migrate on its own outside the work area. The observing contractor will then contact the project Environmental Licensing & Permitting specialist from Eversource, who will contact NH F&G as follows:
  - i. Brendan Clifford 603-944-0885;
  - ii. Melissa Winters 603-479-1129; and
  - iii. If NHF&G staff are unable to be reached, contact the Wildlife Administrator at 603- 271- 2461.
- b. Blanding's turtle and wood turtle:
  - 1) During Active Period (April 1 - October 15):
    - i. If work must occur during the active season, all contractors working will be trained by a qualified biologist on the identification and response protocols for spotted turtles.
    - ii. Immediately prior to the placement of matting in wetlands within turtle habitat, the areas shall be cleared by a qualified biologist or herpetologist.
  - 2) Avoid permanent impacts in any wet meadows and seasonal pools.
  - 3) During Inactive Period (October 16 - March 31):
    - i. All contractors working within known habitats will be trained by a qualified biologist on the identification and response protocols for spotted turtles and instructed to notify the appropriate authorities to relocate any observed turtle.
    - ii. Prior to matting placement in these wetlands, the area shall be swept by a qualified biologist or herpetologist to ensure any turtles relocate away from the area to be matted.
  - 4) Prior to the start of construction within known habitat, trained contractors will search the work area. If a state-listed turtle is observed, the turtle shall be photographed and placed in a safe location outside the work area. The observing contractor will then contact the project Environmental Licensing & Permitting specialist from Eversource, who will contact NH F&G as follows:
    - i. Brendan Clifford 603-944-0885; or
    - ii. Melissa Winters 603-479-1129.

If NHF&G staff are unable to be reached, contact the Wildlife Administrator at 603-271-2461.

#### 2.3.4 Identification of Cultural and Historical Resources

GZA will submit a Request for Project Review (RPR) to the New Hampshire Division of Historical Resources (NHDHR) for the proposed project.

Independent Archaeological Consulting, LLC (IAC) completed Phase IA Archeological Assessment in 2017 for the entirety of the A253 ROW, which is partially located within the same ROW corridor as the C196 Transmission line from C196 Structure 83 in Dunbarton to C196 Structure 1 in Bow. In addition, IAC completed Phase IA Archeological Assessment in four separate segments for the portion of the C196 Transmission Line from Structure 143 in Goffstown to Structure 83 in Dunbarton in support of vegetation maintenance projects in 2017.





GZA engaged IAC in 2022 to complete Phase IA Archeological Assessment for the remainder of the C196 Transmission Line between Structure 143 in Goffstown to Structure 83 in Dunbarton to fill the gaps between the four previously assessed segments. In addition, GZA also engaged IAC to complete Phase IB Archeological Assessment for 21 sensitivity areas along the C196 and Q171 Transmission Lines where Phase IA work has been previously completed.

### 3.0 EXISTING CONDITIONS

The proposed project is located within the existing and maintained Q171, and C196 Transmission Line shared ROW. The proposed project work areas subject to the Alteration of Terrain permit cross through portions of three towns. Existing dirt and/or grass access routes currently used for access to existing utility structures within the ROW are proposed to be improved using gravel and stone as a part of a routine structure maintenance project. Proposed access road improvements include 12- to 16-foot-wide gravel and stone roads with a 20-foot total width limit of disturbance. Based on NRCS soil mapping, existing upland soils are primarily Chatfield-Hollis complex being very rocky, and Canton fine sandy loam and Canton very stony fine sandy loam. Slopes are variable and generally range from 0 to 60%, with an average of approximately 15%.

The project includes areas of uplands and wetlands located in primarily rural farmland and forested areas. In uplands, the shrub layer contains meadowsweet (*Spiraea alba*), steeplebush (*Spiraea tomentosa*), speckled alder (*Alnus incana*), winterberry holly (*Ilex verticillata*), highbush blueberry (*Vaccinium corymbosum*), red maple (*Acer rubrum*), and gray birch (*Betula populifolia*). The herbaceous layer contains broad-leaved cattail (*Typha latifolia*), cinnamon fern (*Osmundastrum cinnamomeum*), sensitive fern (*Onoclea sensibilis*), green bull rush (*Scirpus atrovirens*), reed canary grass (*Phalaris arundinacea*), and sphagnum moss (*Sphagnum* spp.).

Wetlands in the ROW primarily consist of palustrine emergent (PEM) or palustrine scrub-shrub (PSS) systems that are seasonally saturated. Dominant species observed in the shrub layer include silky dogwood (*Cornus amomum*), glossy buckthorn (*Rhamnus frangula*), pussy willow (*Salix caprea*), highbush blueberry, red maple, meadowsweet, steeplebush, winterberry holly, gray birch, and speckled alder. The herbaceous layer contains a variety of species, including reed canary grass (*Phalaris arundinacea*), sensitive fern (*Onoclea sensibilis*), goldenrod (*Solidago* spp.), cinnamon fern, broadleaf cattail (*Typha latifolia*), poison ivy (*Toxicodendron radicans*), sphagnum moss, and bristly dewberry (*Rubus hispidus*).

Existing conditions along the Q171 and C196 Transmission Lines are discussed below by areas subject to jurisdiction under the Alteration of Terrain Law and Rules and consistent with discussions with the AoT Bureau for Eversource Line projects.

#### 3.1 AOT AREA A – TOWN OF GOFFSTOWN

Area A includes portions of the shared C196 and Q171 Transmission Line Right of Way (ROW) from Elm Street northerly to the Goffstown/Dunbarton town line. The total work area in this portion of the ROW is approximately 2.0 miles in length and a variable width from approximately 200 ft to 300-ft in width. This area includes upland and wetland areas with elevations ranging from approximately 270 feet above sea level (fasl) adjacent to C196 Structure 143 to 602 fasl adjacent to C196 Structure 111. This portion of the ROW is located in primarily forested undeveloped areas of Goffstown and abuts some residential areas. This area also lacks documented drainage structures in the proposed access route.



Land disturbance subject to Alteration of Terrain Law and Rules due to *Env-Wq 1502.58 (b) (2)* (see *Section 5.1.2* below) within Area A includes:

- Work pads associated with C196 Structures 91 to 96, 125 to 128, 130, 132 to 137, 141 to 143;
- Work pads associated with Q171 Structures 89 to 92, 104, 109 to 112, 117 to 124, 126, 128 to 130, 136, 137, 139; and
- Access from:
  - Elm Street to Q171 Structure 136;
  - Locust Hill Road to C196 Structures 137 and 130;
  - Kimberly Lane to C196 Structure 128 and Q171 Structure 117;

**3.1.1 Surface and Groundwater Protection – Area A**

There are two named watercourses (Harry Brook and Purgatory Brook) and two unnamed streams within this portion of the project area associated with Wetlands GW-33, GW-6, and GW-42 (see **Figure 3 – Surface Water and Groundwater Overlay Plans**). This portion of the project area includes temporary wetland matting in 15 wetland systems for access and work pad placement. A NHDES Statutory Permit by Notification (SPN) will be submitted for temporary wetland impacts for the proposed project in the Town of Goffstown. Temporary wetland matting totals are summarized in the table below. The AoT disturbance area is summarized in *Section 5.1.2*.

Temporary Matting	Impact (sq. ft.)
Wetland Matting	75,864

According to **Figure 3**, there are multiple portions of Area A that fall within AoT screening Areas:

- The area from C196 Structure 143 to Q171 Structure 136 is located within portions of the “Designated River Quarter Mile Buffer” and “All Lakes within a quarter-mile buffer;”
- The area from Locust Hill Road to C196 Structure 130 is located within portions of the “Surface Waters with Impairments (2016) Quarter Mile Buffer;”
- The area from Q171 Structure 124 to Q171 Structure 109 is located within portions of the “Surface Waters with Impairments (2016) Quarter Mile Buffer” and “Wellhead Protection Areas;” and
- The area from Q171 Structure 109 to the Goffstown/Dunbarton town line is located within the “Class A Surface Water (RSA 485 A9) Watersheds” screening layer.

Area A is not located within any of the additional AoT screening layers. These layers include “Outstanding Resource Water Watershed,” “Watersheds with Chloride Impairments 2016,” “Groundwater Classification Areas GA1,” “Groundwater Classification Areas GAA,” “Groundwater Classification Areas GA2,” and “Water Supply Intake Protection.”

**3.1.2 FEMA 100-year Floodplain, Shoreland Protection, Designated Rivers – Area A**

According to the FEMA Flood Insurance layer on **Figure 3**, a portion of Area A on the south side of Elm Steet is located within a mapped 100-year floodplain area. However, the proposed work is located within an existing and maintained corridor area adjacent to the road. According to the Consolidated List of Water Bodies Subject to RSA 483-B (May 11, 2020), there work is proposed within 250-ft of Glen Lake Shoreland Protected Zone. In accordance with the NHDES Designated River Corridor Web Map, C196 Structures 141 through 143 and Q171 Structures



136 through 139 and associated access and work pads are located within a quarter-mile of the Piscataquog River, protected under RSA 483.

**3.2 AOT AREA B – TOWN OF DUNBARTON**

Area B includes portions of the shared C196 and Q171 Transmission Line ROW from the Goffstown/Dunbarton town line northerly to C196 Structure 89. The total work area in this portion of the ROW is approximately 1.4 miles in length and an approximate width of 200-ft. Area B includes upland and wetland areas with elevations ranging from approximately 484 fasl adjacent to C196 Structure 93 to approximately 704 fasl at the proposed access between C196 Structures 72 and 73. This portion of the ROW is located in a primarily forested undeveloped areas in the Town of Dunbarton.

Land disturbance subject to Alteration of Terrain Law and Rules due to *Env-Wq 1502.58 (b) (2)* (see *Section 5.1.2* below) within Area B includes:

- Work Pads associated with C196 Structures 70 to 74, 88 to 90;
- Work Pads associated with Q171 Structures 73, 74, 78, 79, and 86 to 88; and
- Access from:
  - Goffstown/Dunbarton town line to C196 Structure 89;
  - C196 Structure 88 to Twist Hill Road; and
  - Twist Hill Road to the Dunbarton/Bow town line.

**3.2.1 Surface and Groundwater Protection – Area B**

There is one named stream (Purgatory Brook) within this portion of the project area associated with Wetland DW- 59 (see **Figure 3 – Surface Water and Groundwater Overlay Plans**). This portion of the project area includes temporary wetland matting in nine wetland systems for access and work pad placement. A NHDES SPN will be submitted for temporary wetland impacts for the proposed project in the Town of Dunbarton. Temporary wetland matting totals are summarized in the table below. AoT disturbance area is summarized in *Section 5.1.2*.

Temporary Matting	Impact (sq. ft.)
Wetland Matting	48,326

According to Figure 3, the entirety of Area B is located within the "Class A Surface Water (RSA 485 A9) Watersheds" screening layer. Area B is not located within any remaining screening layers. These layers include "Designated River quarter-mile buffer," "Surface Water with Impairments quarter-mile buffer," "Surface Water with Impairments quarter-mile buffer," "All Lakes within a quarter-mile buffer," "Outstanding Resource Water Watershed," "Water Supply Intake Protection Area," "Watersheds with Chloride Impairments 2016," "Wellhead Protection Areas," "Groundwater Classification Areas," and "Water Supply Intake Protection."

**3.2.2 FEMA 100-year Floodplain, Shoreland Protection, Designated Rivers – Area B**

According to the FEMA Flood Insurance layer on Figure 3, Area B is not located within a mapped 100-year floodplain area. According to the Consolidated List of Water Bodies Subject to RSA 483-B (May 11, 2020), there is no proposed work within the 250-ft of a protected shoreland. Based on the NHDES Designated River Corridor Web Map, there is no proposed work within a quarter-mile of a designated river protected under RSA 483.



**3.3 AOT AREA C – BOW**

Area C includes portions of the shared C196 and Q171 Transmission Line Right of Way (ROW) from the Dunbarton/Bow town line northerly to the C196 Structure 1. The total work area in this portion of the ROW is approximately 3.2 miles in length and a variable width from approximately 500-ft to 800-ft in width. Area C includes upland and wetland areas with elevations ranging from approximately 196 fasl adjacent to C196 Structure 1 to approximately 810 fasl adjacent to Q171 Structure 57. This portion of the ROW is located in a primarily forested undeveloped areas and rural residential areas in the Town of Bow.

Land disturbance subject to Alteration of Terrain Law and Rules due to *Env-Wq 1502.58 (b) (2)* (see *Section 5.1.2* below) within Area C includes:

- C196 Structures 1, 2, 4, 20 to 22, 37, 38, 47 to 49, 63 to 69;
- Q171 Structures 1, 3 to 5, 32 to 34, 39, 43, 44, 63, and 66 to 68; and
- Access from:
  - The Dunbarton/Bow town line to South Bow Road;
  - Woodhill Hooksett Road to C196 Structure 49;
  - C196 Structure 48 to Colby Lane;
  - Colby Lane to C196 Structure 47;
  - C196 Structure 46 to Abbey Road;
  - Abbey Road to C196 Structure 37;
  - Q171 Structure 34 to Bow Bog Road;
  - Morgan Drive to C196 Structure 20;
  - NH Route 3A to Q171 Structure 12;
  - NH Route 3A to Q171 Structure 5;
  - Q171 Structure 4 to River Road; and
  - An Unnamed Private Road to Q171 Structures 1 and 3 and C196 Structures 1, 1A, and 2.

**3.3.1 Surface and Groundwater Protection – Area C**

There is one unnamed stream within this portion of the project area associated with Wetland BW-1 (see **Figure 3 – Surface Water and Groundwater Overlay Plans**). This portion of the project area includes temporary wetland matting in 16 wetland systems for access and work pad placement. A NHDES SPN will be submitted for temporary wetland impacts for the proposed project in the Town of Bow. Temporary wetland matting totals are summarized in the table below. Aot disturbance area is summarized in *Section 5.1.2*.

Temporary Matting	Impact (sq. ft.)
Wetland Matting	139,006

According to Figure 3, a portion of Area C from the Dunbarton/Bow town line to South Bow Road is located within the "Class A Surface Water (RSA 485 A9) Watersheds" screening layer. Additionally, a portion of Area C from Q171 Structure 5 to the work pads associated with C196 and Q171 Structure 1 is located within the "Groundwater Classification Area GA2" screening layer. Area C is not located within any remaining screening layers, including



"Designated River quarter-mile buffer," "Wellhead Protection Area," "Outstanding Resource Water Watershed," "Water Supply Intake Protection Area," "Surface Water with Impairments quarter-mile buffer," "Class A Surface Water (RSA 485 A9) Watersheds," "Watersheds with Chloride Impairments 2016," "All Lakes within a quarter-mile buffer," and "Groundwater Classification Area GA1 or GAA."

### 3.3.2 FEMA 100-year Floodplain, Shoreland Protection, Designated Rivers – Area C

According to the FEMA Flood Insurance layer on Figure 3, a portion of Area C associated with the work pads for Q171 and C196 Structure 1 are located within a mapped 100-year floodplain area. According to the Consolidated List of Water Bodies Subject to RSA 483-B (May 11, 2020), there is no proposed work within the 250-ft of a protected shoreland. Based on the NHDES Designated River Corridor Web Map, there is no proposed work within a quarter-mile of a designated river protected under RSA 483.project description

## 3.4 STRUCTURE REPLACEMENT AND MAINTENANCE

As previously mentioned, the proposed project includes the replacement of 90 existing utility structures within AoT areas. The structures must be replaced due to environmental damage. The process for replacing structures consists of drilling approximately 4-ft diameter holes to install a caisson approximately 7 to 15 ft below the ground surface. New structures will be installed in caissons and backfilled with clean, suitable materials. Spoils produced from drilling will be disposed in approved upland areas at a minimum distance of 100 ft from wetland areas. Any disturbed upland and wetland areas will be restored or stabilized upon completion of work. Anchors will also be installed to stabilize new structures. Anchors will be installed by excavating trenches, installing the concrete block anchors, and backfilling trenches. Backfill for anchors in wetlands will consist of hydric soils to maintain hydric conditions in the soil.

Old structures will be typically removed in upland areas cut at the ground surface in wetlands. In addition to the removal of old structures, old cross-arms, wires, and accessory equipment will be removed off-Site and disposed. Old structure butts may be dug up and removed depending on field conditions and whether or not the remaining pole butt would impact the structural integrity of new structures.

### 3.4.1 Access

The proposed structure replacement project utilizes existing access routes within the existing C196 and Q171 ROW to the greatest extent practicable. The majority of existing access routes have been improved due to prior maintenance work or are comprised of dirt or grassy areas and are proposed to be improved as part of this project. Proposed access routes are shown on the plans in both **Figures 3 and 4**. Access into the existing ROW will be obtained from various state and local roadways and private properties where permission has been obtained. Proposed access routes, as shown on **Figures 3 and 4**, were identified to minimize ground disturbance to the greatest extent practicable while providing safe and efficient access to existing utility structures. Access through existing wetlands within the project area will be completed using temporary timber matting.

#### 3.4.1.1 Road Construction

Proposed access road improvements include 12- to 16-foot-wide gravel and stone roads with a 20-foot total width limit of disturbance. The roads will provide access to existing utility structures for routine maintenance activities. Improved access will provide reliable, permanent, and quick, efficient access to utility structures for future maintenance activities and when emergency repairs are required (see **Appendix E – Photo Log**).



#### 3.4.1.2 Wetland and Upland Temporary Matting

Access through existing wetlands in the project area will be completed using temporary timber matting to minimize and prevent rutting in the wetlands (see **Figure 4- Alteration of Terrain Permitting Plans**). In addition, upland matting may be used rather than improving access with gravel and stone if access is necessary through maintained property owner lawns or farm fields.

#### 3.4.2 Work Pad Construction

The proposed project includes the construction of 100-foot by 100-foot gravel work pads to stage construction equipment and vehicles necessary to replace utility structures. Work pads will be constructed using clean modified riprap (6- to 8-inch diameter) or equivalent stone. In addition, the work pad will be top-dressed with 1.5- to 3-inch diameter clean stone. Lastly, disturbed areas in proximity to the final work pad configuration will be stabilized with an upland seed mix. Upon completion of work, work pads will be reduced to a 30-foot by 60-foot gravel maintenance work pad. The restored portions of the larger gravel work pad will be seeded and mulched for restoration.

Proposed work pads in wetland areas will be constructed using temporary timber matting and removed upon completion of work.

### 3.5 CONSTRUCTION SEQUENCE

This proposed project is scheduled to begin in October 2022. The work is proposed to be undertaken during the fall and winter of 2022 into May 2023, following the receipt of all regulatory approvals. The following is a description of the anticipated construction sequence for this type of routine maintenance work. Once contractor(s) are scheduled, a more finalized sequence and schedule will be determined.

- 1) Install sediment and erosion controls in proposed locations, as shown in **Figure 4**.
- 2) Upgrade access routes and build work pads. Timber matting to be used in uplands and wetlands as designated by **Figure 4**.
- 3) Conduct drilling activities, including drilling of approximately 4-ft diameter holes for caisson placement, approximately 7-15-ft below ground surface.
- 4) Conduct structure replacement activities, including installation of new structures, removal of old structures, removal of old wire, and installation of OPGW wire.
- 5) Reduce 100-foot by 100-foot gravel work pads to 30-foot x 60-foot gravel work pads to remain after construction and apply seed and mulch to restored portions of gravel work pad.
- 6) Remove temporary timber matting and stabilized exposed soils within the ROW, and restore temporarily disturbed wetland areas with appropriate wetland seed mix, as necessary.
- 7) Remove erosion and sedimentation controls following stabilization.

### 3.6 BEST MANAGEMENT PRACTICES

Work will be conducted in accordance with Eversource's standard Best Management Practices (BMPs) as designated by the NHDES Best Management Practices Manual for Utility Maintenance in and Adjacent to Wetlands and Waterbodies in New Hampshire dated March 2019. By implementing these BMPs, impacts to both wetland and upland areas will be minimized and prevented to the greatest extent practicable.





Where necessary, perimeter protective measures consisting of a silt fence, straw wattle, mulch, and straw bales will be installed around the structures to minimize potential impacts to nearby resource areas. Water bars will be installed in areas of road improvements with steep slopes as identified by the Contractor. If necessary and based on localized Site conditions, a silt fence may be used. Disturbed soil will be seeded and mulched with hay or straw for stabilization as needed following completion of work. No equipment or material will be stored within wetland areas. Erosion controls will be implemented during construction as detailed in Note sheets 1 through 3 of **Figures 3 and 4** to minimize potential impacts during construction (see **Figure 3 – Surface Water and Groundwater Overlay Plans** and **Figure 4 – Alteration of Terrain Permitting Plans**).

Timber matting will be used in wetlands and in some upland areas to minimize impacts and provide level work pads. Upon completion of work where timber matting is implemented in upland areas, those upland areas will be restored and stabilized to pre-existing conditions, and areas of exposed soils will be seeded and/or mulched. Additionally, should any removal of BMPs be necessary, it will occur during restoration activities.

## 4.0 REGULATORY COMPLIANCE

### 4.1 ALTERATION OF TERRAIN

The NHDES requires an AoT permit whenever a project proposes to disturb more than 100,000 sq. ft. of terrain (50,000 sq. ft. if within a protected shoreland). This NHDES requirement, which is found in Administrative Rule Env- Wq-1500, is intended to protect New Hampshire surface waters by controlling soil erosion and managing stormwater runoff from developed areas. The project contains three AoT regulated areas (referred to respectively as Areas A, B, and C) along the C196 and Q171 Transmission Line ROWs based on continuous areas of disturbance. Details on impacts in each regulated area are provided below in *Section 5.1.2* Quantification of Impacts Subject to AoT.

#### 4.1.1 Waiver Request: Stormwater Drainage Report; Drainage Area Plan; Hydrologic Soil Group Plans (Env- WQ 15.09)

Per Env-Wq 1509.02, a waiver is being requested from the requirements to prepare a Stormwater Drainage Report, Drainage Area Plans, and Hydrologic Soil Group Plans because of the new impervious surface is limited to the footprint of new transmission line structures. It is not anticipated that the proposed structures will have a significant impact on- Site drainage patterns. Accordingly, stormwater treatment practices are not proposed. A formal waiver request is provided in **Appendix F**.

#### 4.1.2 Waiver Request: Measurement of Contiguous Area Disturbed; Inclusion of Plans (Env- WQ 1503.12)

Per Env-Wq 1503.12, a waiver is being requested for including past terrain disturbance in the measurement of contiguous disturbed area included in this Q171 and C196 Line AOT application. Existing terrain alteration associated with past transmission line maintenance within the Q171 and C196 ROWs is minimal. Any existing trails or access roads that may have been created within the last 10 years will be utilized and/or improved as part of this project and have been included in the current calculations within this application. Future disturbance beyond the scope of Q171 and C196 structure replacement project described in this application, is not known at this time. The project proposes to improve access routes and work pads around utility structures for the purpose of maintaining existing utility infrastructure. This project is necessary to maintain the safety and reliability of the electrical infrastructure. Project disturbances included in this application and subsequent permit approvals will be considered if future structure maintenance is proposed within the ROW. Eversource respectfully requests a waiver from including past disturbance in this application. A formal waiver request is provided in **Appendix F**.



4.1.3 Waiver Request: Deviation from the Approved Plans and Specifications (Env- WQ 1503.21)

Per Env-Wq 1503.21, a waiver is being requested for deviations from the approved plans without applying for an amended permit or a new permit if shifts in the proposed project layout occur. Changes in the project layout are frequently identified during construction by Eversource and their contractors and may be necessary to safely perform the work. Access shifts would be limited to the extent necessary for safety, would not impact new resources, and access would remain within the existing and maintained ROW. Eversource respectfully requests a waiver from limiting shifts of the project road centerlines and parking areas to 20 feet. A formal waiver request is provided in **Appendix F**.

4.1.4 Quantification of Impacts Subject to AOT

The project requires approximately 1,267,668 square feet (sq. ft.) of total impact, including 263,196 sq. ft. of temporary wetland matting, 8,254 sq. ft. of temporary upland matting, and 996,218 sq. ft. of ground disturbance along the C196 and Q171 Transmission Line ROW that requires an AoT permit in accordance with Env-Wq 1502.58. Specific areas and construction activities that significantly alter the terrain are detailed below. Additional details are shown in **Figure 4**.

<b><u>AoT Area A - Goffstown</u></b>	
Map Sheets 1 to 11	
<b>Disturbance Type</b>	<b>Impact (sq. ft)</b>
New Access	130,030
Gravel Work Pad	361,624
<b><u>Total AoT Disturbed Area</u></b>	<b><u>491,654</u></b>
-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10-year period, cumulatively exceeds 100,000 square feet of contiguous area or cumulatively exceeds 50,000 square feet of contiguous area if any portion of the disturbance is within the protected shoreland as defined in RSA 483-B"	
-Work pad dimensions: Up to 100-ft x 100-ft; Access road width: 16-ft	

<b><u>AoT Area B - Dunbarton</u></b>	
Map Sheets 11 to 17	
<b>Disturbance Type</b>	<b>Impact (sq. ft)</b>
New Access	69,891
Gravel Work Pad	156,816
<b><u>Total AoT Disturbed Area</u></b>	<b><u>226,707</u></b>
-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10-year period, cumulatively exceeds 100,000 square feet of contiguous area."	
-Work pad dimensions: Up to 100-ft x 100-ft; Access road width: 16-ft	





<b>AoT Area C - Bow</b>	
Map Sheets 17 to 31	
<b>Disturbance Type</b>	<b>Impact (sq. ft)</b>
New Access	17,702
Gravel Work Pad	260,155
<b><u>Total AoT Disturbed Area</u></b>	<b><u>277,857</u></b>
-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10-year period, cumulatively exceeds 100,000 square feet of contiguous area."	
-Work pad dimensions: Up to 100-ft x 100-ft; Access road width: 16-ft	

4.2 OTHER REGULATORY PROGRAMS

Other regulatory permits and notifications required for the proposed project are summarized below.

<b>Agency</b>	<b>Permit/Notification</b>	<b>Status</b>
<i>Local</i>		
Town of Bow	Conditional Use Permit	<i>Pending</i>
Town of Goffstown	Conditional Use Permit	<i>Pending</i>
Town of Goffstown	Temporary Driveway Permits	<i>Pending</i>
<i>State</i>		
NHDES	Statutory Permit by Notification	
	Town/City	SPN File No.
	Goffstown	TBD
	Dunbarton Bow	TBD TBD
		<i>Pending</i>
NHDES	Shoreland Permit by Notification	
	Waterbody/Town	PBN File No.
	Goffstown – Glen Lake	TBD
		<i>Pending</i>
NHDOT	Driveway Permits	<i>Pending</i>
<i>Federal</i>		
EPA (Construction General Permit)	Stormwater Pollution Prevention Plan (SWPPP)	<i>Pending</i>

The proposed project includes the replacement of 90 existing utility structures along the Q171 and C196 Transmission Lines that exceed AoT impact thresholds, including 46 structures along the C196 Transmission Line and 44 along the Q171 Transmission Line. This includes a total of approximately 996,218 sq. ft. of the impact associated with access improvements and work pad grading across three separate work areas broken out by Town.

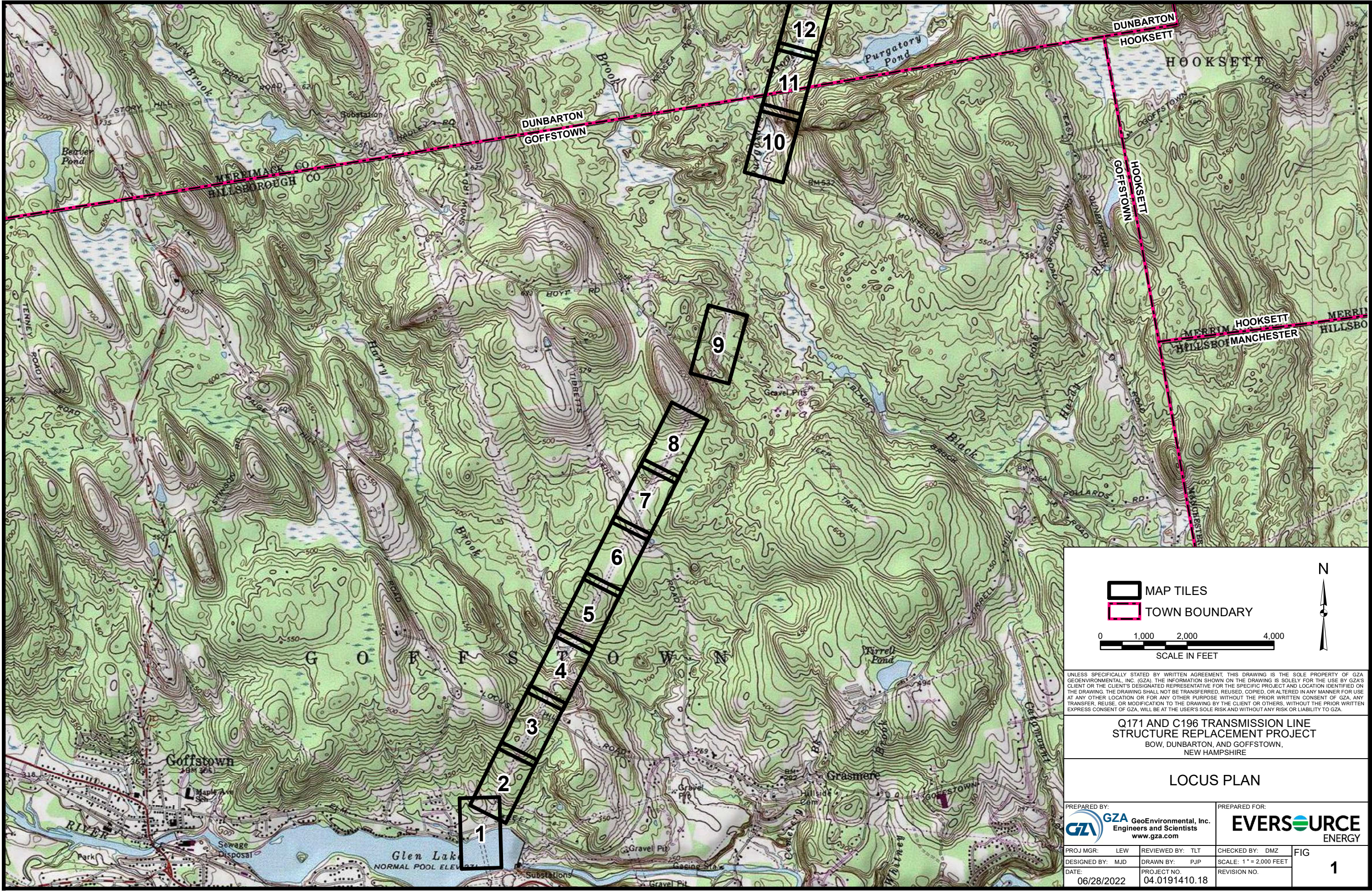
The proposed project is necessary for routine maintenance of the Q171 and C196 Transmission Lines and to ensure the long-term safety and reliability of the electrical infrastructure.



**Figure 1 – USGS Topographic Map**



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**MAP TILES**  
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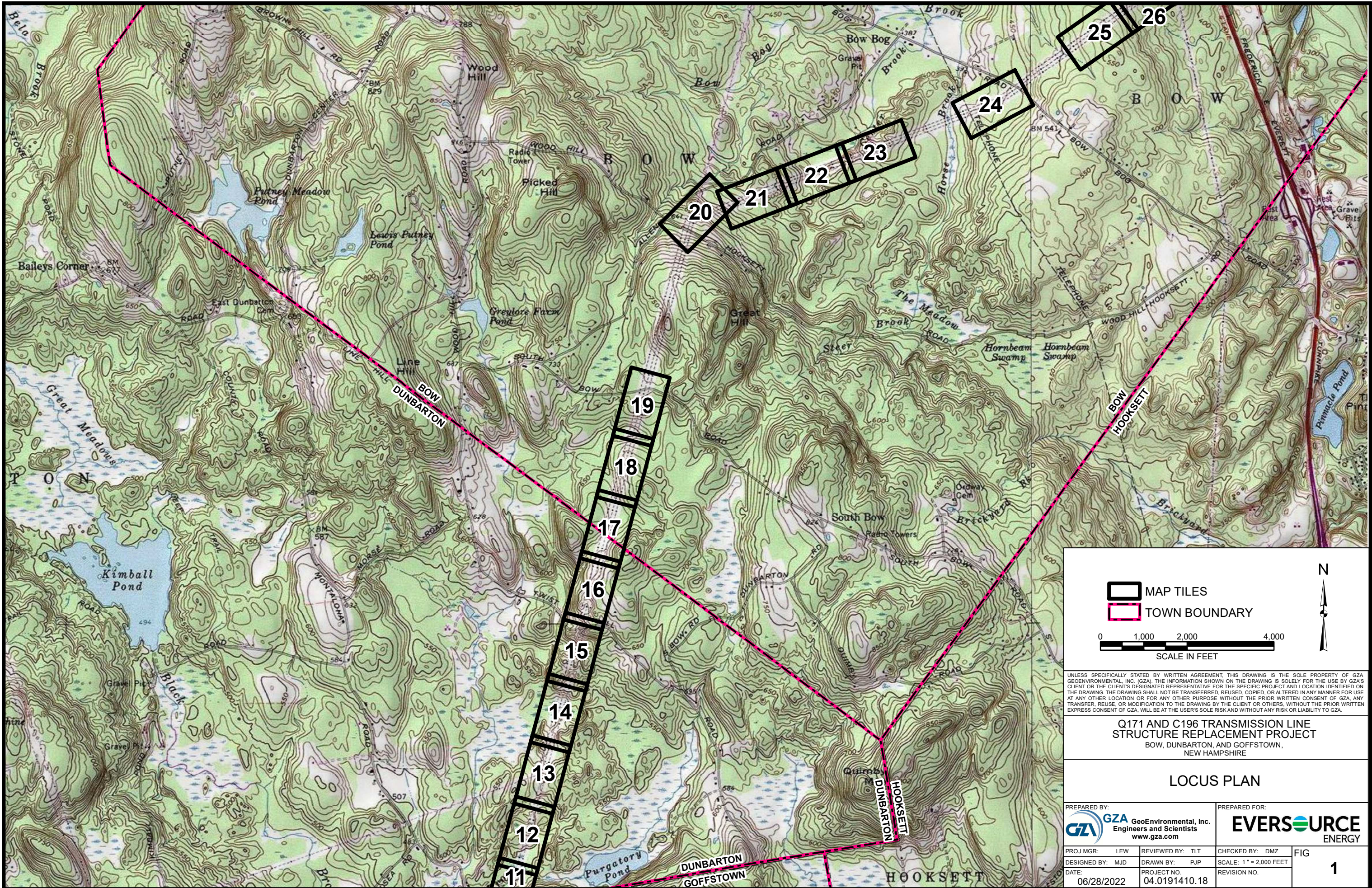
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**Q171 AND C196 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT**  
BOW, DUNBARTON, AND GOFFSTOWN,  
NEW HAMPSHIRE

**LOCUS PLAN**

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PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	FIG
DESIGNED BY: MJD	DRAWN BY: PJP	SCALE: 1" = 2,000 FEET	1
DATE: 06/28/2022	PROJECT NO: 04.0191410.18	REVISION NO.	





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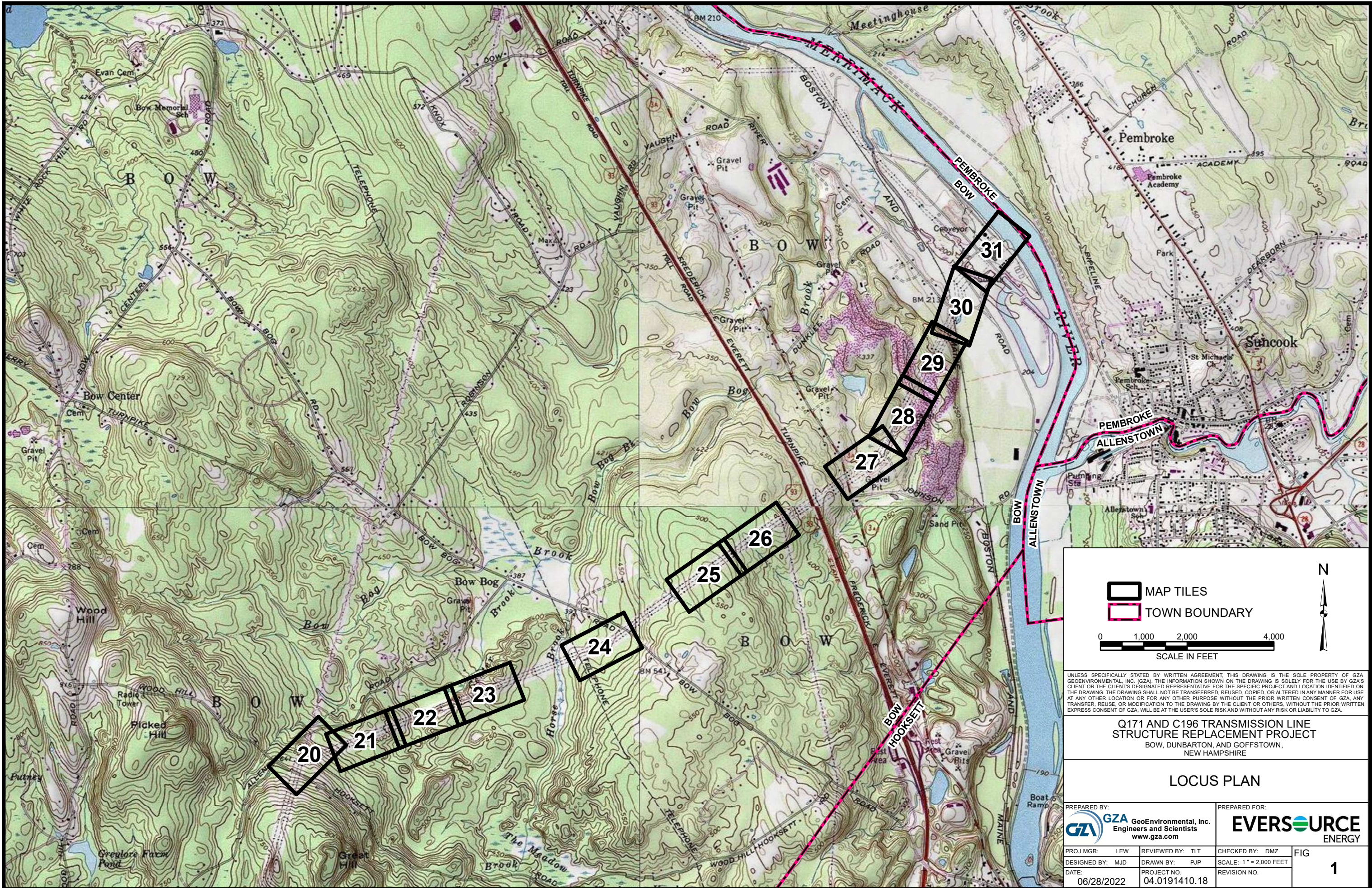
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Q171 AND C196 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT  
BOW, DUNBARTON, AND GOFFSTOWN,  
NEW HAMPSHIRE

LOCUS PLAN

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<b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		<b>EVERSOURCE</b> ENERGY	
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DESIGNED BY: MJD	DRAWN BY: PJP	SCALE: 1" = 2,000 FEET	1
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**Q171 AND C196 TRANSMISSION LINE  
 STRUCTURE REPLACEMENT PROJECT**  
 BOW, DUNBARTON, AND GOFFSTOWN,  
 NEW HAMPSHIRE

**LOCUS PLAN**

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PROJ MGR: LEW DESIGNED BY: MJD DATE: 06/28/2022	REVIEWED BY: TLT DRAWN BY: PJP PROJECT NO.: 04.0191410.18	CHECKED BY: DMZ SCALE: 1" = 2,000 FEET REVISION NO.	FIG <b>1</b>

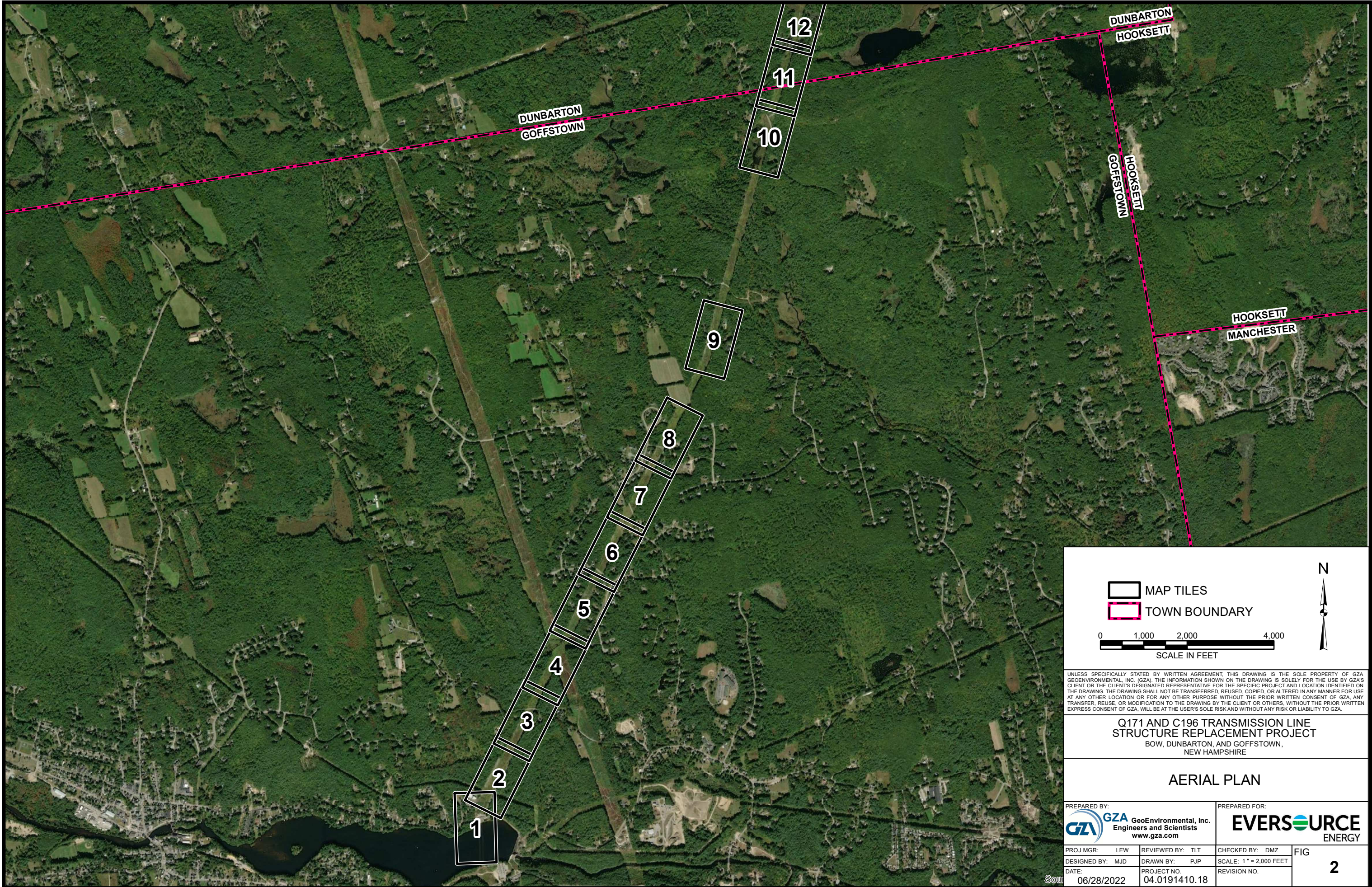




**Figure 2 – Orthophotograph Site Map**



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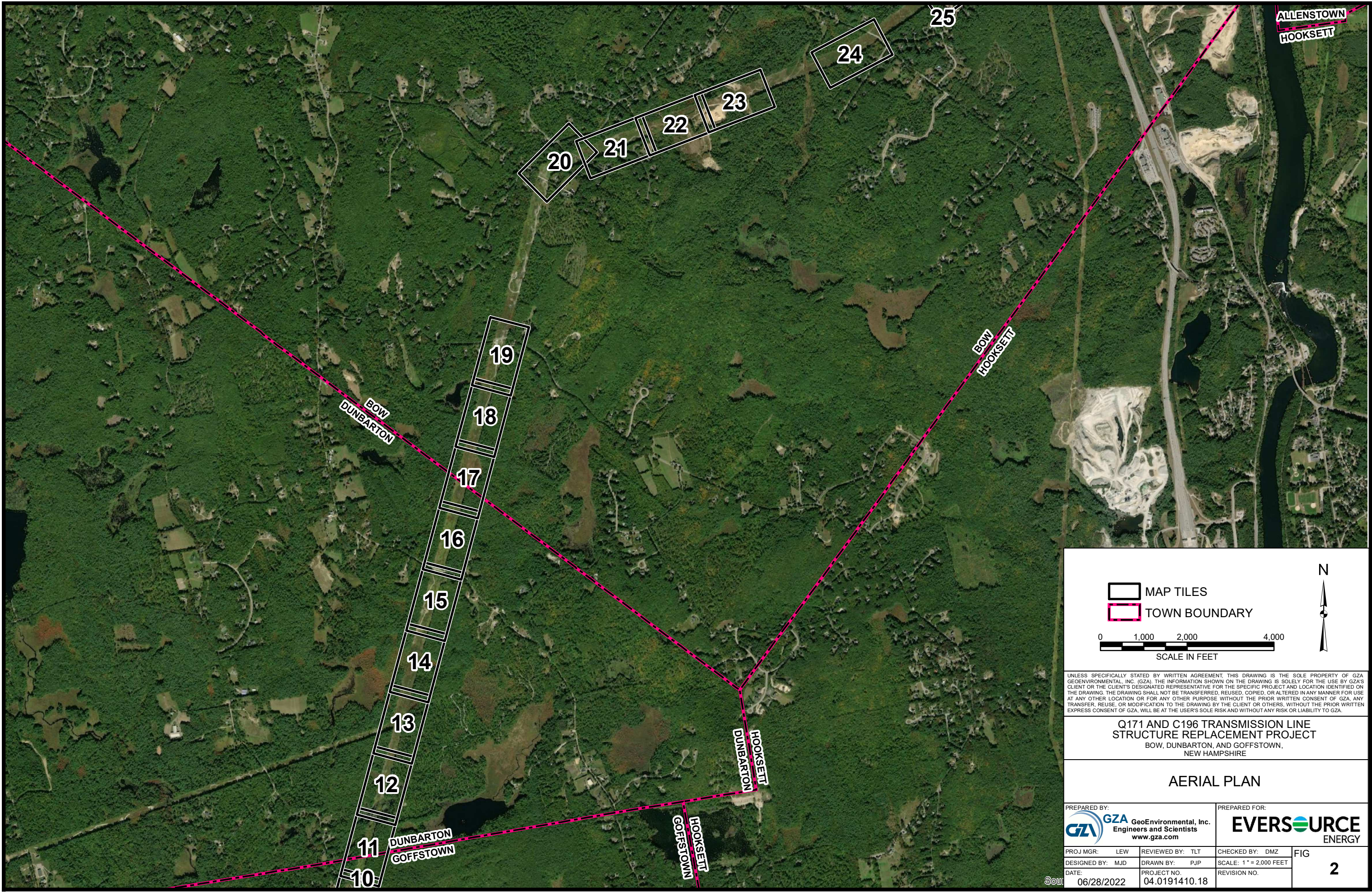
**Q171 AND C196 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT**  
BOW, DUNBARTON, AND GOFFSTOWN,  
NEW HAMPSHIRE

**AERIAL PLAN**

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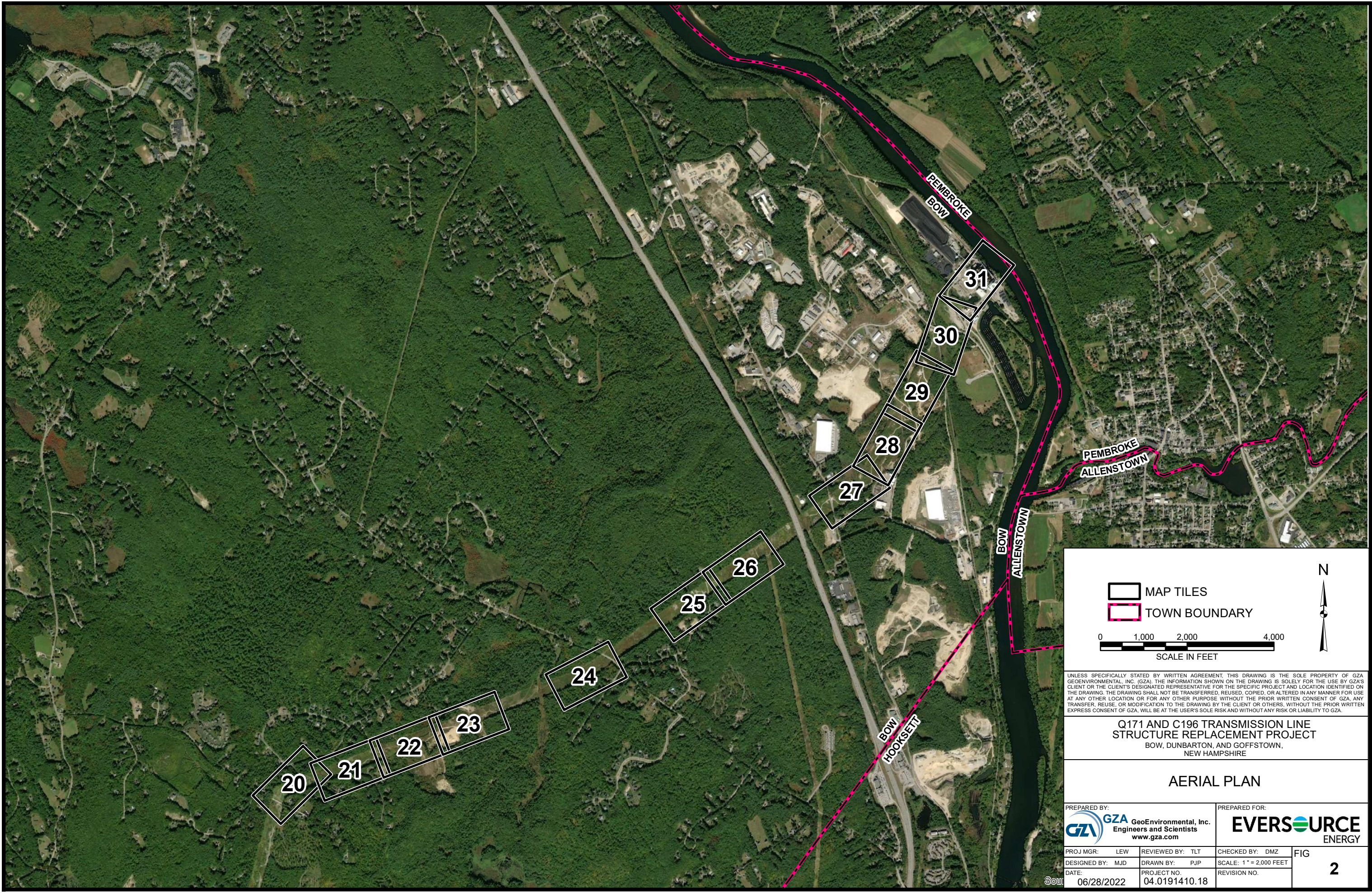
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**Q171 AND C196 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT**  
BOW, DUNBARTON, AND GOFFSTOWN,  
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**Q171 AND C196 TRANSMISSION LINE  
 STRUCTURE REPLACEMENT PROJECT**  
 BOW, DUNBARTON, AND GOFFSTOWN,  
 NEW HAMPSHIRE

**AERIAL PLAN**

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DATE: 06/28/2022	PROJECT NO: 04.0191410.18	REVISION NO.	





**Figure 3 – Surface Water and Groundwater Overlay Plans**

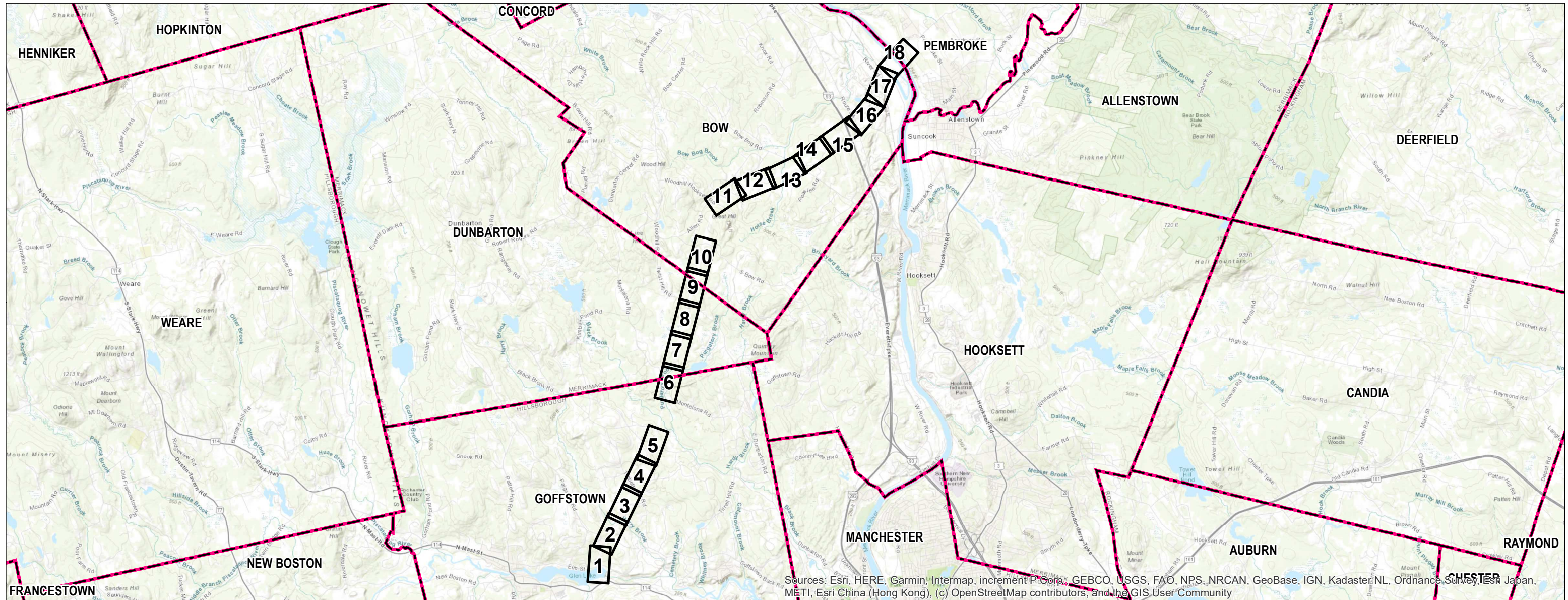


# C196 & Q171 Transmission Line - Structure Replacement Project

GOFFSTOWN, DUNBARTON, AND BOW, NEW HAMPSHIRE

Alteration of Terrain Water Resources Planset

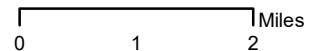
Date: June 28, 2022



PREPARED FOR:



13 Legends Drive  
Hooksett, NH 03106



INDEX OF FIGURES

Title Sheet / Index Map  
Map Sheets 1-18  
Note Sheets 1-3

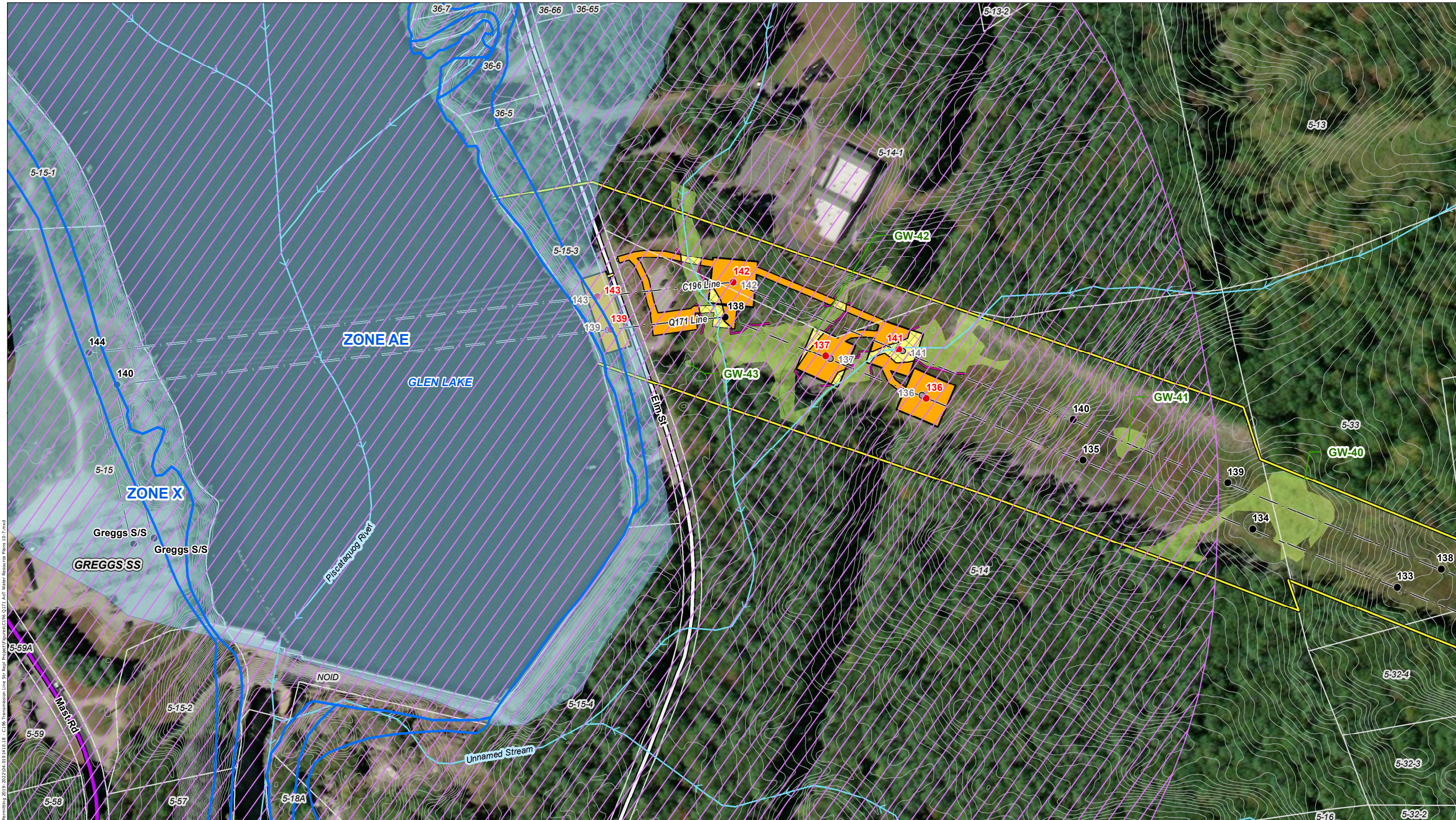
NO.	DATE	REVISIONS

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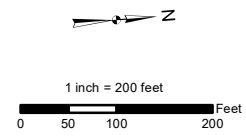
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- ▲ Local Potential Contamination Sources
- FEMA Special Flood Hazard Area
- Outstanding Resource Water (None Present)
- Designated River Quarter Mile Buffer
- Wellhead Protection Areas
- Watersheds with Chloride Impairments 2016
- Surface Waters with Impairments 2016 with Quarter Mile Buffer
- Water Supply Intake Protection Areas
- All Lakes with a Quarter Mile Buffer
- Groundwater Classification Area GAA (None Present)
- Groundwater Classification Area GA1 (None Present)
- Groundwater Classification Areas GA2
- Class A Surface Waters RSA 485A9
- PROPOSED STRUCTURE REPLACEMENT
- EXISTING STRUCTURE - NO PROPOSED WORK
- EXISTING STRUCTURE TO BE REPLACED
- NHD FLOWLINES
- EXISTING TRANSMISSION LINE
- APPROXIMATE ROW
- RAILROAD
- TEMPORARY UPLAND MATTING
- PARCEL BOUNDARY
- EVERSOURCE OWNED PARCEL
- AOT IMPACT AREA
- TEMPORARY WETLAND MATTING
- PROPOSED ACCESS
- EXISTING ACCESS
- OFF-ROW/SECONDARY ACCESS
- TOWN MAINTAINED ROAD
- STATE MAINTAINED ROADS
- PRIVATE ROAD
- WORK PAD
- EROSION AND SEDIMENT CONTROL
- TOWN BOUNDARY
- 2FT ELEVATION CONTOURS
- FIELD DELINEATED WETLAND

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NO.	DATE	REVISIONS

**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**

**Surface and Groundwater Overlay Plans**

Goffstown, NH      MAP SHEET

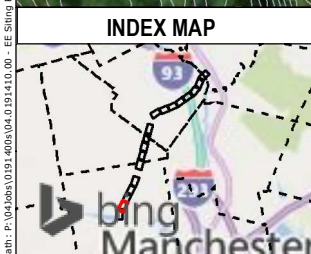
Date: June, 2022

**1 OF 18**



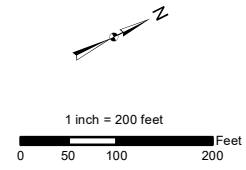


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NO.	DATE	REVISIONS

**EVERSOURCE**  
ENERGY

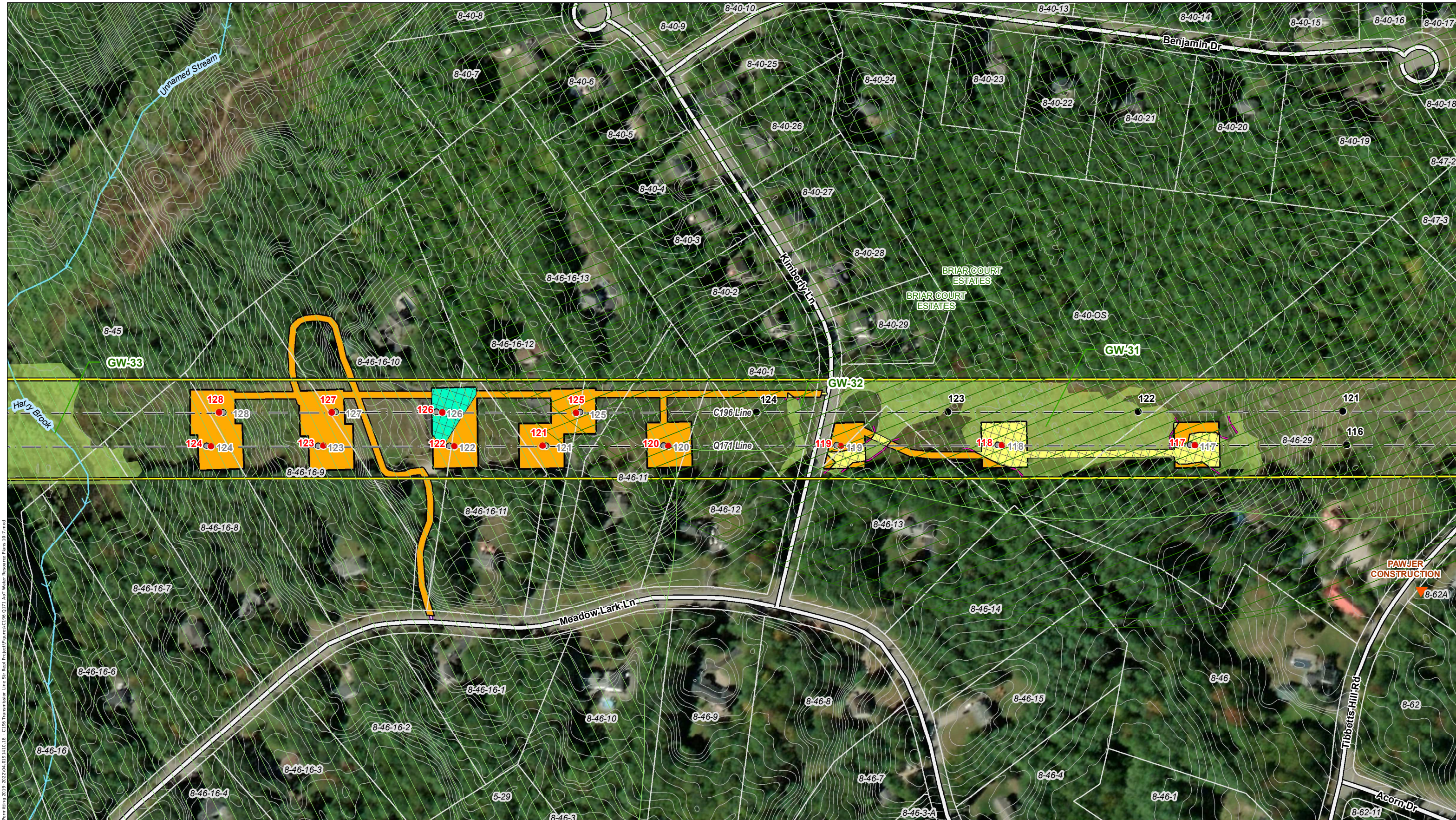
**C196 and Q171 Transmission Line  
Structure Replacement Project  
Surface and Groundwater Overlay Plans**

