ELLENVILLE STREAM BANK RESTORATION PROJECT
VILLAGE OF ELLENVILLE AND TOWN OF WAWARSING
ULSTER COUNTY, NEW YORK

ENVIRONMENTAL REVIEW RECORD

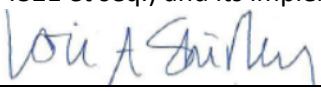
ENVIRONMENTAL ASSESSMENT

New York State Homes and Community Renewal
US Department of Housing and Urban Development
38-40 State Street
Albany, NY 12207

February 24, 2020

ELLENVILLE STREAM BANK RESTORATION PROJECT
VILLAGE OF ELLENVILLE AND TOWN OF WAWARSING, ULSTER COUNTY, NEW YORK

Environmental Assessment
February 24, 2020

Project Name:	Ellenville Stream Bank Restoration Project
Project Location:	Village of Ellenville and Town of Wawarsing, Ulster County, New York
Federal Agency: **Responsible Entity:**	U.S. Department of Housing and Urban Development New York State Homes and Community Renewal
Responsible Agency's Certifying Officer:	Lori A Shirley, HTFC Certifying Officer
Project Sponsor:	Village of Ellenville Jeff Kaplan, Village Mayor
Primary Contact:	Village of Ellenville 2 Elting Court Ellenville, New York 12428 (845) 647-7080 jkaplan.kkzf@gmail.com
Project NEPA Classification:	24 CFR 58.36 (Environmental Assessment)
Environmental Finding:	☒ Finding of No Significant Impact - The project will not result in a significant impact on the quality of the human environment. ☐ Finding of Significant Impact - The project may significantly affect the quality of the human environment.
Certification	The undersigned hereby certifies that New York State Homes and Community Renewal has conducted an environmental review of the project identified above and prepared the attached environmental review record in compliance with all applicable provisions of the National Environmental Policy Act of 1969, as amended (42 USC Sec. 4321 et seq.) and its implementing regulations at 24 CFR Part 58.
Signature	 Lori A Shirley, HTFC Certifying Officer

Environmental Review Prepared By: **Alicia Shultz**
Senior Environmental Scientist
GOSR

CERTIFICATION OF NEPA CLASSIFICATION

It is the finding of the New York State Housing Trust Fund Corporation that the activity(ies) proposed in its 2020 NYS CDBG-DR project, Ellenville Stream Bank Restoration are:

Check the applicable classification.

☐ Exempt as defined in 24 CFR 58.34 (a).

☐ Categorically Excluded as defined in 24 CFR 58.35(b).

☐ Categorically Excluded as defined in 24 CFR 58.35(a) and no activities are affected by federal environmental statues and executive orders [i.e., exempt under 58.34(a)(12)].

☒ Categorically Excluded as defined in 24 CFR 58.35(a) and some activities are affected by federal environmental statues and executive orders.

☐ "Other" neither exempt (24 CFR 58.34(a)) nor categorically excluded (24 CFR 58.35).

☒ Part or all of the project is located in an area identified as a floodplain or wetland. For projects located in a floodplain or wetland, evidence of compliance with Executive Orders 11988 and/or 11990 is required.

For activities excluding those classified as "Other," attached is the appropriate Classification Checklist (Exhibit 2-4) that identifies each activity and the corresponding citation.

Signature of Certifying Officer	**February 24, 2020**
	Date
Lori A. Shirley	**HTFC Certifying Officer**
Print Name	**Title**

CERTIFICATION OF SEQRA CLASSIFICATION

It is the finding of the New York State Housing Trust Fund Corporation that the activity(ies) proposed in its 2020 NYS CDBG-DR project, Ellenville Stream Bank Restoration are:

Check the applicable classification:

- ☐ Type I Action (6NYCRR Section 617.4)
- ☐ Type II Action (6NYCRR Section 617.5)
- ☒ Unlisted Action (not Type I or Type II Action)

Check if applicable:

- ☐ Environmental Impact Statement (EIS) Prepared
  - ☐ Draft EIS
  - ☐ Final EIS

Lori A Shirley	**February 24, 2020**
Signature of Certifying Officer	**Date**
Lori A. Shirley	**HTFC Certifying Officer**
Print Name	**Title**

Description of the Proposed Project [24 CFR 50.12 & 58.32; 40 CFR 1508.25]**:**

The Village of Ellenville (Village) applied for U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant (CDBG-DR) funding for design and construction of stream bank restoration improvements within and along the West Branch of Beer Kill and Sandburg Creek. The Ellenville Stream Bank Restoration Project involves the restoration of damaged streams and stream corridors, including resiliency measures, for eight (8) sites within the Village of Ellenville and Town of Wawarsing, in Ulster County, New York (the Proposed Project). Stream restoration measures include channel realignments to original channel paths, removal of existing structures necessary to return stream banks to previous ground level grades, and placement of materials (soils and riprap armoring) to retain existing and future bank elevations and slopes. The flood mitigation measures include the construction of floodplain benches with rock and/or wood revetment (to reduce cutting at the toe of bank); lowering of the height, angle and overall erosion hazard of the eroding streambanks; installation of in-stream rock structures to provide grade control and reduce the erosive force of water upon streambanks (by directing flood flows to the center of the stream channel); and the reconnection of floodplains in select areas (to reduce channel confinement and the corresponding increases in flood velocity that contribute to flood severity).

Originally, thirteen project sites were included in the proposed project. Five sites (6, 7, 9, 11 and 12) have been removed from the project scope. A total of eight (8) sites in the project area are proposed for improvements and are summarized below and shown in the attached figures (See **Attachment** 1- Design Plans and **Appendix A** - Figures). **Attachment 2** includes the engineering analysis used to select mitigation projects. **Attachment 3** includes the Joint Permit Application, which provides the dimensions and quantities of impacts of streams.

Site 1 - West Branch Beer Kill at Old Greenfield Road

West Branch Beer Kill channel will be re-graded and four rock cross vanes and five grade control structures will be constructed in the regraded portion of the channel. Rip-rap will be constructed at bankfill elevation along the south bank to provide overbank flood protection. The existing retaining wall will be reconstructed. Table 1 below quantifies the proposed stream impacts.

Table 1. Impacts to the West Branch Beer Kill

Site	Length (ft)	Width (ft)	Area of Disturbance (sq ft)	Excavation Quantity (CY)	Backfill Quantity (CY)	Rock Structures (CY)	Total Fill (CY)	Net Fill (CY)
1	650	90	58500	2,900	2,800	385	3185	285

Source: Attachment 3

Two temporary gravel roads, one the north side and one on the south side of the stream will be constructed to bring in materials. A temporary coffer dam/channel block will be installed at the upstream end of Site 1 to dewater the stream channel during construction. The bypass pipe will run along the southern bank of the stream and discharge below Site 1. The project shall be staged such that the dewatered “work area” shall be limited to an amount of work to be completed within one to two days. The work area will be delineated by a

stone wall barrier. Where feasible, excavated spoil material and stones will be used to create the barrier. Prior to construction of the barrier, a turbidity curtain shall be placed on the downstream side of the barrier to capture sediment during barrier construction and excavation, and on the upstream side to deflect stream flow around the work area. Once the barrier is in place, a pump(s) and hose(s) shall be used to dewater the work area to the extent necessary to perform the work. It is proposed that the hose will run up the streambank and across Old Greenfield Road (pending permit for road closure during construction) where it will filter through dewatering bag(s) into the existing roadside ditch. The existing vegetated ditch will offer additional filtration of any remaining sediment before the water returns to the stream through existing culvert(s). This system shall be repeated as many times as necessary for Site 1. All disturbed areas will be restored to pre-construction conditions. After construction the temporary road and dam and associated pipe will be removed, and the area planted with grass, scrubs and trees.

Site 2 - West Branch Beer Kill at Barbara Road Bridge

A cross vane be constructed just downstream of the Barbara Road Bridge to maintain bed grade and protect the bridge foundation from flood flows that have partially scoured its footings. Existing gabion baskets near the bridge will be retained. Existing rock revetment wall will be extended along the left bank adjacent to Old Greenfield Road. Seven stream barbs will be constructed on the north side of the stream and four random boulder clusters will be placed in the stream (see attached design plans). The total area of disturbance is 30,334 square feet, including 788 linear feet and 251 cubic yards (CY) of fill and 191 CY of cut below the Ordinary High Water Mark (OHWM).

Full width stream bed excavation will be required for the installation of a proposed cross vane downstream of the bridge. Localized excavation and grading along the southern edge of Old Greenfield Road at the toe of slope and along the slope itself is required for the purpose of setting rock structures and minimizing disturbance. Two permanent and one temporary access road will be constructed to bring materials into and out of the construction area. The permanent road will be used for maintenance.

Site 3- West Branch Beer Kill at Old Greenfield Road

Seven stream barbs will be constructed along the stream bank adjacent to Old Greenfield Road to control flood flows as well as help protect the roadway embankment. Two isolated areas of randomly placed boulders are proposed at the toe of slope to provide additional stability and control of stream energy. The total area of disturbance is 18,872 square feet and 701 linear feet with 135 CY of fill and 100 CY of cut below the OHWM.

Construction will include localized excavation and grading at the toe of the slope at strategic areas along the southern edge of Old Greenfield Road, as well as along the slope itself. This will allow for the setting of rock structures to protect the toe of slope and minimizing disturbance. A temporary access road will be constructed to bring materials into and out of the site.

Site 4 - West Branch Beer Kill at Old Greenfield Road

Three stream barbs will be installed to prevent the excessive sediment deposition that currently causes the migration of meander toward the adjacent roadway embankment and aide in enhancing grade control and a single thread channel through this problem area. Three boulder clusters will be placed in the stream (see attached design plans). The total area of disturbance is 31,446 square feet and 393 linear feet with 61 CY of fill and 57 CY of cut below the OHWM.

Construction will require localized excavation and grading at the toe of the slope along the southern edge of Old Greenfield Road, as well as along the slope itself. This will allow for the setting of barbs and rock clusters to protect the slope and strategic spacing and tree preservation to extent possible to minimize disturbance. A temporary access road will be constructed to bring materials into and out of the site.

Site 5 - West Branch Beer Kill at Old Greenfield Road

Stream barbs will be installed at five locations to establish grade control and provide transition to the existing channel. This also encourages the stream to maintain a single thread channel thought the upper portion of the area as well. Approximately 550 LF of rock toe revetment will be installed at the base of the roadway embankment to reduce scouring of the embankment. Two randomly placed boulders will be laced all along the stream bank to protect the roadway embankment and establish grade control throughout (see attached design plans, Attachment 1). The total area of disturbance is 30,132 square feet and 763 linear feet with 433 CY of fill and 406 CY of cut.

Construction will include localized excavation and grading at the toe of the slope along the southern edge of Old Greenfield Road, as well as along the slope itself. This will allow for the setting of rock structures to protect the slope and minimizing disturbance. A temporary access road will be constructed to bring materials into and out of the site.

Site 8 - Sandburg Creek at Roslyn Street Pump Station

Rip-Rap will be installed along 171 feet of eastern bank of the creek (see attached design plans). The total area of disturbance estimated at 30,334 square feet, 788 linear feet, and 251 CY of fill and 197 of cut below OHWM. A dewatering and turbidity curtain will be installed at the upstream end of Site 8 to dewater the creek channel during construction. After construction the structure will be removed, and the area planted with grass, scrubs and trees (see sheet C-501, detail 19 in the attached design plans, Attachment 1). Two temporary access roads will be constructed to bring materials into and out of the site.

Site 10 - Sandburg Creek at Hang Glider Road

Restoration/stabilization of Sandburg Creek will require some channel relocation to soften bend angles, grading the areas adjacent to the channel to create an interactive floodplain, installing cross vanes to anchor the bed elevation and to direct flow into the center of the channel away from currently eroding banks, and installing structures at critical locations along the bank to stabilize actively eroding banks and improve fish habitat. Proposed construction includes the installation of floodplain benches, rock cross vanes (4), and rock

and rood wad/toe wood revetment along portions of the stream bank to prevent lateral bank erosion. Table 2, below, quantifies the proposed stream impacts.

Table 2. Impacts to the West Branch Beer Kill

Site	Length (ft)	Width (ft)	Area of Disturbance (sq ft)	Excavation Quantity (CY)	Backfill Quantity (CY)	Rock Structures (CY)	Total Fill (CY)	Net Fill (CY)
10	750	110	82,500	3,200	1,200	347	1547	-1653

Source: Attachment 3

Two temporary gravel roads on the south side of the stream will be constructed to bring in materials. A temporary coffer dam/channel block will be installed at the upstream end of Site 10 to dewater the stream channel during construction. The project shall be staged such that the dewatered "work area" shall be limited to an amount of work to be completed within one to two days. This system shall be repeated as many times as necessary for Site 10. All disturbed areas will be restored to pre-construction conditions. After construction the temporary road and dam and associated pipe will be removed, and the area planted with grass, scrubs and trees.

