Wetland & Waterbodies Delineation Report

Champlain Hudson Power Express Segment 11-Package 7A

CSX Railroad - Catskill, New York

CHA Project Number: 066076

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LIST OF ATTACHMENTS

1.0 INTRODUCTION

CHA Consulting, Inc. ("CHA") has prepared this wetland and waterbodies delineation report on behalf of Champlain Hudson Power Express, Inc. ("CHPE") and Kiewit Construction (Kiewit) for the Champlain Hudson Power Express Project (Project). CHA was retained by Kiewit to identify and delineate jurisdictional wetlands and waterbodies regulated under Section 404 of the Clean Water Act (CWA), Section 10 of the Rivers and Harbors Act of 1899, Article 24 Freshwater Wetlands Act (FWW)) & Article 15 (Protection of Waters) of the Environmental Conservation Law along the overland transmission cable route that follows State, county and local roadways and the CSX railroad rights-of-way ("ROW"), herein referred to as the Project Corridor. Delineations were conducted with the objective of verifying and updating previous wetland delineations performed for the Project Corridor as part of the Article VII and Section 10/404 permitting processes. This report describes the wetland delineation methodology and the existing wetland and waterbody resources that were identified in the Project Corridor (also defined as the Jurisdictional Determination limits) during field surveys for the overland portions of the Project.

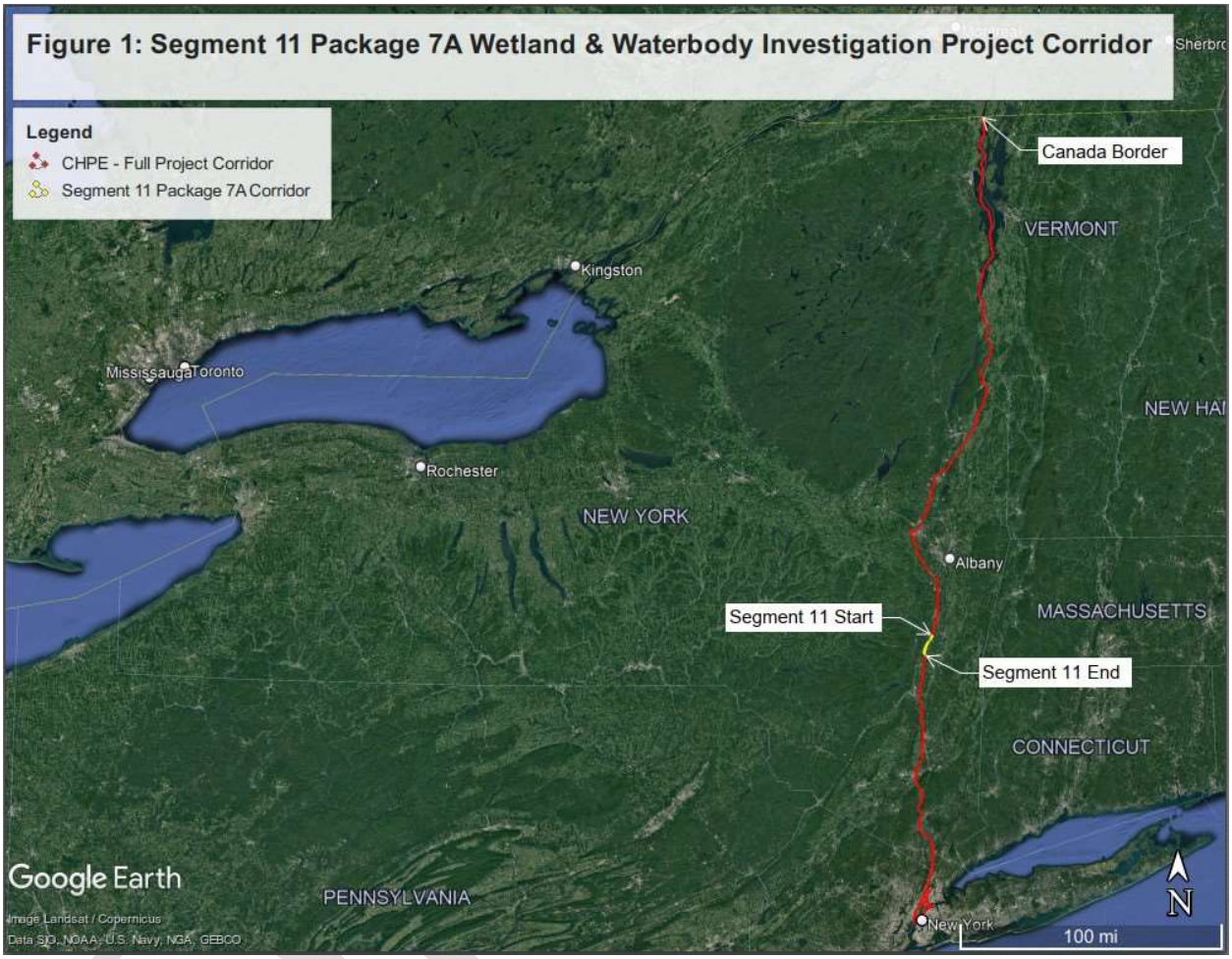
The project also includes equipment staging, laydown areas and access roads. These areas were not confirmed when the delineation activities described in this report were being completed. A supplemental delineation report will include these areas and will be prepared as the design of the project progresses.

2.0 SEGMENT 11-PACKAGE 7A CORRIDOR OVERVIEW

The entire Project Corridor is approximately 339 miles from Montreal, Quebec, Canada to New York City, New York, USA. Figure 1 below shows the route from the Canadian border to New York City and highlights the approximately 8.7 miles of the Segment 11- Package 7A Project Corridor that was investigated for wetlands and waterbodies.

Segment 11-Package 7A begins in Catskill, NY at station 70000+00 on the CSX railroad. Segment 11-Package 7A extends south approximately 8.7 miles along CSX railroad as well as along Allen Street, Route 9W and Alpha Boulevard to where Segment 11-Package 7A terminates at the west bank of the Hudson River at end of Alpha Boulevard in Catskill, NY.

Figure 1: Segment 11-Package 7A Wetland & Waterbody Investigation Project Corridor



3.0 WETLAND DELINEATION METHODOLOGY

To determine the potential for wetland impacts from construction of the Project, Fisher Associates (Fisher) and Shumaker Consulting Engineering & Land Surveying, D.P.C. (Shumaker) assessed the Project Corridor in the field for the presence of federal (Section 404 CWA & Section 10 of the Rivers and Harbors Act of 1899) and state (Article 24 FWW & Article 15 Protection of Waters) jurisdictional wetlands. Wetland scientists conducted wetland delineations in November and December 2021. The delineation criteria and methodology were performed in accordance with the *1987 Corps of Engineers Wetland Delineation Manual,* the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* Version 2.0 (January 2012), as well as the *New York State Freshwater Wetlands Delineation Manual* (Browne et. al., 1995).

The Project Corridor for the surveyed portions of the project included the land within the existing CSX railroad ROW and areas within and outside of ROWs along roadways such as Allen Street, Route 9W and Alpha Boulevard, and areas of undeveloped lands that connect these ROW's. The wetland delineation limits were approximately 50 feet from the edge of pavement and approximately 100 feet from the outside edge of rail, limited to the side of the road or railroad corridor on which the alignment follows and primarily within the ROW of the aforementioned roads and railroad.

In accordance with the procedures provided in the *Corps of Engineers Wetland Delineation Manual (1987)*, and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*, Version 2.0 (January 2012), the "Rou tine Wetland Determination" method was used to delineate wetland boundaries.

The wetland boundaries were determined in the field based on the three-parameter approach, whereby an area is a wetland if it exhibits vegetation adapted to wet conditions (hydrophytes), hydric soils, and the presence or evidence of water at or near the soil surface during the growing season (hydrology).

Coded surveyor's ribbons (e.g. flag code A-1, A-2, etc.) were placed along the wetland boundaries based on observations of vegetation, soils and hydrologic conditions. Data points were recorded

along the wetland boundaries at various locations across different vegetative community types correlating to each wetland. Wetland and upland data points were recorded to show the difference between the wetland and upland habitats. At a minimum, one data point set (wetland and upland) was collected for each wetland. Additional data points were collected for large wetlands and for changes in vegetative communities. Wetland Determination Data Sheets corresponding to each point can be found in Attachment 1.

Wetlands within the Segment 11- Package 7A Project Corridor fall under the jurisdiction of the and the New York State Department of Environmental Conservation (NYSDEC) and/or the U.S. Army Corps of Engineers (USACE). The New York State methodology similarly recognizes the three parameters of vegetation, soils, and hydrology; however, under the New York State method the hydric vegetation criterion is mandatory, while the other two parameters are not (Browne et. al. 1995). Wetlands regulated by the NYSDEC must be at least 12.4 acres (5 hectares) in size, unless they are deemed to have unusual local importance (Article 24 FWW). The NYSDEC publishes maps of wetland areas under state jurisdiction; however, it uses field delineation to determine the precise boundaries of these wetland areas.

Prior to actual field delineations for wetland resources, CHA reviewed USGS 7.5-minute topographic maps, aerial photographs, National Wetland Inventory (NWI) mapping, United States Department of Agriculture Natural Resources Conservation Service (NRCS) soil mapping, and NYSDEC freshwater wetlands mapping to identify potential wetland features present within the Project Corridor. More importantly, CHA used the previous wetland delineation prepared for this Project Corridor for the purposes of verifying and modifying the previous delineation. Refer to Attachment 2 for NWI and NYSDEC Freshwater Wetland & Stream Mapping and Attachment 3 for NRCS Soil Mapping.

Ditches that met the three parameters for wetland delineation (i.e., presence of hydrology, hydric soils, and hydrophytic vegetation) were identified as a wetland community. Those that did not, but carried stream flow from off-site (redirecting flow through the ditch), were categorized as streams.

Waterbodies within the Project Corridor, including streams under NYSDEC Article 15 jurisdiction, were identified by the presence of an ordinary high-water mark (OHWM) or stream

channel. Delineation and flagging were completed to identify the ordinary high-water mark (OHWM) for most perennial and intermittent streams.

This report documents the wetlands and waterbodies potentially under federal and State jurisdiction that were identified in the Project Corridor along the current proposed underground transmission cable route. Summaries of wetlands that were identified are provided in Table 4-1 in Attachment 4. Wetlands and Waterbodies Delineation Mapping is included in Attachment 5. Wetland determination data forms and photographic documentation of the wetlands are included in Attachment 1.

4.0 WETLAND & WATERBODIES DELINEATION RESULTS

A total of 23 wetland areas totaling approximately 22.8 acres. Table 4-1 in Attachment 4 provides a summary of the wetlands identified along the Project Corridor, including their classification in accordance with Cowardin et al. (1979) and their state or federal jurisdiction. Of these delineated wetlands, two (2) correspond with wetlands mapped by the NYSDEC. These include NYSDEC mapped wetlands HS-101 and CS-23.

Narrative descriptions of wetland vegetation, hydrology, and soils observed within the Project Corridor are presented in the following sections. The wetlands and waterbodies delineated within the surveyed areas are summarized in Table 4-1 and Table 4-2. Table 4-3 provides the soil series information. Refer to Attachment 4 for each of these tables. The Wetlands and Waterbodies Delineation Mapping provided in Attachment 5 shows the locations of delineated wetlands and waterbodies. Photographs of the waterbodies can be found in Attachment 6.

4.1 VEGETATION

Vegetative communities within wetlands are described according to *Ecological Communities of New York State, Second Edition* (Edinger 2014)[1] and *Classification of Wetlands and Deepwater*

[1] Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero (editors). 2014. *Ecological* Communities *of New York State.* Second Edition. A revised and expanded edition of Carol Reshke's *Ecological*

Habitats of the United States (Cowardin 1979)[2]. Using this hierarchical wetland classification system three primary cover types were identified for vegetated wetlands in the Project Corridor. These include palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO) wetlands. Some wetlands contained multiple community types. Open water areas (i.e. ponds) were identified as palustrine unconsolidated bottom (PUB).

4.1.1 Palustrine Emergent Wetland

The palustrine emergent wetland cover type is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin et. al., 1979), and with less than 50 percent aerial cover by shrubs and/or trees. The freshwater emergent wetlands along the Project Corridor primarily include shallow emergent marsh, common reed marsh and purple loosestrife marsh (Edinger et. al., 2014).

Shallow emergent marshes occur on mineral soils or deep muck soils that are permanently saturated and seasonally flooded. Water depths range from 6 inches to 3.3 feet during flood stages (Edinger et. al., 2014). Characteristic vegetation of shallow emergent marshes within the Project Corridor includes sensitive fern (*Onoclea sensibilis*), rough goldenrod (*Solidago rugosa*), giant goldenrod (*Solidago gigantea*), devil's beggarticks (*Bidens frondosa*), scouring rush (*Equisetum hyemale*), field horsetail (*Equisetum arvense*), cattails (*Typha* spp.), sedges (*Carex spp*.), asters (*Symphyotrichum spp.*), reed canary grass (*Phalaris arundinacea*) and soft rush (*Juncus effusus*). Invasive species observed within the shallow emergent marshes include common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*) honeysuckle (*Lonicera spp*.) and common buckthorn (*Rhamnus cathartica*).

Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

[2] Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe, 1979. *Classification of wetlands and deepwater habitats of the United States*. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

Common reed marsh and purple loosestrife marsh consist of disturbed marshes where common reed or purple loosestrife has become dominant (Edinger et. al., 2014). This community was commonly found within disturbed areas adjacent to the rail bed.

Linear wetland ditches, which have been constructed for drainage or irrigation, are commonly found along the railroad and road ROW's. Vegetation within the ditches is typically dominated by invasive species such as common reed, purple loosestrife, and reed canary grass; however, some areas may be dominated by native, non-invasive wetland species.

4.1.2 Palustrine Scrub-Shrub Wetland

The scrub-shrub wetland cover type includes areas that are dominated by shrubs and saplings that are less than 6 meters (20 feet) tall (Cowardin et. al., 1979), and have less than 50 percent aerial cover by trees. Scrub-shrub wetlands along the Project Corridor were dominated by silky dogwood (*Cornus amomum*), gray dogwood (*Cornus racemosa*), common buckthorn and honeysuckle. Other vegetation observed includes red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), pussy willow (*Salix discolor*), gray birch (*Betula populifolia*), black willow (*Salix nigra*), sensitive fern, moneywort (*Lysimachia nummularia*) and field horsetail. Invasive species observed include honeysuckle and common buckthorn.

4.1.3 Palustrine Forested Wetland

Forested wetland cover types are dominated by trees and shrubs that have developed a tolerance to a seasonal high-water table. For a community to be characterized as forested, a wetland must be dominated by trees and shrubs that are at least six meters tall (Cowardin et. al., 1979). Forested wetlands typically have a mature tree canopy, and depending upon the species and density, can have a broad range of understory and groundcover community components (Edinger et al., 2014). Forested wetland communities along the Project Corridor include red maple hardwood swamp.

Red maple-hardwood swamps occur in poorly drained depressions, usually on inorganic soils. Red maple is either the only dominant tree species or is codominant with one or more hardwoods (Edinger et. al, 2014). Hardwood species observed within this community type within the Project Corridor include red maple, green ash, American elm (*Ulmus americana*), gray birch, swamp white oak (*Quercus bicolor*) and white pine (*Pinus strobus*). Shrub species commonly observed include

dogwoods, gray birch, spicebush (*Ilex verticillata*), American elm and honeysuckle. The herbaceous layer typically includes sensitive fern, field horsetail, moneywort and young growth of the tree and shrub species. Invasive species primarily included honeysuckle and buckthorn.

4.1.4 Open Water

There is one small pond located along the Project Corridor adjacent to the railroad ROW. As previously noted, this open water community is identified as palustrine unconsolidated bottom (PUB). It is characterized by a vegetation cover of less than 30 percent, although emergent and shrubby vegetation borders the open water area.

4.2 HYDROLOGY

4.2.1 Streams

Table 4-2 lists the 17 streams (perennial (4), intermittent (13)) identified within the Project Corridor, which is located within the Lower Hudson Watershed. This watershed extends from the Battery at the southern end of Manhattan to the Troy Dam at the confluence of the Mohawk River. The basin is 12,800 square miles, most of which is within New York State (NYSDEC 2022). Perennial waterbodies within the Project Corridor include the Catskill Creek, Post Creek and Hans Vosenkill, as well as several unnamed tributaries identified on USGS Topographic Maps and/or identified during the field delineation.

4.2.2 Wetlands

Site hydrology was examined within each wetland and adjacent upland areas. Indicators of wetland hydrology included surface water (A1), high water table (A2), saturation (A3), water-stained leaves (B9), drainage patterns (B10), presence of reduced iron (C4), geomorphic position (D2), microtopographic relief (D4) and FAC-neutral test (D5) (Attachment 1). Hydrologic factors contributing to the presence of wetland hydrology within wetlands in the Project Corridor included inundation with pond or stream water, temporarily ponded runoff, and seasonally to permanently shallow groundwater tables.

Hydrology along the Project Corridor has been historically altered by road and railroad drainage ditches. These ditches were inspected for the presence or absence of wetland indicators and hydrologic connectivity to wetlands or streams. Ditches that met the three parameters for wetland delineation (i.e., presence of hydrology, hydric soils, and hydrophytic vegetation) were identified as a wetland community.

4.3 SOILS

The United States Department of Agriculture NRCS soil map units for the Project Corridor are provided in Attachment 3. Hydric soil indicators include depleted matrix (F3) and redox dark surface (F6) (Attachment 1). Within the Project Corridor, a total of 25 different soil types are mapped by the NRCS. The mapped soil types range from somewhat excessively drained to very poorly drained soils. According to the soil map descriptions (Attachment 3 and Attachment 4-Table 4-3), four (4) of the soils mapped within the Project Corridor are rated as hydric soils (Covington and Madalin soils, Fluvaquents-Udifluvents complex, frequently flooded, Medisaprist, inundated and Medisaprist-Hydraquents, tidal marsh). Hydric soils are defined as soils "that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil" (Federal Register, 1994). Table 4-3 summarizes the soil series in the Project Corridor and lists the soils that are classified as hydric (or associated with wetland hydrology) in the Project Corridor.

Many soils within the Project Corridor are formed from glacial parent materials including outwash, dense till, loose till, and glaciomarine deposits. In active floodplains, soils are formed in recent alluvium. Anthropogenically disturbed soils, associated with road and railroad construction and operation, are common within the Project Corridor. The disturbed soils consist of disturbed natural deposits or human transported materials.

4.4 NATURAL RESOURCE CONSERVATION SERVICE SOIL SERIES DESCRIPTIONS

The following are the abbreviated descriptions of each of the relevant soil types taken from the USDA Web Soil Survey (NRCS 2022). Soils survey mapping and additional information regarding relevant soil characteristics are provided in Attachment 3.

Covington & Madalin Series (Co)

The Covington soils are very deep and poorly drained soils formed in calcareous glaciolacustrine and estuarine clays on glacial lake plains. Slopes range from 0 to 8 percent. The A horizon consists of very dark brown silty clay with strong medium and coarse granular structure. The B horizon is dark gray to very dark gray clay with a weak to strong structure. The C horizon is dark gray clay with a weak to moderate structure.

The Madalin soils are very deep poorly drained soils formed in water deposited materials on lake plains and depressions in uplands. Slopes range from 0 to 3 percent. The A horizon is very dark gray silt loam with moderate medium subangular structure. The B horizon is dark grayish brown with a silty clay texture. The structure is weak subangular. The C horizon is grayish brown stratified silt to clay with moderate medium platy structure.

Fluvaquents (Fu)

These very deep, somewhat poorly drained to very poorly drained soils formed in material recently deposited by rivers and streams. These soils are found on the most actively flooded areas of floodplains along secondary and major streams. The slopes range from 0 to 3 percent. Little or no soil profile development is seen in Fluvaquents. The surface layer typically has a hue of 10YR through 5Y, with low value and chroma. The textures are loamy sand to silt loam and may be gravelly or very gravelly. The substratum typically has a hue of 10YR to 5Y with values of 3 through 6 and chroma of less than 2. The textures are sandy loam to silty clay loam and may be gravelly or very gravelly.

Farmington Series (FaC, FaD and FaE)

These shallow, well drained and somewhat excessively drained soils formed in till. Slopes range from 0 to 70 percent and bedrock is at a depth of 10 to 20 inches. The A horizon is dark grayish brown silt loam with moderate medium and fine granular structure. The B horizon is composed of a yellowish brown or brown silt loam to loam with weak or moderate, fine or medium subangular or granular structure. The R horizon is dominantly limestone, dolomite, or dolomitic limestone bedrock.

Hudson & Vergennes Series (HvB, HvC, HvE, HwC3 & HwD3)

The Hudson soils are very deep, moderately well drained soils formed in clayey and silty lacustrine sediments. These soils are in convex lake plains, dissected lower valley side slopes and rolling through hilly moraines. Slopes can range from 0 to 60 percent. The A horizon is brown silt loam with moderate medium granular structure. The E horizon, when present, is brown silt loam with weak thick platy structure. The B horizon is yellowish brown to brown silty clay with moderate very coarse prismatic structure. The C horizon is mixed grayish brown and light olive brown silty clay, with massive structure, or plate-like divisions.

The Vergennes soils are very deep, moderately well drained soils on glacial lake plains. These soils formed in calcareous estuarine and glaciolacustrine clays. Slopes range from 0 to 50 percent. The A horizon is dark grayish brown clay with weak medium and coarse subangular blocky structure. Occasionally, a clay, silty clay, silty clay loam, or silt loam E horizon is present. The B horizon is typically brown clay, with more dark grayish brown color with depth. The C horizon is generally clay with silt and silty clay varves.

Kingsbury & Rhinebeck Series (KrA & KrB)

Kingsbury soils are very deep, somewhat poorly drained soils formed in lacustrine or marine sediments. They are nearly level and gently sloping on lake plains. Slopes range from 0 to 8 percent slope. The A horizon is very dark grayish brown silty clay with strong medium granular structure. The E horizon is mixed brown and yellowish brown silty clay. The B horizon consists dark grayish brown clay angular or subangular blocky structure, within coarse or very coarse

prisms in some pedons. The C horizon generally has similar color to the deeper portions of the B horizon, although redoximorphic features generally have lower contrast. This horizon ranges from silty clay loam to clay, and has massive structure, which, when disturbed, can part into aggregates resembling very fine blocky structure.

Rhinebeck soils are very deep, somewhat poorly drained soils formed in clayey lacustrine sediments. They are found on glacial lake plains and uplands mantled with lake sediments. Slopes range from 0 to 15 percent. The A horizon is very dark grayish brownish silt loam with moderate medium granular structure. The B horizon is light olive brown silty clay or silty clay loam with moderate medium subangular blocky structure. The C horizon varies in texture and is massive or varved, or have very coarse prismatic structure in the upper part.

Nassau Series (NaC, NrC, NrD & NrE)

These shallow, somewhat excessively drained soils formed in channery till derived from acid shale and slate. They are nearly level to very steep soils that overlie shale bedrock. Slopes range from 0 to 70 percent. The A horizon is dark brown channery silt loam with weak fine granular structure. The B horizon is yellowish brown very channery silt loam with weak fine subangular blocky structure. The C horizon is greenish gray folded shale interbedded with red and green shale.

Riverhead Series (RhA, RhB, RhC & RhD)

These very deep, well drained soils formed in glacial outwash, deposits. They can be found on beaches, water-sorted moraines, valley trains and outwash plains. Slopes range from 0 to 50 percent. The A horizon is brown sandy loam with weak fine granular structure. The B horizon is strong brown to yellowish brown with a sandy loam to loamy sand texture, becoming gravelly with depth. The C horizon is yellowish brown, brown or very pale brown gravelly loamy sand or sand. It is structureless.

Tunkhannock and Chenango Series (TwE)

Tunkhannock soils are very deep, well to somewhat excessively drained soils. These soils formed in water-sorted glacial material derived from reddish sandstone, siltstone, and shale. Slope ranges

from 0 to 60 percent. The A horizon is brown gravelly loam with weak granular structure. The B horizon is brown or reddish brown gravelly loam. The C horizon is reddish brown extremely gravelly loamy sand and stratified loamy fine sand.

The Chenango soils are very deep, well and somewhat excessively well drained soils. These soils formed in water-sorted material on alluvial fans, kames, eskers, terraces and outwash plains. Slopes range for 0 to 60 percent. The A horizon is very dark grayish brown with weak fine and medium granular structure. The B horizon is dark yellowish brown to brown gravelly silt loam and the C horizon is dark grayish brown extremely gravelly loamy coarse sand.

Udorthents (Ur)

These are very deep, nearly level to gently sloping areas of well drained loamy soils that are a result of man-made cuts and fills in loamy upland soils. Slopes range from 0 to 8 percent. Typically, the surface layer is dark brown silt loam extending to 5 inches. Layers below the surface are brown and yellowish-brown silt loam containing up to 80 percent rock fragments to a depth of 72 inches or more.

5.0 SUMMARY

Wetlands identified along the Project Corridor include shallow emergent marsh, common reed marsh, shrub swamp and red maple-hardwood swamp. A small pond also occurs. Stream communities include artificial ditches, intermittent streams, and perennial streams. NYS freshwater wetland C-23 needs to be delineated when the access roads and staging areas are delineated, and may consist of freshwater tidal marsh and freshwater tidal swamp communities.

Land use in the Project Corridor is diverse, ranging from rural, agricultural, and forested areas to more developed areas such as the Town of Rotterdam. Because most of the Project Corridor consists of existing railroad and roadway corridors, many wetlands are characterized by previous anthropogenic disturbance and/or the presence of invasive plant species. The wetland boundaries abutting the rail or road are typically defined by the edge of the soil fill for the railroad and highway embankments.