Goffstown, NH      MAP SHEET

Date: June, 2022

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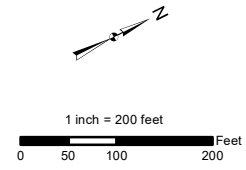


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**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line  
Structure Replacement Project  
Surface and Groundwater Overlay Plans**

Goffstown, NH	MAP SHEET
Date: June, 2022	<b>3 OF 18</b>



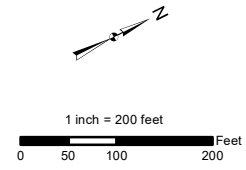


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**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**

**Surface and Groundwater Overlay Plans**

Goffstown, NH	MAP SHEET
Date: June, 2022	4 OF 18



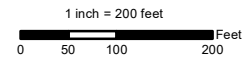


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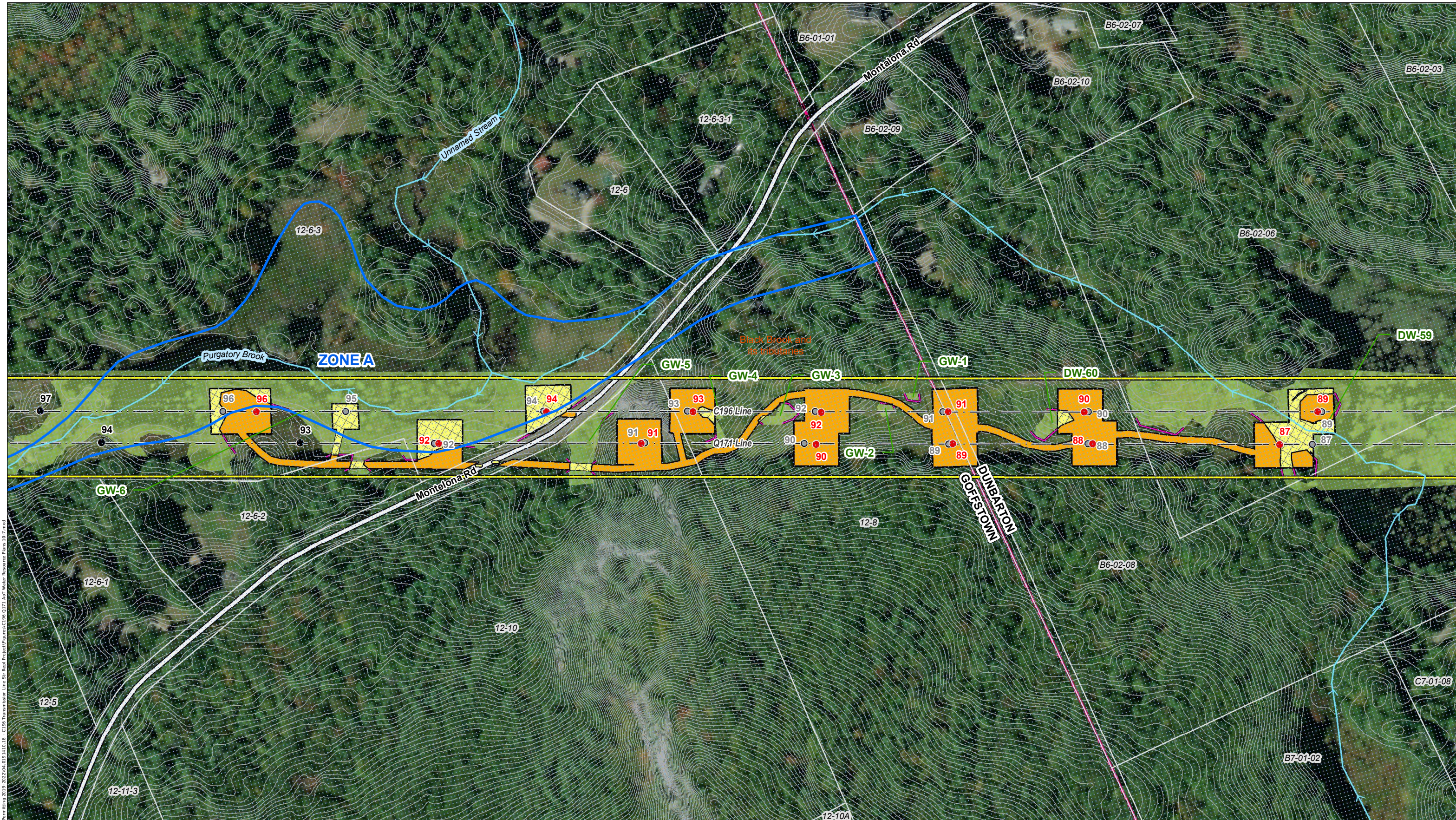
**C196 and Q171 Transmission Line  
Structure Replacement Project  
Surface and Groundwater Overlay Plans**

Goffstown, NH      MAP SHEET

Date: June, 2022

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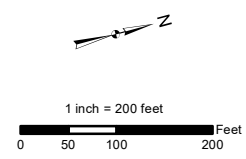


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**C196 and Q171 Transmission Line  
 Structure Replacement Project  
 Surface and Groundwater Overlay Plans**

Goffstown/Dunbarton, NH    MAP SHEET

Date: June, 2022

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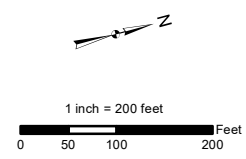


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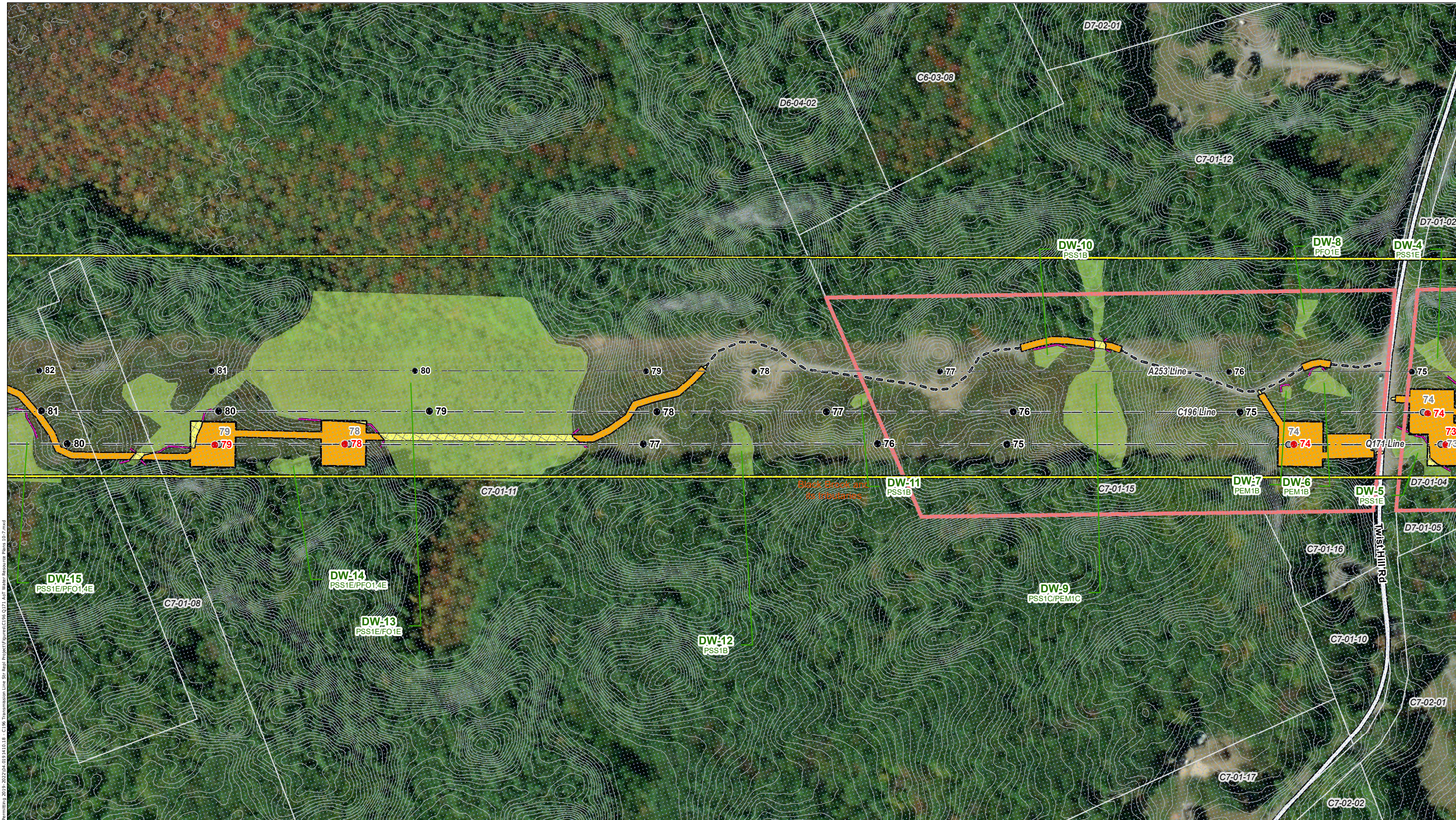


NO.	DATE	REVISIONS

**C196 and Q171 Transmission Line Structure Replacement Project**  
Surface and Groundwater Overlay Plans

Dunbarton, NH	MAP SHEET
Date: June, 2022	7 OF 18



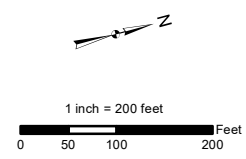


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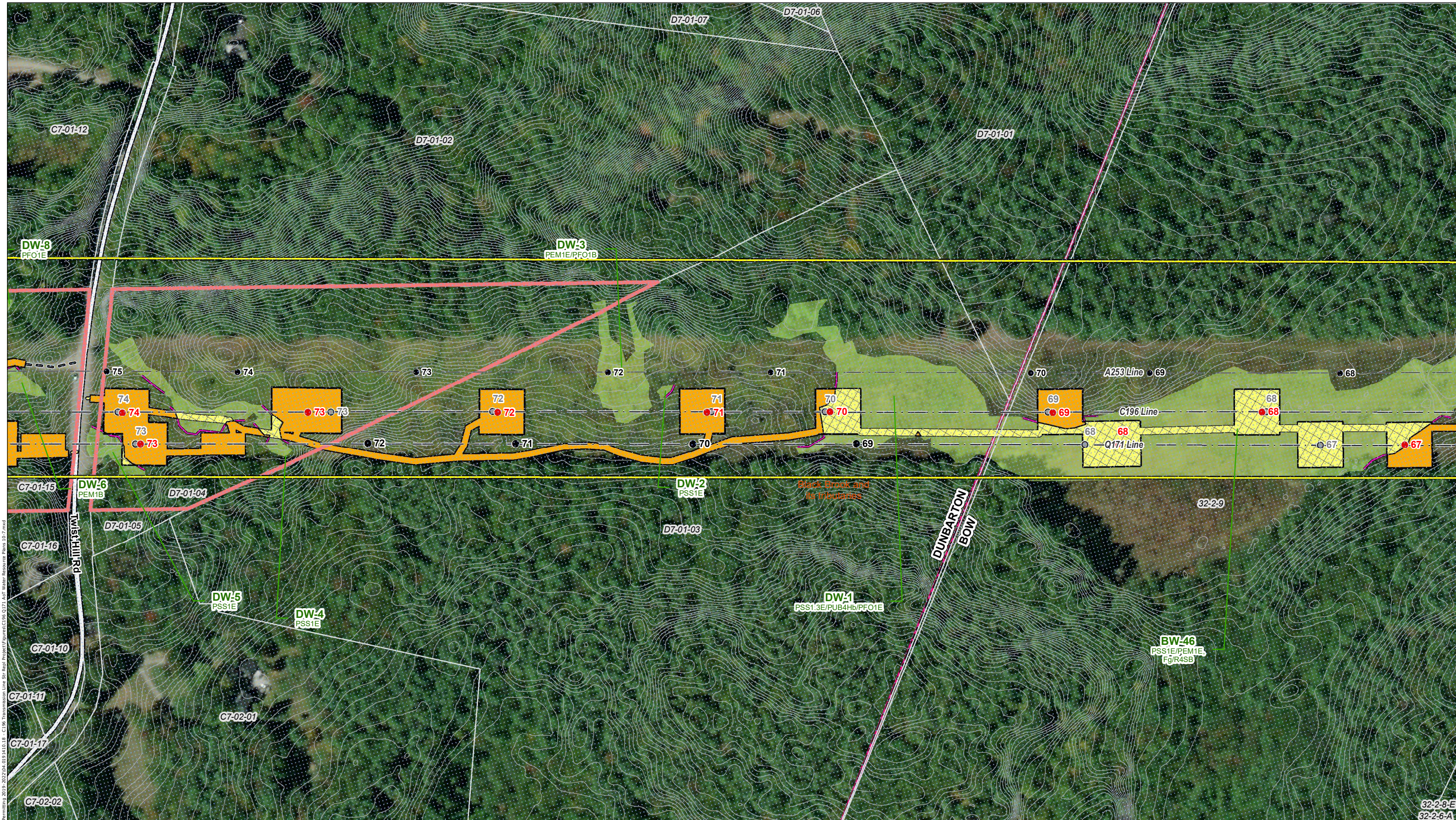
NO.	DATE	REVISIONS

**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**  
**Surface and Groundwater Overlay Plans**

Dunbarton, NH	MAP SHEET
Date: June, 2022	<b>8 OF 18</b>



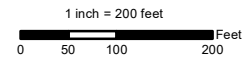


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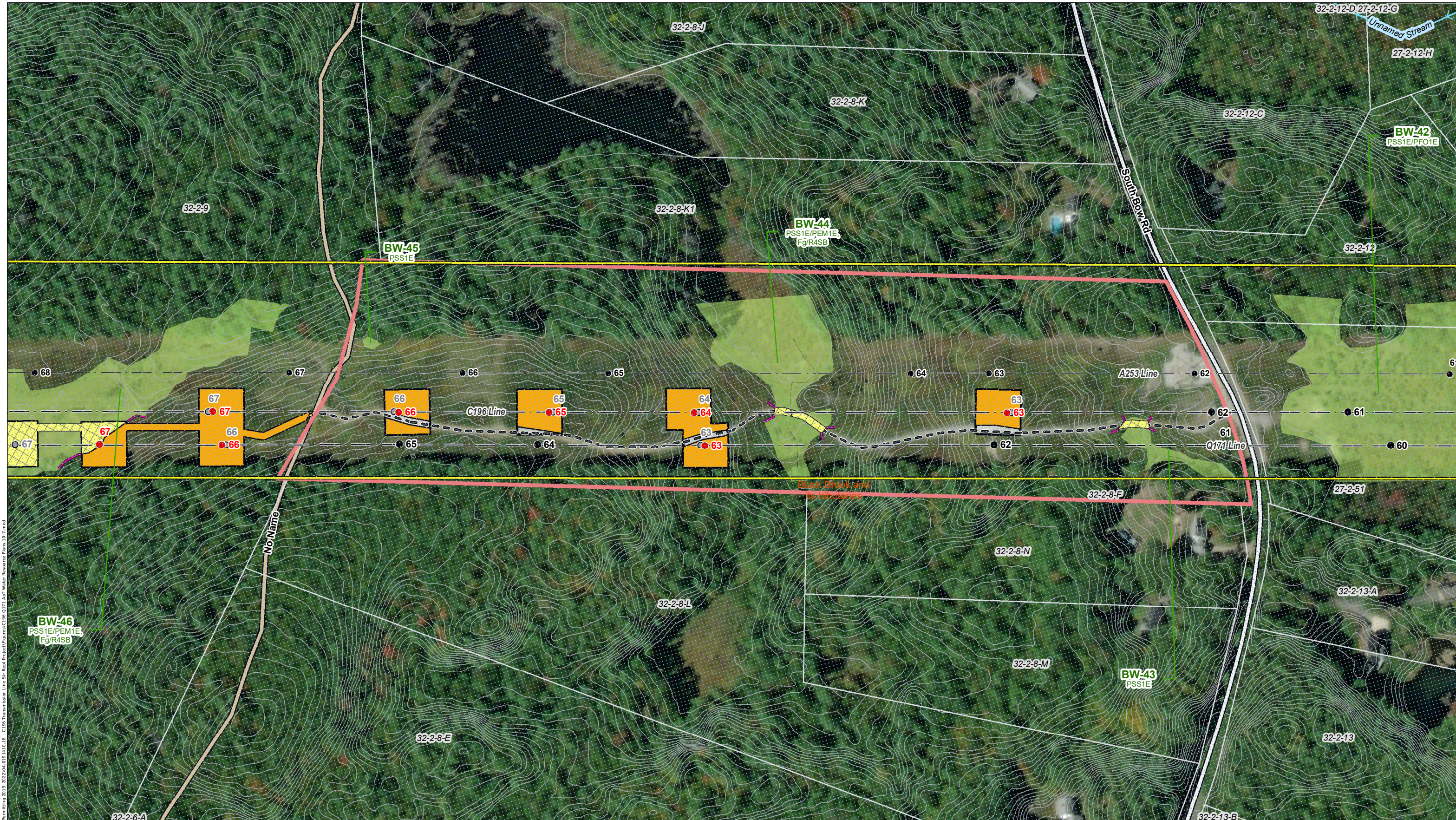
**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project Surface and Groundwater Overlay Plans**

Dunbarton/Bow, NH	MAP SHEET
Date: June, 2022	<b>9 OF 18</b>

32-2-8-E  
32-2-6-A



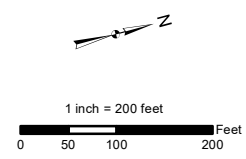


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NO.	DATE	REVISIONS

**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project Surface and Groundwater Overlay Plans**

Bow, NH      MAP SHEET

Date: June, 2022      **10 OF 18**





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**INDEX MAP**

**Legend:**

- Local Potential Contamination Sources
- FEMA Special Flood Hazard Area
- Outstanding Resource Water (None Present)
- Designated River Quarter Mile Buffer
- Wellhead Protection Areas
- Watersheds with Chloride Impairments 2016
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1 inch = 200 feet  
0 50 100 200 Feet

NO.	DATE	REVISIONS

**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project Surface and Groundwater Overlay Plans**

Bow, NH

Date: June, 2022

MAP SHEET

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NO.	DATE	REVISIONS

**C196 and Q171 Transmission Line  
Structure Replacement Project  
Surface and Groundwater Overlay Plans**

Bow, NH      MAP SHEET

Date: June, 2022      **12 OF 18**





- PROPOSED STRUCTURE REPLACEMENT
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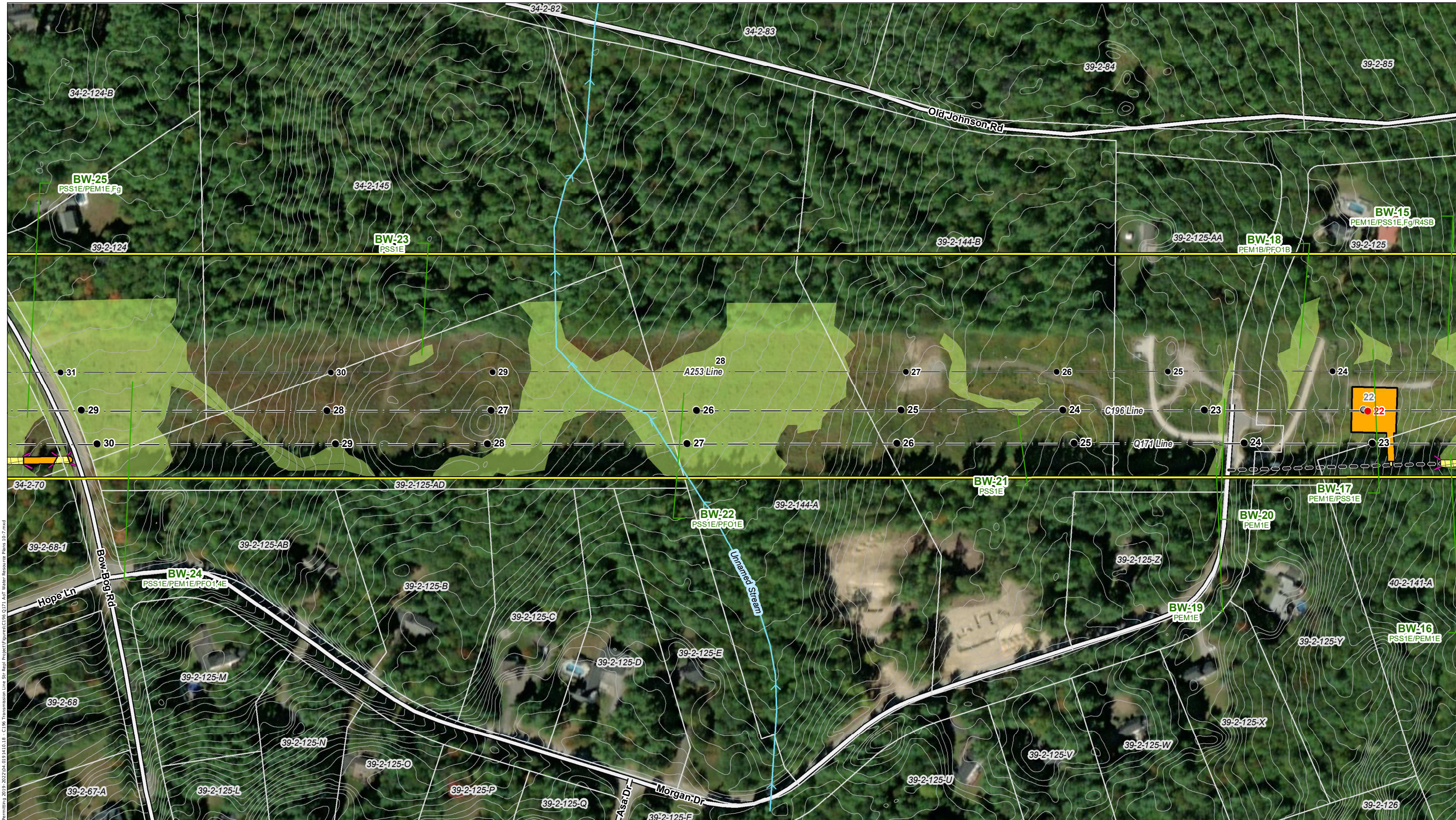
**C196 and Q171 Transmission Line Structure Replacement Project**

**Surface and Groundwater Overlay Plans**

Bow, NH	MAP SHEET
Date: June, 2022	13 OF 18

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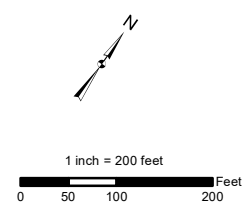


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NO.	DATE	REVISIONS

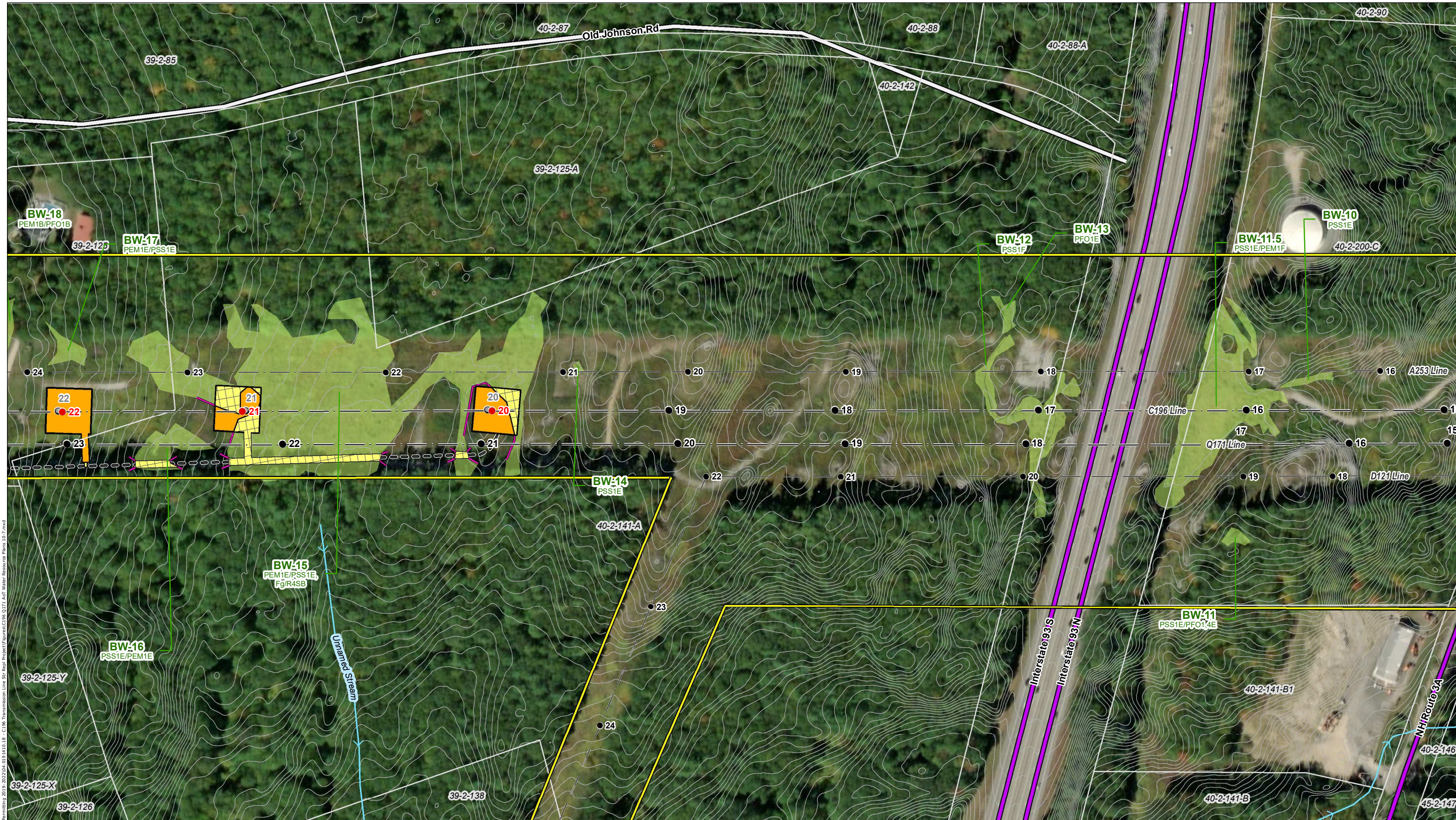
**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**

**Surface and Groundwater Overlay Plans**

Bow, NH	MAP SHEET
Date: June, 2022	14 OF 18



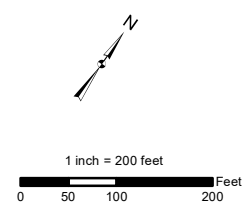


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**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**

**Surface and Groundwater Overlay Plans**

Bow, NH		MAP SHEET
Date: June, 2022		15 OF 18





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1 inch = 200 feet

NO.	DATE	REVISIONS

**C196 and Q171 Transmission Line Structure Replacement Project Surface and Groundwater Overlay Plans**

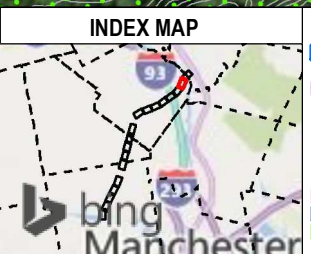
Bow, NH      MAP SHEET

Date: June, 2022      **16 OF 18**



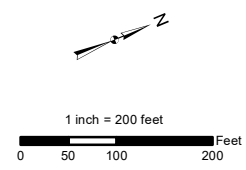


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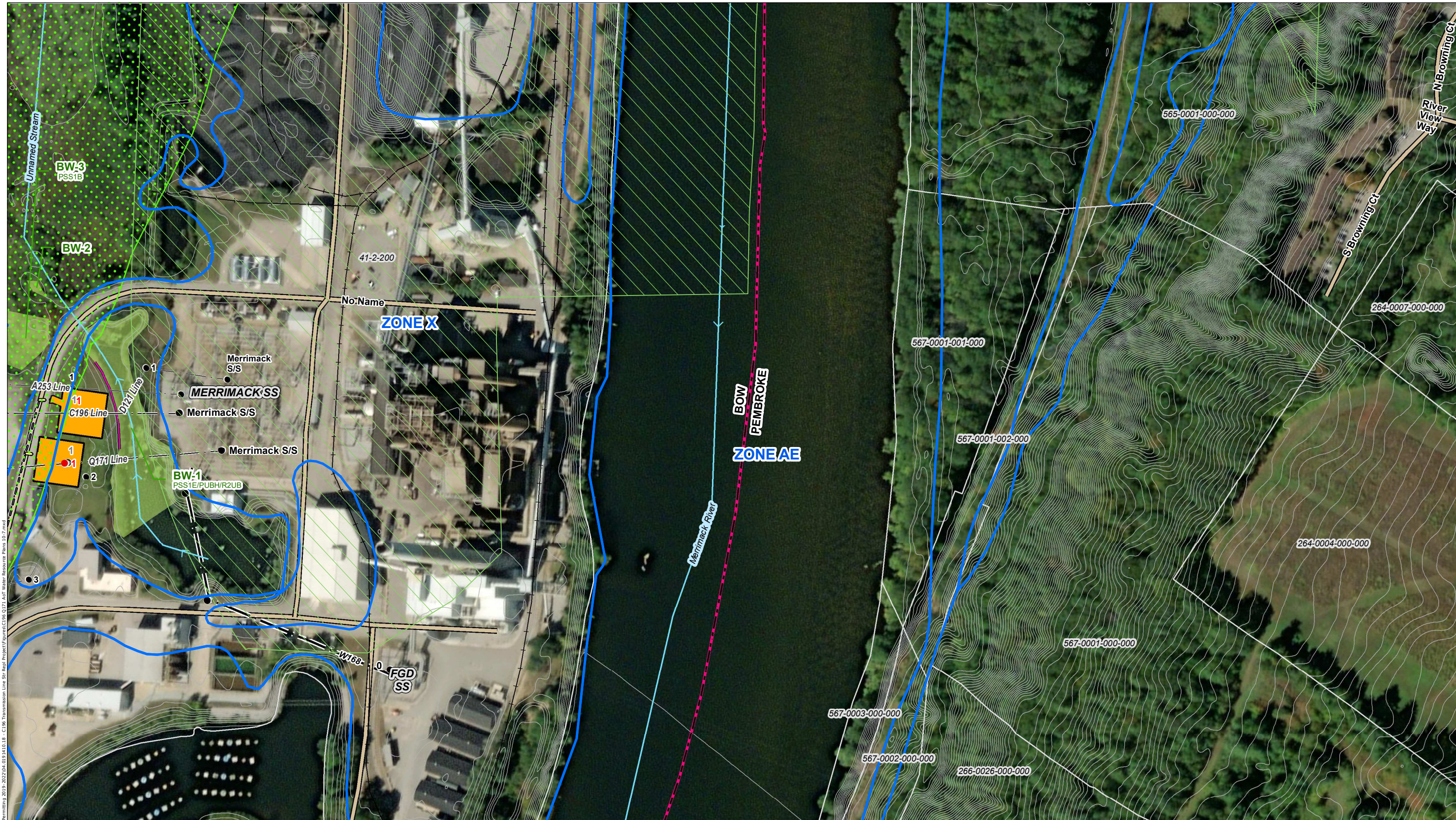
**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**

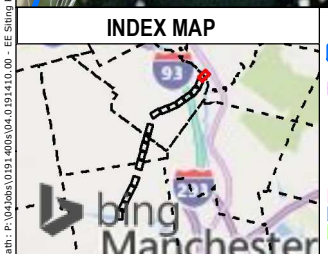
**Surface and Groundwater Overlay Plans**

Bow, NH	MAP SHEET
Date: June, 2022	17 OF 18



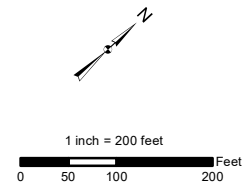


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**EVSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project Surface and Groundwater Overlay Plans**

Bow/Pembroke, NH      MAP SHEET

Date: June, 2022

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CONSTRUCTION SEQUENCE:

1. WETLAND BOUNDARIES TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.
2. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAIL PROVIDED, AS NECESSARY, AND CONSISTENT WITH THE NHDES MARCH 2019 BMP MANUAL FOR UTILITY MAINTENANCE.
3. WETLAND IMPACTS ASSOCIATED WITH WETLAND CROSSINGS ARE REQUIRED FOR ACCESS BETWEEN STRUCTURES WITHIN THE RIGHT OF WAY.
4. ADEQUATE PRECAUTION SHALL BE EXERCISED TO AVOID SPILLAGE OF FUEL OILS, CHEMICALS, OR SIMILAR SUBSTANCES; NO FUELS, LUBRICANTS, CHEMICALS OR SIMILAR SUBSTANCES SHALL BE STORED BENEATH TREES OR IN THE VICINITY OF ANY WETLANDS, RIVER, STREAM OR OTHER BODY OF WATER; OR IN THE VICINITY OF NATURAL OR MAN-MADE CHANNELS LEADING THERETO. NO POWER EQUIPMENT SHALL BE STORED, MAINTAINED, OR FUELED IN ANY AREA ADJACENT TO A WETLAND, RIVER, STREAM OR OTHER BODY OF WATER.
5. REMOVE COMPLETELY ALL CONTAMINATION FROM ANY SPILLAGE OF CHEMICALS OR PETROLEUM PRODUCT WITH COMPLETE REHABILITATION OF THE AFFECTED AREA.
6. ACCESS ROUTES HAVE BEEN SELECTED TO PREVENT DEGRADATION OF THE RIGHT-OF-WAY AND MINIMIZE ENVIRONMENTAL IMPACT. OPERATIONS SHALL BE CONFINED TO THE SPECIFIED ACCESS ROUTES WITHIN THE PROPOSED WETLAND IMPACT AREA. ACCESS ROUTES SHALL NOT EXCEED A 16 FOOT-WIDTH.
7. IMPACT TO VEGETATION WITHIN WETLANDS WILL BE LIMITED TO THE EXTENT NECESSARY TO PLACE THE SWAMP MATS WHERE REQUIRED.
8. LOW GROWING VARIETIES OF VEGETATION ADJACENT TO WETLANDS SHALL BE PRESERVED TO THE EXTENT POSSIBLE. STUMPS AND ROCKS SHALL NOT BE REMOVED, AND THERE SHALL BE NO EXCAVATIONS, FILLS OR GRADING DONE ADJACENT TO WETLANDS, UNLESS MINOR EXCAVATIONS IS NEEDED FOR ACCESS.
9. TIMBER MATS AND PERIMETER CONTROLS WILL BE USED ALONG ACCESS ROUTES AND WORK PADS WITHIN WETLAND AREAS. THESE MATS ARE CONSTRUCTED OF HEAVY TIMBERS OR COMPOSITE MATERIAL, BOLTED TOGETHER, AND ARE PLACED END-TO-END IN THE WETLAND TO SUPPORT HEAVY EQUIPMENT. ALL SWAMP MATS SHALL BE PLACED AND REMOVED SO AS NOT TO CAUSE ANY RUTS, CHANNELS OR DEPRESSIONS, OR OTHERWISE CAUSE ANY UNDUE DISTURBANCE TO WETLANDS.
10. IF TIMBER MAT BMP IS NOT SUFFICIENT DUE TO HIGH WATER, ADDITIONAL BMP'S MAY INCLUDE THE PLACEMENT OF GEOTEXTILE FABRIC, 3"-4" STONE, AND GRAVEL TO PROVIDE A SUITABLE ROAD BED. A TEMPORARY CULVERT MAY BE REQUIRED IN AREAS OF HIGH FLOW TO MAINTAIN HYDROLOGIC CONNECTIVITY. ALL MATERIAL WILL BE REMOVED FROM JURISDICTIONAL AREAS AFTER CONSTRUCTION COMPLETION.
11. NO MATERIAL SHALL BE PLACED IN ANY LOCATION OR IN ANY MANNER SO AS TO IMPAIR SURFACE WATER FLOW INTO, THROUGH OR OUT OF ANY WETLAND AREA. NO INSTALLATION SHALL CREATE AN IMPOUNDMENT THAT WILL IMPEDE THE FLOW OF WATER OR CAUSE FLOODING.
12. NO MATERIAL SHALL BE TAKEN FROM THE WETLANDS AREA EXCEPT THAT WHICH MUST NECESSARILY BE REMOVED FOR THE STRUCTURE OR FOUNDATION PLACEMENT OR STABILIZATION. ALL EXCESS MATERIAL TAKEN FROM THE WETLAND WILL BE REMOVED FROM THE SITE.
13. ANY PROPOSED SUPPORT FILLS SHALL BE CLEAN GRAVEL AND STONE, FREE OF WASTE METAL PRODUCTS, ORGANIC MATERIALS AND SIMILAR DEBRIS AND SHALL NOT EXCEED THE AMOUNT PERMITTED. THIS ALLOWABLE FILL IS THE ONLY FILL THAT MAY REMAIN IN THE WETLAND AFTER CONSTRUCTION. ALL CUT AND FILLS SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
14. INSTALL NEW POLES IN THE LOCATIONS DESIGNATED ON THE PERMITTING PLANS.
15. CABLE INSTALLATION WILL BE PERFORMED IN A MANNER SO AS TO AVOID, OR LIMIT TO THE MAXIMUM EXTENT POSSIBLE, TRAVERSING WETLANDS WITH HEAVY EQUIPMENT. IN SOME CASES, A HELICOPTER MAY BE USED DURING THE INSTALLATION TO MINIMIZE IMPACTS.
16. REMOVAL OF THE OLD POLE WILL OCCUR ONCE THE CABLE HAS BEEN INSTALLED ON THE NEW STRUCTURE. THE OLD STRUCTURES WILL BE REMOVED FROM THE SITE. POLES WILL BE CUT AT THE GROUND SURFACE. FOOTINGS WILL BE ABANDONED IN PLACE TO MINIMIZE IMPACTS.
17. ALL TIMBER MATS, MATERIAL, AND DEBRIS WILL BE REMOVED FROM THE WORK AREA UPON THE COMPLETION OF CONSTRUCTION.
18. UPLAND DISTURBED AREAS SHALL BE RESTORED AND STABILIZED UPON COMPLETION OF CONSTRUCTION. WORK PAD RESTORATION SHOULD INCLUDE REDUCING THE WORK PAD TO A 30 BY 60 FOOT AREA, AND REDUCING SLOPES TO A MAXIMUM OF 25%. STOCKPILED MATERIAL SHOULD BE SPREAD TO REDUCE ANY UNNECESSARY SLOPES. GRAVEL WORK PADS AND SLOPES SHOULD BE SCARIFIED TO A MINIMUM OF 3" BEFORE SPREADING TOPSOIL/LOAM.
19. ALL TEMPORARY WETLAND IMPACTS WILL BE RE-GRADED TO ORIGINAL CONTOURS FOLLOWING CONSTRUCTION. NEW ENGLAND EROSION CONTROL/RESTORATION MIX, AVAILABLE THROUGH NEW ENGLAND WETLAND PLANTS, INC., 820 WEST STREET, AMHERST, MA 01002, 413-548-8000, OR EQUIVALENT SEED MIX SHALL BE APPLIED IN WETLAND AREAS THAT ARE NOT INUNDATED, AS NECESSARY.
20. MULCH USED FOR STABILIZATION SHALL CONSIST OF SEEDLESS STRAW.
21. SEDIMENT AND EROSION CONTROL MEASURES WILL BE EVALUATED AND REMOVED IF NECESSARY UPON THE COMPLETION OF CONSTRUCTION.
22. COMMERCIAL LOAM WILL NOT BE USED AS PART OF RESTORATION. ONLY IN-SITU TOPSOIL WILL BE USED TO RESTORE DISTURBED AREAS.
23. WHERE OPTIMAL TURTLE BREEDING AREAS OVERLAP WITH DISTURBANCE (AS DETERMINED BY AN ENVIRONMENTAL MONITOR), MINERAL SOILS WILL BE SCARIFIED TO ALLEVIATE COMPACTION AND BECOME MORE SUITED FOR TURTLE BREEDING.
24. NATURALLY VEGETATED LOCAL WETLAND BUFFER AREAS OUTSIDE OF EXISTING TRAILS MUST BE RESTORED UPON COMPLETION OF WORK.

WINTER CONSTRUCTION NOTES

1. PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED. STABILIZATION METHODS SHALL INCLUDE SEEDING AND MULCH, AND INSTALLATION OF EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE TEMPORARILY STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.

3. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL (NHDOT 304.3).

GENERAL NOTES:

OWNER: EVERSOURCE ENERGY  
13 LEGENDS DRIVE  
HOOKSETT, NH 03106

1. BASE PLAN PROVIDED BY EVERSOURCE ENERGY. EVERSOURCE ENERGY PROVIDED THE WETLAND DATA. EVERSOURCE ENERGY PROVIDED THE UTILITY DESIGN.
2. JURISDICTIONAL WETLANDS WERE CONFIRMED BY GZA GEOENVIRONMENTAL, INC. IN 2022, IN ACCORDANCE WITH THE 1987 U.S. ARMY CORPS OF ENGINEERS' "WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1," AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTHEAST REGION," JANUARY 2012. WETLANDS WILL BE REVIEWED BY GZA GEOENVIRONMENTAL, INC. PRIOR TO START OF WORK.
3. GZA EVALUATED WETLANDS AS POTENTIAL VERNAL POOLS IN 2022 IN ACCORDANCE WITH "IDENTIFICATION AND DOCUMENTATION OF VERNAL POOLS IN NEW HAMPSHIRE," 2016, NEW HAMPSHIRE FISH AND GAME DEPARTMENT, NONGAME AND ANDANGERED WILDLIFE PROGRAM.
4. AS APPLICABLE, GZA WILL COMPLETE WETLANDS FUNCTION AND VALUES ASSESSMENT IN ACCORDANCE WITH THE ACOE'S "HIGHWAY METHODOLOGY WORKBOOK SUPPLEMENT," SEPTEMBER 1999.
5. SITE PLAN IS FOR PERMITTING PURPOSES ONLY AND DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY.
6. THE PROJECT WILL BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
7. IN ACCORDANCE WITH ENV-WQ 1505.02, THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
  - A MINIMUM 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED
  - A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL HAS BEEN INSTALLED
  - OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
8. IN THE EVENT THAT A RARE OR THREATENED SPECIES IS OBSERVED, THE NEW HAMPSHIRE FISH AND GAME AND NEW HAMPSHIRE NATURAL HERITAGE BUREAU WILL BE NOTIFIED. TURTLE NESTING SEASON EXTENDS FROM LATE MAY THROUGH THE BEGINNING OF JULY. IF WOOD, BLANDING'S OR SPOTTED TURTLES ARE FOUND LAYING EGGS IN THE WORK AREA, CONTACT MELISSA DOPERALSKI AT 603-271-1738 OR JOSH MEGYESY AT 603-271-1125 FOR FURTHER INSTRUCTIONS. OBSERVATIONS OF NORTHERN BLACK RACER SNAKES SEEN IN ANY AREA FROM THE END OF SEPTEMBER THROUGH THE MONTH OF APRIL MUST BE IMMEDIATELY REPORTED TO THE NHFG DEPARTMENT (BRENDAN CLIFFORD AT 603-271-0463 OR MELISSA DOPERALSKI AT 603-271-1738). IF NORTHERN BLACK RACER IS FOUND IN A WORK AREA FROM NOVEMBER THROUGH THE MONTH OF APRIL, WORK SHALL IMMEDIATELY CEASE AND THE OBSERVATION MUST BE REPORTED TO THE NHFG (BRENDAN CLIFFORD OR MELISSA DOPERALSKI).


EROSION CONTROL NOTES:

1. INSTALLATION OF EROSION CONTROL GRINDINGS AND/OR SILT FENCES SHALL BE COMPLETE PRIOR TO THE START OF WORK IN ANY GIVEN AREA. EROSION CONTROLS SHALL BE USED DURING CONSTRUCTION AND REMOVED WHEN ALL SLOPES HAVE A HEALTHY STAND OF VEGETATION COVER. EROSION CONTROL MEASURES SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER .25" OR GREATER RAINFALL EVENTS.
2. AS REQUIRED, CONSTRUCT TEMPORARY BERMS, SILTATION FENCES, SEDIMENT TRAPS, ETC. TO PREVENT EROSION & SEDIMENTATION OF WETLANDS.
3. THE WORK AREA SHALL BE GRADED AND OTHERWISE SHAPED IN SUCH A MANNER AS TO MINIMIZE SOIL EROSION, SILTATION OF DRAINAGE CHANNELS, DAMAGE TO EXISTING VEGETATION, AND DAMAGE TO PROPERTY OUTSIDE LIMITS OF THE WORK AREA. EROSION CONTROL GRINDINGS WILL BE NECESSARY TO ACCOMPLISH THIS END.
4. ANY STRIPPED TOPSOIL SHALL BE STOCKPILED, WITHOUT COMPACTION, AND STABILIZED WITH BMPS.
5. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS, PLANT ANNUAL RYEGRASS PRIOR TO OCTOBER 15TH.
6. EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
7. EROSION CONTROL MATTING, IF REQUIRED, WILL CONSIST OF JUTE MATTING. MATTING WITH WELDED PLASTIC OR 'BIODEGRADABLE PLASTIC' NETTING OR THREAD WILL BE AVOIDED TO LIMIT UNINTENTIONAL MORTALITY TO SNAKES.

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C196 & Q171 TRANSMISSION LINE STRUCTURE REPLACEMENT PROJECT  
GOFFSTOWN, DUNBARTON, AND BOW, NEW HAMPSHIRE

NOTES

PREPARED BY:  <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: <b>EVSOURCE</b> ENERGY	
PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET <b>1</b> 1 OF 2
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 06/16/2022	PROJECT NO: 04.0191410.18	REVISION NO.	

## Best Management Practices (BMP's) for Straw wattles

### Definition and purpose:

Straw wattles are burlap rolls filled with straw that trap sediment and interrupt water flow by reducing slope lengths.

### Applications:

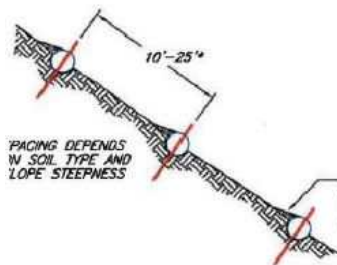
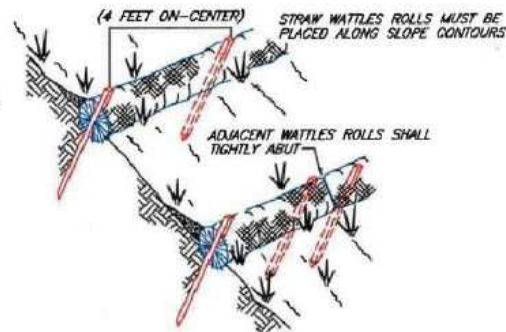
- \* Along erodible or unstabilized slopes
- \* Spread overland waterflow
- \* Trap sediment
- \* Around storm drain inlets to slow water and settle out sediment
- \* Overlap ends approximately 6 inches

### Installation:

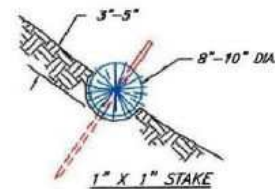
Straw wattles are installed parallel to slope contours and perpendicular to sheet flow.

Spacing\* - Dependent on slope length, soil steepness and soil type (general range 10 - 25').

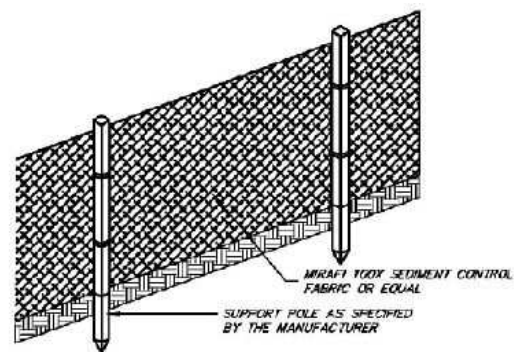
Trenching - 2"-5" inch trench  
Stacking - at each end and four foot on center (i.e. 25 foot wattle uses 6 stacks)



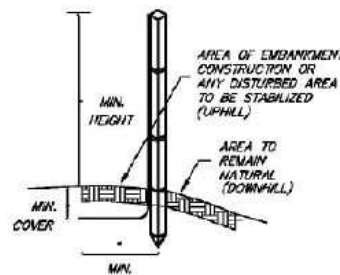
SEDIMENT, ORGANIC MATTER, AND NATIVE SEEDS ARE CAPTURED BEHIND THE WATTLE ROWS.



NOT TO SCALE



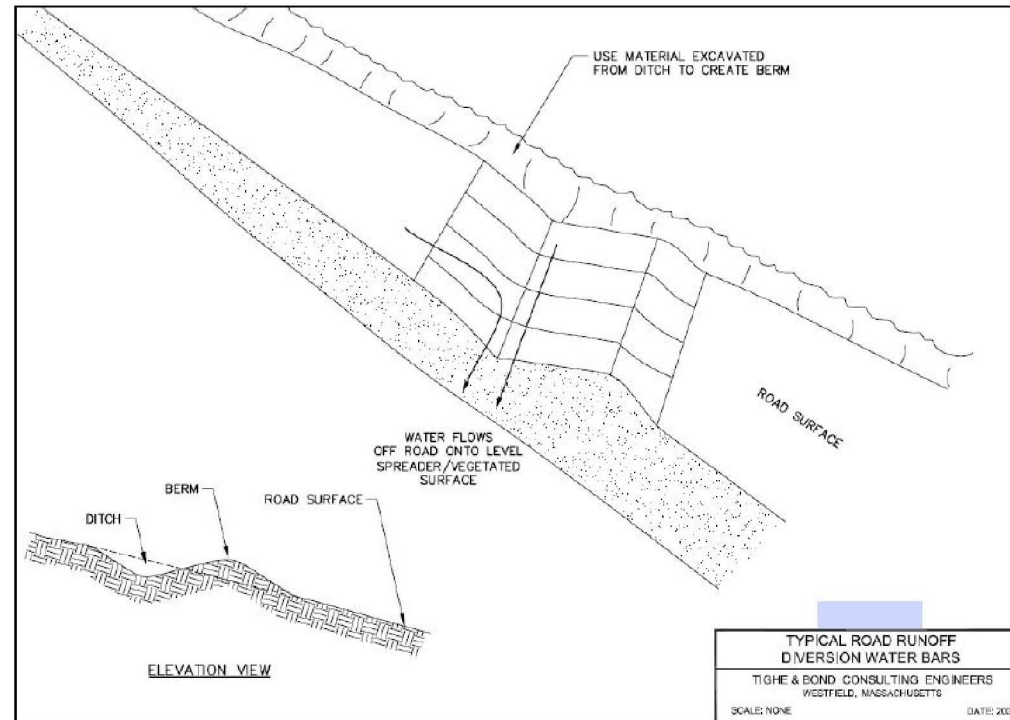
FRONT VIEW



SIDE VIEW

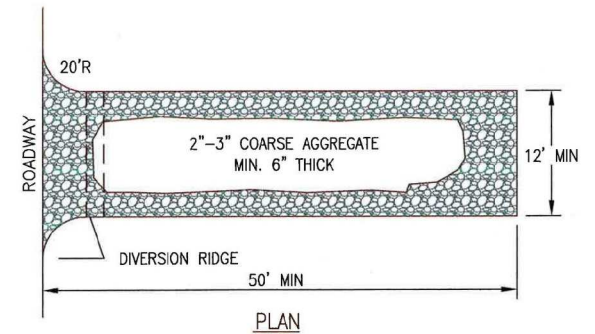
### NOTES (SILT FENCE)

1. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES.
2. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPliced TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATIONS.
3. POSTS SHALL BE PLACED AT A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL BE AS MANUFACTURER RECOMMENDS.
4. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE OF THE BARRIER IN ACCORDANCE WITH RECOMMENDATIONS
5. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE, AND WILL EXTEND A MINIMUM OF 8 INCHES INTO THE TRENCH. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
6. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
7. FABRIC BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
8. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST ONCE DAILY DURING PROLONGED RAINFALL AND ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
9. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
10. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
11. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.



ELEVATION VIEW

TYPICAL ROAD RUNOFF DIVERSION WATER BARS  
TIGHE & BOND CONSULTING ENGINEERS  
WESTFIELD, MASSACHUSETTS  
SCALE: NONE DATE: 2007



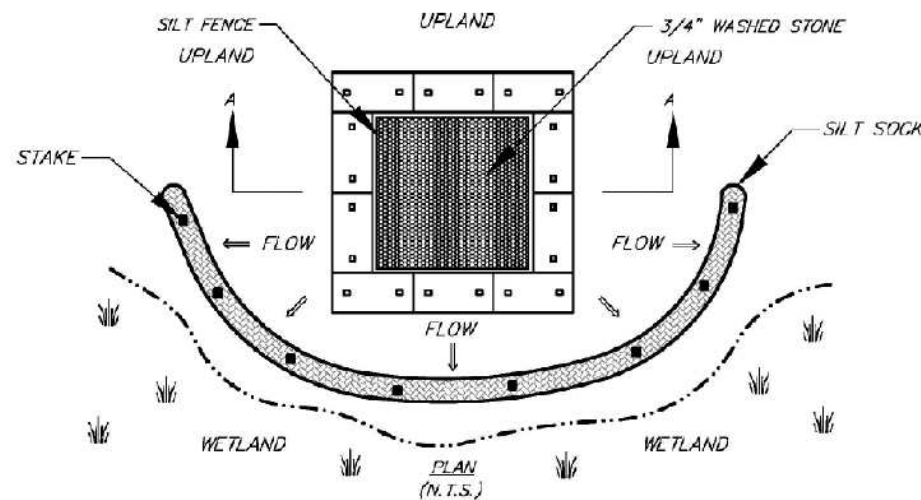
PLAN

### NOTES:

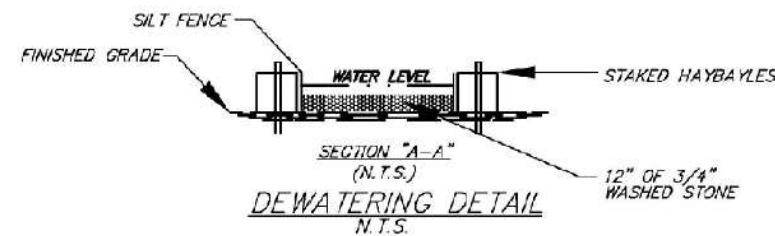
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.

## CONSTRUCTION ENTRANCE

NOT TO SCALE



PLAN (N.T.S.)



SECTION "A-A" (N.T.S.)  
DEWATERING DETAIL N.T.S.

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C196 & Q171 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT  
GOFFSTOWN, DUNBARTON, & BOW, NEW HAMPSHIRE

## BMP DETAILS

PREPARED BY:  
**GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

PREPARED FOR:  
**EVERSOURCE**  
ENERGY

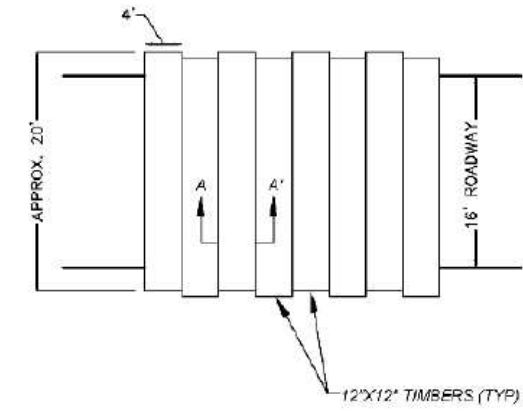
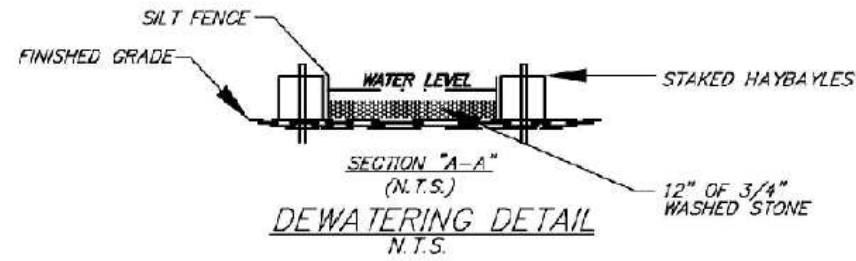
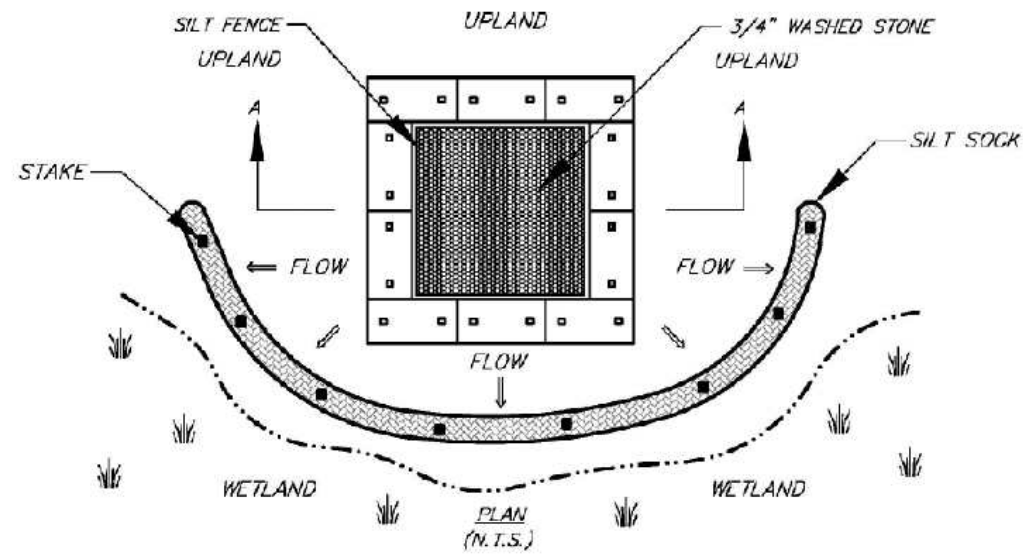
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DESIGNED BY: MJD  
DATE: 06/28/2022

REVIEWED BY: TLT  
DRAWN BY: MJD  
PROJECT NO: 04.0191410.18  
CHECKED BY: DMZ  
SCALE:  
REVISION NO.

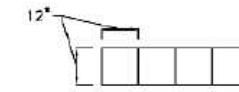
SHEET  
**S2**



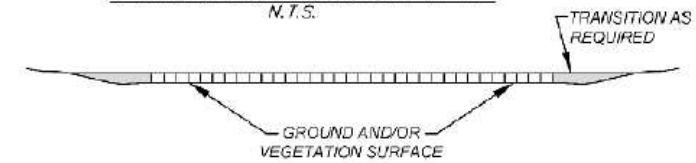
© 2022 - GZA GeoEnvironmental, Inc. P:\04\Jobs\0191410\00 - EE Shing Permitting 2019-2022\04.0191410.18 - C196 Transmission Line Str Repl Project\Figures\C196 Q171 AOT Notesheet 3 10-7.mxd, 6/28/2022, 11:29:00 AM, lindsay.white



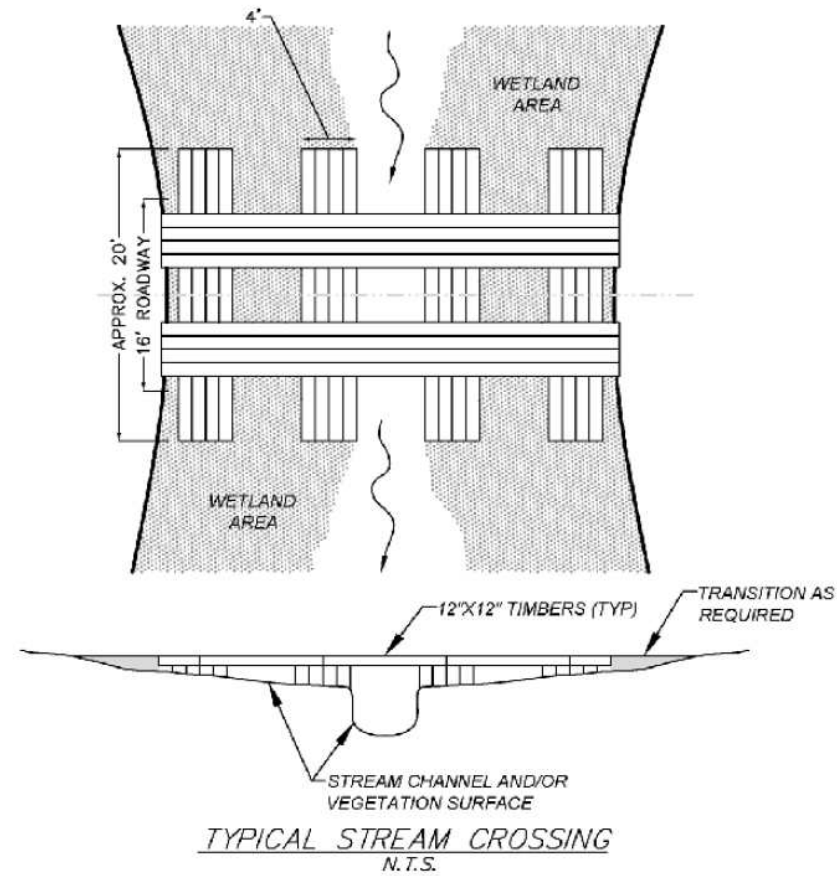
TYPICAL SWAMP MAT PLAN VIEW  
N.T.S.