Site 13 - Sandburg Creek at Fallsview Pump Houses

Design for the restoration/stabilization of Sandburg Creek at Site 13 involves the narrowing of the channel to its stable dimensions, grading the areas adjacent to the channel to create an interactive floodplain, constructing two riffles for grade control, and installing structures in the floodplain to prevent development of secondary channels. This includes using rock bank armoring on the north and south sides of the creek. Channel blocks will also be installed. Table 3, below, quantifies the proposed stream impacts.

Table 3 Impacts to the West Branch Beer Kill

Site	Length (ft)	Width (ft)	Area of Disturbance (sq ft)	Excavation Quantity (CY)	Backfill Quantity (CY)	Rock Structures (CY)	Total Fill (CY)	Net Fill (CY)
13	600	75	45000	370	750	330	1080	710

Source: Attachment 3

A temporary access road will be constructed on the south bank with and adjacent staging area. A coffer dam will be constructed upstream and downstream of Site 13 to dewater the channel. The project shall be staged such that the dewatered "work area" shall be limited to an amount of work to be completed within one to two days. This system shall be repeated as many times as necessary for Site 13. All disturbed areas will be restored to pre-construction conditions. After construction the temporary road and dam and associated pipe will be removed, and the area planted with grass, scrubs and trees.

Purpose and Need:
Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing, including the West Branches of the Beer Kill, and Sandburg Creek.

This Project is expected to provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town. Amongst other benefits, the Project will:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, school emergency services, and the Ellenville Regional Hospital;
- Provide long-term flood protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

Existing Conditions:
New York State has experienced a number of storms (e.g., Hurricane Irene, Tropical Storm Lee, Hurricane Sandy) that have caused substantial damage over the last decade. As a result, this trend has increased the need for streambank restoration for Beer Kill and Sandburg Creek, in the Village of Ellenville to support the storm-stricken communities**.**

Statement of Purpose and Need for the Proposal [40 CFR 1508.9(b)]:

Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing, including the West Branches of the Beer Kill, and Sandburg Creek.

This Project is expected to provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town. Amongst other benefits, the Project will:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, school emergency services, and the Ellenville Regional Hospital;
- Provide long-term flood protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

Standard Conditions for All Projects

Any change to the approved scope of work will require re-evaluation by the GOSR Environmental Certifying Officer for compliance with the National Environmental Policy Act (NEPA) and other laws and Executive Orders.

This review does not address all federal, state, and local requirements. Acceptance of federal funding requires the recipient to comply with all federal state and local laws. Failure to obtain all appropriate federal, state and local environmental permits and clearances may jeopardize federal funding.

Funding Information

Estimated Total HUD Funded Amount:	**$2,952,677.00**
Estimated Total Project Cost (HUD and non-HUD funds) [24 CFR 58.32(d)]**:**	**$2,952,677.00**

Compliance with 24 CFR 58.5 and 58.6 Laws and Authorities

Record below the compliance or conformance determinations for each statute, executive order, or regulation. Provide credible, traceable, and supportive source documentation for each authority. Where applicable, complete the necessary reviews or consultations and obtain or note applicable permits of approvals. Clearly note citations, dates/names/titles of contacts, and page references. Attach additional documentation as appropriate.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 and 58.6		
Airport Hazards 24 CFR Part 51 Subpart D	Yes ☐ No ☒	Based on HUD guidance in Fact Sheet #D1, the National Plan of Integrated Airport Systems (NPIAS) was reviewed for civilian, commercial service airports near the Project site, as projects within 2,500 feet of a civil airport require consultation with the appropriate civil airport operator No civilian airports are within 2,500 of the Project sites, and no military airports are within 15,000 feet of the Project sites (See **Appendix A**, Figures).
Coastal Barrier Resources Coastal Barrier Resources Act, as amended by the Coastal Barrier Improvement Act of 1990 [16 USC 3501]	Yes ☐ No ☒	The Project site is not in a Coastal Barrier Resources Area as defined by the state's Coastal Zone Management Program. (See **Appendix A**, Figures)
Flood Insurance Flood Disaster Protection Act of 1973 and National Flood Insurance Reform Act of 1994 [42 USC 4001-4128 and 42 USC 5154a]	Yes ☐ No ☒	The proposed project does not require flood insurance.

STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 & 58.5		
Clean Air Clean Air Act, as amended, particularly section 176(c) & (d); 40 CFR Parts 6, 51, 93	Yes ☐ No ☒	The Project site is not included in the most recent listing of nonattainment or maintenance areas for inhalable particulate matter (PM2.5) or the 2008 8-hour ozone standard, as defined by the US Environmental Protection Agency (EPA) Green Book Nonattainment Areas for Criteria Pollutants. The Project would not require an NYS Air Registration, Air Facility Permit, or Federal Clean Air Act Title IV or Title V Permit. The Project activities would not substantively affect air quality. The Project size is consistent with the New York State Implementation Plan (SIP). Implementation of standard best management practices (BMP) would control dust and other emissions during construction. Air quality impacts would be short term and localized during construction, and no significant adverse impacts to air quality are anticipated. (See **Appendix A**, Figures)
Coastal Zone Management Coastal Zone Management Act, sections 307(c) & (d)	Yes ☐ No ☒	The Project site is not in a coastal zone as defined by the state's Coastal Zone Management Program or a Local Waterfront Revitalization Program. (See Appendix A, Figures.)
Contamination and Toxic Substances 24 CFR Part 50.3(i) & 58.5(i)(2)	Yes ☐ No ☒	There are no known hazardous materials, contaminants, toxic chemicals, gases, or radioactive substances that could affect health and safety within the project area. EPA NEPAsssist and NYSDEC spills and remedial databases were used to identify hazardous sites that may affect the health and safety of occupants or conflict with the intended utilization of the property. A summary of the findings is provided below. **EPA Superfund Site** Ellenville Scrap Iron and Metal located at 34 Cape Road in Ellenville, NY, was a 24-acre inactive scrap iron and metal facility, and was removed from the EPA National Priorities List, which includes the most contaminated hazardous waste sites. The scrap yard operated from the 1950s through the

		1990s. In addition to handling various grades of scrap metal, the facility was used as a landfill and a location for tires and batteries to be disposed. The cleanup included the following: buildings and facilities associated with previous site operations have been demolished and removed and other debris piles were assessed, sampled and removed; EPA dug up and consolidated contaminated soil on-site landfill was capped to prevent contaminants from leaching out of the landfill into the groundwater; monitoring wells were installed, the landfill area fenced off and the landfill cap seeded with new vegetation; placement of institutional controls on the properties associated with the site cleanup; and ongoing operating and maintenance activities, including groundwater sampling. Land-use restrictions have been placed on the former scrap metal facility, including restrictive covenants and environmental easements for limiting future use of the site and the use of the groundwater to protect the cleanup. Long-term activities at the site will continue, including operating and maintaining the landfill cap system that vents gas from the inactive landfill and continued monitoring of the groundwater (See Attachment 4). The former Superfund site location is shown in Attachment 4. Based on the clean-up activities, the extent of contamination and location of the Superfund site, the site does not pose a threat to the project locations. Using the EPA NEPAssist database a search of EPA regulated facilities was conducted. Attachment 5 shows the location of the hazardous waste sites in Ellenville, New York. Information available for each site was reviewed and none of the sites pose a threat to the project. None have violations and/or releases to the environment that may affect the health and safety of occupants or conflict with the intended utilization of the property. A summary of NYSDEC bulk storage facilities is provided in Attachment 6. None have violations

		and/or releases to the environment that may affect the health and safety of occupants or conflict with the intended utilization of the property. Attachment 7 provides a summary of hazards associated with Channel Master, a NYSDEC Resource Conservation and Recovery facility located at 7 Schrade Court in Ellenville NY. The facility released volatile organic compounds to ground water. Based on the location of the facility, direction of ground water flow (southwest), and concentrations detected in groundwater, the release will not affect the health and safety of occupants or conflict with the intended utilization of the property (Attachment 7). The NYSDEC spill database was used to identify any spills near the project locations. No spills were identified that will affect the health and safety of occupants or conflict with the intended utilization of the property. The spills are closed or of small quantity (Attachment 8). The proposed project is not anticipated to result in any significant adverse impacts related to toxic, hazardous, or radioactive materials. The proposed project includes stream bank restoration. A soil management plan will be implemented and if any hazardous soils or odors are detected, work will be stopped and the NYSDEC will be contacted and notice of a spill will be submitted. The proposed project does not include a residential population.
Endangered Species Endangered Species Act of 1973, particularly section 7; 50 CFR Part 402	Yes ☐ No ☐	According to the United States Fish and Wildlife Service (USFWS) Information, Planning and Conservation (IPaC) online planning tool and Trust Resource List generated for the proposed project, the Indiana Bat (*Myotis sodalist*) is listed as an endangered species and the Northern Long-eared Bat (NLEB) (*Myotis septentrionalis*), the Bog Turtle (*Clemmys muhlenbergii*), and Dwarf Wedgemussel (*Alasmidonta heterodon*) are listed as a threatened species that may be found within the vicinity of the Site. The official species list for the

		proposed project indicates that there are no critical habitats in the project area. According to the New York State Department of Environmental Conservation (NYSDEC) Natural Heritage Program (NHP) database search, the Timber Rattlesnake (*Crotalus horridus*), a New York state listed threatened species, was identified as being located at several locations within one mile of the project area. A description of each federally endangered and threatened species identified by USFWS, and the likelihood that the species occurs within the project areas, is provided below. The species' descriptions are summarized from the NYSDEC fact sheets and the USFWS species profiles unless otherwise referenced (See **Appendix B**). **<u>Bat Habitat/Tree Survey</u>** Due to the potential presence of bat habitat (e.g., NLEB, Indiana Bat) at the project area (according to the IPaC results), and the project scope including the removal of trees, a Phase 1 Habitat Assessment was performed on April 2, 2019 by a NYSDEC representative. The results of the assessment stated that the majority of the project areas are in urban environments, and most tree clearing will occur between the road and a fast-moving stream. Most of the trees, to be removed, are small-medium in size, and the majority are live without roosting opportunities. **However, there are 9 suitable snags (2 in site 8, 1 in site 1, 5 in site 3, and 1 in site 5).** Based on this observation, the NYSDEC representative recommended that **emergence counts be conducted at these snags prior to removal of trees if the trees cannot be removed between November 1 and March 31**. GOSR will conduct an emergence count the night prior to tree removal. If bats are observed, the trees will not be cut and GOSR will consult with USFWS. **<u>USFWS/NHP Consultation</u>** The NYSDEC NHP was consulted on October 22, 2018. A response from NHP was received on

		November 7, 2018. The NHP response stated that the Timber Rattlesnake has been documented within one mile of projects Site 8 and 13. The USFWS was consulted on July 19, 2017. On August 1, 2017, the USFWS responded that, "no further coordination or consultation under the ESA is required with the Service at this time. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered." Since that time, five locations have been removed from the original Proposed Project so GOSR resubmitted the consultation for consideration on April 16, 2019. GOSR determined that the project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule and that the project would have no effect on the Dwarf Wedgemussel. A response was received on April 17, 2019 stating that, "no further coordination or consultation under the ESA is required with the Service at this time. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered." See **Appendix B**.
Explosive and Flammable Hazards 24 CFR Part 51 Subpart C	Yes ☐ No ☒	The Project would not introduce housing or at the site that could be exposed to explosive or flammable hazards. The Project does not constitute a HUD-funded hazardous facility; therefore, 24 CFR Part 51 Subpart C does not apply.
Farmlands Protection Farmland Protection Policy Act of 1981, particularly sections 1504(b) and 1541; 7 CFR Part 658	Yes ☐ No ☒	The Project area is not in a New York State agricultural district and is currently developed. (See **Appendix A**, Figures.) The soils on the Project site are not identified as prime farmland soils. There would be no change in land use.
Floodplain Management Executive Order 11988, particularly section 2(a); 24 CFR Part 55	Yes ☒ No ☐	The project area is within a flood hazard area; therefore, an 8-step floodplain management plan has been prepared. The proposed project will not