Confirmation of the wetland boundaries are the responsibility of the involved regulatory agencies with jurisdiction over wetlands and waterbodies within this Phase of the overall project. As previously noted, wetlands within Segment 11-Package 7A Project Corridor are regulated by USACE (Section 10/404) and the NYSDEC (Article 24). Streams and other waterbodies are regulated by USACE (Section 10/404) and NYSDEC (Article 15). Based on review of the NYSDEC wetland mapping, three wetland areas are identified as regulated under Article 24. These wetlands correspond to two mapped wetland (HS-101 and C-23), and they are regulated by NYSDEC. It is anticipated that USACE will take jurisdiction over all the mapped wetlands within the Project Corridor and NYSDEC will take jurisdiction over the three wetlands associated with NYSDEC freshwater wetlands. Final jurisdictional determinations will be made by the respective agencies.

6.0 REFERENCES

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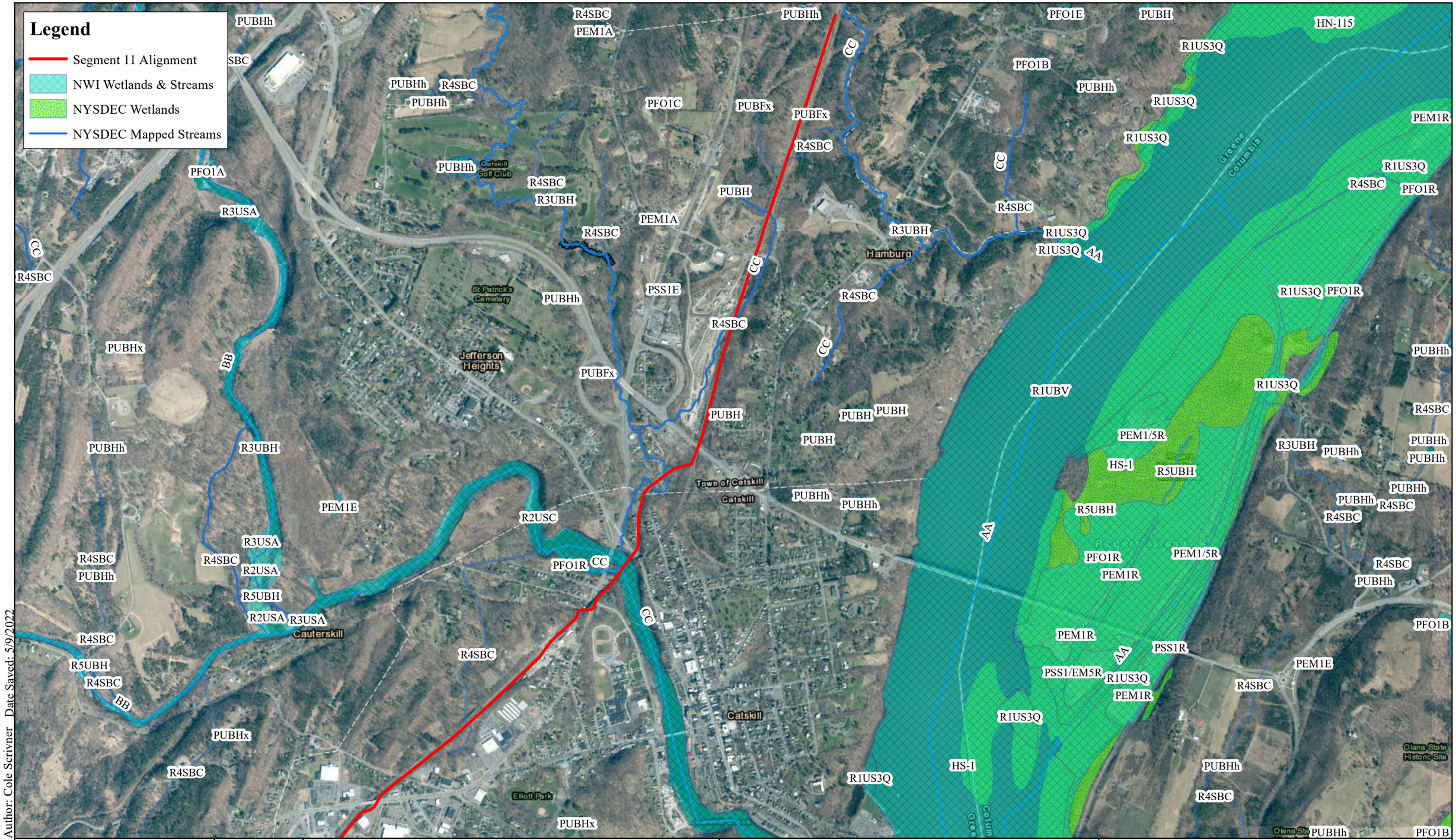
ATTACHMENT 1
WETLAND DETERMINATION DATA SHEETS AND WETLAND PHOTOGRAPHS

(Data Sheets Pending)

ATTACHMENT 2
NWI & NYSDEC WETLAND & STREAM MAPS



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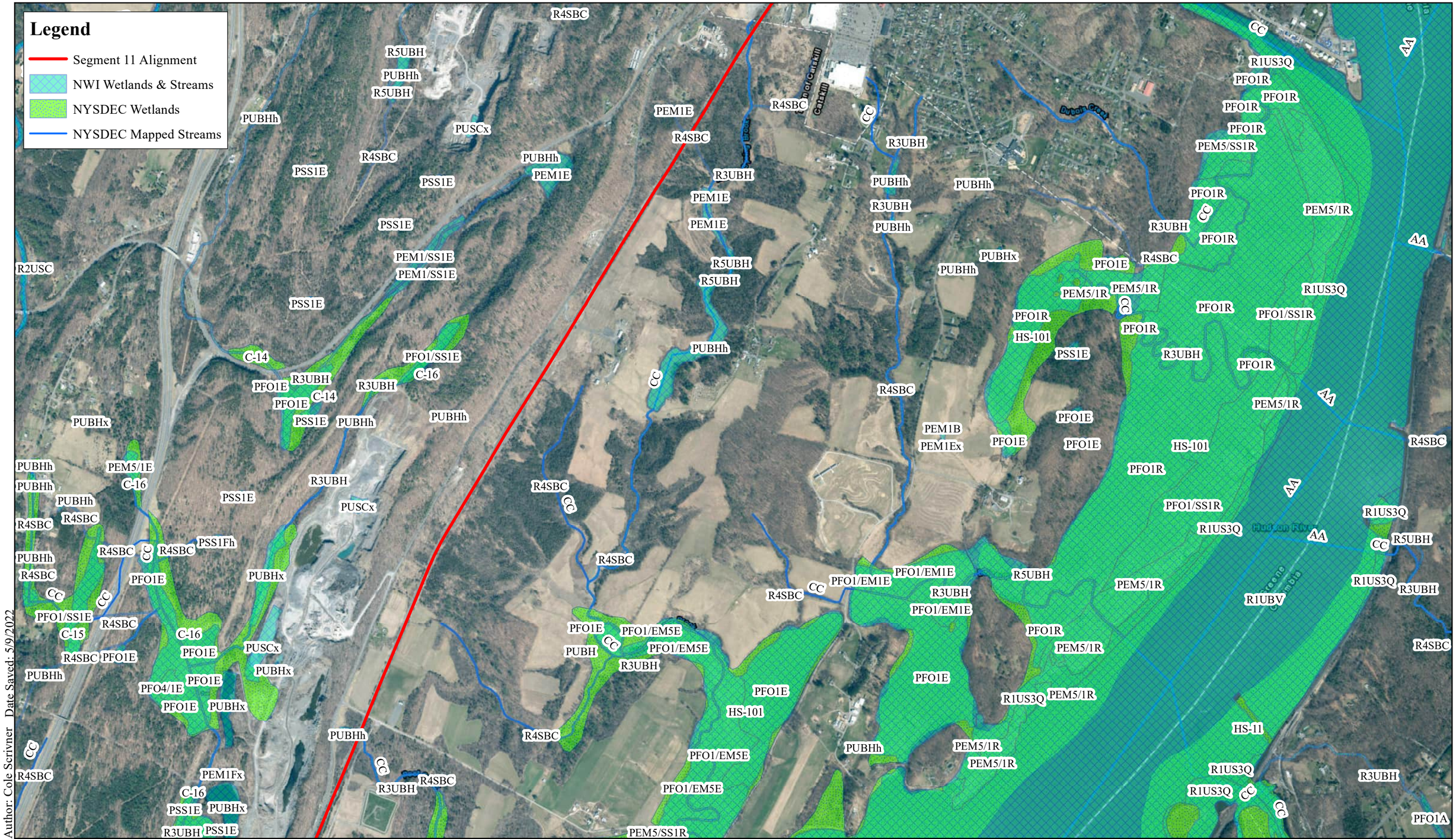
Champlain Hudson Power Express
Segment 11-Package 7A Wetland & Stream Map
(NWI and NYSDEC)

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community.
Wetland layers obtained from USFWS NWI and NYSDEC



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Champlain Hudson Power Express
Segment 11-Package 7A Wetland & Stream Map
(NWI and NYSDEC)

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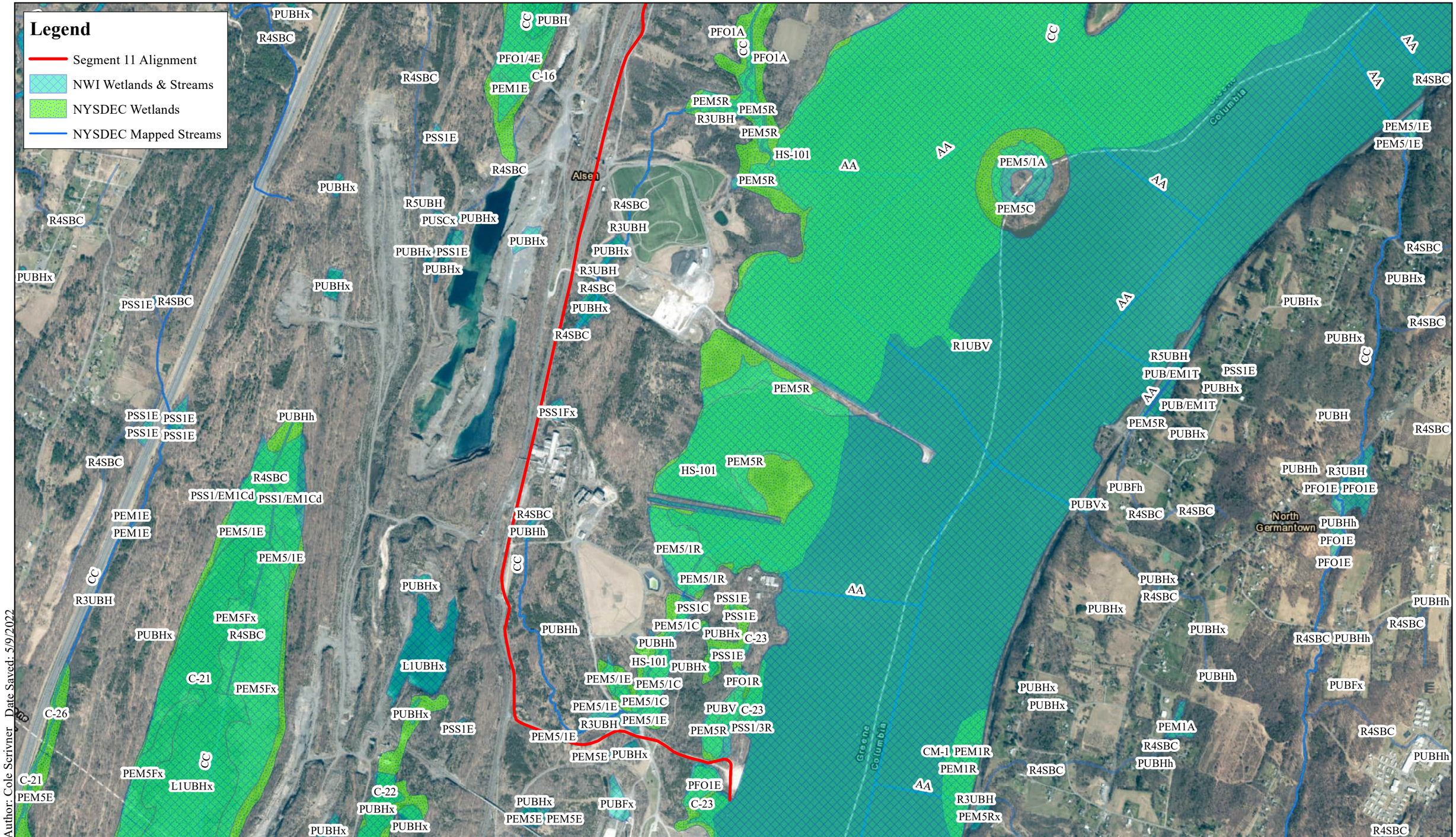

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ATTACHMENT 3
NRCS SOIL MAPS

Legend

Segment 11 Alignment

Greene County Soils (NY039)

- Co
- Fu
- HvB; HvC; HvE
- HwC3; HwD3
- KrA; KrB
- NaC
- NrC; NrD; NrE
- RhA; RhB; RhC; RhD
- TwE
- Ur
- W

Author: Cole Scrivner Date Saved: 5/9/2022

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Champlain Hudson Power Express
Segment 11-Package 7A NRCS Soil Map

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Soil data was obtained from the NRCS.

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Page 2 of 3

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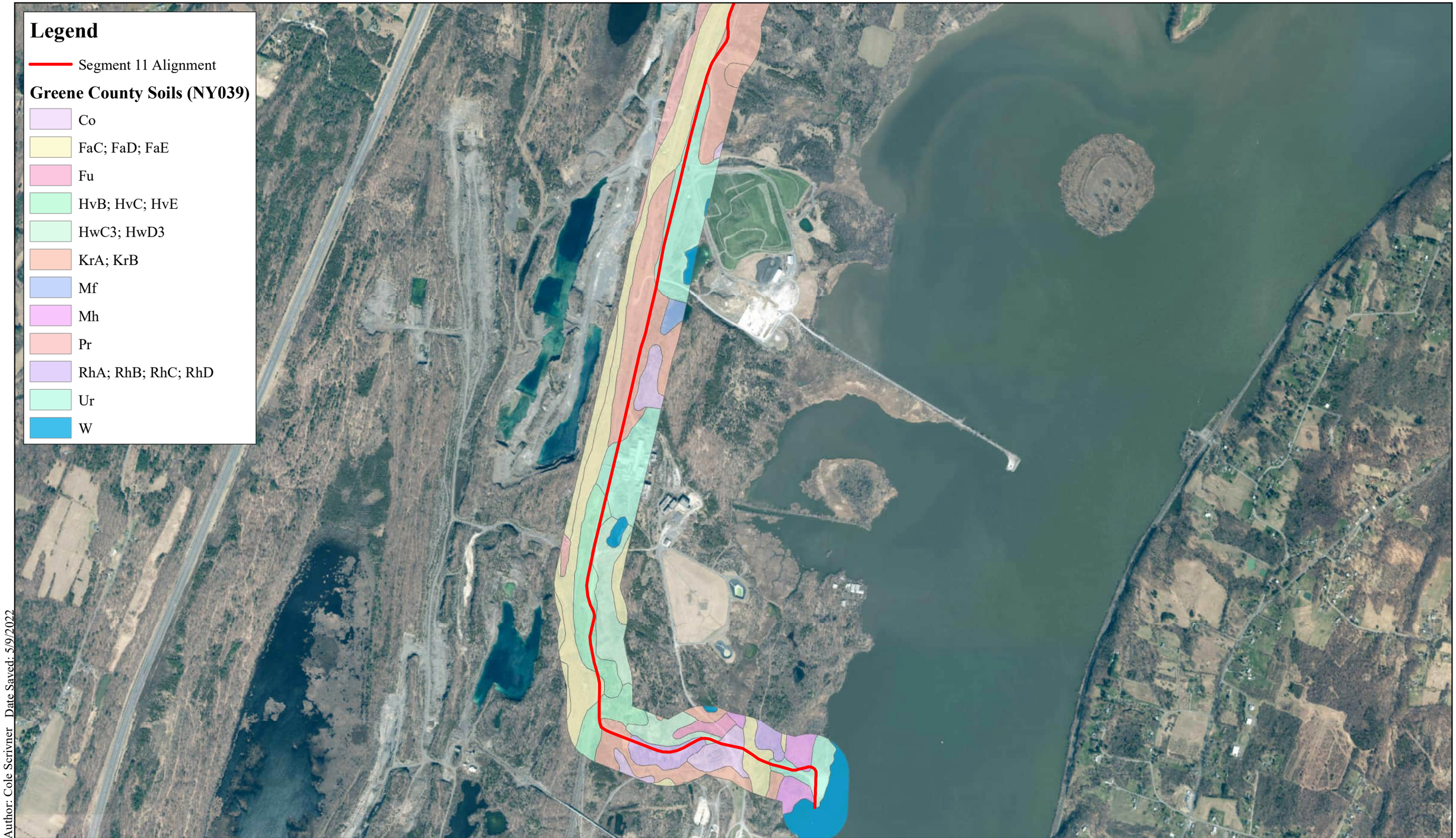
Champlain Hudson Power Express
Segment 11-Package 7A NRCS Soil Map

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Soil data was obtained from the NRCS.



Author: Cole Scrivner Date Saved: 5/9/2022

CHA

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0 0.5 1 Miles

Champlain Hudson Power Express
Segment 11-Package 7A NRCS Soil Map

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Soil data was obtained from the NRCS.

ATTACHMENT 4
TABLES

Table 4-1 Summary of Wetlands Within the Project Corridor[1]						
Approximate Station	**Wetland ID**	**Cowardin Classification[2]**	**Associated Water Course**	**Area w/in JD Limits Square Feet (sf)**	**USACE & NYSDEC Jurisdiction**	**Coordinates (lat., long)**
70018+00	FA-AP	PSS	Unnamed Tributary to Hudson River	3,119	USACE	42.242398, -73.860002
70022+00	FA-AO	PSS	Unnamed Tributary to Hudson River	30,821	USACE	42.241043, -73.860591
70030+00	FA-AN	PEM	Unnamed Tributary to Hudson River	66,879	USACE	42.23827, -73.861857
70044+00	AC	PFO	Unnamed Tributary to Hudson River (38)	23,599	USACE	42.235033, -73.863237
70066+00	BC	PEM	Unnamed Tributary to Hudson River	18,448	USACE	42.229184, -73.865645
70074+00	M-1	PEM	Hans Vosen Kill (S-3)	5,372	USACE	42.228397, -73.86697
70081+00	B	PFO	Hans Vosen Kill (S-3)	5,669	USACE	42.226976, -73.869171
70158+50	CC	PSS	Unnamed Tributary to Hudson River (42)	32,665	USACE	42.210904, -73.887281
70185+00	DC	PEM/PFO	Unnamed Tributary to Hudson River	11,727	USACE	42.204503, -73.892862
70204+00	EC	PEM	Unnamed Tributary to Hudson River	152,732	USACE	42.199067, -73.897135
70242+00	FC	PSS	Unnamed Tributary to Hudson River	113,040	USACE	42.189994, -73.904347
70281+00	GC	PEM	Post Creek (47)	109,847	USACE	42.179533, -73.910472
70309+00	HC	PEM	Unnamed Tributary to Hudson River	20,651	USACE	42.174732, -73.913022
70322+00	IC	PEM	Unnamed Tributary to Hudson River (49)	2,705	USACE	42.171447, -73.914034
70335+00	JC	PEM	Unnamed Tributary to Hudson River	43,313	USACE	42.167695, -73.915718
70346+00	KC	PEM	Unnamed Tributary to Hudson River (50)	210,876	USACE	42.161808, -73.917468
70388+00	LC	PEM/PFO	Unnamed Tributary to Hudson River	14,540	USACE	42.153977, -73.919912
70393+00	MC	PEM	Unnamed Tributary to Hudson River	43,664	USACE	42.15224, -73.920688

Table 4-1 Summary of Wetlands Within the Project Corridor[1]						
Approximate Station	**Wetland ID**	**Cowardin Classification[2]**	**Associated Water Course**	**Area w/in JD Limits Square Feet (sf)**	**USACE & NYSDEC Jurisdiction**	**Coordinates (lat., long)**
70399+00	O-1	PSS	Unnamed Tributary to Hudson River	7,820	USACE	42.15086, -73.920742
70435+00	P-1	PEM	Unnamed Tributary to Hudson River	15,205	USACE	42.145868, -73.913472
70438+50	E	PEM	Unnamed Tributary to Hudson River	6,434	USACE	42.14562, -73.912571
70439+00	NYS FWW HS-101	PEM	Unnamed Tributary to Hudson River	807	USACE NYSDEC (HS-101)	42.14566, -73.912218
70448+00	NYS FWW C-23	PEM5R & PSS1/3R	Hudson River	31,717	USACE NYSDEC (C-23)	42.14452, -73.9092

[1] Wetlands identified include both wetlands that are directly crossed by the overland transmission cable corridor as well as wetlands that are adjacent to the Project Corridor that were delineated during field surveys.

[2]Cowardin et al. 1979 categories include: Palustrine Emergent (PEM), Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS) and palustrine unconsolidated bottom (PUB).

Table 4-2 Summary of Waterbodies within the Project Corridor									
Approximate Station	**Waterbody Name**	**NYSDEC Classification**	**Waterbody Field ID**	**Flow Status**	**Substrate**	**Width (ft.)[1]**	**Depth (ft.)[1]**	**Length w/in JD Boundary**	**Coordinates (lat., long)**
70006+25	Unnamed Tributary to Hudson River	Unmapped	FA-S-AQ	Intermittent	Cobble-gravel/silt	9	0.5	81	42.245593, -73.858556
70047+50	Unnamed Tributary to Hudson River	C/C	38	Intermittent	-	-	-	146	42.235001, -73.863301
70061+00	Unnamed Tributary to Hudson River	C/C	39	Intermittent	-	-	-	339	42.231649, -73.864851
70075+00	Unnamed Tributary to Hudson River	Unmapped	S-2	Intermittent	-	-	-	155	42.228292, -73.864851
70076+50	Hans Vosen Kill	C/C	S-3 (Hans Vosen Kill)	Perennial	-	15	3	146	42.228006, -73.867619
70079+00	Hans Vosen Kill	C/C	156	Perennial					42.227506, -73.868409
70092+00	Catskill Creek	C/C	Catskill Creek	Perennial	-	350	-	219	42.224215, -73.869898
70125+75	Unnamed Tributary to Hudson River	Unmapped	41	Intermittent	-	-	-	144	42.216239, -73.88067
70155+00	Unnamed Tributary to Hudson River	C/C	42	Perennial	-	-	-	173	42.210888, -73.887398
70223+45	Unnamed Tributary to Hudson River	Unmapped	43	Intermittent	-	-	-	71	42.196194, -73.899554
70246+40	Unnamed Tributary to Hudson River	Unmapped	44	Intermittent	-	-	-	45	42.190882, -73.903962

70261+35	Unnamed Tributary to Hudson River	Unmapped	45	Intermittent	-	-	-	81	42.18715, -73.906231
70278+00	Unnamed Tributary to Hudson River	Unmapped	46	Intermittent	-	-	-	217	42.182855, -73.90869
70279+50	Post Creek	C/C	47	Perennial	-	-	-	127	42.182438, -73.908918
70283+00	Unnamed Tributary to Hudson River	Unmapped	47A	Intermittent	-	-	-	283	42.181531, -73.909288
70303+00	Unnamed Tributary to Hudson River	Unmapped	48	Intermittent	-	-	-	301	42.176197, -73.912254
70324+50	Unnamed Tributary to Hudson River	Unmapped	49	Intermittent	-	-	-	134	42.171095, -73.914279
70353+70	Unnamed Tributary to Hudson River	Unmapped	50	Intermittent	-	-	-	78	42.163369, -73.916965

[1] Bankfull width and bankfull depth measurements are approximate.