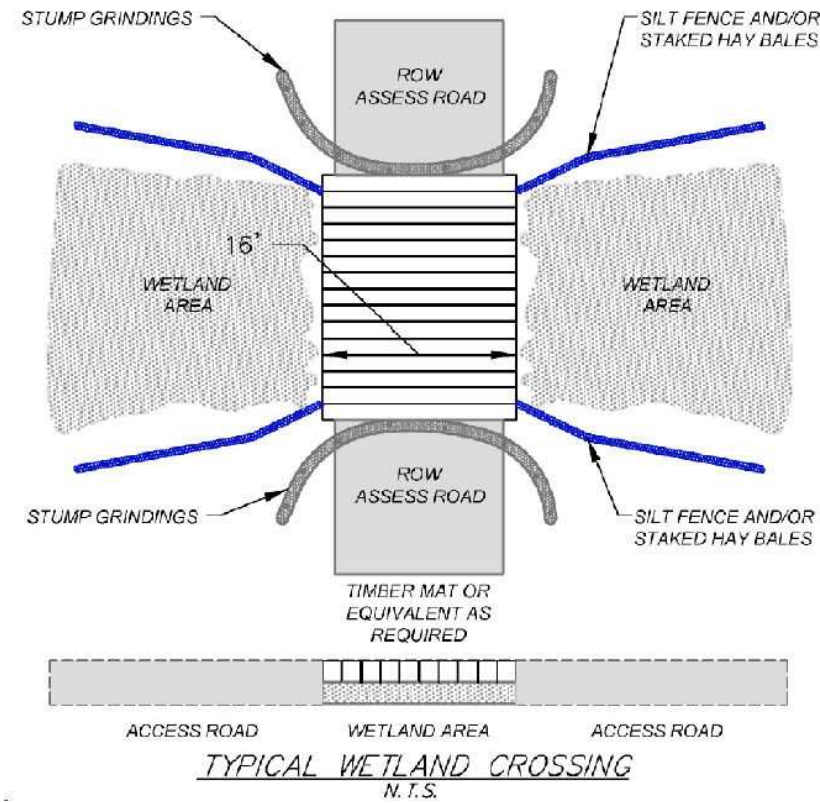
TYPICAL MAT SECTION A-A  
N.T.S.



TYPICAL SWAMP MAT SECTION DETAIL  
N.T.S.



TYPICAL STREAM CROSSING  
N.T.S.



TYPICAL WETLAND CROSSING  
N.T.S.

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C196 & Q171 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT  
GOFFSTOWN, DUNBARTON, & BOW, NEW HAMPSHIRE

BMP DETAILS

PREPARED BY:  
**GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

PREPARED FOR:  
**EVERSOURCE**  
ENERGY

PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET <b>S3</b>
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 06/28/2022	PROJECT NO: 04.0191410.18	REVISION NO.	





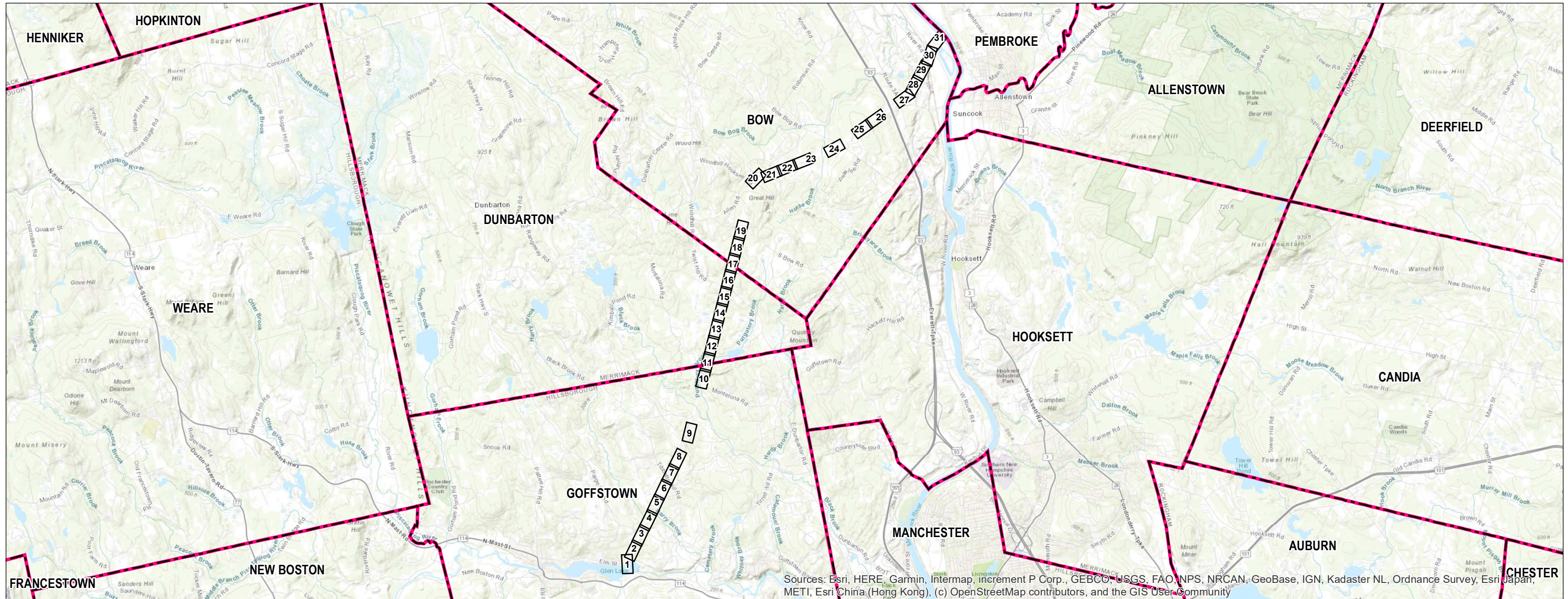
**Figure 4 – Alteration of Terrain Permitting Plans**



# C196 and Q171 Transmission Line - Structure Replacement Project

GOFFSTOWN, DUNBARTON, AND BOW, NEW HAMPSHIRE  
Alteration of Terrain Permitting Planset

Date: June 28, 2022

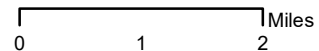


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

PREPARED FOR:



13 Legends Drive  
Hooksett, NH 03106



INDEX OF FIGURES

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Map Sheets 1-31  
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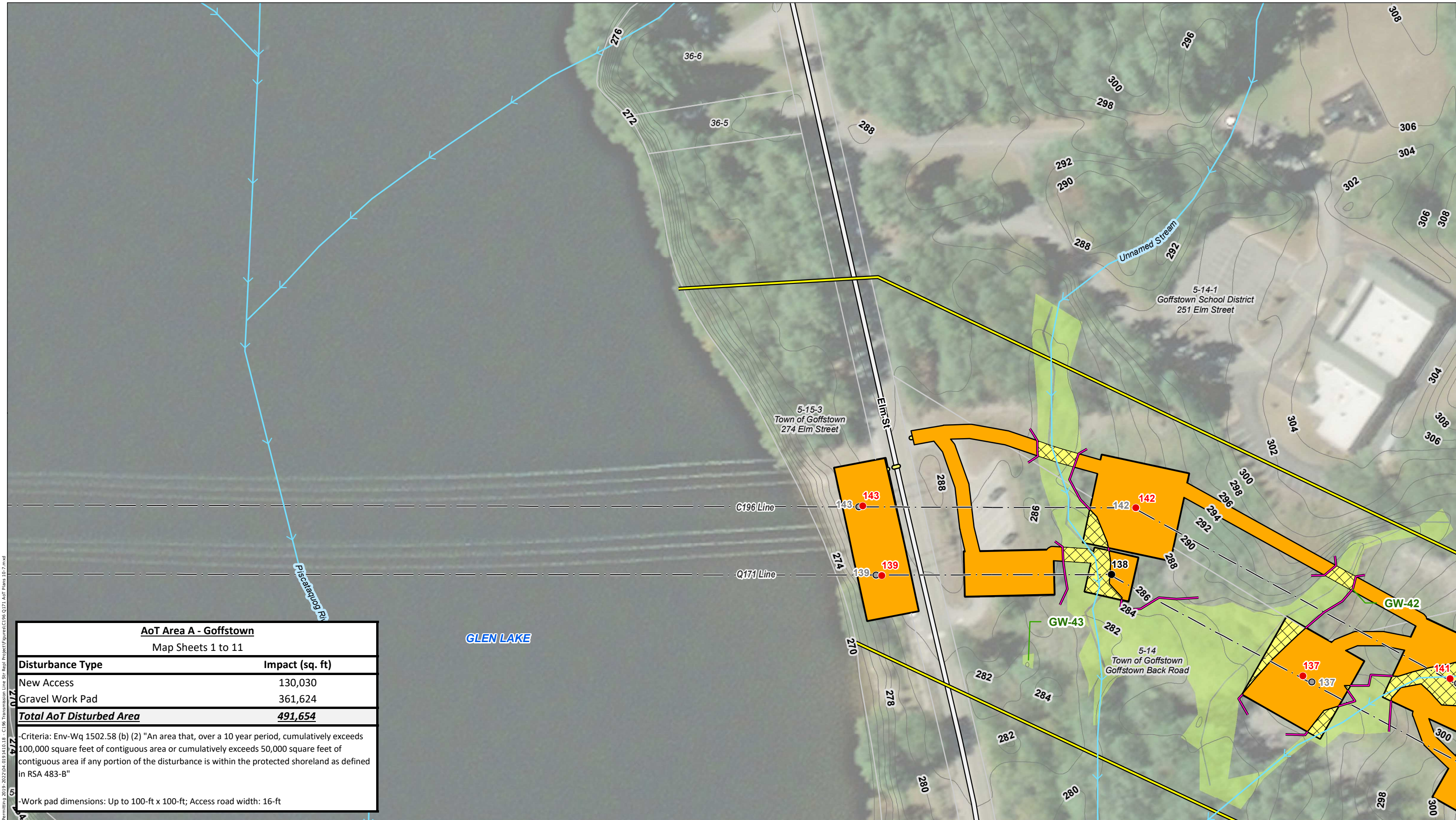
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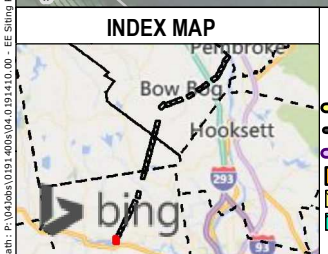


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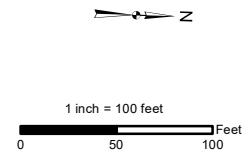


AoT Area A - Goffstown	
Map Sheets 1 to 11	
<b>Disturbance Type</b>	<b>Impact (sq. ft)</b>
New Access	130,030
Gravel Work Pad	361,624
<b>Total AoT Disturbed Area</b>	<b>491,654</b>
-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10 year period, cumulatively exceeds 100,000 square feet of contiguous area or cumulatively exceeds 50,000 square feet of contiguous area if any portion of the disturbance is within the protected shoreland as defined in RSA 483-B"	
-Work pad dimensions: Up to 100-ft x 100-ft; Access road width: 16-ft	



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- 2FT ELEVATION CONTOURS

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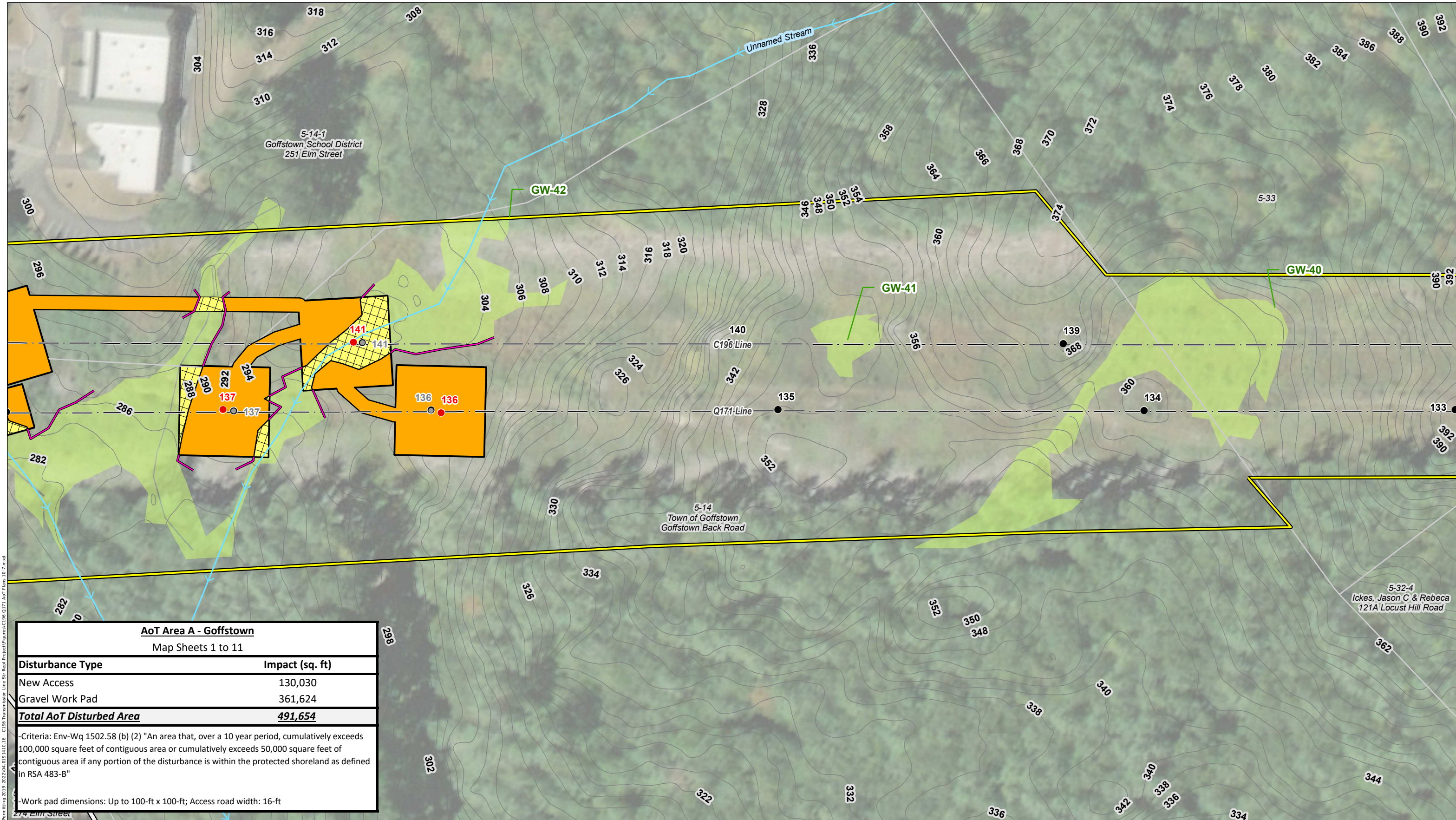
**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**  
**Alternation of Terrain Permitting Plans**

Goffstown, NH	MAP SHEET
Date: June, 2022	<b>1 OF 31</b>

Path: P:\Jobs\01914003\01914003\_00 - EE Shing Permitting 2019-2022\04\_09\_2022\04\_09\_2022\04\_09\_2022\C196 Q171 AoT Plans 10-7.mxd  
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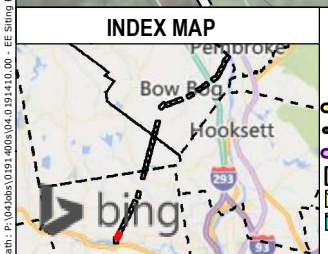


**AoT Area A - Goffstown**  
Map Sheets 1 to 11

Disturbance Type	Impact (sq. ft)
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Gravel Work Pad	361,624
<b>Total AoT Disturbed Area</b>	<b>491,654</b>

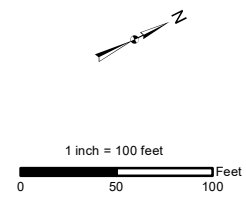
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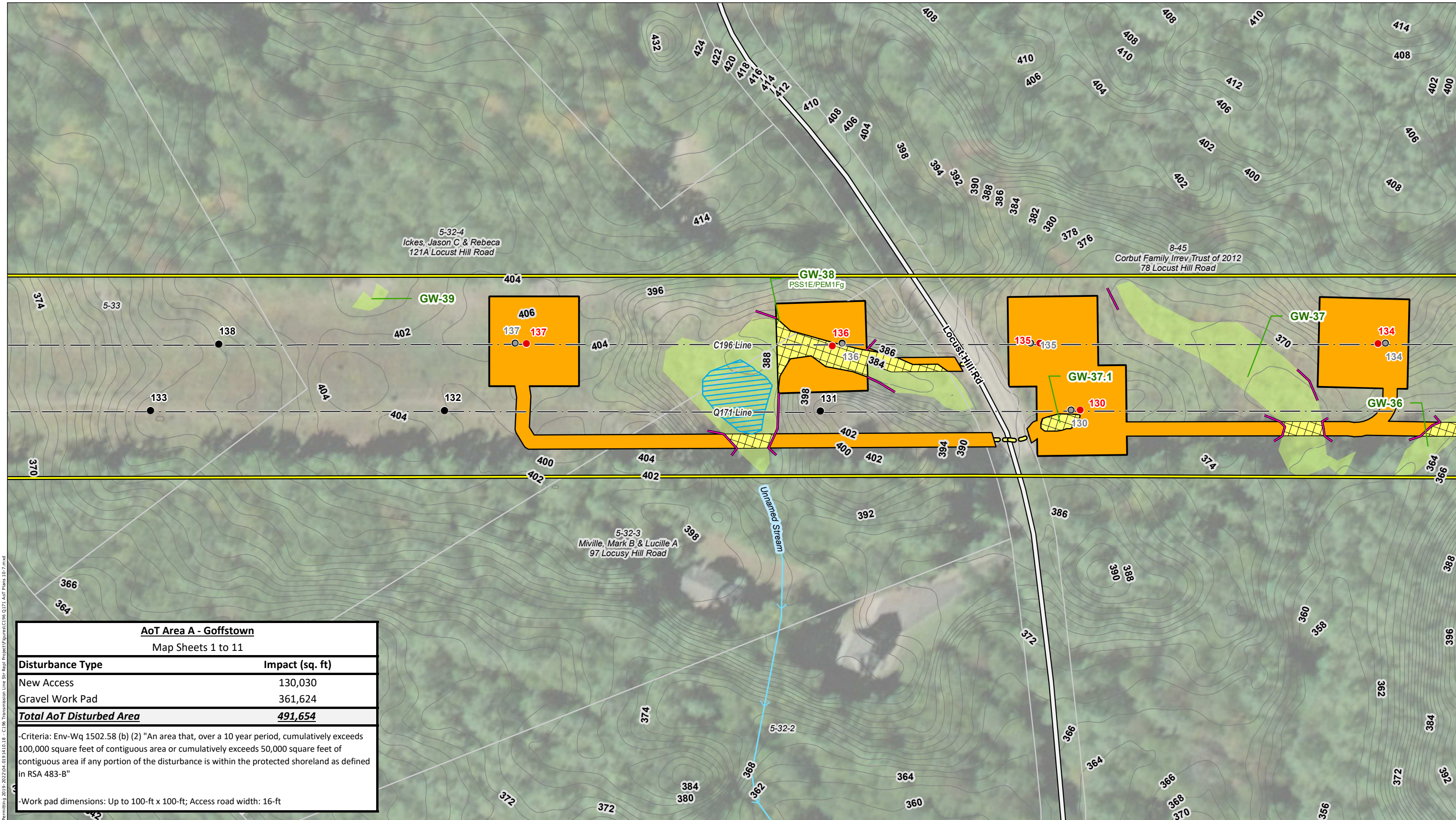
**EVSOURCE ENERGY**

**C196 and Q171 Transmission Line  
Structure Replacement Project  
Alternation of Terrain Permitting Plans**

Goffstown, NH	MAP SHEET
Date: June, 2022	<b>2 OF 31</b>

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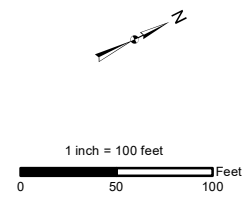
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AoT Area A - Goffstown	
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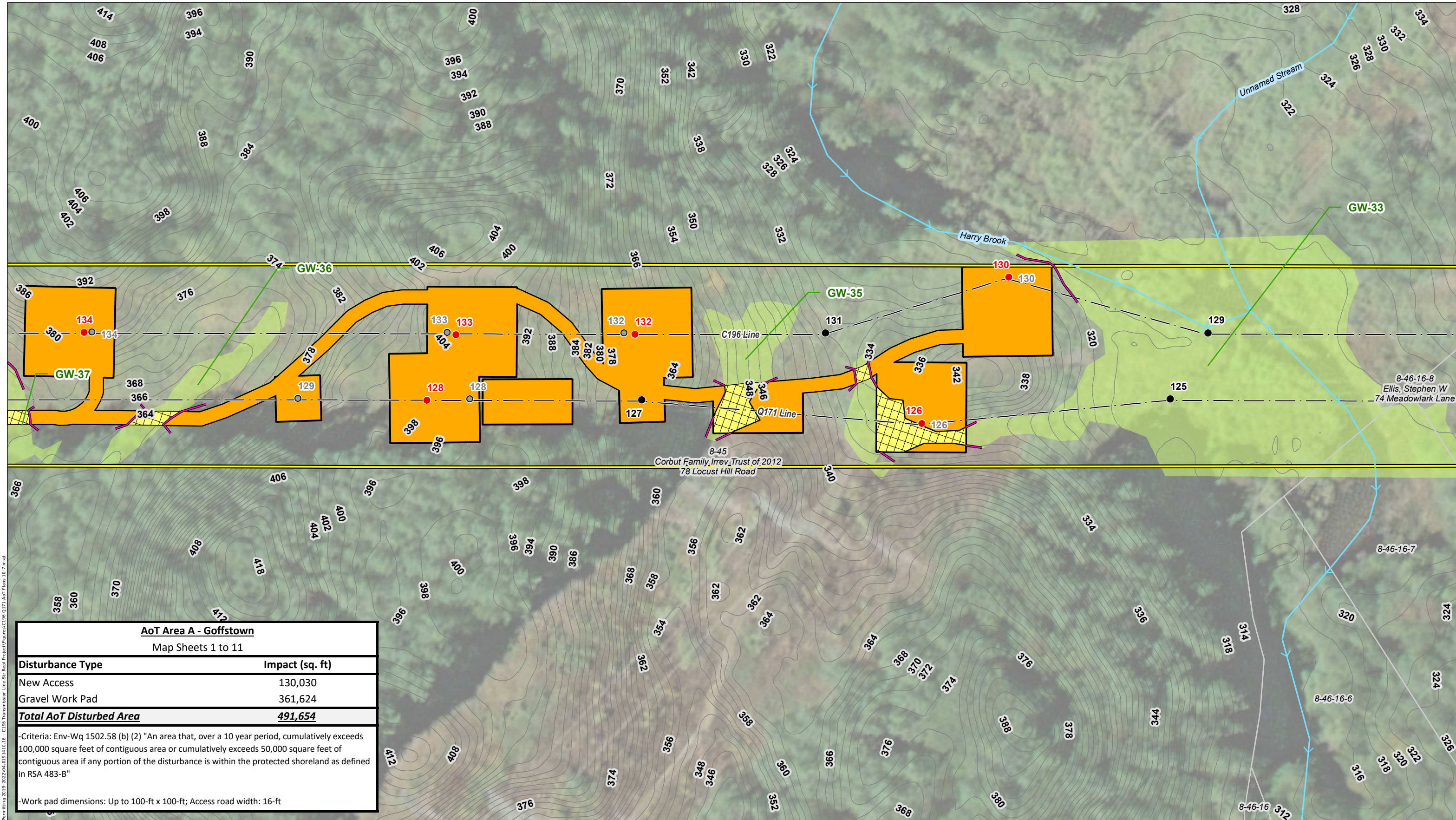
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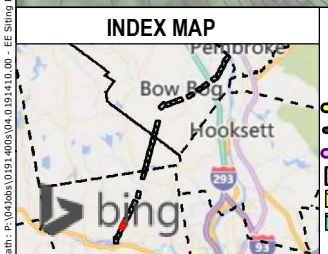
Goffstown, NH      MAP SHEET

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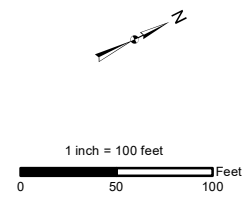


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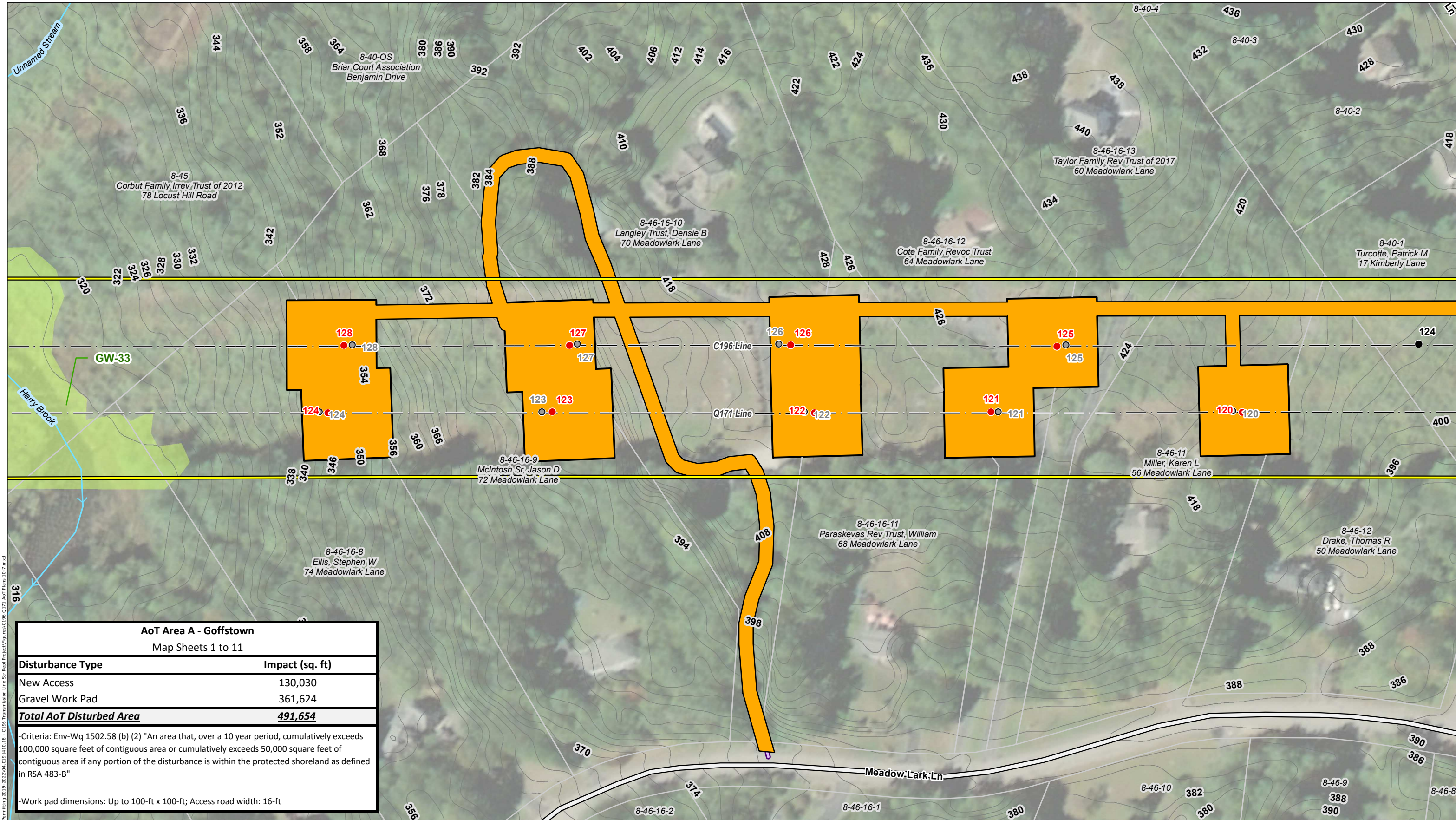
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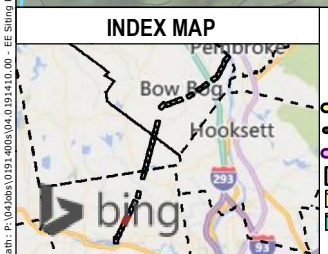
Goffstown, NH	MAP SHEET
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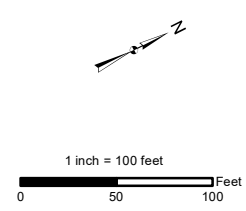


AoT Area A - Goffstown	
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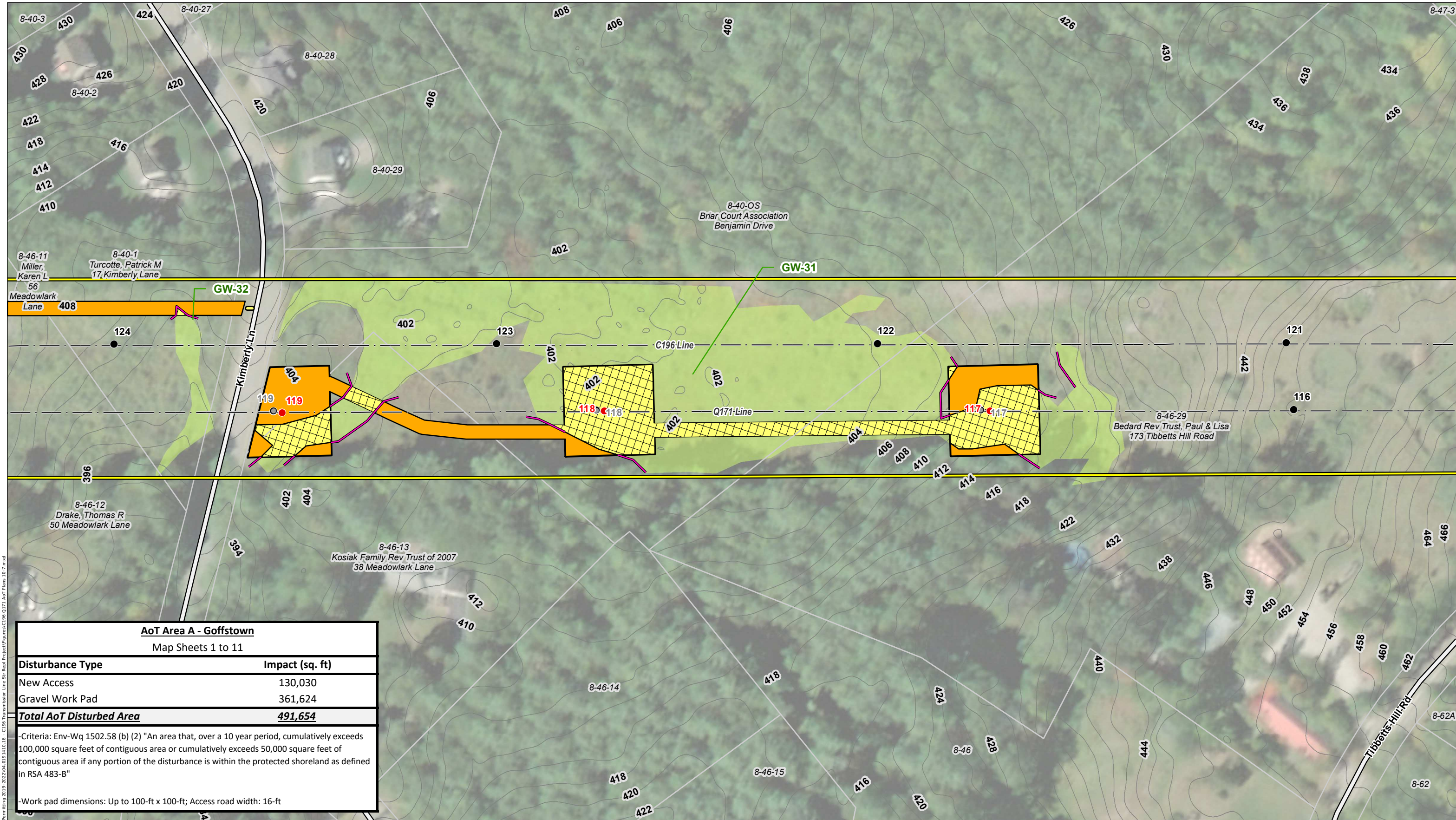
**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**  
**Alternation of Terrain Permitting Plans**

Goffstown, NH	MAP SHEET
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**AoT Area A - Goffstown**  
Map Sheets 1 to 11

Disturbance Type	Impact (sq. ft)
New Access	130,030
Gravel Work Pad	361,624
<b>Total AoT Disturbed Area</b>	<b>491,654</b>

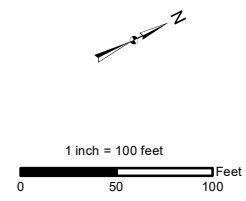
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**EVERSOURCE ENERGY**

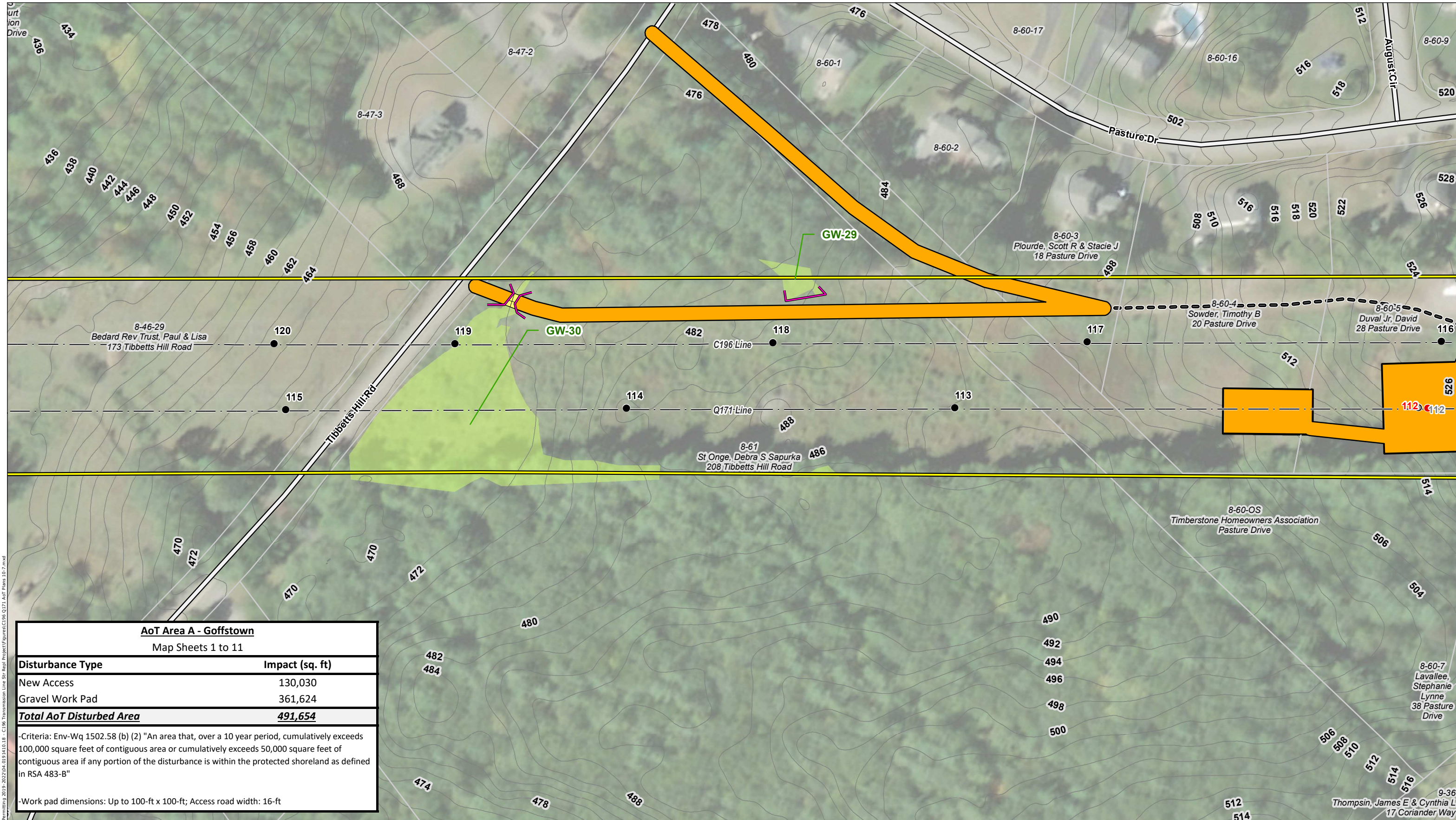
**C196 and Q171 Transmission Line Structure Replacement Project**  
Alternation of Terrain Permitting Plans

Goffstown, NH      MAP SHEET

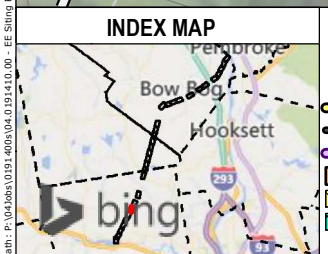
Date: June, 2022      **6 OF 31**

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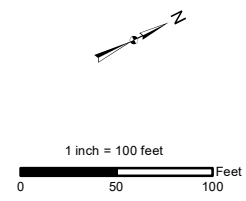


AoT Area A - Goffstown	
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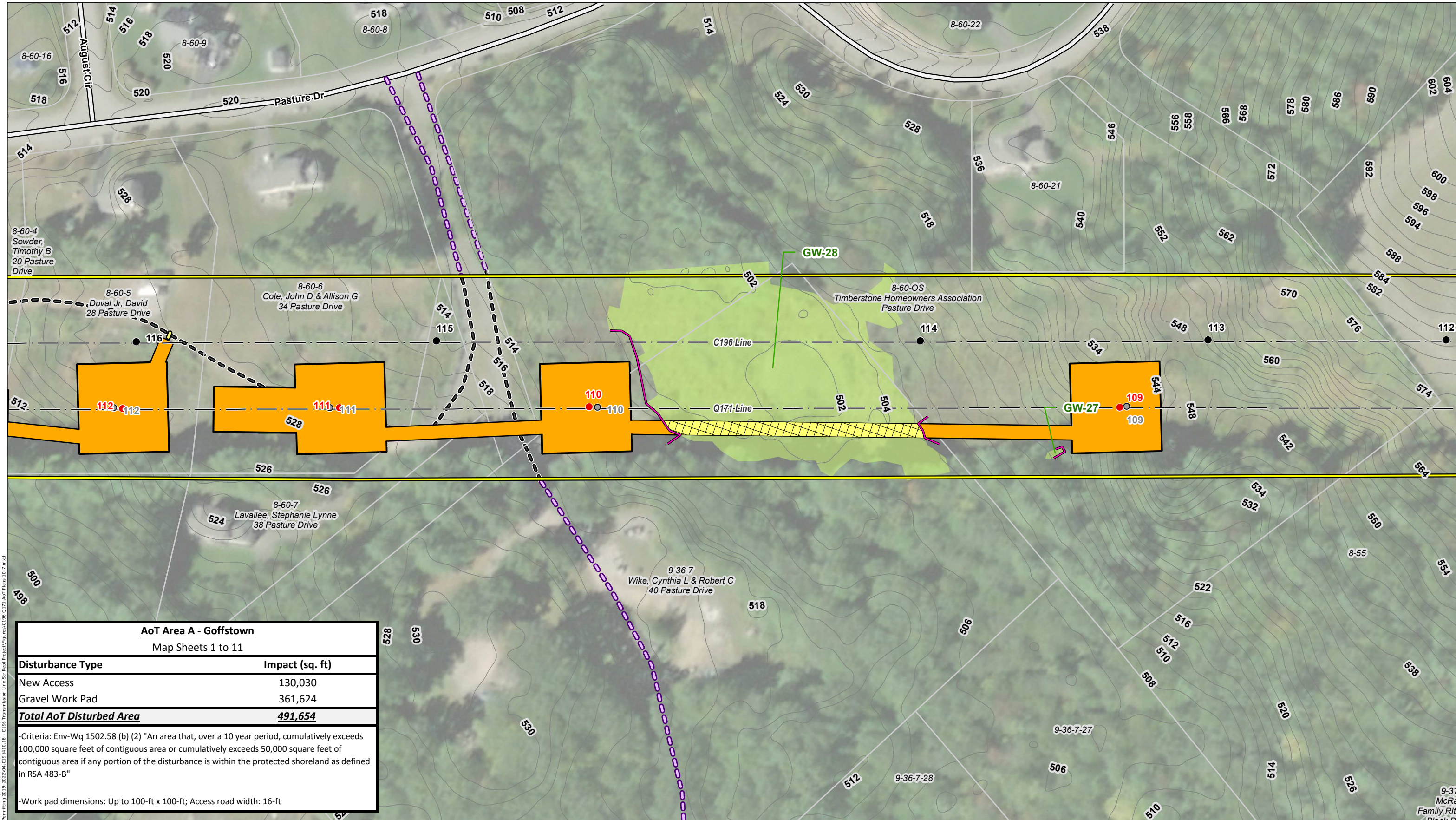
**EVERSOURCE ENERGY**

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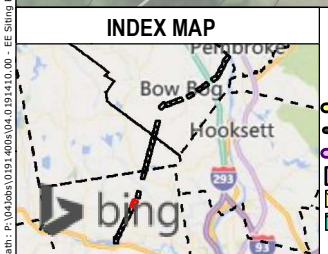
Goffstown, NH	MAP SHEET
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1 inch = 100 feet

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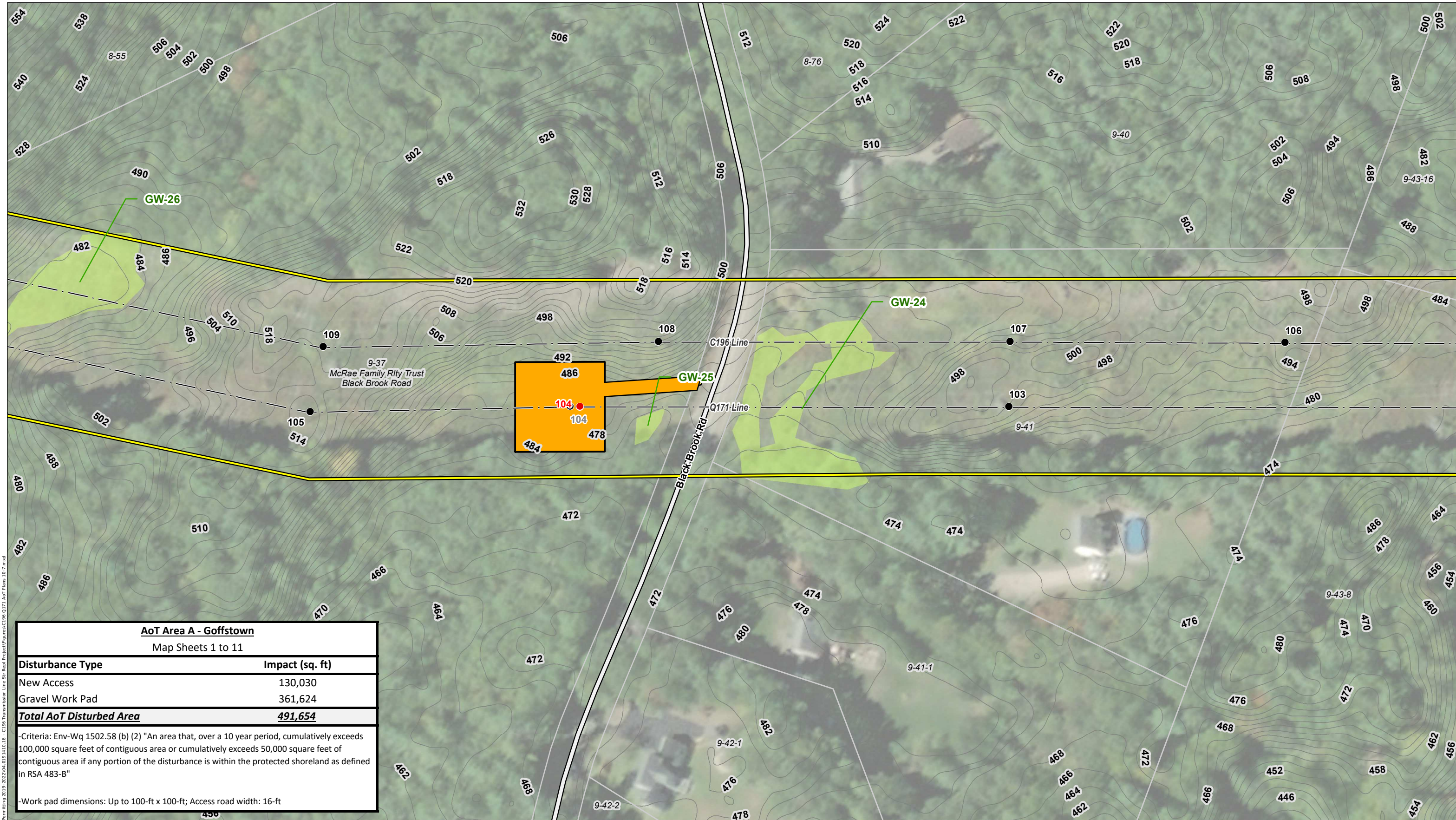
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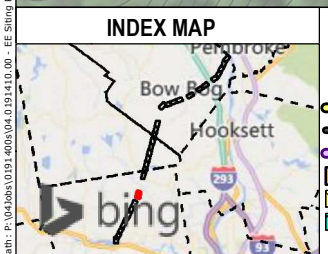
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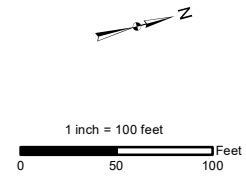


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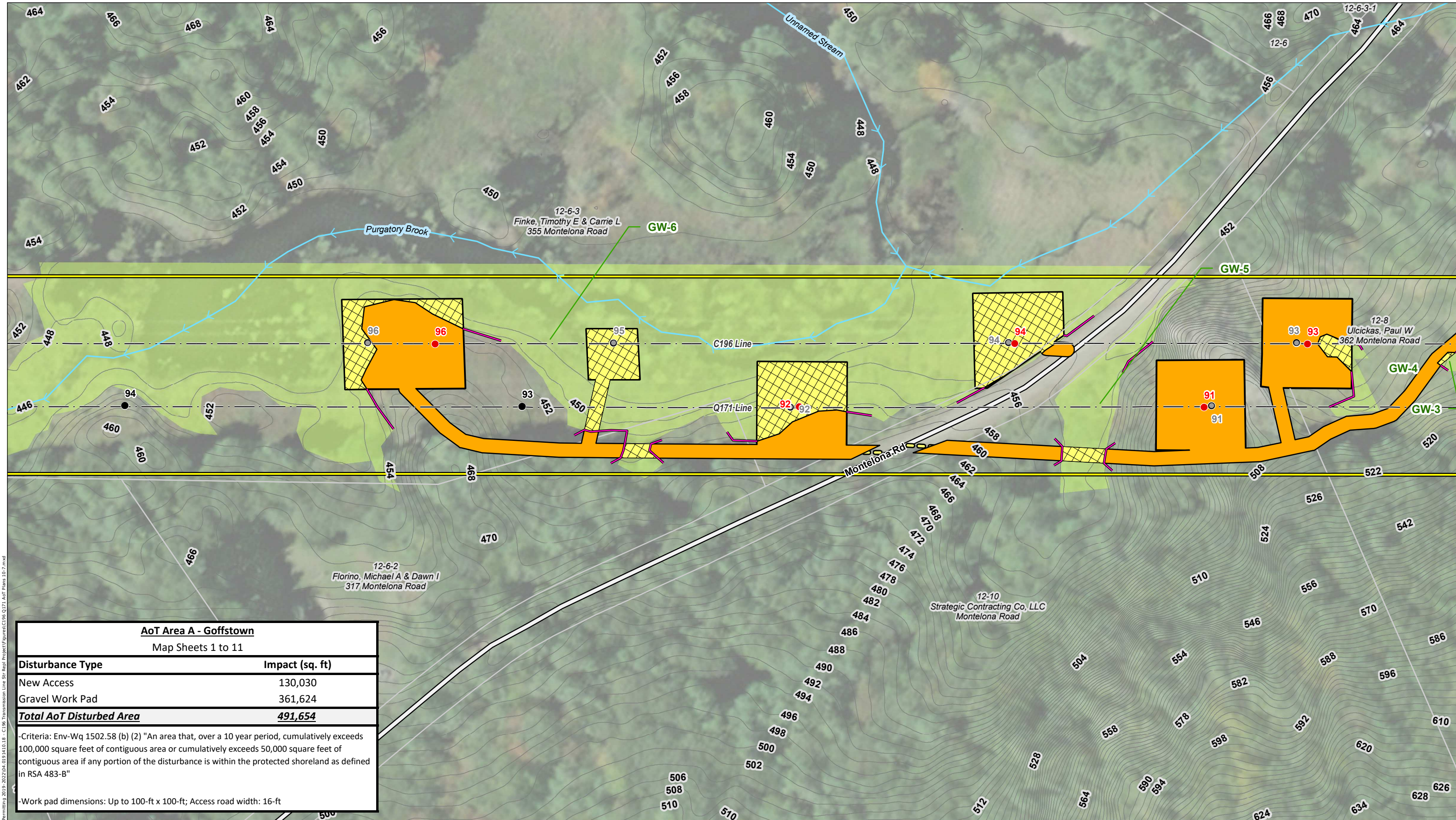
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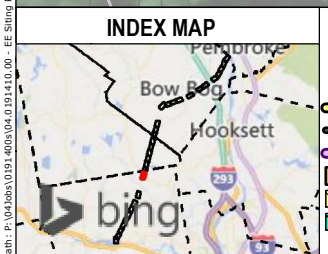
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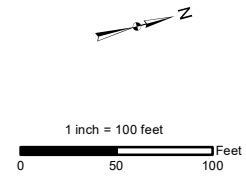


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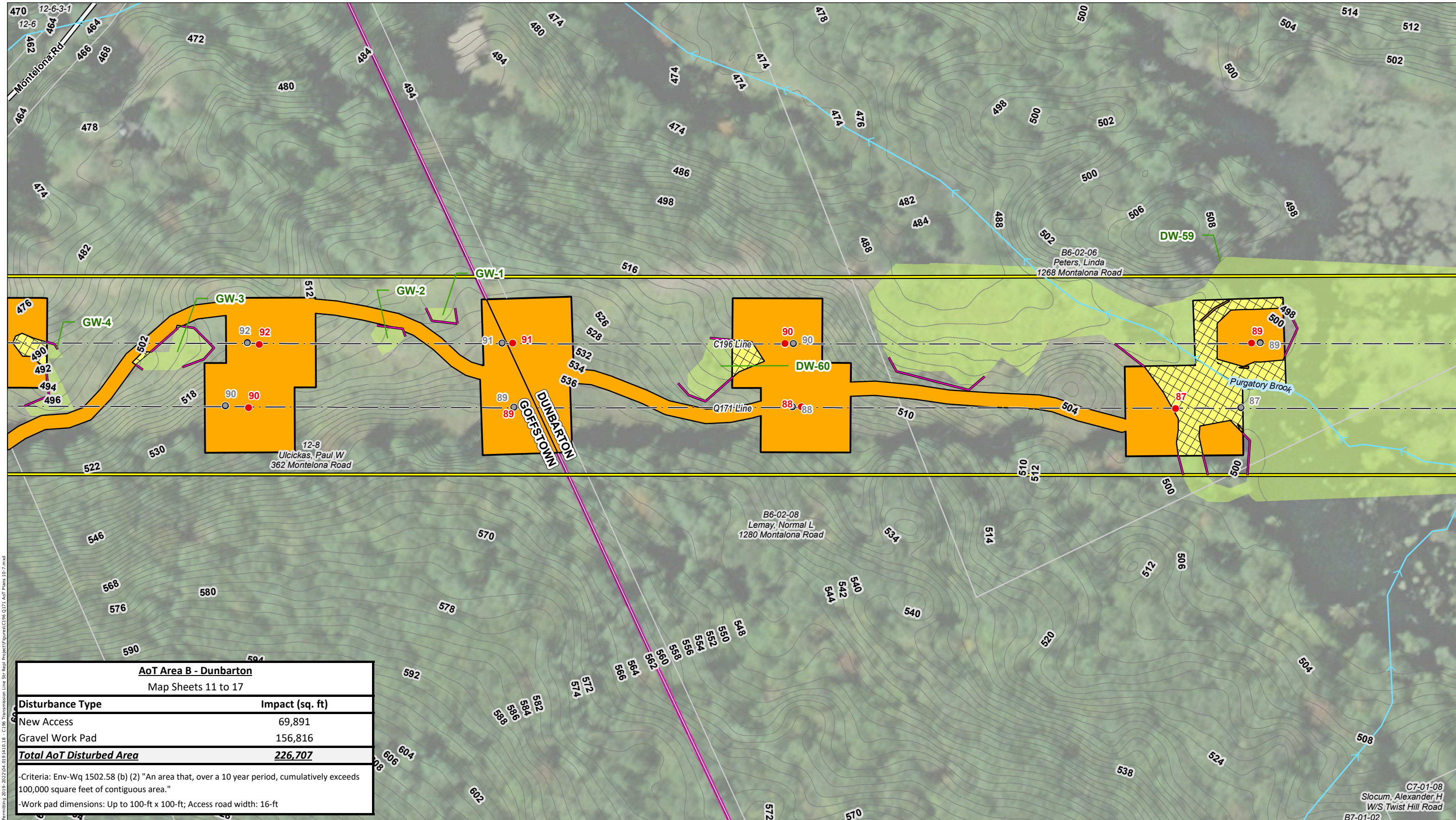
**EVSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**  
**Alternation of Terrain Permitting Plans**

Goffstown, NH	MAP SHEET
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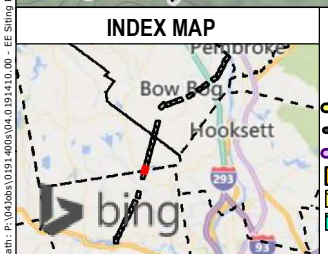
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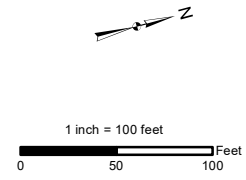
AoT Area B - Dunbarton	
Map Sheets 11 to 17	
Disturbance Type	Impact (sq. ft)
New Access	69,891
Gravel Work Pad	156,816
<b>Total AoT Disturbed Area</b>	<b>226,707</b>

-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10 year period, cumulatively exceeds 100,000 square feet of contiguous area."  
 -Work pad dimensions: Up to 100-ft x 100-ft; Access road width: 16-ft



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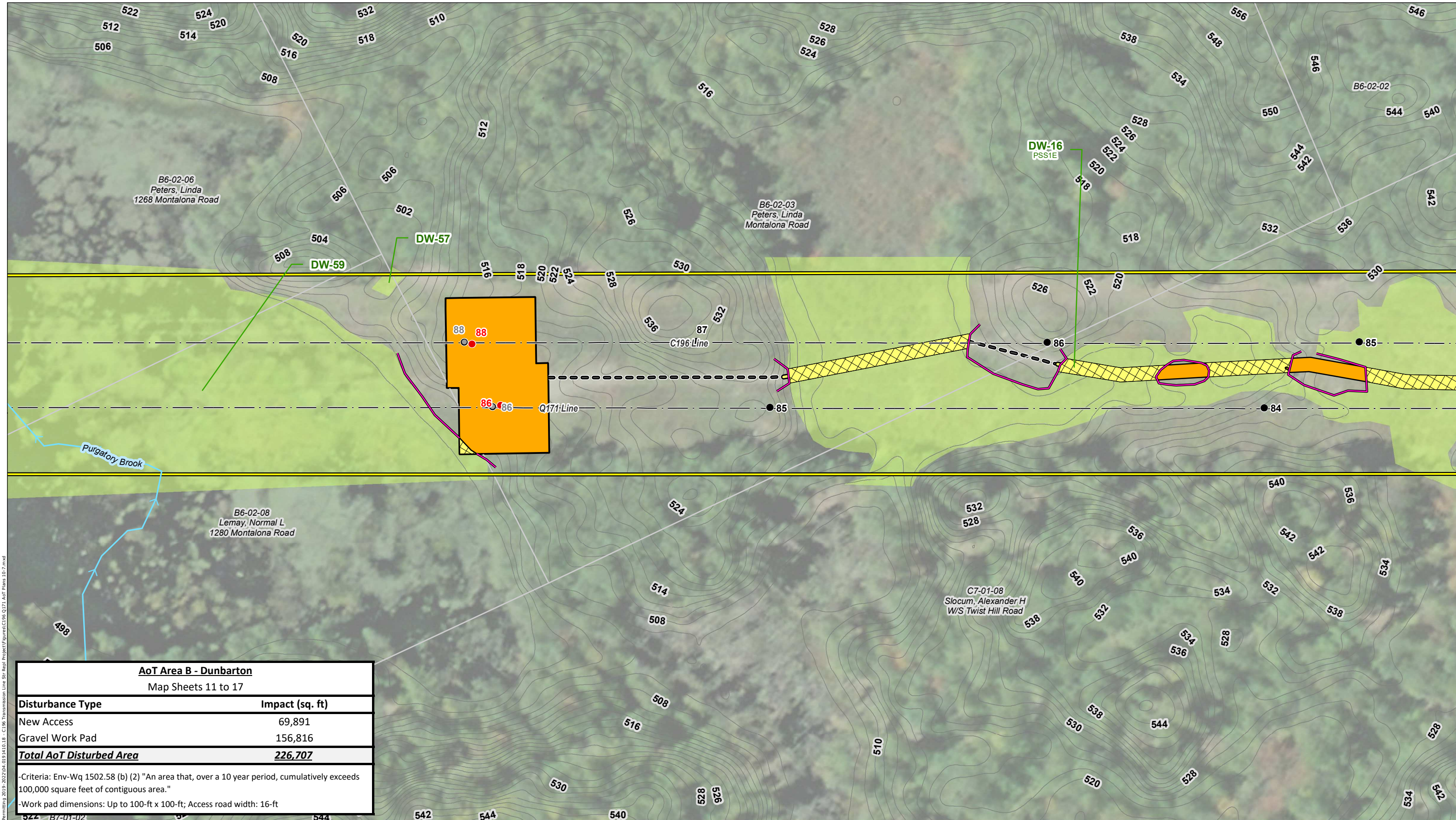
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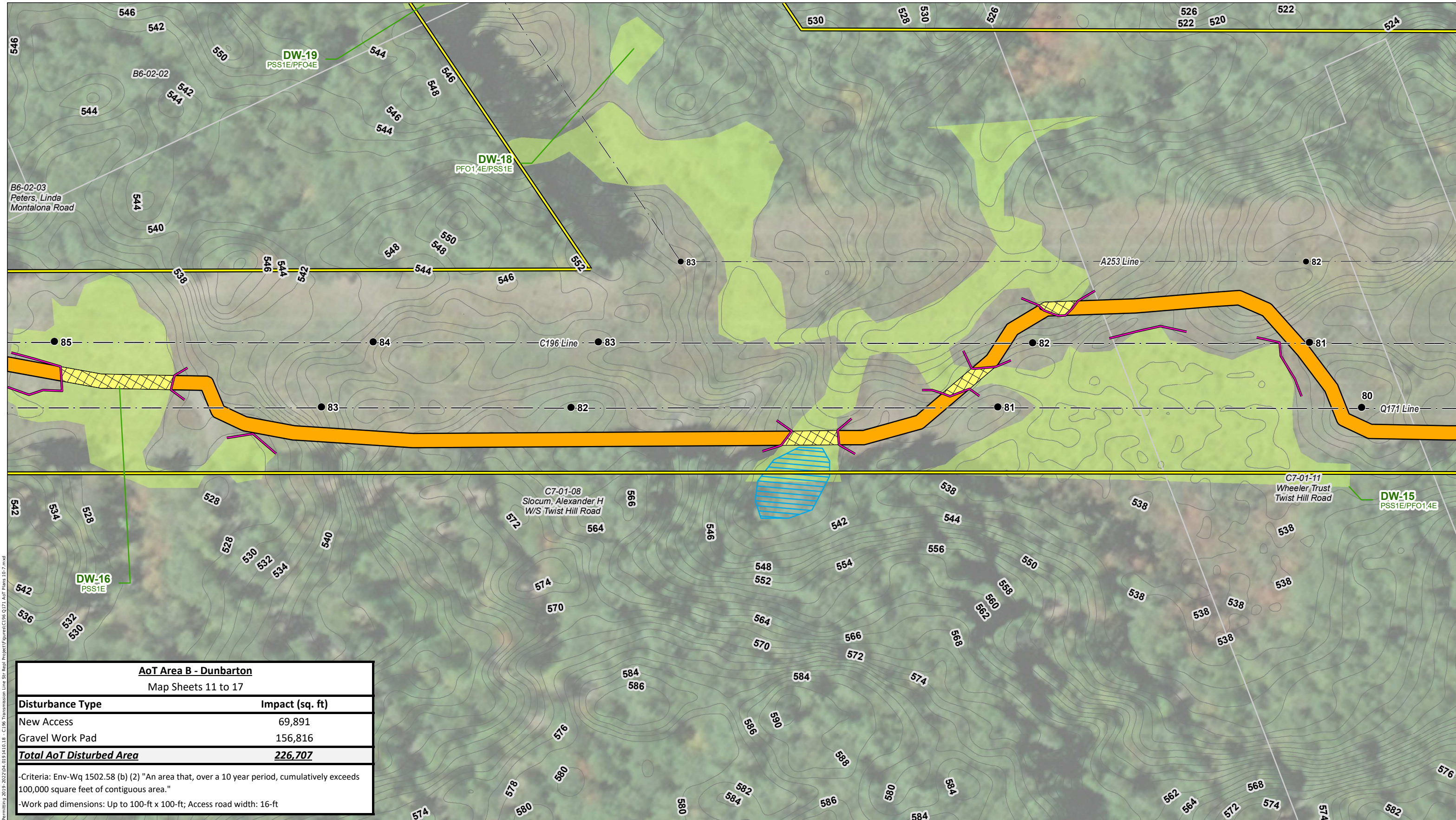
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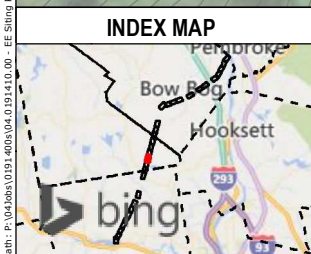