		have negative long-term effects on Beer Kill or Sandburg Creek, nor the floodplain. The intention of the project is to improve the streambank stabilization and stormwater flow. The 8-step floodplain management plan, the early floodplain and wetland and final floodplain and wetland notice, and associated affidavits are provided in **Appendix C**.
Historic Preservation National Historic Preservation Act of 1966, particularly sections 106 and 110; 36 CFR Part 800; Tribal notification for new ground disturbance.	Yes ☒ No ☐	Phase IA Archaeological Investigation of the Ellenville & Wawarsing Stream Bank Restoration of Nine Sites Project Report was completed by Louis Berger US., Inc. in May 2019 and submitted to SHPO. On June 5, 2019, SHPO responded that SHPO reviewed the Phase IA Archaeological Investigation of the Ellenville & Wawarsing Stream Bank Restoration of Nine Sites Project (Landmark Archaeology, May 2019). Based on the information provided, SHPO concurs with the report's conclusions and recommendations. Please conduct a Phase IB investigation of project sites 10 and 13. Testing should examine the full depth of potentially culture-bearing deposits within the project's Area of Potential Effects (APE). A Phase IB Archeological and Geomorphological Survey Report was completed by Tectonic Engineering and Surveying Consultants P.C in July 2019 for *Ellenville Streambank Restoration of Two Sites: Sites 10 And 13 Town of Wawarsing, Ulster County, New York* in response to SHPOs request. The report stated "No archaeological resources were identified within the APE as a result of the Phase IB Archaeological Survey. No further work is recommended for this project area." SHPO responded in a letter dated, August 13, 2019, "SHPO has reviewed Phase IB Archaeological and Geomorphological Survey, Ellenville Streambank Restoration of Two Sites: Sites 10 and 13, Town of Wawarsing, Ulster County, New York (Christine Davis Consultants, July 2019). Based upon this and previously submitted information, it is the opinion of the New York SHPO that no historic properties, including archaeological

		and/or historic resources, will be affected by this undertaking." See **Appendix D** for SHPO consultations and investigations. **Tribal Consultations** Consultation letters were sent to representatives of the Delaware Nation, the Delaware Tribe of Indians, Mohawk Nation, Saint Regis Mohawk Tribe, and the Stockbridge-Munsee Community Band of Mohicans on July 16, 2019. A response from the Delaware Tribe, dated June 22, 2017, stated that their "review indicates that there could be culturally significant areas within the project zone. We request subsurface testing. This testing should include areas that will be used as staging." The Phase IA Background and the Phase IB Archaeological and Geomorphological Survey reports were provided to the Delaware Tribe. After receiving the reports, the Tribe responded that "with the information you have submitted we can concur at present with this proposed plan." The Delaware Nation also responded on June 22, 2017 stating that they, "can concur at present with this proposed plan." The Delaware Nation did not request additional testing. Responses from the remaining tribes were not received prior to the completion of this document. See **Appendix E**.
Noise Abatement and Control Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978; 24 CFR Part 51 Subpart B	Yes ☐ No ☒	The proposed Project is not a noise-sensitive use, and the policies of 24 CFR 51.101(a)(3) do not apply to any action or emergency assistance under disaster assistance provisions or appropriations that are provided to save lives and protect public health and safety.
Sole Source Aquifers Safe Drinking Water Act of 1974, as amended, particularly section 1424(e); 40 CFR Part 149	Yes ☐ No ☒	The Project area is not within the bounds of a Sole Source Aquifer Designated Area. (See Appendix A, Figures)
Wetlands Protection Executive Order 11990, particularly sections 2 and 5	Yes ☒ No ☐	The project will adhere to and comply with the guidelines and regulations of Executive Order 11990, in order to minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. No further analysis is required.

		Best management practices will be implemented to protect the natural environment. All work will be completed within permit conditions, which are protective of the environment. The project sites are located within a floodplain. Neither Beer Kill or Sandburg Creek are NYSDEC-protected waters; however, they are identified by the USFWS as a Federal Riverine Systems. Based on this, a protection of waters joint permit application will be required to be sent to the United States Army Corps of Engineers (USACE) and NYSDEC for review and approval. See **Appendix C** for the wetland and floodplain analysis.
Wild and Scenic Rivers Wild and Scenic Rivers Act of 1968, particularly section 7(b) and (c)	Yes ☐ No ☒	There are no state or federally designated wild and scenic rivers at or near the Project area. (See **Appendix A**, Figures)
ENVIRONMENTAL JUSTICE		
Environmental Justice Executive Order 12898	Yes ☒ No ☐	Because the proposed Project is the stream restoration with no potential adverse impacts, there are no disproportionate adverse impacts anticipated. The Project site is within a potential Environmental Justice (EJ) area, as defined by NYSDEC based on data from the 2010 U.S. Census (See Appendix A, Figures). The Project would have no potential for new or continued disproportionately high and adverse human health and environmental effects on minority or low-income populations. The Project would benefit the entire population of Ellenville including minority and low- and moderate-income residents through stream bank restoration.

Environmental Assessment Factors [24 CFR 58.40; Ref. 40 CFR 1508.8 &1508.27] Recorded below is the qualitative and quantitative significance of the effects of the proposal on the character, features and resources of the project area. Each factor has been evaluated and documented, as appropriate and in proportion to its relevance to the proposed action. Verifiable source documentation has been provided and described in support of each determination, as appropriate. Credible, traceable and supportive source documentation for each authority has been provided. Where applicable, the necessary reviews or consultations have been completed and applicable permits of approvals have been obtained or noted. Citations, dates/names/titles of contacts, and page references are clear. Additional documentation is attached, as appropriate. **All conditions, attenuation or mitigation measures have been clearly identified.**

Impact Codes: Use an impact code from the following list to make the determination of impact for each factor.

- **(1)** Minor beneficial impact
- **(2)** No impact anticipated
- **(3)** Minor Adverse Impact – May require mitigation
- **(4)** Significant or potentially significant impact requiring avoidance or modification which may require an Environmental Impact Statement

Environmental Assessment Factor	Impact Code	Impact Evaluation
LAND DEVELOPMENT		
Conformance with Plans / Compatible Land Use and Zoning / Scale and Urban Design	2	The proposed project involves the stream bank restoration and mitigation measures to the stream bed, channel, banks and adjacent upland areas. The proposed project would be compatible with existing land uses in the surrounding area and would not result in changes to land use. Therefore, no impacts would result.
Soil Suitability/ Slope/ Erosion/ Drainage/ Storm Water Runoff	1	During construction, erosion and sediment controls would be utilized. The project will install soil and slope stability measures in stream reaches that have experienced erosion due to high waters from storm events.
Hazards and Nuisances including Site Safety and Noise	2	The proposed project would not result in hazards and nuisances. All state and local construction safety procedures would be followed. Therefore, no impacts would result.
Energy Consumption	2	The proposed project would not affect energy generation or distribution. Therefore, no impact would result.
SOCIOECONOMIC		
Employment and Income Patterns	**2**	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area improvements and would have no potential to affect employment opportunities or income patterns.
Demographic Character Changes, Displacement	**2**	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area improvements. The project is not expected to induce any change in demographic character of the surrounding area, displace individuals or families, eliminate jobs, local businesses, or community facilities, or disproportionately affect particular populations.

Environmental Assessment Factor	Impact Code	Impact Evaluation
COMMUNITY FACILITIES AND SERVICES		
Educational and Cultural Facilities	2	The proposed project would not introduce any new population that would increase the student population of the area. As a result, the proposed project has no potential to affect educational facilities. In addition, the proposed project would not adversely impact historic/cultural facilities.
Commercial Facilities	2	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area and would not introduce any new development that would require retail services or other commercial facilities.
Health Care and Social Services	2	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area and would not significantly affect social services.
Solid Waste Disposal / Recycling	2	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area and would not introduce any new development that would generate solid waste.
Waste Water / Sanitary Sewers	2	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area improvements and would not introduce any new development that would generate wastewater.
Water Supply	2	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area and would not introduce any new development that would generate demand for water.
Public Safety - Police, Fire and Emergency Medical	2	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area improvements and would not introduce any new development that would generate demand for police, fire, or emergency medical services. Steam stabilization would allow emergency response to areas serviced by the bridges there by increasing public safety.
Parks, Open Space and Recreation	1	The proposed project would not introduce any new population that would increase the student population of the area. As a result, the proposed project has no potential to affect educational facilities. In addition, the proposed project would not adversely impact historic/cultural facilities.
Transportation and Accessibility	2	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area and would not introduce any new development that would require retail services or other commercial facilities.
NATURAL FEATURES		
Unique Natural Features, Water Resources	1	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area improvements. The project improves the streams ability to withstand erosion, flooding and damage from high water events. No unique natural features or water resources will be impacted after construction activities.
Vegetation, Wildlife	1	The construction tasks comprising the proposed project are limited to stream bed, channel, banks and adjacent upland area improvements and would not result in any adverse impacts to vegetation or wildlife
Other Factors		N/A

Additional Studies Performed:
SEQRA Review (Unlisted, Coordinated review) per Section 617.5

List of Sources, Agencies and Persons Consulted [40 CFR 1508.9(b)]:

1. Barton & Loguidice. 2018. Flood Engineering Analysis Report. Stream Bank Restoration Project. Village of Ellenville and Town of Wawarsing. June.
2. Barton & Loguidice, D.P.C. 2019. 95% Design Drawings. Ellenville Stream Restoration. Village of Ellenville and Town of Wawarsing Stream Restoration Project, Contract 1 – General Construction. December.
3. Barton & Loguidice, D.P.C. 2019. Joint Application for Permit. (File: 924.068.002). NY Rising Streambank Stabilization Project, Site #13, Sandburg Creek, Town of Wawarsing, Ulster County, New York. November 14.
4. Barton & Loguidice, D.P.C. 2019. Joint Application for Permit. (File: 924.068.002). NY Rising Streambank Stabilization Project, Site #10, Sandburg Creek, Town of Wawarsing, Ulster County, New York. November 14.
5. Barton & Loguidice, D.P.C. 2019. Joint Application for Permit. (924.068.002). NY Rising Streambank Stabilization Project, Site #1, West Beer Kill, Town of Wawarsing, Ulster County, New York. November 14.
6. Barton & Loguidice, D.P.C. 2019. Joint Application for Permit. DRAFT. NY Rising Streambank Stabilization Project Sandburg Creek - Site 8, Village of Ellenville, Ulster County, New York. April.
7. Barton & Loguidice, D.P.C. 2019. Joint Application for Permit. DRAFT. NY Rising Streambank Stabilization Projec, West Branch Beer Kill, Sites 2-5, Town of Wawarsing, Ulster County, New York. April. Environmental Protection Agency – Greenbook http://epa.gov/airquality/greenbook
8. Environmental Protection Agency NEPAssist Data Base. https://nepassisttool.epa.gov/neapassist/nepamap.aspx
9. Environmental Protection Agency – Greenbook http://epa.gov/airquality/greenbook
10. Environmental Protection Agency – Region 2 Sole Source Aquifers http://www.epa.gov/region2/water/aquifer/index.html
11. Federal Emergency Management Agency – Flood Map Center https://msc.fema.gov/portal
12. Fairweather Consulting. 2009. Comprehensive Plan. Village of Ellenville. May.
13. National Wild and Scenic Rivers Systems http://www.rivers.gov/maps/new-york.php
14. New York State Department of Agriculture and Markets http://www.agriculture.ny.gov/ap/agservices/maps
15. New York State Department of Environmental Conservation – County Maps Showing Potential Environmental Justice Areas (Essex County) http://www.dec.ny.gov/docs/permits_ej_operations_pdf/essexej.pdf
16. New York State Department of Environmental Conservation – EAF Mapper

http://www.dec.ny.gov/eafmapper/
17. New York State Department of Environmental Conservation Spill Incidence Data Base, https://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=2
18. New York State Department of Environmental Conservation – Environmental Site Remediation Database
https://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=3
19. New York State Department of State Office of Planning and Development – NYS Coastal Boundary Map
http://appext20.dos.ny.gov/coastal_map_public/map.aspx
20. New York State Office of Parks, Recreation and Historic Preservation - Cultural Resource Information System
https://cris.parks.ny.gov
21. New York State Office of Parks, Recreation and Historic Preservation – Heritage Areas http://www.nysparks.com/historic-preservation
22. NYRCR Ulster Communities. 2014. NY Rising Community Reconstruction Plan. March.
23. United States Fish and Wildlife Service – Coastal Barrier Resources System Mapper
http://www.fws.gov/cbra/maps/mapper.html
24. United States Fish and Wildlife Service – IPaC – Information, Planning, and Conservation System
http://ecos.fws.gov/ipac
25. United States Fish and Wildlife Service – National Wetlands Inventory – Wetland Mapper
http://www.fws.gov/wetlands/Data/Mapper.html.
26. United States Fish and Wildlife Service – Coastal Barrier Resources System Mapper http://www.fws.gov/cbra/maps/mapper.html

List of Appendices

Appendix A Figures
Appendix B USFWS and NYNHP Correspondence
Appendix C 8-Step Floodplain Management Plan
Appendix D SHPO Correspondence and Phase IA/IB Archeological Investigation
Appendix E Tribal Correspondence

List of Attachments

Attachment 1 – Design Plans
Attachment 2 – Design Report (60% Submission)
Attachment 3 – Joint Permit Application Excerpt
Attachment 4 – Ellenville Scrape Metal Superfund Site
Attachment 5 – EPA Hazardous Waste Sites
Attachment 6 – NYSDEC Bulk Storage Facilities
Attachment 7 – NYSDEC RCRA Facility - Channel Master
Attachment 8 – NYSDEC Spills Database Results

List of Permits Obtained or Required:

1. Joint Applications for Permit, including NYSDEC Article 15- Protection of Waters Permit and NYSDEC Article 15- Stream Disturbance Permit
2. Clean Water Act Section 401, Water Quality Certification
3. SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002 and
4. NYSDOT Highway Work Permit
5. Local Floodplain Development Permit

Public Outreach [24 CFR 50.23 & 58.43]:
A public presentation was held on May 3, 2017 to gain input and share information with the community members during the process of identifying mitigation alternatives (Source 19). Prior to the meeting, letters were sent to identified land owners where easements needed to be obtained. Draft easement maps were sent to property owners before the meeting as well. Public comment cards were made available at the meeting to allow for any residents comments or concerns to be acknowledged. The following items were outlined in the meeting:

- Provide general overview and design principles for the project
- Present proposed mitigation work
- Determine easement needs and process to obtaining easements
- Acknowledge any public questions or concerns.