Table 4-3 Soil Description Summary					
County	**Soil Name**	**Symbol**	**% Slopes**	**Hydric (y/n)**	**Drainage Class**
Hydric Soils					
Greene	Covington and Madalin soils	Co	0-3	Y	Poorly Drained
Greene	Fluvaquents-Udifluvents complex, frequently flooded	Fu	0-3	Y	Poorly Drained
Greene	Medisaprist, inundated	Mf	0-1	Y	Very Poorly Drained
Greene	Medisaprist-Hydraquents, tidal marsh	Mh	0-1	Y	Very Poorly Drained
Non-hydric Soils					
Greene	Farmington gravelly silt loam, rolling, rocky	FaC	8-15	N	Well Drained
Greene	Farmington gravelly silt loam, hilly, rocky	FaD	15-25	N	Well Drained
Greene	Farmington gravelly silt loam, steep, rocky	FaE	15-25	N	Somewhat Excessively Drained
Greene	Hudson and Vergennes soils	HvB	3-8	N	Moderately Well Drained
Greene	Hudson and Vergennes soils	HvC	8-15	N	Moderately Well Drained
Greene	Hudson and Vergennes soils	HvE	25-50	N	Moderately Well Drained
Greene	Hudson and Vergennes silty clay loams	HwC3	8-15	N	Moderately Well Drained
Greene	Hudson and Vergennes silty clay loams	HwD3	15-25	N	Moderately Well Drained
Greene	Kingsbury and Rhinebeck soils	KrA	0-3	N	Somewhat Poorly Drained
Greene	Kingsbury and Rhinebeck soils	KrB	3-8	N	Somewhat Poorly Drained
Greene	Nassau channery silt loam, rolling	NaC	5-15	N	Somewhat Excessively Drained
Greene	Nassau channery silt loam, rolling, very rocky	NrC	8-15	N	Somewhat Excessively Drained
Greene	Nassau channery silt loam, hilly, very rocky	NrD	15-25	N	Somewhat Excessively Drained

Table 4-3 Soil Description Summary					
County	**Soil Name**	**Symbol**	**% Slopes**	**Hydric (y/n)**	**Drainage Class**
Greene	Nassau channery silt loam, steep, very rocky	NrE	25-45	N	Somewhat Excessively Drained
Greene	Pits, quarry	Pr	-	-	-
Greene	Riverhead loam	RhA	0-3	N	Well Drained
Greene	Riverhead loam	RhB	3-8	N	Well Drained
Greene	Riverhead loam, rolling	RhC	8-15	N	Well Drained
Greene	Riverhead loam, hilly	RhD	15-25	N	Well Drained
Greene	Tunkhannock and Chenango gravelly loams	TwE	25-50	N	Well Drained
Greene	Udorthents, loamy	Ur	0-8	N	Somewhat Excessively Drained

ATTACHMENT 5
WETLANDS AND WATERBODIES DELINEATION MAPPING

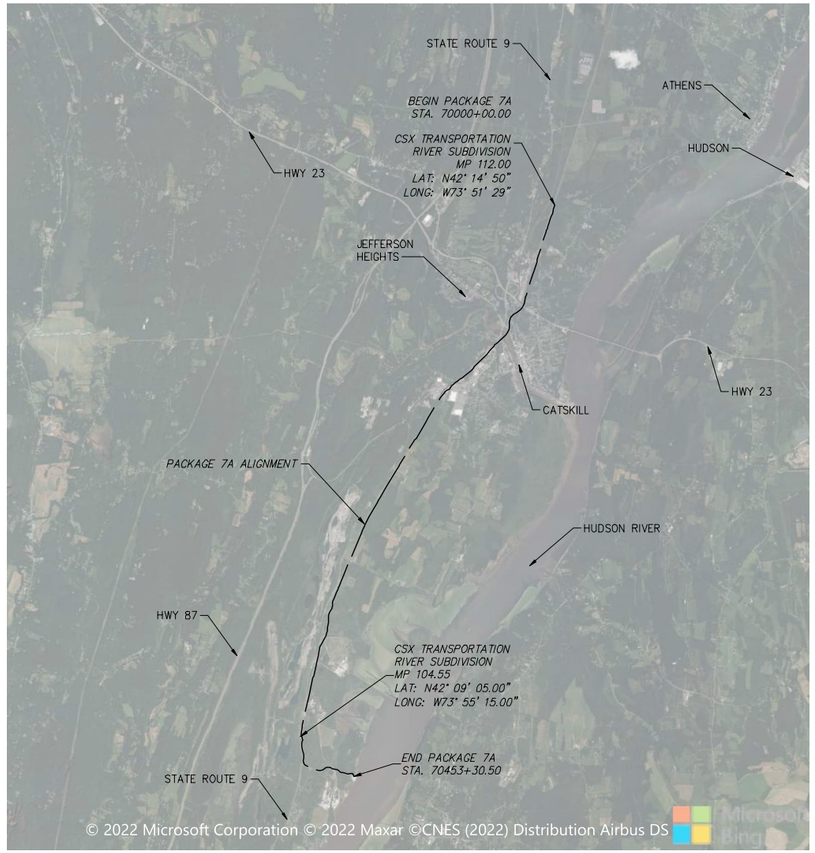
(Cementon Transitional HDD Project Area Plans Only)

CHAMPLAIN HUDSON POWER EXPRESS

SEGMENT 11 - (PACKAGE 7A) - CSX: CATSKILL

GREENE COUNTY, NEW YORK

INTERIM DESIGN DEVELOPMENT PLANS



SITE LOCATION MAP
SCALE: 1" = 5000'

NOTES TO REVIEWERS

1. Supplemental topographic information for numerous areas including Temp Site Access Roads is in the process of being obtained. Utility, Right-of-Way, and Wetland information from the beginning of Package 7A to Sta. 70030+00 is not currently available and is in the process of being obtained.

2. The design of the Horizontal Directional Drill (HDD) alignments and locations is in progress and should be considered preliminary.

3. Permanent and Temporary. Easements are preliminary (in some cases approximate) and are shown to indicate potential and likely areas where easements may be required.

CHPE Champlain Hudson Power Express

Kiewit

TETRA TECH

TETRA TECH ENGINEERING AND SURVEYING P.C.
(A NEW YORK PROFESSIONAL CORPORATION)

No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
D	05/19/2022	ISSUED FOR INTERIM REVIEW	RB	EK
C	03/22/2022	PRELIMINARY DESIGN DEVELOPMENT	BV	TK
B	03/04/2022	PRELIMINARY DESIGN DEVELOPMENT IDR-CR	BV	TK
A	02/14/2022	PRELIMINARY PROGRESS	BV	TK

CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL
COVER SHEET

DRAWN BY: RB | DESIGNED BY: AC | APPROVED BY: EJK | SCALE AS SHOWN | REV. NO. D

KIEWIT PROJECT NO.	21162
TT PROJECT NO.	204-3701
DRAWING NO.	**G-000**
DATE	05/19/2022
SH.NO.	1 OF 66

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
PACKAGE 7A: GENERAL SHEETS	
G-000	COVER SHEET
G-001	SHEET INDEX
G-002	GENERAL NOTES
G-003	LEGEND, & ABBREVIATIONS
G-004	PLAN AND PROFILE KEY MAP
G-005	SPLICE LOCATION TABLE AND SURVEY NOTES
PACKAGE 7A: PLAN AND PROFILE SHEETS	
C-101	STA. 70000+00.00 TO STA. 70015+00.00 PLAN AND PROFILE
C-102	STA. 70015+00.00 TO STA. 70030+00.00 PLAN AND PROFILE
C-103	STA. 70030+00.00 TO STA. 70045+00.00 PLAN AND PROFILE
C-104	STA. 70045+00.00 TO STA. 70060+00.00 PLAN AND PROFILE
C-105	STA. 70060+00.00 TO STA. 70075+00.00 PLAN AND PROFILE
C-106	STA. 70075+00.00 TO STA. 70090+00.00 PLAN AND PROFILE
C-107	STA. 70090+00.00 TO STA. 70105+00.00 PLAN AND PROFILE
C-108	STA. 70105+00.00 TO STA. 70120+00.00 PLAN AND PROFILE
C-109	STA. 70120+00.00 TO STA. 70135+00.00 PLAN AND PROFILE
C-110	STA. 70135+00.00 TO STA. 70150+00.00 PLAN AND PROFILE
C-111	STA. 70150+00.00 TO STA. 70165+00.00 PLAN AND PROFILE
C-112	STA. 70165+00.00 TO STA. 70180+00.00 PLAN AND PROFILE
C-113	STA. 70180+00.00 TO STA. 70195+00.00 PLAN AND PROFILE
C-114	STA. 70195+00.00 TO STA. 70210+00.00 PLAN AND PROFILE
C-115	STA. 70210+00.00 TO STA. 70225+00.00 PLAN AND PROFILE
C-116	STA. 70225+00.00 TO STA. 70240+00.00 PLAN AND PROFILE
C-117	STA. 70240+00.00 TO STA. 70255+00.00 PLAN AND PROFILE
C-118	STA. 70255+00.00 TO STA. 70270+00.00 PLAN AND PROFILE
C-119	STA. 70270+00.00 TO STA. 70285+00.00 PLAN AND PROFILE
C-120	STA. 70285+00.00 TO STA. 70300+00.00 PLAN AND PROFILE
C-121	STA. 70300+00.00 TO STA. 70315+00.00 PLAN AND PROFILE
C-122	STA. 70315+00.00 TO STA. 70330+00.00 PLAN AND PROFILE
C-123	STA. 70330+00.00 TO STA. 70345+00.00 PLAN AND PROFILE
C-124	STA. 70345+00.00 TO STA. 70360+00.00 PLAN AND PROFILE
C-125	STA. 70360+00.00 TO STA. 70375+00.00 PLAN AND PROFILE
C-126	STA. 70375+00.00 TO STA. 70390+00.00 PLAN AND PROFILE
C-127	STA. 70390+00.00 TO STA. 70405+00.00 PLAN AND PROFILE
C-128	STA. 70405+00.00 TO STA. 70420+00.00 PLAN AND PROFILE
C-129	STA. 70420+00.00 TO STA. 70435+00.00 PLAN AND PROFILE
C-130	STA. 70435+00.00 TO STA. 70450+00.00 PLAN AND PROFILE
C-131	STA. 70450+00.00 TO STA. 70453+30.43 PLAN AND PROFILE

PACKAGE 7A: ACCESS AND PROTECTION OF TRAFFIC PLANS	
C-501	WORK ZONE TRAFFIC CONTROL NOTES LEGEND AND ABBREVIATIONS
C-502	WORK ZONE TRAFFIC CONTROL
C-503	WORK ZONE TRAFFIC CONTROL
C-504	WORK ZONE TRAFFIC CONTROL
C-505	WORK ZONE TRAFFIC CONTROL
C-506	WORK ZONE TRAFFIC CONTROL
PACKAGE 7A: HDD TRENCHLESS PLANS	
C-312	PROPOSED PLAN AND PROFILE HDD 112
C-312.2	PROPOSED PLAN AND PROFILE HDD 112.2
C-313	PROPOSED PLAN AND PROFILE HDD 113
C-313.2	PROPOSED PLAN AND PROFILE HDD 113.2
C-314	PROPOSED PLAN AND PROFILE HDD 114
C-314.2	PROPOSED PLAN AND PROFILE HDD 114.2
C-315 P1	PROPOSED PLAN AND PROFILE HDD 115 PAGE 1
C-315 P2	PROPOSED PLAN AND PROFILE HDD 115 PAGE 2
C-315.2 P1	PROPOSED PLAN AND PROFILE HDD 115.2 PAGE 1
C-315.2 P2	PROPOSED PLAN AND PROFILE HDD 115.2 PAGE 2
C-317	PROPOSED PLAN AND PROFILE HDD 117
C-317.2	PROPOSED PLAN AND PROFILE HDD 117.2
C-318	PROPOSED PLAN AND PROFILE HDD 118
C-318.2	PROPOSED PLAN AND PROFILE HDD 118.2
C-319	PROPOSED PLAN AND PROFILE HDD 119
C-319.2	PROPOSED PLAN AND PROFILE HDD 119.2
C-320	PROPOSED PLAN AND PROFILE HDD 120
C-320.2	PROPOSED PLAN AND PROFILE HDD 120.2
C-322	PROPOSED PLAN AND PROFILE HDD 122
C-322.2	PROPOSED PLAN AND PROFILE HDD 122.2
C-323 P1	PROPOSED PLAN AND PROFILE HDD 123 PAGE 1
C-323 P2	PROPOSED PLAN AND PROFILE HDD 123 PAGE 2
C-323.2 P1	PROPOSED PLAN AND PROFILE HDD 123.2 PAGE 1
C-323.2 P2	PROPOSED PLAN AND PROFILE HDD 123.2 PAGE 2
PACKAGE 7A: EROSION AND SEDIMENT CONTROL PLANS	
C-401	STA. 70000+00 TO STA. 70030+00
C-402	STA. 70030+00 TO STA. 70060+00
C-403	STA. 70060+00 TO STA. 70090+00
C-404	STA. 70090+00 TO STA. 70120+00
C-405	STA. 70120+00 TO STA. 70150+00
C-406	STA. 70150+00 TO STA. 70180+00
C-407	STA. 70180+00 TO STA. 70210+00
C-408	STA. 70210+00 TO STA. 70240+00
C-409	STA. 70240+00 TO STA. 70270+00
C-410	STA. 70270+00 TO STA. 70300+00
C-411	STA. 70300+00 TO STA. 70330+00
C-412	STA. 70330+00 TO STA. 70360+00
C-413	STA. 70360+00 TO STA. 70390+00
C-414	STA. 70390+00 TO STA. 70420+00
C-415	STA. 70420+00 TO STA. 70450+00
C-416	STA. 70450+00 TO STA. 70453+50
PACKAGE 7A: DETAILS	
S-700	SPLICE VAULT PLAN & ELEVATION
S-701	SPLICE VAULT SECTION & DETAILS
S-710	LINK BOX HANDHOLE PLAN ELEVATION & SECTION
S-720	SELF SUPPORTING STRUCTURE OVER UTILITIES
S-730	TRANSITION VAULT PLAN & ELEVATION
S-731	TRANSITION VAULT SECTION DETAILS
S-770	COMMUNICATION HANDHOLE PLAN ELEVATION & SECTION
C-801	POLE MARKING DETIALS
PACKAGE 7A: ACCESS ROAD PLANS	
C-201	ACCESS ROADS OFF W. BRIDGE ST.
C-202	ACCESS ROADS OFF RTE 9W
C-203	ACCESS ROAD STA 7037+00 TO STA 70391+00

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CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL
SHEET INDEX

DRAWN BY: RB | DESIGNED BY: AC | APPROVED BY: EK | SCALE AS SHOWN | REV. NO. D

KIEWIT PROJECT NO.	21162
TT PROJECT NO.	204-3701
DRAWING NO.	G-001
DATE	05/19/2022
SH.NO.	2 OF 66

GENERAL NOTES:

1. THE PLANS SHOW SUBSURFACE STRUCTURES, ABOVE GROUND STRUCTURES AND/OR UTILITIES FROM FIELD LOCATION AND RECORD MAPPING, EXACT LOCATION OF WHICH MAY VARY FROM THE LOCATIONS INDICATED. IN PARTICULAR, THE CONTRACTOR IS WARNED THAT THE EXACT OR EVEN APPROXIMATE LOCATION OF SUCH PIPELINES, SUBSURFACE STRUCTURES AND/OR UTILITIES IN THE AREA MAY BE DIFFERENT FROM THAT SHOWN OR MAY NOT BE SHOWN, AND IT SHALL BE HIS RESPONSIBILITY TO PROCEED WITH GREAT CARE IN EXECUTING ANY WORK. 48 HOURS BEFORE YOU DIG, DRILL, OR BLAST, CALL U.F.P.O. 1-(800)-962-7962 TOLL FREE.

2. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY CONDITIONS THAT VARY FROM THOSE SHOWN ON THE PLANS. THE CONTRACTOR'S WORK SHALL NOT VARY FROM THE PLANS WITHOUT THE EXPRESSED APPROVAL OF THE ENGINEER.

3. THE CONTRACTOR SHALL RESTORE LAWNS, DRIVEWAYS, CULVERTS, SIGNS AND OTHER PUBLIC OR PRIVATE PROPERTY DAMAGED OR REMOVED TO AT LEAST AS GOOD A CONDITION AS BEFORE BEING DISTURBED AS DETERMINED BY THE ENGINEER.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND INCURRING THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES, ETC. AND SHALL COMPLY WITH ALL REQUIRED PERMITS.

5. ALL WORK SHALL BE DONE IN STRICT COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES, STANDARDS, ORDINANCES, RULES, AND REGULATIONS.

6. ALL PROPOSED UTILITIES AND APPURTENANCES TO BE CONSTRUCTED IN COMPLIANCE WITH THE LOCAL MUNICIPALITIES' CODES AND REGULATIONS GOVERNING THE INSTALLATION OF SUCH UTILITIES.

7. THE ENGINEER RESERVES THE RIGHT TO EXAMINE ANY WORK DONE ON THIS PROJECT AT ANY TIME TO DETERMINE THE CONFORMANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS OF THIS PROJECT.

8. THE CONTRACTOR SHALL PROTECT EXISTING PROPERTY LINE MONUMENTATION. ANY MONUMENTATION DISTURBED OR DESTROYED, AS JUDGED BY THE ENGINEER OR OWNER, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE UNDER THE SUPERVISION OF A NEW YORK STATE LICENSED LAND SURVEYOR.

9. IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE ALL PLAN SHEETS AND COORDINATE WORK WITH ALL OTHER CONTRACTS FOR THE SITE.

10. THE CONTRACTOR SHALL:

    A. VERIFY ALL CONDITIONS IN THE FIELD PRIOR TO COMMENCEMENT OF WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
    B. EXAMINE THE SITE AND INCLUDE IN HIS WORK THE EFFECT OF ALL EXISTING CONDITIONS ON THE WORK.
    C. PROVIDE AND INSTALL ALL MATERIALS AND PERFORM ALL WORK IN ACCORDANCE WITH RECOGNIZED GOOD STANDARD PRACTICE.

11. ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS OF NEW YORK STATE INDUSTRIAL CODE RULE 23 AND OSHA REGULATIONS FOR CONSTRUCTION. SHEET PILING SHALL BE DESIGNED AND SEALED BY A NEW YORK STATE PROFESSIONAL ENGINEER.

12. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK AND SHALL SUBMIT A DEWATERING PLAN DESIGNED AND SEALED BY A NEW YORK STATE PROFESSIONAL ENGINEER. CONTRACTOR SHALL MAINTAIN EXISTING SITE DRAINAGE PATTERNS THROUGHOUT CONSTRUCTION UNLESS OTHERWISE SHOWN ON THE PLANS.

13. MAINTAIN FLOW FOR ALL EXISTING UTILITIES.

14. ALL FRAMES/COVERS WITHIN PAVED AREAS SHALL HAVE THE TOPS SET FLUSH WITH THE EXISTING PAVEMENT GRADE. IN LANDSCAPED AREAS, ALL FRAMES SHALL BE 0.1' ABOVE GRADE.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL FIELD LAYOUT. THE CONTRACTOR SHALL TAKE TIES TO ALL UTILITY CONNECTIONS AND PROVIDE MARKED-UP AS-BUILT PLANS FOR ALL UTILITIES SHOWING TIES TO CONNECTIONS, BENDS, VALVES, LENGTHS OF LINES, AND INVERTS. AS-BUILT PLANS SHOWING ALL UNDERGROUND UTILITIES INSTALLED OR ENCOUNTERED SHALL BE REVIEWED BY THE OWNER AND HIS REPRESENTATIVES. THE CONTRACTOR SHALL PROVIDE ANY CORRECTION OR ADMISSIONS TO THE SATISFACTION OF THE OWNER AND HIS REPRESENTATIVES BEFORE UTILITIES WILL BE ACCEPTED.

16. TEMPORARY PAVEMENT SHALL BE PLACED WITHIN 48 HOURS OF COMPLETION OF BACKFILL OPERATIONS WITHIN THE EXISTING PAVEMENT LIMITS.

17. CONTRACTOR SHALL MAINTAIN ALL TRAFFIC IN ALL AREAS IN ACCORDANCE WITH THE NYSDOT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

18. ALL EXCAVATIONS SHALL BE PROTECTED AT THE END OF EACH WORK DAY.

19. CONTRACTOR SHALL TAKE CARE TO PREVENT DAMAGE TO EXISTING UTILITIES. DAMAGED UTILITIES SHALL BE IMMEDIATELY REPAIRED BY CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

20. THE MINIMUM BENDING RADIUS OF CONDUITS WITHIN THE DUCT BANK SHALL BE 400 FEET, EXCEPT AS OTHERWISE NOTED ON THE DRAWINGS. ALL BENDS OF RADII LESS THAN 100 FEET SHALL BE FACTORY FORMED AND MANDREL TESTED PRIOR TO CONCRETE ENCASEMENT. CONDUIT SHALL NOT BE FIELD BENT BY HEATING, WITHOUT ENGINEER APPROVAL. FIELD BENT CONDUIT SHALL BE MANDREL TESTED PRIOR TO INSTALLATION AND PRIOR TO ENCASEMENT.

Dig Safely. New York. Call 811 before you dig

CHPE Champlain Hudson Power Express

Kiewit

TETRA TECH

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A	02/14/2022	PRELIMINARY PROGRESS	BV	TK

CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL
GENERAL NOTES

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KIEWIT PROJECT NO. 21162
TT PROJECT NO. 204-3701
DRAWING NO. G-002
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LEGEND

- CL OF TRENCH/CONDUITS
- PROPOSED TEMP ACCESS RD OR OFF-SITE ACCESS RD
- PROPOSED TEMP OFF-SITE ACCESS ROUTE (EXISTING ROAD OR PAVEMENT)
- PROPOSED LAYDOWN YARDS, PARKING, STORAGE, AND MUSTER AREAS
- PROPOSED WORK AREAS
- LIMITS OF WORK
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- RAILROAD TRACK
- 7' FOUL ZONE: NO VEHICLES, MATERIALS, DISTURBANCE, PERSONNEL, OR WORK SHALL ENCROACH THE ZONE WITHIN 7 FEET OF THE NEAREST RAIL WITHOUT CSX COORDINATION AND APPROVAL
- WETLAND BOUNDARY
- RIGHT OF WAY
- FIBER OPTIC LINE
- GAS LINE
- UNDERGROUND STORM
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC

WETLAND COMMUNITY TYPES LEGEND

- PEM – PALUSTRINE EMERGENT
- PSS – PALUSTRINE SCRUB-SHRUB
- PFO – PALUSTRINE FORESTED
- PUB – PALUSTRINE UNCONSOLIDATED BOTTOM
- L1 – LACUSTRINE LIMNETIC
- L2 – LACUSTRINE LITTORAL
- NYSDEC FWW 100-FOOT ADJACENT AREA
- GIS – WETLAND
- JD BOUNDARY

- HYD – HYDRANT
- WV – WATER VALVE
- WATER MARK – WATER MARKER
- CB – CATCH BASIN
- ST – MANHOLE STORM
- SS – MANHOLE SANITARY
- ELEC MARK – ELECTRIC MARKER
- POLE – UTILITY POLE
- FIBER BOX – FIBER BOX
- FIBER MARK – FIBER OPTIC
- P – TELEPHONE PEDESTAL
- CAPPED IRON ROD – CAPPED IRON ROD
- IRON PIPE
- CONCRETE BOUND
- POST – POST
- XX-## – WETLAND FLAG
- GAS MARK – GAS
- VENT GAS – VENT GAS
- BORE HOLE

ABBREVIATIONS

APP	APPROVED
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
DB	DESIGNED BY
DEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DEG|	DEGREES
DR	DRIVE
DZ	DEVIATION ZONE
E	EASTING
ELECTRIC	ELECTRIC CABLE
ELEV	ELEVATION
FIBER	FIBER OPTIC CABLE
FT	FEET
GAS	GAS PIPE
H	HORIZONTAL
HDD	HORIZONTAL DIRECTIONAL DRILLING
HVDC	HIGH-VOLTAGE DIRECT CURRENT TRANSMISSION LINE
INV	INVERT ELEVATION
LOD	LIMITS OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
N	NORTHING
NO	NUMBER
NY	NEW YORK
P#	PACKAGE #
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
REV	REVISION
ROW	RIGHT-OF-WAY
RTE	ROUTE
SEWER	SANITARY SEWER PIPE
SH	SHEET
ST	STREET
STA	STATION
STORM	STORM DRAIN PIPE
TELECOM	TELECOMMUNICATIONS CABLE
TEMP	TEMPORARY
TYP	TYPICAL
V	VERTICAL
WATER	WATERLINE

WILLIAMS AERIAL & MAPPING, INC.
MAPPING FEATURES LEGEND

TRANSPORTATION

- BRIDGE DECK
- PAVED DRIVEWAY
- UNPAVED DRIVEWAY
- PAVED PARKING
- UNPAVED PARKING
- ABANDONDED ROAD
- CURBED ROAD
- PAVED ROAD
- UNPAVED ROAD
- RAILROAD
- INACTIVE RAILROAD
- RAILROAD SWITCH/BOX/SIGNAL/POLE
- PAVED SHOULDER
- UNPAVED SHOULDER
- SIDEWALK
- TRAIL

UTILITIES

- ANTENNA
- UTILITY BOX
- CATCH BASIN
- HANDHOLE
- FIRE HYDRANT
- LIGHT POLE
- MANHOLE
- MISCELLANEOUS POLE
- PIPELINE
- UTILITY POLE
- GUYWIRE

STRUCTURES

- BUILDING
- RUIN
- TANK
- CONCRETE
- CONCRETE SPILLWAY
- DECK
- DOCK
- FENCE
- FENCE, OBSCURED/INDEFINTE
- RAILING
- GIRDER BRIDGE FRAME
- GIRDER BRIDGE PILING
- GUARDRAIL
- MAILBOX
- MISCELLANEOUS OVERHEAD
- MISCELLANEOUS
- PATIO
- PEDESTAL
- PLANTER
- PLATFORM
- POOL
- POST
- SATELLITE DISH
- SIGN
- STEPS
- STONEWALL
- WALL
- RETAINING WALL

TOPOGRAPHY

- CONTOUR, INDEX
- CONTOUR, DEPRESSION INDEX
- CONTOUR, INTERMEDIATE
- CONTOUR, DEPRESSION INTERMEDIATE
- SPOT ELEVATION

CULTURAL

- DEBRIS
- FIELD LINE
- LANDSCAPE AREA
- PILE
- STORAGE AREA

HYDROGRAPHIC

- HYDROGRAPHIC
- CULVERT
- CULVERT, OBSCURED
- INUNDATED AREA
- RIP-RAP
- STREAM
- SWAMP
- WATER LEVEL

NATURAL

- BOULDER
- SCRUB
- TREE LINE
- SINGLE TREE/BUSH

PROJECT

- MAPPING BOUNDARY
- GROUND CONTROL

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A	02/14/2022	PRELIMINARY PROGRESS	BV	TK

CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL
LEGEND & ABBREVIATIONS

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21162	
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G-003	
DATE	05/19/2022
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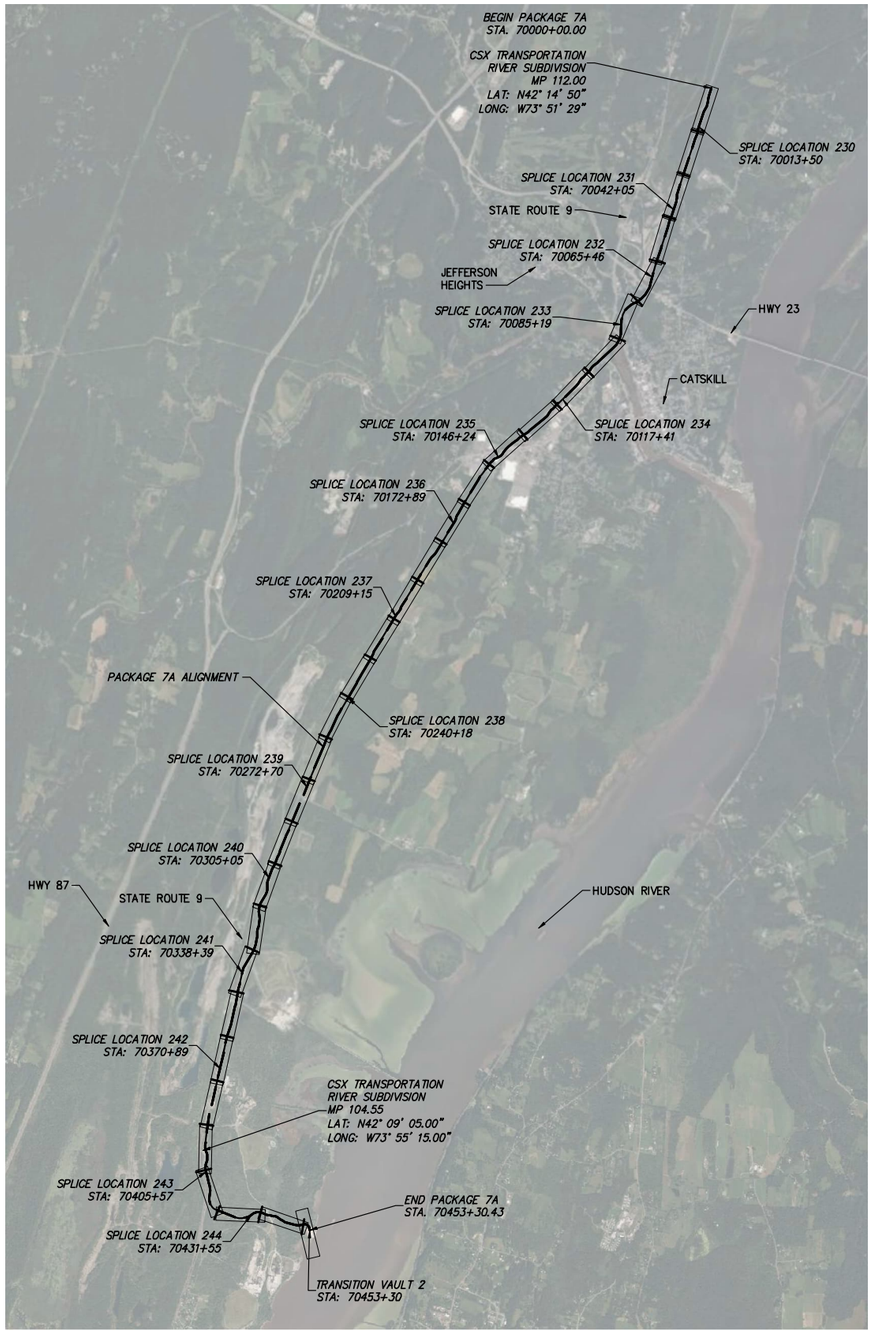

PLAN AND PROFILE KEY MAP

SCALE: 1" = 2500'

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CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL
PLAN AND PROFILE
KEY MAP

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DRAWING NO.	G-004
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SH.NO.	5 OF 66

STRUCTURE TABLE				
DESCRIPTION	STATION	NORTHING	EASTING	ELEVATION
SPLICE LOCATION 230	70012+52.9	1243090.24	665595.5949	132.474'
SPLICE LOCATION 231	70044+51.1	1240050.83	664618.8945	111.253'
SPLICE LOCATION 232	70063+93.8	1238192.016	664064.1885	109.544'
SPLICE VAULT 233	70081+97.9	1236847.532	663033.9265	22.804'
SPLICE LOCATION 234	70106+50.2	1234858.564	661822.9362	96.685'
SPLICE LOCATION 235	70136+85.2	1232746.739	659654.5838	121.718'
SPLICE LOCATION 236	70169+07.1	1230312.326	657636.6341	118.369'
SPLICE LOCATION 237	70201+37.5	1227571.303	655956.8635	130.758'
SPLICE LOCATION 238	70233+38.4	1224821.366	654324.6203	104.283'
SPLICE LOCATION 239	70265+36.3	1221963.528	652901.7315	108.645'
SPLICE LOCATION 240	70297+40.9	1219005.382	651673.7885	113.270'
SPLICE LOCATION 241	70328+85.0	1215994.792	650904.403	0.000'
SPLICE LOCATION 242	70361+16.8	1212934.087	649968.5631	110.031'
SPLICE LOCATION 243	70393+21.7	1209802.037	649294.3271	90.084'
SPLICE LOCATION 244	70424+36.9	1207112.17	650030.64	62.77
TRANSITION VAULT 2	70453+82.6	1206614.647	652689.5698	8.874'

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CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL
SPLICE LOCATION TABLE AND SURVEY NOTES

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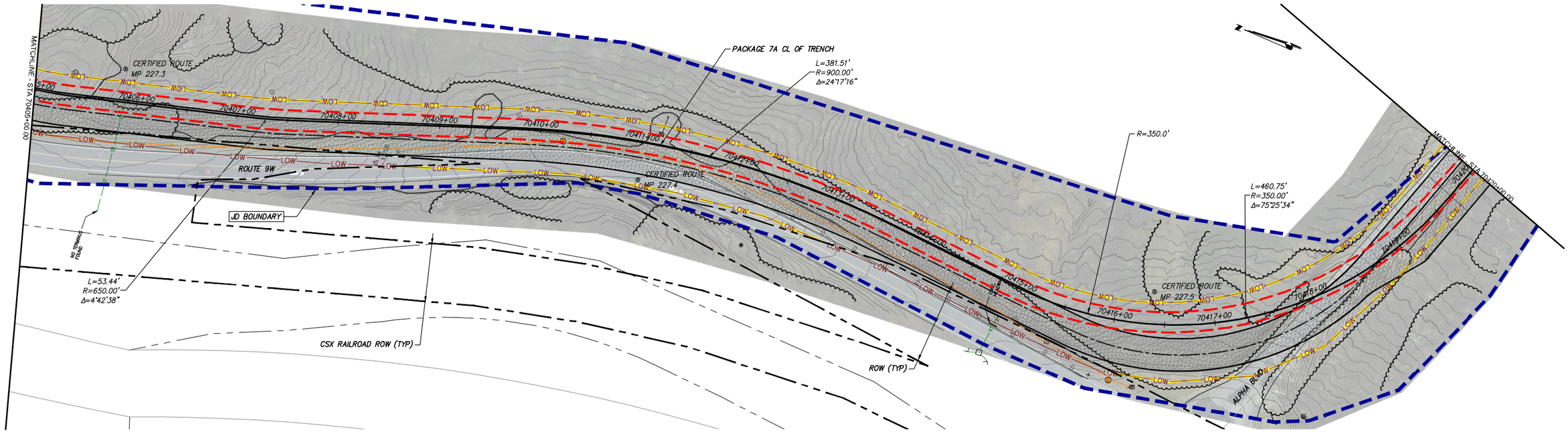
KIEWIT PROJECT NO. 21162
TT PROJECT NO. 204-3701
DRAWING NO. G-005

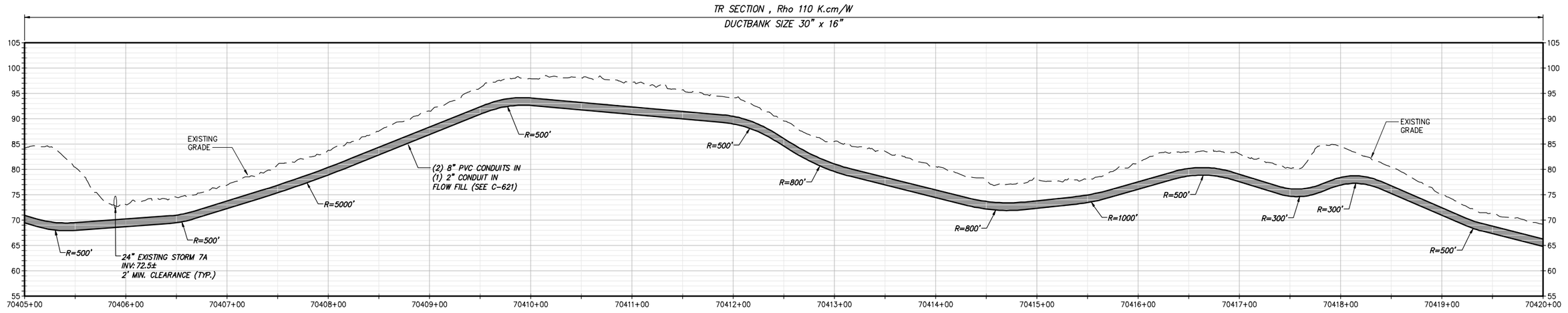


STA. 70405+00.00 TO STA. 70420+00.00 PLAN VIEW

SCALE: 1" = 50'

0 50 100

Scale in feet



STA. 70405+00 TO STA. 70420+00 PROFILE VIEW

SCALE: H:1" = 50' V:1" = 10'

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CHAMPLAIN HUDSON POWER EXPRESS

SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL

STA. 70405+00.00 TO STA. 70420+00.00

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KIEWIT PROJECT NO. 21162

TT PROJECT NO. 204-3701

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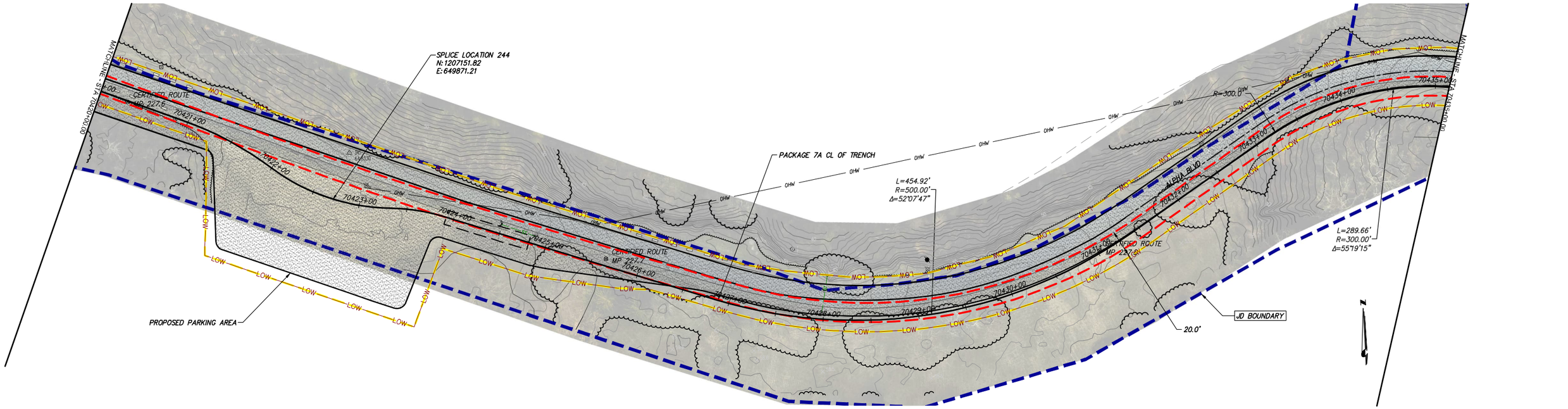
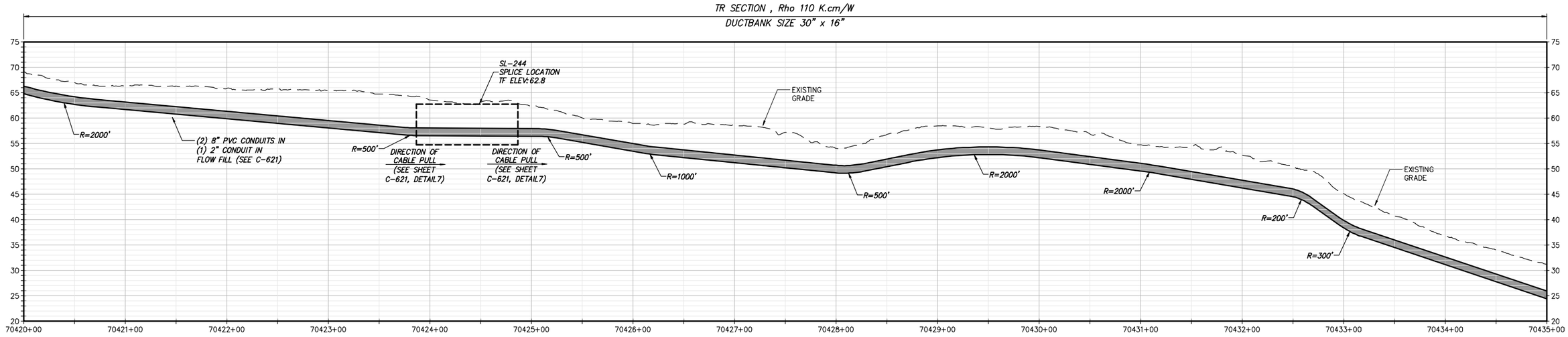


STA. 70420+00.00 TO STA. 70435+00.00 PLAN VIEW

SCALE: 1" = 50'

0 50 100

Scale in feet



STA. 70420+00 TO STA. 70435+00 PROFILE VIEW

SCALE: H:1" = 50' V:1" = 10'

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CHAMPLAIN HUDSON POWER EXPRESS

SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL

STA. 70420+00.00 TO STA. 70435+00.00

KIEWIT PROJECT NO.	21162
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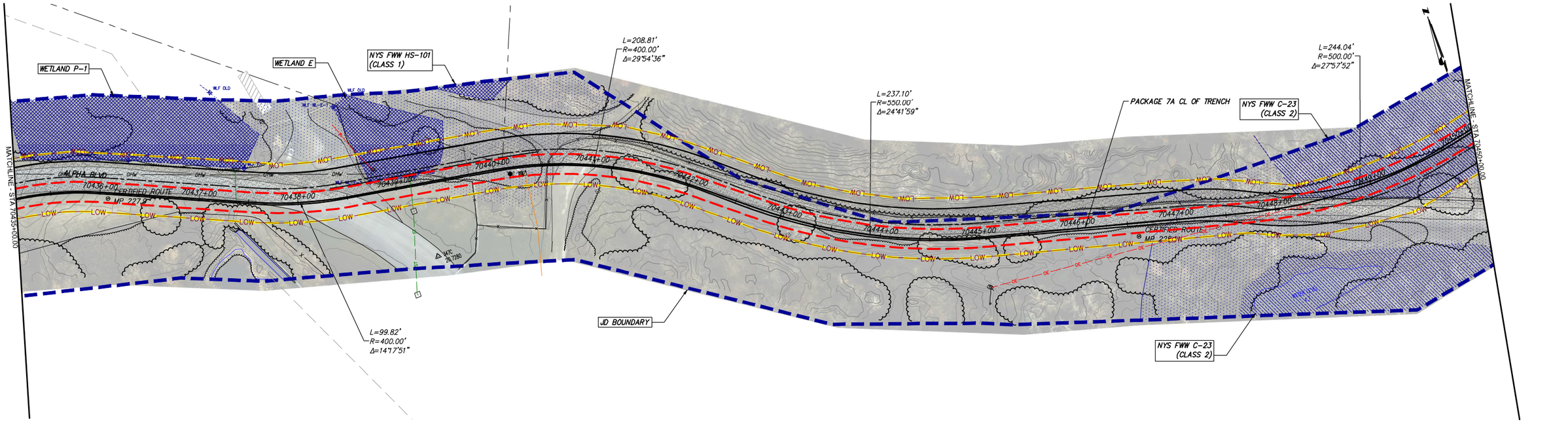

STA. 70435+00.00 TO STA. 70450+00.00 PLAN VIEW

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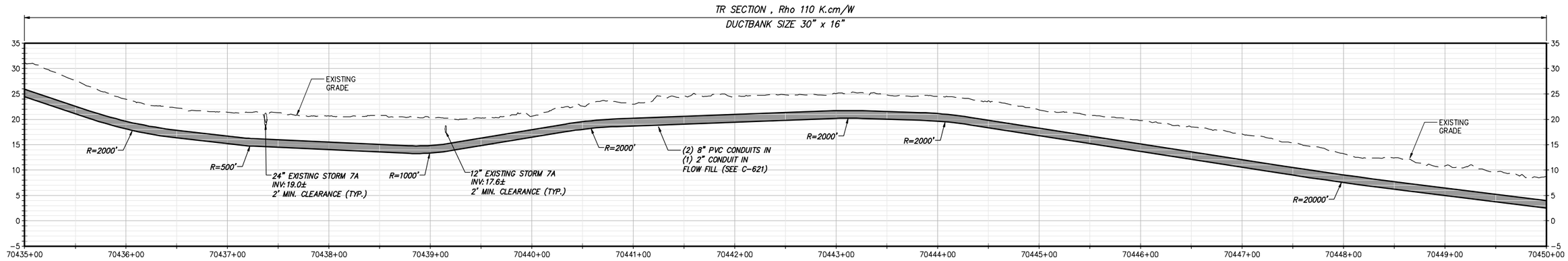
Scale in feet



STA. 70435+00 TO STA. 70450+00 PROFILE VIEW

SCALE: H:1" = 50' V:1" = 10'

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CHAMPLAIN HUDSON POWER EXPRESS

SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL

STA. 70435+00.00 TO STA. 70450+00.00

KIEWIT PROJECT NO.	21162
TT PROJECT NO.	204-3701
DRAWING NO.	C-130

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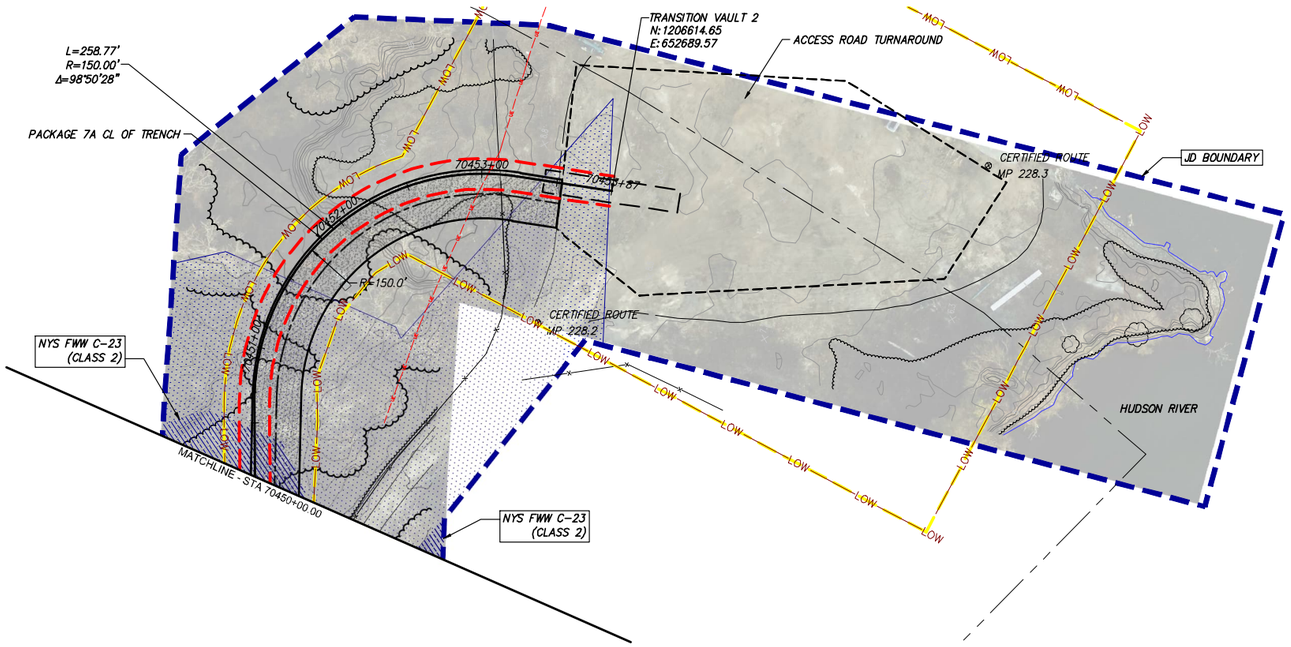

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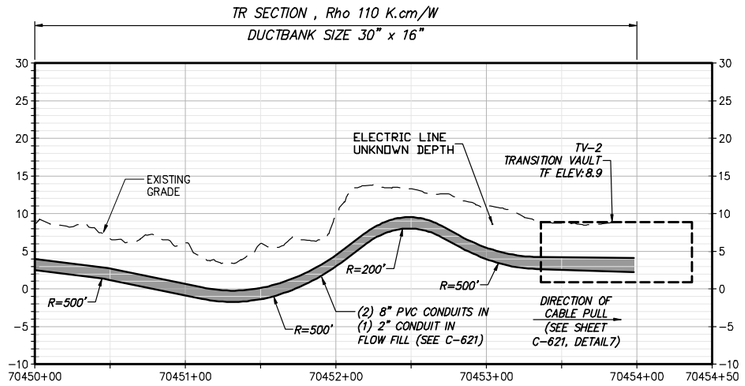
0 50 100

Scale in feet



STA. 70450+00.00 TO STA. 70454+50 PROFILE VIEW

SCALE: H:1" = 50' V:1" = 10'

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CHAMPLAIN HUDSON POWER EXPRESS

SEGMENT 11 (PACKAGE 7A) - CSX: CATSKILL

STA. 70450+00.00 TO STA. 70453+30.43

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DRAWING NO.	C-131
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ATTACHMENT 6
WATERBODY PHOTOGRAPHS

(No Waterbodies Identified at Cementon Transitional HDD Project Area)

Wetland & Waterbodies Delineation Report

Champlain Hudson Power Express Segment 12-Package 7B

Route 9W - Rockland, New York

CHA Project Number: 066076

Prepared for:
Transmission Developers Inc.
1301 Avenue of the Americas
26th Floor
New York, NY 10019

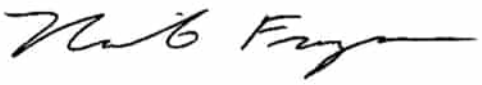
Prepared by:
CHA Consulting, Inc.
III Winners Circle
Albany, NY 12205
Phone: (518) 453-4500

June 2022

SIGNATURE PAGE

This report has been prepared and reviewed by the following qualified personnel employed by CHA.

Report Prepared By:



Nicole E. Frazer
Principal Scientist

Report Reviewed By:

Christopher R. Einstein, PWS
Principal Scientist

TABLE OF CONTENTS

LIST OF ATTACHMENTS

1.0 INTRODUCTION

CHA Consulting, Inc. ("CHA") has prepared this wetland and waterbodies delineation report on behalf of Champlain Hudson Power Express, Inc. ("CHPE") and Kiewit Construction (Kiewit) for the Champlain Hudson Power Express Project (Project). CHA was retained by Kiewit to identify and delineate jurisdictional wetlands and waterbodies regulated under Section 404 of the Clean Water Act (CWA), Section 10 of the Rivers and Harbors Act of 1899, Article 24 Freshwater Wetlands Act (FWW)) & Article 15 (Protection of Waters) of the Environmental Conservation Law along the overland transmission cable route that predominantly follows State, county and local roadways rights-of-way ("ROW"), herein referred to as the Project Corridor. Delineations were conducted with the objective of verifying and updating previous wetland delineations performed for the Project Corridor as part of the Article VII and Section 10/404 permitting processes. This report describes the wetland delineation methodology and the existing wetland and waterbody resources that were identified in the Project Corridor (also defined as the Jurisdictional Determination (JD) limits) during field surveys for the overland portions of the Project.

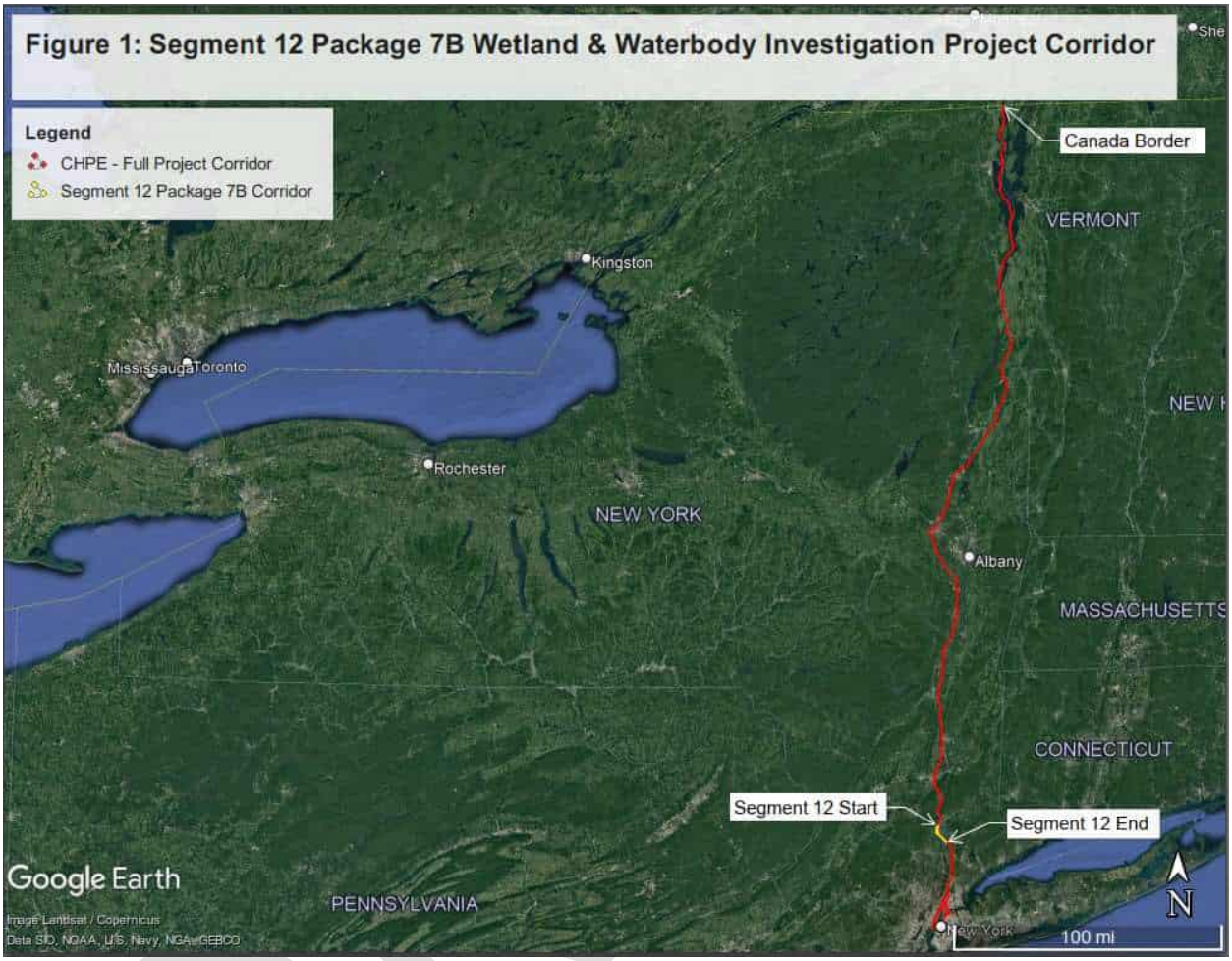
The project also includes equipment staging, laydown areas and access roads. These areas were not confirmed when the delineation activities described in this report were being completed. A supplemental delineation report will include these areas and will be prepared as the design of the project progresses.