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Map Sheets 11 to 17

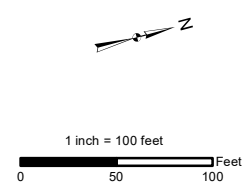
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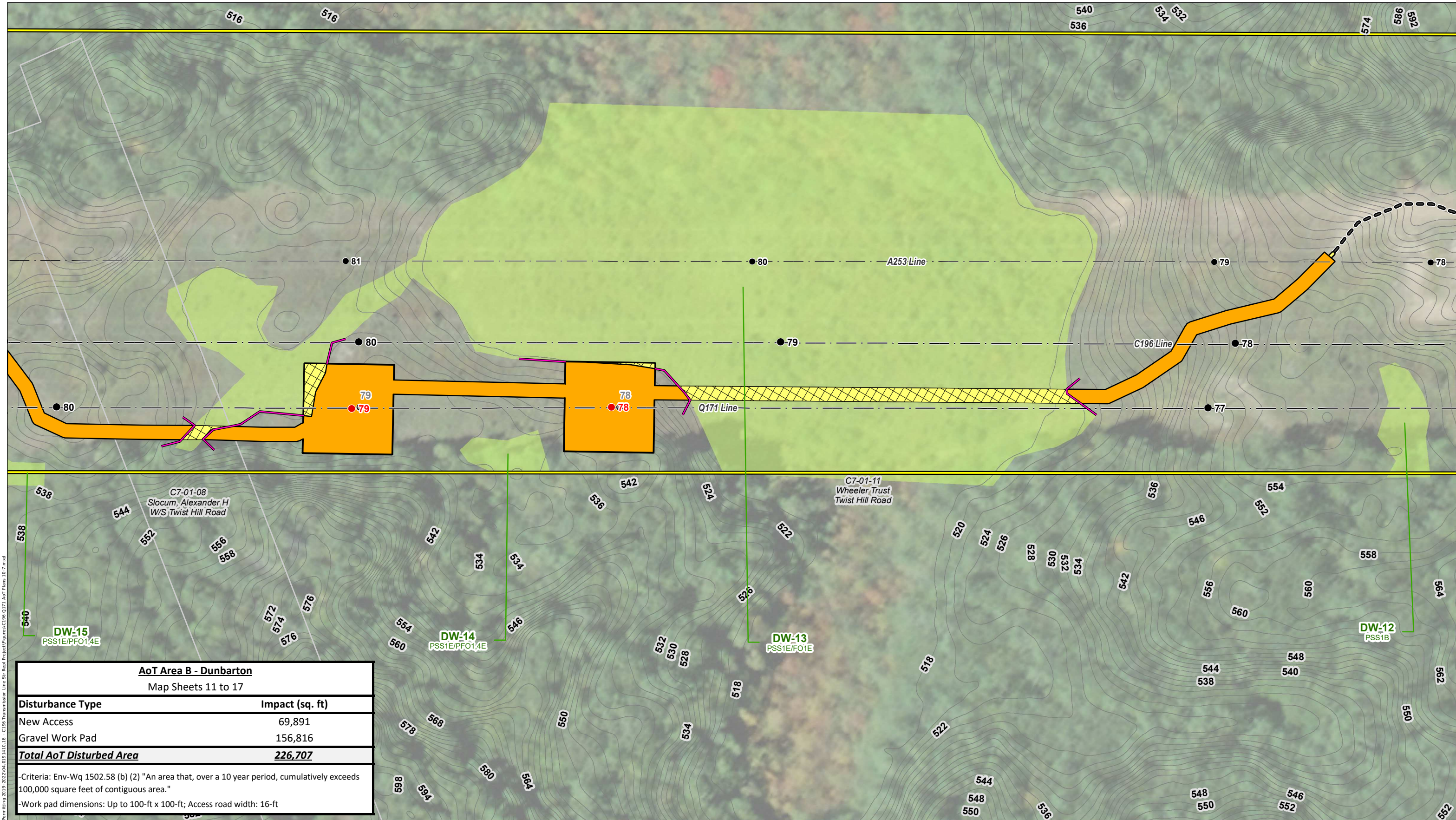
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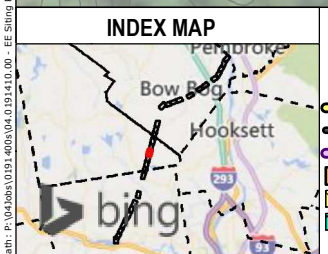
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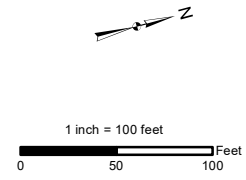


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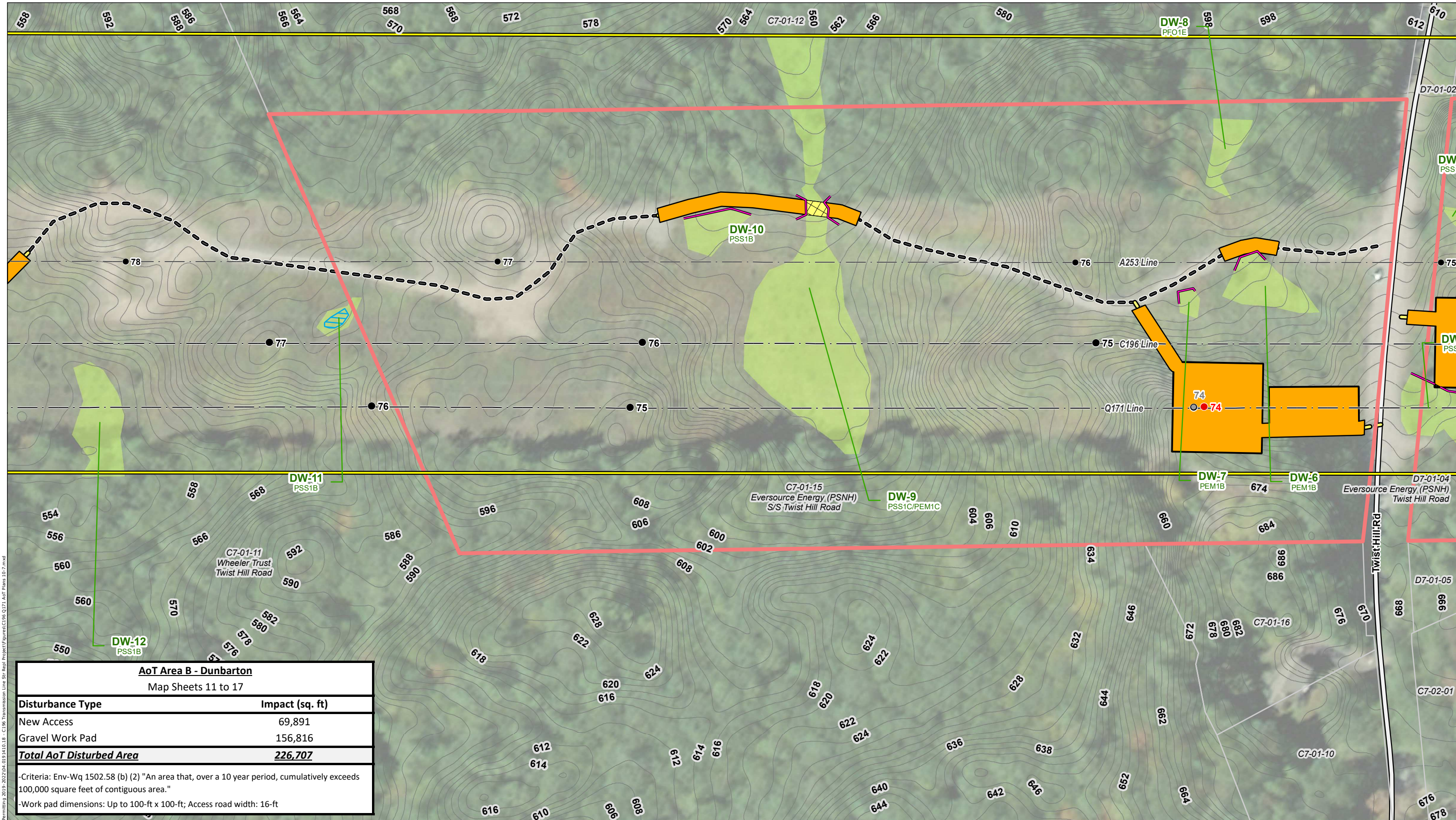
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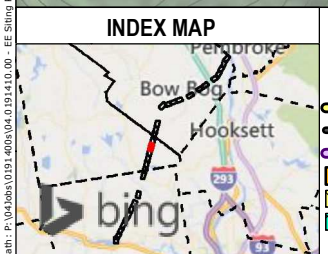
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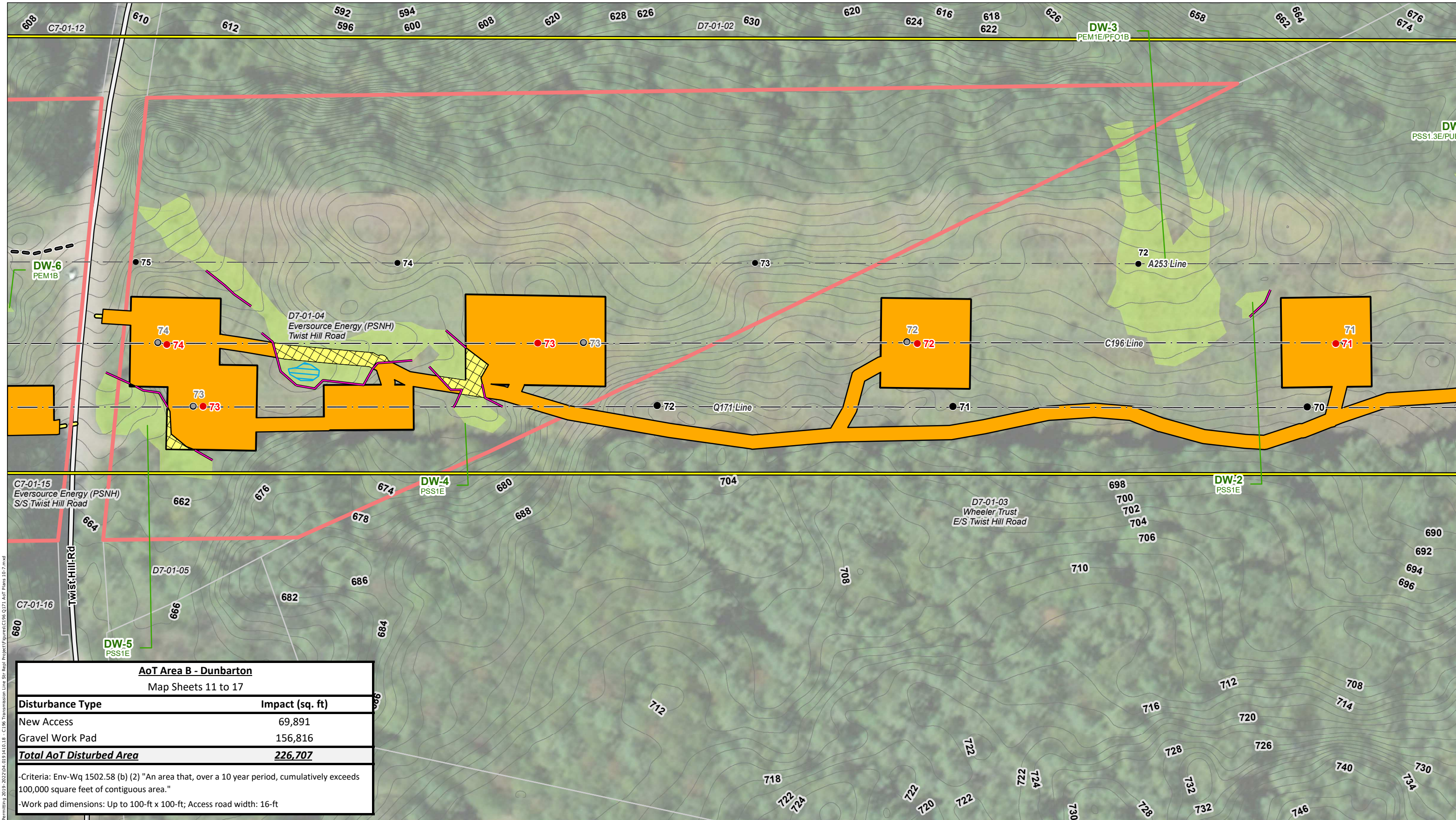
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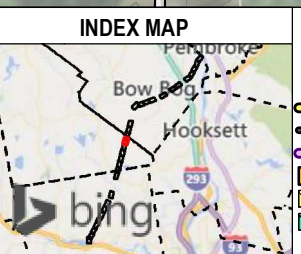
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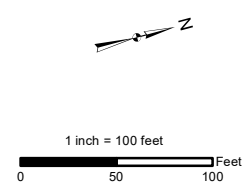


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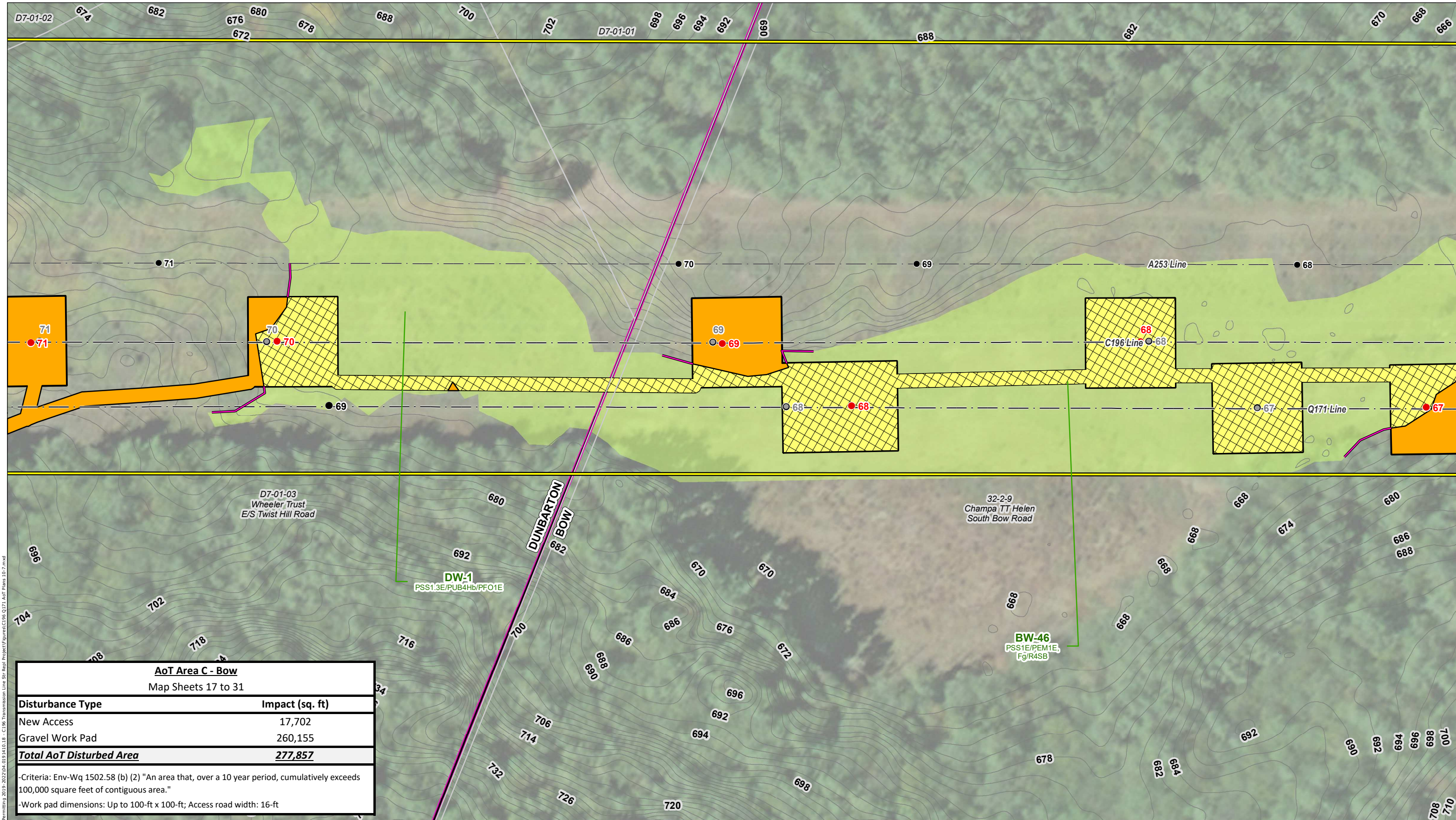
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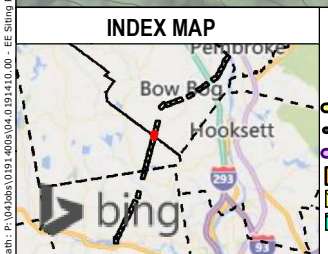
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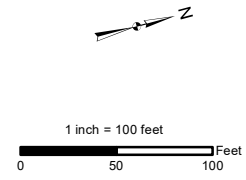


AoT Area C - Bow	
Map Sheets 17 to 31	
Disturbance Type	Impact (sq. ft)
New Access	17,702
Gravel Work Pad	260,155
<b>Total AoT Disturbed Area</b>	<b>277,857</b>
-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10 year period, cumulatively exceeds 100,000 square feet of contiguous area."	
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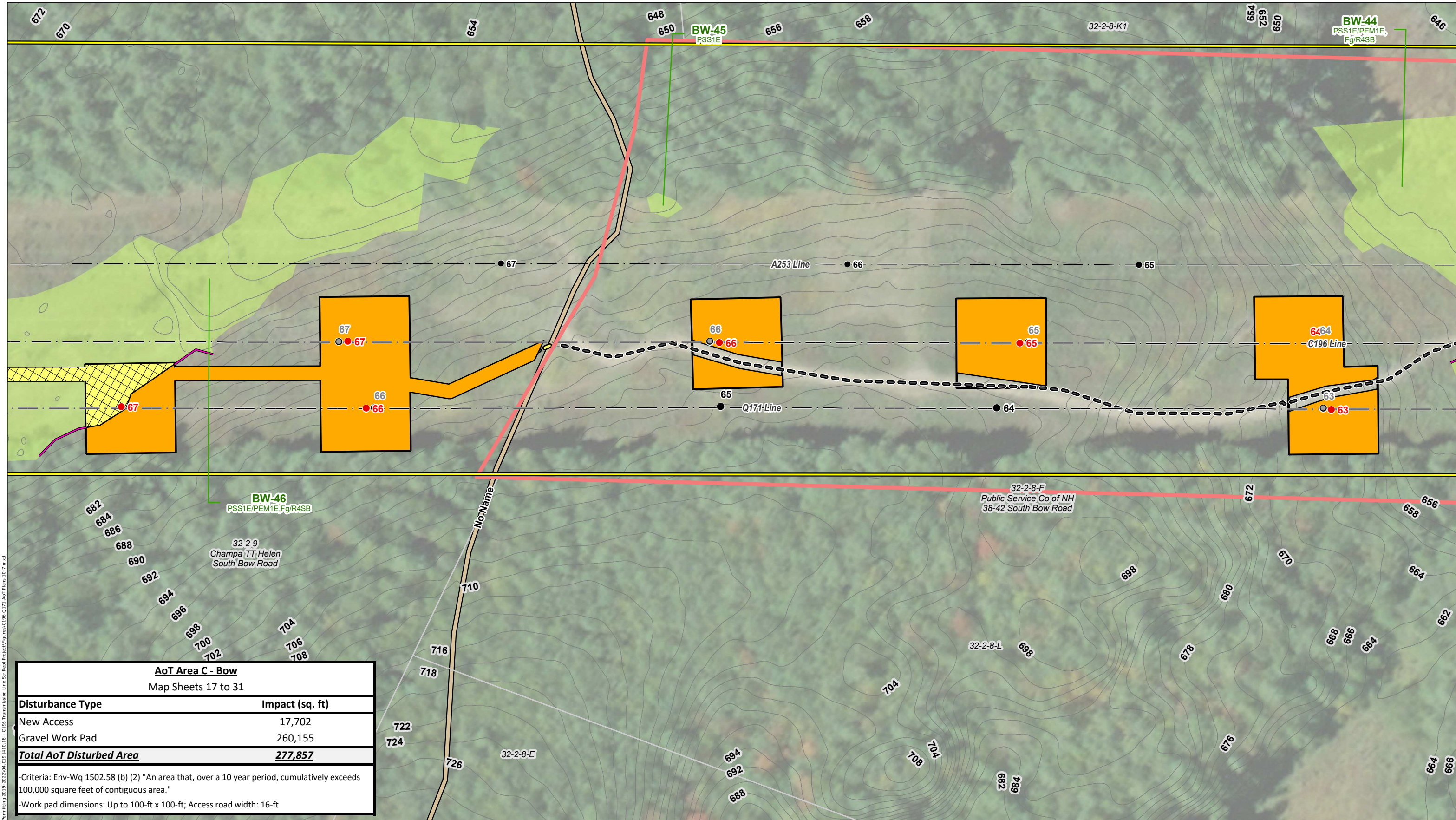
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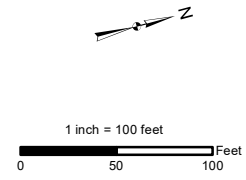
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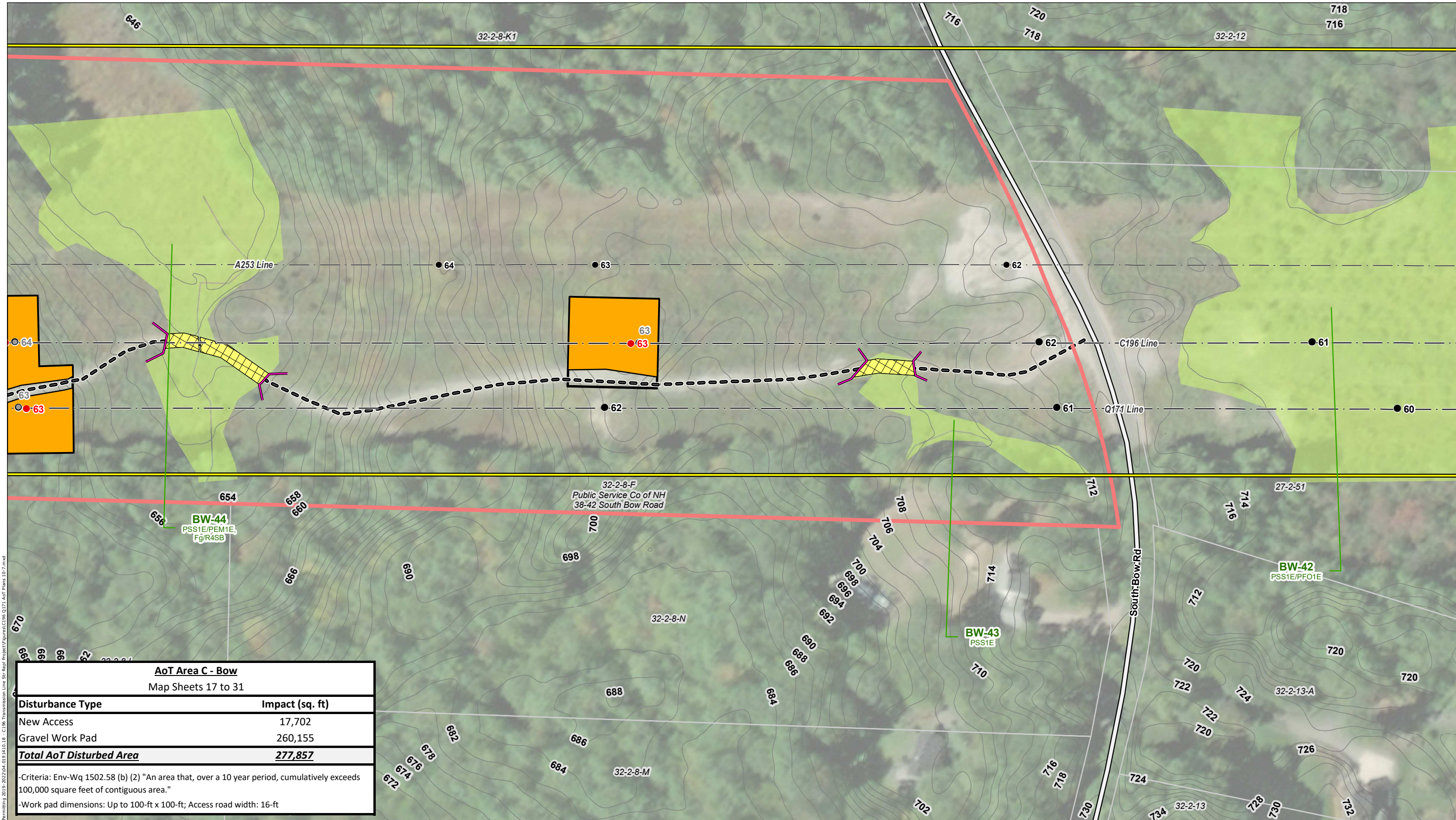


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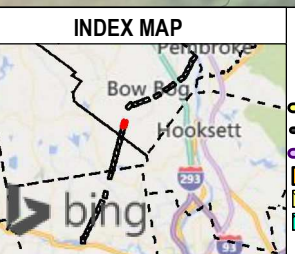
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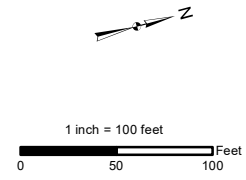
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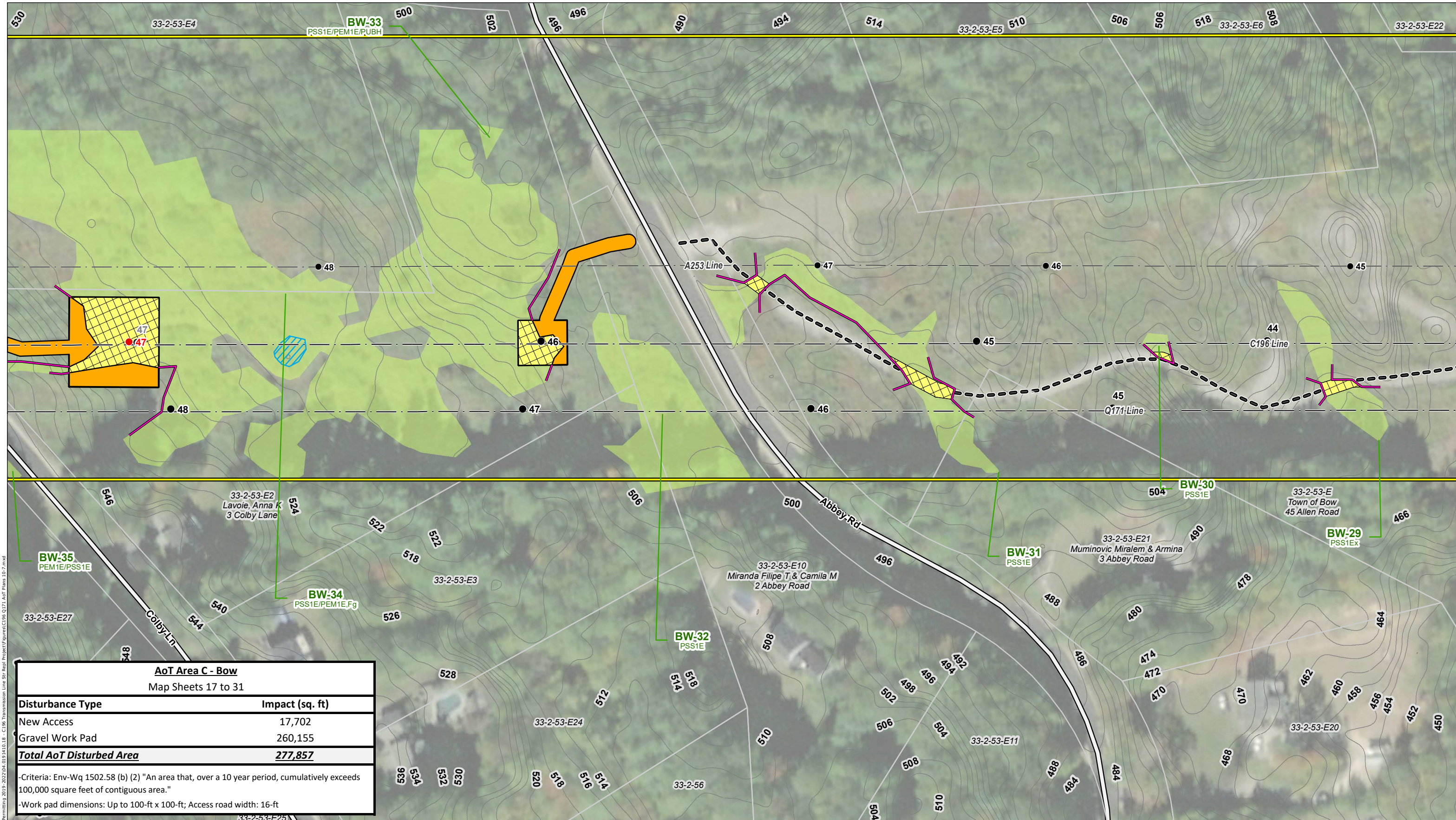
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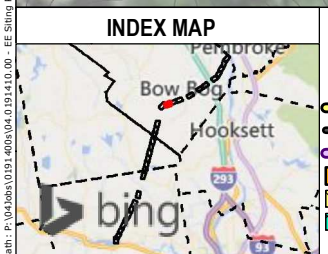






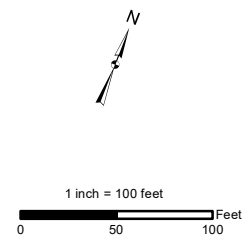
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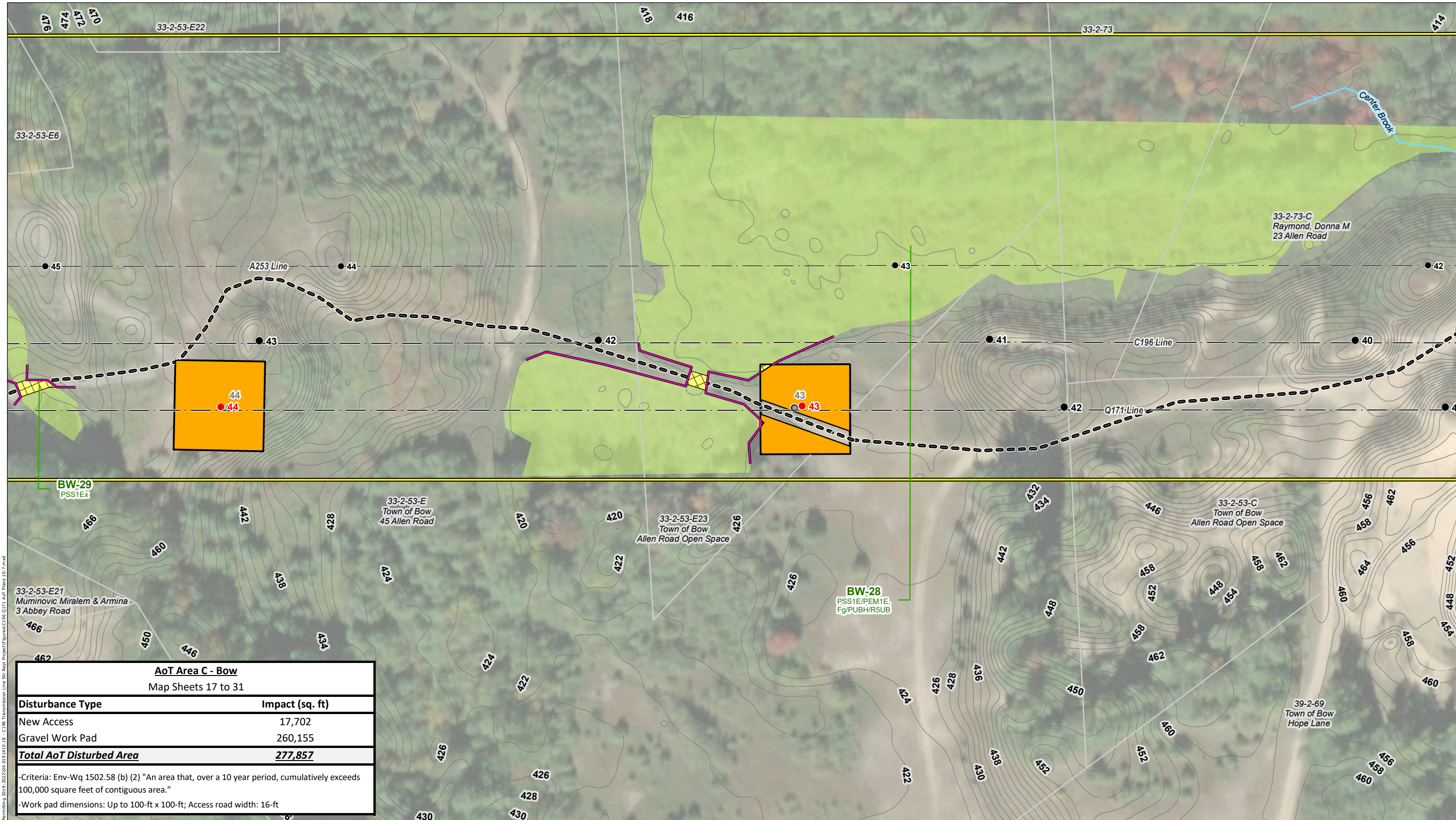
**EVSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**  
**Alternation of Terrain Permitting Plans**

Bow, NH	MAP SHEET
Date: June, 2022	<b>21 OF 31</b>

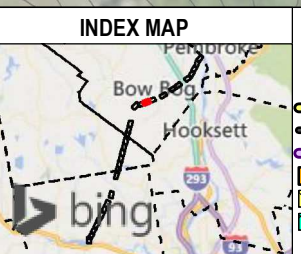
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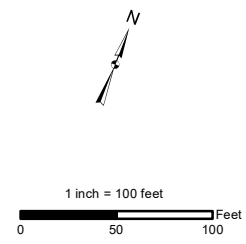
AoT Area C - Bow	
Map Sheets 17 to 31	
<b>Disturbance Type</b>	<b>Impact (sq. ft)</b>
New Access	17,702
Gravel Work Pad	260,155
<b>Total AoT Disturbed Area</b>	<b>277,857</b>
-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10 year period, cumulatively exceeds 100,000 square feet of contiguous area."	
-Work pad dimensions: Up to 100-ft x 100-ft; Access road width: 16-ft	

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- PROPOSED STRUCTURE REPLACEMENT
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- PROPOSED ACCESS
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- 2FT ELEVATION CONTOURS

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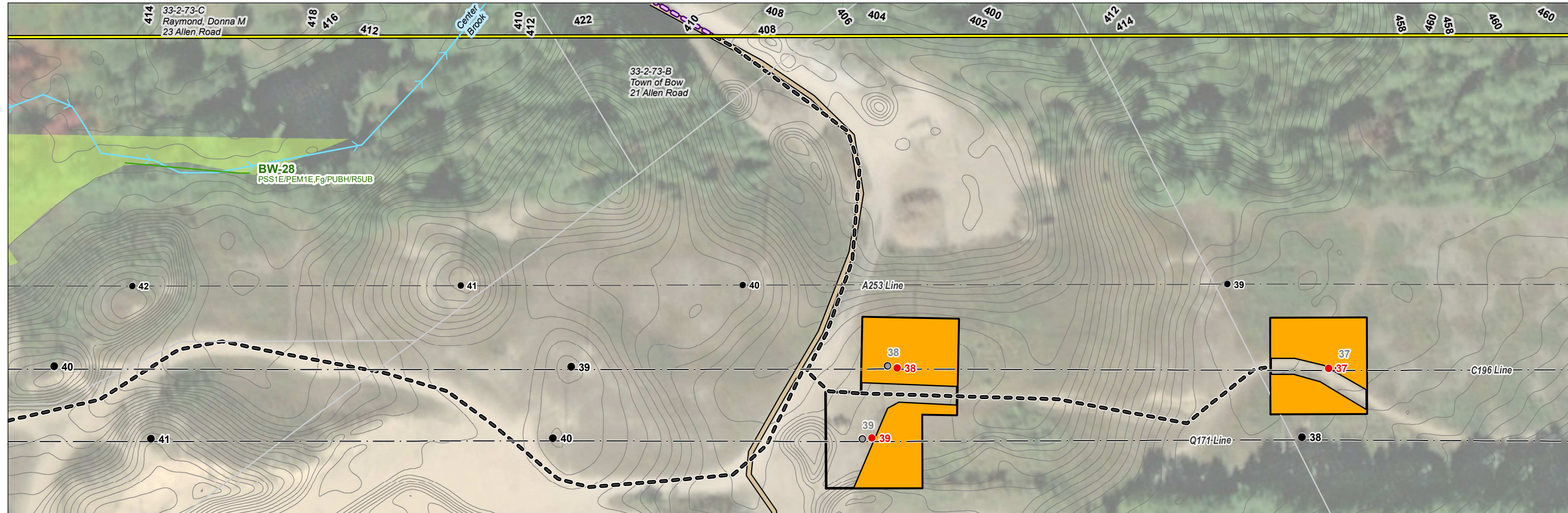
NO.	DATE	REVISIONS

**EVERSOURCE ENERGY**

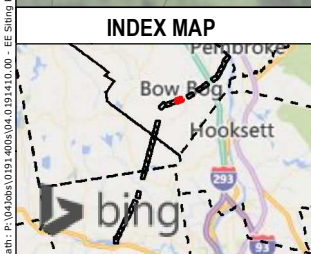
**C196 and Q171 Transmission Line Structure Replacement Project**  
**Alternation of Terrain Permitting Plans**

Bow, NH	MAP SHEET
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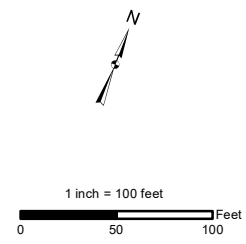


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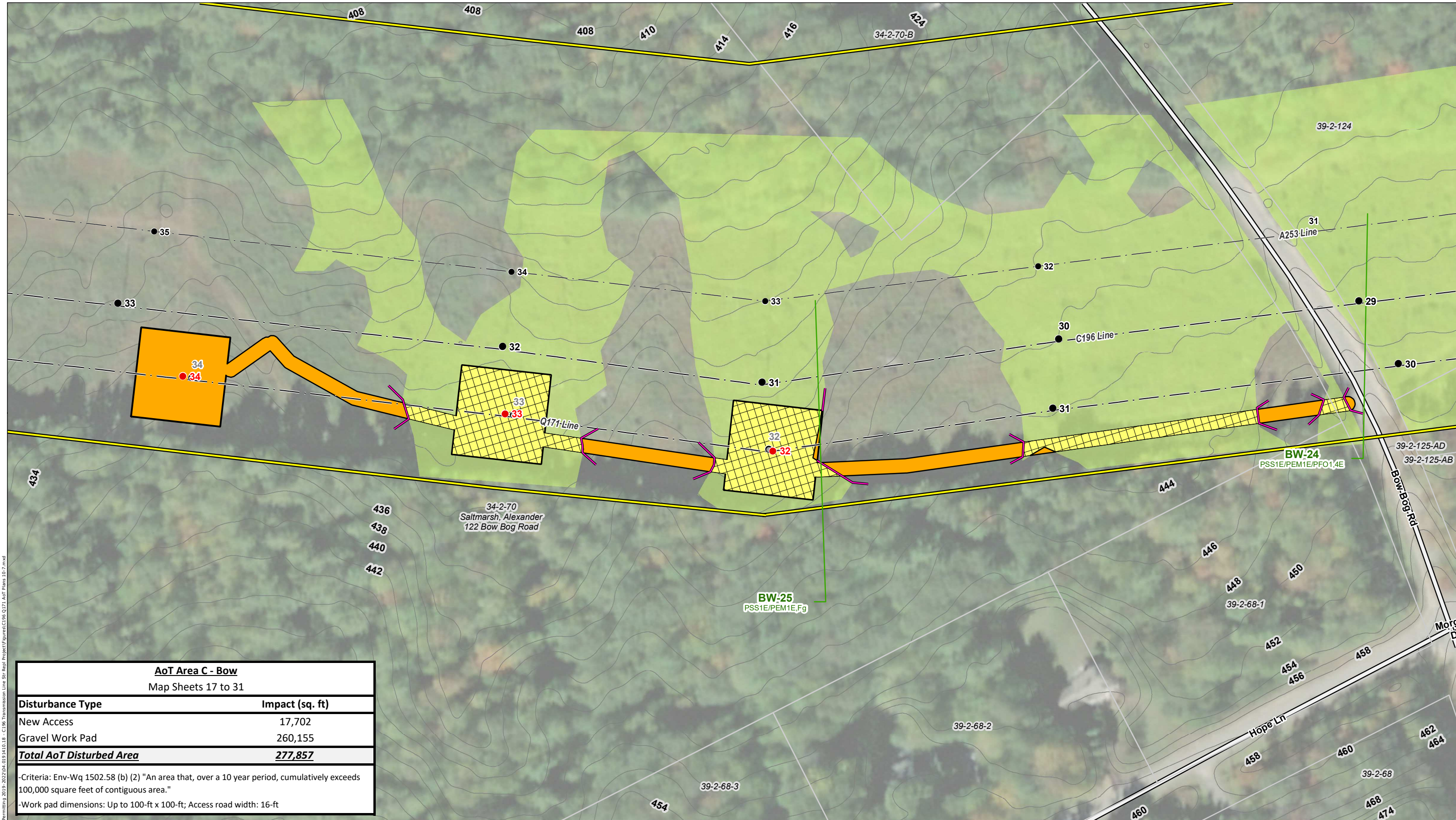
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**C196 and Q171 Transmission Line Structure Replacement Project**  
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Bow, NH	MAP SHEET
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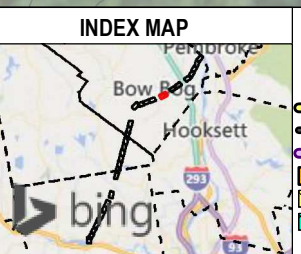
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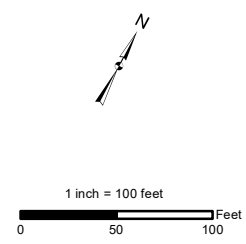
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**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line  
Structure Replacement Project  
Alternation of Terrain Permitting Plans**

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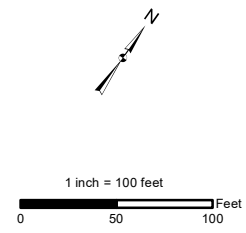
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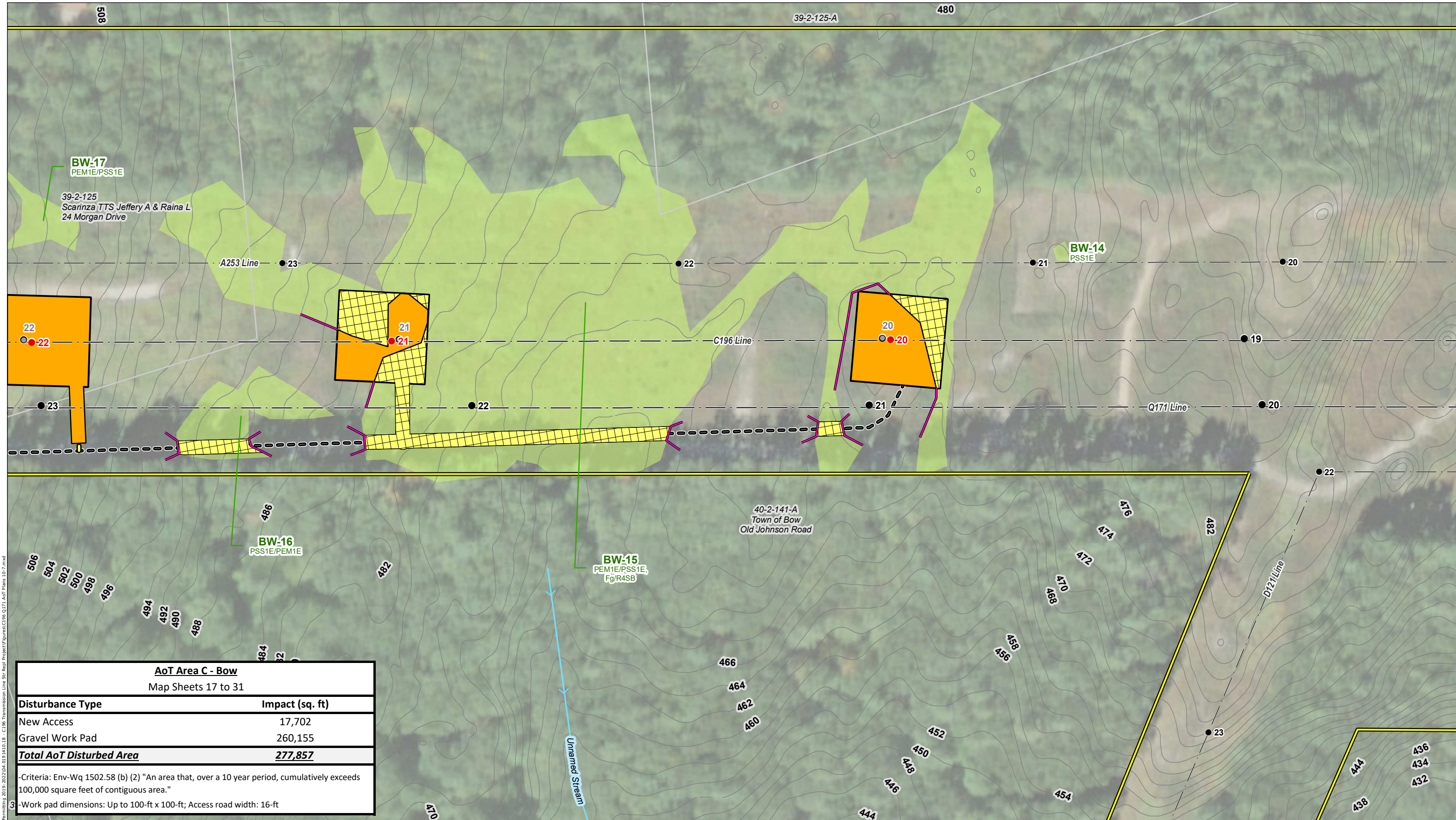
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**EVERSOURCE ENERGY**

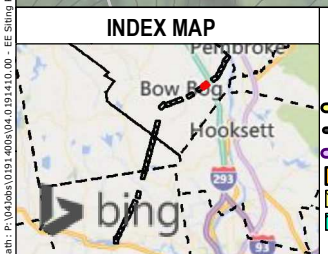
**C196 and Q171 Transmission Line Structure Replacement Project**  
**Alternation of Terrain Permitting Plans**

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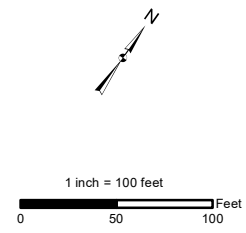


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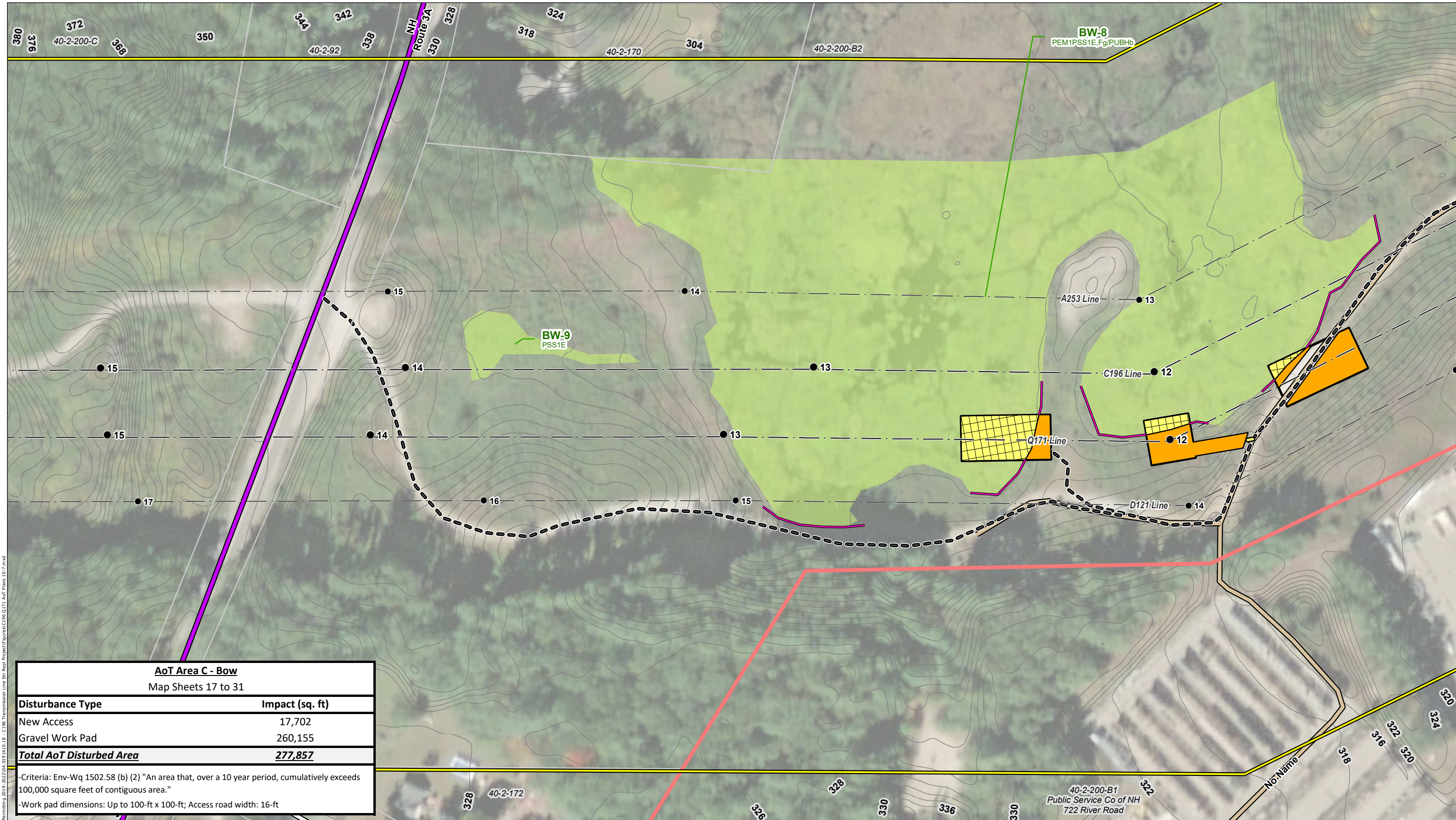
**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**  
**Alternation of Terrain Permitting Plans**

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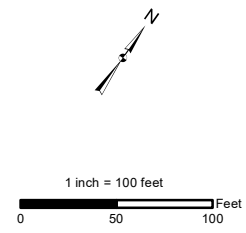
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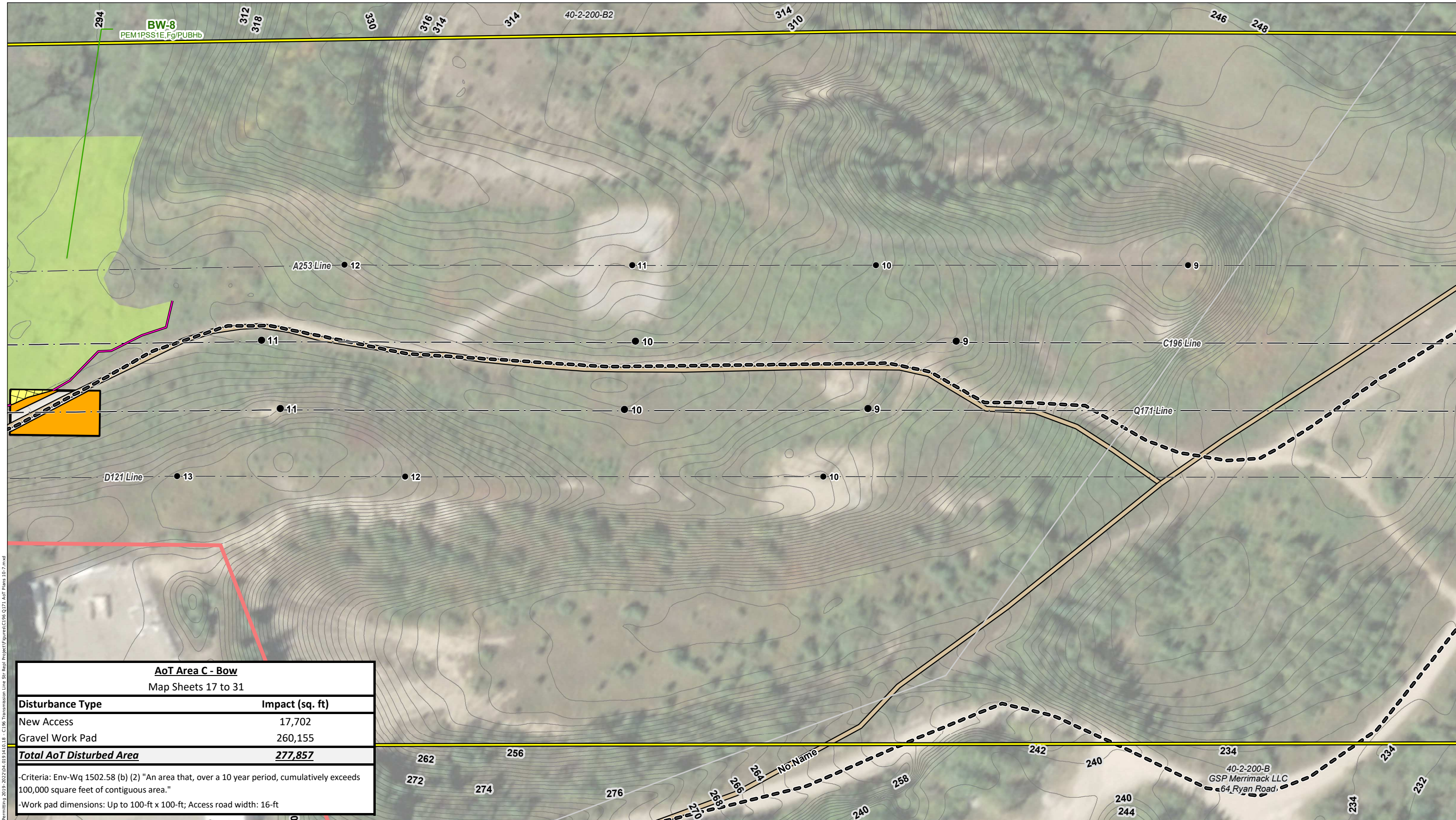
**EVERSOURCE ENERGY**

**C196 and Q171 Transmission Line Structure Replacement Project**  
**Alternation of Terrain Permitting Plans**

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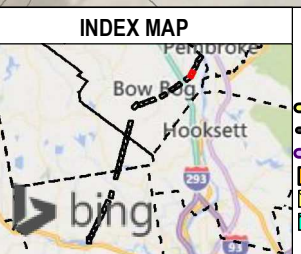
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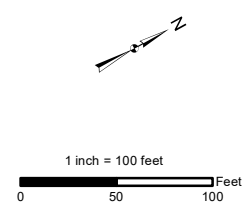
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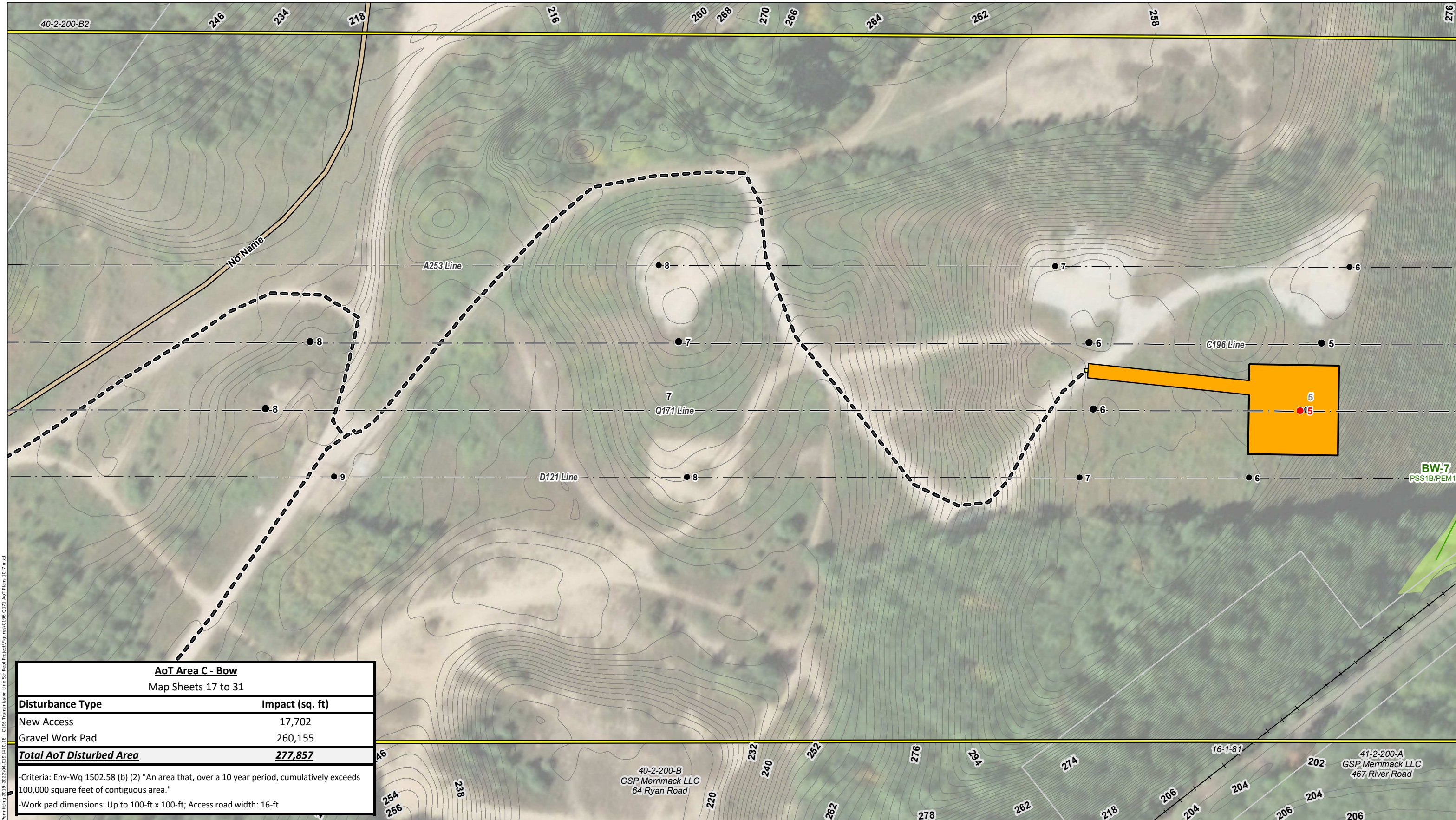
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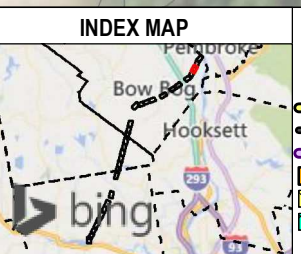
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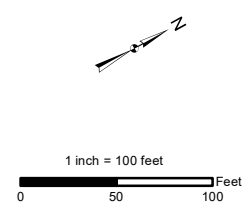


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40-2-200-B  
GSP Merrimack LLC  
64 Ryan Road

41-2-200-A  
GSP Merrimack LLC  
467 River Road

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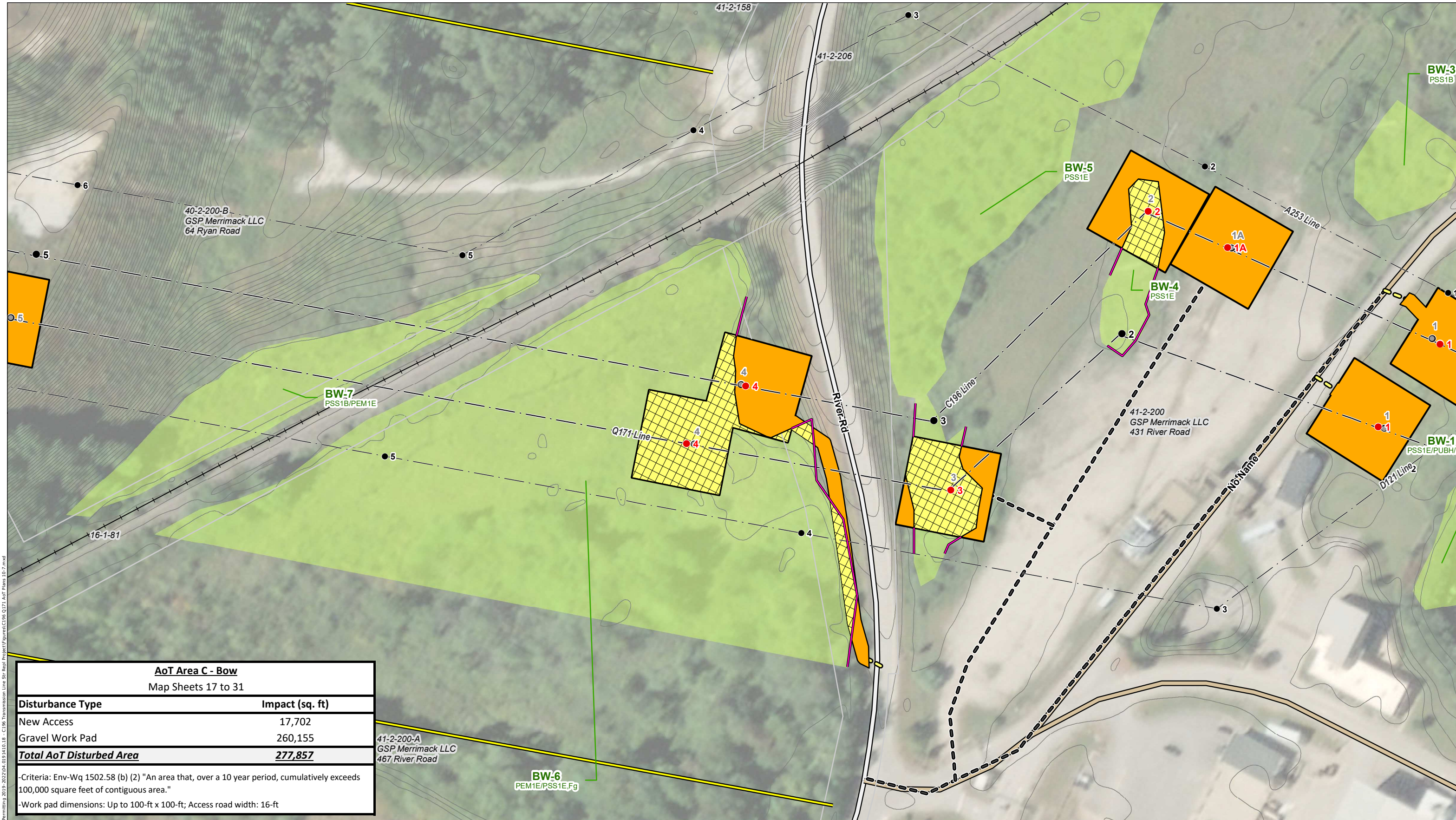
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**C196 and Q171 Transmission Line  
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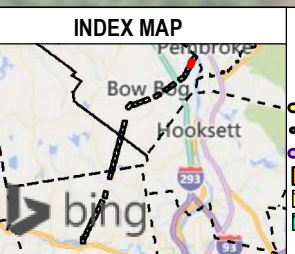




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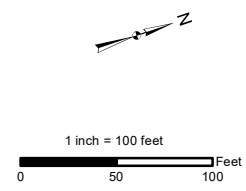
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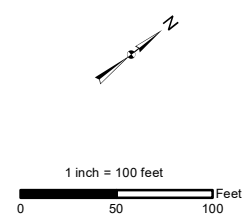
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**C196 and Q171 Transmission Line Structure Replacement Project**  
**Alternation of Terrain Permitting Plans**

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CONSTRUCTION SEQUENCE:

1. WETLAND BOUNDARIES TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.
2. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAIL PROVIDED, AS NECESSARY, AND CONSISTENT WITH THE NHDES MARCH 2019 BMP MANUAL FOR UTILITY MAINTENANCE.
3. WETLAND IMPACTS ASSOCIATED WITH WETLAND CROSSINGS ARE REQUIRED FOR ACCESS BETWEEN STRUCTURES WITHIN THE RIGHT OF WAY.
4. ADEQUATE PRECAUTION SHALL BE EXERCISED TO AVOID SPILLAGE OF FUEL OILS, CHEMICALS, OR SIMILAR SUBSTANCES; NO FUELS, LUBRICANTS, CHEMICALS OR SIMILAR SUBSTANCES SHALL BE STORED BENEATH TREES OR IN THE VICINITY OF ANY WETLANDS, RIVER, STREAM OR OTHER BODY OF WATER; OR IN THE VICINITY OF NATURAL OR MAN-MADE CHANNELS LEADING THERETO. NO POWER EQUIPMENT SHALL BE STORED, MAINTAINED, OR FUELED IN ANY AREA ADJACENT TO A WETLAND, RIVER, STREAM OR OTHER BODY OF WATER.
5. REMOVE COMPLETELY ALL CONTAMINATION FROM ANY SPILLAGE OF CHEMICALS OR PETROLEUM PRODUCT WITH COMPLETE REHABILITATION OF THE AFFECTED AREA.
6. ACCESS ROUTES HAVE BEEN SELECTED TO PREVENT DEGRADATION OF THE RIGHT-OF-WAY AND MINIMIZE ENVIRONMENTAL IMPACT. OPERATIONS SHALL BE CONFINED TO THE SPECIFIED ACCESS ROUTES WITHIN THE PROPOSED WETLAND IMPACT AREA. ACCESS ROUTES SHALL NOT EXCEED A 16 FOOT-WIDTH.
7. IMPACT TO VEGETATION WITHIN WETLANDS WILL BE LIMITED TO THE EXTENT NECESSARY TO PLACE THE SWAMP MATS WHERE REQUIRED.
8. LOW GROWING VARIETIES OF VEGETATION ADJACENT TO WETLANDS SHALL BE PRESERVED TO THE EXTENT POSSIBLE. STUMPS AND ROCKS SHALL NOT BE REMOVED, AND THERE SHALL BE NO EXCAVATIONS, FILLS OR GRADING DONE ADJACENT TO WETLANDS, UNLESS MINOR EXCAVATIONS IS NEEDED FOR ACCESS.
9. TIMBER MATS AND PERIMETER CONTROLS WILL BE USED ALONG ACCESS ROUTES AND WORK PADS WITHIN WETLAND AREAS. THESE MATS ARE CONSTRUCTED OF HEAVY TIMBERS OR COMPOSITE MATERIAL, BOLTED TOGETHER, AND ARE PLACED END-TO-END IN THE WETLAND TO SUPPORT HEAVY EQUIPMENT. ALL SWAMP MATS SHALL BE PLACED AND REMOVED SO AS NOT TO CAUSE ANY RUTS, CHANNELS OR DEPRESSIONS, OR OTHERWISE CAUSE ANY UNDUE DISTURBANCE TO WETLANDS.
10. IF TIMBER MAT BMP IS NOT SUFFICIENT DUE TO HIGH WATER, ADDITIONAL BMP'S MAY INCLUDE THE PLACEMENT OF GEOTEXTILE FABRIC, 3"-4" STONE, AND GRAVEL TO PROVIDE A SUITABLE ROAD BED. A TEMPORARY CULVERT MAY BE REQUIRED IN AREAS OF HIGH FLOW TO MAINTAIN HYDROLOGIC CONNECTIVITY. ALL MATERIAL WILL BE REMOVED FROM JURISDICTIONAL AREAS AFTER CONSTRUCTION COMPLETION.
11. NO MATERIAL SHALL BE PLACED IN ANY LOCATION OR IN ANY MANNER SO AS TO IMPAIR SURFACE WATER FLOW INTO, THROUGH OR OUT OF ANY WETLAND AREA. NO INSTALLATION SHALL CREATE AN IMPOUNDMENT THAT WILL IMPEDE THE FLOW OF WATER OR CAUSE FLOODING.
12. NO MATERIAL SHALL BE TAKEN FROM THE WETLANDS AREA EXCEPT THAT WHICH MUST NECESSARILY BE REMOVED FOR THE STRUCTURE OR FOUNDATION PLACEMENT OR STABILIZATION. ALL EXCESS MATERIAL TAKEN FROM THE WETLAND WILL BE REMOVED FROM THE SITE.
13. ANY PROPOSED SUPPORT FILLS SHALL BE CLEAN GRAVEL AND STONE, FREE OF WASTE METAL PRODUCTS, ORGANIC MATERIALS AND SIMILAR DEBRIS AND SHALL NOT EXCEED THE AMOUNT PERMITTED. THIS ALLOWABLE FILL IS THE ONLY FILL THAT MAY REMAIN IN THE WETLAND AFTER CONSTRUCTION. ALL CUT AND FILLS SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
14. INSTALL NEW POLES IN THE LOCATIONS DESIGNATED ON THE PERMITTING PLANS.
15. CABLE INSTALLATION WILL BE PERFORMED IN A MANNER SO AS TO AVOID, OR LIMIT TO THE MAXIMUM EXTENT POSSIBLE, TRAVERSING WETLANDS WITH HEAVY EQUIPMENT. IN SOME CASES, A HELICOPTER MAY BE USED DURING THE INSTALLATION TO MINIMIZE IMPACTS.
16. REMOVAL OF THE OLD POLE WILL OCCUR ONCE THE CABLE HAS BEEN INSTALLED ON THE NEW STRUCTURE. THE OLD STRUCTURES WILL BE REMOVED FROM THE SITE. POLES WILL BE CUT AT THE GROUND SURFACE. FOOTINGS WILL BE ABANDONED IN PLACE TO MINIMIZE IMPACTS.
17. ALL TIMBER MATS, MATERIAL, AND DEBRIS WILL BE REMOVED FROM THE WORK AREA UPON THE COMPLETION OF CONSTRUCTION.
18. UPLAND DISTURBED AREAS SHALL BE RESTORED AND STABILIZED UPON COMPLETION OF CONSTRUCTION. WORK PAD RESTORATION SHOULD INCLUDE REDUCING THE WORK PAD TO A 30 BY 60 FOOT AREA, AND REDUCING SLOPES TO A MAXIMUM OF 25%. STOCKPILED MATERIAL SHOULD BE SPREAD TO REDUCE ANY UNNECESSARY SLOPES. GRAVEL WORK PADS AND SLOPES SHOULD BE SCARIFIED TO A MINIMUM OF 3" BEFORE SPREADING TOPSOIL/LOAM.
19. ALL TEMPORARY WETLAND IMPACTS WILL BE RE-GRADED TO ORIGINAL CONTOURS FOLLOWING CONSTRUCTION. NEW ENGLAND EROSION CONTROL/RESTORATION MIX, AVAILABLE THROUGH NEW ENGLAND WETLAND PLANTS, INC., 820 WEST STREET, AMHERST, MA 01002, 413-548-8000, OR EQUIVALENT SEED MIX SHALL BE APPLIED IN WETLAND AREAS THAT ARE NOT INUNDATED, AS NECESSARY.
20. MULCH USED FOR STABILIZATION SHALL CONSIST OF SEEDLESS STRAW.
21. SEDIMENT AND EROSION CONTROL MEASURES WILL BE EVALUATED AND REMOVED IF NECESSARY UPON THE COMPLETION OF CONSTRUCTION.
22. COMMERCIAL LOAM WILL NOT BE USED AS PART OF RESTORATION. ONLY IN-SITU TOPSOIL WILL BE USED TO RESTORE DISTURBED AREAS.
23. WHERE OPTIMAL TURTLE BREEDING AREAS OVERLAP WITH DISTURBANCE (AS DETERMINED BY AN ENVIRONMENTAL MONITOR), MINERAL SOILS WILL BE SCARIFIED TO ALLEVIATE COMPACTION AND BECOME MORE SUITED FOR TURTLE BREEDING.
24. NATURALLY VEGETATED LOCAL WETLAND BUFFER AREAS OUTSIDE OF EXISTING TRAILS MUST BE RESTORED UPON COMPLETION OF WORK.