An early public notice of proposed activity within the 100-year floodplain was published by the Governor's Office of Storm Recovery on January 16, 2020 with a public comment period ending on January 31, 2020. No comments were received.

On February 6, 2020, a Combined Final Notice and Public Review of a Proposed Activity in a 100-Year Floodplain and Notice of Intent to Request Release of Funds was published in the *Shawangunk Journal*. Any individual, group, or agency may submit written comments on the Environmental Review Record to:

Lori A. Shirley
HTFC Certifying Officer
Homes and Community Renewal
38-40 State Street
Hampton Plaza
Albany, New York 12207
(518) 474-0755
NYSCDBG_DR_ER@nyshcr.org

Cumulative Impact Analysis [24 CFR 58.32]:
The Project is not expected to trigger cumulative impacts, including the degradation of important natural resources, socioeconomic resources, human health, recreation, quality of life issues, and cultural and historic resources. The Project is not of a scale large enough to contribute significantly to cumulative impacts.

The force of Hurricane Irene resulted in stream bank erosion flooding dozens of homes and depositing natural and man-made debris throughout streams and on dry land in Village of Ellenville and Town of Wawarsing. Residents were forced to evacuate, moving to shelters established in local emergency service buildings, schools and community centers.

Implementation of this project would permanently mitigate flooding along stream corridors, resulting in sustainable benefits. The useful life of the flood mitigation would be over a period of 10 to 20 years. The project supports the Mid-Hudson Regional Economic Development

Council's goal of improving and leveraging natural resources as drivers to tourism in the area. Other benefits include savings of local government expenditures from reduced flooding of the roadways, for improved emergency vehicle access and lower reconstruction and rehabilitation costs for improved emergency vehicle access and lower reconstruction and rehabilitation costs for roadways.

Stream bank and stream bed restoration would provide flood mitigation along the stream corridors and would potentially increase their attractiveness as a recreational and tourist attraction. Long-term protection of Town and Village assets including homes and businesses is key to the communities' economic health by ensuring retention of residents, and the commercial tax base.

This project will have significant environmental benefits including restoring the health, resiliency and capacity of the Beer Kill and the Sandberg Creek. Stream restoration involves the modification of a stressed/disturbed stream via morphological changes to its bed and banks, to make its flow, flooding behavior, and biological components more stable and sustainable. Waterways such as the Beer Kill and Sandberg Creek, have had changes to their watersheds due to development and storm damage, and therefore generally suffer from increased rates of erosion, loss of adjacent wetlands and in-stream flora/fauna, undercut/eroded banks, and an imbalance in their erosion/deposition budget. Such highly "stressed" waterways, which suffer from these problems typically have poor quality and biological diversity and therefore would benefit significantly from stream restoration.

Regional watershed restoration projects would not directly secure or provide better access to health and social service facilities or providers although the resulting reduction in roadway inundation will benefit the entire community and improve local and regional access to/from emergency, health and social service providers and facilities. Further, improved emergency response time during and after storm events reduces risk of injury to residents.

Alternatives [24 CFR 58.40(e); 40 CFR 1508.9]:

The proposed mitigation actions were identified through a Flood Engineering Analysis Report (FEAR), a detailed assessment of the flooding characteristics in the Village of Ellenville and Town of Wawarsing. The analysis considered the existing flood hazards within the focus area, identified existing infrastructure elements in the community that are at risk for flood damage, evaluated potential alternatives aimed at reducing flood impacts, and described an implementation plan for prioritized alternatives. The analysis was based on field-derived data reflecting current river- and floodplain conditions. The analysis included a review of available information pertinent to the hydrologic and hydraulic functions of the Sandburg Creek, West Branch Beer Kill, North Gully, Roundout Creek, and Fantine Kill and engineering analysis required to assess the flooding characteristics within the focus area. Hydraulic assessments were completed to characterize flow and identify required mitigation and objectives for each site.

The engineering analysis identified specific mitigation for each of the 8 sites. The mitigation was selected based on the objective for each site, such as sediment deposition reduction.

No Action Alternative [24 CFR 58.40(e)]:

Flash flooding and stream bank erosion will continue after several excessive storms, if improvements are not undertaken. Sediment and debris will also continue to compromise the hydraulic capacity of the water bodies if no actions are taken. Upgrades are needed to prevent localized flooding and drainage problems. Maintaining the status quo would only contribute to continuing erosion and increased sediment deposit downstream.

Summary of Findings and Conclusions:

Proposed improvements will help mitigate damage caused by flooding in future storm events, while stabilizing stream banks, reducing erosion and decreasing sediment deposit downstream. The project will help to strengthen the existing drainage system and resolve existing problems. As shown above in the Environmental Assessment Checklist, no significant land development, neighborhood, socioeconomic, natural resources, community facilities or other direct, indirect, or cumulative impacts would result from the proposed project. As shown in the accompanying Statutory Checklists, the proposed project would comply with all relevant regulations listed in 24 CFR subparts 58.5 and 58.6.

Mitigation Measures and Conditions [40 CFR 1505.2(c)]

Summarize below all mitigation measures adopted by the Responsible Entity to reduce, avoid, or eliminate adverse environmental impacts and to avoid non-compliance or non-conformance with the above-listed authorities and factors. These measures/conditions must be incorporated into project contracts, development agreements, and other relevant documents. The staff responsible for implementing and monitoring mitigation measures should be clearly identified in the mitigation plan.

Law, Authority, or Factor	Mitigation Measure
Permit Requirements	• USACE Nationwide Permit 3 • NYSDEC Article 15 - Protection of Waters for to physically disturb the bed or banks (up to 50 feet from stream) of any streams identified as "protected," • CWA Section 401 Water Quality Certification • NYSDOT Highway Work Permit
Mitigation	• Erosion and Sediment Control Plan Stream Protection Plan • Winter tree clearing, between November 1 and March 31. If winter tree clearing is not feasible, there are 9 suitable snags (2 in site 8, 1 in site 1, 5 in site 3, and 1 in site 5) requiring an emergence count the night prior to tree removal. If bats are observed, the trees will not be cut and GOSR will consult with USFWS.

Standard Conditions for All Projects

Any change to the approved scope of work will require re-evaluation by the Certifying Officer for compliance with NEPA and other laws and Executive Orders.

This review does not address all federal, state and local requirements. Acceptance of federal funding requires recipient to comply with all federal state and local laws. Failure to obtain all appropriate federal, state and local environmental permits and clearances may jeopardize federal funding.

Determination:

☒ **Finding of No Significant Impact** [24 CFR 58.40(g)(1); 40 CFR 1508.27]
The project will not result in a significant impact on the quality of the human environment.

☐ **Finding of Significant Impact** [24 CFR 58.40(g)(2); 40 CFR 1508.27]
The project may significantly affect the quality of the human environment.

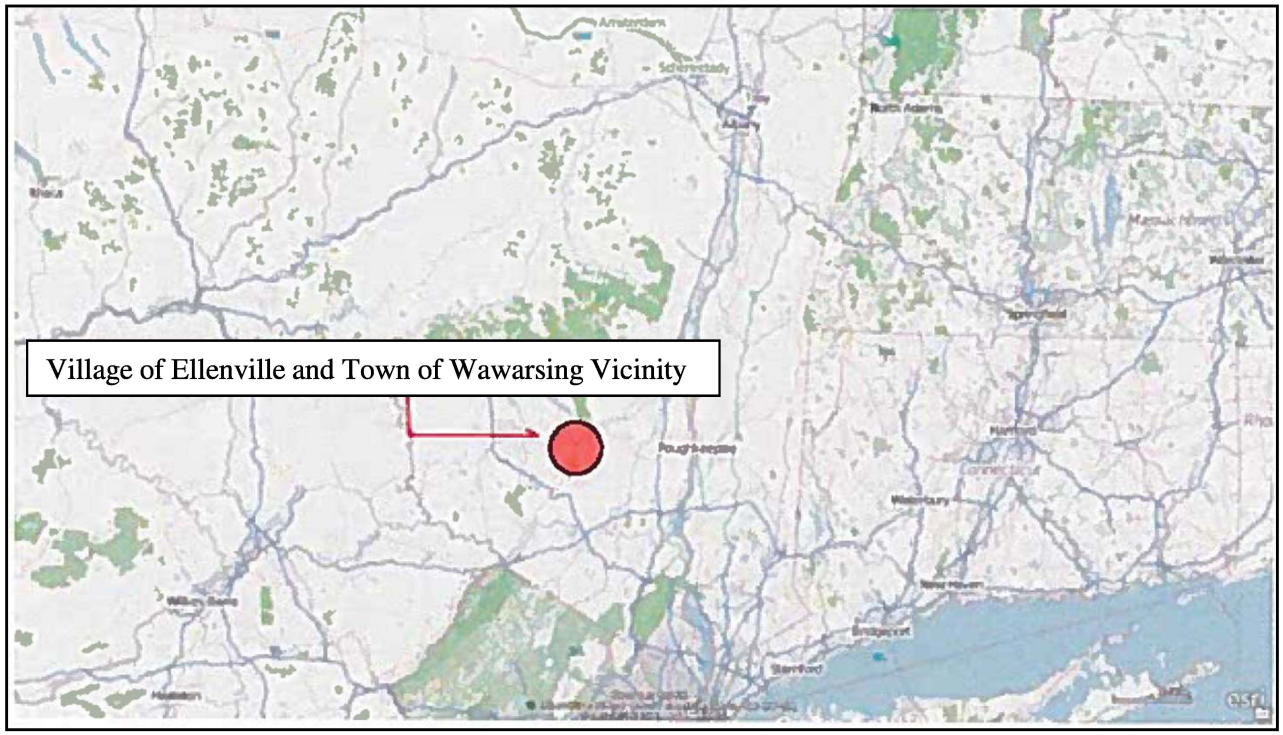
Alicia Shultz	**February 24, 2020**
Preparer Signature	**Date**
Alicia Shultz	
Name/Title/Organization	
Lori A Shirley	**February 24, 2020**
Signature of Certifying Officer	**Date**
Lori A. Shirley	**Certifying Officer**
Print Name	**Title**