2.0 SEGMENT 12-PACKAGE 7B CORRIDOR OVERVIEW

The entire Project Corridor is approximately 339 miles from Montreal, Quebec, Canada to New York City, New York, USA. Figure 1 below shows the route from the Canadian border to New York City and highlights the approximately 7.6 miles of the Segment 12- Package 7B Project Corridor that was investigated for wetlands and waterbodies.

Segment 12- Package 7B begins in Haverstraw, NY at station 72500+00 and extends south approximately 7.6 miles along the following roads through Haverstraw, New York: Park Road, N. Liberty Drive, S. Liberty Drive, South Route 9W, Route 9W, Conger Avenue, and North Route 9W. Segment 12- Package 7B terminates at station 72898+72.52.

Figure 1: Segment 12-Package 7B Wetland & Waterbody Investigation Project Corridor



3.0 WETLAND DELINEATION METHODOLOGY

To determine the potential for wetland impacts from construction of the Project, Shumaker Consulting Engineering & Land Surveying, D.P.C. (Shumaker) assessed the Project Corridor in the field for the presence of federal (Section 404 CWA & Section 10 of the Rivers and Harbors Act of 1899) and state (Article 24 FWW & Article 15 Protection of Waters) jurisdictional wetlands. Wetland scientists conducted wetland delineations in November 2021 and May 2022. The delineation criteria and methodology were performed in accordance with the *1987 Corps of Engineers Wetland Delineation Manual,* the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* Version 2.0 (January 2012), as well as the *New York State Freshwater Wetlands Delineation Manual* (Browne et. al., 1995).

The Project Corridor for the surveyed portions of the project included the land within the existing ROWs along Park Road, N. Liberty Drive, S. Liberty Drive, South Route 9W, Route 9W, Conger Avenue, and North Route 9W. The wetland delineation limits were approximately 50 feet from the edge of pavement, limited to the side of the road corridor on which the alignment follows and primarily within the ROW of the aforementioned roads.

In accordance with the procedures provided in the *Corps of Engineers Wetland Delineation Manual (1987)*, and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*, Version 2.0 (January 2012), the "Routine Wetland Determination" method was used to delineate wetland boundaries.

The wetland boundaries were determined in the field based on the three-parameter approach, whereby an area is a wetland if it exhibits vegetation adapted to wet conditions (hydrophytes), hydric soils, and the presence or evidence of water at or near the soil surface during the growing season (hydrology).

Coded surveyor's ribbons (e.g. flag code A-1, A-2, etc.) were placed along the wetland boundaries based on observations of vegetation, soils and hydrologic conditions. Data points were recorded along the wetland boundaries at various locations across different vegetative community types correlating to each wetland. Wetland and upland data points were recorded to show the difference between the wetland and upland habitats. At a minimum, one data point set (wetland and upland)

was collected for each wetland. Additional data points were collected for large wetlands and for changes in vegetative communities. Wetland Determination Data Sheets corresponding to each point can be found in Attachment 1.

Wetlands within the Segment 12- Package 7B Project Corridor fall under the jurisdiction of the and the New York State Department of Environmental Conservation (NYSDEC) and/or the U.S. Army Corps of Engineers (USACE). The New York State methodology similarly recognizes the three parameters of vegetation, soils, and hydrology; however, under the New York State method the hydric vegetation criterion is mandatory, while the other two parameters are not (Browne et. al. 1995). Wetlands regulated by the NYSDEC must be at least 12.4 acres (5 hectares) in size, unless they are deemed to have unusual local importance (Article 24 FWW). The NYSDEC publishes maps of wetland areas under state jurisdiction; however, it uses field delineation to determine the precise boundaries of these wetland areas.

Prior to actual field delineations for wetland resources, CHA reviewed USGS 7.5-minute topographic maps, aerial photographs, National Wetland Inventory (NWI) mapping, United States Department of Agriculture Natural Resources Conservation Service (NRCS) soil mapping, and NYSDEC freshwater wetlands mapping to identify potential wetland features present within the Project Corridor. More importantly, CHA used the previous wetland delineations prepared for this Project Corridor for the purposes of verifying and modifying the previous delineation. Refer to Attachment 2 for NWI and NYSDEC Freshwater Wetland & Stream Mapping and Attachment 3 for NRCS Soil Mapping.

Waterbodies within the Project Corridor, including streams under NYSDEC Article 15 jurisdiction, were identified by the presence of an ordinary high-water mark (OHWM) or stream channel. Delineation and flagging were completed to identify the ordinary high-water mark (OHWM) for most perennial and intermittent streams.

This report documents the wetlands and waterbodies potentially under federal and State jurisdiction that were identified in the Project Corridor along the current proposed underground transmission cable route. Summaries of wetlands that were identified are provided in Table 4-1 in Attachment 4. Wetlands and Waterbodies Delineation Mapping is included in Attachment 5.

Wetland determination data forms and photographic documentation of the wetlands are included in Attachment 1.

4.0 WETLAND & WATERBODIES DELINEATION RESULTS

A total of four wetland areas were identified in the Project Corridor totaling approximately 0.49 acres. Table 4-1 in Attachment 4 provides a summary of the wetlands identified along the Project Corridor, including their classification in accordance with Cowardin et al. (1979) and their state or federal jurisdiction. Of these delineated wetlands, one (1) corresponds with a wetland mapped by the NYSDEC. This NYSDEC mapped wetland is HS-2.

Narrative descriptions of wetland vegetation, hydrology, and soils observed within the Project Corridor are presented in the following sections. The wetlands and waterbodies delineated within the surveyed areas are summarized in Table 4-1 and Table 4-2. Table 4-3 provides the soil series information. Refer to Attachment 4 for each of these tables. The Wetlands and Waterbodies Delineation Mapping provided in Attachment 5 shows the locations of delineated wetlands and waterbodies. Photographs of the waterbodies can be found in Attachment 6.

4.1 VEGETATION

Vegetative communities within wetlands are described according to *Ecological Communities of New York State, Second Edition* (Edinger 2014)[1] and *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin 1979)[2]. Using this hierarchical wetland classification system three primary cover types were identified for vegetated wetlands in the Project Corridor. These include palustrine emergent (PEM) and palustrine forested (PFO) wetlands. Open water areas (i.e. ponds) were identified as palustrine unconsolidated bottom (PUB).

[1] Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero (editors). 2014. *Ecological* Communities *of New York State.* Second Edition. A revised and expanded edition of Carol Reshke's *Ecological Communities of New York State*. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

[2] Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe, 1979. *Classification of wetlands and deepwater habitats of the United States*. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

4.1.1 Palustrine Emergent Wetland

The palustrine emergent wetland cover type is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin et. al., 1979), and with less than 50 percent aerial cover by shrubs and/or trees. The freshwater emergent wetlands along the Project Corridor primarily include shallow emergent marsh and common reed marsh (Edinger et. al., 2014).

Shallow emergent marshes occur on mineral soils or deep muck soils that are permanently saturated and seasonally flooded. Water depths range from 6 inches to 3.3 feet during flood stages (Edinger et. al., 2014). Characteristic vegetation of shallow emergent marshes within the Project Corridor includes goldenrod (*Solidago sp*.), sedge species (*Carex sp.* and *Cyperus sp*.) and willowherb species (*Epilobium sp*.).

Common reed marsh consists of disturbed marshes where common reed has become dominant (Edinger et. al., 2014).

4.1.2 Palustrine Forested Wetland

Forested wetland cover types are dominated by trees and shrubs that have developed a tolerance to a seasonal high-water table. For a community to be characterized as forested, a wetland must be dominated by trees and shrubs that are at least six meters tall (Cowardin et. al., 1979). Forested wetlands typically have a mature tree canopy, and depending upon the species and density, can have a broad range of understory and groundcover community components (Edinger et al., 2014). Forested wetland communities along the Project Corridor include red maple hardwood swamp.

Red maple-hardwood swamps occur in poorly drained depressions, usually on inorganic soils. Red maple is either the only dominant tree species or is codominant with one or more hardwoods (Edinger et. al, 2014). Species observed within this community type within the Project Corridor include American elm (*Ulmus americana*), common reed and smartweed species (*Persicaria sp.)*.

4.1.3 Open Water

There are ponds located along the Project Corridor. As previously noted, these open water communities are identified as palustrine unconsolidated bottom (PUB). They are characterized by

a vegetation cover of less than 30 percent, although there may often be emergent or shrubby vegetation bordering the open water areas. Common duckweed (*Lemna minor*) is commonly present. Characteristic species observed along the edges of these ponds include goldenrod and sedge species. Substrates are silt, mud, cobble, or sand.

4.2 HYDROLOGY

4.2.1 Streams

Table 4-2 lists the 4 streams (perennial (3), intermittent (1)) identified within the Project Corridor, which is located within the Lower Hudson Watershed. This watershed extends from the Battery at the southern end of Manhattan to the Troy Dam at the confluence of the Mohawk River. The basin is 12,800 square miles, most of which is within New York State (NYSDEC 2022). Perennial waterbodies within the Project Corridor include Cedar Pond Brook and Minisceongo Creek as well as unnamed tributaries identified on USGS Topographic Maps and/or identified during the field delineation.

4.2.2 Wetlands

Site hydrology was examined within each wetland and adjacent upland areas. Indicators of wetland hydrology included surface water (A1) , high water table (A2), saturation (A3), presence of reduced iron (C4), and FAC-neutral test (D5) (Attachment 1). Hydrologic factors contributing to the presence of wetland hydrology within wetlands in the Project Corridor included inundation with river, pond, or stream water, temporarily ponded runoff, and seasonally to permanently shallow groundwater tables.

4.3 SOILS

The United States Department of Agriculture NRCS soil map units for the Project Corridor are provided in Attachment 3. Hydric soil indicators include depleted matrix (F3) and redox dark surface (F6) (Attachment 1). Within the Project Corridor, a total of twenty five (25) different soil types are mapped by the NRCS. The mapped soil types range from excessively drained to very poorly drained soils. According to the soil map descriptions (Attachment 3 and Attachment 4-Table 4-3), two (2) of the soils mapped within the Project Corridor are rated as hydric soils

(Ipswich mucky peat and Rippowam sandy loam). Hydric soils are defined as soils "that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil" (Federal Register, 1994). Table 4-3 summarizes the soil series in the Project Corridor and lists the soils that are classified as hydric (or associated with wetland hydrology) in the Project Corridor.

Many soils within the Project Corridor are formed from glacial parent materials including outwash, dense till, loose till, and glaciomarine deposits. In active floodplains, soils are formed in recent alluvium. Anthropogenically disturbed soils, associated with road construction and operation, are common within the Project Corridor. The disturbed soils consist of disturbed natural deposits or human transported materials.

4.4 NATURAL RESOURCE CONSERVATION SERVICE SOIL SERIES DESCRIPTIONS

The following are the abbreviated descriptions of each of the relevant soil types taken from the USDA Web Soil Survey (NRCS 2022). Soils survey mapping and additional information regarding relevant soil characteristics are provided in Attachment 3.

Charlton Series (CeB, CeC & CeD)

These very deep, well drained soils formed in loamy melt-out till. These soils are nearly level to very steep on ridges, moraines and hills. Slopes range from 0 to 60 percent. The A horizon is a dark brown fine sandy loam with weak granular structure. The B horizon is brown, yellowish brown or light olive brown fine sandy loam with weak granular or subangular blocky structure. The C horizon is grayish brown gravelly fine sandy loam with lenses of loamy sand. This horizon is massive or has plates of geogenic origin.

Chatfield Series (CoC & CoD)

These well drained soils formed in loamy melt-out till. They are moderately deep to bedrock. Slopes range from 0 to 70 percent. The surface layer is organic material 0-3 cm thick. The A horizon is very dark gray fine sandy loam with weak fine subangular blocky structure. The AB

horizon, where present, has similar texture to the A horizon. The B horizon is strong brown gravelly fine sandy loam. The structure is subangular blocky or granular structure and is friable or very friable. The C horizon, if present, has hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 2 to 4. The texture is sandy loam, very fine sandy loam, loam or silt loam. This horizon is massive and may contain plate-like divisions. The 2R horizon is dominantly schist, gneiss bedrock or granite and is massive in places.

Hinckley Series (HcA, HcB, HcD & HdB)

These very deep, excessively drained soils formed in glaciofluvial materials. These soils are nearly level to very steep and can be found on outwash terraces, outwash deltas, outwash plains, eskers, kames and kame terraces. The slopes range from 0 to 60 percent. The surface layer is 0-3 centimeters of moderately decomposed plant material derived from twigs and red pine needles. The A horizon is very dark grayish brown loamy sand with weak fine and medium granular structure. The B horizon is strong brown to yellowish brown gravelly loamy sand to very gravelly sand. The C horizon is light olive brown extremely gravelly sand consisting of stratified sand, gravel and cobbles.

Holyoke Series (HoC, HoD & HoF)

These shallow, well drained and somewhat excessively drained soils formed in a thin mantle of till derived mainly from basalt and red sandstone, conglomerate, and shale. Slopes range from 0 to 60 percent. The A horizon is dark brown silt loam with weak medium granular structure. The B horizon is comprised of two layers. From 8-20 centimeters, the soil is brown silt loam with weak course granular structure and from 20-46 centimeters, the soil is yellowish red silt loam with weak medium subangular blocky structure. The R horizon is composed of basalt bedrock.

Ipswich Series (Ip)

These very deep, very poorly drained soils formed in thick herbaceous organic deposits. They are found on level tidal marshes subject to salt water inundation twice daily. The surface layer is dark grayish brown organic material. Below this layer is a layer of very dark grayish brown, mucky peat that is followed by a layer of very dark gray muck.

Rippowam Series (Ra)

These very deep, poorly drained loamy soils formed in alluvial sediments. These nearly level soils are found on floodplains subject to frequent flooding. The slopes range from 0 to 3 percent. The A horizon is a very dark grayish brown fine sandy loam with weak medium granular structure. The B horizon is dark grayish brown to very dark gray fine sandy loam or sandy loam that is massive or has weak granular or subangular blocky structure. The C horizon is dark gray or grayish brown with textures ranging from loamy fine sand to coarse sand.

Udorthents (Ur & Us)

These are very deep, nearly level to gently sloping areas of well drained loamy soils that are a result of man-made cuts and fills in loamy upland soils. Slopes range from 0 to 8 percent. Typically, the surface layer is dark brown silt loam extending to 5 inches. Layers below the surface are brown and yellowish-brown silt loam containing up to 80 percent rock fragments to a depth of 72 inches or more.

Urban Land (Ux)

Urban land consists of nearly level to strongly sloping areas where asphalt, concrete, buildings, or other impervious materials cover more than 85 percent of the surface. Slopes range from 0 to 15 percent. This map unit includes very few areas of soil material, and those areas which are used mainly as lawns or landscaping have been disturbed by adjacent building activities.

Watchaug Series (Wc)

These are very deep, moderately well drained loamy soils formed in meltout till. The soils are nearly level to strongly sloping on hill and till plains, typically on the lower slopes and in slight depressions. Slopes range from 0 to 15 percent. The A horizon is deep reddish brown fine sandy loam with weak medium and fine granular structure. The B horizon is reddish brown to yellowish brown fine sandy loam with weak medium subangular blocky structure. The C horizon is reddish brown gravelly sandy loam . This horizon is massive or has weak plates.

Wethersfield Series (WeB, WeC, WeD & WuB)

These very deep, well drained loamy soils formed in dense glacial till on uplands. Slopes range from 0 to 35 percent. The surface layer is 0-3 centimeters of black, moderately decomposed plant material. The A horizon is dark brown loam with granular structure. The B horizon is reddish brown loam to gravelly loam with a weak medium subangular blocky structure. The C horizon is reddish brown gravelly loam with weak thick platy structure.

Yalesville Series (YaC & YaD)

These moderately deep, well drained soils formed in a loamy till. They are nearly level to moderately steep soils on hills and ridges. Slopes range from 0 to 50 percent. The A horizon is dark brown fine sandy loam with weak medium granular structure. The B horizon is reddish brown fine sandy loam to loam. It has a weak medium subangular blocky structure. The C horizon is reddish brown gravelly sandy loam, and is massive. The R horizon is reddish brown hard sandstone bedrock.

5.0 SUMMARY

Wetlands identified along the Project Corridor include shallow emergent marsh, common reed marsh, red maple hardwood swamp. Ponds also occur within the Project Corridor. Stream communities include intermittent and perennial streams.

Land use in the Project Corridor is ranges from undeveloped areas to residential and commercial areas. Because most of the Project Corridor consists of existing roadway corridors, some wetlands are characterized by previous anthropogenic disturbance and/or the presence of invasive plant species. The wetland boundaries abutting the road are typically defined by the edge of the soil fill for the highway embankments.

Confirmation of the wetland boundaries are the responsibility of the involved regulatory agencies with jurisdiction over wetlands and waterbodies within this Phase of the overall project. As previously noted, wetlands within Segment 12-Package 7B Project Corridor are regulated by USACE (Section 10/404) and the NYSDEC (Article 24). Streams and other waterbodies are

regulated by USACE (Section 10/404) and NYSDEC (Article 15). Based on review of the NYSDEC wetland mapping, one delineated wetland area is identified as regulated under Article 24. This wetland correspond to mapped wetland HS-2 and it is regulated by NYSDEC. It is anticipated that USACE will take jurisdiction over all the mapped wetlands within the Project Corridor and NYSDEC will take jurisdiction over the one wetland associated with the NYSDEC freshwater wetland. Final jurisdictional determinations will be made by the respective agencies.

6.0 REFERENCES

Browne, S. et. al. 1995. New York State Freshwater Wetlands Delineation Manual. New York State Department of Environmental Conservation, Division of Fish and Wildlife, Bureau of Habitat, Albany, NY.

Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe, 1979. *Classification of wetlands and deepwater habitats of the United States*. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

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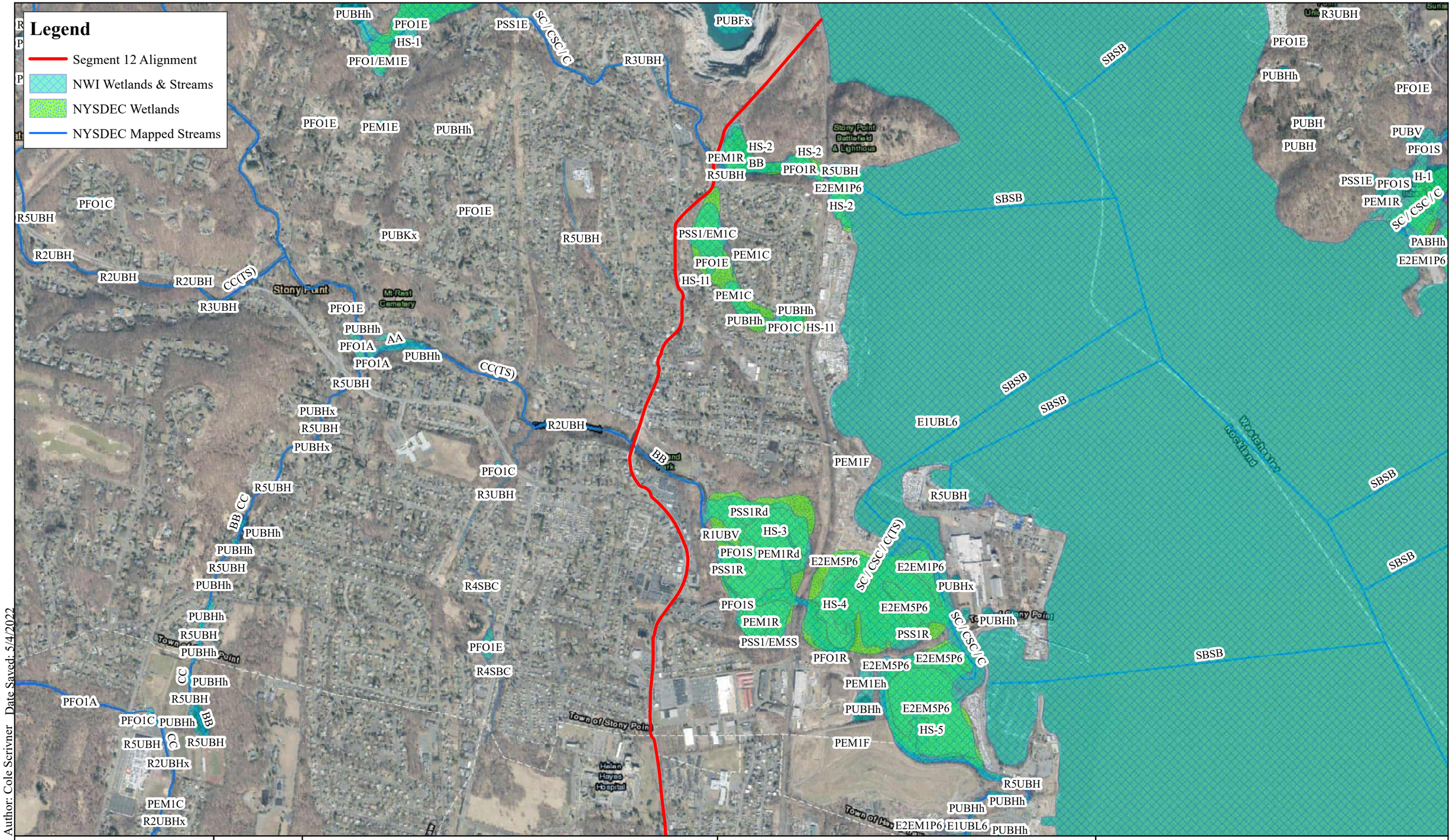
ATTACHMENT 1
WETLAND DETERMINATION DATA SHEETS AND WETLAND PHOTOGRAPHS

(No Wetlands Identified at Congers Transitional HDD Project Area)

ATTACHMENT 2
NWI & NYSDEC WETLAND & STREAM MAPS



Author: Cole Scrivner Date Saved: 5/4/2022

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Page 1 of 3

Champlain Hudson Power Express
Segment 12-Package 7B Wetland & Stream Map
(NWI and NYSDEC)

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community.
Wetland layers obtained from USFWS NWI and NYSDEC

Author: Cole Scrivner Date Saved: 5/4/2022

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Page 2 of 3

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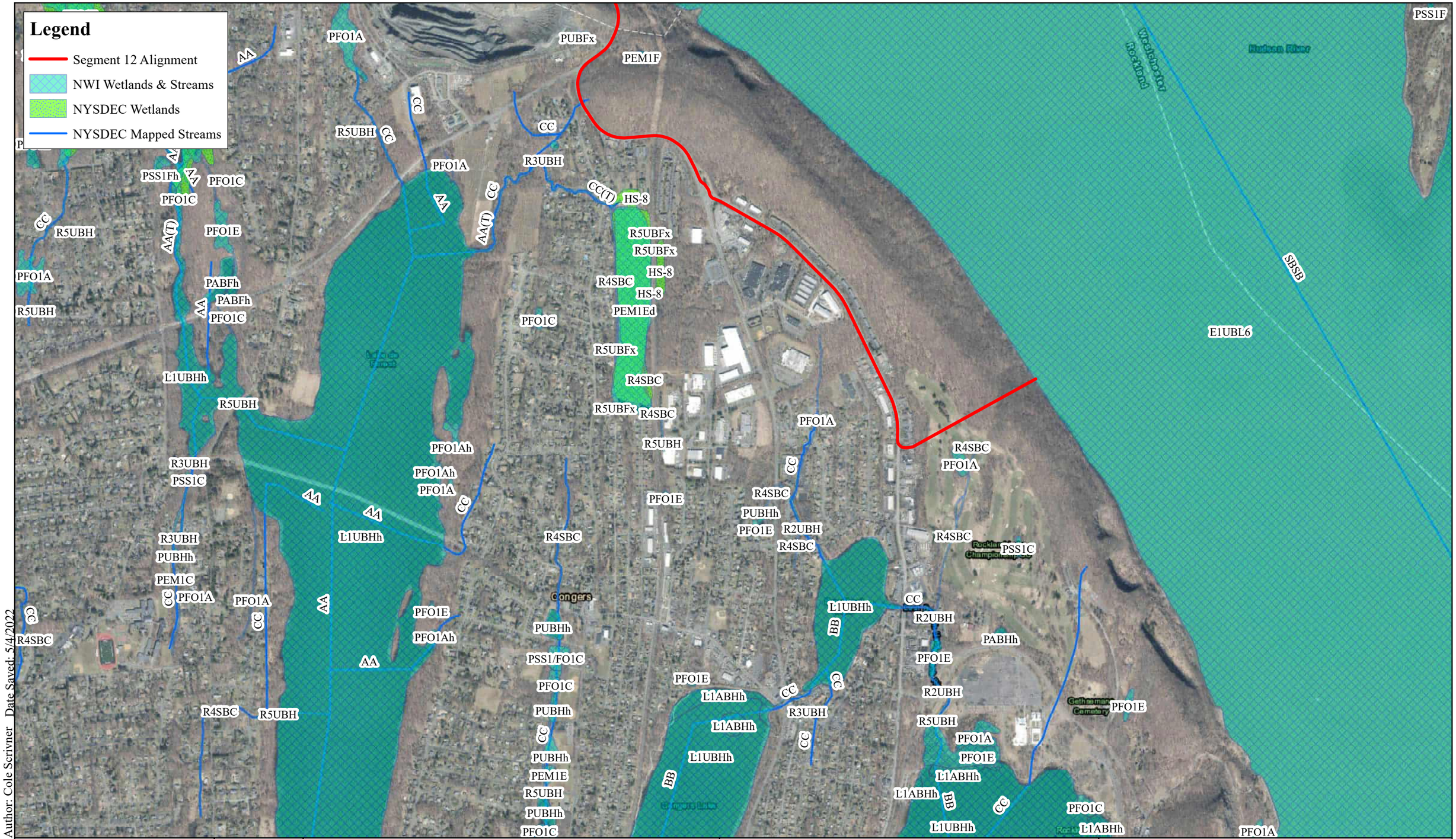
Champlain Hudson Power Express
Segment 12-Package 7B Wetland & Stream Map
(NWI and NYSDEC)