WINTER CONSTRUCTION NOTES

1. PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED. STABILIZATION METHODS SHALL INCLUDE SEEDING AND MULCH, AND INSTALLATION OF EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE TEMPORARILY STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.

3. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL (NHDOT 304.3).

GENERAL NOTES:

OWNER: EVERSOURCE ENERGY  
13 LEGENDS DRIVE  
HOOKSETT, NH 03106

1. BASE PLAN PROVIDED BY EVERSOURCE ENERGY. EVERSOURCE ENERGY PROVIDED THE WETLAND DATA. EVERSOURCE ENERGY PROVIDED THE UTILITY DESIGN.
2. JURISDICTIONAL WETLANDS WERE CONFIRMED BY GZA GEOENVIRONMENTAL, INC. IN 2022, IN ACCORDANCE WITH THE 1987 U.S. ARMY CORPS OF ENGINEERS' "WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1," AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTHEAST REGION," JANUARY 2012. WETLANDS WILL BE REVIEWED BY GZA GEOENVIRONMENTAL, INC. PRIOR TO START OF WORK.
3. GZA EVALUATED WETLANDS AS POTENTIAL VERNAL POOLS IN 2022 IN ACCORDANCE WITH "IDENTIFICATION AND DOCUMENTATION OF VERNAL POOLS IN NEW HAMPSHIRE," 2016, NEW HAMPSHIRE FISH AND GAME DEPARTMENT, NONGAME AND ANDANGERED WILDLIFE PROGRAM.
4. AS APPLICABLE, GZA WILL COMPLETE WETLANDS FUNCTION AND VALUES ASSESSMENT IN ACCORDANCE WITH THE ACOE'S "HIGHWAY METHODOLOGY WORKBOOK SUPPLEMENT," SEPTEMBER 1999.
5. SITE PLAN IS FOR PERMITTING PURPOSES ONLY AND DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY.
6. THE PROJECT WILL BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
7. IN ACCORDANCE WITH ENV-WQ 1505.02, THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
  - A MINIMUM 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED
  - A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL HAS BEEN INSTALLED
  - OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
8. IN THE EVENT THAT A RARE OR THREATENED SPECIES IS OBSERVED, THE NEW HAMPSHIRE FISH AND GAME AND NEW HAMPSHIRE NATURAL HERITAGE BUREAU WILL BE NOTIFIED, TURTLE NESTING SEASON EXTENDS FROM LATE MAY THROUGH THE BEGINNING OF JULY. IF WOOD, BLANDING'S OR SPOTTED TURTLES ARE FOUND LAYING EGGS IN THE WORK AREA, CONTACT MELISSA DOPERALSKI AT 603-271-1738 OR JOSH MEGYESY AT 603-271-1125 FOR FURTHER INSTRUCTIONS. OBSERVATIONS OF NORTHERN BLACK RACER SNAKES SEEN IN ANY AREA FROM THE END OF SEPTEMBER THROUGH THE MONTH OF APRIL MUST BE IMMEDIATELY REPORTED TO THE NHFG DEPARTMENT (BRENDAN CLIFFORD AT 603-271-0463 OR MELISSA DOPERALSKI AT 603-271-1738). IF NORTHERN BLACK RACER IS FOUND IN A WORK AREA FROM NOVEMBER THROUGH THE MONTH OF APRIL, WORK SHALL IMMEDIATELY CEASE AND THE OBSERVATION MUST BE REPORTED TO THE NHFG (BRENDAN CLIFFORD OR MELISSA DOPERALSKI).


EROSION CONTROL NOTES:

1. INSTALLATION OF EROSION CONTROL GRINDINGS AND/OR SILT FENCES SHALL BE COMPLETE PRIOR TO THE START OF WORK IN ANY GIVEN AREA. EROSION CONTROLS SHALL BE USED DURING CONSTRUCTION AND REMOVED WHEN ALL SLOPES HAVE A HEALTHY STAND OF VEGETATION COVER. EROSION CONTROL MEASURES SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER .25" OR GREATER RAINFALL EVENTS.
2. AS REQUIRED, CONSTRUCT TEMPORARY BERMS, SILTATION FENCES, SEDIMENT TRAPS, ETC. TO PREVENT EROSION & SEDIMENTATION OF WETLANDS.
3. THE WORK AREA SHALL BE GRADED AND OTHERWISE SHAPED IN SUCH A MANNER AS TO MINIMIZE SOIL EROSION, SILTATION OF DRAINAGE CHANNELS, DAMAGE TO EXISTING VEGETATION, AND DAMAGE TO PROPERTY OUTSIDE LIMITS OF THE WORK AREA. EROSION CONTROL GRINDINGS WILL BE NECESSARY TO ACCOMPLISH THIS END.
4. ANY STRIPPED TOPSOIL SHALL BE STOCKPILED, WITHOUT COMPACTION, AND STABILIZED WITH BMPS.
5. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS, PLANT ANNUAL RYEGRASS PRIOR TO OCTOBER 15TH.
6. EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
7. EROSION CONTROL MATTING, IF REQUIRED, WILL CONSIST OF JUTE MATTING. MATTING WITH WELDED PLASTIC OR 'BIODEGRADABLE PLASTIC' NETTING OR THREAD WILL BE AVOIDED TO LIMIT UNINTENTIONAL MORTALITY TO SNAKES.

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C196 & Q171 TRANSMISSION LINE STRUCTURE REPLACEMENT PROJECT  
GOFFSTOWN, DUNBARTON, AND BOW, NEW HAMPSHIRE

NOTES

PREPARED BY:  <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: <b>EVSOURCE</b> ENERGY	
PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET <b>1</b> 1 OF 2
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 06/16/2022	PROJECT NO: 04.0191410.18	REVISION NO.	



## Best Management Practices (BMP's) for Straw wattles

### Definition and purpose:

Straw wattles are burlap rolls filled with straw that trap sediment and interrupt water flow by reducing slope lengths.

### Applications:

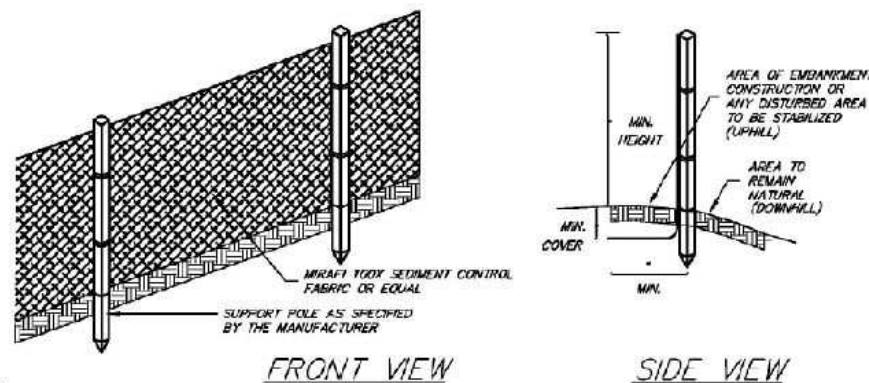
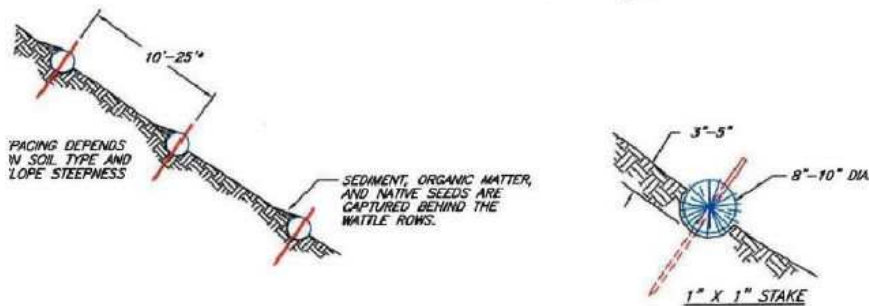
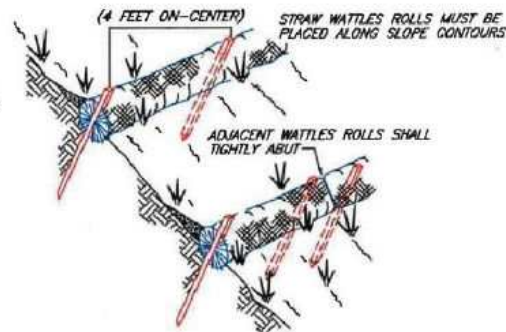
- \* Along erodible or unstabilized slopes
- \* Spread overland waterflow
- \* Trap sediment
- \* Around storm drain inlets to slow water and settle out sediment
- \* Overlap ends approximately 6 inches

### Installation:

Straw wattles are installed parallel to slope contours and perpendicular to sheet flow.

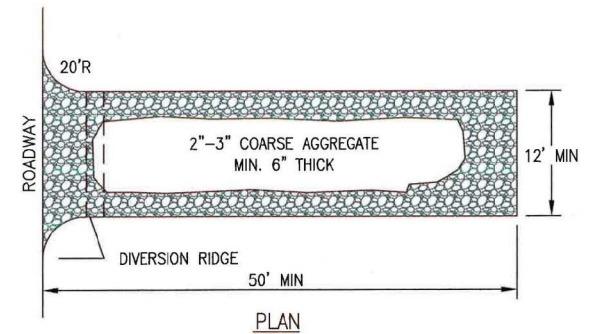
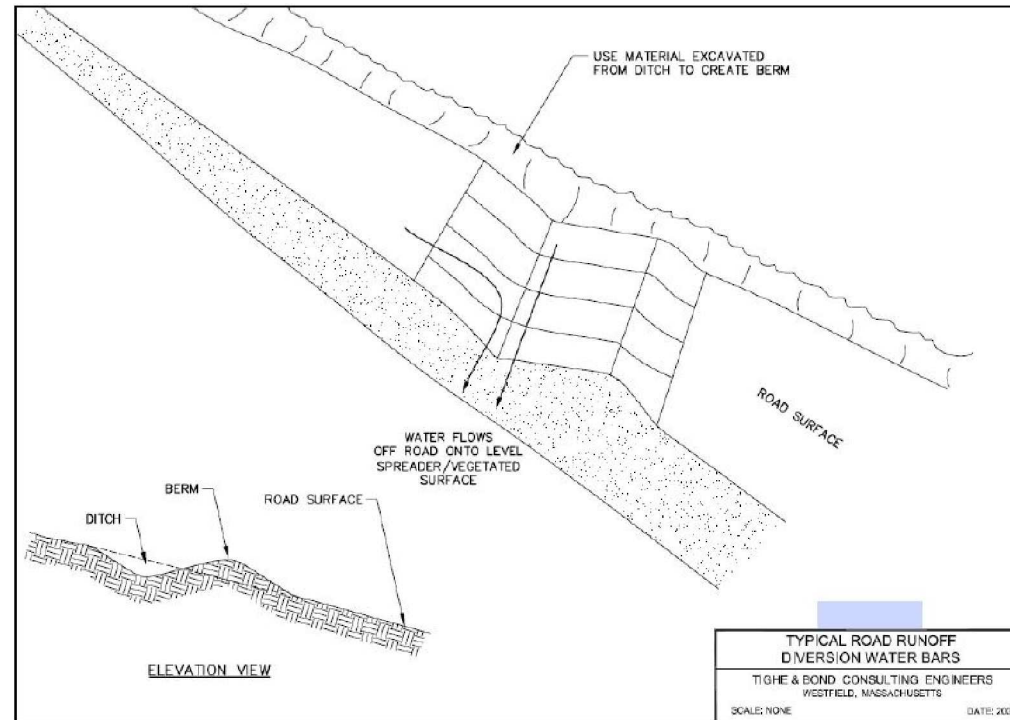
Spacing\* - Dependent on slope length, soil steepness and soil type (general range 10 - 25').

Trenching - 2"-5" inch trench  
Stacking - at each end and four foot on center (i.e. 25 foot wattle uses 6 stacks)



### NOTES (SILT FENCE)

1. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES.
2. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPliced TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATIONS.
3. POSTS SHALL BE PLACED AT A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL BE AS MANUFACTURER RECOMMENDS.
4. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE OF THE BARRIER IN ACCORDANCE WITH RECOMMENDATIONS
5. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE, AND WILL EXTEND A MINIMUM OF 8 INCHES INTO THE TRENCH. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
6. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
7. FABRIC BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
8. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST ONCE DAILY DURING PROLONGED RAINFALL AND ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
9. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
10. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
11. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

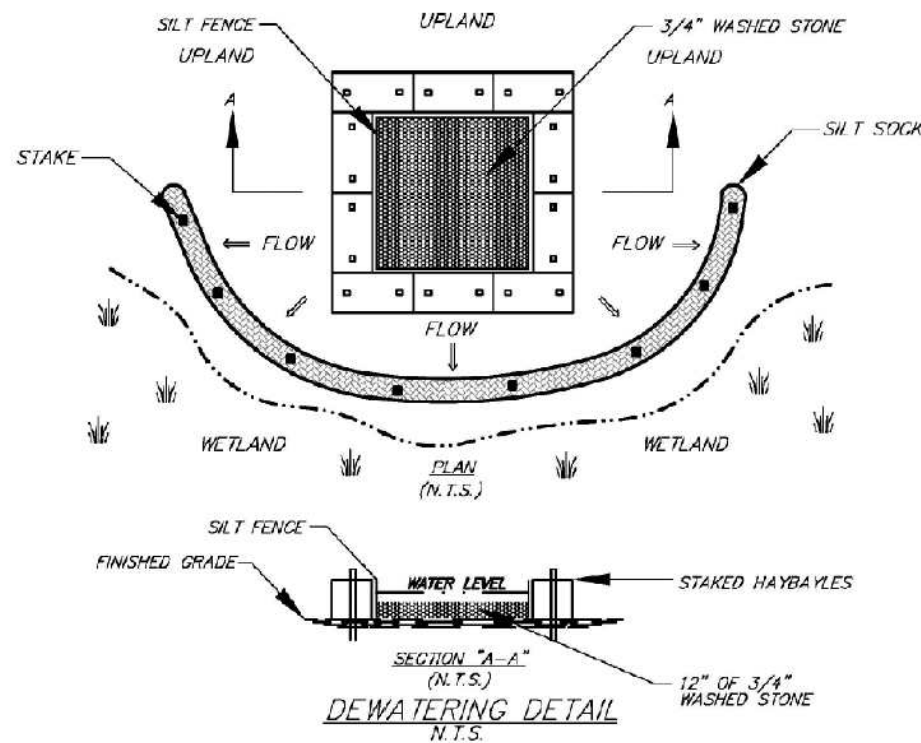


### NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.

## CONSTRUCTION ENTRANCE

NOT TO SCALE



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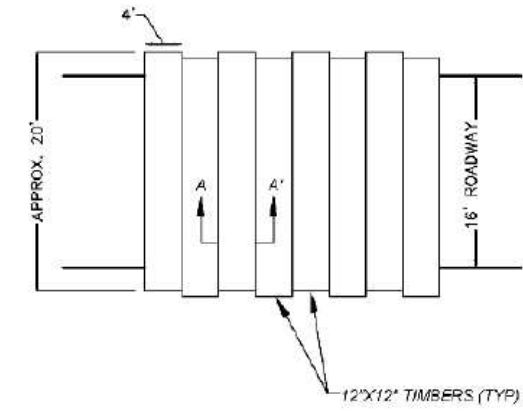
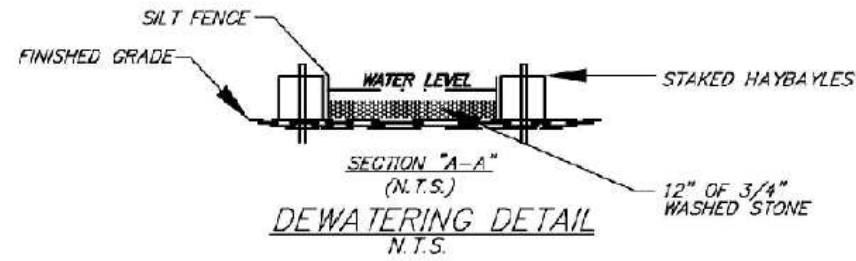
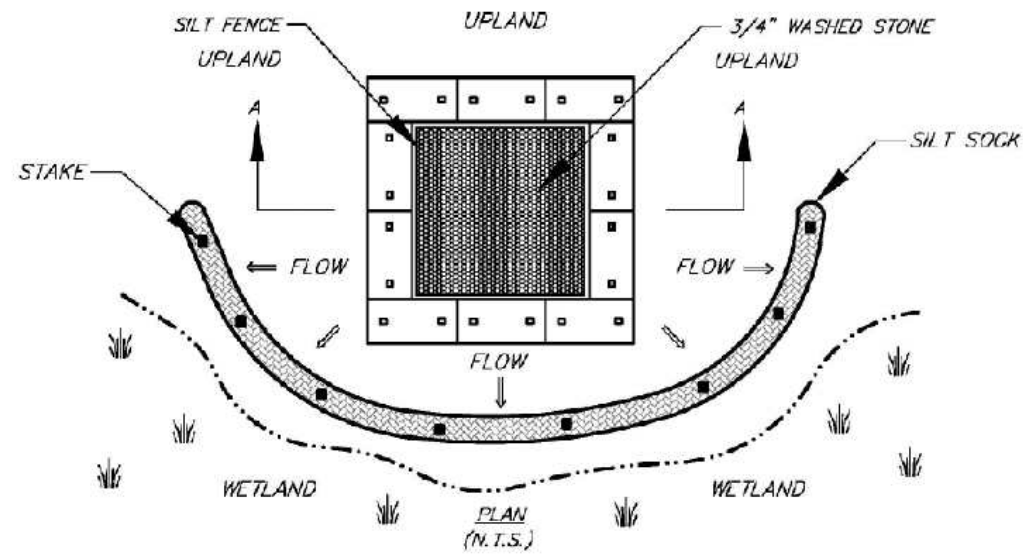
C196 & Q171 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT  
GOFFSTOWN, DUNBARTON, & BOW, NEW HAMPSHIRE

## BMP DETAILS

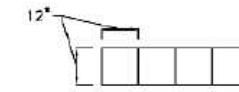
PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: <b>EVERSOURCE</b> ENERGY	
PROJ MGR: CEM	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	<b>S2</b>
DATE: 06/28/2022	PROJECT NO: 04.0191410.18	REVISION NO:	



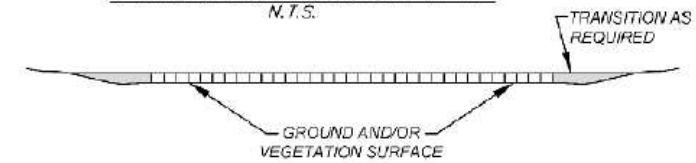
© 2022 - GZA GeoEnvironmental, Inc. P:\04\Jobs\0191410\00 - EE Shing Permitting 2019-2022\04.0191410.18 - C196 Transmission Line Str Repl Project\Figures\C196 Q171 AOT Notesheet 3 10-7.mxd, 6/28/2022, 11:29:00 AM, lindsay.white



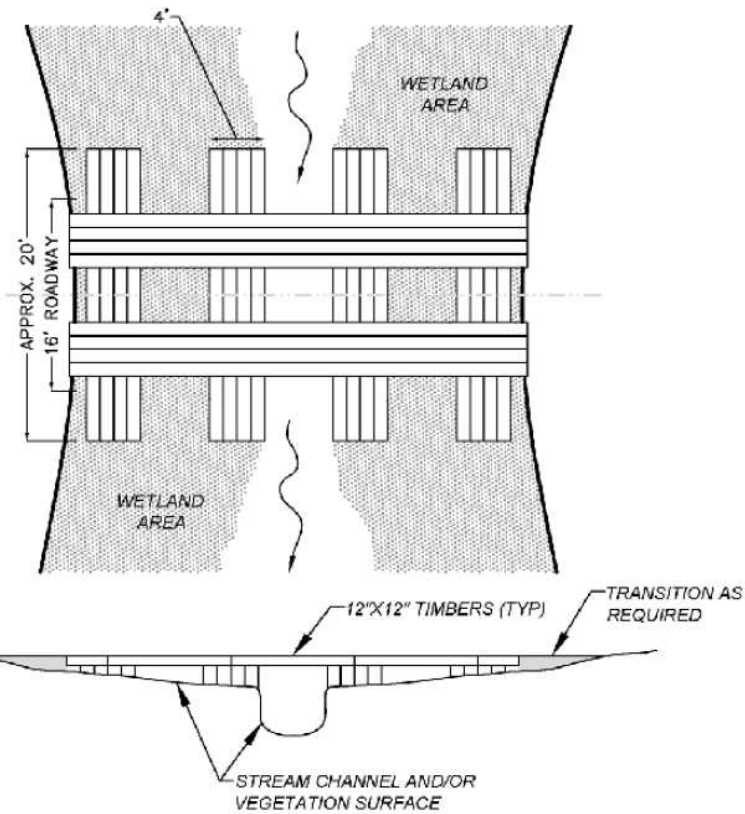
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N.T.S.



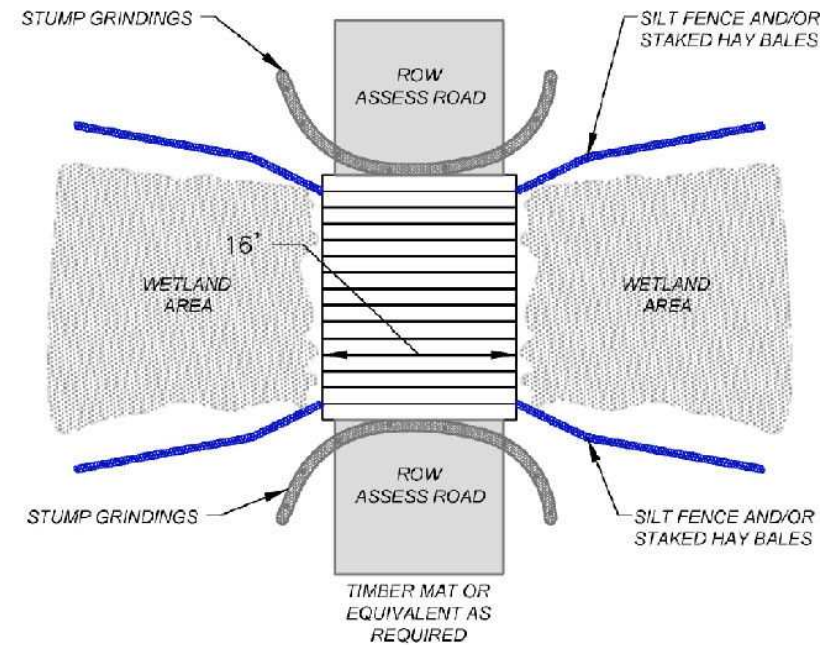
TYPICAL MAT SECTION A-A  
N.T.S.



TYPICAL SWAMP MAT SECTION DETAIL  
N.T.S.



TYPICAL STREAM CROSSING  
N.T.S.



TYPICAL WETLAND CROSSING  
N.T.S.

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C196 & Q171 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT  
GOFFSTOWN, DUNBARTON, & BOW, NEW HAMPSHIRE

BMP DETAILS

PREPARED BY:  
**GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

PREPARED FOR:  
**EVERSOURCE**  
ENERGY

PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET <b>S3</b>
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 06/28/2022	PROJECT NO: 04.0191410.18	REVISION NO:	





## **Appendix A – Alteration of Terrain Permit Application Form**





# ALTERATION OF TERRAIN PERMIT APPLICATION



Water Division/ Alteration of Terrain Bureau/ Land Resources Management  
Check the Status of your Application: [www.des.nh.gov/onestop](http://www.des.nh.gov/onestop)

RSA/ Rule: RSA 485-A:17, Env-Wq 1500

Administrative Use Only	Administrative Use Only	Administrative Use Only	File Number:
			Check No.
			Amount:
			Initials:

**1. APPLICANT INFORMATION (INTENDED PERMIT HOLDER)**

Applicant Name: Eversource Energy		Contact Name: Ashley Friend	
Email: ashley.friend@eversource.com		Daytime Telephone: 603-634-2992	
Mailing Address: 13 Legends Drive			
Town/City: Hooksett		State: NH	Zip Code: 03106

**2. APPLICANT'S AGENT INFORMATION** If none, check here:

Business Name: GZA GeoEnvironmental, Inc.		Contact Name: Lindsey White	
Email: lindsey.white@gza.com		Daytime Telephone: 603-232-8753	
Address: 5 Commerce Park North, Suite 201			
Town/City: Bedford		State: NH	Zip Code: 03110

**3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)**

Applicant Name: ROW consists of existing easements		Contact Name:	
Email:		Daytime Telephone:	
Mailing Address:			
Town/City:		State:	Zip Code:

**4. PROPERTY OWNER'S AGENT INFORMATION** If none, check here:

Business Name:		Contact Name:	
Email:		Daytime Telephone:	
Address:			
Town/City:		State:	Zip Code:

**5. CONSULTANT INFORMATION** If none, check here:

Engineering Firm: GZA GeoEnvironmental, Inc.		Contact Name: Lindsey White	
Email: lindsey.white@gza.com		Daytime Telephone: 603-232-8753	
Address: 5 Commerce Park North, Suite 201			
Town/City: Bedford		State: NH	Zip Code: 03110



<b>6. PROJECT TYPE</b>			
<input type="checkbox"/> Excavation Only	<input type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input type="checkbox"/> Golf Course
<input type="checkbox"/> Agricultural	<input type="checkbox"/> Land Conversion	<input checked="" type="checkbox"/> Other: Utility	
<input type="checkbox"/> School <input type="checkbox"/> Municipal			
<b>7. PROJECT LOCATION INFORMATION</b>			
Project Name: C196 and Q171 Transsmission Line Structure Replacement Project			
Street/Road Address: Existing Utility Right-of-Way			
Town/City: Goffstown, Dunbarton, and Bow		County: Hillsborough and Merrimack	
Tax Map: See attached	Block:	Lot Number:	Unit:
Location Coordinates: 189475N, 1009842E		<input type="checkbox"/> Latitude/Longitude	<input type="checkbox"/> UTM <input checked="" type="checkbox"/> State Plane
Post-development, will the proposed project withdraw from or directly discharge to any of the following? If yes, identify the purpose.			
1. Stream or Wetland Purpose:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Discharge
2. Man-made pond created by impounding a stream or wetland Purpose:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Discharge
3. Unlined pond dug into the water table Purpose:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Discharge
Post-development, will the proposed project discharge to:			
• A surface water impaired for phosphorus and/or nitrogen? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen			
• A Class A surface water or Outstanding Resource Water? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen			
• A lake or pond not covered previously? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes - include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond			
Is the project a High Load area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, specify the type of high load land use or activity: _____			
Is the project within a Water Supply Intake Protection Area (WSIPA)?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Is the project within a Groundwater Protection Area (GPA)?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Will the well setbacks identified in Env-Wq 1508.02 be met?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Note: Guidance document titled " <a href="#">Using NHDES's OneStop WebGIS to Locate Protection Areas</a> " is available online. For more details on the restrictions in these areas, read Chapter 3.1 in Volume 2 of the NH Stormwater Manual.			
Is any part of the property within the 100-year floodplain?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
If yes: Cut volume: <u>N/A</u> cubic feet within the 100-year floodplain Fill volume: <u>N/A</u> cubic feet within the 100-year floodplain			
<input checked="" type="checkbox"/> Project IS within ¼ mile of a designated river		Name of River: Piscataquog River	
<input type="checkbox"/> Project is NOT within ¼ mile of a designated river			
<input type="checkbox"/> Project IS within a Coastal/Great Bay Region community - include info required by Env-Wq 1503.08(I) if applicable			
<input checked="" type="checkbox"/> Project is NOT within a Coastal/Great Bay Region community			
<b>8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")</b>			
The proposed project includes the replacement of 88 existing utility structures, including 47 along the C196 Transmission Line and 41 along the Q171 Transmission Line in the Towns of Goffstown, Dunbarton, and Bow. Access road improvements and work pad grading are proposed as part of this project for continued maintenance of the existing line.			
<b>9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT</b>			
No work has been started prior to receiving a permit.			



**10. ADDITIONAL REQUIRED INFORMATION**

A. Date a copy of the application was sent to the municipality as required by Env-Wq 1503.05(e)<sup>1</sup>: 7/7/2022  
**(Attach proof of delivery)**

B. Date a copy of the application was sent to the local river advisory committee if required by Env-Wq 1503.05(e)<sup>2</sup>: 7/7/2022  
**(Attach proof of delivery)**

C. Type of plan required:  Land Conversion  Detailed Development  Excavation, Grading & Reclamation  Steep Slope

D. Additional plans required:  Stormwater Drainage & Hydrologic Soil Groups  Source Control  Chloride Management

E. Total area of disturbance: 996,218 square feet

F. Additional impervious cover as a result of the project: \_\_\_\_\_ square feet (use the "-" symbol to indicate a net reduction in impervious coverage).  
 Total final impervious cover: 0 square feet

G. Total undisturbed cover: 0 square feet

H. Number of lots proposed: 0

I. Total length of roadway: 0 linear feet

J. Name(s) of receiving water(s): 0

K. Identify all other NHDES permits required for the project, and for each indicate whether an application has been filed and is pending, or if the required approval has been issued provide the permit number, registration date, or approval letter number, as applicable.

Type of Approval	Application Filed?	Status	
		Pending	If Issued:
1. Water Supply Approval	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/>	Permit number:
2. Wetlands Permit	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/>	Permit number: TBD
3. Shoreland Permit	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/>	Permit number: TBD
4. UIC Registration	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/>	Registration date:
5. Large/Small Community Well Approval	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/>	Approval letter date:
6. Large Groundwater Withdrawal Permit	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<input type="checkbox"/>	Permit number:
7. Other:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	Permit number:

L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern: Blanding's turtle, wood turtle, northern black racer snake, smooth green snake, eastern hognose snake

M. Using NHDES's Web GIS OneStop program ([www2.des.state.nh.us/gis/onestop/](http://www2.des.state.nh.us/gis/onestop/)), with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A." ESCHERICHIA COLI

N. Did the applicant/applicant's agent have a pre-application meeting with AOT staff?  Yes  No  
 If yes, name of staff member: \_\_\_\_\_

O. Will blasting of bedrock be required?  Yes  No If yes, estimated quantity of blast rock: \_\_\_\_\_ cubic yards  
 If yes, standard blasting BMP notes must be placed on the plans, available at:  
<http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf>  
**NOTE:** If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact AOT staff for additional detail.

<sup>1</sup> Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed.

<sup>2</sup> Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river.



**11. CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN ORDER LISTED)****LOOSE:**

- Signed application form: [des.nh.gov/organization/divisions/water/aot/index.htm](http://des.nh.gov/organization/divisions/water/aot/index.htm) (with attached proof(s) of delivery)
- Check for the application fee: [des.nh.gov/organization/divisions/water/aot/fees.htm](http://des.nh.gov/organization/divisions/water/aot/fees.htm)
- Color copy of a USGS map with the property boundaries outlined (1" = 2,000' scale)
- If Applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.

**BIND IN A REPORT IN THE FOLLOWING ORDER:**

- Copy of the signed application form & application checklist ([des.nh.gov/organization/divisions/water/aot/index.htm](http://des.nh.gov/organization/divisions/water/aot/index.htm))
- Copy of the check
- Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale)
- Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points
- Web GIS printout with the "Surface Water Impairments" layer turned on - <http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx>
- Web GIS printouts with the AOT screening layers turned on - <http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx>
- NHB letter using DataCheck Tool – [www.nhdfi.org/about-forests-and-lands/bureaus/natural-heritage-bureau/](http://www.nhdfi.org/about-forests-and-lands/bureaus/natural-heritage-bureau/)
- The Web Soil Survey Map with project's watershed outlined – [websoilsurvey.nrcs.usda.gov](http://websoilsurvey.nrcs.usda.gov)
- Aerial photograph (1" = 2,000' scale with the site boundaries outlined)
- Photographs representative of the site
- Groundwater Recharge Volume calculations (one worksheet for each permit application): [des.nh.gov/organization/divisions/water/aot/documents/bmp\\_worksh.xls](http://des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls)
- BMP worksheets (one worksheet for each treatment system): [des.nh.gov/organization/divisions/water/aot/documents/bmp\\_worksh.xls](http://des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls)
- Drainage analysis, stamped by a professional engineer (see Application Checklist for details)
- Riprap apron or other energy dissipation or stability calculations
- Site Specific Soil Survey report, stamped and with a certification note prepared by the soil scientist that the survey was done in accordance with the Site Specific Soil Mapping standards, *Site-Specific Soil Mapping Standards for NH & VT, SSSNNE Special Publication No. 3*.
- Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)]
- Registration and Notification Form for Storm Water Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches): [http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw\\_discharge](http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw_discharge)
- Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)]
- Source control plan

**PLANS:**

- One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)
- Pre & post-development color coded soil plans on 11" x 17" (see Application Checklist for details)
- Pre & post-development drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)

**100-YEAR FLOODPLAIN REPORT:**

- All information required in Env-Wq 1503.09, submitted as a separate report.

**ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE**

- See Checklist for Details

- REVIEW APPLICATION FOR COMPLETENESS & CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.**



**12. REQUIRED SIGNATURES**

AF By initialing here, I acknowledge that I am required by Env-Wq 1503.20(e) to submit a copy of all approved documents to the department in PDF format on a CD within one week after permit approval.

By signing below, I certify that:

- The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief;
- I understand that the submission of false, incomplete, or misleading information constitutes grounds for the department to deny the application, revoke any permit that is granted based on the information, and/or refer the matter to the board of professional engineers established by RSA 310-A:3 if I am a professional engineer; and
- I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641.

**APPLICANT**



**APPLICANT'S AGENT:**

Signature: \_\_\_\_\_

Date: 7/7/2022

Name (print or type): Ashley Friend

Title: Licensing and Permitting Specialist

**PROPERTY OWNER**

**PROPERTY OWNER'S AGENT:**

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Name (print or type): \_\_\_\_\_

Title: \_\_\_\_\_



## ATTACHMENT A: ALTERATION OF TERRAIN PERMIT APPLICATION CHECKLIST

Check the box to indicate the item has been provided or provide an explanation why the item does not apply.

### DESIGN PLANS

- Plans printed on 34 - 36" by 22 - 24" white paper
- PE stamp
- Wetland delineation
- Temporary erosion control measures
- Treatment for all stormwater runoff from impervious surfaces such as roadways (including gravel roadways), parking areas, and non-residential roof runoff. Guidance on treatment BMPs can be found in Volume 2, Chapter 4 of the NH Stormwater Management Manual.
- Pre-existing 2-foot contours
- Proposed 2-foot contours
- Drainage easements protecting the drainage/treatment structures
- Compliance with the Wetlands Bureau, RSA 482- A <http://des.nh.gov/organization/divisions/water/wetlands/index.htm>. Note that artificial detention in wetlands is not allowed.
- Compliance with the Comprehensive Shoreland Protection Act, RSA 483-B. <http://des.nh.gov/organization/divisions/water/wetlands/cspa>
- Benches. Benching is needed if you have more than 20 feet change in elevation on a 2:1 slope, 30 feet change in elevation on a 3:1 slope, 40 feet change in elevation on a 4:1 slope.
- Check to see if any proposed ponds need state Dam permits.  
<http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf>

### DETAILS

- Typical roadway x-section
- Detention basin with inverts noted on the outlet structure
- Stone berm level spreader
- Outlet protection – riprap aprons
- A general installation detail for an erosion control blanket
- Silt fences or mulch berm
- Storm drain inlet protection. Note that since hay bales must be embedded 4 inches into the ground, they are not to be used on hard surfaces such as pavement.
- Hay bale barriers
- Stone check dams
- Gravel construction exit
- Temporary sediment trap
- The treatment BMP's proposed
- Any innovative BMP's proposed



**CONSTRUCTION SEQUENCE/EROSION CONTROL**

- Note that the project is to be managed in a manner that meets the requirements and intent of RSA 430:53 and Chapter Agr 3800 relative to invasive species.
- Note that perimeter controls shall be installed prior to earth moving operations.
- Note that temporary water diversion (swales, basins, etc) must be used as necessary until areas are stabilized.
- Note that ponds and swales shall be installed early on in the construction sequence (before rough grading the site).
- Note that all ditches and swales shall be stabilized prior to directing runoff to them.
- Note that all roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.
- Note that all cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade
- Note that all erosion controls shall be inspected weekly AND after every half-inch of rainfall.
- Note the limits on the open area allowed, see Env-Wq 1505.02 for detailed information.

Example note: The smallest practical area shall be disturbed during construction, but in no case shall exceed 5 acres at any one time before disturbed areas are stabilized.

- Note the definition of the word “stable”

Example note: An area shall be considered stable if one of the following has occurred:

- Base course gravels have been installed in areas to be paved.
- A minimum of 85 percent vegetated growth has been established.
- A minimum of 3 inches of non-erosive material such stone or riprap has been installed.
- Or, erosion control blankets have been properly installed.

- Note the limit of time an area may be exposed  
Example note: All areas shall be stabilized within 45 days of initial disturbance.

- Provide temporary and permanent seeding specifications. (Reed canary grass is listed in the Green Book; however, this is a problematic species according to the Wetlands Bureau and therefore should not be specified)

- Provide winter construction notes that meet or exceed our standards.

**Standard Winter Notes:**

- All proposed vegetated areas that do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events.
  - All ditches or swales which do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions.
  - After October 15, incomplete road or parking surfaces, where work has stopped for the winter season, shall be protected with a minimum of 3 inches of crushed gravel per NHDOT item 304.3.
- Note at the end of the construction sequence that “Lot disturbance, other than that shown on the approved plans, shall not commence until after the roadway has the base course to design elevation and the associated drainage is complete and stable.” – This note is applicable to single/duplex family subdivisions, when lot development is not part of the permit.

**DRAINAGE ANALYSES**



Please double-side 8 ½" × 11" sheets where possible but, **do not** reduce the text such that more than one page fits on one side.

- PE stamp
- Rainfall amount obtained from the Northeast Regional Climate Center- <http://precip.eas.cornell.edu/>. Include extreme precipitation table as obtained from the above referenced website.
- Drainage analyses, in the following order:
- Pre-development analysis: Drainage diagram.
  - Pre-development analysis: Area Listing and Soil Listing.
  - Pre-development analysis: Node listing 1-year (if applicable), 2-year, 10-year and 50-year.
  - Pre-development analysis: Full summary of the 10-year storm.
  - Post-development analysis: Drainage diagram.
  - Post-development analysis: Area Listing and Soil Listing.
  - Post-development analysis: Node listing for the 2-year, 10-year and 50-year.
  - Post-development analysis: Full summary of the 10-year storm.
- Review the Area Listing and Soil Listing reports
- Hydrologic soil groups (HSG) match the HSGs on the soil maps provided.
  - There is the same or less HSG A soil area after development (check for each HSG).
  - There is the same or less "woods" cover in the post-development.
  - Undeveloped land was assumed to be in "good" condition.
  - The amount of impervious cover in the analyses is correct.

Note: A good check is to subtract the total impervious area used in the pre analysis from the total impervious area used in the post-analysis. For residential projects without demolition occurring, a good check is to take this change in impervious area, subtract out the roadway and divide the remaining by the number of houses/units proposed. Do these numbers make sense?

- Check the storage input used to model the ponds.
- Check to see if the artificial berms pass the 50-year storm, i.e., make sure the constructed berms on ponds are not overtopped.
- Check the outlet structure proposed and make sure it matches that modeled.
- Check to see if the total areas in the pre and post analyses are same.
- Confirm the correct NRCS storm type was modeled (Coos, Carroll & Grafton counties are Type II, all others Type III).

#### **PRE- AND POST-DEVELOPMENT DRAINAGE AREA PLANS**

- Plans printed on 34 - 36" by 22 - 24" on white paper.
- Submit these plans separate from the soil plans.
- A north arrow.
- A scale.
- Labeled subcatchments, reaches and ponds.
- Tc lines.
- A clear delineation of the subcatchment boundaries.
- Roadway station numbers.
- Culverts and other conveyance structures.

#### **PRE AND POST-DEVELOPMENT COLOR-CODED SOIL PLANS**



- 11" × 17" sheets suitable, as long as it is readable.
- Submit these plans separate from the drainage area plans.
- A north arrow.
- A scale.
- Name of the soil scientist who performed the survey and date the soil survey took place.
- 2-foot contours (5-foot contours if application is for a gravel pit) as well as other surveyed features.
- Delineation of the soil boundaries and wetland boundaries.
- Delineation of the subcatchment boundaries.
- Soil series symbols (e.g., 26).
- A key or legend which identifies each soil series symbol and its associated soil series name (e.g., 26 = Windsor).
- The hydrologic soil group color coding (A = Green, B = yellow, C= orange, D=red, Water=blue, & Impervious = gray).

**Please note that excavation projects (e.g., gravel pits) have similar requirements to that above, however the following are common exceptions/additions:**

- Drainage report is not needed if site does not have off-site flow.
- 5 foot contours allowed rather than 2 foot.
- No PE stamp needed on the plans.
- Add a note to the plans that the applicant must submit to the Department of Environmental Services a written update of the project and revised plans documenting the project status every five years from the date of the Alteration of Terrain permit.
- Add reclamation notes.

See NRCS publication titled: *Vegetating New Hampshire Sand and Gravel Pits* for a good resource, it is posted online at: <http://des.nh.gov/organization/divisions/water/aot/categories/publications>.

**ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE**

- If project will discharge stormwater to a surface water impaired for phosphorus and/or nitrogen, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.
- If project will discharge stormwater to a Class A surface water or Outstanding Resource Water, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.
- If project will discharge stormwater to a lake or pond not covered previously, include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond.
- If project is within a Coastal/Great Bay Region community, include info required by Env-Wq 1503.08(I) if applicable.





## **Appendix B – Abutters List**





Eversource C196 and Q171 Transmission Line Structure Replacement Project  
 Goffstown, Dunbarton, and Bow  
 New Hampshire

**Appendix B - Parcels Intersecting Project Area**

<b>Goffstown</b>
<b>Tax Map-Lot</b>
12-10
12-6-2
12-6-3
12-8
5-14
5-14-1
5-15-3
5-32-3
5-32-4
8-40-1
8-40-OS
8-45
8-46-11
8-46-12
8-46-13
8-46-16-10
8-46-16-11
8-46-16-12
8-46-16-13
8-46-16-9
8-46-29
8-60-3
8-60-4
8-60-5
8-60-6
8-60-7
8-60-OS
8-61
9-36-7
9-37

<b>Bow</b>
<b>Tax Map-Lot</b>
28-2-53-E7
32-2-8-F
32-2-9
33-2-53-C
33-2-53-E
33-2-53-E10
33-2-53-E2
33-2-53-E21
33-2-53-E23
33-2-53-E28
33-2-53-F
33-2-73-B
33-2-73-C
34-2-70
39-2-125
39-2-69
40-2-141-A
40-2-200-B
40-2-200-B1
40-2-200-B2
41-2-200

<b>Dunbarton</b>
<b>Tax Map - Lot</b>
B6-02-03
B6-02-06
B6-02-08
C7-01-08
C7-01-11
C7-01-15
D7-01-03
D7-01-04





**Appendix C – New Hampshire Natural Heritage Bureau Report and E-Mail Review from  
NHB and New Hampshire Fish and Game**



# Memo

## NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.

Maps and NHB record pages are confidential and should be redacted from public documents.

**To:** Lindsey White, GZA GeoEnvironmental  
5 Commerce Park North  
Suite 201  
Bedford, NH 03110

**From:** NHB Review, NH Natural Heritage Bureau

**Date:** 5/24/2022 (valid until 05/24/2023)

**Re:** Review by NH Natural Heritage Bureau

**Permits:** MUNICIPAL POR - Dunbarton, NHDES - Alteration of Terrain Permit, NHDES - Utility Statutory Permit by Notification (SPN), USACE - General Permit, USEPA - Stormwater Pollution Prevention

**NHB ID:** NHB22-1755

**Town:** Dunbarton

**Location:** Eversource Energy ROW

**Description:** Eversource is proposing to replace select utility poles along the existing Q171 and C196 Transmission Lines. Work requires access to each proposed utility pole replacement and a work pad around each pole. Wetlands will be temporarily crossed using timber matting which will be removed upon completion of work. The work is proposed to begin in October 2022.

**cc:** NHFG Review

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

**Comments** NHB: No comments at this time.

**F&G:** Refer to NHFG consultation requirements below.

Vertebrate species	State <sup>1</sup>	Federal	Notes
Blanding's Turtle ( <i>Emydoidea blandingii</i> )	E	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle ( <i>Glyptemys insculpta</i> )	SC	--	Contact the NH Fish & Game Dept (see below).

<sup>1</sup>Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (\*) indicates that the most recent report for that occurrence was more than 20 years ago.

*For all animal reviews, refer to 'IMPORTANT: NHFG Consultation' section below.*

---

Disclaimer: A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences,



## Memo

## NH Natural Heritage Bureau NHB DataCheck Results Letter

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based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

---

### **IMPORTANT: NHFG Consultation**

If this NHB Datacheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB Datacheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to <https://wildlife.state.nh.us/wildlife/environmental-review.html>. All requests for consultation and submittals should be sent via email to [NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov) or can be sent by mail, and **must include the NHB Datacheck results letter number and “Fis 1004 consultation request” in the subject line.**

If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule*), coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email: Kim Tuttle [kim.tuttle@wildlife.nh.gov](mailto:kim.tuttle@wildlife.nh.gov) with a copy to [NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov), and include the NHB Datacheck results letter number and “review request” in the email subject line.

Contact NH Fish & Game at (603) 271-0467 with questions.



CONFIDENTIAL DNCR















# Memo

## NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.

Maps and NHB record pages are confidential and should be redacted from public documents.

**To:** Lindsey White, GZA GeoEnvironmental  
5 Commerce Park North  
Suite 201  
Bedford, NH 03110

**From:** NHB Review, NH Natural Heritage Bureau

**Date:** 5/24/2022 (valid until 05/24/2023)

**Re:** Review by NH Natural Heritage Bureau

**Permits:** MUNICIPAL POR - Goffstown, NHDES - Alteration of Terrain Permit, NHDES - Utility Statutory Permit by Notification (SPN), USACE - General Permit, USEPA - Stormwater Pollution Prevention

**NHB ID:** NHB22-1756

**Town:** Goffstown

**Location:** Eversource Energy ROW

**Description:** Eversource is proposing to replace select utility poles along the existing Q171 and C196 Transmission Lines. Work requires access to each proposed utility pole replacement and a work pad around each pole. Wetlands will be temporarily crossed using timber matting which will be removed upon completion of work. The work is proposed to begin in October 2022.

**cc:** NHFG Review

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

**Comments** NHB: No comments at this time.

**F&G:** Refer to NHFG consultation requirements below.

Vertebrate species	State <sup>1</sup>	Federal	Notes
Blanding's Turtle ( <i>Emydoidea blandingii</i> )	E	--	Contact the NH Fish & Game Dept (see below).
Northern Black Racer ( <i>Coluber constrictor constrictor</i> )	T	--	Contact the NH Fish & Game Dept (see below).
Smooth Green Snake ( <i>Ophedryss vernalis</i> )	SC	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle ( <i>Glyptemys insculpta</i> )	SC	--	Contact the NH Fish & Game Dept (see below).

<sup>1</sup>Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (\*) indicates that the most recent report for that occurrence was more than 20 years ago.



## Memo

## NH Natural Heritage Bureau NHB DataCheck Results Letter

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Maps and NHB record pages are confidential and should be redacted from public documents.

*For all animal reviews, refer to 'IMPORTANT: NHFG Consultation' section below.*

---

Disclaimer: A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

---

### **IMPORTANT: NHFG Consultation**

If this NHB Datacheck letter DOES NOT include ANY wildlife species records, then, based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

If this NHB Datacheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to <https://wildlife.state.nh.us/wildlife/environmental-review.html>. All requests for consultation and submittals should be sent via email to [NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov) or can be sent by mail, and **must include the NHB Datacheck results letter number and "Fis 1004 consultation request" in the subject line.**

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Contact NH Fish & Game at (603) 271-0467 with questions.



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# Memo

## NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.

Maps and NHB record pages are confidential and should be redacted from public documents.

**To:** Lindsey White, GZA GeoEnvironmental  
5 Commerce Park North  
Suite 201  
Bedford, NH 03110

**From:** NHB Review, NH Natural Heritage Bureau

**Date:** 5/24/2022 (valid until 05/24/2023)

**Re:** Review by NH Natural Heritage Bureau

**Permits:** MUNICIPAL POR - Bow, NHDES - Alteration of Terrain Permit, NHDES - Utility Statutory Permit by Notification (SPN), USACE - General Permit, USEPA - Stormwater Pollution Prevention

**NHB ID:** NHB22-1754

**Town:** Bow

**Location:** Eversource Energy ROW

**Description:** Eversource is proposing to replace select utility poles along the existing Q171 and C196 Transmission Lines. Work requires access to each proposed utility pole replacement and a work pad around each pole. Wetlands will be temporarily crossed using timber matting which will be removed upon completion of work. The work is proposed to begin in October 2022.

**cc:** NHFG Review

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

**Comments** NHB: No comments at this time.

**F&G:** Refer to NHFG consultation requirements below.

<b>Vertebrate species</b>	<b>State<sup>1</sup></b>	<b>Federal</b>	<b>Notes</b>
Blanding's Turtle ( <i>Emydoidea blandingii</i> )	E	--	Contact the NH Fish & Game Dept (see below).
Eastern Hognose Snake ( <i>Heterodon platirhinos</i> )	E	--	Contact the NH Fish & Game Dept (see below).
Northern Black Racer ( <i>Coluber constrictor constrictor</i> )	T	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle ( <i>Glyptemys insculpta</i> )	SC	--	Contact the NH Fish & Game Dept (see below).

<sup>1</sup>Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (\*) indicates that the most recent report for that occurrence was more than 20 years ago.



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If this NHB Datacheck letter includes a record for a threatened (T) or endangered (E) wildlife species, consultation with the New Hampshire Fish and Game Department under Fis 1004 may be required. To review the Fis 1000 rules (effective February 3, 2022), please go to <https://wildlife.state.nh.us/wildlife/environmental-review.html>. All requests for consultation and submittals should be sent via email to [NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov) or can be sent by mail, and **must include the NHB Datacheck results letter number and "Fis 1004 consultation request" in the subject line.**

If the NHB DataCheck response letter does not include a threatened or endangered wildlife species but includes other wildlife species (e.g., Species of Special Concern), consultation under Fis 1004 is not required; however, some species are protected under other state laws or rules, so coordination with NH Fish & Game is highly recommended or may be required for certain permits. While some permitting processes are exempt from required consultation under Fis 1004 (e.g., *statutory permit by notification, permit by rule, permit by notification, routine roadway registration, docking structure registration, or conditional authorization by rule*), coordination with NH Fish & Game may still be required under the rules governing those specific permitting processes, and it is recommended you contact the applicable permitting agency. For projects not requiring consultation under Fis 1004, but where additional coordination with NH Fish and Game is requested, please email: Kim Tuttle [kim.tuttle@wildlife.nh.gov](mailto:kim.tuttle@wildlife.nh.gov) with a copy to [NHFGreview@wildlife.nh.gov](mailto:NHFGreview@wildlife.nh.gov), and include the NHB Datacheck results letter number and "review request" in the email subject line.

Contact NH Fish & Game at (603) 271-0467 with questions.



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# Memo

## NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.

Maps and NHB record pages are confidential and should be redacted from public documents.

**To:** Lindsey White, GZA GeoEnvironmental  
5 Commerce Park North  
Suite 201  
Bedford, NH 03110

**From:** NHB Review, NH Natural Heritage Bureau

**Date:** 6/28/2022 (valid until 06/28/2023)

**Re:** Review by NH Natural Heritage Bureau

**Permits:** NHDES - Alteration of Terrain Permit, NHDES - Utility Statutory Permit by Notification (SPN)

**NHB ID:** NHB22-2081

**Town:** Bow

**Location:** Eversource Right-of-way

**Description:** Eversource is proposing to replace a single utility structure within the existing and maintained Q171 transmission line.

**cc:** NHFG Review

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

**Comments** NHB: No comments at this time.

**F&G:** Please refer to NHFG consultation requirements below. Please confirm whether an AOT is required for the replacement of a single utility structure.

Vertebrate species	State <sup>1</sup>	Federal	Notes
Blanding's Turtle ( <i>Emydoidea blandingii</i> )	E	--	Contact the NH Fish & Game Dept (see below).
Eastern Hognose Snake ( <i>Heterodon platirhinos</i> )	E	--	Contact the NH Fish & Game Dept (see below).
Northern Black Racer ( <i>Coluber constrictor constrictor</i> )	T	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle ( <i>Glyptemys insculpta</i> )	SC	--	Contact the NH Fish & Game Dept (see below).