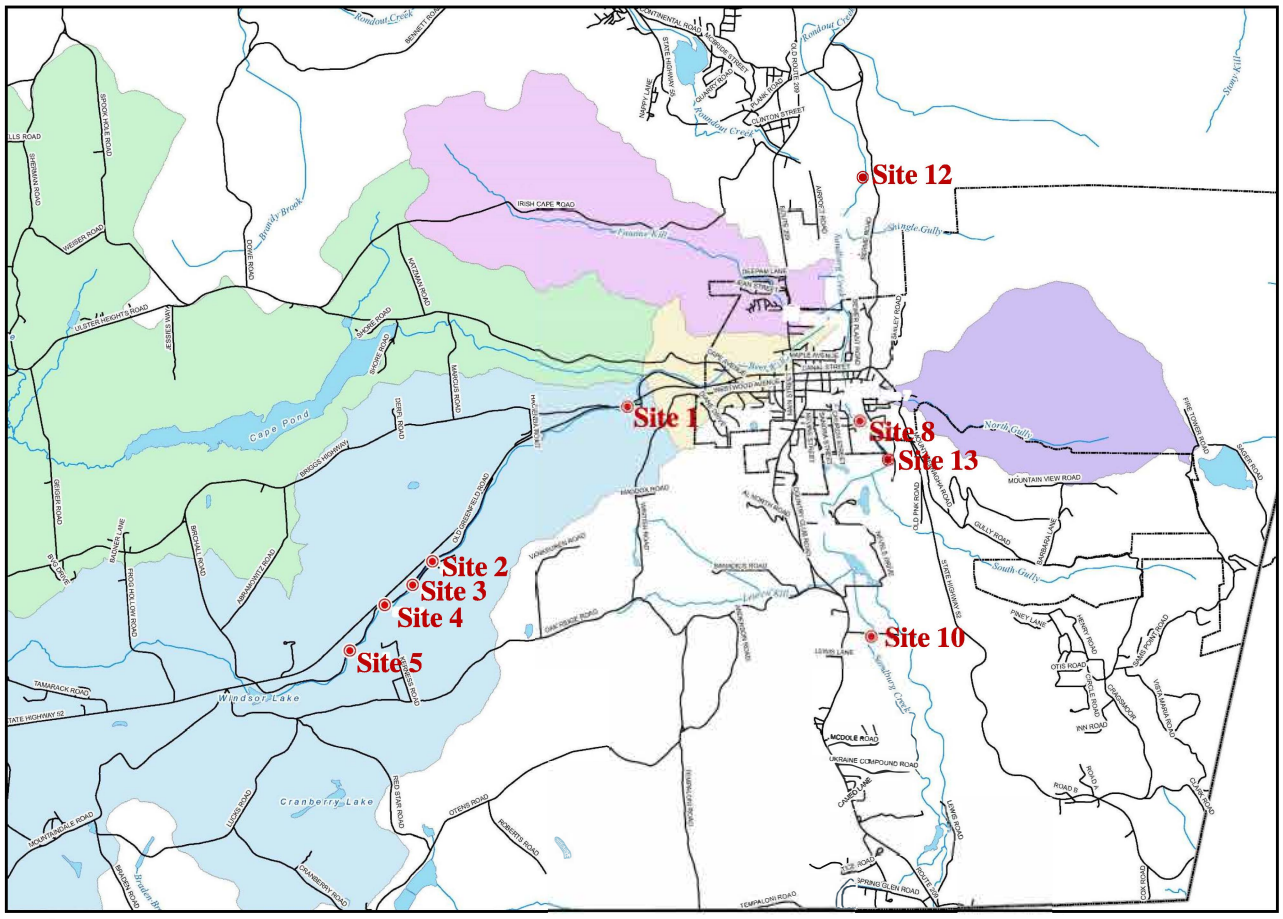
This original, signed document and related supporting material must be retained on file by the Responsible Entity in an Environmental Review Record (ERR) for the activity/project (ref: 24 CFR Part 58.38) and in accordance with recordkeeping requirements for the HUD program(s).

Appendix A

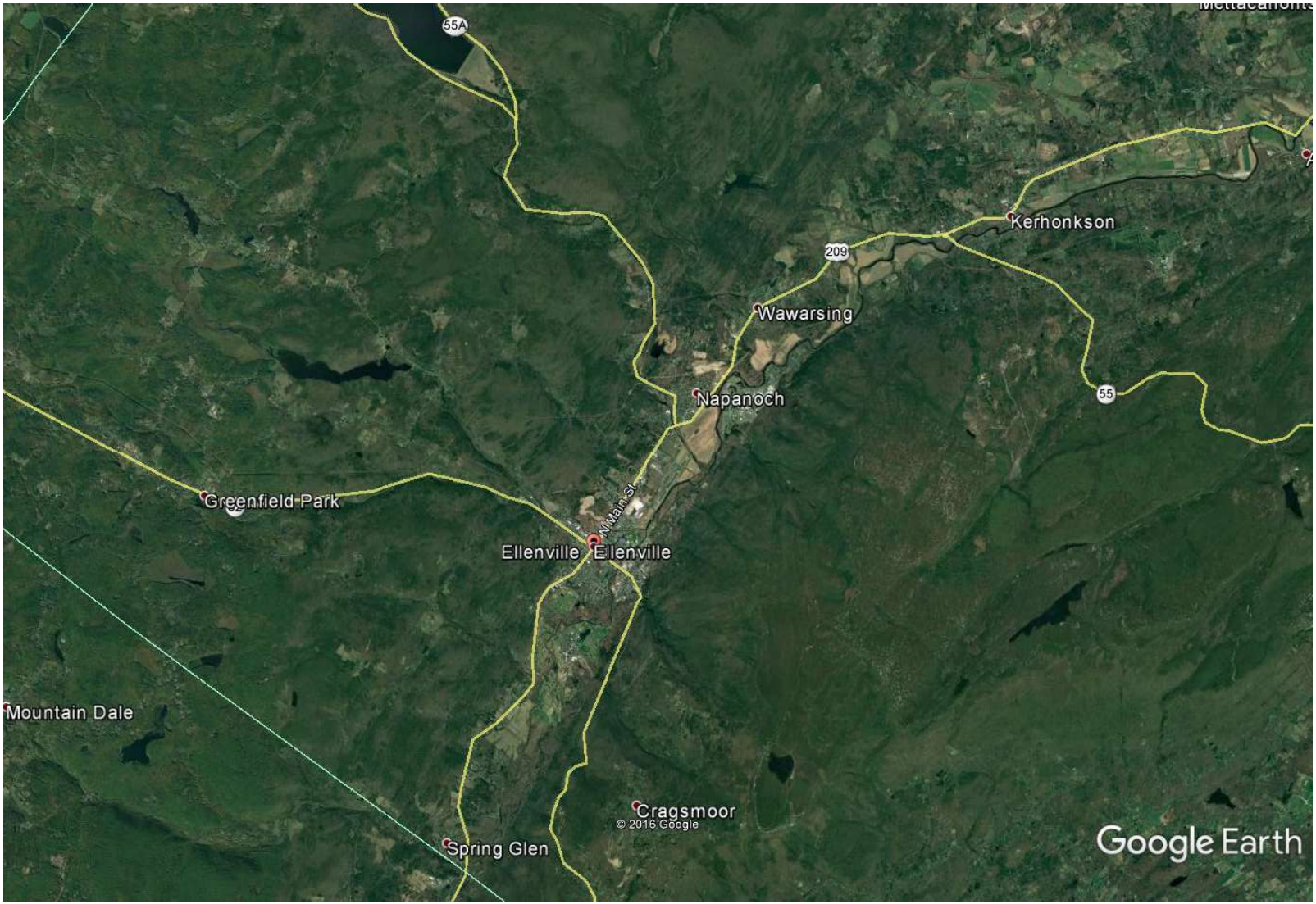
SITE LOCATION MAP

Village of Ellenville and Town of Wawarsing – Stream Bank Restoration Project





SITE OVERVIEW AERIAL PHOTOGRAPH



Legend:

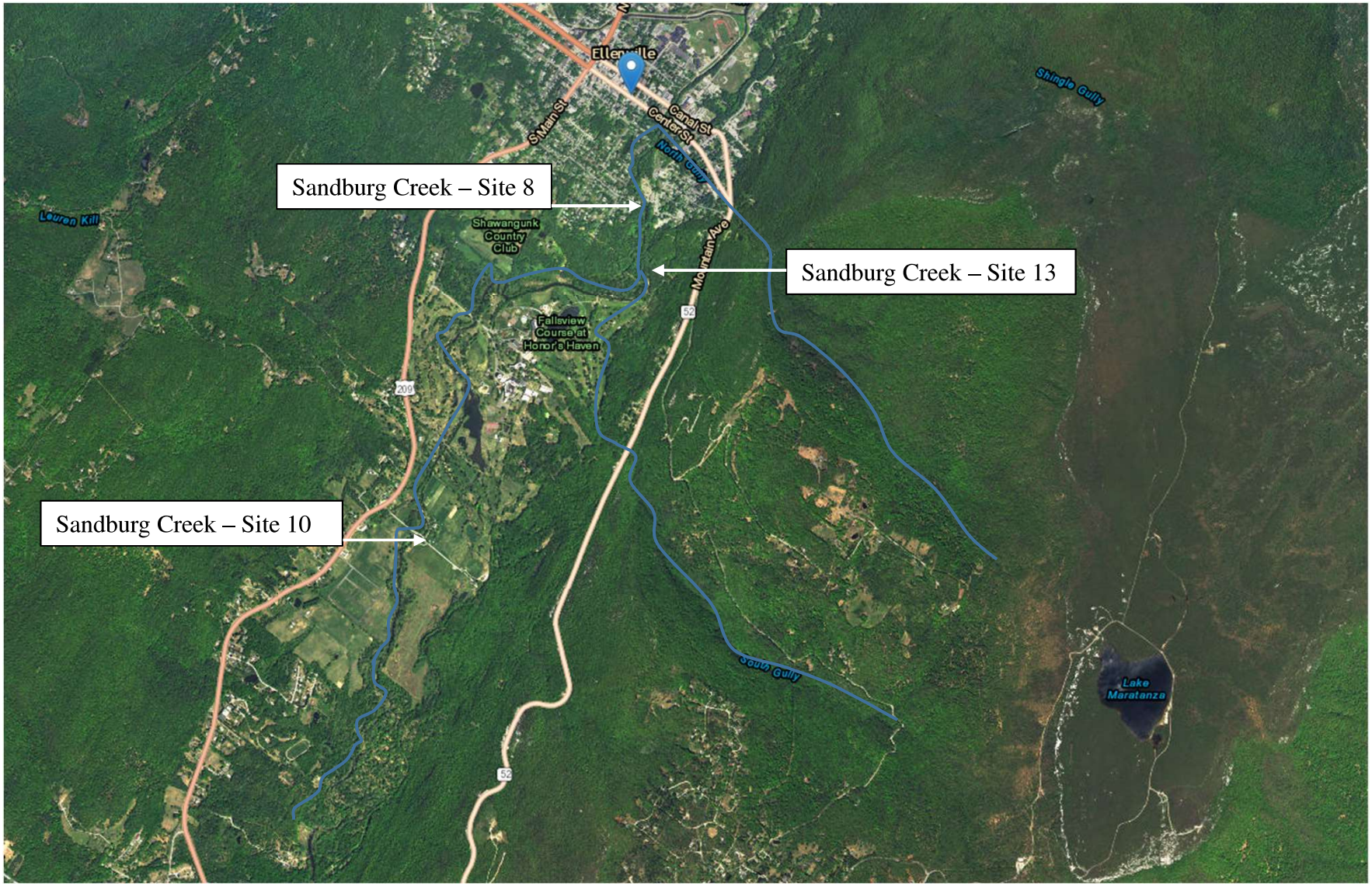
Aerial Imagery Source: Google Earth (dated April 2016)

Approximate Watercourse Location

N

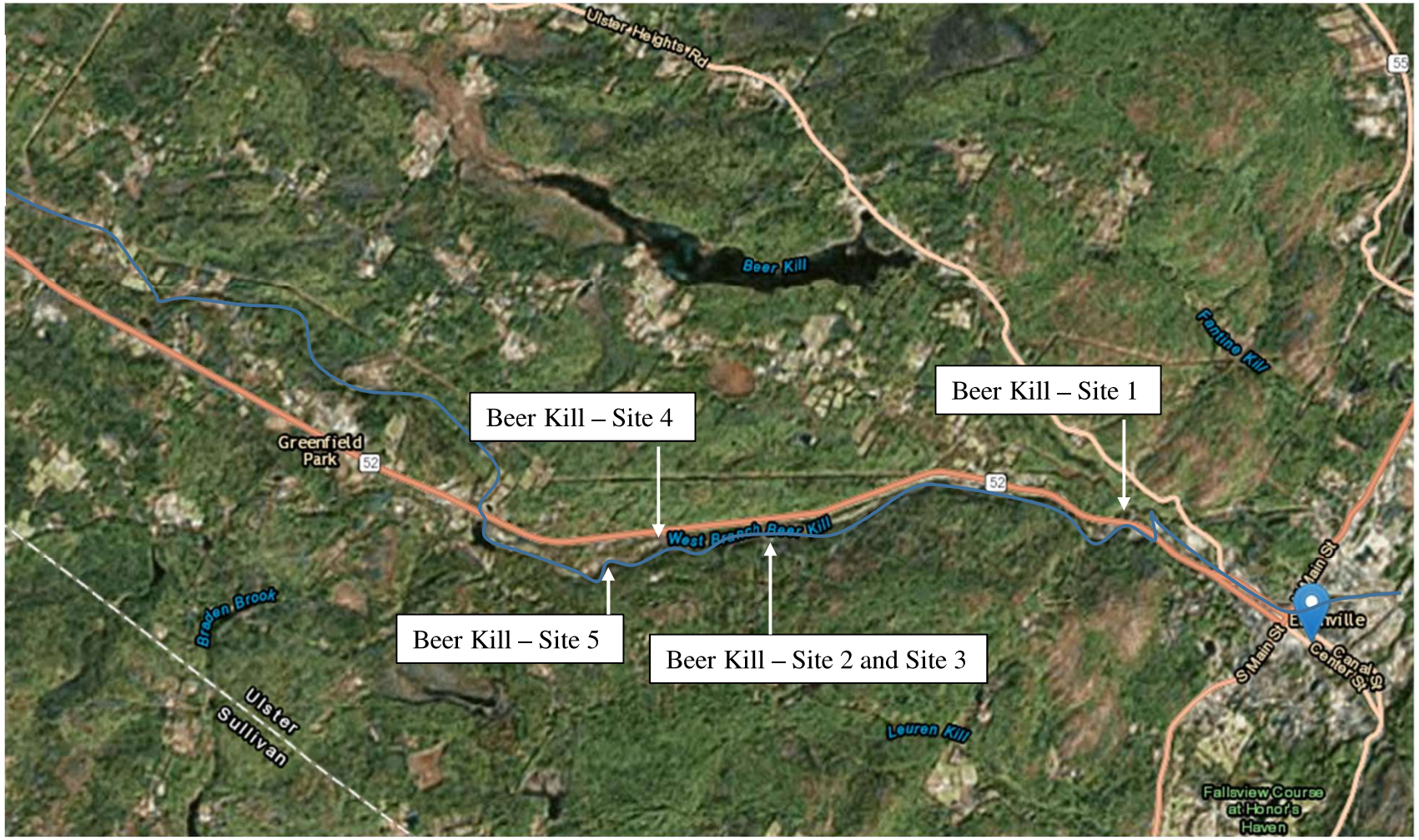
Village of Ellenville and Town of Wawarsing – Stream Bank Restoration Project