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community.
Wetland layers obtained from USFWS NWI and NYSDEC



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Champlain Hudson Power Express
Segment 12-Package 7B Wetland & Stream Map
(NWI and NYSDEC)

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community.
Wetland layers obtained from USFWS NWI and NYSDEC

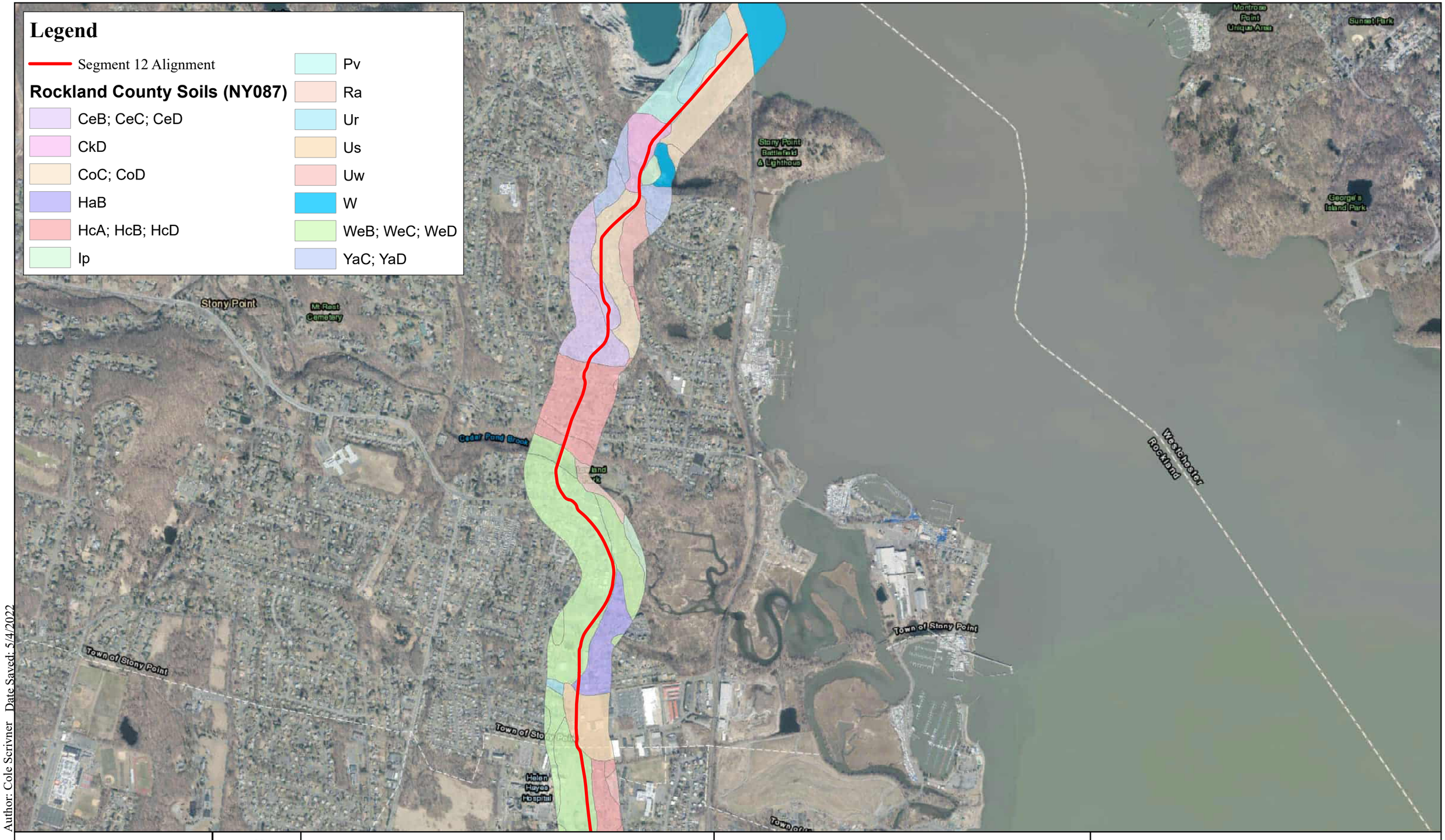
ATTACHMENT 3
NRCS SOIL MAPS

Legend

Segment 12 Alignment

Rockland County Soils (NY087)

- CeB; CeC; CeD
- CkD
- CoC; CoD
- HaB
- HcA; HcB; HcD
- Ip
- Pv
- Ra
- Ur
- Us
- Uw
- W
- WeB; WeC; WeD
- YaC; YaD



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Champlain Hudson Power Express
Segment 12-Package 7B NRCS Soil Map

Author: Cole Scrivner Date Saved: 5/4/2022

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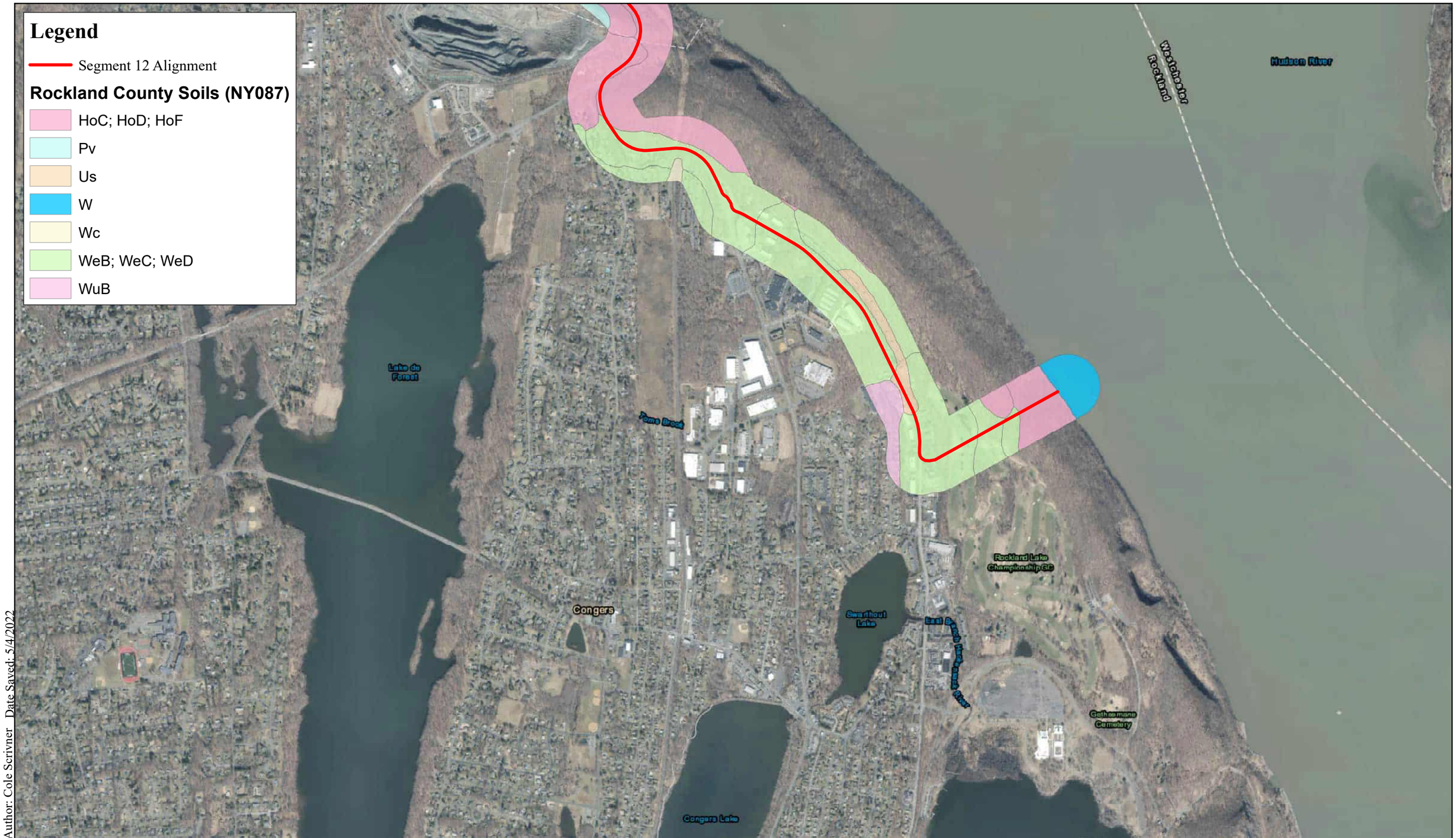
Page 2 of 3

Champlain Hudson Power Express
Segment 12-Package 7B NRCS Soil Map

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the



Author: Cole Scrivner Date Saved: 5/4/2022

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Champlain Hudson Power Express
Segment 12-Package 7B NRCS Soil Map

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the

Map Unit Description

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 in this report, 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, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

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

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

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

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given 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.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Rockland County, New York

CeB—Charlton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2wh0n
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: All areas are prime farmland

Map Unit Composition

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

Description of Charlton

Setting

Landform: Ridges, ground moraines, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw - 7 to 22 inches: gravelly fine sandy loam
C - 22 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 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): 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: Moderate (about 6.9 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

Minor Components

Sutton

Percent of map unit: 8 percent
Landform: Hills, ground moraines

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

Paxton

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

Chatfield

Percent of map unit: 1 percent
Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Leicester

Percent of map unit: 1 percent
Landform: Depressions, drainageways
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

CeC—Charlton fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2wh0q
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 statewide importance

Map Unit Composition

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

Description of Charlton

Setting

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

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw - 7 to 22 inches: gravelly fine sandy loam
C - 22 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 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): 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: Moderate (about 6.9 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
Hydric soil rating: No

Minor Components

Sutton, fine sandy loam

Percent of map unit: 5 percent
Landform: Ridges, hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Paxton

Percent of map unit: 5 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: Convex
Hydric soil rating: No

Chatfield

Percent of map unit: 3 percent

Landform: Ridges, hills
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Crest, nose slope, side slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Canton

Percent of map unit: 2 percent
Landform: Ridges, ground moraines, hills
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, nose slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

CeD—Charlton fine sandy loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2wh0t
Elevation: 0 to 1,290 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

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

Description of Charlton

Setting

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

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw - 7 to 22 inches: gravelly fine sandy loam
C - 22 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 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): 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: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Paxton

Percent of map unit: 5 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: Convex
Hydric soil rating: No

Sutton, fine sandy loam

Percent of map unit: 5 percent
Landform: Ridges, hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Chatfield

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

Canton

Percent of map unit: 2 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

CkD—Charlton-Rock outcrop complex, hilly

Map Unit Setting

National map unit symbol: 9v41
Elevation: 0 to 1,200 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton and similar soils: 50 percent
Rock outcrop: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Till plains, ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Acid loamy till derived mainly from schist, gneiss, or granite

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 38 inches: gravelly loam
H3 - 38 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 10 to 30 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 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: Moderate (about 7.8 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 Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 10 to 30 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Minor Components

Chatfield

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

Hollis

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

Paxton

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

Watchaug

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

CoC—Chatfield-Rock outcrop complex, rolling

Map Unit Setting

National map unit symbol: 9v44
Elevation: 100 to 1,000 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield and similar soils: 60 percent
Rock outcrop: 15 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from granite, gneiss, or schist

Typical profile

H1 - 0 to 9 inches: gravelly sandy loam
H2 - 9 to 25 inches: gravelly sandy loam
H3 - 25 to 35 inches: unweathered bedrock

Properties and qualities

Slope: 4 to 16 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 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): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 4 to 16 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydric soil rating: Unranked

Minor Components

Charlton

Percent of map unit: 10 percent

Hydric soil rating: No

Hollis

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

Watchaug

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

CoD—Chatfield-Rock outcrop complex, hilly

Map Unit Setting

National map unit symbol: 9v45
Elevation: 100 to 1,000 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield and similar soils: 50 percent
Rock outcrop: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from granite, gneiss, or schist

Typical profile

H1 - 0 to 9 inches: gravelly sandy loam
H2 - 9 to 25 inches: gravelly sandy loam
H3 - 25 to 35 inches: unweathered bedrock

Properties and qualities

Slope: 10 to 30 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 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): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 10 to 30 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Minor Components

Charlton

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

Hollis

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

Watchaug

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

HaB—Haven loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9v4f
Elevation: 20 to 510 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Haven and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haven

Setting

Landform: Outwash plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 5 inches: loam
H2 - 5 to 28 inches: loam
H3 - 28 to 60 inches: stratified very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 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 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY023CT - Well Drained Outwash
Hydric soil rating: No

Minor Components

Riverhead

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

Wethersfield

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

Hinckley

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

Fredon

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

HcB—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm8
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: Farmland of statewide 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, kames, kame terraces, moraines, eskers, outwash plains
Landform position (two-dimensional): Summit, backslope, footslope, shoulder
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, 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
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, tread, riser
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): Side slope, base slope, head 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, tread, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

HcD—Hinckley loamy sand, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2svmc
Elevation: 0 to 1,460 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: Kames, kame terraces, outwash deltas, outwash terraces, moraines, eskers, 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
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 25 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): 6e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 8 percent

Landform: Eskers, outwash terraces, kames, outwash plains, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, head slope, crest, side slope, riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Kames, kame terraces, moraines, eskers, outwash deltas, outwash terraces, 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
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

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

Ip—Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded

Map Unit Setting

National map unit symbol: 2tyqj
Elevation: 0 to 10 feet
Mean annual precipitation: 36 to 71 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

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

Description of Ipswich

Setting

Landform: Tidal marshes
Landform position (three-dimensional): Dip

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Partially- decomposed herbaceous organic material

Typical profile

Oe - 0 to 42 inches: mucky peat
Oa - 42 to 59 inches: muck

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 very high (0.14 to 99.90 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Very high (about 26.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

Minor Components

Westbrook

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

Pawcatuck

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: R144AY002CT - Tidal Salt High Marsh mesic very frequently flooded, R144AY001CT - Tidal Salt Low Marsh mesic very frequently flooded
Hydric soil rating: Yes

Pv—Pits, quarry

Map Unit Setting

National map unit symbol: 9v51
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits, quarry: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits, Quarry

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Chatfield

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

Charlton

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

Alden

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Water

Percent of map unit: 1 percent
Hydric soil rating: Unranked

Ra—Rippowam sandy loam

Map Unit Setting

National map unit symbol: 9v52
Elevation: 20 to 740 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Rippowam and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rippowam

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy over sandy alluvium derived mainly from crystalline rock

Typical profile

H1 - 0 to 10 inches: sandy loam
H2 - 10 to 35 inches: fine sandy loam
H3 - 35 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: NoneFrequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F144AY014CT - Wet Sandy Low Floodplain
Hydric soil rating: Yes

Minor Components

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

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

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

Sloan
Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

Ur—Udorthents, refuse substratum

Map Unit Setting
National map unit symbol: 9v5c
Elevation: 100 to 1,600 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, refuse substratum, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Refuse Substratum

Typical profile
H1 - 0 to 24 inches: gravelly loam
H2 - 24 to 70 inches: variable

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 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 2.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s
Hydrologic Soil Group: C
Hydric soil rating: Unranked

Us—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9v5d
Elevation: 0 to 890 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, smoothed, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Smoothed

Typical profile

H1 - 0 to 20 inches: channery loam
H2 - 20 to 70 inches: very gravelly loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Udorthents, wet substratum

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

Urban land

Percent of map unit: 4 percent
Hydric soil rating: Unranked

Alden
Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Wallington
Percent of map unit: 2 percent
Hydric soil rating: No

Wethersfield
Percent of map unit: 2 percent
Hydric soil rating: No

Riverhead
Percent of map unit: 2 percent
Hydric soil rating: No

Hollis
Percent of map unit: 2 percent
Hydric soil rating: No

Rock outcrop
Percent of map unit: 1 percent
Hydric soil rating: Unranked

Uw—Udorthents, wet substratum

Map Unit Setting
National map unit symbol: 9v5f
Elevation: 50 to 2,400 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, wet substratum, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Wet Substratum

Typical profile
H1 - 0 to 20 inches: channery loam
H2 - 20 to 70 inches: very gravelly loam

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A
Hydric soil rating: Yes

Minor Components

Udorthents

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

Urban land

Percent of map unit: 4 percent
Hydric soil rating: Unranked

Paxton

Percent of map unit: 2 percent
Hydric soil rating: No

Hinckley

Percent of map unit: 2 percent
Hydric soil rating: No

Rippowam

Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: Yes

Sloan

Percent of map unit: 2 percent
Landform: Flood plains
Hydric soil rating: Yes

Palms

Percent of map unit: 2 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: Unranked

W—Water

Map Unit Setting

National map unit symbol: 9v5s
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days

Farmland classification: Not prime farmland

Map Unit Composition

Water: 100 percent

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

WeB—Wethersfield gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9v5l
Elevation: 30 to 690 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wethersfield and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile

H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

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

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

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

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

WeC—Wethersfield gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9v5m
Elevation: 20 to 690 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Wethersfield and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting
Landform: Till plains, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile
H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Cheshire

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

Charlton

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

Riverhead

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

Wallington

Percent of map unit: 3 percent
Hydric soil rating: No

Yalesville

Percent of map unit: 2 percent
Hydric soil rating: No

WeD—Wethersfield gravelly silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9v5n
Elevation: 0 to 640 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Wethersfield and similar soils: 80 percent

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

Description of Wethersfield

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile

H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Riverhead

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

Charlton

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

Cheshire

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

Wallington

Percent of map unit: 3 percent
Hydric soil rating: No

Yalesville
Percent of map unit: 2 percent
Hydric soil rating: No

YaC—Yalesville sandy loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9v5v
Elevation: 20 to 710 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Yalesville and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yalesville

Setting
Landform: Ridges, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile
H1 - 0 to 10 inches: sandy loam
H2 - 10 to 27 inches: gravelly loam
H3 - 27 to 30 inches: extremely channery loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities
Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B

Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

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

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

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

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

YaD—Yalesville sandy loam, 15 to 25 percent slopes

Map Unit Setting
National map unit symbol: 9v5w
Elevation: 0 to 640 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition
Yalesville and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yalesville

Setting
Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile
H1 - 0 to 10 inches: sandy loam
H2 - 10 to 27 inches: gravelly loam
H3 - 27 to 30 inches: extremely channery loam
H4 - 30 to 34 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F145XY013CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Holyoke

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

Cheshire

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

Wethersfield

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

Hollis

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

Data Source Information

Soil Survey Area: Rockland County, New York
Survey Area Data: Version 19, Sep 1, 2021

Map Unit Description

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 in this report, 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, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

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

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

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

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given 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.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Rockland County, New York

HcA—Hinckley loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svm7
Elevation: 0 to 1,420 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

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 terraces, outwash plains, kame terraces, outwash deltas
Landform position (three-dimensional): 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: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
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): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent

Landform: Outwash deltas, outwash terraces, kame terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash deltas, kame terraces, outwash terraces
Landform position (three-dimensional): 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, kame terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

HcB—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm8
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: Farmland of statewide 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, kames, kame terraces, moraines, eskers, outwash plains
Landform position (two-dimensional): Summit, backslope, footslope, shoulder
Landform position (three-dimensional): Crest, base slope, side slope, nose slope, 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
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, tread, riser
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): Side slope, base slope, head 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, tread, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

HdB—Hinckley-Urban land complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm0
Elevation: 0 to 460 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: 45 percent
Urban land: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Kame terraces, kames, outwash deltas, moraines, outwash plains, outwash terraces, eskers
Landform position (two-dimensional): Summit, footslope, toeslope, shoulder, backslope
Landform position (three-dimensional): Nose slope, crest, head slope, side slope, 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

A - 0 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: 0 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 2.9 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

Description of Urban Land

Typical profile

M - 0 to 10 inches: cemented material

Properties and qualities

Slope: 0 to 8 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

Greenbelt

Percent of map unit: 5 percent
Landform position (two-dimensional): Footslope, summit, backslope
Landform position (three-dimensional): Interfluve, base slope, crest, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Hydric soil rating: No

Riverhead

Percent of map unit: 5 percent
Landform: Moraines, outwash plains
Landform position (two-dimensional): Summit, backslope, shoulder, footslope, toeslope

Landform position (three-dimensional): Crest, head slope, nose slope, side slope, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Fredon, poorly drained

Percent of map unit: 5 percent
Landform: Outwash deltas, outwash plains, kame terraces, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: Yes

HoC—Holyoke-Rock outcrop complex, rolling

Map Unit Setting

National map unit symbol: 9v4p
Elevation: 0 to 850 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Holyoke and similar soils: 60 percent
Rock outcrop: 15 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holyoke

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 6 inches: silt loam
H2 - 6 to 18 inches: silt loam
H3 - 18 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 4 to 16 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
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: D
Ecological site: F145XY011CT - Well Drained Shallow Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 4 to 16 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydric soil rating: Unranked

Minor Components

Chatfield

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

Charlton

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

Watchaug

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

HoD—Holyoke-Rock outcrop complex, hilly

Map Unit Setting

National map unit symbol: 9v4q
Elevation: 0 to 740 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Holyoke and similar soils: 55 percent
Rock outcrop: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holyoke

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 6 inches: silt loam
H2 - 6 to 18 inches: silt loam
H3 - 18 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 10 to 30 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F145XY011CT - Well Drained Shallow Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 10 to 30 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Minor Components

Charlton

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

Chatfield

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

Watchaug

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

HoF—Holyoke-Rock outcrop complex, very steep

Map Unit Setting

National map unit symbol: 9v4r
Elevation: 0 to 890 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Holyoke and similar soils: 45 percent
Rock outcrop: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holyoke

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 6 inches: silt loam
H2 - 6 to 18 inches: silt loam
H3 - 18 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 50 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F145XY011CT - Well Drained Shallow Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 50 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Minor Components

Charlton

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

Chatfield

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

Watchaug

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

Us—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9v5d
Elevation: 0 to 890 feet

Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, smoothed, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Smoothed

Typical profile

H1 - 0 to 20 inches: channery loam
H2 - 20 to 70 inches: very gravelly loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Udorthents, wet substratum

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

Urban land

Percent of map unit: 4 percent
Hydric soil rating: Unranked

Alden

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Wallington

Percent of map unit: 2 percent
Hydric soil rating: No

Wethersfield
Percent of map unit: 2 percent
Hydric soil rating: No

Riverhead
Percent of map unit: 2 percent
Hydric soil rating: No

Hollis
Percent of map unit: 2 percent
Hydric soil rating: No

Rock outcrop
Percent of map unit: 1 percent
Hydric soil rating: Unranked

Ux—Urban land

Map Unit Setting
National map unit symbol: 9v5g
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition
Urban land: 75 percent
Minor components: 25 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

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

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

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

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

Udorthents, wet substratum
Percent of map unit: 5 percent
Hydric soil rating: No

WeB—Wethersfield gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9v5l
Elevation: 30 to 690 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Wethersfield and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting
Landform: Till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile
H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

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

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

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

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

WeC—Wethersfield gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9v5m
Elevation: 20 to 690 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Wethersfield and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting
Landform: Till plains, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile
H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Cheshire

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

Charlton

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

Riverhead

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

Wallington

Percent of map unit: 3 percent
Hydric soil rating: No

Yalesville

Percent of map unit: 2 percent
Hydric soil rating: No

WeD—Wethersfield gravelly silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9v5n
Elevation: 0 to 640 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Wethersfield and similar soils: 80 percent

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

Description of Wethersfield

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile

H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Riverhead

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

Charlton

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

Cheshire

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

Wallington

Percent of map unit: 3 percent
Hydric soil rating: No

Yalesville
Percent of map unit: 2 percent
Hydric soil rating: No

WuB—Wethersfield-Urban land complex, 2 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9v5p
Elevation: 0 to 710 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition
Wethersfield and similar soils: 50 percent
Urban land: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting
Landform: Till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile
H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities
Slope: 2 to 8 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

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

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

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

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

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

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

Data Source Information

Soil Survey Area: Rockland County, New York
Survey Area Data: Version 19, Sep 1, 2021

Map Unit Description

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 in this report, 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, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

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

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

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

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given 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.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Rockland County, New York

HoC—Holyoke-Rock outcrop complex, rolling

Map Unit Setting

National map unit symbol: 9v4p
Elevation: 0 to 850 feet

Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Holyoke and similar soils: 60 percent
Rock outcrop: 15 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holyoke

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 6 inches: silt loam
H2 - 6 to 18 inches: silt loam
H3 - 18 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 4 to 16 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
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: D
Ecological site: F145XY011CT - Well Drained Shallow Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 4 to 16 percent

Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydric soil rating: Unranked

Minor Components

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

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

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

HoD—Holyoke-Rock outcrop complex, hilly

Map Unit Setting
National map unit symbol: 9v4q
Elevation: 0 to 740 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition
Holyoke and similar soils: 55 percent
Rock outcrop: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holyoke