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## Memo

## NH Natural Heritage Bureau NHB DataCheck Results Letter

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## **Appendix D – Natural Resources Conservation Service Web Soil Survey**





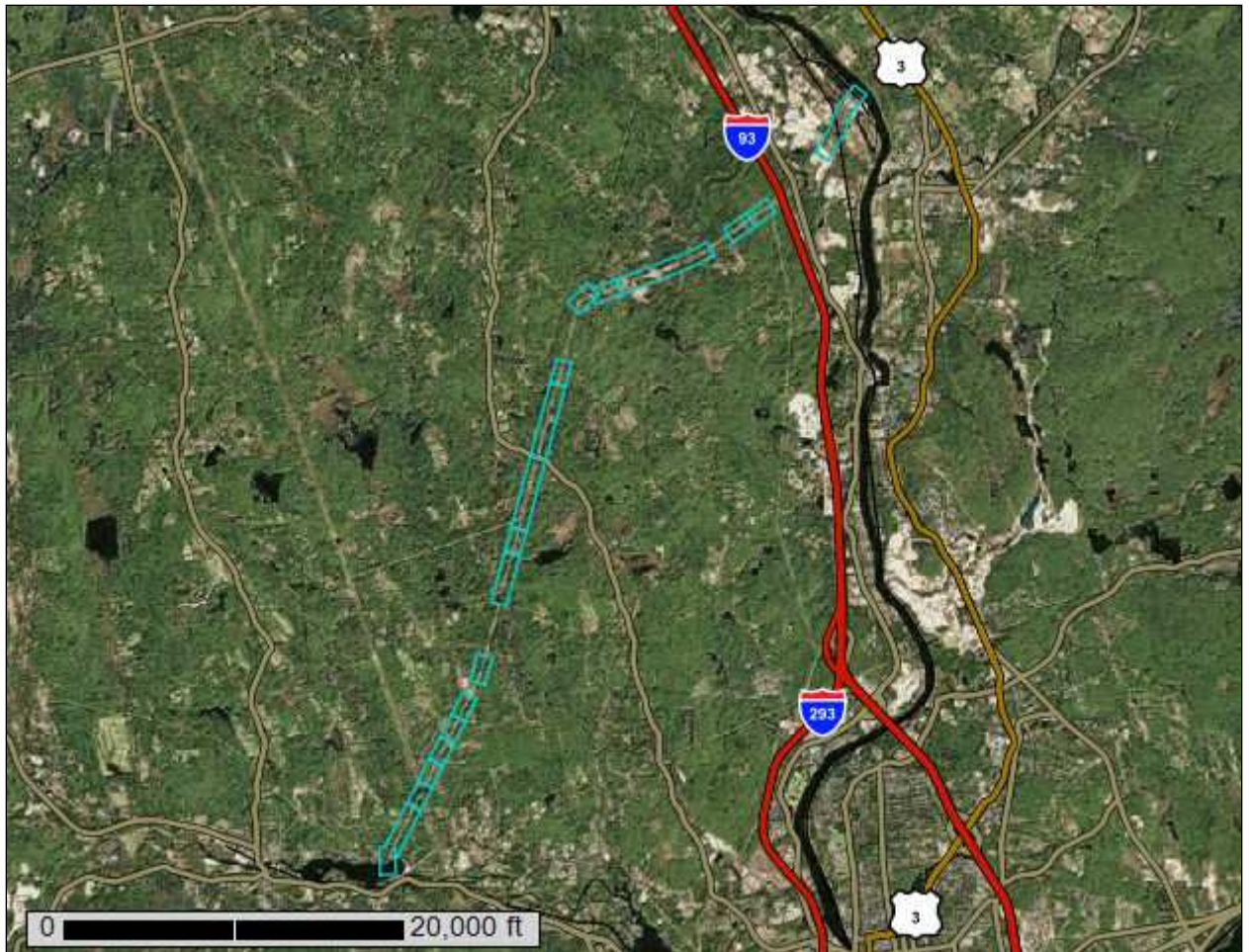
United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

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

# Custom Soil Resource Report for Hillsborough County, New Hampshire, Eastern Part; and Merrimack and Belknap Counties, New Hampshire





# Preface

---

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

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

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

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

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

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

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

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

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



## Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and



## Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.



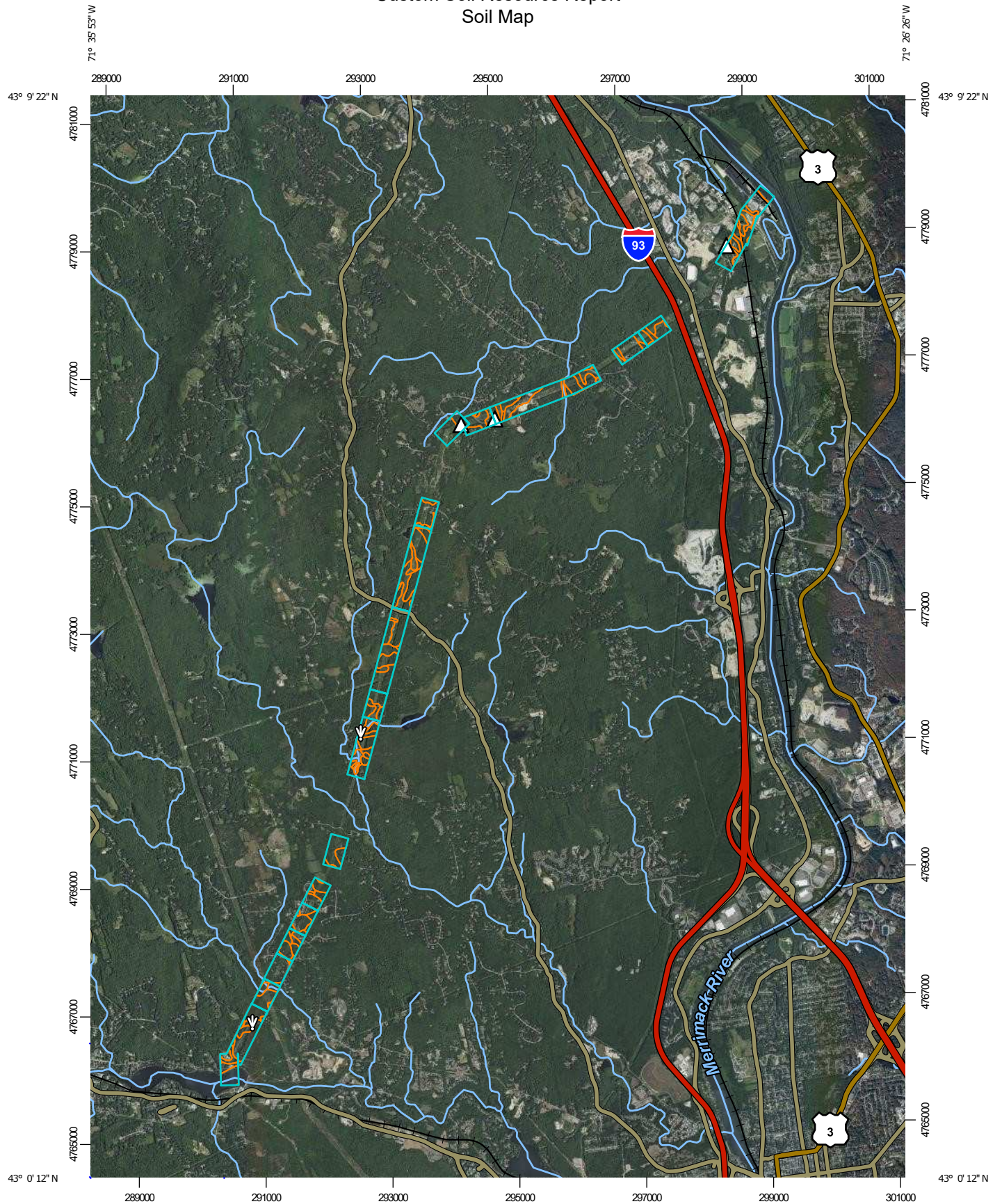
# Soil Map

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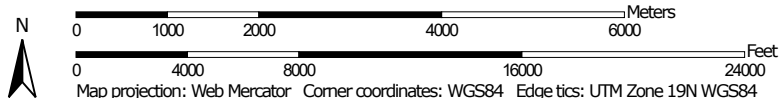
The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



# Custom Soil Resource Report Soil Map



Map Scale: 1:82,700 if printed on A portrait (8.5" x 11") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge ticks: UTM Zone 19N WGS84



### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)




















**Soils**

 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

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

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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

Soil Survey Area: Hillsborough County, New Hampshire, Eastern Part  
 Survey Area Data: Version 24, Aug 31, 2021

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire  
 Survey Area Data: Version 27, Aug 31, 2021

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 8, 2011—Nov 1, 2021



**MAP LEGEND**

**MAP INFORMATION**

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



## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CaB	Canton fine sandy loam, 0 to 8 percent slopes	6.5	0.7%
CaC	Canton fine sandy loam, 8 to 15 percent slopes	7.9	0.8%
CmC	Canton fine sandy loam, 8 to 15 percent slopes, very stony	29.4	3.1%
CmD	Canton fine sandy loam, 15 to 25 percent slopes, very stony	67.9	7.2%
CmE	Canton stony fine sandy loam, 25 to 35 percent slopes	0.9	0.1%
CnD	Canton very stony fine sandy loam, 15 to 35 percent slopes	36.7	3.9%
CoC	Canton-Urban land complex, 3 to 15 percent slopes	0.2	0.0%
CpB	Chatfield-Hollis-Canton complex, 3 to 8 percent slopes	6.8	0.7%
CsC	Chatfield-Hollis complex, 8 to 15 percent slopes, rocky	22.6	2.4%
CtD	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	48.8	5.2%
Gw	Freetown mucky peat, 0 to 2 percent slopes	8.0	0.8%
HsB	Hinckley loamy sand, 3 to 8 percent slopes	0.7	0.1%
HsD	Hinckley loamy sand, 15 to 35 percent slopes	0.1	0.0%
LvA	Leicester-Walpole complex stony, 0 to 3 percent slopes	9.7	1.0%
MtC	Montauk fine sandy loam, 8 to 15 percent slopes, very stony	1.1	0.1%
PbB	Paxton fine sandy loam, 3 to 8 percent slopes	0.9	0.1%
PbC	Paxton fine sandy loam, 8 to 15 percent slopes	0.5	0.1%
PfC	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	2.1	0.2%
PfE	Paxton fine sandy loam, 25 to 35 percent slopes, very stony	13.1	1.4%
PiA	Pipestone loamy sand, 0 to 3 percent slopes	6.7	0.7%
SsA	Scituate fine sandy loam, 0 to 3 percent slopes	14.1	1.5%



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Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
StA	Scituate stony fine sandy loam, 0 to 3 percent slopes	16.3	1.7%
W	Water (less than 40 acres)	19.1	2.0%
WnC	Windsor-Urban land complex, 3 to 15 percent slopes	6.7	0.7%
WvB	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	0.3	0.0%
<b>Subtotals for Soil Survey Area</b>		<b>327.4</b>	<b>34.6%</b>
<b>Totals for Area of Interest</b>		<b>945.9</b>	<b>100.0%</b>

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
4A	Pootatuck very fine sandy loam, 0 to 3 percent slopes, occasionally flooded	9.8	1.0%
6A	Saco mucky silt loam, 0 to 2 percent slopes, frequently flooded	7.3	0.8%
12C	Hinckley loamy sand, 8 to 15 percent slopes	4.2	0.4%
12E	Hinckley loamy sand, 15 to 60 percent slopes	7.2	0.8%
26A	Windsor loamy sand, 0 to 3 percent slopes	0.1	0.0%
26B	Windsor loamy sand, 3 to 8 percent slopes	9.6	1.0%
26C	Windsor loamy sand, 8 to 15 percent slopes	44.8	4.7%
26E	Windsor loamy sand, 15 to 60 percent slopes	28.7	3.0%
43B	Canton fine sandy loam, 0 to 8 percent slopes, very stony	1.1	0.1%
43C	Canton fine sandy loam, 8 to 15 percent slopes, very stony	15.5	1.6%
43D	Canton fine sandy loam, 15 to 25 percent slopes, very stony	7.2	0.8%
45B	Montauk fine sandy loam, 0 to 8 percent slopes, very stony	22.8	2.4%
49A	Whitman fine sandy loam, 0 to 3 percent slopes, very stony	17.6	1.9%
67C	Paxton fine sandy loam, 8 to 15 percent slopes, very stony	27.6	2.9%
67D	Paxton fine sandy loam, 15 to 25 percent slopes, very stony	25.0	2.6%
196A	Meadowsedge peat, 0 to 1 percent slopes, ponded	11.1	1.2%
250B	Chatfield-Montauk-Hollis complex, 0 to 8 percent slopes, very rocky	7.9	0.8%



## Custom Soil Resource Report

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
250C	Chatfield-Montauk-Hollis complex, 8 to 15 percent slopes, very rocky	168.5	17.8%
250D	Chatfield-Montauk-Hollis complex, 15 to 35 percent slopes, very rocky	68.7	7.3%
300B	Udipsamments, 0 to 6 percent slopes	20.4	2.2%
315A	Mashpee sand 0 to 5 percent slopes	0.5	0.0%
393A	Swansea mucky peat, 0 to 2 percent slopes	43.6	4.6%
425A	Scarboro-Ridgebury complex, 0 to 3 percent slopes, rocky	11.3	1.2%
449B	Scituate fine sandy loam, 3 to 8 percent slopes, very stony	2.9	0.3%
449C	Scituate fine sandy loam, 8 to 15 percent slopes, very stony	25.7	2.7%
657B	Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony	2.3	0.2%
699B	Urban land, 0 to 8 percent slopes	19.3	2.0%
W	Water	7.7	0.8%
<b>Subtotals for Soil Survey Area</b>		<b>618.4</b>	<b>65.4%</b>
<b>Totals for Area of Interest</b>		<b>945.9</b>	<b>100.0%</b>

## Map Unit Descriptions

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

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different



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

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

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

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

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

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

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

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

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

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



## Hillsborough County, New Hampshire, Eastern Part

### CaB—Canton fine sandy loam, 0 to 8 percent slopes

#### Map Unit Setting

*National map unit symbol:* 9fby

*Elevation:* 0 to 1,000 feet

*Mean annual precipitation:* 42 to 46 inches

*Mean annual air temperature:* 45 to 48 degrees F

*Frost-free period:* 120 to 160 days

*Farmland classification:* Farmland of statewide importance

#### Map Unit Composition

*Canton and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Canton

##### Setting

*Parent material:* Ablation till derived from granite and gneiss

##### Typical profile

*H1 - 0 to 4 inches:* fine sandy loam

*H2 - 4 to 19 inches:* fine sandy loam

*H3 - 19 to 60 inches:* gravelly loamy sand

##### Properties and qualities

*Slope:* 0 to 8 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Low (about 5.0 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2e

*Hydrologic Soil Group:* A

*Ecological site:* F144AY034CT - Well Drained Till Uplands

*Hydric soil rating:* No

#### Minor Components

##### Not named

*Percent of map unit:* 10 percent

*Hydric soil rating:* No

##### Scituate

*Percent of map unit:* 5 percent

*Hydric soil rating:* No



## CaC—Canton fine sandy loam, 8 to 15 percent slopes

### Map Unit Setting

*National map unit symbol:* 2w817

*Elevation:* 0 to 1,330 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Canton and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Canton

#### Setting

*Landform:* Hills, moraines, ridges

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Nose slope, side slope, crest

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Parent material:* Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

#### Typical profile

*Ap - 0 to 7 inches:* fine sandy loam

*Bw1 - 7 to 15 inches:* fine sandy loam

*Bw2 - 15 to 26 inches:* gravelly fine sandy loam

*2C - 26 to 65 inches:* gravelly loamy sand

#### Properties and qualities

*Slope:* 8 to 15 percent

*Depth to restrictive feature:* 19 to 39 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.17 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3e

*Hydrologic Soil Group:* B

*Ecological site:* F144AY034CT - Well Drained Till Uplands



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*Hydric soil rating:* No

### Minor Components

#### Montauk

*Percent of map unit:* 6 percent  
*Landform:* Moraines, ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Scituate

*Percent of map unit:* 6 percent  
*Landform:* Hills, drumlins, ground moraines  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Newfields

*Percent of map unit:* 4 percent  
*Landform:* Ground moraines, hills, moraines  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Concave  
*Hydric soil rating:* No

#### Charlton

*Percent of map unit:* 4 percent  
*Landform:* Ridges, ground moraines, hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

## CmC—Canton fine sandy loam, 8 to 15 percent slopes, very stony

### Map Unit Setting

*National map unit symbol:* 2w814  
*Elevation:* 0 to 1,160 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance



### Map Unit Composition

*Canton, very stony, and similar soils: 85 percent*

*Minor components: 15 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Canton, Very Stony

#### Setting

*Landform: Moraines, ridges, hills*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Side slope*

*Down-slope shape: Convex, linear*

*Across-slope shape: Convex*

*Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist*

#### Typical profile

*O<sub>i</sub> - 0 to 2 inches: slightly decomposed plant material*

*A - 2 to 5 inches: fine sandy loam*

*Bw<sub>1</sub> - 5 to 16 inches: fine sandy loam*

*Bw<sub>2</sub> - 16 to 22 inches: gravelly fine sandy loam*

*2C - 22 to 67 inches: gravelly loamy sand*

#### Properties and qualities

*Slope: 8 to 15 percent*

*Surface area covered with cobbles, stones or boulders: 1.6 percent*

*Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification*

*Drainage class: Well drained*

*Runoff class: Low*

*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>): Moderately low to high (0.14 to 14.17 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)*

*Available water supply, 0 to 60 inches: Low (about 3.4 inches)*

#### Interpretive groups

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 6s*

*Hydrologic Soil Group: B*

*Ecological site: F144AY034CT - Well Drained Till Uplands*

*Hydric soil rating: No*

### Minor Components

#### Montauk, very stony

*Percent of map unit: 6 percent*

*Landform: Recessional moraines, ground moraines, hills, drumlins*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Side slope*

*Down-slope shape: Convex, linear*

*Across-slope shape: Convex*

*Hydric soil rating: No*



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### **Scituate, very stony**

*Percent of map unit:* 5 percent  
*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

### **Chatfield, very stony**

*Percent of map unit:* 3 percent  
*Landform:* Hills, ridges  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

### **Swansea**

*Percent of map unit:* 1 percent  
*Landform:* Marshes, depressions, bogs, swamps, kettles  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

## **CmD—Canton fine sandy loam, 15 to 25 percent slopes, very stony**

### **Map Unit Setting**

*National map unit symbol:* 2w81h  
*Elevation:* 70 to 1,120 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Canton, very stony, and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Canton, Very Stony**

#### **Setting**

*Landform:* Moraines, hills, ridges  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Parent material:* Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist



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### Typical profile

*O<sub>i</sub>* - 0 to 2 inches: slightly decomposed plant material  
*A* - 2 to 5 inches: fine sandy loam  
*Bw<sub>1</sub>* - 5 to 16 inches: fine sandy loam  
*Bw<sub>2</sub>* - 16 to 22 inches: gravelly fine sandy loam  
*2C* - 22 to 67 inches: gravelly loamy sand

### Properties and qualities

*Slope*: 15 to 25 percent  
*Surface area covered with cobbles, stones or boulders*: 1.6 percent  
*Depth to restrictive feature*: 19 to 39 inches to strongly contrasting textural stratification  
*Drainage class*: Well drained  
*Runoff class*: Medium  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>)*: Moderately low to high (0.14 to 14.17 in/hr)  
*Depth to water table*: More than 80 inches  
*Frequency of flooding*: None  
*Frequency of ponding*: None  
*Maximum salinity*: Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches*: Low (about 3.4 inches)

### Interpretive groups

*Land capability classification (irrigated)*: None specified  
*Land capability classification (nonirrigated)*: 6s  
*Hydrologic Soil Group*: B  
*Ecological site*: F144AY034CT - Well Drained Till Uplands  
*Hydric soil rating*: No

### Minor Components

#### Chatfield, very stony

*Percent of map unit*: 6 percent  
*Landform*: Ridges, hills  
*Landform position (two-dimensional)*: Summit, shoulder, backslope  
*Landform position (three-dimensional)*: Nose slope, side slope, crest  
*Down-slope shape*: Convex  
*Across-slope shape*: Linear, convex  
*Hydric soil rating*: No

#### Montauk, very stony

*Percent of map unit*: 5 percent  
*Landform*: Hills, drumlins, recessional moraines, ground moraines  
*Landform position (two-dimensional)*: Backslope  
*Landform position (three-dimensional)*: Side slope  
*Down-slope shape*: Convex, linear  
*Across-slope shape*: Convex  
*Hydric soil rating*: No

#### Newfields, very stony

*Percent of map unit*: 4 percent  
*Landform*: Ground moraines, hills, moraines  
*Landform position (two-dimensional)*: Footslope  
*Landform position (three-dimensional)*: Base slope  
*Down-slope shape*: Linear  
*Across-slope shape*: Concave



*Hydric soil rating:* No

## **CmE—Canton stony fine sandy loam, 25 to 35 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 9fc4  
*Elevation:* 0 to 1,000 feet  
*Mean annual precipitation:* 42 to 46 inches  
*Mean annual air temperature:* 45 to 48 degrees F  
*Frost-free period:* 120 to 160 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Canton and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Canton**

#### **Setting**

*Parent material:* Ablation till derived from granite and gneiss

#### **Typical profile**

*H1 - 0 to 4 inches:* fine sandy loam  
*H2 - 4 to 19 inches:* fine sandy loam  
*H3 - 19 to 60 inches:* gravelly loamy sand

#### **Properties and qualities**

*Slope:* 25 to 35 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 5.1 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* A  
*Ecological site:* F144AY034CT - Well Drained Till Uplands  
*Hydric soil rating:* No

### **Minor Components**

#### **Chatfield**

*Percent of map unit:* 10 percent



*Hydric soil rating:* No

## **CnD—Canton very stony fine sandy loam, 15 to 35 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 9fc6  
*Elevation:* 0 to 1,000 feet  
*Mean annual precipitation:* 42 to 46 inches  
*Mean annual air temperature:* 45 to 48 degrees F  
*Frost-free period:* 120 to 160 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Canton and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Canton**

#### **Setting**

*Parent material:* Ablation till derived from granite and gneiss

#### **Typical profile**

*H1 - 0 to 4 inches:* fine sandy loam  
*H2 - 4 to 19 inches:* fine sandy loam  
*H3 - 19 to 60 inches:* gravelly loamy sand

#### **Properties and qualities**

*Slope:* 15 to 35 percent  
*Surface area covered with cobbles, stones or boulders:* 9.0 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 5.0 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* A  
*Ecological site:* F144AY034CT - Well Drained Till Uplands  
*Hydric soil rating:* No

### **Minor Components**

#### **Scituate**

*Percent of map unit:* 5 percent



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*Hydric soil rating:* No

### **Chatfield**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

## **CoC—Canton-Urban land complex, 3 to 15 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 9fc7

*Elevation:* 0 to 1,000 feet

*Mean annual precipitation:* 42 to 46 inches

*Mean annual air temperature:* 45 to 48 degrees F

*Frost-free period:* 120 to 160 days

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Canton and similar soils:* 50 percent

*Urban land:* 35 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Canton**

#### **Setting**

*Parent material:* Ablation till derived from granite and gneiss

#### **Typical profile**

*H1 - 0 to 4 inches:* fine sandy loam

*H2 - 4 to 19 inches:* fine sandy loam

*H3 - 19 to 60 inches:* gravelly loamy sand

#### **Properties and qualities**

*Slope:* 3 to 15 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Low (about 5.0 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3e

*Hydrologic Soil Group:* A

*Ecological site:* F144AY034CT - Well Drained Till Uplands

*Hydric soil rating:* No



**Minor Components**

**Scituate**

*Percent of map unit:* 10 percent  
*Hydric soil rating:* No

**Not named**

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

**CpB—Chatfield-Hollis-Canton complex, 3 to 8 percent slopes**

**Map Unit Setting**

*National map unit symbol:* 2w82q  
*Elevation:* 140 to 1,040 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Chatfield and similar soils:* 35 percent  
*Hollis and similar soils:* 30 percent  
*Canton and similar soils:* 25 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Chatfield**

**Setting**

*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

**Typical profile**

*O<sub>i</sub> - 0 to 1 inches:* slightly decomposed plant material  
*A - 1 to 2 inches:* fine sandy loam  
*B<sub>w</sub> - 2 to 30 inches:* gravelly fine sandy loam  
*2R - 30 to 40 inches:* bedrock

**Properties and qualities**

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* 20 to 41 inches to lithic bedrock  
*Drainage class:* Well drained  
*Runoff class:* High



## Custom Soil Resource Report

*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 4.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2e

*Hydrologic Soil Group:* B

*Ecological site:* F144AY034CT - Well Drained Till Uplands

*Hydric soil rating:* No

### Description of Hollis

#### Setting

*Landform:* Ridges, hills

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Nose slope, side slope, crest

*Down-slope shape:* Convex

*Across-slope shape:* Linear, convex

*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

#### Typical profile

*O<sub>i</sub> - 0 to 2 inches:* slightly decomposed plant material

*A - 2 to 7 inches:* gravelly fine sandy loam

*B<sub>w</sub> - 7 to 16 inches:* gravelly fine sandy loam

*2R - 16 to 26 inches:* bedrock

#### Properties and qualities

*Slope:* 3 to 8 percent

*Depth to restrictive feature:* 8 to 23 inches to lithic bedrock

*Drainage class:* Somewhat excessively drained

*Runoff class:* Very high

*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3s

*Hydrologic Soil Group:* D

*Ecological site:* F144AY033MA - Shallow Dry Till Uplands

*Hydric soil rating:* No

### Description of Canton

#### Setting

*Landform:* Moraines, hills, ridges

*Landform position (two-dimensional):* Summit, shoulder, backslope



## Custom Soil Resource Report

*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Parent material:* Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

### Typical profile

*O<sub>i</sub> - 0 to 2 inches:* slightly decomposed plant material  
*A - 2 to 5 inches:* fine sandy loam  
*Bw<sub>1</sub> - 5 to 16 inches:* fine sandy loam  
*Bw<sub>2</sub> - 16 to 22 inches:* gravelly fine sandy loam  
*2C - 22 to 67 inches:* gravelly loamy sand

### Properties and qualities

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* 19 to 39 inches to strongly contrasting textural stratification  
*Drainage class:* Well drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Moderately low to high (0.14 to 14.17 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 3.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2s  
*Hydrologic Soil Group:* B  
*Ecological site:* F144AY034CT - Well Drained Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### Leicester

*Percent of map unit:* 5 percent  
*Landform:* Depressions, ground moraines, hills, drainageways  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Linear, concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

#### Paxton

*Percent of map unit:* 5 percent  
*Landform:* Hills, drumlins, ground moraines  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Linear, convex  
*Hydric soil rating:* No



## **CsC—Chatfield-Hollis complex, 8 to 15 percent slopes, rocky**

### **Map Unit Setting**

*National map unit symbol:* 2w69l

*Elevation:* 110 to 1,320 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Chatfield, very stony, and similar soils:* 55 percent

*Hollis, very stony, and similar soils:* 30 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Chatfield, Very Stony**

#### **Setting**

*Landform:* Ridges, hills

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Nose slope, side slope, crest

*Down-slope shape:* Convex

*Across-slope shape:* Linear, convex

*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

#### **Typical profile**

*O<sub>i</sub> - 0 to 1 inches:* slightly decomposed plant material

*A - 1 to 2 inches:* fine sandy loam

*B<sub>w</sub> - 2 to 30 inches:* gravelly fine sandy loam

*2R - 30 to 40 inches:* bedrock

#### **Properties and qualities**

*Slope:* 8 to 15 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 20 to 41 inches to lithic bedrock

*Drainage class:* Well drained

*Runoff class:* High

*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Very low (0.00 to 0.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 4.3 inches)



**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* B  
*Ecological site:* F144AY034CT - Well Drained Till Uplands  
*Hydric soil rating:* No

**Description of Hollis, Very Stony**

**Setting**

*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

**Typical profile**

*O<sub>i</sub> - 0 to 2 inches:* slightly decomposed plant material  
*A - 2 to 7 inches:* gravelly fine sandy loam  
*B<sub>w</sub> - 7 to 16 inches:* gravelly fine sandy loam  
*2R - 16 to 26 inches:* bedrock

**Properties and qualities**

*Slope:* 8 to 15 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 8 to 23 inches to lithic bedrock  
*Drainage class:* Somewhat excessively drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Very low (0.00 to 0.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* D  
*Ecological site:* F144AY033MA - Shallow Dry Till Uplands  
*Hydric soil rating:* No

**Minor Components**

**Charlton, very stony**

*Percent of map unit:* 8 percent  
*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No



## Custom Soil Resource Report

### **Paxton, very stony**

*Percent of map unit:* 4 percent  
*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Linear, convex  
*Hydric soil rating:* No

### **Leicester, very stony**

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines, hills, drainageways, depressions  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

### **Rock outcrop**

*Percent of map unit:* 1 percent  
*Landform:* Ridges, hills  
*Hydric soil rating:* No

## **CtD—Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2w69h  
*Elevation:* 0 to 1,540 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Chatfield, extremely stony, and similar soils:* 35 percent  
*Hollis, extremely stony, and similar soils:* 30 percent  
*Rock outcrop:* 20 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Chatfield, Extremely Stony**

#### **Setting**

*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear, convex



## Custom Soil Resource Report

*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

### Typical profile

*Oi - 0 to 1 inches:* slightly decomposed plant material  
*A - 1 to 2 inches:* fine sandy loam  
*Bw - 2 to 30 inches:* gravelly fine sandy loam  
*2R - 30 to 40 inches:* bedrock

### Properties and qualities

*Slope:* 15 to 35 percent  
*Surface area covered with cobbles, stones or boulders:* 9.0 percent  
*Depth to restrictive feature:* 20 to 41 inches to lithic bedrock  
*Drainage class:* Well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* B  
*Ecological site:* F144AY034CT - Well Drained Till Uplands  
*Hydric soil rating:* No

## Description of Hollis, Extremely Stony

### Setting

*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

### Typical profile

*Oi - 0 to 2 inches:* slightly decomposed plant material  
*A - 2 to 7 inches:* gravelly fine sandy loam  
*Bw - 7 to 16 inches:* gravelly fine sandy loam  
*2R - 16 to 26 inches:* bedrock

### Properties and qualities

*Slope:* 15 to 35 percent  
*Surface area covered with cobbles, stones or boulders:* 9.0 percent  
*Depth to restrictive feature:* 8 to 23 inches to lithic bedrock  
*Drainage class:* Somewhat excessively drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None



## Custom Soil Resource Report

*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* D  
*Ecological site:* F144AY033MA - Shallow Dry Till Uplands  
*Hydric soil rating:* No

### Description of Rock Outcrop

#### Setting

*Landform:* Ridges, hills  
*Parent material:* Igneous and metamorphic rock

#### Typical profile

*R - 0 to 79 inches:* bedrock

#### Properties and qualities

*Slope:* 15 to 35 percent  
*Depth to restrictive feature:* 0 inches to lithic bedrock  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)  
*Available water supply, 0 to 60 inches:* Very low (about 0.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 8  
*Hydrologic Soil Group:* D  
*Hydric soil rating:* No

### Minor Components

#### Charlton, extremely stony

*Percent of map unit:* 7 percent  
*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Leicester, extremely stony

*Percent of map unit:* 4 percent  
*Landform:* Ground moraines, hills, drainageways, depressions  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

#### Sutton, extremely stony

*Percent of map unit:* 2 percent  
*Landform:* Ground moraines, hills  
*Landform position (two-dimensional):* Footslope



## Custom Soil Resource Report

*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

### **Paxton, extremely stony**

*Percent of map unit:* 2 percent  
*Landform:* Hills, drumlins, ground moraines  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Linear, convex  
*Hydric soil rating:* No

## **Gw—Freetown mucky peat, 0 to 2 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2w68v  
*Elevation:* 0 to 860 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 145 to 240 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Freetown and similar soils:* 82 percent  
*Minor components:* 18 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Freetown**

#### **Setting**

*Landform:* Depressions, kettles, marshes, bogs, swamps  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Parent material:* Moderately decomposed organic material

#### **Typical profile**

*Oe1 - 0 to 2 inches:* mucky peat  
*Oe2 - 2 to 79 inches:* mucky peat

#### **Properties and qualities**

*Slope:* 0 to 1 percent  
*Surface area covered with cobbles, stones or boulders:* 0.0 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Very poorly drained  
*Runoff class:* Negligible



## Custom Soil Resource Report

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high  
(0.14 to 14.17 in/hr)

*Depth to water table:* About 0 to 6 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Available water supply, 0 to 60 inches:* Very high (about 20.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8

*Hydrologic Soil Group:* B/D

*Ecological site:* F144AY043MA - Acidic Organic Wetlands

*Hydric soil rating:* Yes

### Minor Components

#### Swansea

*Percent of map unit:* 8 percent

*Landform:* Marshes, depressions, bogs, swamps, kettles

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

#### Natchaug

*Percent of map unit:* 6 percent

*Landform:* Depressions, depressions, depressions

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

#### Scarboro

*Percent of map unit:* 3 percent

*Landform:* Outwash terraces, outwash deltas, depressions, drainageways

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

#### Whitman

*Percent of map unit:* 1 percent

*Landform:* Depressions, hills

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

## HsB—Hinckley loamy sand, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2svm8



## Custom Soil Resource Report

*Elevation:* 0 to 1,430 feet  
*Mean annual precipitation:* 36 to 53 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 250 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Hinckley and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Hinckley

#### Setting

*Landform:* Outwash deltas, outwash terraces, kames, kame terraces, moraines, eskers, outwash plains  
*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope  
*Landform position (three-dimensional):* Nose slope, side slope, base slope, crest, riser, tread  
*Down-slope shape:* Concave, convex, linear  
*Across-slope shape:* Convex, linear, concave  
*Parent material:* Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

#### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material  
*A - 1 to 8 inches:* loamy sand  
*Bw1 - 8 to 11 inches:* gravelly loamy sand  
*Bw2 - 11 to 16 inches:* gravelly loamy sand  
*BC - 16 to 19 inches:* very gravelly loamy sand  
*C - 19 to 65 inches:* very gravelly sand

#### Properties and qualities

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Excessively drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Very low (about 3.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3s  
*Hydrologic Soil Group:* A  
*Ecological site:* F144AY022MA - Dry Outwash  
*Hydric soil rating:* No

### Minor Components

#### Windsor

*Percent of map unit:* 8 percent



## Custom Soil Resource Report

*Landform:* Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces

*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope

*Landform position (three-dimensional):* Nose slope, side slope, base slope, crest, riser, tread

*Down-slope shape:* Concave, convex, linear

*Across-slope shape:* Convex, linear, concave

*Hydric soil rating:* No

### **Sudbury**

*Percent of map unit:* 5 percent

*Landform:* Outwash deltas, outwash terraces, moraines, outwash plains, kame terraces

*Landform position (two-dimensional):* Backslope, footslope

*Landform position (three-dimensional):* Head slope, side slope, base slope, tread

*Down-slope shape:* Concave, linear

*Across-slope shape:* Concave, linear

*Hydric soil rating:* No

### **Agawam**

*Percent of map unit:* 2 percent

*Landform:* Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces

*Landform position (two-dimensional):* Summit, shoulder, backslope, footslope

*Landform position (three-dimensional):* Nose slope, side slope, base slope, crest, riser, tread

*Down-slope shape:* Concave, convex, linear

*Across-slope shape:* Convex, linear, concave

*Hydric soil rating:* No

## **HsD—Hinckley loamy sand, 15 to 35 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2svmd

*Elevation:* 0 to 860 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Hinckley and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Hinckley**

#### **Setting**

*Landform:* Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces



## Custom Soil Resource Report

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, riser

*Down-slope shape:* Concave, convex, linear

*Across-slope shape:* Convex, linear, concave

*Parent material:* Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 8 inches:* loamy sand

*Bw1 - 8 to 11 inches:* gravelly loamy sand

*Bw2 - 11 to 16 inches:* gravelly loamy sand

*BC - 16 to 19 inches:* very gravelly loamy sand

*C - 19 to 65 inches:* very gravelly sand

### Properties and qualities

*Slope:* 15 to 35 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Excessively drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 3.1 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6e

*Hydrologic Soil Group:* A

*Ecological site:* F144AY022MA - Dry Outwash

*Hydric soil rating:* No

### Minor Components

#### Windsor

*Percent of map unit:* 10 percent

*Landform:* Moraines, eskers, kames, outwash deltas, outwash terraces, outwash plains, kame terraces

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, riser

*Down-slope shape:* Concave, convex, linear

*Across-slope shape:* Convex, linear, concave

*Hydric soil rating:* No

#### Merrimac

*Percent of map unit:* 3 percent

*Landform:* Kame terraces, outwash plains, outwash terraces, moraines, eskers, kames

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, riser

*Down-slope shape:* Concave, convex, linear



## Custom Soil Resource Report

*Across-slope shape:* Convex, linear, concave  
*Hydric soil rating:* No

### **Sudbury**

*Percent of map unit:* 2 percent  
*Landform:* Outwash deltas, outwash plains, kame terraces, outwash terraces, moraines  
*Landform position (two-dimensional):* Backslope, footslope, toeslope  
*Landform position (three-dimensional):* Base slope, tread  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Concave, linear  
*Hydric soil rating:* No

## **LvA—Leicester-Walpole complex stony, 0 to 3 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 9fcw  
*Elevation:* 0 to 2,100 feet  
*Mean annual precipitation:* 27 to 47 inches  
*Mean annual air temperature:* 46 to 52 degrees F  
*Frost-free period:* 100 to 195 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Leicester and similar soils:* 40 percent  
*Walpole and similar soils:* 35 percent  
*Minor components:* 25 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Leicester**

#### **Setting**

*Landform:* Ground moraines  
*Parent material:* Ablation till derived from granite and gneiss and/or ablation till derived from mica schist

#### **Typical profile**

*H1 - 0 to 9 inches:* loam  
*H2 - 9 to 22 inches:* fine sandy loam  
*H3 - 22 to 60 inches:* gravelly sandy loam

#### **Properties and qualities**

*Slope:* 0 to 3 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)  
*Depth to water table:* About 0 to 18 inches  
*Frequency of flooding:* None



## Custom Soil Resource Report

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Moderate (about 8.1 inches)

### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7s

*Hydrologic Soil Group:* A/D

*Ecological site:* F144AY009CT - Wet Till Depressions

*Hydric soil rating:* Yes

### **Description of Walpole**

#### **Setting**

*Landform:* Ground moraines

*Parent material:* Glaciofluvial deposits derived from granite and gneiss

#### **Typical profile**

*H1 - 0 to 5 inches:* sandy loam

*H2 - 5 to 18 inches:* sandy loam

*H3 - 18 to 60 inches:* gravelly sand

#### **Properties and qualities**

*Slope:* 0 to 3 percent

*Surface area covered with cobbles, stones or boulders:* 0.1 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Poorly drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)

*Depth to water table:* About 0 to 12 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Low (about 4.6 inches)

### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4w

*Hydrologic Soil Group:* A/D

*Ecological site:* F144AY028MA - Wet Outwash

*Hydric soil rating:* Yes

### **Minor Components**

#### **Ridgebury**

*Percent of map unit:* 7 percent

*Landform:* Ground moraines

*Hydric soil rating:* Yes

#### **Saugatuck**

*Percent of map unit:* 6 percent

*Landform:* Outwash terraces

*Hydric soil rating:* Yes

#### **Pipestone**

*Percent of map unit:* 6 percent

*Landform:* Outwash terraces

*Hydric soil rating:* Yes



**Scarboro**

*Percent of map unit:* 6 percent  
*Landform:* Depressions  
*Hydric soil rating:* Yes

**MtC—Montauk fine sandy loam, 8 to 15 percent slopes, very stony**

**Map Unit Setting**

*National map unit symbol:* 2w80w  
*Elevation:* 0 to 1,120 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance

**Map Unit Composition**

*Montauk, very stony, and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Montauk, Very Stony**

**Setting**

*Landform:* Hills, recessional moraines, ground moraines, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Parent material:* Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

**Typical profile**

*Oe - 0 to 2 inches:* moderately decomposed plant material  
*A - 2 to 6 inches:* fine sandy loam  
*Bw1 - 6 to 28 inches:* fine sandy loam  
*Bw2 - 28 to 36 inches:* sandy loam  
*2Cd - 36 to 74 inches:* gravelly loamy sand

**Properties and qualities**

*Slope:* 8 to 15 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 43 inches to densic material  
*Drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 1.42 in/hr)  
*Depth to water table:* About 18 to 37 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None



## Custom Soil Resource Report

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 5.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C  
*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### Scituate, very stony

*Percent of map unit:* 6 percent  
*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Canton, very stony

*Percent of map unit:* 5 percent  
*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Ridgebury, very stony

*Percent of map unit:* 4 percent  
*Landform:* Depressions, ground moraines, hills, drainageways  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Head slope, base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

## PbB—Paxton fine sandy loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2t2qp  
*Elevation:* 0 to 1,570 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Paxton and similar soils:* 80 percent



## Custom Soil Resource Report

*Minor components: 20 percent*  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Paxton

#### Setting

*Landform:* Ground moraines, drumlins, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

#### Typical profile

*Ap - 0 to 8 inches:* fine sandy loam  
*Bw1 - 8 to 15 inches:* fine sandy loam  
*Bw2 - 15 to 26 inches:* fine sandy loam  
*Cd - 26 to 65 inches:* gravelly fine sandy loam

#### Properties and qualities

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* 18 to 39 inches to densic material  
*Drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)  
*Depth to water table:* About 18 to 37 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 3.1 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2s  
*Hydrologic Soil Group:* C  
*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### Woodbridge

*Percent of map unit:* 9 percent  
*Landform:* Ground moraines, drumlins, hills  
*Landform position (two-dimensional):* Summit, backslope, footslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

#### Ridgebury

*Percent of map unit:* 6 percent  
*Landform:* Depressions, ground moraines, hills, drainageways  
*Landform position (two-dimensional):* Toeslope, backslope, footslope  
*Landform position (three-dimensional):* Base slope, head slope, dip  
*Down-slope shape:* Concave



## Custom Soil Resource Report

*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

### **Charlton**

*Percent of map unit:* 5 percent  
*Landform:* Hills  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

## **PbC—Paxton fine sandy loam, 8 to 15 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2w66y  
*Elevation:* 0 to 1,320 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of statewide importance

### **Map Unit Composition**

*Paxton and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Paxton**

#### **Setting**

*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

#### **Typical profile**

*Ap - 0 to 8 inches:* fine sandy loam  
*Bw1 - 8 to 15 inches:* fine sandy loam  
*Bw2 - 15 to 26 inches:* fine sandy loam  
*Cd - 26 to 65 inches:* gravelly fine sandy loam

#### **Properties and qualities**

*Slope:* 8 to 15 percent  
*Depth to restrictive feature:* 20 to 39 inches to densic material  
*Drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)  
*Depth to water table:* About 18 to 37 inches  
*Frequency of flooding:* None



## Custom Soil Resource Report

*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.1 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3e  
*Hydrologic Soil Group:* C  
*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### Charlton

*Percent of map unit:* 7 percent  
*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Woodbridge

*Percent of map unit:* 6 percent  
*Landform:* Hills, drumlins, ground moraines  
*Landform position (two-dimensional):* Summit, backslope, footslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

#### Ridgebury

*Percent of map unit:* 2 percent  
*Landform:* Drumlins, drainageways, depressions, ground moraines, hills  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Head slope, base slope  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Concave, linear  
*Hydric soil rating:* Yes

## PfC—Paxton fine sandy loam, 8 to 15 percent slopes, very stony

### Map Unit Setting

*National map unit symbol:* 2w677  
*Elevation:* 0 to 1,330 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance



### Map Unit Composition

*Paxton, very stony, and similar soils: 85 percent*

*Minor components: 15 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Paxton, Very Stony

#### Setting

*Landform: Ground moraines, hills, drumlins*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Side slope*

*Down-slope shape: Convex, linear*

*Across-slope shape: Linear, convex*

*Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist*

#### Typical profile

*Oe - 0 to 2 inches: moderately decomposed plant material*

*A - 2 to 10 inches: fine sandy loam*

*Bw1 - 10 to 17 inches: fine sandy loam*

*Bw2 - 17 to 28 inches: fine sandy loam*

*Cd - 28 to 67 inches: gravelly fine sandy loam*

#### Properties and qualities

*Slope: 8 to 15 percent*

*Surface area covered with cobbles, stones or boulders: 1.6 percent*

*Depth to restrictive feature: 20 to 43 inches to densic material*

*Drainage class: Well drained*

*Runoff class: Medium*

*Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)*

*Depth to water table: About 18 to 37 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)*

*Available water supply, 0 to 60 inches: Low (about 4.7 inches)*

#### Interpretive groups

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 6s*

*Hydrologic Soil Group: C*

*Ecological site: F144AY007CT - Well Drained Dense Till Uplands*

*Hydric soil rating: No*

### Minor Components

#### Woodbridge, very stony

*Percent of map unit: 8 percent*

*Landform: Hills, drumlins, ground moraines*

*Landform position (two-dimensional): Backslope, footslope*

*Landform position (three-dimensional): Side slope*

*Down-slope shape: Concave*

*Across-slope shape: Linear*

*Hydric soil rating: No*



**Charlton, very stony**

*Percent of map unit:* 5 percent  
*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Ridgebury, very stony**

*Percent of map unit:* 2 percent  
*Landform:* Drumlins, depressions, ground moraines, hills, drainageways  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Head slope, base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**PfE—Paxton fine sandy loam, 25 to 35 percent slopes, very stony**

**Map Unit Setting**

*National map unit symbol:* 2w67v  
*Elevation:* 80 to 1,030 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 145 to 240 days  
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Paxton, very stony, and similar soils:* 95 percent  
*Minor components:* 5 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Paxton, Very Stony**

**Setting**

*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

**Typical profile**

*Oe - 0 to 2 inches:* moderately decomposed plant material  
*A - 2 to 10 inches:* fine sandy loam  
*Bw1 - 10 to 17 inches:* fine sandy loam  
*Bw2 - 17 to 28 inches:* fine sandy loam  
*Cd - 28 to 67 inches:* gravelly fine sandy loam



## Custom Soil Resource Report

### Properties and qualities

*Slope:* 25 to 35 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 43 inches to densic material  
*Drainage class:* Well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)  
*Depth to water table:* About 18 to 37 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* C  
*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### Chatfield, very stony

*Percent of map unit:* 3 percent  
*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Woodbridge, very stony

*Percent of map unit:* 1 percent  
*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

#### Canton, very stony

*Percent of map unit:* 1 percent  
*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No



## **PiA—Pipestone loamy sand, 0 to 3 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 9fdl  
*Elevation:* 0 to 1,000 feet  
*Mean annual precipitation:* 27 to 55 inches  
*Mean annual air temperature:* 45 to 52 degrees F  
*Frost-free period:* 120 to 200 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Pipestone and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Pipestone**

#### **Setting**

*Landform:* Outwash terraces  
*Parent material:* Sandy outwash derived mainly from granite, gneiss and schist

#### **Typical profile**

*H1 - 0 to 9 inches:* loamy sand  
*H2 - 9 to 22 inches:* sand  
*H3 - 22 to 61 inches:* coarse sand

#### **Properties and qualities**

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Negligible  
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (6.00 to 20.00 in/hr)  
*Depth to water table:* About 6 to 18 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 4.3 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 4w  
*Hydrologic Soil Group:* A/D  
*Ecological site:* F144AY027MA - Moist Sandy Outwash  
*Hydric soil rating:* Yes

### **Minor Components**

#### **Saugatuck**

*Percent of map unit:* 5 percent  
*Landform:* Outwash terraces



## Custom Soil Resource Report

*Hydric soil rating:* Yes

### **Deerfield**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

## **SsA—Scituate fine sandy loam, 0 to 3 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 9ff2

*Elevation:* 160 to 800 feet

*Mean annual precipitation:* 42 to 47 inches

*Mean annual air temperature:* 46 to 48 degrees F

*Frost-free period:* 155 to 160 days

*Farmland classification:* Farmland of statewide importance

### **Map Unit Composition**

*Scituate and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Scituate**

#### **Setting**

*Parent material:* Flow till derived from granite and gneiss

#### **Typical profile**

*H1 - 0 to 9 inches:* fine sandy loam

*H2 - 9 to 22 inches:* fine sandy loam

*H3 - 22 to 60 inches:* gravelly loamy sand

#### **Properties and qualities**

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* 20 to 39 inches to densic material

*Drainage class:* Moderately well drained

*Runoff class:* Medium

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)

*Depth to water table:* About 18 to 36 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Low (about 3.1 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* C

*Ecological site:* F144AY037MA - Moist Dense Till Uplands

*Hydric soil rating:* No



**Minor Components**

**Walpole**

*Percent of map unit:* 8 percent  
*Landform:* Depressions  
*Hydric soil rating:* Yes

**Leicester**

*Percent of map unit:* 7 percent  
*Landform:* Depressions  
*Hydric soil rating:* Yes

**StA—Scituate stony fine sandy loam, 0 to 3 percent slopes**

**Map Unit Setting**

*National map unit symbol:* 9ff5  
*Elevation:* 130 to 900 feet  
*Mean annual precipitation:* 42 to 47 inches  
*Mean annual air temperature:* 46 to 48 degrees F  
*Frost-free period:* 155 to 160 days  
*Farmland classification:* Farmland of local importance

**Map Unit Composition**

*Scituate and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Scituate**

**Setting**

*Parent material:* Flow till derived from granite and gneiss

**Typical profile**

*H1 - 0 to 9 inches:* fine sandy loam  
*H2 - 9 to 22 inches:* fine sandy loam  
*H3 - 22 to 60 inches:* gravelly loamy sand

**Properties and qualities**

*Slope:* 0 to 3 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 39 inches to densic material  
*Drainage class:* Moderately well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* About 18 to 36 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Very low (about 3.0 inches)



## Custom Soil Resource Report

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 5s  
*Hydrologic Soil Group:* C  
*Ecological site:* F144AY037MA - Moist Dense Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### Woodbridge

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

#### Leicester

*Percent of map unit:* 5 percent  
*Landform:* Depressions  
*Hydric soil rating:* Yes

#### Walpole

*Percent of map unit:* 5 percent  
*Landform:* Depressions  
*Hydric soil rating:* Yes

## W—Water (less than 40 acres)

### Map Unit Composition

*Water < 40:* 100 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

## WnC—Windsor-Urban land complex, 3 to 15 percent slopes

### Map Unit Setting

*National map unit symbol:* 2svmx  
*Elevation:* 100 to 960 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Windsor and similar soils:* 50 percent  
*Urban land:* 35 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Windsor

#### Setting

*Landform:* Dunes, deltas, outwash terraces, outwash plains



## Custom Soil Resource Report

*Landform position (three-dimensional):* Tread, riser

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex, linear

*Parent material:* Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

### Typical profile

*A - 0 to 3 inches:* loamy sand

*Bw - 3 to 25 inches:* loamy sand

*C - 25 to 65 inches:* sand

### Properties and qualities

*Slope:* 3 to 15 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Excessively drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 4.4 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* A

*Ecological site:* F144AY022MA - Dry Outwash

*Hydric soil rating:* No

## Description of Urban Land

### Typical profile

*M - 0 to 10 inches:* cemented material

### Properties and qualities

*Slope:* 3 to 15 percent

*Depth to restrictive feature:* 0 inches to manufactured layer

*Runoff class:* Very high

*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)

*Available water supply, 0 to 60 inches:* Very low (about 0.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8

*Hydrologic Soil Group:* D

*Hydric soil rating:* Unranked

## Minor Components

### Hinckley

*Percent of map unit:* 5 percent

*Landform:* Deltas, kames, eskers, outwash plains

*Landform position (two-dimensional):* Summit, shoulder, backslope



## Custom Soil Resource Report

*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, rise

*Down-slope shape:* Convex

*Across-slope shape:* Convex, linear

*Hydric soil rating:* No

### **Deerfield**

*Percent of map unit:* 5 percent

*Landform:* Deltas, terraces, outwash plains

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread, tal

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

### **Udorthents**

*Percent of map unit:* 5 percent

*Landform:* Dunes, deltas, outwash terraces, outwash plains

*Landform position (three-dimensional):* Tread, riser

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex, linear

*Hydric soil rating:* No

## **WvB—Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony**

### **Map Unit Setting**

*National map unit symbol:* 2t2qr

*Elevation:* 0 to 1,440 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Farmland of local importance

### **Map Unit Composition**

*Woodbridge, very stony, and similar soils:* 82 percent

*Minor components:* 18 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Woodbridge, Very Stony**

#### **Setting**

*Landform:* Ground moraines, hills, drumlins

*Landform position (two-dimensional):* Summit, backslope, footslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Concave

*Across-slope shape:* Linear

*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist



## Custom Soil Resource Report

### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material  
*A - 2 to 9 inches:* fine sandy loam  
*Bw1 - 9 to 20 inches:* fine sandy loam  
*Bw2 - 20 to 32 inches:* fine sandy loam  
*Cd - 32 to 67 inches:* gravelly fine sandy loam

### Properties and qualities

*Slope:* 0 to 8 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 43 inches to densic material  
*Drainage class:* Moderately well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)  
*Depth to water table:* About 19 to 27 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C/D  
*Ecological site:* F144AY037MA - Moist Dense Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### Paxton, very stony

*Percent of map unit:* 10 percent  
*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Linear, convex  
*Hydric soil rating:* No

#### Ridgebury, very stony

*Percent of map unit:* 8 percent  
*Landform:* Hills, drainageways, drumlins, depressions, ground moraines  
*Landform position (two-dimensional):* Toeslope  
*Landform position (three-dimensional):* Head slope, base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes



## Merrimack and Belknap Counties, New Hampshire

### 4A—Pootatuck very fine sandy loam, 0 to 3 percent slopes, occasionally flooded

#### Map Unit Setting

*National map unit symbol:* 9dkl

*Elevation:* 200 to 790 feet

*Mean annual precipitation:* 40 to 50 inches

*Mean annual air temperature:* 45 to 52 degrees F

*Frost-free period:* 100 to 160 days

*Farmland classification:* Prime farmland if protected from flooding or not frequently flooded during the growing season

#### Map Unit Composition

*Pootatuck, occasionally flooded, and similar soils:* 75 percent

*Minor components:* 25 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Pootatuck, Occasionally Flooded

##### Setting

*Landform:* Flood plains

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Sandy and/or coarse-loamy alluvium derived from granite, gneiss or schist

##### Typical profile

*H1 - 0 to 14 inches:* very fine sandy loam

*H2 - 14 to 60 inches:* fine sandy loam

*H3 - 60 to 65 inches:* fine sand

##### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Moderately well drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)

*Depth to water table:* About 18 to 30 inches

*Frequency of flooding:* OccasionalNone

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Moderate (about 8.7 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2w

*Hydrologic Soil Group:* B

*Ecological site:* F144AY012CT - Sandy Low Floodplain

*Hydric soil rating:* No

#### Minor Components

##### Rippowam

*Percent of map unit:* 10 percent



Custom Soil Resource Report

*Landform:* Flood plains  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* Yes

**Suncook**

*Percent of map unit:* 5 percent  
*Landform:* Flood plains  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Saco**

*Percent of map unit:* 5 percent  
*Landform:* Flood plains  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**Occum, frequently flooded**

*Percent of map unit:* 3 percent  
*Landform:* Flood plains  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Occum, occasionally flooded**

*Percent of map unit:* 2 percent  
*Landform:* Flood plains  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**6A—Saco mucky silt loam, 0 to 2 percent slopes, frequently flooded**

**Map Unit Setting**

*National map unit symbol:* 9dm3  
*Elevation:* 200 to 790 feet  
*Mean annual precipitation:* 40 to 50 inches  
*Mean annual air temperature:* 37 to 52 degrees F  
*Frost-free period:* 90 to 160 days  
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Saco, frequently flooded, and similar soils:* 75 percent  
*Minor components:* 25 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*



## Description of Saco, Frequently Flooded

### Setting

*Landform:* Flood plains

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Sandy and/or coarse-loamy alluvium derived from granite, gneiss or schist

### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material

*H1 - 2 to 8 inches:* mucky silt loam

*H2 - 8 to 35 inches:* silt loam

*H3 - 35 to 65 inches:* fine sand

### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Very poorly drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 2.00 in/hr)

*Depth to water table:* About 0 to 6 inches

*Frequency of flooding:* FrequentNone

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* High (about 9.8 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6w

*Hydrologic Soil Group:* B/D

*Ecological site:* F144AY016MA - Very Wet Low Floodplain

*Hydric soil rating:* Yes

## Minor Components

### Timakwa

*Percent of map unit:* 10 percent

*Landform:* Bogs

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

### Rippowam

*Percent of map unit:* 10 percent

*Landform:* Flood plains

*Down-slope shape:* Linear

*Across-slope shape:* Convex

*Hydric soil rating:* Yes

### Pootatuck

*Percent of map unit:* 5 percent

*Landform:* Flood plains

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No



## 12C—Hinckley loamy sand, 8 to 15 percent slopes

### Map Unit Setting

*National map unit symbol:* 2svm9

*Elevation:* 0 to 1,480 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Farmland of local importance

### Map Unit Composition

*Hinckley and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Hinckley

#### Setting

*Landform:* Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces

*Landform position (two-dimensional):* Shoulder, backslope, footslope, toeslope

*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, riser

*Down-slope shape:* Concave, convex, linear

*Across-slope shape:* Convex, linear, concave

*Parent material:* Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

#### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 8 inches:* loamy sand

*Bw1 - 8 to 11 inches:* gravelly loamy sand

*Bw2 - 11 to 16 inches:* gravelly loamy sand

*BC - 16 to 19 inches:* very gravelly loamy sand

*C - 19 to 65 inches:* very gravelly sand

#### Properties and qualities

*Slope:* 8 to 15 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Excessively drained

*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 3.1 inches)



**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 4e  
*Hydrologic Soil Group:* A  
*Ecological site:* F144AY022MA - Dry Outwash  
*Hydric soil rating:* No

**Minor Components**

**Sudbury**

*Percent of map unit:* 5 percent  
*Landform:* Outwash deltas, moraines, outwash plains, kame terraces, outwash terraces  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Base slope, tread  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Concave, linear  
*Hydric soil rating:* No

**Windsor**

*Percent of map unit:* 5 percent  
*Landform:* Moraines, eskers, kames, outwash deltas, outwash terraces, outwash plains, kame terraces  
*Landform position (two-dimensional):* Shoulder, backslope, footslope, toeslope  
*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, riser  
*Down-slope shape:* Concave, convex, linear  
*Across-slope shape:* Convex, linear, concave  
*Hydric soil rating:* No

**Merrimac**

*Percent of map unit:* 5 percent  
*Landform:* Kames, outwash plains, outwash terraces, moraines, eskers  
*Landform position (two-dimensional):* Shoulder, backslope, footslope, toeslope  
*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, riser  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**12E—Hinckley loamy sand, 15 to 60 percent slopes**

**Map Unit Setting**

*National map unit symbol:* 2svmh  
*Elevation:* 0 to 890 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 145 to 240 days  
*Farmland classification:* Not prime farmland



### Map Unit Composition

*Hinckley and similar soils: 85 percent*

*Minor components: 15 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Hinckley

#### Setting

*Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser*

*Down-slope shape: Concave, convex, linear*

*Across-slope shape: Convex, linear, concave*

*Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist*

#### Typical profile

*Oe - 0 to 1 inches: moderately decomposed plant material*

*A - 1 to 8 inches: loamy sand*

*Bw1 - 8 to 11 inches: gravelly loamy sand*

*Bw2 - 11 to 16 inches: gravelly loamy sand*

*BC - 16 to 19 inches: very gravelly loamy sand*

*C - 19 to 65 inches: very gravelly sand*

#### Properties and qualities

*Slope: 15 to 60 percent*

*Depth to restrictive feature: More than 80 inches*

*Drainage class: Excessively drained*

*Runoff class: Low*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)*

*Available water supply, 0 to 60 inches: Low (about 3.1 inches)*

#### Interpretive groups

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 7e*

*Hydrologic Soil Group: A*

*Ecological site: F144AY022MA - Dry Outwash*

*Hydric soil rating: No*

### Minor Components

#### Windsor

*Percent of map unit: 10 percent*

*Landform: Outwash terraces, moraines, eskers, kames, kame terraces, outwash deltas, outwash plains*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser*

*Down-slope shape: Concave, convex, linear*



## Custom Soil Resource Report

*Across-slope shape:* Convex, linear, concave  
*Hydric soil rating:* No

### **Merrimac**

*Percent of map unit:* 5 percent  
*Landform:* Outwash plains, outwash terraces, moraines, eskers, kames  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope, crest, head slope, nose slope, riser  
*Down-slope shape:* Concave, convex, linear  
*Across-slope shape:* Convex, linear, concave  
*Hydric soil rating:* No

## **26A—Windsor loamy sand, 0 to 3 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2svkg  
*Elevation:* 0 to 990 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance

### **Map Unit Composition**

*Windsor, loamy sand, and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Windsor, Loamy Sand**

#### **Setting**

*Landform:* Outwash plains, outwash terraces, deltas, dunes  
*Landform position (three-dimensional):* Tread, riser  
*Down-slope shape:* Linear, convex  
*Across-slope shape:* Linear, convex  
*Parent material:* Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

#### **Typical profile**

*O - 0 to 1 inches:* moderately decomposed plant material  
*A - 1 to 3 inches:* loamy sand  
*Bw - 3 to 25 inches:* loamy sand  
*C - 25 to 65 inches:* sand

#### **Properties and qualities**

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Excessively drained  
*Runoff class:* Low



## Custom Soil Resource Report

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 3.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* A

*Ecological site:* F144AY022MA - Dry Outwash

*Hydric soil rating:* No

### Minor Components

#### Deerfield, loamy sand

*Percent of map unit:* 10 percent

*Landform:* Deltas, terraces, outwash plains

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread, tal

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Hinckley, loamy sand

*Percent of map unit:* 5 percent

*Landform:* Deltas, kames, eskers, outwash plains

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Head slope, nose slope, crest, side slope, rise

*Down-slope shape:* Convex

*Across-slope shape:* Convex, linear

*Hydric soil rating:* No

## 26B—Windsor loamy sand, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2svkf

*Elevation:* 0 to 1,210 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Farmland of local importance

### Map Unit Composition

*Windsor, loamy sand, and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*



## Description of Windsor, Loamy Sand

### Setting

*Landform:* Dunes, outwash plains, deltas, outwash terraces

*Landform position (three-dimensional):* Tread, riser

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex, linear

*Parent material:* Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

### Typical profile

*O - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 3 inches:* loamy sand

*Bw - 3 to 25 inches:* loamy sand

*C - 25 to 65 inches:* sand

### Properties and qualities

*Slope:* 3 to 8 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Excessively drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 4.5 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* A

*Ecological site:* F144AY022MA - Dry Outwash

*Hydric soil rating:* No

## Minor Components

### Hinckley, loamy sand

*Percent of map unit:* 10 percent

*Landform:* Deltas, kames, eskers, outwash plains

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Head slope, nose slope, crest, side slope, rise

*Down-slope shape:* Convex

*Across-slope shape:* Convex, linear

*Hydric soil rating:* No

### Deerfield, loamy sand

*Percent of map unit:* 5 percent

*Landform:* Deltas, terraces, outwash plains

*Landform position (two-dimensional):* Footslope

*Landform position (three-dimensional):* Tread, tal

*Down-slope shape:* Linear

*Across-slope shape:* Linear



*Hydric soil rating:* No

## **26C—Windsor loamy sand, 8 to 15 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2svkq  
*Elevation:* 0 to 1,260 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance

### **Map Unit Composition**

*Windsor and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Windsor**

#### **Setting**

*Landform:* — error in exists on —  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Side slope, riser  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex, linear  
*Parent material:* Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

#### **Typical profile**

*Oe - 0 to 1 inches:* moderately decomposed plant material  
*Ap - 1 to 11 inches:* loamy sand  
*Bw - 11 to 31 inches:* loamy sand  
*C - 31 to 65 inches:* sand

#### **Properties and qualities**

*Slope:* 8 to 15 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Excessively drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.2 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3e



## Custom Soil Resource Report

*Hydrologic Soil Group:* A  
*Ecological site:* F144AY022MA - Dry Outwash  
*Hydric soil rating:* No

### Minor Components

#### Hinckley

*Percent of map unit:* 10 percent  
*Landform:* Deltas, kames, eskers, outwash plains  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, rise  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex, linear  
*Hydric soil rating:* No

#### Deerfield

*Percent of map unit:* 5 percent  
*Landform:* Deltas, terraces, outwash plains  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Tread, talf  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

## 26E—Windsor loamy sand, 15 to 60 percent slopes

### Map Unit Setting

*National map unit symbol:* 2w2ws  
*Elevation:* 0 to 760 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Windsor and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Windsor