Village of Ellenville and Town of Wawarsing – Stream Bank Restoration Project
Site Aerial Photograph
Southern Portion of Project Area



Legend:
Aerial Imagery Source: USFWS
Approximate Watercourse Location
Site locations are approximate

Village of Ellenville and Town of Wawarsing – Stream Bank Restoration Project
Site Aerial Photograph
Western Portion of Project Area

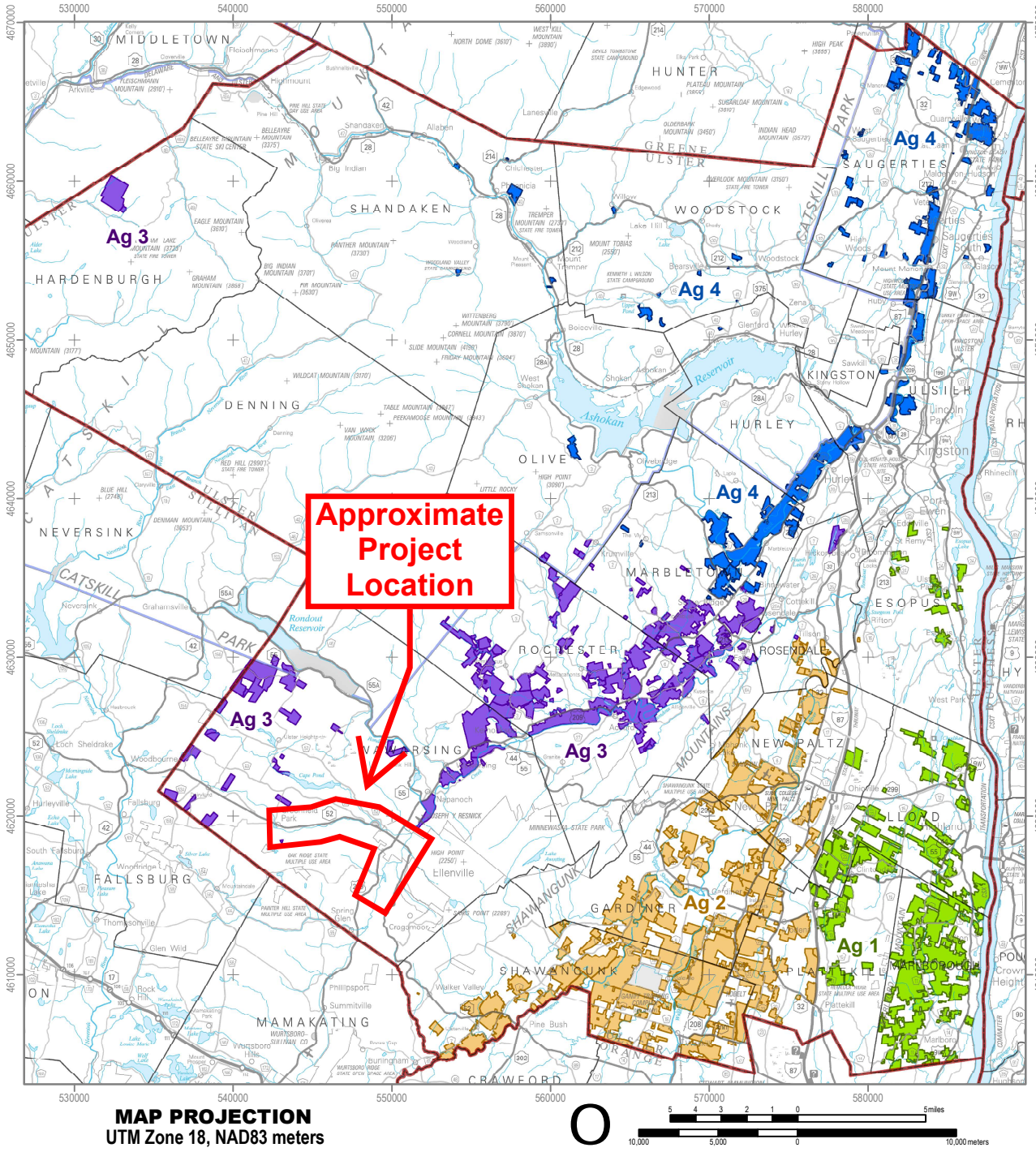


Legend:
Aerial Imagery Source: USFWS
Approximate Watercourse Location
Site locations are approximate

New York State Dept of Agriculture and Markets

ULSTER COUNTY

Agricultural Districts 2018



MAP PROJECTION
UTM Zone 18, NAD83 meters

5 4 3 2 1 0 5miles
10,000 5,000 0 10,000 meters

KEY

- Ag. District 1
- Ag. District 2
- Ag. District 3
- Ag. District 4

DISTRICT CERTIFICATIONS and TOWNS

DISTRICT 1
CERTIFIED 9/19/2013
Esopus
Lloyd
Marlborough
New Paltz
Plattekill

DISTRICT 2
CERTIFIED 8/28/2015
Esopus
Gardiner
New Paltz
Plattekill
Rosendale
Shawangunk

DISTRICT 3
CERTIFIED 8/17/2017
Hardenburgh
Marbletown
Olive
Rochester
Rosendale
Wawarsing

DISTRICT 4
CERTIFIED 4/9/2015
Hurley
Kingston
Marbletown
Olive
Saugerties
Shandaken
Ulster
Woodstock

MAP SOURCE INFORMATION

Map created at Cornell IRIS (Institute for Resource Information Sciences) <http://iris.cals.cornell.edu> for the NYS Department of Agriculture and Markets <https://www.agriculture.ny.gov>

Agricultural Districts boundary data is available at CUGIR (Cornell University Geospatial Information Repository) website: <http://cugir.library.cornell.edu>

Base Map: state250_bw.tif 1998
Scale: 1:250,000; County boundaries imported from the file nyshore.e00 from the NYSGIS Clearinghouse website: <http://gis.ny.gov>

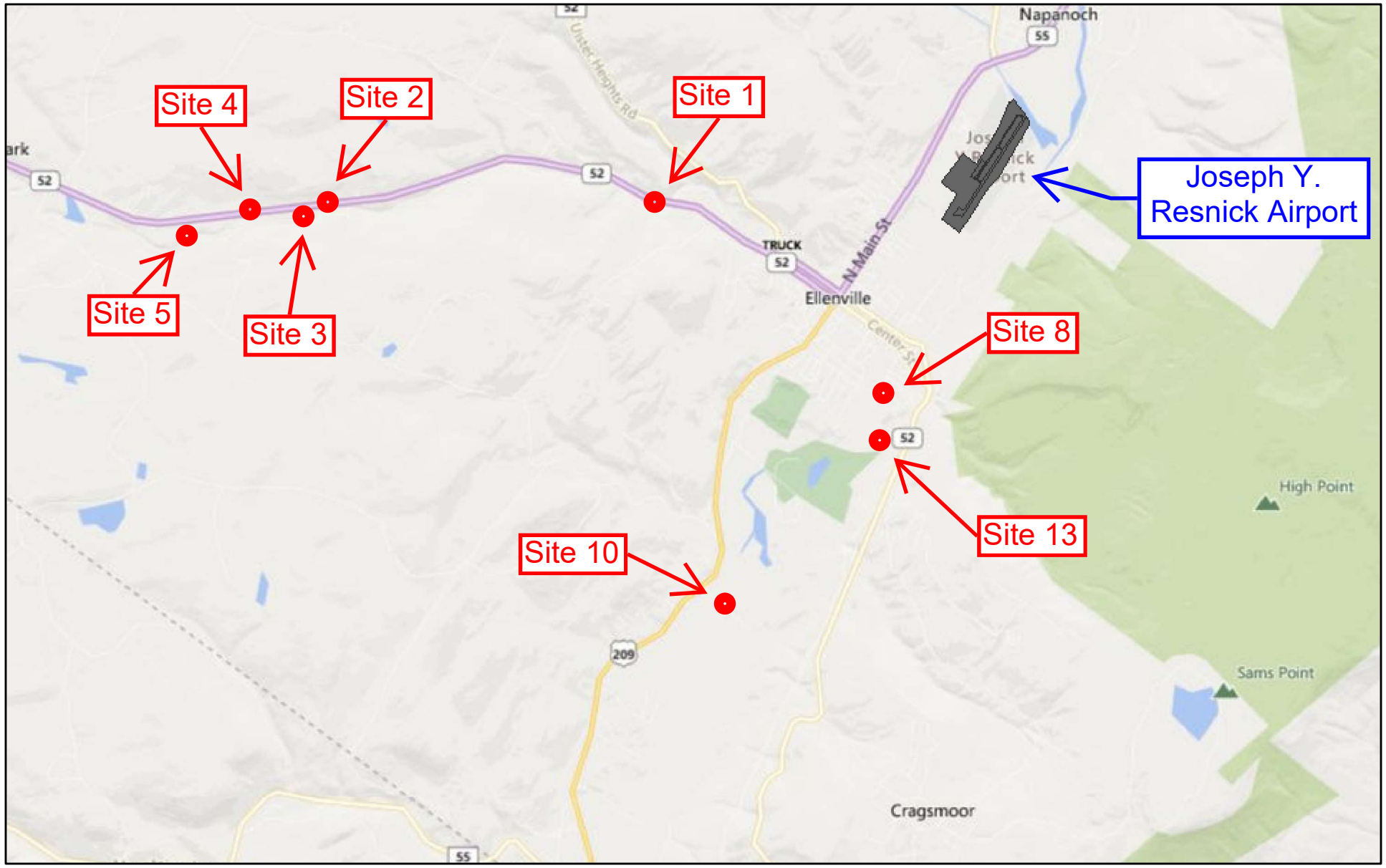
Base map contains data copyrighted by the NYS ITS GIS Program.

DISCLAIMER
This is a general reference to Agricultural District boundaries; not a legal substitute for actual tax parcel information.

Boundaries as certified prior to January 2018

Open Enrollment Annual Additions are not included in this data. Check with county agencies to confirm the status of individual parcels.