Setting
Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till

Typical profile
Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 6 inches: silt loam
H2 - 6 to 18 inches: silt loam

H3 - 18 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 10 to 30 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F145XY011CT - Well Drained Shallow Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 10 to 30 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Minor Components

Charlton

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

Chatfield

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

Watchaug

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

HoF—Holyoke-Rock outcrop complex, very steep

Map Unit Setting

National map unit symbol: 9v4r

Elevation: 0 to 890 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Holyoke and similar soils: 45 percent
Rock outcrop: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holyoke

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
H1 - 2 to 6 inches: silt loam
H2 - 6 to 18 inches: silt loam
H3 - 18 to 28 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 50 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F145XY011CT - Well Drained Shallow Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 50 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Minor Components

Charlton

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

Chatfield

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

Watchaug

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

Pv—Pits, quarry

Map Unit Setting

National map unit symbol: 9v51
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits, quarry: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits, Quarry

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s

Hydric soil rating: Unranked

Minor Components

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

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

Alden
Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Water
Percent of map unit: 1 percent
Hydric soil rating: Unranked

Us—Udorthents, smoothed

Map Unit Setting
National map unit symbol: 9v5d
Elevation: 0 to 890 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, smoothed, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Smoothed

Typical profile
H1 - 0 to 20 inches: channery loam
H2 - 20 to 70 inches: very gravelly loam

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Low (about 5.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Udorthents, wet substratum

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

Urban land

Percent of map unit: 4 percent
Hydric soil rating: Unranked

Alden

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Wallington

Percent of map unit: 2 percent
Hydric soil rating: No

Wethersfield

Percent of map unit: 2 percent
Hydric soil rating: No

Riverhead

Percent of map unit: 2 percent
Hydric soil rating: No

Hollis

Percent of map unit: 2 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: Unranked

W—Water

Map Unit Setting

National map unit symbol: 9v5s
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Wc—Watchaug fine sandy loam

Map Unit Setting

National map unit symbol: 9v5j
Elevation: 50 to 750 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Watchaug

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
H1 - 2 to 7 inches: fine sandy loam
H2 - 7 to 23 inches: gravelly fine sandy loam
H3 - 23 to 64 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F144AY008CT - Moist Till Uplands
Hydric soil rating: No

Minor Components

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

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

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

WeB—Wethersfield gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9v5l
Elevation: 30 to 690 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Wethersfield and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting
Landform: Till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile
H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Cheshire

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

Charlton

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

Riverhead

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

Wallington

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

WeC—Wethersfield gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9v5m
Elevation: 20 to 690 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Wethersfield and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile

H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Cheshire

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

Charlton

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

Riverhead

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

Wallington

Percent of map unit: 3 percent
Hydric soil rating: No

Yalesville

Percent of map unit: 2 percent
Hydric soil rating: No

WeD—Wethersfield gravelly silt loam, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9v5n
Elevation: 0 to 640 feet
Mean annual precipitation: 47 to 50 inches

Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Wethersfield and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile

H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Riverhead

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

Charlton

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

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

Wallington
Percent of map unit: 3 percent
Hydric soil rating: No

Yalesville
Percent of map unit: 2 percent
Hydric soil rating: No

WuB—Wethersfield-Urban land complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9v5p
Elevation: 0 to 710 feet
Mean annual precipitation: 47 to 50 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Wethersfield and similar soils: 50 percent
Urban land: 25 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wethersfield

Setting

Landform: Till plains, hills
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile

H1 - 0 to 13 inches: gravelly silt loam
H2 - 13 to 22 inches: gravelly loam
H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
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 30 inches

Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

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

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

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

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

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

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

Data Source Information

Soil Survey Area: Rockland County, New York
Survey Area Data: Version 19, Sep 1, 2021

ATTACHMENT 4
TABLES

Table 4-1 Summary of Wetlands Within the Project Corridor[1]						
Approximate Station	**Wetland ID**	**Cowardin Classification[2]**	**Associated Water Course**	**Area w/in JD Limits (Square Feet)**	**USACE & NYSDEC Jurisdiction**	**Coordinates (lat., long.)**
72500+00	D	PEM	Unnamed Tributary to Hudson River (Stream 3/S-3)	18,670	USACE/ NYSDEC (HS-2)	N041° 14' 26.41", W073° 58' 57.36"
72643+25	C	PUB	-	0	USACE	N041° 12' 15.95", W073° 59' 1.32"
72808+75	B	PFO	-	1,074	USACE	N041° 10' 28.92", W073° 56' 38.76"
72840+25	A	PEM	-	1,552	USACE	N041° 10' 11.71", W073° 56' 21.84"

[1] Wetlands identified include both wetlands that are directly crossed by the overland transmission cable corridor as well as wetlands that are adjacent to the Project Corridor that were delineated during field surveys.

[2]Cowardin et al. 1979 categories include: Palustrine Emergent (PEM), Palustrine Forested (PFO) and Palustrine Unconsolidated Bottom (PUB).

Table 4-2
Summary of Waterbodies within the Project Corridor

Approximate Station	Waterbody Name	NYSDEC Classification	Waterbody Field ID	Flow Status	Substrate	Width (ft.)[1]	Depth (ft.)[1]	Length w/in JD Limits (ft.)	Coordinates (lat., long.)
72503+00	Unnamed Tributary to Hudson River	SC/C	Stream 3 (S-3)	Perennial	Cobbles and Gravel	4	0.5	92	N041° 14' 25.08", W073° 58' 57.61"
72515+00	Unnamed Tributary to Hudson River	Unmapped	Stream 5.10 (S-4)	Intermittent	Cobbles and Gravel	4	0.5	46	N041° 14' 15.09", W073° 59' 05.94"
72551+00	Cedar Pond Brook	B/B	Stream 2 (S-2)	Perennial	Cobbles and Gravel	15	1	35	N041° 13' 41.76", W073° 59' 14.29"
72643+50	Minisceongo Creek	SC/C	Stream 1 (S-1)	Perennial	Cobbles	20	1-3	3	N041° 12' 15.37", W073° 59' 01.65"

[1] **Bankfull width and bankfull depth measurements are approximate.**

Table 4-3 Soil Description Summary					
County	**Soil Name**	**Symbol**	**% Slopes**	**Hydric (y/n)**	**Drainage Class**
Hydric Soils					
Rockland	Ipswich mucky peat	Ip	0-2	Y	Very Poorly Drained
Rockland	Rippowam sandy loam	Ra	0-2	Y	Poorly Drained
Non-hydric Soils					
Rockland	Charlton fine sandy loam	CeB	3-8	N	Well Drained
Rockland	Charlton fine sandy loam	CeC	8-15	N	Well Drained
Rockland	Charlton fine sandy loam	CeD	15-25	N	Well Drained
Rockland	Chatfield-Rock outcrop complex, rolling	CoC	4-16	N	Well Drained
Rockland	Chatfield-Rock outcrop complex, hilly	CoD	10-30	N	Well Drained
Rockland	Hinckley loamy sand	HcA	0-3	N	Excessively Drained
Rockland	Hinckley loamy sand	HcB	3-8	N	Excessively Drained
Rockland	Hinckley loamy sand	HcD	15-25	N	Excessively Drained
Rockland	Hinckley-Urban land complex	HdB	0-8	N	Excessively Drained
Rockland	Holyoke-Rock outcrop complex, rolling	HoC	4-16	N	Well Drained
Rockland	Holyoke-Rock outcrop complex, hilly	HoD	10-30	N	Well Drained
Rockland	Holyoke-Rock outcrop complex, very steep	HoF	25-50	N	Well Drained
Rockland	Pits, quarry	Pv	0-5	-	-
Rockland	Udorthents, refuse substratum	Ur	0-8	N	Well Drained
Rockland	Udorthents, smoothed	Us	0-8	N	Somewhat Excessively Drained
Rockland	Urban land	Ux	-	-	-

Table 4-3 Soil Description Summary					
County	**Soil Name**	**Symbol**	**% Slopes**	**Hydric (y/n)**	**Drainage Class**
Rockland	Watchaug fine sandy loam	Wc	0-3	N	Moderately Well Drained
Rockland	Wethersfield gravelly silt loam	WeB	3-8	N	Well Drained
Rockland	Wethersfield gravelly silt loam	WeC	8-15	N	Well Drained
Rockland	Wethersfield gravelly silt loam	WeD	15-25	N	Well Drained
Rockland	Wethersfield-Urban land complex	WuB	2-8	N	Well Drained
Rockland	Yalesville sandy loam	YaC	8-15	N	Well Drained
Rockland	Yalesville sandy loam	YaD	15-25	N	Well Drained

ATTACHMENT 5
WETLANDS AND WATERBODIES DELINEATION MAPPING

(Congers Transitional HDD Project Area Plans Only)

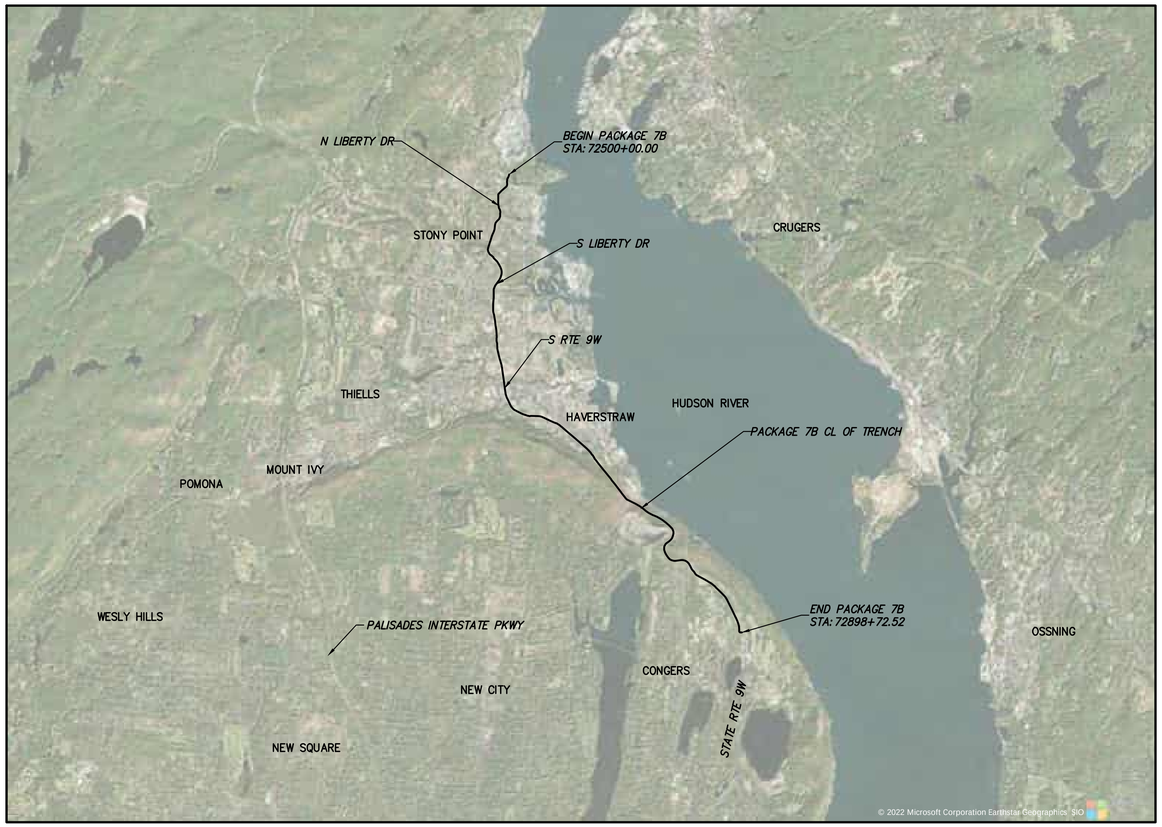
CHAMPLAIN HUDSON POWER EXPRESS

SEGMENT 12 - PACKAGE 7B - ROUTE 9W: ROCKLAND

ROCKLAND COUNTY, NEW YORK

INTERIM DESIGN DEVELOPMENT PLANS

MAY 20, 2022



SITE LOCATION MAP
SCALE: 1" = 5000'

NOTES TO REVIEWERS

1. Supplemental topographic information for numerous areas including Temp Site Access Roads is in the process of being obtained. Utility, Right-of-Way, Geotech and Wetland information from the beginning of Package 7A to Sta. 72500+00 is not currently available and is in the process of being obtained.

2. The design of the Horizontal Directional Drill (HDD) alignments and locations is in progress and should be considered preliminary.

3. Permanent and Temporary. Easements are preliminary (in some cases approximate) and are shown to indicate potential and likely areas where easements may be required.

CHPE Champlain Hudson Power Express

Kiewit

TETRA TECH

TETRA TECH ENGINEERING AND SURVEYING P.C.
(A NEW YORK PROFESSIONAL CORPORATION)

No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
D	05/19/2022	ISSUED FOR INTERIM REVIEW	AH	EK
C	03/22/2022	PRELIMINARY DESIGN DEVELOPMENT	BV	TK
B	03/07/2022	PRELIMINARY DESIGN DEVELOPMENT IDR-CR	BV	TK
A	02/18/2022	PRELIMINARY PROGRESS	BV	TK

CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 12 (PACKAGE 7B) - ROUTE 9W: ROCKLAND
COVER SHEET

DRAWN BY: AH | DESIGNED BY: AC | APPROVED BY: EK | SCALE AS SHOWN | REV. NO. D

KIEWIT PROJECT NO. 21162
TT PROJECT NO. 204-3701
DRAWING NO. G-000

DATE 05/19/2022
SH.NO. 1 OF 100

File: C:\PWWORKING\PEI\DM5514\21162_7B_G-000.DWG Saved: 5/13/2022 3:34:59 PM Plotted: 5/19/2022 9:30:27 PM Current User: Wager, Mike LastSavedBy: AMY.HOVMEIER

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
PACKAGE 7B: GENERAL SHEETS	
G-000	COVER SHEET
G-001	SHEET INDEX
G-002	GENERAL NOTES
G-003	LEGEND, & ABBREVIATIONS
G-004	PLAN AND PROFILE KEY MAP
G-005	SPLICE LOCATION TABLE AND SURVEY NOTES
PACKAGE 7B: PLAN AND PROFILE SHEETS	
C-101	STA. 72500+00.00 TO STA. 72515+00.00 PLAN AND PROFILE
C-102	STA. 72515+00.00 TO STA. 72530+00.00 PLAN AND PROFILE
C-103	STA. 72530+00.00 TO STA. 72545+00.00 PLAN AND PROFILE
C-104	STA. 72545+00.00 TO STA. 72560+00.00 PLAN AND PROFILE
C-105	STA. 72560+00.00 TO STA. 72575+00.00 PLAN AND PROFILE
C-106	STA. 72575+00.00 TO STA. 72590+00.00 PLAN AND PROFILE
C-107	STA. 72590+00.00 TO STA. 72605+00.00 PLAN AND PROFILE
C-108	STA. 72605+00.00 TO STA. 72620+00.00 PLAN AND PROFILE
C-109	STA. 72620+00.00 TO STA. 72635+00.00 PLAN AND PROFILE
C-110	STA. 72635+00.00 TO STA. 72650+00.00 PLAN AND PROFILE
C-111	STA. 72650+00.00 TO STA. 72665+00.00 PLAN AND PROFILE
C-112	STA. 72665+00.00 TO STA. 72680+00.00 PLAN AND PROFILE
C-113	STA. 72680+00.00 TO STA. 72695+00.00 PLAN AND PROFILE
C-114	STA. 72695+00.00 TO STA. 72710+00.00 PLAN AND PROFILE
C-115	STA. 72710+00.00 TO STA. 72725+00.00 PLAN AND PROFILE
C-116	STA. 72725+00.00 TO STA. 72740+00.00 PLAN AND PROFILE
C-117	STA. 72740+00.00 TO STA. 72755+00.00 PLAN AND PROFILE
C-118	STA. 72755+00.00 TO STA. 72770+00.00 PLAN AND PROFILE
C-119	STA. 72770+00.00 TO STA. 72785+00.00 PLAN AND PROFILE
C-120	STA. 72785+00.00 TO STA. 72800+00.00 PLAN AND PROFILE
C-121	STA. 72800+00.00 TO STA. 72815+00.00 PLAN AND PROFILE
C-122	STA. 72815+00.00 TO STA. 72830+00.00 PLAN AND PROFILE
C-123	STA. 72830+00.00 TO STA. 72845+00.00 PLAN AND PROFILE
C-124	STA. 72845+00.00 TO STA. 72860+00.00 PLAN AND PROFILE
C-125	STA. 72860+00.00 TO STA. 72875+00.00 PLAN AND PROFILE
C-126	STA. 72875+00.00 TO STA. 72890+00.00 PLAN AND PROFILE
C-127	STA. 72890+00.00 TO STA. 72898+00.00 PLAN AND PROFILE
PACKAGE 7B: ACCESS AND PROTECTION OF TRAFFIC PLANS	
O-001	GENERAL NOTES & ABBREVIATIONS
O-002	WORK ZONE TRAFFIC CONTROL
O-401	STAGE 1 DETOUR PLAN
O-402	STAGE 2 DETOUR PLAN
O-403	STAGE 3 DETOUR PLAN
O-404	STAGE 4 DETOUR PLAN
O-405	STAGE 4 DETOUR PLAN
O-406	STAGE 5A DETOUR PLAN
O-407	STAGE 5B DETOUR PLAN
O-408	STAGE 5B DETOUR PLAN
O-409	STAGE 6 DETOUR PLAN
O-410	STAGE 7 DETOUR PLAN
O-411	STAGE 8 DETOUR PLAN
O-412	STAGE 6-8 DETOUR PLAN
O-413	STAGE 9 DETOUR PLAN
O-414	STAGE 10 DETOUR PLAN
O-511A	STANDARD DETAIL – 01
O-511B	STANDARD DETAIL – 02
O-512	STANDARD DETAIL – 03
O-513	STANDARD DETAIL – 04
O-514	STANDARD DETAIL – 05
O-515	STANDARD DETAIL – 06
O-516	STANDARD DETAIL – 07
O-517	STANDARD DETAIL – 08
O-5XXA	WORK ZONE TRAFFIC CONTROL DETIALS
O-5XXB	WORK ZONE TRAFFIC CONTROL DETIALS
O-5XXA	WORK ZONE TRAFFIC CONTROL DETIALS
O-5XXB	WORK ZONE TRAFFIC CONTROL DETIALS
O-5XXC	WORK ZONE TRAFFIC CONTROL DETIALS
O-5XXA	WORK ZONE TRAFFIC CONTROL DETIALS
O-5XXB	WORK ZONE TRAFFIC CONTROL DETIALS
O-5XXC	WORK ZONE TRAFFIC CONTROL DETIALS
PACKAGE 7B: HDD TRENCHLESS PLANS	
C-324	PROPOSED PLAN AND PROFILE HDD 124
C-324.2	PROPOSED PLAN AND PROFILE HDD 124.2
C-325	PROPOSED PLAN AND PROFILE HDD 125
C-325.2	PROPOSED PLAN AND PROFILE HDD 125.2
C-326	PROPOSED PLAN AND PROFILE HDD 126
C-326 P2	PROPOSED PLAN AND PROFILE HDD 126 P2
C-326.2	PROPOSED PLAN AND PROFILE HDD 126.2
C-326.2 P2	PROPOSED PLAN AND PROFILE HDD 126.2 P2
C-327	PROPOSED PLAN AND PROFILE HDD 127
C-327.2	PROPOSED PLAN AND PROFILE HDD 127.2
C-329	PROPOSED PLAN AND PROFILE HDD 129
C-329.2	PROPOSED PLAN AND PROFILE HDD 129.2
C-331	PROPOSED PLAN AND PROFILE HDD 131
C-331.2	PROPOSED PLAN AND PROFILE HDD 131.2
C-332	PROPOSED PLAN AND PROFILE HDD 132
C-332.2	PROPOSED PLAN AND PROFILE HDD 132.2
PACKAGE 7B: EROSION AND SEDIMENT CONTROL PLANS	
C-400	KEY PLAN E&SC
C-401	STA. 72500+00.00 TO STA. 72530+00.00
C-402	STA. 72530+00.00 TO STA. 72560+00.00
C-403	STA. 72560+00.00 TO STA. 72590+00.00
C-404	STA. 72590+00.00 TO STA. 72620+00.00
C-405	STA. 72620+00.00 TO STA. 72650+00.00
C-406	STA. 72650+00.00 TO STA. 72680+00.00
C-407	STA. 72680+00.00 TO STA. 72710+00.00
C-408	STA. 72710+00.00 TO STA. 72740+00.00
C-409	STA. 72740+00.00 TO STA. 72770+00.00
C-410	STA. 72770+00.00 TO STA. 72800+00.00
C-411	STA. 72800+00.00 TO STA. 72830+00.00
C-412	STA. 72830+00.00 TO STA. 72860+00.00
C-413	STA. 72860+00.00 TO STA. 72890+00.00
C-414	STA. 72890+00.00 TO STA. 72898+73.00
C-601	EROSION AND SEDIMENT CONTROL DETAILS
C-602	EROSION AND SEDIMENT CONTROL DETAILS
C-611	WETLAND CROSSING DETAILS
PACKAGE 7B: DETAILS	
S-700	SPLICE VAULT PLAN & ELEVATION
S-701	SPLICE VAULT SECTION & DETAILS
S-710	LINK BOX HANDHOLE PLAN ELEVATION & SECTION
S-720	SELF SUPPORTING STRUCTURE OVER UTILITIES
S-730	TRANSITION VAULT PLAN & ELEVATION
S-731	TRANSITION VAULT SECTION & DETAILS
S-750	BRIDGE ATTACHMENT BRIDGE NO. 9 PLAN & ELEVATION
S-751	BRIDGE ATTACHMENT BRIDGE NO. 9 SECTION AND DETAILS
S-770	COMMUNICATION HANDHOLE PLAN ELEVATION & SECTION
C-801	POLE MARKING DETIALS
PACKAGE 7B: ACCESS ROAD PLANS	
C-201	ACCESS ROADS OFF RTE 9W
C-202	TOMKINS COVE LAYDOWN YARD

CHPE Champlain Hudson Power Express

Kiewit

TETRA TECH

TETRA TECH ENGINEERING AND SURVEYING P.C.
(A NEW YORK PROFESSIONAL CORPORATION)

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CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 12 (PACKAGE 7B) - ROUTE 9W:
ROCKLAND
SHEET INDEX

DRAWN BY: AH | DESIGNED BY: AC | APPROVED BY: EK | SCALE AS SHOWN | REV. NO. D

KIEWIT PROJECT NO.	
21162	
TT PROJECT NO.	
204-3701	
DRAWING NO.	
G-001	
DATE	05/19/2022
SH.NO.	2 OF 100

GENERAL NOTES:

1. THE PLANS SHOW SUBSURFACE STRUCTURES, ABOVE GROUND STRUCTURES AND/OR UTILITIES FROM FIELD LOCATION AND RECORD MAPPING, EXACT LOCATION OF WHICH MAY VARY FROM THE LOCATIONS INDICATED. IN PARTICULAR, THE CONTRACTOR IS WARNED THAT THE EXACT OR EVEN APPROXIMATE LOCATION OF SUCH PIPELINES, SUBSURFACE STRUCTURES AND/OR UTILITIES IN THE AREA MAY BE DIFFERENT FROM THAT SHOWN OR MAY NOT BE SHOWN, AND IT SHALL BE HIS RESPONSIBILITY TO PROCEED WITH GREAT CARE IN EXECUTING ANY WORK. 48 HOURS BEFORE YOU DIG, DRILL, OR BLAST, CALL U.F.P.O. 1-(800)-962-7962 TOLL FREE.

2. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY CONDITIONS THAT VARY FROM THOSE SHOWN ON THE PLANS. THE CONTRACTOR'S WORK SHALL NOT VARY FROM THE PLANS WITHOUT THE EXPRESSED APPROVAL OF THE ENGINEER.

3. THE CONTRACTOR SHALL RESTORE LAWNS, DRIVEWAYS, CULVERTS, SIGNS AND OTHER PUBLIC OR PRIVATE PROPERTY DAMAGED OR REMOVED TO AT LEAST AS GOOD A CONDITION AS BEFORE BEING DISTURBED AS DETERMINED BY THE ENGINEER.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND INCURRING THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES, ETC. AND SHALL COMPLY WITH ALL REQUIRED PERMITS.

5. ALL WORK SHALL BE DONE IN STRICT COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES, STANDARDS, ORDINANCES, RULES, AND REGULATIONS.

6. ALL PROPOSED UTILITIES AND APPURTENANCES TO BE CONSTRUCTED IN COMPLIANCE WITH THE LOCAL MUNICIPALITIES' CODES AND REGULATIONS GOVERNING THE INSTALLATION OF SUCH UTILITIES.

7. THE ENGINEER RESERVES THE RIGHT TO EXAMINE ANY WORK DONE ON THIS PROJECT AT ANY TIME TO DETERMINE THE CONFORMANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS OF THIS PROJECT.

8. THE CONTRACTOR SHALL PROTECT EXISTING PROPERTY LINE MONUMENTATION. ANY MONUMENTATION DISTURBED OR DESTROYED, AS JUDGED BY THE ENGINEER OR OWNER, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE UNDER THE SUPERVISION OF A NEW YORK STATE LICENSED LAND SURVEYOR.

9. IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE ALL PLAN SHEETS AND COORDINATE WORK WITH ALL OTHER CONTRACTS FOR THE SITE.

10. THE CONTRACTOR SHALL:

    A. VERIFY ALL CONDITIONS IN THE FIELD PRIOR TO COMMENCEMENT OF WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
    B. EXAMINE THE SITE AND INCLUDE IN HIS WORK THE EFFECT OF ALL EXISTING CONDITIONS ON THE WORK.
    C. PROVIDE AND INSTALL ALL MATERIALS AND PERFORM ALL WORK IN ACCORDANCE WITH RECOGNIZED GOOD STANDARD PRACTICE.

11. ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS OF NEW YORK STATE INDUSTRIAL CODE RULE 23 AND OSHA REGULATIONS FOR CONSTRUCTION. SHEET PILING SHALL BE DESIGNED AND SEALED BY A NEW YORK STATE PROFESSIONAL ENGINEER.

12. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK AND SHALL SUBMIT A DEWATERING PLAN DESIGNED AND SEALED BY A NEW YORK STATE PROFESSIONAL ENGINEER. CONTRACTOR SHALL MAINTAIN EXISTING SITE DRAINAGE PATTERNS THROUGHOUT CONSTRUCTION UNLESS OTHERWISE SHOWN ON THE PLANS.

13. MAINTAIN FLOW FOR ALL EXISTING UTILITIES.

14. ALL FRAMES/COVERS WITHIN PAVED AREAS SHALL HAVE THE TOPS SET FLUSH WITH THE EXISTING PAVEMENT GRADE. IN LANDSCAPED AREAS, ALL FRAMES SHALL BE 0.1' ABOVE GRADE.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL FIELD LAYOUT. THE CONTRACTOR SHALL TAKE TIES TO ALL UTILITY CONNECTIONS AND PROVIDE MARKED-UP AS-BUILT PLANS FOR ALL UTILITIES SHOWING TIES TO CONNECTIONS, BENDS, VALVES, LENGTHS OF LINES, AND INVERTS. AS-BUILT PLANS SHOWING ALL UNDERGROUND UTILITIES INSTALLED OR ENCOUNTERED SHALL BE REVIEWED BY THE OWNER AND HIS REPRESENTATIVES. THE CONTRACTOR SHALL PROVIDE ANY CORRECTION OR ADMISSIONS TO THE SATISFACTION OF THE OWNER AND HIS REPRESENTATIVES BEFORE UTILITIES WILL BE ACCEPTED.

16. TEMPORARY PAVEMENT SHALL BE PLACED WITHIN 48 HOURS OF COMPLETION OF BACKFILL OPERATIONS WITHIN THE EXISTING PAVEMENT LIMITS.

17. CONTRACTOR SHALL MAINTAIN ALL TRAFFIC IN ALL AREAS IN ACCORDANCE WITH THE NYSDOT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

18. ALL EXCAVATIONS SHALL BE PROTECTED AT THE END OF EACH WORK DAY.

19. CONTRACTOR SHALL TAKE CARE TO PREVENT DAMAGE TO EXISTING UTILITIES. DAMAGED UTILITIES SHALL BE IMMEDIATELY REPAIRED BY CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

20. THE MINIMUM BENDING RADIUS OF CONDUITS WITHIN THE DUCT BANK SHALL BE 400 FEET, EXCEPT AS OTHERWISE NOTED ON THE DRAWINGS. ALL BENDS OF RADII LESS THAN 100 FEET SHALL BE FACTORY FORMED AND MANDREL TESTED PRIOR TO CONCRETE ENCASEMENT. CONDUIT SHALL NOT BE FIELD BENT BY HEATING, WITHOUT ENGINEER APPROVAL. FIELD BENT CONDUIT SHALL BE MANDREL TESTED PRIOR TO INSTALLATION AND PRIOR TO ENCASEMENT.

NYSDOT NOTES

1. MAINTAIN EXISTING GUIDE RAIL, MEDIAN BARRIER, AND BRIDGE RAIL. WHEN CONSTRUCTION OPERATIONS REQUIRE THE TEMPORARY REMOVAL OF EXISTING BRIDGE RAIL, GUIDE RAIL OR MEDIAL BARRIER; OR WHEN EXISTING RAIL WILL BE REMOVED AND REPLACED WITH NEW RAIL, THE CONTRACTOR SHALL SCHEDULE OPERATIONS TO MINIMIZE THE TIME PERIOD THAT RAIL IS NOT INSTALLED.

2. UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS, GUIDE RAIL OR MEDIAN BARRIER SHALL BE REPLACED OR THE LOCATION OTHERWISE PROTECTED WITHIN 14 CALENDAR DAYS. BRIDGE RAIL SYSTEMS SHALL BE MAINTAINED IN SERVICE AT ALL TIMES ON ANY STRUCTURE ON WHICH VEHICLE OR PEDESTRIAN TRAFFIC IS MAINTAINED, UNLESS A TEMPORARY BARRIER IS INSTALLED, OR OTHER MEANS ARE USED TO ENSURE THAT VEHICLES, BICYCLISTS AND PEDESTRIANS ARE NOT EXPOSED TO THE UNPROTECTED EDGE OF A BRIDGE.

3. DURING NON-WORK HOURS WHEN TRAFFIC IS BEING MAINTAINED ON THE FACILITY, ALL TEMPORARY ENDS (FREE ENDS) OF GUIDE RAIL, MEDIAN BARRIER AND BRIDGE RAIL SHALL BE TEMPORARILY TERMINATED AND MARKED WITH A CHANNELIZING DRUM OR OBJECT MARKER EQUIPPED WITH A TYPE OF FLASHING WARNING LIGHT. CORRUGATED BEAM GUIDE RAIL AND MEDIAN BARRIER, AND HEAVY-POST, BLOCKED-OUT, CORRUGATED BEAM GUIDE RAIL AND MEDIAN BARRIER SHALL BE TEMPORARILY TERMINATED BY HAVING THE EXPOSED ENDS (FREE ENDS) DROPPED TO THE GROUND AND PINNED.

4. THE APPROACH ENDS OF BOX BEAM GUIDE RAIL, MEDIAN BARRIER AND BRIDGE RAIL SHALL BE TEMPORARILY TERMINATED WITH BOX BEAM GUIDE RAIL END ASSEMBLIES UTILIZING TWO SPLICE PLATES AND THE PROPER NUMBER OF BOLTS PER CONNECTION. NO POSTS FOR ANCHORAGES WILL BE REQUIRED. SPECIAL TEMPORARY SPLICE PLATES ARE REQUIRED TO ADAPT BOX BEAM GUIDE RAIL END ASSEMBLIES TO BOX BEAN MEDIAN BARRIERS.

5. DURING ANY OVERNIGHT PERIOD WHEN EXISTING GUIDE RAIL OR MEDIAN BARRIER IS TEMPORARILY REMOVED, THE CONTRACTOR SHALL INSTALL CHANNELIZING DEVICES IN THE LOCATION WHERE THE GUIDE RAIL OR MEDIAN BARRIER WAS REMOVED IN ACCORDANCE WITH 619-3.02J.6. REMOVED EXISTING GUIDE RAIL OR MEDIAN BARRIER.

6. GUIDERAIL REPLACEMENT TYPE TO BE COORDINATE WITH NYSDOT.

7. THE PLANS DEPICT AREAS OF EXPANDED LIMIT OF WORK AT EXISTING CULVERTS THAT WILL BE EVALUATED WITH NYSDOT AND THE CERTIFICATE HOLDERS FOR POTENTIAL REPLACEMENT OR REPAIR. IF ANY REPAIRS OR REPLACEMENTS ARE DETERMINED, THE WORK WILL BE DONE IN ACCORDANCE WITH NYSDOT SPECIFICATIONS.

8. ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS OF NEW YORK STATE INDUSTRIAL CODE RULE 23 AND OSHA REGULATIONS FOR CONSTRUCTION. SHEET PILING SHALL BE DESIGNED AND SEALED BY A NEW YORK STATE PROFESSIONAL ENGINEER. WHERE WITHIN RAIL ROAD ROW, ANY EXCAVATION AND SHORING SHALL BE DESIGNED TO MINIMUM CP AND AREAMA REQUIREMENTS.

9. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK AND SHALL SUBMIT A DEWATERING PLAN. CONTRACTOR SHALL MAINTAIN EXISTING SITE DRAINAGE PATTERNS THROUGHOUT CONSTRUCTION UNLESS OTHERWISE SHOWN ON THE PLANS.

10. MAINTAIN FLOW FOR ALL EXISTING UTILITIES.

11. ALL FRAMES/COVERS WITHIN PAVED AREAS SHALL HAVE THE TOPS SET FLUSH WITH THE EXISTING PAVEMENT GRADE. IN LANDSCAPED AREAS, ALL FRAMES SHALL BE 0.1' ABOVE GRADE.

12. TEMPORARY PAVEMENT SHALL BE PLACED WITHIN 48 HOURS OF COMPLETION OF BACKFILL OPERATIONS WITHIN THE EXISTING PAVEMENT LIMITS.

13. CONTRACTOR SHALL MAINTAIN ALL TRAFFIC IN ALL AREAS IN ACCORDANCE WITH THE NYSDOT MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

14. ALL EXCAVATIONS SHALL BE PROTECTED AT THE END OF EACH WORK DAY PER OSHA AND NYSDOT REQUIREMENTS.

15. WITHIN NYSDOT ROW ALL OPEN EXCAVATIONS TO BE PROTECTED BY CONCRETE BARRIERS OR BE COVERED BY A STEEL PLATE, 3/4" THICK MINIMUM. A SINGLE PLATE SHOULD COVER THE ENTIRE EXCAVATION AND HAVE ENOUGH BEARING ON SURROUNDING SURFACES TO SUPPORT A VEHICLE.

16. CONTRACTOR SHALL TAKE CARE TO PREVENT DAMAGE TO EXISTING UTILITIES. UTILITIES DAMAGED BY CONTRACTOR SHALL BE IMMEDIATELY REPAIRED BY CONTRACTOR AT THE CONTRACTOR'S EXPENSE. IF DURING EXCAVATION PREVIOUSLY DAMAGED UTILITIES ARE UNCOVERED, CONTRACTOR SHALL DOCUMENT THE DAMAGE AND REPORT DAMAGE TO THE APPROPRIATE OWNER .

17. DEPTH OF BURY FOR EXISTING CABLED UTILITIES FIBER/ELECTRICAL/TELECOM AND WATERLINES UNKNOWN. ASSUMED DEPTH OF BURY FOR CABLED UTILITIES IS 30" UNLESS OTHERWISE SHOWN. ASSUMED DEPTH OF BURY FOR WATERLINES IS 5' UNLESS OTHERWISE SHOWN.

18. CONTRACTOR TO COORDINATE ALL DRIVEWAY CROSSINGS WITH THE PROPERTY OWNERS PRIOR TO EXCAVATING. ACCESS TO ALL DRIVEWAYS FOR THE RESIDENTS AND COMMERCIAL PROSPERITIES, WILL NEED TO BE MAINTAINED DURING THE PROJECT. ALL EXCAVATIONS IN THE ENTRANCES/DRIVEWAYS WILL NEED TO BE BACKFILLED AT THE END OF EACH WORKDAY, OR STEEL PLATES SHALL BE INSTALLED TO ALLOW ACCESS DURING CONSTRUCTION. REFER TO THE EM&CP FOR EMERGENCY ACCESS MANAGEMENT PLAN.

Dig Safely. New York Call 811 before you dig

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CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 12 (PACKAGE 7B) - ROUTE 9W:
ROCKLAND
GENERAL NOTES

KIEWIT PROJECT NO.	21162
TT PROJECT NO.	204-3701
DRAWING NO.	G-002

DRAWN BY: AH | DESIGNED BY: AC | APPROVED BY: EK | SCALE AS SHOWN | REV. NO. D | DATE 05/19/2022 | SH.NO. 3 OF 100

LEGEND

- CL OF TRENCH/CONDUITS
- PROPOSED TEMP ACCESS RD OR OFF-SITE ACCESS RD
- PROPOSED TEMP OFF-SITE ACCESS ROUTE (EXISTING ROAD OR PAVEMENT)
- PROPOSED LAYDOWN YARDS, PARKING, STORAGE, AND MUSTER AREAS
- PROPOSED WORK AREAS
- LIMITS OF WORK
- PERMANENT EASEMENT
- TEMPORARY EASEMENT
- RAILROAD TRACK
- 7' FOUL ZONE: NO VEHICLES, MATERIALS, DISTURBANCE, PERSONNEL, OR WORK SHALL ENCROACH THE ZONE WITHIN 7 FEET OF THE NEAREST RAIL WITHOUT CSX COORDINATION AND APPROVAL
- WETLAND BOUNDARY
- RIGHT OF WAY
- FIBER OPTIC LINE
- GAS LINE
- UNDERGROUND STORM
- UNDERGROUND ELECTRIC
- OVERHEAD ELECTRIC

WETLAND COMMUNITY TYPES LEGEND

- PEM – PALUSTRINE EMERGENT
- PSS – PALUSTRINE SCRUB-SHRUB
- PFO – PALUSTRINE FORESTED
- PUB – PALUSTRINE UNCONSOLIDATED BOTTOM
- L1 – LACUSTRINE LIMNETIC
- L2 – LACUSTRINE LITTORAL
- NYSDEC FWW 100-FOOT ADJACENT AREA
- GIS – WETLAND
- JD BOUNDARY

- HYD – HYDRANT
- WV – WATER VALVE
- WATER MARK – WATER MARKER
- CB – CATCH BASIN
- ST – MANHOLE STORM
- SS – MANHOLE SANITARY
- ELEC MARK – ELECTRIC MARKER
- POLE – UTILITY POLE
- FIBER BOX – FIBER BOX
- FIBER MARK – FIBER OPTIC
- P – TELEPHONE PEDESTAL
- CAPPED IRON ROD – CAPPED IRON ROD
- IRON PIPE
- CONCRETE BOUND
- POST – POST
- XX-## – WETLAND FLAG
- GAS MARK – GAS
- VENT GAS – VENT GAS
- BORE HOLE

ABBREVIATIONS

APP	APPROVED
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
DB	DESIGNED BY
DEC	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DEG	DEGREES
DR	DRIVE
DZ	DEVIATION ZONE
E	EASTING
ELECTRIC	ELECTRIC CABLE
ELEV	ELEVATION
FIBER	FIBER OPTIC CABLE
FT	FEET
GAS	GAS PIPE
H	HORIZONTAL
HDD	HORIZONTAL DIRECTIONAL DRILLING
HVDC	HIGH-VOLTAGE DIRECT CURRENT TRANSMISSION LINE
INV	INVERT ELEVATION
LOD	LIMITS OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
N	NORTHING
NO	NUMBER
NY	NEW YORK
P#	PACKAGE #
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
REV	REVISION
ROW	RIGHT-OF-WAY
RTE	ROUTE
SEWER	SANITARY SEWER PIPE
SH	SHEET
ST	STREET
STA	STATION
STORM	STORM DRAIN PIPE
TELECOM	TELECOMMUNICATIONS CABLE
TEMP	TEMPORARY
TYP	TYPICAL
V	VERTICAL
WATER	WATERLINE

WILLIAMS AERIAL & MAPPING, INC.
MAPPING FEATURES LEGEND

TRANSPORTATION

- BRIDGE DECK
- PAVED DRIVEWAY
- UNPAVED DRIVEWAY
- PAVED PARKING
- UNPAVED PARKING
- ABANDONDED ROAD
- CURBED ROAD
- PAVED ROAD
- UNPAVED ROAD
- RAILROAD
- INACTIVE RAILROAD
- RAILROAD SWITCH/BOX/SIGNAL/POLE
- PAVED SHOULDER
- UNPAVED SHOULDER
- SIDEWALK
- TRAIL

UTILITIES

- ANTENNA
- UTILITY BOX
- CATCH BASIN
- HANDHOLE
- FIRE HYDRANT
- LIGHT POLE
- MANHOLE
- MISCELLANEOUS POLE
- PIPELINE
- UTILITY POLE
- GUYWIRE

STRUCTURES

- BUILDING
- RUIN
- TANK
- CONCRETE
- CONCRETE SPILLWAY
- DECK
- DOCK
- FENCE
- FENCE, OBSCURED/INDEFINTE
- RAILING
- GIRDER BRIDGE FRAME
- GIRDER BRIDGE PILING
- GUARDRAIL
- MAILBOX
- MISCELLANEOUS OVERHEAD
- MISCELLANEOUS
- PATIO
- PEDESTAL
- PLANTER
- PLATFORM
- POOL
- POST
- SATELLITE DISH
- SIGN
- STEPS
- STONEWALL
- WALL
- RETAINING WALL

TOPOGRAPHY

- CONTOUR, INDEX
- CONTOUR, DEPRESSION INDEX
- CONTOUR, INTERMEDIATE
- CONTOUR, DEPRESSION INTERMEDIATE
- SPOT ELEVATION

CULTURAL

- DEBRIS
- FIELD LINE
- LANDSCAPE AREA
- PILE
- STORAGE AREA

HYDROGRAPHIC

- HYDROGRAPHIC
- CULVERT
- CULVERT, OBSCURED
- INUNDATED AREA
- RIP-RAP
- STREAM
- SWAMP
- WATER LEVEL

NATURAL

- BOULDER
- SCRUB
- TREE LINE
- SINGLE TREE/BUSH

PROJECT

- MAPPING BOUNDARY
- GROUND CONTROL

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CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 12 (PACKAGE 7B) - ROUTE 9W:
ROCKLAND
LEGEND & ABBREVIATIONS

KIEWIT PROJECT NO.	
	21162
TT PROJECT NO.	
	204-3701
DRAWING NO.	
	G-003

DRAWN BY: AH | DESIGNED BY: AC | APPROVED BY: EK | SCALE AS SHOWN | REV. NO. D | DATE 05/19/2022 | SH.NO. 4 OF 100

STRUCTURE TABLE				
STRUCTURE NAME	STATION	NORTHING	EASTING	FINISHED GRADE
LINK VAULT 244	72500+24.0	877436.5	634424.1	11.606'
LINK VAULT 247	72591+01.4	869241.4	633381.7	121.736'
LINK VAULT 249	72677+01.7	861516.9	635730.3	133.634'
LINK VAULT 251	72785+16.1	854988.7	643905.7	199.636'
LINK VAULT 252	72898+38.0	847220.0	649769.8	214.774'
TRANSITION VAULT 3	72500+00.0	877458.0	634435.5	12.584'
SPLICE VAULT 245	72538+52.8	873987.0	633471.6	122.367'
SPLICE VAULT 246	72590+77.4	869265.2	633386.4	122.893'
SPLICE VAULT 247	72631+45.1	865234.5	633799.2	104.489'
SPLICE VAULT 248	72676+77.7	861524.8	635707.3	132.380'
SPLICE VAULT 249	72729+47.7	858831.8	640026.8	155.311'
SPLICE VAULT 250	72784+92.1	855002.1	643885.3	198.627'
SPLICE VAULT 251	72842+01.8	851458.9	646478.9	257.329'
TRANSITION VAULT 4	72898+62.0	847216.0	649793.8	215.527'

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CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 12 (PACKAGE 7B) - ROUTE 9W: ROCKLAND
SPLICE LOCATION TABLE & SURVEY NOTES

DRAWN BY: AH | DESIGNED BY: AC | APPROVED BY: EK | SCALE AS SHOWN | REV. NO. D

KIEWIT PROJECT NO.	
21162	
TT PROJECT NO.	
204-3701	
DRAWING NO.	
G-004	
DATE	05/19/2022
SH.NO.	5 OF 100

PLAN AND PROFILE KEY MAP

SCALE: 1" = 2000'

CHPE Champlain Hudson Power Express

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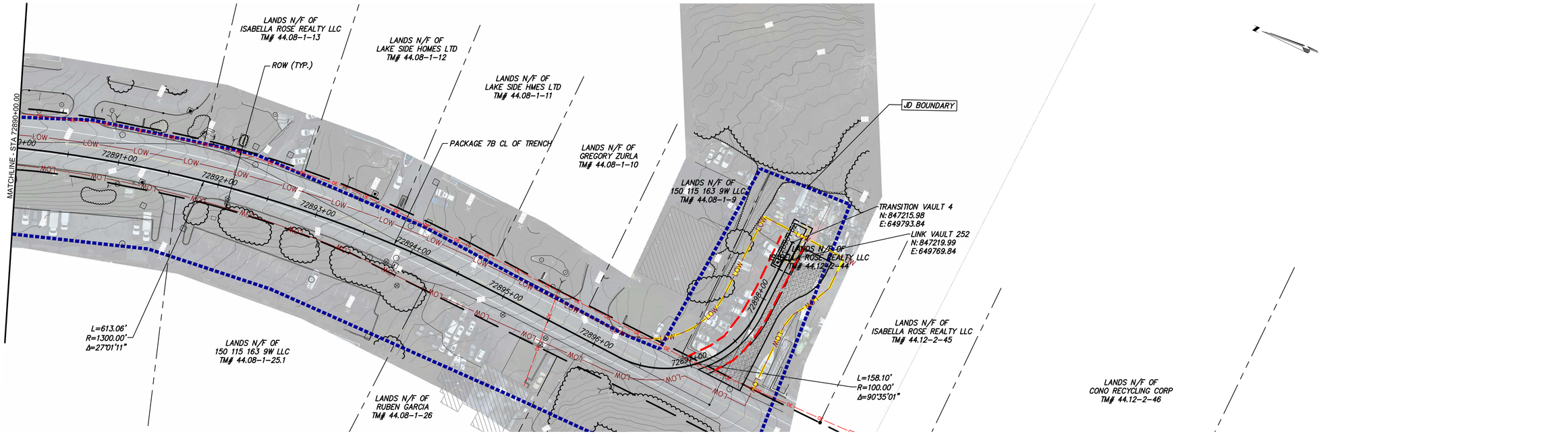
CHAMPLAIN HUDSON POWER EXPRESS
SEGMENT 12 (PACKAGE 7B) - ROUTE 9W: ROCKLAND
PLAN AND PROFILE KEY MAP

KIEWIT PROJECT NO.	21162
TT PROJECT NO.	204-3701
DRAWING NO.	G-005

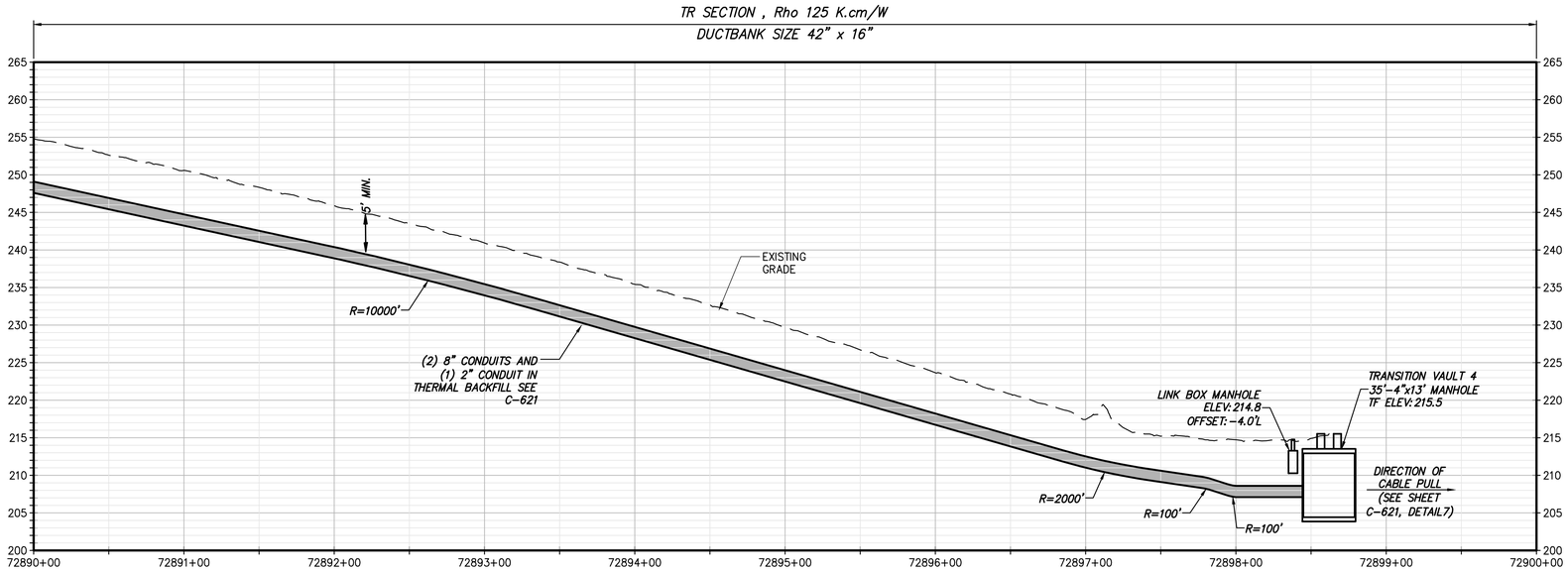
DRAWN BY: AH | DESIGNED BY: AC | APPROVED BY: EK | SCALE AS SHOWN | REV. NO. D | DATE 05/19/2022 | SH.NO. 6 OF 100



STA. 72890+00.00 TO STA. 72898+72.52 PLAN VIEW

SCALE: 1" = 50'

0 50 100
Scale in feet



STA. 72890+00 TO STA. 72900+00 PROFILE VIEW

SCALE: H:1" = 50' V:1" = 10'

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No.	DATE	SUBMITTAL / REVISION DESCRIPTION	DB	APP
D	05/19/2022	ISSUED FOR INTERIM REVIEW	AH	EK
C	03/22/2022	PRELIMINARY DESIGN DEVELOPMENT	BV	TK
B	03/07/2022	PRELIMINARY DESIGN DEVELOPMENT IDR-CR	BV	TK
A	02/18/2022	PRELIMINARY PROGRESS	BV	TK

CHAMPLAIN HUDSON POWER EXPRESS

SEGMENT 12 (PACKAGE 7B) - ROUTE 9W: ROCKLAND

STA. 72890+00.00 TO STA. 72898+72.52

DRAWN BY: AH | DESIGNED BY: AC | APPROVED BY: EK | SCALE AS SHOWN | REV. NO. D

KIEWIT PROJECT NO.	21162
TT PROJECT NO.	204-3701
DRAWING NO.	C-127
DATE	05/19/2022
SH.NO.	33 OF 100

ATTACHMENT 6
WATERBODY PHOTOGRAPHS

(No Waterbodies Identified at Congers Transitional HDD Project Area)