#### Setting

*Landform:* Dunes, deltas, outwash terraces, outwash plains  
*Landform position (three-dimensional):* Tread, riser  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex, linear  
*Parent material:* Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss



## Custom Soil Resource Report

### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material  
*A - 1 to 3 inches:* loamy sand  
*Bw - 3 to 25 inches:* loamy sand  
*C - 25 to 65 inches:* sand

### Properties and qualities

*Slope:* 15 to 60 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Excessively drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to very high (1.42 to 99.90 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.5 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7e  
*Hydrologic Soil Group:* A  
*Ecological site:* F144AY022MA - Dry Outwash  
*Hydric soil rating:* No

### Minor Components

#### Hinckley

*Percent of map unit:* 10 percent  
*Landform:* Deltas, kames, eskers, outwash plains  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, rise  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex, linear  
*Hydric soil rating:* No

#### Deerfield

*Percent of map unit:* 5 percent  
*Landform:* Deltas, terraces, outwash plains  
*Landform position (two-dimensional):* Footslope  
*Landform position (three-dimensional):* Tread, tal  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No



## 43B—Canton fine sandy loam, 0 to 8 percent slopes, very stony

### Map Unit Setting

*National map unit symbol:* 2w81l  
*Elevation:* 0 to 1,180 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance

### Map Unit Composition

*Canton, very stony, and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Canton, Very Stony

#### Setting

*Landform:* Moraines, hills, ridges  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Parent material:* Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

#### Typical profile

*O<sub>i</sub> - 0 to 2 inches:* slightly decomposed plant material  
*A - 2 to 5 inches:* fine sandy loam  
*Bw<sub>1</sub> - 5 to 16 inches:* fine sandy loam  
*Bw<sub>2</sub> - 16 to 22 inches:* gravelly fine sandy loam  
*2C - 22 to 67 inches:* gravelly loamy sand

#### Properties and qualities

*Slope:* 0 to 8 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 19 to 39 inches to strongly contrasting textural stratification  
*Drainage class:* Well drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Moderately low to high (0.14 to 14.17 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 3.4 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified



Custom Soil Resource Report

*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* B  
*Ecological site:* F144AY034CT - Well Drained Till Uplands  
*Hydric soil rating:* No

**Minor Components**

**Scituate, very stony**

*Percent of map unit:* 9 percent  
*Landform:* Hills, drumlins, ground moraines  
*Landform position (two-dimensional):* Summit, backslope, footslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Montauk, very stony**

*Percent of map unit:* 5 percent  
*Landform:* Recessionial moraines, ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Gloucester, very stony**

*Percent of map unit:* 4 percent  
*Landform:* Moraines, hills, ridges  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Swansea**

*Percent of map unit:* 2 percent  
*Landform:* Marshes, depressions, bogs, swamps, kettles  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**43C—Canton fine sandy loam, 8 to 15 percent slopes, very stony**

**Map Unit Setting**

*National map unit symbol:* 2w814  
*Elevation:* 0 to 1,160 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance



### Map Unit Composition

*Canton, very stony, and similar soils: 85 percent*

*Minor components: 15 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Canton, Very Stony

#### Setting

*Landform: Moraines, ridges, hills*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Side slope*

*Down-slope shape: Convex, linear*

*Across-slope shape: Convex*

*Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist*

#### Typical profile

*O<sub>i</sub> - 0 to 2 inches: slightly decomposed plant material*

*A - 2 to 5 inches: fine sandy loam*

*Bw<sub>1</sub> - 5 to 16 inches: fine sandy loam*

*Bw<sub>2</sub> - 16 to 22 inches: gravelly fine sandy loam*

*2C - 22 to 67 inches: gravelly loamy sand*

#### Properties and qualities

*Slope: 8 to 15 percent*

*Surface area covered with cobbles, stones or boulders: 1.6 percent*

*Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification*

*Drainage class: Well drained*

*Runoff class: Low*

*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>): Moderately low to high (0.14 to 14.17 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)*

*Available water supply, 0 to 60 inches: Low (about 3.4 inches)*

#### Interpretive groups

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 6s*

*Hydrologic Soil Group: B*

*Ecological site: F144AY034CT - Well Drained Till Uplands*

*Hydric soil rating: No*

### Minor Components

#### Montauk, very stony

*Percent of map unit: 6 percent*

*Landform: Recessional moraines, ground moraines, hills, drumlins*

*Landform position (two-dimensional): Backslope*

*Landform position (three-dimensional): Side slope*

*Down-slope shape: Convex, linear*

*Across-slope shape: Convex*

*Hydric soil rating: No*



**Scituate, very stony**

*Percent of map unit:* 5 percent  
*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Chatfield, very stony**

*Percent of map unit:* 3 percent  
*Landform:* Hills, ridges  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Swansea**

*Percent of map unit:* 1 percent  
*Landform:* Marshes, depressions, bogs, swamps, kettles  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**43D—Canton fine sandy loam, 15 to 25 percent slopes, very stony**

**Map Unit Setting**

*National map unit symbol:* 2w81h  
*Elevation:* 70 to 1,120 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance

**Map Unit Composition**

*Canton, very stony, and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Canton, Very Stony**

**Setting**

*Landform:* Moraines, hills, ridges  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Parent material:* Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist



## Custom Soil Resource Report

### Typical profile

*O<sub>i</sub>* - 0 to 2 inches: slightly decomposed plant material  
*A* - 2 to 5 inches: fine sandy loam  
*Bw<sub>1</sub>* - 5 to 16 inches: fine sandy loam  
*Bw<sub>2</sub>* - 16 to 22 inches: gravelly fine sandy loam  
*2C* - 22 to 67 inches: gravelly loamy sand

### Properties and qualities

*Slope*: 15 to 25 percent  
*Surface area covered with cobbles, stones or boulders*: 1.6 percent  
*Depth to restrictive feature*: 19 to 39 inches to strongly contrasting textural stratification  
*Drainage class*: Well drained  
*Runoff class*: Medium  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>)*: Moderately low to high (0.14 to 14.17 in/hr)  
*Depth to water table*: More than 80 inches  
*Frequency of flooding*: None  
*Frequency of ponding*: None  
*Maximum salinity*: Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches*: Low (about 3.4 inches)

### Interpretive groups

*Land capability classification (irrigated)*: None specified  
*Land capability classification (nonirrigated)*: 6s  
*Hydrologic Soil Group*: B  
*Ecological site*: F144AY034CT - Well Drained Till Uplands  
*Hydric soil rating*: No

### Minor Components

#### Chatfield, very stony

*Percent of map unit*: 6 percent  
*Landform*: Ridges, hills  
*Landform position (two-dimensional)*: Summit, shoulder, backslope  
*Landform position (three-dimensional)*: Nose slope, side slope, crest  
*Down-slope shape*: Convex  
*Across-slope shape*: Linear, convex  
*Hydric soil rating*: No

#### Montauk, very stony

*Percent of map unit*: 5 percent  
*Landform*: Hills, drumlins, recessional moraines, ground moraines  
*Landform position (two-dimensional)*: Backslope  
*Landform position (three-dimensional)*: Side slope  
*Down-slope shape*: Convex, linear  
*Across-slope shape*: Convex  
*Hydric soil rating*: No

#### Newfields, very stony

*Percent of map unit*: 4 percent  
*Landform*: Ground moraines, hills, moraines  
*Landform position (two-dimensional)*: Footslope  
*Landform position (three-dimensional)*: Base slope  
*Down-slope shape*: Linear  
*Across-slope shape*: Concave



*Hydric soil rating:* No

## **45B—Montauk fine sandy loam, 0 to 8 percent slopes, very stony**

### **Map Unit Setting**

*National map unit symbol:* 2w80v

*Elevation:* 0 to 1,070 feet

*Mean annual precipitation:* 36 to 71 inches

*Mean annual air temperature:* 39 to 55 degrees F

*Frost-free period:* 140 to 240 days

*Farmland classification:* Farmland of local importance

### **Map Unit Composition**

*Montauk, very stony, and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Montauk, Very Stony**

#### **Setting**

*Landform:* Recessional moraines, ground moraines, hills, drumlins

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Side slope, crest

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Parent material:* Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

#### **Typical profile**

*Oe - 0 to 2 inches:* moderately decomposed plant material

*A - 2 to 6 inches:* fine sandy loam

*Bw1 - 6 to 28 inches:* fine sandy loam

*Bw2 - 28 to 36 inches:* sandy loam

*2Cd - 36 to 74 inches:* gravelly loamy sand

#### **Properties and qualities**

*Slope:* 0 to 8 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 20 to 43 inches to densic material

*Drainage class:* Well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 1.42 in/hr)

*Depth to water table:* About 18 to 37 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 5.6 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified



## Custom Soil Resource Report

*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C  
*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### **Scituate, very stony**

*Percent of map unit:* 6 percent  
*Landform:* Drumlins, ground moraines, hills  
*Landform position (two-dimensional):* Summit, backslope, footslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### **Canton, very stony**

*Percent of map unit:* 5 percent  
*Landform:* Hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### **Ridgebury, very stony**

*Percent of map unit:* 4 percent  
*Landform:* Depressions, ground moraines, hills, drainageways  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Head slope, base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

## **49A—Whitman fine sandy loam, 0 to 3 percent slopes, very stony**

### **Map Unit Setting**

*National map unit symbol:* 2zggg  
*Elevation:* 130 to 970 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Whitman, very stony, and similar soils:* 81 percent  
*Minor components:* 19 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*



## Description of Whitman, Very Stony

### Setting

*Landform:* Drumlins, ground moraines, hills, drainageways, depressions

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Coarse-loamy lodgment till derived from granite and gneiss and/or schist

### Typical profile

*O<sub>i</sub> - 0 to 1 inches:* peat

*A - 1 to 10 inches:* fine sandy loam

*B<sub>g</sub> - 10 to 17 inches:* gravelly fine sandy loam

*C<sub>dg</sub> - 17 to 61 inches:* fine sandy loam

### Properties and qualities

*Slope:* 0 to 3 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 7 to 38 inches to densic material

*Drainage class:* Very poorly drained

*Runoff class:* Negligible

*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Very low to moderately low (0.00 to 0.14 in/hr)

*Depth to water table:* About 0 to 6 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 3.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 5s

*Hydrologic Soil Group:* D

*Ecological site:* F144AY041MA - Very Wet Till Depressions

*Hydric soil rating:* Yes

## Minor Components

### Ridgebury, very stony

*Percent of map unit:* 10 percent

*Landform:* Hills, drainageways, drumlins, depressions, ground moraines

*Landform position (two-dimensional):* Footslope, toeslope

*Landform position (three-dimensional):* Head slope, base slope

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Ecological site:* F144AY009CT - Wet Till Depressions

*Hydric soil rating:* Yes

### Scarboro

*Percent of map unit:* 5 percent

*Landform:* Depressions, drainageways, outwash terraces, outwash deltas

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave



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*Ecological site:* F144AY031MA - Very Wet Outwash  
*Hydric soil rating:* Yes

### **Swansea**

*Percent of map unit:* 3 percent  
*Landform:* Marshes, bogs, swamps  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Ecological site:* F144AY043MA - Acidic Organic Wetlands  
*Hydric soil rating:* Yes

### **Woodbridge, very stony**

*Percent of map unit:* 1 percent  
*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Summit, backslope, footslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Ecological site:* F144AY037MA - Moist Dense Till Uplands  
*Hydric soil rating:* No

## **67C—Paxton fine sandy loam, 8 to 15 percent slopes, very stony**

### **Map Unit Setting**

*National map unit symbol:* 2w677  
*Elevation:* 0 to 1,330 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance

### **Map Unit Composition**

*Paxton, very stony, and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Paxton, Very Stony**

#### **Setting**

*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

#### **Typical profile**

*Oe - 0 to 2 inches:* moderately decomposed plant material  
*A - 2 to 10 inches:* fine sandy loam  
*Bw1 - 10 to 17 inches:* fine sandy loam



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*Bw2 - 17 to 28 inches: fine sandy loam*  
*Cd - 28 to 67 inches: gravelly fine sandy loam*

### Properties and qualities

*Slope: 8 to 15 percent*  
*Surface area covered with cobbles, stones or boulders: 1.6 percent*  
*Depth to restrictive feature: 20 to 43 inches to densic material*  
*Drainage class: Well drained*  
*Runoff class: Medium*  
*Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)*  
*Depth to water table: About 18 to 37 inches*  
*Frequency of flooding: None*  
*Frequency of ponding: None*  
*Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)*  
*Available water supply, 0 to 60 inches: Low (about 4.7 inches)*

### Interpretive groups

*Land capability classification (irrigated): None specified*  
*Land capability classification (nonirrigated): 6s*  
*Hydrologic Soil Group: C*  
*Ecological site: F144AY007CT - Well Drained Dense Till Uplands*  
*Hydric soil rating: No*

### Minor Components

#### Woodbridge, very stony

*Percent of map unit: 8 percent*  
*Landform: Hills, drumlins, ground moraines*  
*Landform position (two-dimensional): Backslope, footslope*  
*Landform position (three-dimensional): Side slope*  
*Down-slope shape: Concave*  
*Across-slope shape: Linear*  
*Hydric soil rating: No*

#### Charlton, very stony

*Percent of map unit: 5 percent*  
*Landform: Hills*  
*Landform position (two-dimensional): Backslope*  
*Landform position (three-dimensional): Side slope*  
*Down-slope shape: Convex*  
*Across-slope shape: Convex*  
*Hydric soil rating: No*

#### Ridgebury, very stony

*Percent of map unit: 2 percent*  
*Landform: Drumlins, depressions, ground moraines, hills, drainageways*  
*Landform position (two-dimensional): Footslope, toeslope*  
*Landform position (three-dimensional): Head slope, base slope*  
*Down-slope shape: Concave*  
*Across-slope shape: Concave*  
*Hydric soil rating: Yes*



## 67D—Paxton fine sandy loam, 15 to 25 percent slopes, very stony

### Map Unit Setting

*National map unit symbol:* 2w67h  
*Elevation:* 0 to 1,400 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance

### Map Unit Composition

*Paxton, very stony, and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Paxton, Very Stony

#### Setting

*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

#### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material  
*A - 2 to 10 inches:* fine sandy loam  
*Bw1 - 10 to 17 inches:* fine sandy loam  
*Bw2 - 17 to 28 inches:* fine sandy loam  
*Cd - 28 to 67 inches:* gravelly fine sandy loam

#### Properties and qualities

*Slope:* 15 to 25 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 43 inches to densic material  
*Drainage class:* Well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)  
*Depth to water table:* About 18 to 37 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s



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*Hydrologic Soil Group:* C  
*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands  
*Hydric soil rating:* No

**Minor Components**

**Woodbridge, very stony**

*Percent of map unit:* 5 percent  
*Landform:* Hills, drumlins, ground moraines  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Charlton, very stony**

*Percent of map unit:* 4 percent  
*Landform:* Hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Ridgebury, very stony**

*Percent of map unit:* 1 percent  
*Landform:* Drumlins, depressions, ground moraines, hills, drainageways  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Head slope, base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**196A—Meadowsedge peat, 0 to 1 percent slopes, ponded**

**Map Unit Setting**

*National map unit symbol:* 21xtp  
*Elevation:* 250 to 2,940 feet  
*Mean annual precipitation:* 40 to 50 inches  
*Mean annual air temperature:* 37 to 46 degrees F  
*Frost-free period:* 90 to 135 days  
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Meadowsedge, ponded, and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*



**Description of Meadowsedge, Pondered**

**Setting**

*Landform:* Bogs  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Parent material:* Organics

**Typical profile**

*O<sub>i</sub> - 0 to 4 inches:* mucky peat  
*O<sub>e</sub> - 4 to 65 inches:* moderately decomposed plant material

**Properties and qualities**

*Slope:* 0 to 1 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Very poorly drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Moderately high to high  
(0.20 to 6.00 in/hr)  
*Depth to water table:* About 0 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Very high (about 20.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7w  
*Hydrologic Soil Group:* A/D  
*Hydric soil rating:* Yes

**Minor Components**

**Chocorua**

*Percent of map unit:* 5 percent  
*Landform:* Bogs  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**Chocorua**

*Percent of map unit:* 3 percent  
*Landform:* Bogs  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**Searsport**

*Percent of map unit:* 3 percent  
*Landform:* Outwash terraces  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**Medomak**

*Percent of map unit:* 2 percent  
*Landform:* Flood plains



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*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

### **Peacham**

*Percent of map unit:* 2 percent  
*Landform:* Depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

## **250B—Chatfield-Montauk-Hollis complex, 0 to 8 percent slopes, very rocky**

### **Map Unit Setting**

*National map unit symbol:* 2xfdx  
*Elevation:* 270 to 1,040 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Farmland of local importance

### **Map Unit Composition**

*Chatfield, very stony, and similar soils:* 35 percent  
*Montauk, very stony, and similar soils:* 25 percent  
*Hollis, very stony, and similar soils:* 20 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Chatfield, Very Stony**

#### **Setting**

*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

#### **Typical profile**

*O<sub>i</sub> - 0 to 1 inches:* slightly decomposed plant material  
*A - 1 to 2 inches:* fine sandy loam  
*B<sub>w</sub> - 2 to 30 inches:* gravelly fine sandy loam  
*2R - 30 to 40 inches:* bedrock

#### **Properties and qualities**

*Slope:* 0 to 8 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 41 inches to lithic bedrock  
*Drainage class:* Well drained



## Custom Soil Resource Report

*Runoff class:* High

*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 4.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* B

*Ecological site:* F144AY034CT - Well Drained Till Uplands

*Hydric soil rating:* No

### Description of Montauk, Very Stony

#### Setting

*Landform:* Recessional moraines, ground moraines, hills, drumlins

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Side slope, crest

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Parent material:* Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

#### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material

*A - 2 to 6 inches:* fine sandy loam

*Bw1 - 6 to 28 inches:* fine sandy loam

*Bw2 - 28 to 36 inches:* sandy loam

*2Cd - 36 to 74 inches:* gravelly loamy sand

#### Properties and qualities

*Slope:* 0 to 8 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 20 to 43 inches to densic material

*Drainage class:* Well drained

*Runoff class:* Medium

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 1.42 in/hr)

*Depth to water table:* About 18 to 37 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 5.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* C

*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands

*Hydric soil rating:* No



## Description of Hollis, Very Stony

### Setting

*Landform:* Ridges, hills

*Landform position (two-dimensional):* Summit, shoulder, backslope

*Landform position (three-dimensional):* Nose slope, side slope, crest

*Down-slope shape:* Convex

*Across-slope shape:* Linear, convex

*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

### Typical profile

*O<sub>i</sub> - 0 to 2 inches:* slightly decomposed plant material

*A - 2 to 7 inches:* gravelly fine sandy loam

*B<sub>w</sub> - 7 to 16 inches:* gravelly fine sandy loam

*2R - 16 to 26 inches:* bedrock

### Properties and qualities

*Slope:* 0 to 8 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 8 to 23 inches to lithic bedrock

*Drainage class:* Somewhat excessively drained

*Runoff class:* Very high

*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Very low (0.00 to 0.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* D

*Ecological site:* F144AY033MA - Shallow Dry Till Uplands

*Hydric soil rating:* No

## Minor Components

### Walpole, very stony

*Percent of map unit:* 7 percent

*Landform:* Deltas, depressions, outwash plains, depressions, outwash terraces

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

### Scituate, very stony

*Percent of map unit:* 5 percent

*Landform:* Hills, drumlins, ground moraines

*Landform position (two-dimensional):* Summit, backslope, footslope

*Landform position (three-dimensional):* Side slope, crest

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Hydric soil rating:* No



**Rock outcrop**

*Percent of map unit:* 4 percent  
*Landform:* Ridges, hills  
*Hydric soil rating:* No

**Canton, very stony**

*Percent of map unit:* 4 percent  
*Landform:* Hills, ridges, moraines  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**250C—Chatfield-Montauk-Hollis complex, 8 to 15 percent slopes, very rocky**

**Map Unit Setting**

*National map unit symbol:* 2w69v  
*Elevation:* 200 to 1,200 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 145 to 240 days  
*Farmland classification:* Farmland of local importance

**Map Unit Composition**

*Chatfield, very stony, and similar soils:* 35 percent  
*Montauk, very stony, and similar soils:* 25 percent  
*Hollis, very stony, and similar soils:* 20 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Chatfield, Very Stony**

**Setting**

*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

**Typical profile**

*O<sub>i</sub> - 0 to 1 inches:* slightly decomposed plant material  
*A - 1 to 2 inches:* fine sandy loam  
*B<sub>w</sub> - 2 to 30 inches:* gravelly fine sandy loam



## Custom Soil Resource Report

2R - 30 to 40 inches: bedrock

### Properties and qualities

*Slope:* 8 to 15 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 20 to 41 inches to lithic bedrock

*Drainage class:* Well drained

*Runoff class:* High

*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 4.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* B

*Ecological site:* F144AY034CT - Well Drained Till Uplands

*Hydric soil rating:* No

## Description of Montauk, Very Stony

### Setting

*Landform:* Hills, recessional moraines, ground moraines, drumlins

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Parent material:* Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material

*A - 2 to 6 inches:* fine sandy loam

*Bw1 - 6 to 28 inches:* fine sandy loam

*Bw2 - 28 to 36 inches:* sandy loam

*2Cd - 36 to 74 inches:* gravelly loamy sand

### Properties and qualities

*Slope:* 8 to 15 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 20 to 43 inches to densic material

*Drainage class:* Well drained

*Runoff class:* Medium

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 1.42 in/hr)

*Depth to water table:* About 18 to 37 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 5.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified



## Custom Soil Resource Report

*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C  
*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands  
*Hydric soil rating:* No

### Description of Hollis, Very Stony

#### Setting

*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

#### Typical profile

*O<sub>i</sub> - 0 to 2 inches:* slightly decomposed plant material  
*A - 2 to 7 inches:* gravelly fine sandy loam  
*B<sub>w</sub> - 7 to 16 inches:* gravelly fine sandy loam  
*2R - 16 to 26 inches:* bedrock

#### Properties and qualities

*Slope:* 8 to 15 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 8 to 23 inches to lithic bedrock  
*Drainage class:* Somewhat excessively drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Very low (0.00 to 0.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* D  
*Ecological site:* F144AY033MA - Shallow Dry Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### Ridgebury, very stony

*Percent of map unit:* 6 percent  
*Landform:* Depressions, ground moraines, hills, drainageways  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Head slope, base slope  
*Down-slope shape:* Concave, linear  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

#### Canton, very stony

*Percent of map unit:* 5 percent  
*Landform:* Moraines, hills, ridges



## Custom Soil Resource Report

*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

### **Rock outcrop**

*Percent of map unit:* 5 percent  
*Landform:* Ridges, hills  
*Hydric soil rating:* No

### **Scituate, very stony**

*Percent of map unit:* 4 percent  
*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Summit, backslope, footslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

## **250D—Chatfield-Montauk-Hollis complex, 15 to 35 percent slopes, very rocky**

### **Map Unit Setting**

*National map unit symbol:* 2xfdw  
*Elevation:* 200 to 1,310 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Chatfield, very stony, and similar soils:* 35 percent  
*Montauk, very stony, and similar soils:* 25 percent  
*Hollis, very stony, and similar soils:* 20 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Chatfield, Very Stony**

#### **Setting**

*Landform:* Ridges, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist



## Custom Soil Resource Report

### Typical profile

*Oi - 0 to 1 inches:* slightly decomposed plant material  
*A - 1 to 2 inches:* fine sandy loam  
*Bw - 2 to 30 inches:* gravelly fine sandy loam  
*2R - 30 to 40 inches:* bedrock

### Properties and qualities

*Slope:* 15 to 35 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 41 inches to lithic bedrock  
*Drainage class:* Well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* B  
*Ecological site:* F144AY034CT - Well Drained Till Uplands  
*Hydric soil rating:* No

## Description of Montauk, Very Stony

### Setting

*Landform:* Hills, recessional moraines, ground moraines, drumlins  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Parent material:* Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material  
*A - 2 to 6 inches:* fine sandy loam  
*Bw1 - 6 to 28 inches:* fine sandy loam  
*Bw2 - 28 to 36 inches:* sandy loam  
*2Cd - 36 to 74 inches:* gravelly loamy sand

### Properties and qualities

*Slope:* 15 to 35 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 43 inches to densic material  
*Drainage class:* Well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately high (0.00 to 1.42 in/hr)  
*Depth to water table:* About 18 to 37 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None



## Custom Soil Resource Report

*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 5.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* C  
*Ecological site:* F144AY007CT - Well Drained Dense Till Uplands  
*Hydric soil rating:* No

### Description of Hollis, Very Stony

#### Setting

*Landform:* Hills, ridges  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Nose slope, side slope, crest  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear, convex  
*Parent material:* Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

#### Typical profile

*O<sub>i</sub> - 0 to 2 inches:* slightly decomposed plant material  
*A - 2 to 7 inches:* gravelly fine sandy loam  
*B<sub>w</sub> - 7 to 16 inches:* gravelly fine sandy loam  
*2R - 16 to 26 inches:* bedrock

#### Properties and qualities

*Slope:* 15 to 35 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 8 to 23 inches to lithic bedrock  
*Drainage class:* Somewhat excessively drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Very low (0.00 to 0.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* D  
*Ecological site:* F144AY033MA - Shallow Dry Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### Scituate, very stony

*Percent of map unit:* 5 percent  
*Landform:* Hills, drumlins, ground moraines  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Side slope  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex



## Custom Soil Resource Report

*Hydric soil rating:* No

### **Walpole, very stony**

*Percent of map unit:* 5 percent

*Landform:* Outwash plains, depressions, outwash terraces, deltas, depressions

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

### **Canton, very stony**

*Percent of map unit:* 5 percent

*Landform:* Moraines, hills, ridges

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Side slope

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Hydric soil rating:* No

### **Rock outcrop**

*Percent of map unit:* 5 percent

*Landform:* Ridges, hills

*Hydric soil rating:* No

## **300B—Udipsamments, 0 to 6 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 23g13

*Elevation:* 200 to 2,940 feet

*Mean annual precipitation:* 40 to 50 inches

*Mean annual air temperature:* 37 to 55 degrees F

*Frost-free period:* 90 to 200 days

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Udipsamments and similar soils:* 90 percent

*Minor components:* 10 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Udipsamments**

#### **Setting**

*Landform:* Terraces

*Parent material:* Outwash

#### **Typical profile**

*H1 - 0 to 1 inches:* loamy sand

*H2 - 1 to 65 inches:* gravelly sand



## Custom Soil Resource Report

### Properties and qualities

*Slope:* 0 to 6 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Excessively drained

*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (6.00 to 20.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Very low (about 2.4 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydrologic Soil Group:* A

*Ecological site:* F144BY601ME - Dry Sand

*Hydric soil rating:* No

### Minor Components

#### Adams

*Percent of map unit:* 3 percent

*Landform:* Outwash terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Champlain

*Percent of map unit:* 2 percent

*Landform:* Terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Windsor

*Percent of map unit:* 2 percent

*Landform:* Terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Hinckley

*Percent of map unit:* 1 percent

*Landform:* Terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Boscawen

*Percent of map unit:* 1 percent

*Landform:* Terraces

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Colton

*Percent of map unit:* 1 percent



## Custom Soil Resource Report

*Landform:* Terraces  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

### 315A—Mashpee sand 0 to 5 percent slopes

#### Map Unit Setting

*National map unit symbol:* 21pfq  
*Elevation:* 200 to 1,000 feet  
*Mean annual precipitation:* 40 to 50 inches  
*Mean annual air temperature:* 45 to 52 degrees F  
*Frost-free period:* 100 to 160 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Mashpee and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Mashpee

##### Setting

*Landform:* Depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Parent material:* Sandy outwash

##### Typical profile

*Oi - 0 to 3 inches:* mucky peat  
*Oe - 3 to 6 inches:* moderately decomposed plant material  
*H1 - 6 to 8 inches:* sand  
*H2 - 8 to 11 inches:* sand  
*H3 - 11 to 65 inches:* sand

##### Properties and qualities

*Slope:* 0 to 5 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Negligible  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.20 to 6.00 in/hr)  
*Depth to water table:* About 6 to 18 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 5.4 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 4w



## Custom Soil Resource Report

*Hydrologic Soil Group: A/D*  
*Ecological site: F144AY028MA - Wet Outwash*  
*Hydric soil rating: Yes*

### Minor Components

#### Scarboro

*Percent of map unit: 5 percent*  
*Landform: Depressions*  
*Down-slope shape: Concave*  
*Across-slope shape: Concave*  
*Hydric soil rating: Yes*

#### Scituate

*Percent of map unit: 5 percent*  
*Landform: Hillslopes*  
*Down-slope shape: Linear*  
*Across-slope shape: Linear*  
*Hydric soil rating: No*

#### Timakwa

*Percent of map unit: 5 percent*  
*Landform: Bogs*  
*Down-slope shape: Concave*  
*Across-slope shape: Concave*  
*Hydric soil rating: Yes*

#### Deerfield

*Percent of map unit: 5 percent*  
*Landform: Terraces*  
*Down-slope shape: Linear*  
*Across-slope shape: Linear*  
*Hydric soil rating: No*

## 393A—Swansea mucky peat, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol: 2w68x*  
*Elevation: 0 to 950 feet*  
*Mean annual precipitation: 36 to 71 inches*  
*Mean annual air temperature: 39 to 55 degrees F*  
*Frost-free period: 145 to 240 days*  
*Farmland classification: Not prime farmland*

### Map Unit Composition

*Swansea and similar soils: 83 percent*  
*Minor components: 17 percent*  
*Estimates are based on observations, descriptions, and transects of the mapunit.*



## Description of Swansea

### Setting

*Landform:* Marshes, depressions, kettles, bogs, swamps

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Parent material:* Moderately decomposed organic material over sandy and gravelly glaciofluvial deposits

### Typical profile

*Oe1 - 0 to 12 inches:* mucky peat

*Oe2 - 12 to 25 inches:* mucky peat

*Cg - 25 to 79 inches:* sand

### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Very poorly drained

*Runoff class:* Negligible

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.17 in/hr)

*Depth to water table:* About 0 to 6 inches

*Frequency of flooding:* None

*Frequency of ponding:* Frequent

*Available water supply, 0 to 60 inches:* High (about 11.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8

*Hydrologic Soil Group:* B/D

*Ecological site:* F144AY043MA - Acidic Organic Wetlands

*Hydric soil rating:* Yes

## Minor Components

### Freetown

*Percent of map unit:* 7 percent

*Landform:* Depressions, kettles, marshes, bogs, swamps

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

### Scarboro

*Percent of map unit:* 5 percent

*Landform:* Outwash deltas, depressions, outwash terraces, drainageways

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

### Walpole

*Percent of map unit:* 5 percent

*Landform:* Depressions, outwash terraces, drainageways, outwash deltas

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes



## **425A—Scarboro-Ridgebury complex, 0 to 3 percent slopes, rocky**

### **Map Unit Setting**

*National map unit symbol:* 2xffz  
*Elevation:* 280 to 960 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 145 to 240 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Scarboro and similar soils:* 60 percent  
*Ridgebury, very stony, and similar soils:* 30 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Scarboro**

#### **Setting**

*Landform:* Drainageways, depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Parent material:* Sandy glaciofluvial deposits derived from schist and/or gneiss and/or granite

#### **Typical profile**

*Oa - 0 to 8 inches:* muck  
*A - 8 to 14 inches:* mucky fine sandy loam  
*Cg1 - 14 to 22 inches:* sand  
*Cg2 - 22 to 65 inches:* gravelly sand

#### **Properties and qualities**

*Slope:* 0 to 1 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Very poorly drained  
*Runoff class:* Negligible  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (1.42 to 14.17 in/hr)  
*Depth to water table:* About 0 to 2 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* Frequent  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Moderate (about 6.1 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 5w  
*Hydrologic Soil Group:* A/D  
*Ecological site:* F144AY031MA - Very Wet Outwash  
*Hydric soil rating:* Yes



## Description of Ridgebury, Very Stony

### Setting

*Landform:* Drumlins, hills, drainageways, depressions, ground moraines  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Head slope, base slope  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material  
*A - 1 to 6 inches:* fine sandy loam  
*Bw - 6 to 10 inches:* sandy loam  
*Bg - 10 to 19 inches:* gravelly sandy loam  
*Cd - 19 to 66 inches:* gravelly sandy loam

### Properties and qualities

*Slope:* 0 to 3 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 15 to 35 inches to densic material  
*Drainage class:* Poorly drained  
*Runoff class:* Very high  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)  
*Depth to water table:* About 0 to 6 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 3.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* D  
*Ecological site:* F144AY009CT - Wet Till Depressions  
*Hydric soil rating:* Yes

## Minor Components

### Freetown

*Percent of map unit:* 5 percent  
*Landform:* Depressions, kettles, marshes, bogs, swamps  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

### Scituate, very stony

*Percent of map unit:* 4 percent  
*Landform:* Ground moraines, hills, drumlins  
*Landform position (two-dimensional):* Summit, backslope, footslope  
*Landform position (three-dimensional):* Side slope, crest  
*Down-slope shape:* Convex, linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Rock outcrop**

*Percent of map unit:* 1 percent  
*Landform:* Ridges, hills  
*Hydric soil rating:* No

**449B—Scituate fine sandy loam, 3 to 8 percent slopes, very stony**

**Map Unit Setting**

*National map unit symbol:* 23blh  
*Elevation:* 200 to 790 feet  
*Mean annual precipitation:* 40 to 50 inches  
*Mean annual air temperature:* 45 to 52 degrees F  
*Frost-free period:* 100 to 160 days  
*Farmland classification:* Farmland of local importance

**Map Unit Composition**

*Scituate and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Scituate**

**Setting**

*Landform:* Hillslopes  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Basal melt-out till derived from granite, gneiss, or schist

**Typical profile**

*Oi - 0 to 1 inches:* slightly decomposed plant material  
*H1 - 1 to 4 inches:* fine sandy loam  
*H2 - 4 to 25 inches:* fine sandy loam  
*H3 - 25 to 65 inches:* gravelly loamy fine sand

**Properties and qualities**

*Slope:* 3 to 8 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 34 inches to densic material  
*Drainage class:* Moderately well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* About 18 to 36 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 3.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified



Custom Soil Resource Report

*Land capability classification (nonirrigated): 6s*  
*Hydrologic Soil Group: C*  
*Ecological site: F144AY037MA - Moist Dense Till Uplands*  
*Hydric soil rating: No*

**Minor Components**

**Newfields**

*Percent of map unit: 5 percent*  
*Landform: Hillslopes*  
*Hydric soil rating: No*

**Woodbridge**

*Percent of map unit: 3 percent*  
*Landform: Hillslopes*  
*Down-slope shape: Linear*  
*Across-slope shape: Linear*  
*Hydric soil rating: No*

**Montauk**

*Percent of map unit: 3 percent*  
*Landform: Hills*  
*Down-slope shape: Linear*  
*Across-slope shape: Linear*  
*Hydric soil rating: No*

**Ridgebury**

*Percent of map unit: 3 percent*  
*Landform: Ground moraines*  
*Down-slope shape: Linear*  
*Across-slope shape: Convex*  
*Hydric soil rating: Yes*

**Whitman**

*Percent of map unit: 3 percent*  
*Landform: Depressions*  
*Down-slope shape: Concave*  
*Across-slope shape: Concave*  
*Hydric soil rating: Yes*

**Canton**

*Percent of map unit: 3 percent*  
*Landform: Hillslopes*  
*Down-slope shape: Linear*  
*Across-slope shape: Linear*  
*Hydric soil rating: No*

**449C—Scituate fine sandy loam, 8 to 15 percent slopes, very stony**

**Map Unit Setting**

*National map unit symbol: 23blj*  
*Elevation: 200 to 790 feet*

## Custom Soil Resource Report

*Mean annual precipitation:* 40 to 50 inches  
*Mean annual air temperature:* 45 to 52 degrees F  
*Frost-free period:* 100 to 160 days  
*Farmland classification:* Farmland of local importance

### Map Unit Composition

*Scituate and similar soils:* 80 percent  
*Minor components:* 20 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Scituate

#### Setting

*Landform:* Hillslopes  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Basal melt-out till derived from granite, gneiss, or schist

#### Typical profile

*O<sub>i</sub> - 0 to 1 inches:* slightly decomposed plant material  
*H<sub>1</sub> - 1 to 4 inches:* fine sandy loam  
*H<sub>2</sub> - 4 to 25 inches:* fine sandy loam  
*H<sub>3</sub> - 25 to 65 inches:* gravelly loamy fine sand

#### Properties and qualities

*Slope:* 8 to 15 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* 20 to 34 inches to densic material  
*Drainage class:* Moderately well drained  
*Runoff class:* High  
*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* About 18 to 36 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 3.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C  
*Ecological site:* F144AY037MA - Moist Dense Till Uplands  
*Hydric soil rating:* No

### Minor Components

#### Newfields

*Percent of map unit:* 5 percent  
*Landform:* Hillslopes  
*Hydric soil rating:* No

#### Woodbridge

*Percent of map unit:* 3 percent  
*Landform:* Hillslopes  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No



**Canton**

*Percent of map unit:* 3 percent  
*Landform:* Hillslopes  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**Ridgebury**

*Percent of map unit:* 3 percent  
*Landform:* Ground moraines  
*Down-slope shape:* Linear  
*Across-slope shape:* Convex  
*Hydric soil rating:* Yes

**Whitman**

*Percent of map unit:* 3 percent  
*Landform:* Depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

**Montauk**

*Percent of map unit:* 3 percent  
*Landform:* Hills  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

**657B—Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony**

**Map Unit Setting**

*National map unit symbol:* 2xffx  
*Elevation:* 40 to 1,320 feet  
*Mean annual precipitation:* 36 to 71 inches  
*Mean annual air temperature:* 39 to 55 degrees F  
*Frost-free period:* 140 to 240 days  
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Ridgebury, very stony, and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Ridgebury, Very Stony**

**Setting**

*Landform:* Drumlins, depressions, ground moraines, hills, drainageways  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Head slope, base slope  
*Down-slope shape:* Concave

## Custom Soil Resource Report

*Across-slope shape:* Concave

*Parent material:* Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 6 inches:* fine sandy loam

*Bw - 6 to 10 inches:* sandy loam

*Bg - 10 to 19 inches:* gravelly sandy loam

*Cd - 19 to 66 inches:* gravelly sandy loam

### Properties and qualities

*Slope:* 3 to 8 percent

*Surface area covered with cobbles, stones or boulders:* 1.6 percent

*Depth to restrictive feature:* 15 to 35 inches to densic material

*Drainage class:* Poorly drained

*Runoff class:* Very high

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.14 in/hr)

*Depth to water table:* About 0 to 6 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Low (about 3.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 4w

*Hydrologic Soil Group:* D

*Ecological site:* F144AY009CT - Wet Till Depressions

*Hydric soil rating:* Yes

### Minor Components

#### Woodbridge, very stony

*Percent of map unit:* 7 percent

*Landform:* Ground moraines, hills, drumlins

*Landform position (two-dimensional):* Summit, backslope, footslope

*Landform position (three-dimensional):* Side slope, crest

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Hydric soil rating:* No

#### Whitman, very stony

*Percent of map unit:* 4 percent

*Landform:* Drumlins, ground moraines, hills, drainageways, depressions

*Landform position (two-dimensional):* Toeslope

*Landform position (three-dimensional):* Base slope

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

#### Scituate, very stony

*Percent of map unit:* 2 percent

*Landform:* Ground moraines, hills, drumlins

*Landform position (two-dimensional):* Summit, backslope, footslope

*Landform position (three-dimensional):* Side slope, crest



## Custom Soil Resource Report

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex

*Hydric soil rating:* No

### **Walpole**

*Percent of map unit:* 2 percent

*Landform:* Drainageways, outwash terraces, depressions

*Landform position (three-dimensional):* Tread

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

## **699B—Urban land, 0 to 8 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 9dmm

*Elevation:* 200 to 1,970 feet

*Mean annual precipitation:* 40 to 50 inches

*Mean annual air temperature:* 37 to 52 degrees F

*Frost-free period:* 90 to 160 days

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Urban land:* 90 percent

*Minor components:* 10 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Urban Land**

#### **Typical profile**

*H1 - 0 to 6 inches:* variable

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydric soil rating:* Unranked

### **Minor Components**

#### **Udipsamments**

*Percent of map unit:* 10 percent

*Landform:* Terraces

*Hydric soil rating:* No

## **W—Water**

### **Map Unit Setting**

*National map unit symbol:* wm74

*Elevation:* 200 to 2,610 feet

*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Water:* 100 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*



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## **Appendix E – Photo Log**

**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 1: Looking at proposed access and work pad location from Elm Street for Q171 Structure 139 (left).



Photograph No. 2: Looking at proposed access and work pad location from Elm Street for C196 Structure 143.  
04.0191410.18 GZA GeoEnvironmental, Inc.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 3: Looking at proposed access and work pad location for C196 Structure 142.



Photograph No. 4: Looking at proposed access and work area for C196 Structure 141.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 5: Looking at proposed access and work pad location for Q171 Structure 137.



Photograph No. 6: Looking at proposed access and work pad location adjacent to Q171 Structure 136.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 7: Looking at proposed access and work pad location from Locus Hill Road for C196 Structure 136 (right).



Photograph No. 8: Looking at proposed access and work pad location for C196 Structure 137.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 9: Looking at proposed access and work pad location from Locus Hill Road to Q171 Structure 130.



Photograph No. 10: Looking at proposed access and work pad location from Locus Hill Road for C196 Structure 135.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 11: Looking at proposed access for C196 Structure 134.



Photograph No. 12: Looking at proposed access and work pad location for C196 Structure 133.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 13: Looking at proposed access for Q171 Structure 128.



Photograph No. 14: Looking at proposed access and work pad location for C196 Structure 132.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 15: Looking at proposed access and work pad location for Q171 Structure 126.



Photograph No. 16: Looking at proposed access and work pad location for C196 Structure 130.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 17: Looking at proposed access and work pad location for C196 Structure 128 (right).



Photograph No. 18: Looking at proposed access and work pad location for C196 Structure 127.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 19: Looking at proposed work pad location for Q171 Structure 122.



Photograph No. 20: Looking at proposed access and work pad location for C196 Structure 126.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 21: Looking at proposed access and work pad location for C196 Structure 125.



Photograph No. 22: Looking at proposed access and work pad location for Q171 Structure 120.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 23: Looking at proposed access and work pad location from Kimberly Lane for Q171 Structure 119.



Photograph No. 24: Looking at proposed access and work pad location for Q171 Structure 118.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 25: Looking at proposed access and work pad location for Q171 Structure 117.



Photograph No. 26: Looking at proposed access and work pad location for Q171 Structure 112.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 27: Looking at proposed access and work pad location for Q171 Structure 111.



Photograph No. 28: Looking at proposed access and work pad location for Q171 Structure 110.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 29: Looking at proposed access and work pad location for Q171 Structure 109.



Photograph No. 30: Looking at proposed access and work pad location from Black Brook Road for Q171 Structure 104.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 31: Looking at proposed access and work pad location for C196 Structure 96.



Photograph No. 32: Looking at proposed access to C196 Structure 95.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 33: Looking at proposed access from Montelona Road to Q171 Structure 92.



Photograph No. 34: Looking at proposed access and work pad location from Montelona Road for C196 Structure 94.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 35: Looking at proposed access and work pad location for Q171 Structure 91.



Photograph No. 36: Looking at proposed access to C196 Structure 93.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 37: Looking at proposed access and work pad location for Q171 Structure 90.



Photograph No. 38: Looking at proposed access for C196 Structure 92.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 39: Looking at proposed access and work pad location for Q171 Structure 89.



Photograph No. 40: Looking at proposed access and work pad location for C196 Structure 91.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 41: Looking at proposed access to C196 Structure 90.



Photograph No. 42: Looking at proposed access and work pad location for Q171 Structure 88.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 43: Looking at proposed access and work pad location adjacent to C196 Structure 89.



Photograph No. 44: Looking at proposed access and work pad location for Q171 Structure 87.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 45: Looking at proposed access and work pad location for C196 Structure 88.



Photograph No. 46: Looking at proposed access and work pad location for Q171 Structure 86.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 47: Looking at proposed access and work pad location for Q171 Structure 79.



Photograph No. 48: Looking at proposed access and work pad location for Q171 Structure 78.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 49: Looking at proposed access and work pad location for Q171 Structure 78.



Photograph No. 50: Looking at proposed access and work pad location for C196 Structure 74.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 51: Looking at proposed access and work pad location for Q171 Structure 73.



Photograph No. 52: Looking at proposed access and work pad location for C196 Structure 73.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 53: Looking at proposed access and work pad location for C196 Structure 72.



Photograph No. 54: Looking at proposed access and work pad location for C196 Structure 71.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 55: Looking at proposed access and work pad location for C196 Structure 70.



Photograph No. 56: Looking at proposed access and work pad location for C196 Structure 69.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 57: Looking at proposed access and work pad location for Q171 Structure 68



Photograph No. 58: Looking at proposed access and work pad location for C196 Structure 68 (center).



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 59: Looking at proposed access and work pad location for Q171 Structure 67.



Photograph No. 60: Looking at proposed access and work pad location for C196 Structure 67.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 61: Looking at proposed access and work pad location for Q171 Structure 66.



Photograph No. 62: Looking at proposed access and work pad location for C196 Structure 66.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 63: Looking at proposed access and work pad location for C196 Structure 65.



Photograph No. 64: Looking at proposed access and work pad location for Q171 Structure 63.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 65: Looking at proposed access and work pad location for C196 Structure 64 (center).



Photograph No. 66: Looking at proposed access and work pad location for C196 Structure 63.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 67: Looking at proposed access and work pad location for C196 Structure 49.



Photograph No. 68: Looking at proposed access and work pad location for C196 Structure 48.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 69: Looking at proposed access and work pad location for C196 Structure 47.



Photograph No. 70: Looking at proposed access and work pad location for C196 Structure 46.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 71: Looking at proposed access and work pad location for Q171 Structure 44.



Photograph No. 72: Looking at proposed access and work pad location for Q171 Structure 43.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 73: Looking at proposed access and work pad location for Q171 Structure 39.



Photograph No. 74: Looking at proposed access and work pad location for C196 Structure 38.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 75: Looking at proposed access and work pad location for C196 Structure 37.



Photograph No. 76: Looking at proposed access and work pad location for Q171 Structure 34.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 77: Looking at proposed access and work pad location for Q171 Structure 33.



Photograph No. 78: Looking at proposed access and work pad location for Q171 Structure 32.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 79: Looking at proposed access and work pad location for C196 Structure 22.



Photograph No. 80: Looking at proposed access and work pad location for C196 Structure 21.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 81: Looking at proposed access and work pad location for C196 Structure 20.



Photograph No. 82: Looking at proposed access and work pad location for Q171 Structure 5.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 83: Looking at proposed access and work pad location for Q171 Structure 4.



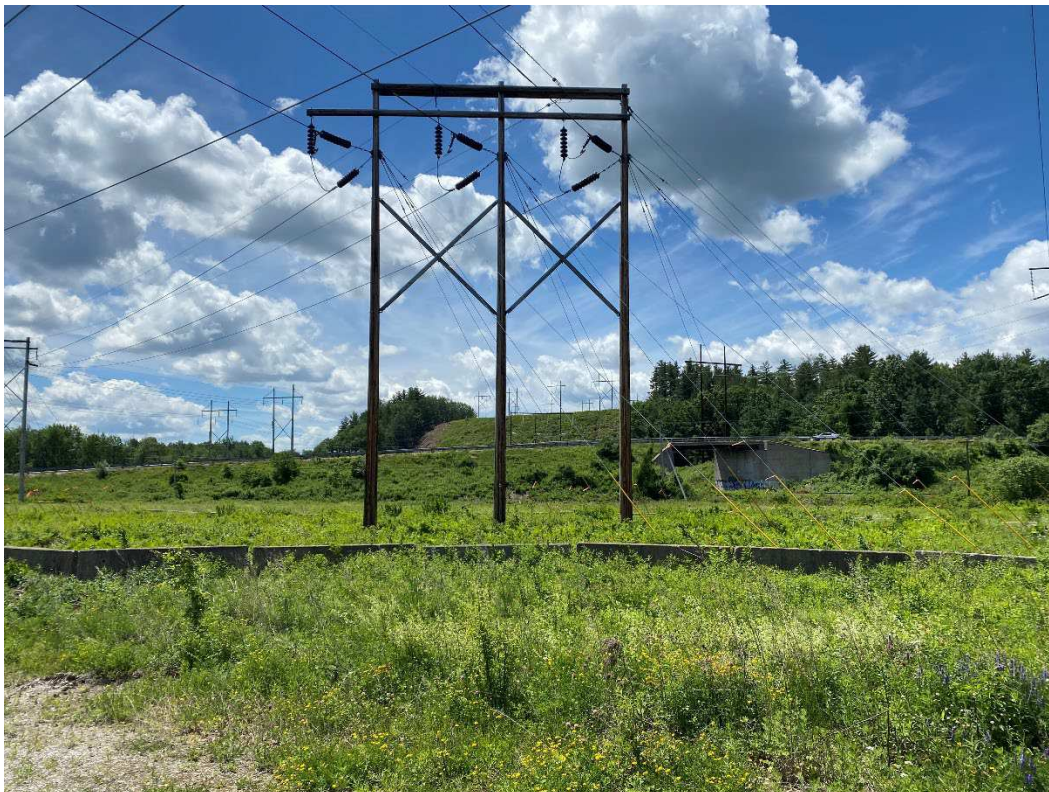
Photograph No. 84: Looking at proposed access and work pad location for C196 Structure 4.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 85: Looking at proposed access and work pad location for Q171 Structure 3.



Photograph No. 86: Looking at proposed access and work pad location for C196 Structure 2.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 87: Looking at proposed access and work pad location for C196 Structure 1A.



Photograph No. 88: Looking at proposed access and work pad location for Q171 Structure 1.



**PHOTO LOG**  
**C196 & Q171 Transmission Line OPGW and Structure Replacement Project**  
**Goffstown, Dunbarton, and Bow, New Hampshire**  
**Photos Taken: June 8 & 10, 2022**



Photograph No. 89: Looking at proposed access and work pad location for C196 Structure 1.





## **Appendix F – Waiver Request**



## Alteration of Terrain Waiver Request

RSA/Rule: RSA 485-A:17, Env – WQ 1500

Water Division / Alteration of Terrain Bureau / Land resources Management

29 Hazen Drive, PO Box 95

Concord, New Hampshire 03302-0095

A. PROJECT INFORMATION		
C196 and Q171 Transmission Line Structure Replacement Project <b>Project Name</b>		
Existing C196 and Q171 Transmission Line Right-of-Way <b>Street Address</b>		
Goffstown, Dunbarton, and Bow <b>City/Town</b>	Multiple <b>Zip Code</b>	
Multiple – see attached <b>Tax Map/Lot Number</b>		
B. APPLICANT/OWNER INFORMATION		
Ashley <b>First Name</b>	Friend <b>Last Name</b>	
Eversource Energy <b>Organization</b>		
13 Legends Drive <b>Street Address</b>		
Hooksett <b>City/Town</b>	New Hampshire <b>State</b>	03106 <b>Zip Code</b>
Ashley.friend@eversource.com <b>Email</b>	603-634-2992 <b>Telephone Number</b>	
C. APPLICANT/OWNER AGENT INFORMATION		
Lindsey <b>First Name</b>	White <b>Last Name</b>	
GZA GeoEnvironmental, Inc. <b>Organization</b>		
5 Commerce Park North, Suite 201 <b>Street Address</b>		
Bedford <b>City/Town</b>	New Hampshire <b>State</b>	03110 <b>Zip Code</b>
Lindsey.white@gza.com <b>Email</b>	603-232-8753 <b>Telephone Number</b>	



<b>D. WAIVER REQUESTS</b>	
<p>Env-Wq 1504.09</p> <p><b>Rule Section Waiver Request</b></p>	<p>Stormwater Drainage Report; Drainage Area Plans; Hydrologic Soil Group Plans</p> <p><b>Name of Rule</b></p>
<p><b>Reason for Waiver Request</b></p> <p>Eversource is requesting a waiver for preparing a Stormwater Drainage Report, Drainage Area Plans and Hydrologic Soil Group Plans for proposed access improvements and work pad grading associated with maintenance of the existing C196 and Q171 Transmission Line structures. The proposed access and work pad improvements for continued transmission line maintenance work will not result in new impervious surfaces. As a result, stormwater treatment practices are not proposed.</p>	
<p><b>Waiver Timeline</b></p> <p>Permanent</p>	
<p><b>Proposed Alternative</b></p> <p>The proposed access and work pad improvements will not result in new impervious surface. Therefore, there is no proposed alternative to substitute the requirements of Env-Wq 1504.09.</p>	
<p><b>Compliance with Env- WQ 1509.04</b></p> <p>The project proposes to improve access routes and work pads around utility structures for the purpose of maintaining existing utility infrastructure. This project is necessary in order to maintain the safety and reliability of the electrical infrastructure. Access and work pad improvements will be completed using stone and gravel, and therefore stormwater drainage should not be affected by the proposed project. In addition, it is not anticipated that stormwater drainage area plans would show significant differences between existing and proposed conditions. An NRCS Web Soil Survey report was generated to show general soil information within the project area. Since there is no new impervious surface area proposed and stormwater drainage is not anticipated to be affected by the proposed project, it is not anticipated that soils will be significantly impacted by the project.</p> <p>Best Management Practices will be utilized to protect wetlands from erosion, sedimentation, or other environmental degradation. In addition, gravel work pads will be coated with seed and mulch to allow vegetation growth on the surface, further minimizing and preventing erosion and sedimentation. As a result, Eversource respectfully requests that a Stormwater Drainage Report, Drainage Area Plans, and Hydrologic Soil Group Plans be waived for the purposes of the proposed utility line maintenance project.</p>	



**E. SIGNATURES**



Applicant/Owner, **Ashley Friend,**  
**Eversource Energy**

7/7/2022

Date



Applicant/Owner Agent, **Lindsey White,**  
**GZA GeoEnvironmental, Inc.**

7/7/2022

Date



## Alteration of Terrain Waiver Request

RSA/Rule: RSA 485-A:17, Env – WQ 1500


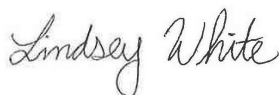
Water Division / Alteration of Terrain Bureau / Land resources Management  
29 Hazen Drive, PO Box 95  
Concord, New Hampshire 03302-0095

A. PROJECT INFORMATION		
C196 and Q171 Transmission Line Structure Replacement Project <b>Project Name</b>		
Existing C196 and Q171 Transmission Line Right-of-Way <b>Street Address</b>		
Goffstown, Dunbarton, and Bow <b>City/Town</b>	Multiple <b>Zip Code</b>	
Multiple – see attached plans <b>Tax Map/Lot Number</b>		
B. APPLICANT/OWNER INFORMATION		
Ashley <b>First Name</b>	Friend <b>Last Name</b>	
Eversource Energy <b>Organization</b>		
13 Legends Drive <b>Street Address</b>		
Hooksett <b>City/Town</b>	New Hampshire <b>State</b>	03106 <b>Zip Code</b>
Ashley.friend@eversource.com <b>Email</b>	603-634-2992 <b>Telephone Number</b>	
C. APPLICANT/OWNER AGENT INFORMATION		
Lindsey <b>First Name</b>	White <b>Last Name</b>	
GZA GeoEnvironmental, Inc. <b>Organization</b>		
5 Commerce Park North, Suite 201 <b>Street Address</b>		
Bedford <b>City/Town</b>	New Hampshire <b>State</b>	03110 <b>Zip Code</b>
<a href="mailto:Lindsey.white@gza.com">Lindsey.white@gza.com</a> <b>Email</b>	603-770-5752 <b>Telephone Number</b>	



<b>D. WAIVER REQUESTS</b>	
<p>Env-Wq 1503.12 (d)(1&amp;2)</p> <p><b>Rule Section Waiver Request</b></p>	<p>Measurement of Contiguous Area Disturbed; Inclusion in Plans</p> <p><b>Name of Rule</b></p>
<p><b>Reason for Waiver Request</b></p> <p>Eversource is requesting a waiver for including past terrain disturbance in the measurement of contiguous disturbed area included in this C196 and Q171 Line AOT application. Future disturbance, beyond the scope of C196 and Q171 line structure replacement project described in this application is not known at this time.</p>	
<p><b>Waiver Timeline</b></p> <p>Permanent</p>	
<p><b>Proposed Alternative</b></p> <p>Any existing trails or access roads that may have been created within the last 10 years will be utilized and/or improved as part of this project and have been included in the current calculations within this application. Future structure maintenance may occur within the C196 and Q171 ROWs. Eversource, through consultation with NHDES, will evaluate whether future terrain disturbances within the C196 and Q171 ROWs will be permitted with an amendment to this application or subject to a new, separate application.</p>	
<p><b>Compliance with Env-Wq 1503.12 (d)(1&amp;2)</b></p> <p>The project proposes to improve access routes and work pads around utility structures for the purpose of maintaining existing utility infrastructure. This project is necessary to maintain the safety and reliability of the electrical infrastructure. Proposed disturbances anticipated for 2022 and 2023 within the C196 and Q171 ROWs are included in this application and shown on Figures 3 and 4. Project disturbances included in this application and subsequent permit approvals will be considered if future structure maintenance is proposed within the C196 and Q171 ROWs. Eversource respectfully requests a waiver from including past disturbance in this application. Future disturbances within the C196 and Q171 ROWs will be evaluated and discussed with NHDES and permit amendments or new permit applications will be submitted, if necessary.</p>	

**E. SIGNATURES**

 <hr style="border: 0; border-top: 1px solid black; margin-top: 5px;"/>	<p style="text-align: center;"><u>7/7/2022</u></p> <hr style="border: 0; border-top: 1px solid black; margin-top: 5px;"/>
<p>Applicant/Owner, <b>Ashley Friend,</b> <b>Eversource Energy</b></p>	<p>Date</p>
 <hr style="border: 0; border-top: 1px solid black; margin-top: 5px;"/>	<p style="text-align: center;"><u>7/7/2022</u></p> <hr style="border: 0; border-top: 1px solid black; margin-top: 5px;"/>
<p>Applicant/Owner Agent, <b>Lindsey White,</b> <b>GZA GeoEnvironmental, Inc.</b></p>	<p>Date</p>



## Alteration of Terrain Waiver Request

RSA/Rule: RSA 485-A:17, Env – WQ 1500

Water Division / Alteration of Terrain Bureau / Land resources Management  
29 Hazen Drive, PO Box 95  
Concord, New Hampshire 03302-0095

A. PROJECT INFORMATION		
C196 and Q171 Transmission Line Structure Replacement Project <b>Project Name</b>		
Existing C196 and Q171 Transmission Line Right-of-Way <b>Street Address</b>		
Goffstown, Dunbarton, and Bow <b>City/Town</b>	Multiple <b>Zip Code</b>	
Multiple – see attached plans <b>Tax Map/Lot Number</b>		
B. APPLICANT/OWNER INFORMATION		
Ashley <b>First Name</b>	Friend <b>Last Name</b>	
Eversource Energy <b>Organization</b>		
13 Legends Drive <b>Street Address</b>		
Hooksett <b>City/Town</b>	New Hampshire <b>State</b>	03106 <b>Zip Code</b>
Ashley.friend@eversource.com <b>Email</b>	603-634-2992 <b>Telephone Number</b>	
C. APPLICANT/OWNER AGENT INFORMATION		
Lindsey <b>First Name</b>	White <b>Last Name</b>	
GZA GeoEnvironmental, Inc. <b>Organization</b>		
5 Commerce Park North, Suite 201 <b>Street Address</b>		
Bedford <b>City/Town</b>	New Hampshire <b>State</b>	03310 <b>Zip Code</b>
Lindsey.white@gza.com <b>Email</b>	603-770-5752 <b>Telephone Number</b>	



<b>D. WAIVER REQUESTS</b>	
<p>Env-Wq 1503.21 (d)(6&amp;7)</p> <p><b>Rule Section Waiver Request</b></p>	<p>Notification; Certification</p> <p><b>Name of Rule</b></p>
<p><b>Reason for Waiver Request</b></p> <p>Eversource is requesting a waiver for deviations from the approved plans without applying for an amended permit or a new permit if shifts in the proposed project layout occur. Changes in project layout are frequently identified during construction by Eversource and their contractors and may be necessary to safely perform the work. Access shifts would be limited to the extent necessary for safety, would not impact new resources, and access would remain within the existing and maintained ROW. The need for additional permit applications can impact construction schedules and incur costly delays.</p>	
<p><b>Waiver Timeline</b></p> <p>Permanent</p>	
<p><b>Proposed Alternative</b></p> <p>Allow for the access road centerlines to be relocated during construction, if necessary, up to a distance equal to the approximate width of the ROW (approximately 170-350 feet on the C196 and Q171 Lines). Shifts would not create greater than 5% increase in disturbed area along the individual access segment, which is assumed to be the length of the access road between two work pads/structures.</p> <p>Allow for the center point of the parking area, assumed to be the structure replacement work pads for transmission line projects, to be relocated during construction, if necessary, up to a distance equal to half the approximate width of the ROW (approximately 170-350 feet on the C196 and Q171 Lines). Shifts would not create greater than 5% increase in disturbed area at each work pad.</p> <p>This would allow contractors to avoid steep terrain or other hazardous areas, or areas that may require significant grading or earthwork that may not have been identified during initial constructability reviews. Landowners may also request layout changes be made after project permitting is complete. In most cases this shift is done to reduce the amount of disturbed area.</p>	
<p><b>Compliance with Env-Wq 1503.21 (d)(6&amp;7)</b></p> <p>The project proposes to improve access routes and work pads around utility structures for the purpose of maintaining existing utility infrastructure. This project is necessary to maintain the safety and reliability of the electrical infrastructure. Proposed disturbances shown on Figures 3 and 4 are the result of avoidance and minimization measures and constructability reviews. Layout changes and shifts will be limited to the proposed alternative above. A reduction in disturbed area is often the result. As previously mentioned, access shifts would be limited to the extent necessary to safely perform work. Access routes will remain within the existing and maintained ROW and would not disturb new resources. Best Management Practices will be utilized to protect wetlands from erosion, sedimentation, or other environmental degradation as originally proposed. Eversource respectfully requests a waiver from limiting shifts of the project road centerlines and parking areas to 20 feet.</p>	

<b>E. SIGNATURES</b>
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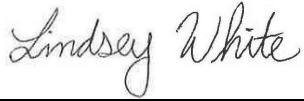
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Applicant/Owner, **Ashley Friend,**  
**Eversource Energy**

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7/7/2022

Date



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Applicant/Owner Agent, **Lindsey White,**  
**GZA GeoEnvironmental, Inc.**

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7/7/2022

Date





**Appendix G – Certified Mail Receipts**  
**[Reserved for DES certified mailing receipts]**

7017 3040 0001 1084 1102

U.S. Postal Service™  
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Certified Mail Fee  
\$ 3.75  
Extra Services & Fees (check box, add fee as appropriate)  
 Return Receipt (hardcopy) \$ 3.05  
 Return Receipt (electronic) \$  
 Certified Mail Restricted Delivery \$  
 Adult Signature Required \$  
 Adult Signature Restricted Delivery \$



Postage  
\$ 9.90  
Total Postage and Fees  
\$ 16.70

Sent To  
Town of Bow  
Street and Apt. No., or PO Box No.  
10 Grandview Road  
City, State, ZIP+4®  
Bow, NH 03304

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 3040 0001 1084 1119

U.S. Postal Service™  
CERTIFIED MAIL® RECEIPT  
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For delivery information, visit our website at [www.usps.com](http://www.usps.com)®.