Ellenville Stream Bank Restoration Project Airport Locations



January 16, 2020

Airport Points

Airport Polygons

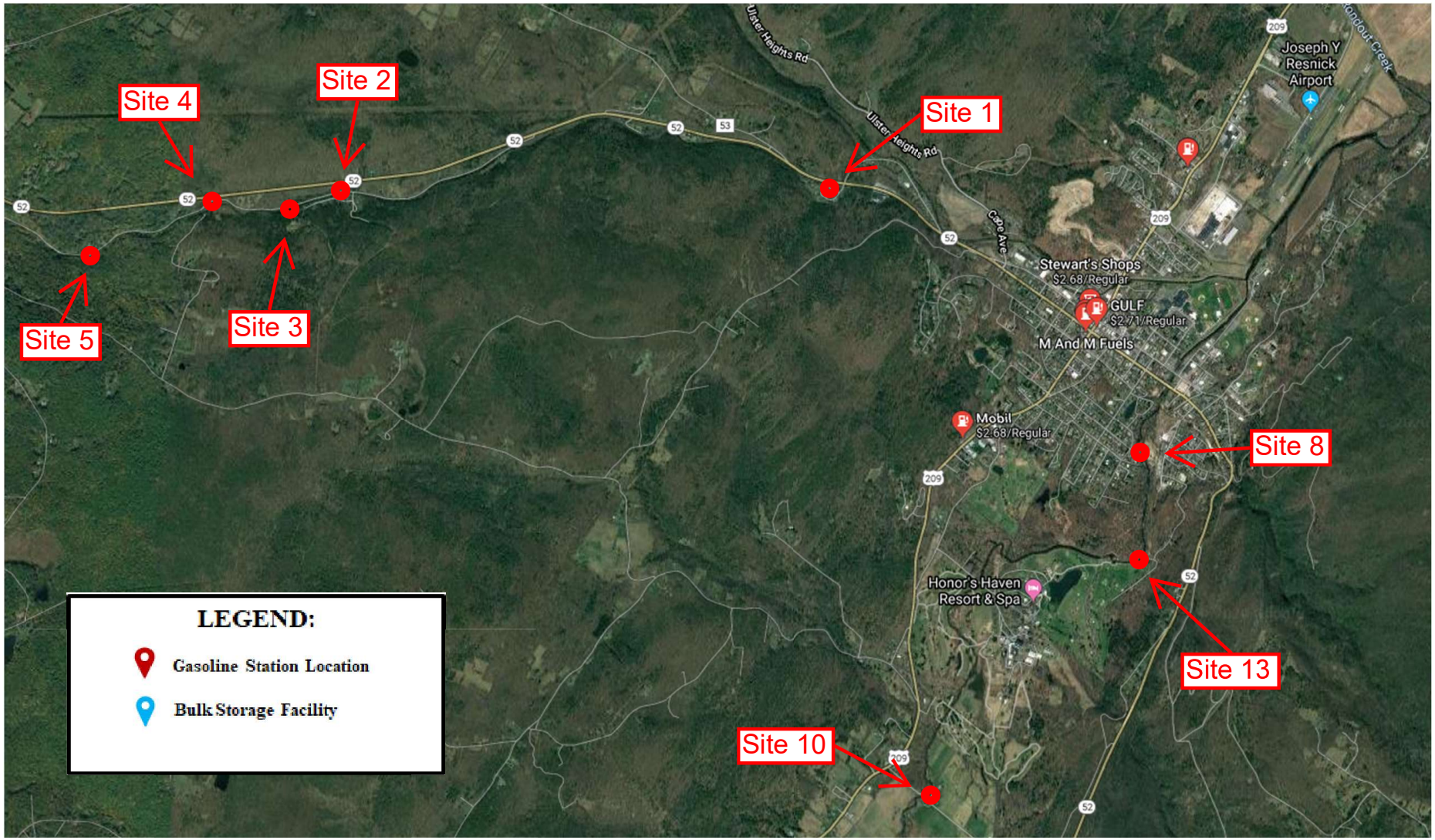
1:72,224

0 0.45 0.9 1.8 mi

0 0.75 1.5 3 km

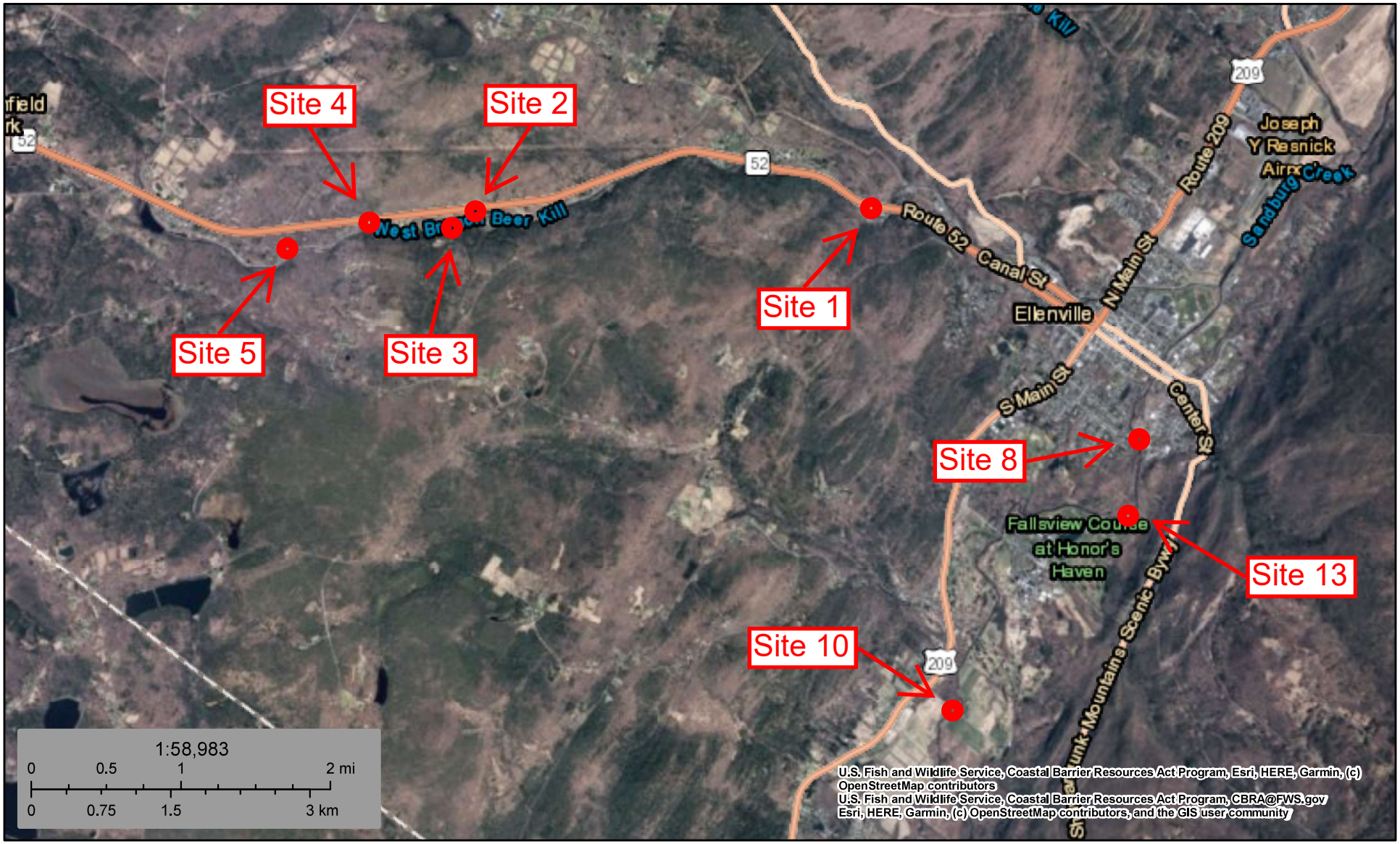
© 2020 Microsoft Corporation © 2019 HERE, EPA OEI

Ellenville Stream Bank Restoration Project Bulk Storage Facilities



U.S. Fish and Wildlife Service
Coastal Barrier Resources System

Ellenville Stream Bank Restoration Project



January 16, 2020

CBRS Buffer Zone

System Unit

CBRS Units

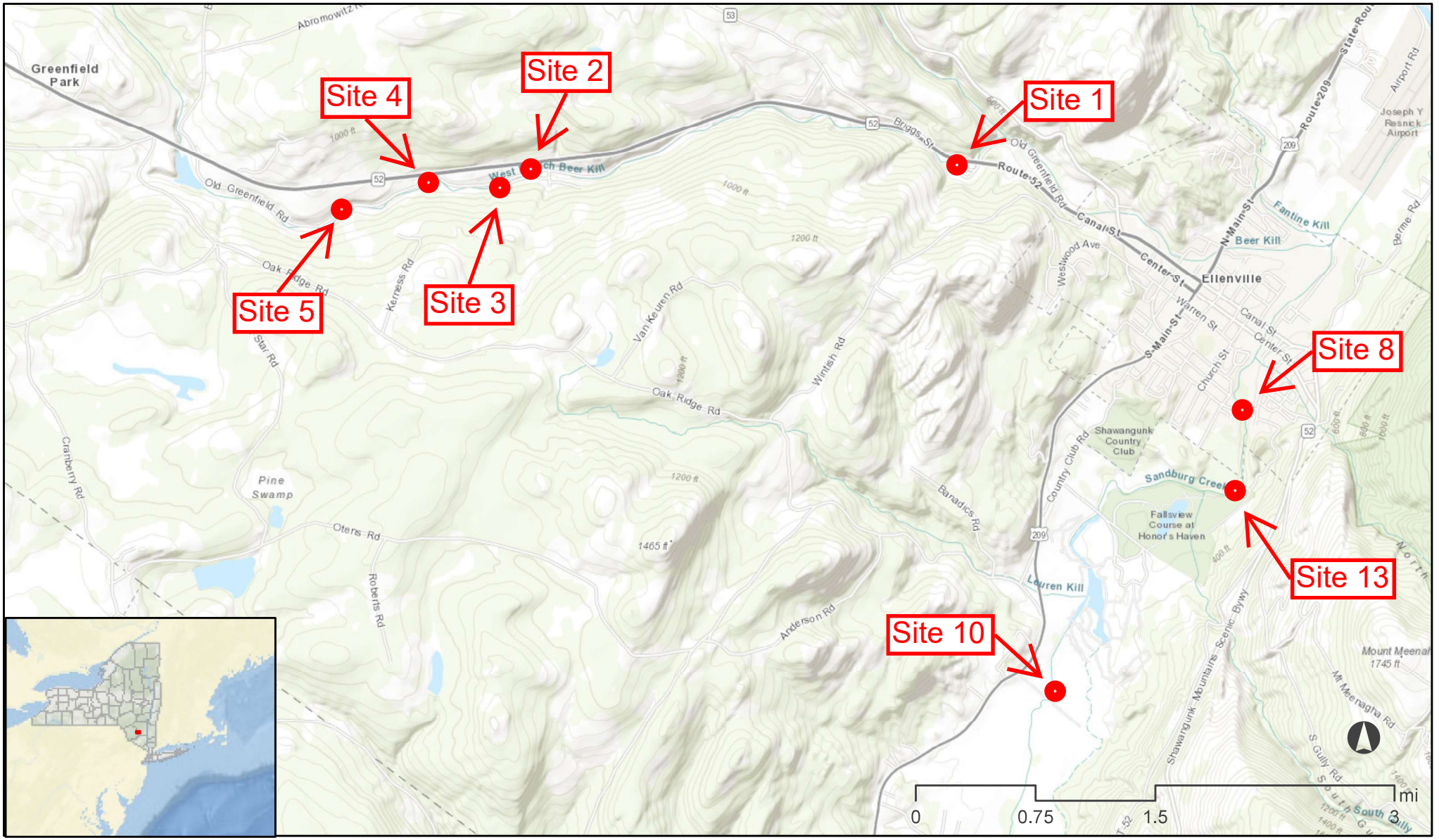
Otherwise Protected Area

This map is for general reference only. The Coastal Barrier Resources System (CBRS) boundaries depicted on this map are representations of the controlling CBRS boundaries, which are shown on the official maps, accessible at https://www.fws.gov/cbra/maps/index.html. All CBRS related data should be used in accordance with the layer metadata found on the CBRS Mapper website.

The CBRS Buffer Zone represents the area immediately adjacent to the CBRS boundary where users are advised to contact the Service for an official determination (http://www.fws.gov/cbra/Determinations.html) as to whether the property or project site is located "in" or "out" of the CBRS.

CBRS Units normally extend seaward out to the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS mapper.