OFFICIAL USE

Certified Mail Fee  
\$ 3.75  
Extra Services & Fees (check box, add fee as appropriate)  
 Return Receipt (hardcopy) \$ 3.05  
 Return Receipt (electronic) \$  
 Certified Mail Restricted Delivery \$  
 Adult Signature Required \$  
 Adult Signature Restricted Delivery \$



Postage  
\$ 9.90  
Total Postage and Fees  
\$ 16.70

Sent To  
Town of Dunbarton  
Street and Apt. No., or PO Box No.  
101 School St  
City, State, ZIP+4®  
Dunbarton, NH 03046

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 3040 0001 1084 1126

U.S. Postal Service™  
CERTIFIED MAIL® RECEIPT  
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OFFICIAL USE

Certified Mail Fee  
\$ 3.75  
Extra Services & Fees (check box, add fee as appropriate)  
 Return Receipt (hardcopy) \$ 3.05  
 Return Receipt (electronic) \$  
 Certified Mail Restricted Delivery \$  
 Adult Signature Required \$  
 Adult Signature Restricted Delivery \$



Postage  
\$ 9.90  
Total Postage and Fees  
\$ 16.70

Sent To  
Town of Goffstown  
Street and Apt. No., or PO Box No.  
16 Main Street  
City, State, ZIP+4®  
Goffstown, NH 03045

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7017 3040 0001 1084 1133

U.S. Postal Service™  
CERTIFIED MAIL® RECEIPT  
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For delivery information, visit our website at [www.usps.com](http://www.usps.com)®.

OFFICIAL USE

Certified Mail Fee  
\$ 3.75  
Extra Services & Fees (check box, add fee as appropriate)  
 Return Receipt (hardcopy) \$ 3.05  
 Return Receipt (electronic) \$  
 Certified Mail Restricted Delivery \$  
 Adult Signature Required \$  
 Adult Signature Restricted Delivery \$



Postage  
\$ 9.90  
Total Postage and Fees  
\$ 16.70

Sent To  
Piscataquog River LAC  
Street and Apt. No., or PO Box No.  
609 South Main St  
City, State, ZIP+4®  
Manchester, NH 03102

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions





GZA GeoEnvironmental, Inc.

## **Revised Plan Pages**



© 2022 - GZA GeoEnvironmental, Inc. P:\04 Jobs\0191400s\04\_0191410.00 - EE Siting Permitting 2019-2022\04\_0191410.18 - C196 Transmission Line Str. Repl. Project\Figures\C196 Q171 Notesheet 1 10-7.mxd, 8/22/2022, 11:22:12 AM, Sydney, Wicklund

**CONSTRUCTION SEQUENCE:**

1. WETLAND BOUNDARIES TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.
2. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAIL PROVIDED, AS NECESSARY, AND CONSISTENT WITH THE NHDES MARCH 2019 BMP MANUAL FOR UTILITY MAINTENANCE.
3. WETLAND IMPACTS ASSOCIATED WITH WETLAND CROSSINGS ARE REQUIRED FOR ACCESS BETWEEN STRUCTURES WITHIN THE RIGHT OF WAY.
4. ADEQUATE PRECAUTION SHALL BE EXERCISED TO AVOID SPILLAGE OF FUEL OILS, CHEMICALS, OR SIMILAR SUBSTANCES; NO FUELS, LUBRICANTS, CHEMICALS OR SIMILAR SUBSTANCES SHALL BE STORED BENEATH TREES OR IN THE VICINITY OF ANY WETLANDS, RIVER, STREAM OR OTHER BODY OF WATER; OR IN THE VICINITY OF NATURAL OR MAN-MADE CHANNELS LEADING THERETO. NO POWER EQUIPMENT SHALL BE STORED, MAINTAINED, OR FUELED IN ANY AREA ADJACENT TO A WETLAND, RIVER, STREAM OR OTHER BODY OF WATER.
5. REMOVE COMPLETELY ALL CONTAMINATION FROM ANY SPILLAGE OF CHEMICALS OR PETROLEUM PRODUCT WITH COMPLETE REHABILITATION OF THE AFFECTED AREA.
6. ACCESS ROUTES HAVE BEEN SELECTED TO PREVENT DEGRADATION OF THE RIGHT-OF-WAY AND MINIMIZE ENVIRONMENTAL IMPACT. OPERATIONS SHALL BE CONFINED TO THE SPECIFIED ACCESS ROUTES WITHIN THE PROPOSED WETLAND IMPACT AREA. ACCESS ROUTES SHALL NOT EXCEED A 16 FOOT-WIDTH.
7. IMPACT TO VEGETATION WITHIN WETLANDS WILL BE LIMITED TO THE EXTENT NECESSARY TO PLACE THE SWAMP MATS WHERE REQUIRED.
8. LOW GROWING VARIETIES OF VEGETATION ADJACENT TO WETLANDS SHALL BE PRESERVED TO THE EXTENT POSSIBLE. STUMPS AND ROCKS SHALL NOT BE REMOVED, AND THERE SHALL BE NO EXCAVATIONS, FILLS OR GRADING DONE ADJACENT TO WETLANDS, UNLESS MINOR EXCAVATIONS IS NEEDED FOR ACCESS.
9. TIMBER MATS AND PERIMETER CONTROLS WILL BE USED ALONG ACCESS ROUTES AND WORK PADS WITHIN WETLAND AREAS. THESE MATS ARE CONSTRUCTED OF HEAVY TIMBERS OR COMPOSITE MATERIAL, BOLTED TOGETHER, AND ARE PLACED END-TO-END IN THE WETLAND TO SUPPORT HEAVY EQUIPMENT. ALL SWAMP MATS SHALL BE PLACED AND REMOVED SO AS NOT TO CAUSE ANY RUTS, CHANNELS OR DEPRESSIONS, OR OTHERWISE CAUSE ANY UNDUE DISTURBANCE TO WETLANDS.
10. IF TIMBER MAT BMP IS NOT SUFFICIENT DUE TO HIGH WATER, ADDITIONAL BMP'S MAY INCLUDE THE PLACEMENT OF GEOTEXTILE FABRIC, 3"-4" STONE, AND GRAVEL TO PROVIDE A SUITABLE ROAD BED. A TEMPORARY CULVERT MAY BE REQUIRED IN AREAS OF HIGH FLOW TO MAINTAIN HYDROLOGIC CONNECTIVITY. ALL MATERIAL WILL BE REMOVED FROM JURISDICTIONAL AREAS AFTER CONSTRUCTION COMPLETION.
11. NO MATERIAL SHALL BE PLACED IN ANY LOCATION OR IN ANY MANNER SO AS TO IMPAIR SURFACE WATER FLOW INTO, THROUGH OR OUT OF ANY WETLAND AREA. NO INSTALLATION SHALL CREATE AN IMPOUNDMENT THAT WILL IMPEDE THE FLOW OF WATER OR CAUSE FLOODING.
12. NO MATERIAL SHALL BE TAKEN FROM THE WETLANDS AREA EXCEPT THAT WHICH MUST NECESSARILY BE REMOVED FOR THE STRUCTURE OR FOUNDATION PLACEMENT OR STABILIZATION. ALL EXCESS MATERIAL TAKEN FROM THE WETLAND WILL BE REMOVED FROM THE SITE.
13. ANY PROPOSED SUPPORT FILLS SHALL BE CLEAN GRAVEL AND STONE, FREE OF WASTE METAL PRODUCTS, ORGANIC MATERIALS AND SIMILAR DEBRIS AND SHALL NOT EXCEED THE AMOUNT PERMITTED. THIS ALLOWABLE FILL IS THE ONLY FILL THAT MAY REMAIN IN THE WETLAND AFTER CONSTRUCTION. ALL CUT AND FILLS SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
14. INSTALL NEW POLES IN THE LOCATIONS DESIGNATED ON THE PERMITTING PLANS.
15. CABLE INSTALLATION WILL BE PERFORMED IN A MANNER SO AS TO AVOID, OR LIMIT TO THE MAXIMUM EXTENT POSSIBLE, TRAVERSING WETLANDS WITH HEAVY EQUIPMENT. IN SOME CASES, A HELICOPTER MAY BE USED DURING THE INSTALLATION TO MINIMIZE IMPACTS.
16. REMOVAL OF THE OLD POLE WILL OCCUR ONCE THE CABLE HAS BEEN INSTALLED ON THE NEW STRUCTURE. THE OLD STRUCTURES WILL BE REMOVED FROM THE SITE. POLES WILL BE CUT AT THE GROUND SURFACE. FOOTINGS WILL BE ABANDONED IN PLACE TO MINIMIZE IMPACTS.
17. ALL TIMBER MATS, MATERIAL, AND DEBRIS WILL BE REMOVED FROM THE WORK AREA UPON THE COMPLETION OF CONSTRUCTION.
18. UPLAND DISTURBED AREAS SHALL BE RESTORED AND STABILIZED UPON COMPLETION OF CONSTRUCTION. WORK PAD RESTORATION SHOULD INCLUDE REDUCING THE WORK PAD TO A 30 BY 60 FOOT AREA, AND REDUCING SLOPES TO A MAXIMUM OF 25%. STOCKPILED MATERIAL SHOULD BE SPREAD TO REDUCE ANY UNNECESSARY SLOPES. GRAVEL WORK PADS AND SLOPES SHOULD BE SCARIFIED TO A MINIMUM OF 3" BEFORE SPREADING TOPSOIL/LOAM.
19. ALL TEMPORARY WETLAND IMPACTS WILL BE RE-GRADED TO ORIGINAL CONTOURS FOLLOWING CONSTRUCTION. NEW ENGLAND EROSION CONTROL/RESTORATION MIX, AVAILABLE THROUGH NEW ENGLAND WETLAND PLANTS, INC., 820 WEST STREET, AMHERST, MA 01002, 413-548-8000, OR EQUIVALENT SEED MIX SHALL BE APPLIED IN WETLAND AREAS THAT ARE NOT INUNDATED, AS NECESSARY.
20. MULCH USED FOR STABILIZATION SHALL CONSIST OF SEEDLESS STRAW.
21. SEDIMENT AND EROSION CONTROL MEASURES WILL BE EVALUATED AND REMOVED IF NECESSARY UPON THE COMPLETION OF CONSTRUCTION.
22. COMMERCIAL LOAM WILL NOT BE USED AS PART OF RESTORATION. ONLY IN-SITU TOPSOIL WILL BE USED TO RESTORE DISTURBED AREAS.
23. WHERE OPTIMAL TURTLE BREEDING AREAS OVERLAP WITH DISTURBANCE (AS DETERMINED BY AN ENVIRONMENTAL MONITOR), MINERAL SOILS WILL BE SCARIFIED TO ALLEVIATE COMPACTION AND BECOME MORE SUITED FOR TURTLE BREEDING.
24. NATURALLY VEGETATED LOCAL WETLAND BUFFER AREAS OUTSIDE OF EXISTING TRAILS MUST BE RESTORED UPON COMPLETION OF WORK.

**WINTER CONSTRUCTION NOTES**

1. PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED. STABILIZATION METHODS SHALL INCLUDE SEEDING AND MULCH, AND INSTALLATION OF EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE TEMPORARILY STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.

3. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL (NHDOT 304.3).

**GENERAL NOTES:**

OWNER: EVERSOURCE ENERGY  
13 LEGENDS DRIVE  
HOOKSETT, NH 03106

1. BASE PLAN PROVIDED BY EVERSOURCE ENERGY. EVERSOURCE ENERGY PROVIDED THE WETLAND DATA. EVERSOURCE ENERGY PROVIDED THE UTILITY DESIGN.
2. JURISDICTIONAL WETLANDS WERE CONFIRMED BY GZA GEOENVIRONMENTAL, INC. IN 2022, IN ACCORDANCE WITH THE 1987 U.S. ARMY CORPS OF ENGINEERS' "WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1," AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTHEAST REGION," JANUARY 2012. WETLANDS WILL BE REVIEWED BY GZA GEOENVIRONMENTAL, INC. PRIOR TO START OF WORK.
3. GZA EVALUATED WETLANDS AS POTENTIAL VERNAL POOLS IN 2022 IN ACCORDANCE WITH "IDENTIFICATION AND DOCUMENTATION OF VERNAL POOLS IN NEW HAMPSHIRE," 2016, NEW HAMPSHIRE FISH AND GAME DEPARTMENT, NONGAME AND ANDANGERED WILDLIFE PROGRAM.
4. AS APPLICABLE, GZA WILL COMPLETE WETLANDS FUNCTION AND VALUES ASSESSMENT IN ACCORDANCE WITH THE ACOE'S "HIGHWAY METHODOLOGY WORKBOOK SUPPLEMENT," SEPTEMBER 1999.
5. SITE PLAN IS FOR PERMITTING PURPOSES ONLY AND DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY.
6. THE PROJECT WILL BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
7. IN ACCORDANCE WITH ENV-WQ 1505.02, THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
  - A MINIMUM 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED
  - A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL HAS BEEN INSTALLED
  - OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

**EROSION CONTROL NOTES:**



1. INSTALLATION OF EROSION CONTROL GRINDINGS AND/OR SILT FENCES SHALL BE COMPLETE PRIOR TO THE START OF WORK IN ANY GIVEN AREA. EROSION CONTROLS SHALL BE USED DURING CONSTRUCTION AND REMOVED WHEN ALL SLOPES HAVE A HEALTHY STAND OF VEGETATION COVER. EROSION CONTROL MEASURES SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER .25" OR GREATER RAINFALL EVENTS.
2. AS REQUIRED, CONSTRUCT TEMPORARY BERMS, SILTATION FENCES, SEDIMENT TRAPS, ETC. TO PREVENT EROSION & SEDIMENTATION OF WETLANDS.
3. THE WORK AREA SHALL BE GRADED AND OTHERWISE SHAPED IN SUCH A MANNER AS TO MINIMIZE SOIL EROSION, SILTATION OF DRAINAGE CHANNELS, DAMAGE TO EXISTING VEGETATION, AND DAMAGE TO PROPERTY OUTSIDE LIMITS OF THE WORK AREA. EROSION CONTROL GRINDINGS WILL BE NECESSARY TO ACCOMPLISH THIS END.
4. ANY STRIPPED TOPSOIL SHALL BE STOCKPILED, WITHOUT COMPACTION, AND STABILIZED WITH BMPS.
5. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS, PLANT ANNUAL RYEGRASS PRIOR TO OCTOBER 15TH.
6. EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
7. EROSION CONTROL MATTING, IF REQUIRED, WILL CONSIST OF JUTE MATTING. MATTING WITH WELDED PLASTIC OR 'BIODEGRADABLE PLASTIC' NETTING OR THREAD WILL BE AVOIDED TO LIMIT UNINTENTIONAL MORTALITY TO SNAKES.

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**C196 & Q171 TRANSMISSION LINE STRUCTURE  
REPLACEMENT PROJECT**

GOFFSTOWN, DUNBARTON, AND BOW, NEW HAMPSHIRE

**NOTES**

PREPARED BY:  <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com		PREPARED FOR: 	
PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET <b>S1</b>
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 08/22/2022	PROJECT NO: 04.0191410.18	REVISION NO:	

## Best Management Practices (BMP's) for Straw wattles

### Definition and purpose:

Straw wattles are burlap rolls filled with straw that trap sediment and interrupt water flow by reducing slope lengths.

### Applications:

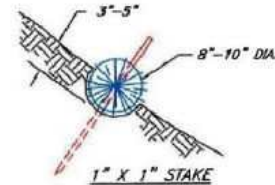
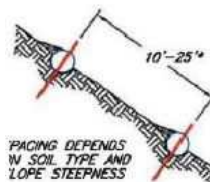
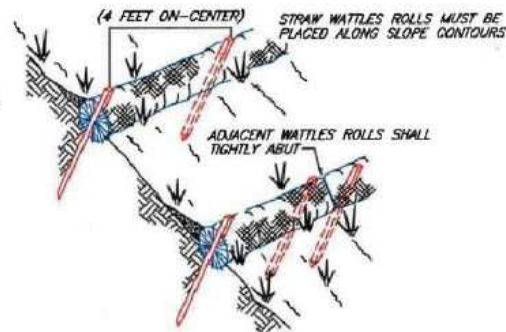
- \* Along erodible or unstabilized slopes
- \* Spread overland waterflow
- \* Trap sediment
- \* Around storm drain inlets to slow water and settle out sediment
- \* Overlap ends approximately 6 inches

### Installation:

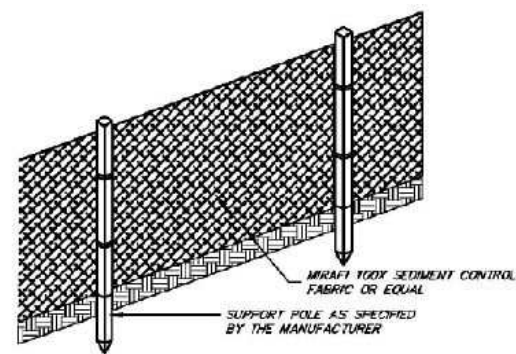
Straw wattles are installed parallel to slope contours and perpendicular to sheet flow.

Spacing\* - Dependent on slope length, soil steepness and soil type (general range 10 - 25').

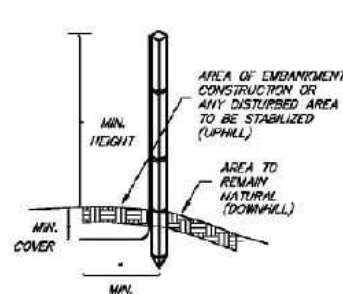
Trenching - 2"-5" inch trench  
Stacking - at each end and four foot on center (i.e. 25 foot wattle uses 6 stacks)



NOT TO SCALE



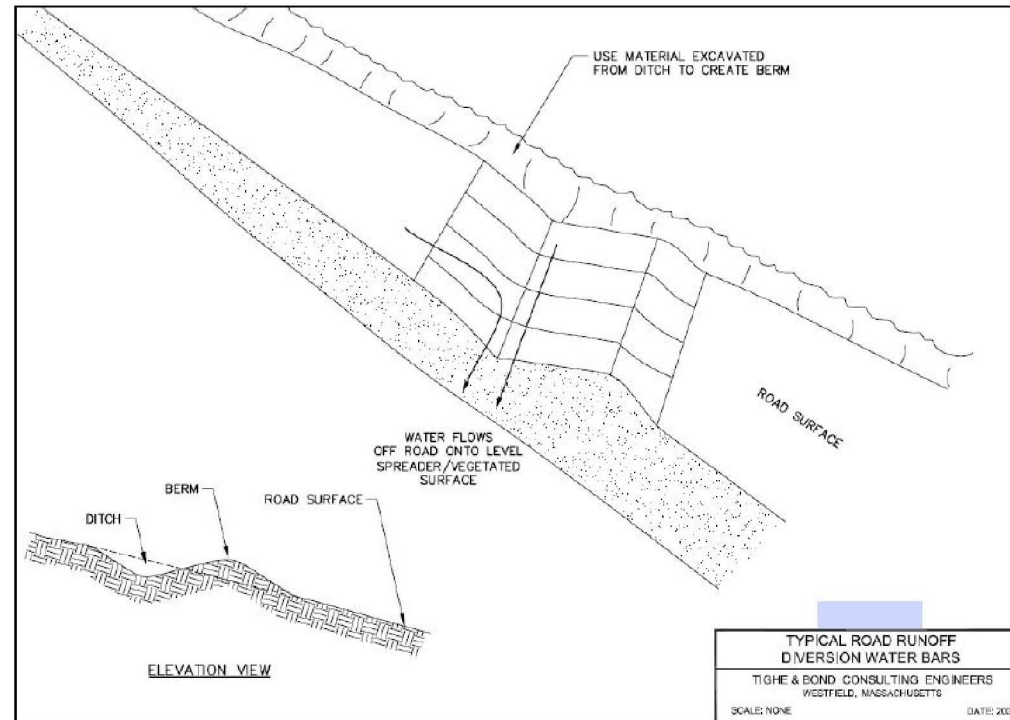
FRONT VIEW



SIDE VIEW

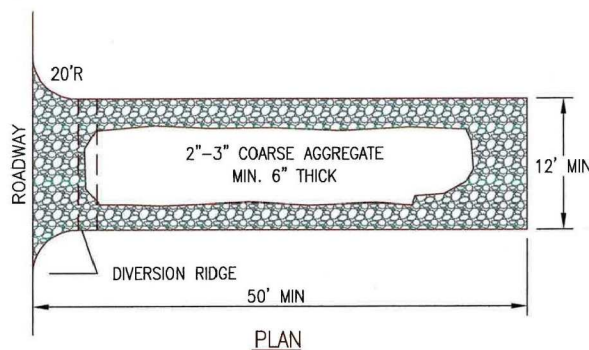
### NOTES (SILT FENCE)

1. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES.
2. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATIONS.
3. POSTS SHALL BE PLACED AT A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL BE AS MANUFACTURER RECOMMENDS.
4. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE OF THE BARRIER IN ACCORDANCE WITH RECOMMENDATIONS.
5. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE, AND WILL EXTEND A MINIMUM OF 8 INCHES INTO THE TRENCH. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
6. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
7. FABRIC BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
8. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST ONCE DAILY DURING PROLONGED RAINFALL AND ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
9. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
10. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
11. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.



ELEVATION VIEW

TYPICAL ROAD RUNOFF DIVERSION WATER BARS  
TIGHE & BOND CONSULTING ENGINEERS  
WESTFIELD, MASSACHUSETTS  
SCALE: NONE DATE: 2017



PLAN

### NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.

## CONSTRUCTION ENTRANCE

NOT TO SCALE

Figure 5

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C196 & Q171 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT  
GOFFSTOWN, DUNBARTON, & BOW, NEW HAMPSHIRE

## BMP DETAILS

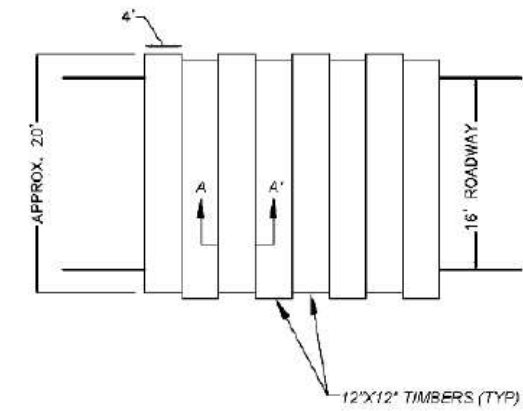
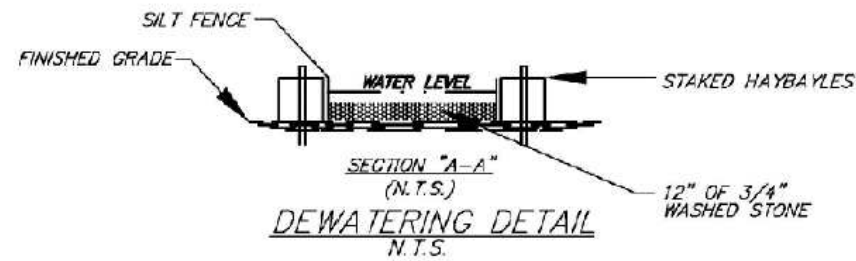
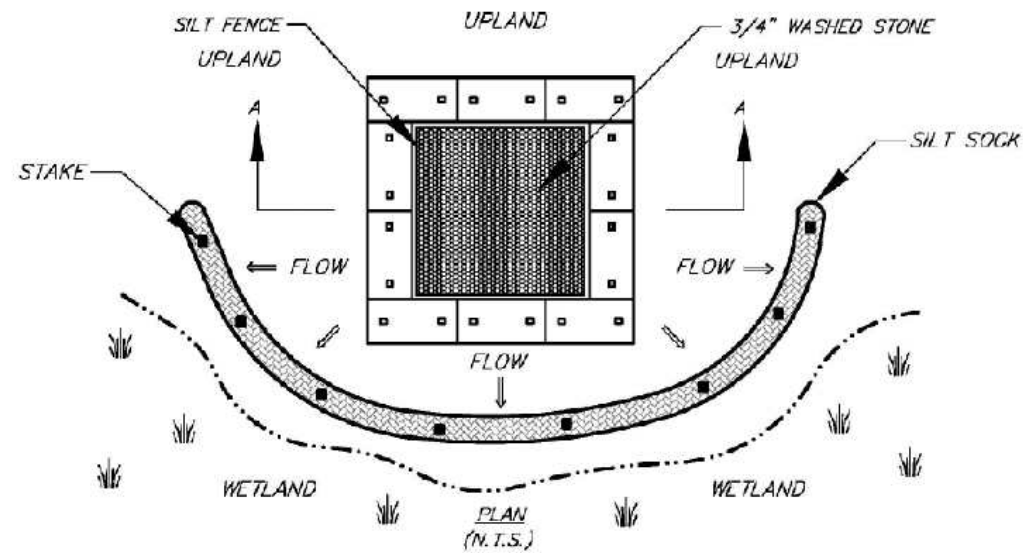
PREPARED BY:  
**GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

PREPARED FOR:  
**EVERSOURCE**  
ENERGY

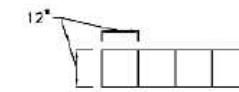
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DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 08/29/2022	PROJECT NO: 04.0191410.18	REVISION NO:	



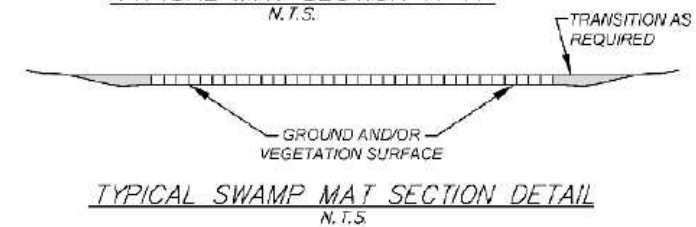
© 2022 - GZA GeoEnvironmental, Inc. P:\04\Jobs\0191410\00 - EE Shing Permitting 2019-2022\04.0191410.18 - C196 Transmission Line Str Repl Project\Figures\C196 Q171 AOT Notesheet 3 10-7.mxd, 8/22/2022, 9:16:54 AM, Sydney Wicklund



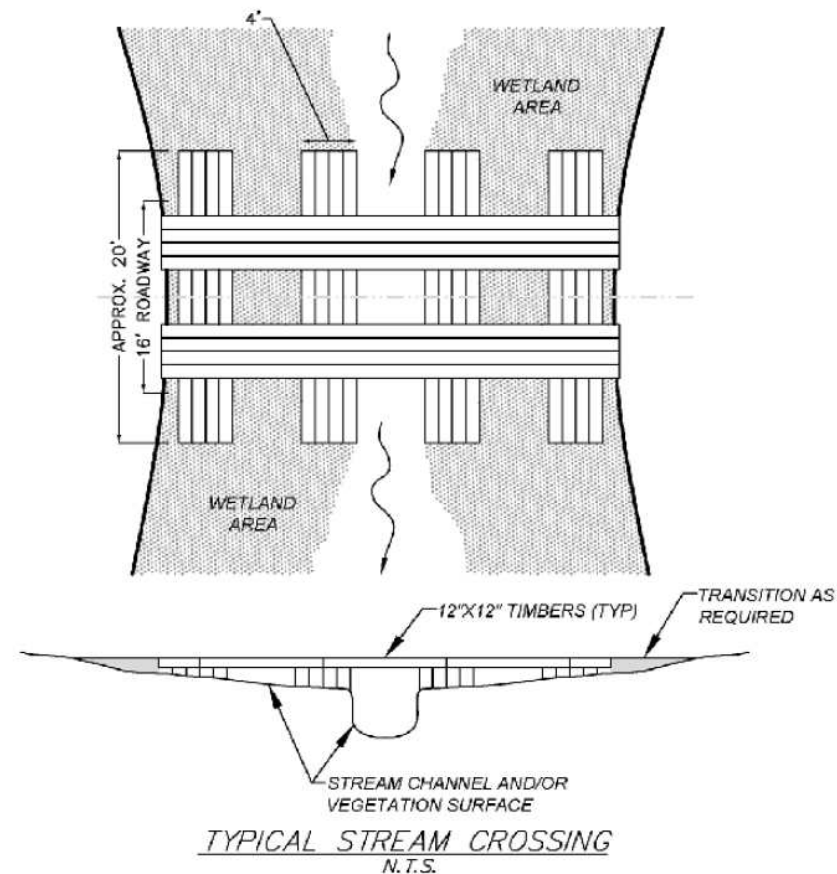
TYPICAL SWAMP MAT PLAN VIEW  
N.T.S.



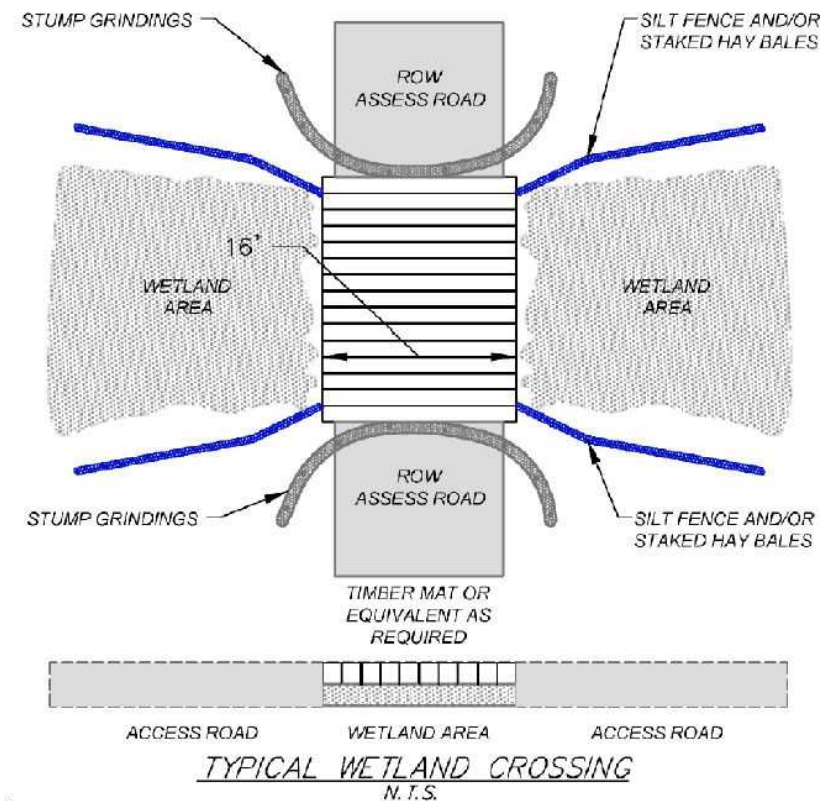
TYPICAL MAT SECTION A-A  
N.T.S.



TYPICAL SWAMP MAT SECTION DETAIL  
N.T.S.



TYPICAL STREAM CROSSING  
N.T.S.



TYPICAL WETLAND CROSSING  
N.T.S.

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C196 & Q171 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT  
GOFFSTOWN, DUNBARTON, & BOW, NEW HAMPSHIRE

BMP DETAILS

PREPARED BY:  
**GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

PREPARED FOR:  
**EVERSOURCE**  
ENERGY

PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET <b>S3</b>
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 08/22/2022	PROJECT NO: 04.0191410.18	REVISION NO.	

**NEW HAMPSHIRE FISH AND GAME AOT PERMIT CONDITIONS IN ACCORDANCE WITH ENV-WQ 1504.18 – WILDLIFE PROTECTION NOTES:**

**NHB22-1754 AND NHB22-2081 (BOW)**



PROPOSED WORK IN BOW (EXISTING STRUCTURE C196 69 TO 59) OCCURS WITHIN A PRIORITY CONSERVATION AREA FOR BLANDING'S AND SPOTTED TURTLES. THIS SHOULD BE COMMUNICATED TO PERSONNEL, AND IMPACTS SHOULD BE MINIMIZED TO THE EXTENT POSSIBLE.

1. BMPS IN THE DOCUMENT TITLED "C196 Q171 NHFG BMP RECOMMENDATIONS 8-17-22" SUBMITTED TO NHFG 8/15/22 SHALL BE ADHERED TO AT ALL TIMES DURING THIS PROJECT.
2. BLANDING'S TURTLE (STATE ENDANGERED), SPOTTED TURTLE (STATE THREATENED), EASTERN HOGNOSE SNAKE (STATE ENDANGERED), NORTHERN BLACK RACER (STATE THREATENED), AND WOOD TURTLE (STATE SPECIES OF SPECIAL CONCERN) OCCUR WITHIN THE VICINITY OF THE PROJECT AREA. ALL OPERATORS AND PERSONNEL WORKING ON OR ENTERING THE SITE SHALL BE MADE AWARE OF THE POTENTIAL PRESENCE OF THESE SPECIES AND SHALL BE PROVIDED FLYERS THAT HELP TO IDENTIFY THESE SPECIES, ALONG WITH NHFG CONTACT INFORMATION. SEE PLAN SHEET S7 AND S8.
3. VERNAL POOLS AND POTENTIAL VERNAL POOLS SHALL BE FLAGGED PRIOR TO WORK AND ALL IMPACTS TO VERNAL POOLS AND POTENTIAL VERNAL POOLS SHALL BE AVOIDED.
4. EASTERN HOGNOSE SNAKE OBSERVATIONS SHALL BE REPORTED IMMEDIATELY TO NHFG WILDLIFE BIOLOGISTS MELISSA WINTERS (603-479-1129) OR BRENDAN CLIFFORD (603-944-0885). IMMEDIATE REPORTING OF OBSERVATIONS IS CRITICAL AS NHFG BIOLOGISTS WILL NEED TO COLLECT DATA ON THE INDIVIDUAL.
5. TURTLES AND SNAKES MAY BE ATTRACTED TO DISTURBED GROUND DURING NESTING SEASON. TURTLE NESTING SEASON OCCURS APPROXIMATELY MAY 15TH – JUNE 30TH. NESTING AREAS MAY INCLUDE WORK PADS AND ACCESS ROADS THAT ARE NOT HARD PACK GRAVEL AND OTHER SANDY/GRAVEL WORK AREAS. ALL TURTLE SPECIES NESTS AND NORTHERN BLACK RACER NESTS ARE PROTECTED BY NH LAWS. BE AWARE OF THE POTENTIAL TO ENCOUNTER NESTING WILDLIFE IN THESE AREAS.
6. IF A TURTLE OR SNAKE NEST IS OBSERVED OR SUSPECTED, OR A TURTLE IS EXHIBITING NESTING BEHAVIORS, EVERSOURCE OR A DESIGNATED PROJECT REPRESENTATIVE SHALL CONTACT MELISSA WINTERS (603-479-1129) OR JOSH MEGYESY (978-578-0802) AT NHFG IMMEDIATELY FOR FURTHER CONSULTATION. TURTLE NESTS OR TURTLES EXHIBITING NESTING BEHAVIOR SHALL NOT BE DISTURBED.
7. OBSERVATIONS OF NORTHERN BLACK RACERS IN THE MONTHS OF APRIL-MAY AND SEPTEMBER-OCTOBER MAY INDICATE THE POTENTIAL FOR A DEN SITE ON OR NEAR THE PROJECT SITE. OBSERVATIONS OF THIS SPECIES DURING THIS TIMEFRAME SHALL BE REPORTED IMMEDIATELY TO THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM. PLEASE CONTACT MELISSA WINTERS (603-479-1129) OR BRENDAN CLIFFORD (603-944-0885). OBSERVATIONS OF THIS SPECIES OUTSIDE OF THIS TIMEFRAME CAN FOLLOW GENERAL REPORTING GUIDANCE. PLEASE INCLUDE PHOTOGRAPH WITH TEXT IF FEASIBLE.
8. ALL MATTING WHICH WILL BE PLACED IN WATERBODIES DEEMED SUITABLE FOR HIBERNATING RARE TURTLES WILL BE PLACED PRIOR TO THE START OF THE INACTIVE SEASON SO AS TO PREVENT ACCIDENTAL PLACEMENT ATOP HIBERNATING TURTLES. PRIOR TO MATTING PLACEMENT IN THESE WETLANDS, THE AREA SHALL BE SWEEP BY A QUALIFIED BIOLOGIST OR HERPETOLOGIST TO ENSURE ANY TURTLES RELOCATE AWAY FROM THE AREA TO BE MATTED.
9. IMMEDIATELY PRIOR TO THE PLACEMENT OF MATTING IN WETLANDS WITHIN RARE TURTLE HABITAT DURING THE ACTIVE SEASON, THE AREAS SHALL BE CLEARED BY A QUALIFIED BIOLOGIST OR HERPETOLOGIST.
10. SWEEPS OF WORK AREAS AND ACCESS ROUTES SHALL BE CONDUCTED IMMEDIATELY PRIOR TO START OF WORK AND EQUIPMENT MOVEMENT IN ORDER TO MINIMIZE THE POTENTIAL OF ANIMALS ENTERING A WORK AREA BETWEEN THE SWEEP AND ACTIVITY.
11. ALL WORK ACTIVITIES SHALL BE RESTRICTED TO THE DEFINED ROADS, CONSTRUCTION AREAS, AND STAGING AREAS, WITH NO EQUIPMENT OR MATERIALS STAGED OR STORED OUTSIDE OF THE DEFINED AREAS AS SHOWN ON PLAN SHEETS.
12. ALL MANUFACTURED EROSION AND SEDIMENT CONTROL PRODUCTS, WITH THE EXCEPTION OF TURF REINFORCEMENT MATS, UTILIZED FOR, BUT NOT LIMITED TO, SLOPE PROTECTION, RUNOFF DIVERSION, SLOPE INTERRUPTION, PERIMETER CONTROL, INLET PROTECTION, CHECK DAMS, AND SEDIMENT TRAPS SHALL NOT CONTAIN PLASTIC, OR MULTIFILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES;
13. ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES ON THE PROJECT SITE SHALL BE REPORTED IMMEDIATELY TO THE NHFG NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603-271-2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV, WITH THE EMAIL SUBJECT LINE CONTAINING THE NHB DATACHECK TOOL RESULTS LETTER ASSIGNED NUMBER, THE PROJECT NAME, AND THE TERM WILDLIFE SPECIES OBSERVATION;
14. PHOTOGRAPHS OF THE OBSERVED SPECIES AND NEARBY ELEMENTS OF HABITAT OR AREAS OF LAND DISTURBANCE SHALL BE PROVIDED TO NHFG IN DIGITAL FORMAT AT THE ABOVE EMAIL ADDRESS FOR VERIFICATION, AS FEASIBLE;
15. IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHFG AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHFG.  
-SITE OPERATORS SHALL BE ALLOWED TO RELOCATE WILDLIFE ENCOUNTERED IF DISCOVERED WITHIN THE ACTIVE WORK ZONE AND IF IN DIRECT HARM FROM PROJECT ACTIVITIES. WILDLIFE SHALL BE RELOCATED IN CLOSE PROXIMITY TO THE CAPTURE LOCATION BUT OUTSIDE OF THE WORK ZONE AND IN THE DIRECTION THE INDIVIDUAL WAS HEADING. NHFG SHALL BE CONTACTED IMMEDIATELY IF THIS ACTION OCCURS.
16. THE NHFG, INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.

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**C196 & Q171 TRANSMISSION LINE STRUCTURE REPLACEMENT PROJECT**  
  
GOFFSTOWN, DUNBARTON, AND BOW, NEW HAMPSHIRE

**NOTES**

PREPARED BY:  <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: 	
PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET  <b>S4</b>
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 08/29/2022	PROJECT NO: 04.0191410.18	REVISION NO:	



**NEW HAMPSHIRE FISH AND GAME AOT PERMIT CONDITIONS IN ACCORDANCE WITH ENV-WQ 1504.18 – WILDLIFE PROTECTION NOTES:**

**NHB22-1755 (DUNBARTON)**



PROPOSED WORK IN DUNBARTON (C196 EXISTING STRUCTURE 70 TO 74) OCCURS WITHIN A PRIORITY CONSERVATION AREA FOR BLANDING'S AND SPOTTED TURTLES. THIS SHOULD BE COMMUNICATED TO PERSONNEL, AND IMPACTS SHOULD BE MINIMIZED TO THE EXTENT POSSIBLE.

1. BMPS IN THE DOCUMENT TITLED "C196 Q171 NHFG BMP RECOMMENDATIONS 8-17-22" SUBMITTED TO NHFG 8/15/22 SHALL BE ADHERED TO AT ALL TIMES DURING THIS PROJECT.
2. BLANDING'S TURTLE (STATE ENDANGERED), SPOTTED TURTLE (STATE THREATENED) , AND WOOD TURTLE (STATE SPECIES OF SPECIAL CONCERN) OCCUR WITHIN THE VICINITY OF THE PROJECT AREA. ALL OPERATORS AND PERSONNEL WORKING ON OR ENTERING THE SITE SHALL BE MADE AWARE OF THE POTENTIAL PRESENCE OF THESE SPECIES AND SHALL BE PROVIDED FLYERS THAT HELP TO IDENTIFY THESE SPECIES, ALONG WITH NHFG CONTACT INFORMATION. SEE PLAN SHEET S7 AND S8.
3. VERNAL POOLS AND POTENTIAL VERNAL POOLS SHALL BE FLAGGED PRIOR TO WORK AND ALL IMPACTS TO VERNAL POOLS AND POTENTIAL VERNAL POOLS SHALL BE AVOIDED.
4. TURTLES MAY BE ATTRACTED TO DISTURBED GROUND DURING NESTING SEASON. TURTLE NESTING SEASON OCCURS APPROXIMATELY MAY 15TH – JUNE 30TH. NESTING AREAS MAY INCLUDE WORK PADS AND ACCESS ROADS THAT ARE NOT HARD PACK GRAVEL AND OTHER SANDY/GRAVEL WORK AREAS. ALL TURTLE SPECIES NESTS ARE PROTECTED BY NH LAWS. BE AWARE OF THE POTENTIAL TO ENCOUNTER NESTING WILDLIFE IN THESE AREAS.
5. IF A TURTLE NEST IS OBSERVED OR SUSPECTED, OR A TURTLE IS EXHIBITING NESTING BEHAVIORS, EVERSOURCE OR A DESIGNATED PROJECT REPRESENTATIVE SHALL CONTACT MELISSA WINTERS (603-479-1129) OR JOSH MEGYESY (978-578-0802) AT NHFG IMMEDIATELY FOR FURTHER CONSULTATION. TURTLE NESTS OR TURTLES EXHIBITING NESTING BEHAVIOR SHALL NOT BE DISTURBED.
6. ALL MATTING WHICH WILL BE PLACED IN WATERBODIES DEEMED SUITABLE FOR HIBERNATING RARE TURTLES WILL BE PLACED PRIOR TO THE START OF THE INACTIVE SEASON SO AS TO PREVENT ACCIDENTAL PLACEMENT ATOP HIBERNATING TURTLES. PRIOR TO MATTING PLACEMENT IN THESE WETLANDS, THE AREA SHALL BE SWEEP BY A QUALIFIED BIOLOGIST OR HERPETOLOGIST TO ENSURE ANY TURTLES RELOCATE AWAY FROM THE AREA TO BE MATTED.
7. IMMEDIATELY PRIOR TO THE PLACEMENT OF MATTING IN WETLANDS WITHIN RARE TURTLE HABITAT DURING THE ACTIVE SEASON, THE AREAS SHALL BE CLEARED BY A QUALIFIED BIOLOGIST OR HERPETOLOGIST.
8. SWEEPS OF WORK AREAS AND ACCESS ROUTES SHALL BE CONDUCTED IMMEDIATELY PRIOR TO START OF WORK AND EQUIPMENT MOVEMENT IN ORDER TO MINIMIZE THE POTENTIAL OF ANIMALS ENTERING A WORK AREA BETWEEN THE SWEEP AND ACTIVITY.
9. ALL WORK ACTIVITIES SHALL BE RESTRICTED TO THE DEFINED ROADS, CONSTRUCTION AREAS, AND STAGING AREAS, WITH NO EQUIPMENT OR MATERIALS STAGED OR STORED OUTSIDE OF THE DEFINED AREAS AS SHOWN ON PLAN SHEETS.
10. ALL MANUFACTURED EROSION AND SEDIMENT CONTROL PRODUCTS, WITH THE EXCEPTION OF TURF REINFORCEMENT MATS, UTILIZED FOR, BUT NOT LIMITED TO, SLOPE PROTECTION, RUNOFF DIVERSION, SLOPE INTERRUPTION, PERIMETER CONTROL, INLET PROTECTION, CHECK DAMS, AND SEDIMENT TRAPS SHALL NOT CONTAIN PLASTIC, OR MULTIFILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES;
11. ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES ON THE PROJECT SITE SHALL BE REPORTED IMMEDIATELY TO THE NHFG NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603-271-2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV, WITH THE EMAIL SUBJECT LINE CONTAINING THE NHB DATACHECK TOOL RESULTS LETTER ASSIGNED NUMBER, THE PROJECT NAME, AND THE TERM WILDLIFE SPECIES OBSERVATION;
12. PHOTOGRAPHS OF THE OBSERVED SPECIES AND NEARBY ELEMENTS OF HABITAT OR AREAS OF LAND DISTURBANCE SHALL BE PROVIDED TO NHFG IN DIGITAL FORMAT AT THE ABOVE EMAIL ADDRESS FOR VERIFICATION, AS FEASIBLE;
13. IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHFG AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHFG.  
-SITE OPERATORS SHALL BE ALLOWED TO RELOCATE WILDLIFE ENCOUNTERED IF DISCOVERED WITHIN THE ACTIVE WORK ZONE AND IF IN DIRECT HARM FROM PROJECT ACTIVITIES. WILDLIFE SHALL BE RELOCATED IN CLOSE PROXIMITY TO THE CAPTURE LOCATION BUT OUTSIDE OF THE WORK ZONE AND IN THE DIRECTION THE INDIVIDUAL WAS HEADING. NHFG SHALL BE CONTACTED IMMEDIATELY IF THIS ACTION OCCURS.
14. THE NHFG, INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.

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**C196 & Q171 TRANSMISSION LINE STRUCTURE REPLACEMENT PROJECT**  
  
GOFFSTOWN, DUNBARTON, AND BOW, NEW HAMPSHIRE

**NOTES**

PREPARED BY:  <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR:  <b>EVERSOURCE</b> ENERGY	
PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET  <b>S5</b>
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 08/29/2022	PROJECT NO: 04.0191410.18	REVISION NO:	

**NEW HAMPSHIRE FISH AND GAME AOT PERMIT CONDITIONS IN ACCORDANCE WITH ENV-WQ 1504.18 – WILDLIFE PROTECTION NOTES:**

**NHB22-1756 (GOFFSTOWN)**

PROPOSED WORK IN GOFFSTOWN (EXISTING STRUCTURE Q171 139 TO 136) OCCURS WITHIN A PRIORITY CONSERVATION AREA FOR WOOD TURTLES AND POPULATIONS IN THE VICINITY ARE BEING MONITORED BY NHFG. THIS SHOULD BE COMMUNICATED TO PERSONNEL, AND IMPACTS SHOULD BE MINIMIZED TO THE EXTENT POSSIBLE.

1. BMPS IN THE DOCUMENT TITLED "C196 Q171 NHFG BMP RECOMMENDATIONS 8-17-22" SUBMITTED TO NHFG 8/15/22 SHALL BE ADHERED TO AT ALL TIMES DURING THIS PROJECT.
2. THERE IS HIGH POTENTIAL OF A NORTHERN BLACK RACER DEN SITE IN THE VICINITY OF THIS PROJECT. NORTHERN BLACK RACER SURVEYS SHALL BE CONDUCTED IN MID-SEPTEMBER THROUGH MID-OCTOBER FOLLOWING THE PROTOCOL PROVIDED TO EVERSOURCE IN THE DOCUMENT TITLED "SURVEY PROTOCOLS FOR NORTHERN BLACK RACERS DURING THE C196 Q171 STRUCTURE REPLACEMENT PROJECT" (ATTACHED). THIS WILL REQUIRE A SCIENTIFIC LICENSE FROM NHFG.
3. BLANDING'S TURTLE (STATE ENDANGERED), SPOTTED TURTLE (STATE THREATENED), NORTHERN BLACK RACER (STATE THREATENED), AND WOOD TURTLE (STATE SPECIES OF SPECIAL CONCERN) OCCUR WITHIN THE VICINITY OF THE PROJECT AREA. ALL OPERATORS AND PERSONNEL WORKING ON OR ENTERING THE SITE SHALL BE MADE AWARE OF THE POTENTIAL PRESENCE OF THESE SPECIES AND SHALL BE PROVIDED FLYERS THAT HELP TO IDENTIFY THESE SPECIES, ALONG WITH NHFG CONTACT INFORMATION. SEE PLAN SHEET S7 AND S8.
4. VERNAL POOLS AND POTENTIAL VERNAL POOLS SHALL BE FLAGGED PRIOR TO WORK AND ALL IMPACTS TO VERNAL POOLS AND POTENTIAL VERNAL POOLS SHALL BE AVOIDED.
5. TURTLES AND SNAKES MAY BE ATTRACTED TO DISTURBED GROUND DURING NESTING SEASON. TURTLE NESTING SEASON OCCURS APPROXIMATELY MAY 15TH – JUNE 30TH. NESTING AREAS MAY INCLUDE WORK PADS AND ACCESS ROADS THAT ARE NOT HARD PACK GRAVEL AND OTHER SANDY/GRAVEL WORK AREAS. ALL TURTLE SPECIES NESTS AND NORTHERN BLACK RACER NESTS ARE PROTECTED BY NH LAWS. BE AWARE OF THE POTENTIAL TO ENCOUNTER NESTING WILDLIFE IN THESE AREAS.
6. IF A TURTLE OR SNAKE NEST IS OBSERVED OR SUSPECTED, OR A TURTLE IS EXHIBITING NESTING BEHAVIORS, EVERSOURCE OR A DESIGNATED PROJECT REPRESENTATIVE SHALL CONTACT MELISSA WINTERS (603-479-1129) OR JOSH MEGYESY (978-578-0802) AT NHFG IMMEDIATELY FOR FURTHER CONSULTATION. TURTLE NESTS OR TURTLES EXHIBITING NESTING BEHAVIOR SHALL NOT BE DISTURBED.
7. OBSERVATIONS OF NORTHERN BLACK RACERS SHALL BE REPORTED IMMEDIATELY TO THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM. PLEASE CONTACT MELISSA WINTERS (603-479-1129) OR BRENDAN CLIFFORD (603-944-0885). PLEASE INCLUDE PHOTOGRAPH WITH TEXT IF FEASIBLE. OBSERVATIONS OF NORTHERN BLACK RACERS IN THE MONTHS OF APRIL-MAY AND SEPTEMBER-OCTOBER MAY INDICATE THE POTENTIAL FOR A DEN SITE ON OR NEAR THE PROJECT SITE.
8. ALL MATTING WHICH WILL BE PLACED IN WATERBODIES DEEMED SUITABLE FOR HIBERNATING RARE TURTLES WILL BE PLACED PRIOR TO THE START OF THE INACTIVE SEASON SO AS TO PREVENT ACCIDENTAL PLACEMENT ATOP HIBERNATING TURTLES. PRIOR TO MATTING PLACEMENT IN THESE WETLANDS, THE AREA SHALL BE SWEEPED BY A QUALIFIED BIOLOGIST OR HERPETOLOGIST TO ENSURE ANY TURTLES RELOCATE AWAY FROM THE AREA TO BE MATTED.
9. IMMEDIATELY PRIOR TO THE PLACEMENT OF MATTING IN WETLANDS WITHIN RARE TURTLE HABITAT DURING THE ACTIVE SEASON, THE AREAS SHALL BE CLEARED BY A QUALIFIED BIOLOGIST OR HERPETOLOGIST.
10. SWEEPS OF WORK AREAS AND ACCESS ROUTES SHALL BE CONDUCTED IMMEDIATELY PRIOR TO START OF WORK AND EQUIPMENT MOVEMENT IN ORDER TO MINIMIZE THE POTENTIAL OF ANIMALS ENTERING A WORK AREA BETWEEN THE SWEEP AND ACTIVITY.
11. ALL WORK ACTIVITIES SHALL BE RESTRICTED TO THE DEFINED ROADS, CONSTRUCTION AREAS, AND STAGING AREAS, WITH NO EQUIPMENT OR MATERIALS STAGED OR STORED OUTSIDE OF THE DEFINED AREAS AS SHOWN ON PLAN SHEETS.
12. ALL MANUFACTURED EROSION AND SEDIMENT CONTROL PRODUCTS, WITH THE EXCEPTION OF TURF REINFORCEMENT MATS, UTILIZED FOR, BUT NOT LIMITED TO, SLOPE PROTECTION, RUNOFF DIVERSION, SLOPE INTERRUPTION, PERIMETER CONTROL, INLET PROTECTION, CHECK DAMS, AND SEDIMENT TRAPS SHALL NOT CONTAIN PLASTIC, OR MULTIFILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES;
13. ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES ON THE PROJECT SITE SHALL BE REPORTED IMMEDIATELY TO THE NHFG NONGAME AND ENDANGERED WILDLIFE ENVIRONMENTAL REVIEW PROGRAM BY PHONE AT 603-271-2461 AND BY EMAIL AT NHFGREVIEW@WILDLIFE.NH.GOV, WITH THE EMAIL SUBJECT LINE CONTAINING THE NHB DATACHECK TOOL RESULTS LETTER ASSIGNED NUMBER, THE PROJECT NAME, AND THE TERM WILDLIFE SPECIES OBSERVATION;
14. PHOTOGRAPHS OF THE OBSERVED SPECIES AND NEARBY ELEMENTS OF HABITAT OR AREAS OF LAND DISTURBANCE SHALL BE PROVIDED TO NHFG IN DIGITAL FORMAT AT THE ABOVE EMAIL ADDRESS FOR VERIFICATION, AS FEASIBLE;
15. IN THE EVENT A THREATENED OR ENDANGERED SPECIES IS OBSERVED ON THE PROJECT SITE DURING THE TERM OF THE PERMIT, THE SPECIES SHALL NOT BE DISTURBED, HANDLED, OR HARMED IN ANY WAY PRIOR TO CONSULTATION WITH NHFG AND IMPLEMENTATION OF CORRECTIVE ACTIONS RECOMMENDED BY NHFG.  
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16. THE NHFG, INCLUDING ITS EMPLOYEES AND AUTHORIZED AGENTS, SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.



**ADDITIONAL RECOMMENDATIONS**

17. SMOOTH GREEN SNAKES (STATE SPECIES OF SPECIAL CONCERN) OCCUR WITHIN THE VICINITY OF THE PROJECT SITE. SITE OPERATORS SHOULD BE INFORMED OF THE POTENTIAL PRESENCES OF THIS SPECIES AND SHALL BE PROVIDED A FLYER THAT HELPS TO IDENTIFY THIS SPECIES ALONG WITH NHFG CONTACT INFORMATION. SEE PLAN SHEET S7 AND S8.

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**C196 & Q171 TRANSMISSION LINE STRUCTURE REPLACEMENT PROJECT**  
  
GOFFSTOWN, DUNBARTON, AND BOW, NEW HAMPSHIRE

**NOTES**

PREPARED BY:  <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: 	
PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET  <b>S6</b>
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 08/29/2022	PROJECT NO: 04.0191410.18	REVISION NO:	



**WOOD TURTLE (GLYPTEMYS INSCULPTA)**

STATE SPECIES OF SPECIAL CONCERN

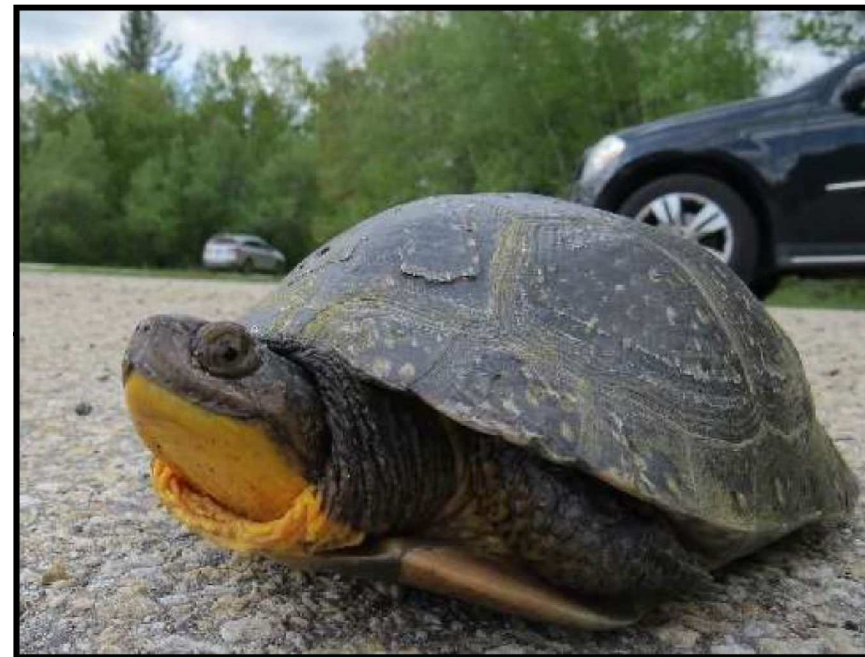


**WOOD TURTLE IDENTIFICATION**

1. NECK AND FORELIMBS ARE ORANGE.
2. CHARACTERIZED BY ITS HIGHLY SCULPTED SHELL WITH EACH LARGE SCUTE TAKING ON AN IRREGULAR PYRAMIDAL SHAPE.
3. ADULTS CAN BE 5-8 INCHES LONG.

**BLANDING'S TURTLE (EMYDOIDEA BLANDINGII)**

STATE ENDANGERED



**BLANDING'S TURTLE IDENTIFICATION**



1. LARGE, DARK/BLACK DOMED SHELL WITH LIGHTER SPECKLES.
2. DISTINCT YELLOW THROAT/CHIN.
3. AQUATIC BUT OFTEN MOVES ON LAND.

*\*ALL PHOTOS AND IDENTIFICATION INFORMATION COURTESY OF NEW HAMPSHIRE FISH AND GAME DEPARTMENT.*

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**C196 AND Q171 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT  
BOW, DUNBARTON, AND GOFFSTOWN,  
NEW HAMPSHIRE**

**WILDLIFE NOTES**

PREPARED BY:  <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists <a href="http://www.gza.com">www.gza.com</a>		PREPARED FOR: 	
PROJ MGR: LEW	DESIGNED BY: MJD	REVIEWED BY: TLT	CHECKED BY: DMZ
DATE: 08/23/2022	PROJECT NO: 04.0191410.18	DRAWN BY: MJD	SCALE:
		REVISION NO.	
			SHEET <b>S7</b>



**NORTHERN BLACK RACER (COLUBER CONSTRICTOR)**

STATE THREATENED



**NORTHERN BLACK RACER IDENTIFICATION**

1. SOLID BLACK WITH A WHITE THROAT.
2. SLENDER WITH GLOSSY SCALES.
3. 3-6 FT. LONG.
4. HATCHLINGS ARE VERY SMALL AND PATTERNED.

**SMOOTH GREEN SNAKE (LIOCHLOROPHIS VERNALIS)**

SPECIES OF SPECIAL CONCERN

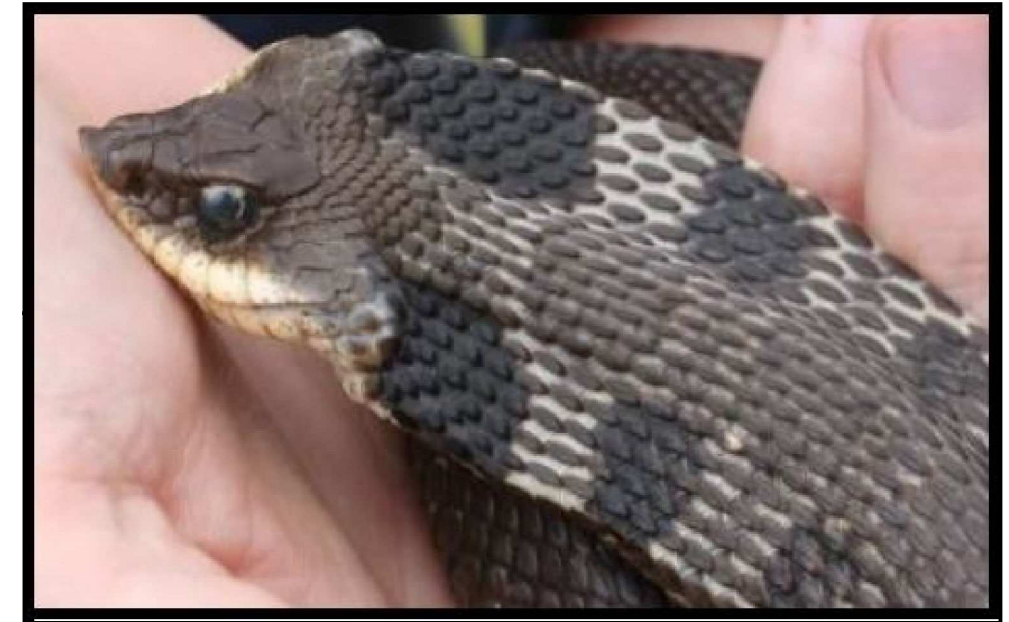


**SMOOTH GREEN SNAKE IDENTIFICATION**

1. A THIN, SLENDER BRIGHT-GREEN SNAKE MEASURING 10-20 INCHES
2. THE UNDERSIDE IS WHILE OR PALE YELLOW

**EASTERN HOGNOSE SNAKE (HETERODON PLATIRHINOS)**

STATE ENDANGERED



**EASTERN HOGNOSE IDENTIFICATION**

1. 20-35 INCHES LONG
2. UPTURNED SNOUT
3. KEELED DORSAL SCALES
4. LIGHT AND DARK BLOTCHES OF COLOR FROM BROWN TO RED AND ORANGE

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**C196 AND Q171 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT**

BOW, DUNBARTON, AND BOW,  
NEW HAMPSHIRE

**WILDLIFE NOTES**

PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: <b>EVERSOURCE</b> ENERGY	
PROJ MGR: LEW	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET <b>S8</b>
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 08/23/2022	PROJECT NO: 04.0191410.18	REVISION NO:	



# Redaction Log

Total Number of Redactions in Document: 30

## Redaction Reasons by Page

Page	Reason	Description	Occurrences
102	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
103	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
104	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
105	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
108	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
109	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
110	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
111	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1

# Redaction Log

Page	Reason	Description	Occurrences
112	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
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114	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
115	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
118	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
119	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
120	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
121	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
122	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1



## Redaction Log

Page	Reason	Description	Occurrences
123	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
124	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
125	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
126	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
127	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
128	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
129	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
132	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
133	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1

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134	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
135	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
136	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
137	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1



# Redaction Log

## Redaction Reasons by Exemption

Reason	Description	Pages (Count)
CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	102(1) 103(1) 104(1) 105(1) 108(1) 109(1) 110(1) 111(1) 112(1) 113(1) 114(1) 115(1) 118(1) 119(1) 120(1) 121(1) 122(1) 123(1) 124(1) 125(1) 126(1) 127(1) 128(1) 129(1) 132(1) 133(1) 134(1) 135(1) 136(1) 137(1)