Ellenville Stream Bank Restoration Project Coastal Boundary



DOS_identified_artificial_canals

Significant coastal fish & wildlife habitats - NYS Dept of State

Coastal_Boundary_Polyline_update

SASS

Local Waterfront Revitalization Program [LWRP] Community Boundaries, Approved

Long_Island_Sound_Program

NativeAmericanLands

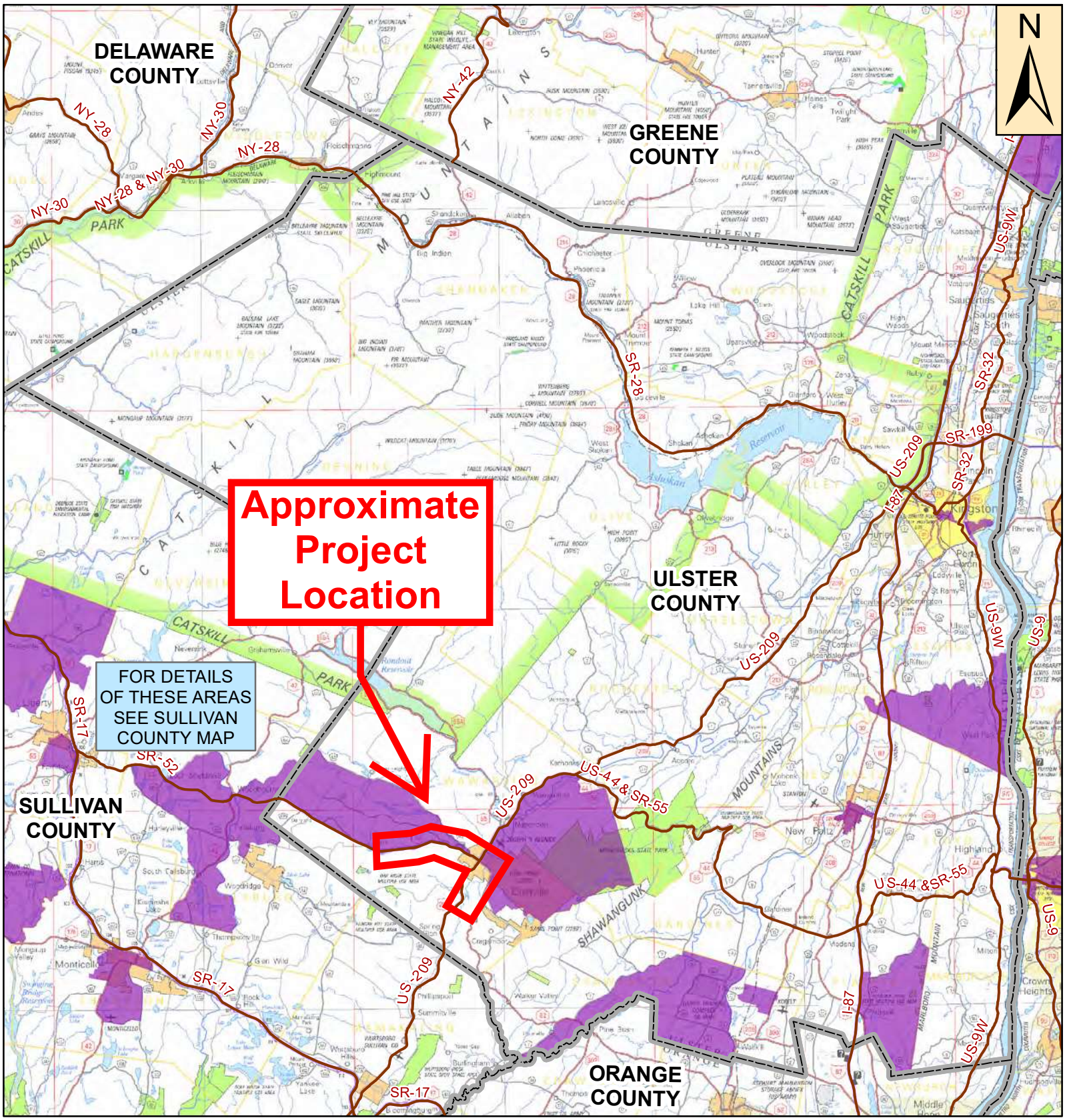
FederalLands_NY

CoastalBoundary_Polygon_March2017

NEW YORK STATE OF OPPORTUNITY. Department of State

The New York Department of State (DOS) gives no warranty, expressed or implied, as to the accuracy, reliability, or completeness of data shown on this map product. DOS does not assume responsibility for the use or application of any information represented on this map nor responsibility for any error, omission or other discrepancy between the electronic and printed versions of documents.

Ellenville Stream Bank Restoration Project
Potential Environmental Justice Areas in Ulster County, NY



This computer representation has been compiled from supplied data or information that has not been verified by EPA or NYSDEC. The data is offered here as a general representation only and is not to be used for commercial purposes without verification by an independent professional qualified to verify such data or information.

Neither EPA nor NYSDEC guarantee the accuracy, completeness, or timeliness of the information shown and shall not be liable for any loss or injury resulting from reliance.

Data Source for Potential Environmental Justice Areas:
U.S. Census Bureau, 2000 U.S. Census

Legend

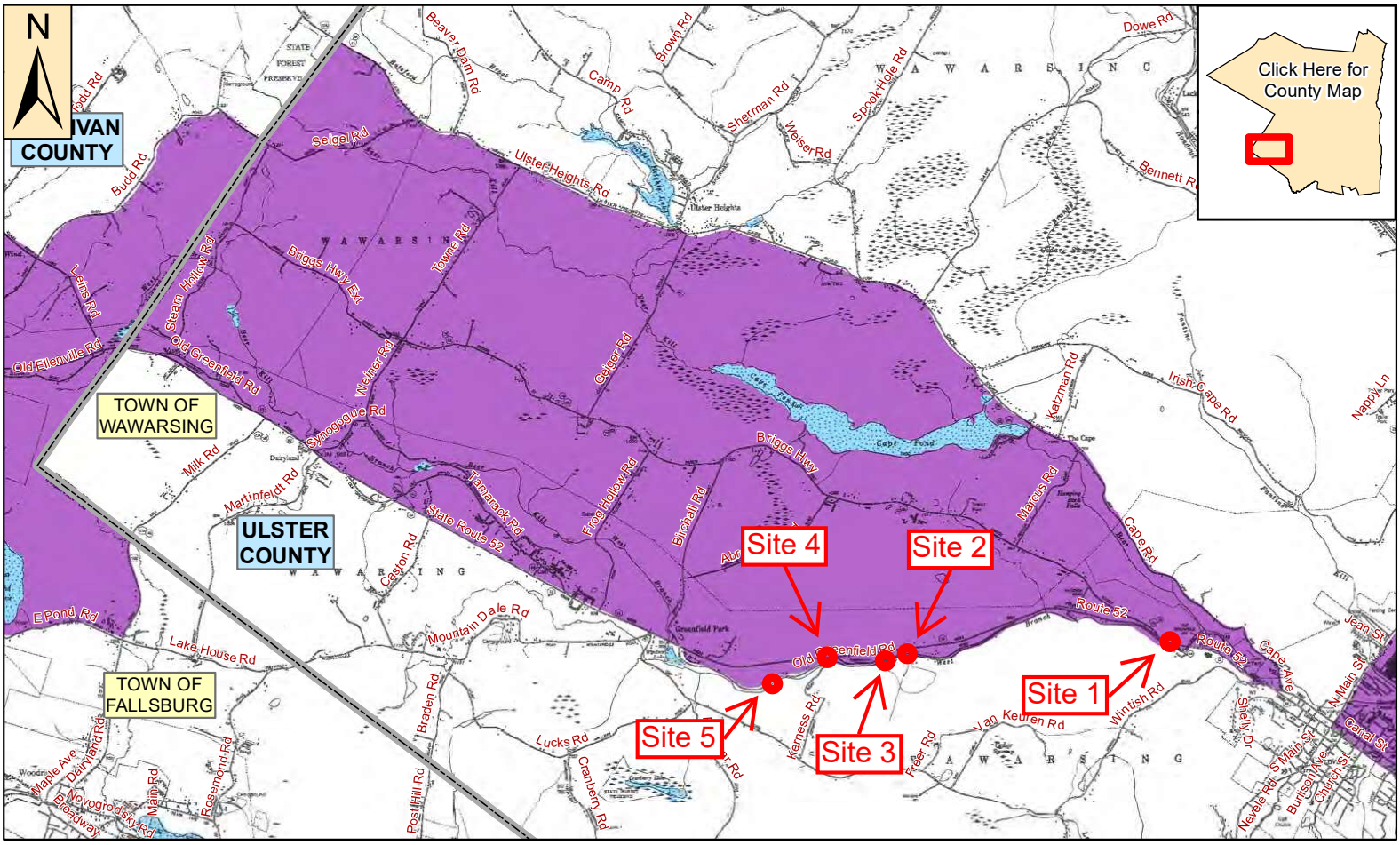
- Potential EJ Area
- County Boundary

Miles
0 2 4 6 8 10

SCALE: 1:350,000

For questions about this map contact:
New York State Department of Environmental Conservation
Office of Environmental Justice
625 Broadway, 14th Floor
Albany, New York 12233-1500
(518) 402-8556
ej@gw.dec.state.ny.us

Potential Environmental Justice Areas in the Town of Wawarsing (West detail), Ulster County, New York



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Neither EPA nor NYSDEC guarantee the accuracy, completeness, or timeliness of the information shown and shall not be liable for any loss or injury resulting from reliance.

Data Source for Potential Environmental Justice Areas:
U.S. Census Bureau, 2000 U.S. Census

Legend

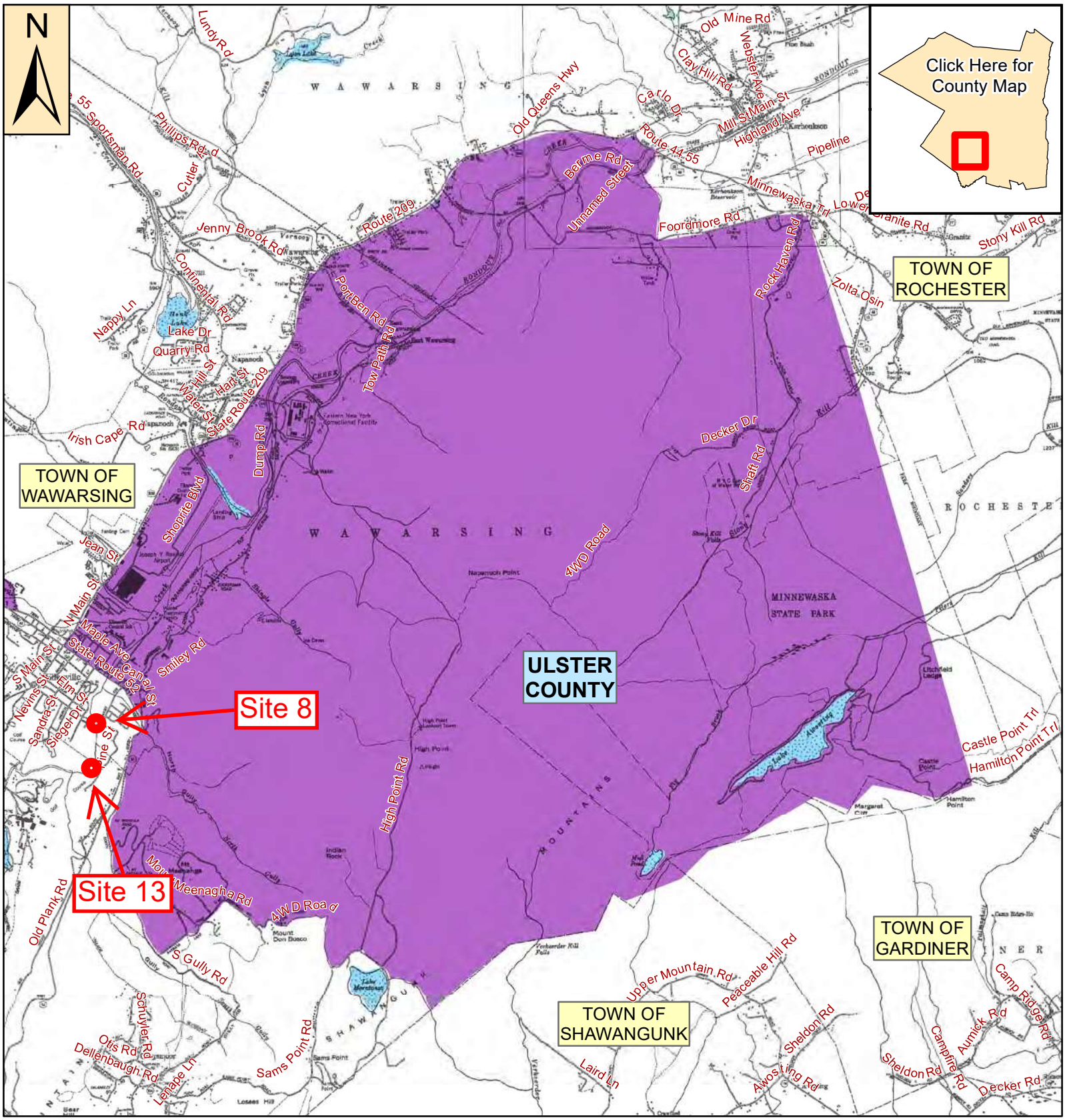
- Potential EJ Area
- County Boundary
- Waterbodies

0 0.5 1 1.5 2 Miles

SCALE: 1:60,000

For questions about this map contact:
New York State Department of Environmental Conservation
Office of Environmental Justice
625 Broadway, 14th Floor
Albany, New York 12233-1500
(518) 402-8556
ej@gw.dec.state.ny.us

Potential Environmental Justice Areas in the Town of Wawarsing (East detail), Ulster County, New York



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Data Source for Potential Environmental Justice Areas:
U.S. Census Bureau, 2000 U.S. Census

Legend

- Potential EJ Area
- County Boundary
- Waterbodies

Miles
0 0.5 1 1.5 2

SCALE: 1:60,000

For questions about this map contact:
New York State Department of Environmental Conservation
Office of Environmental Justice
625 Broadway, 14th Floor
Albany, New York 12233-1500
(518) 402-8556
ej@gw.dec.state.ny.us

Ellenville Stream Bank Restoration Project Flood Zones

FEMA

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/23/2019 at 3:42:21 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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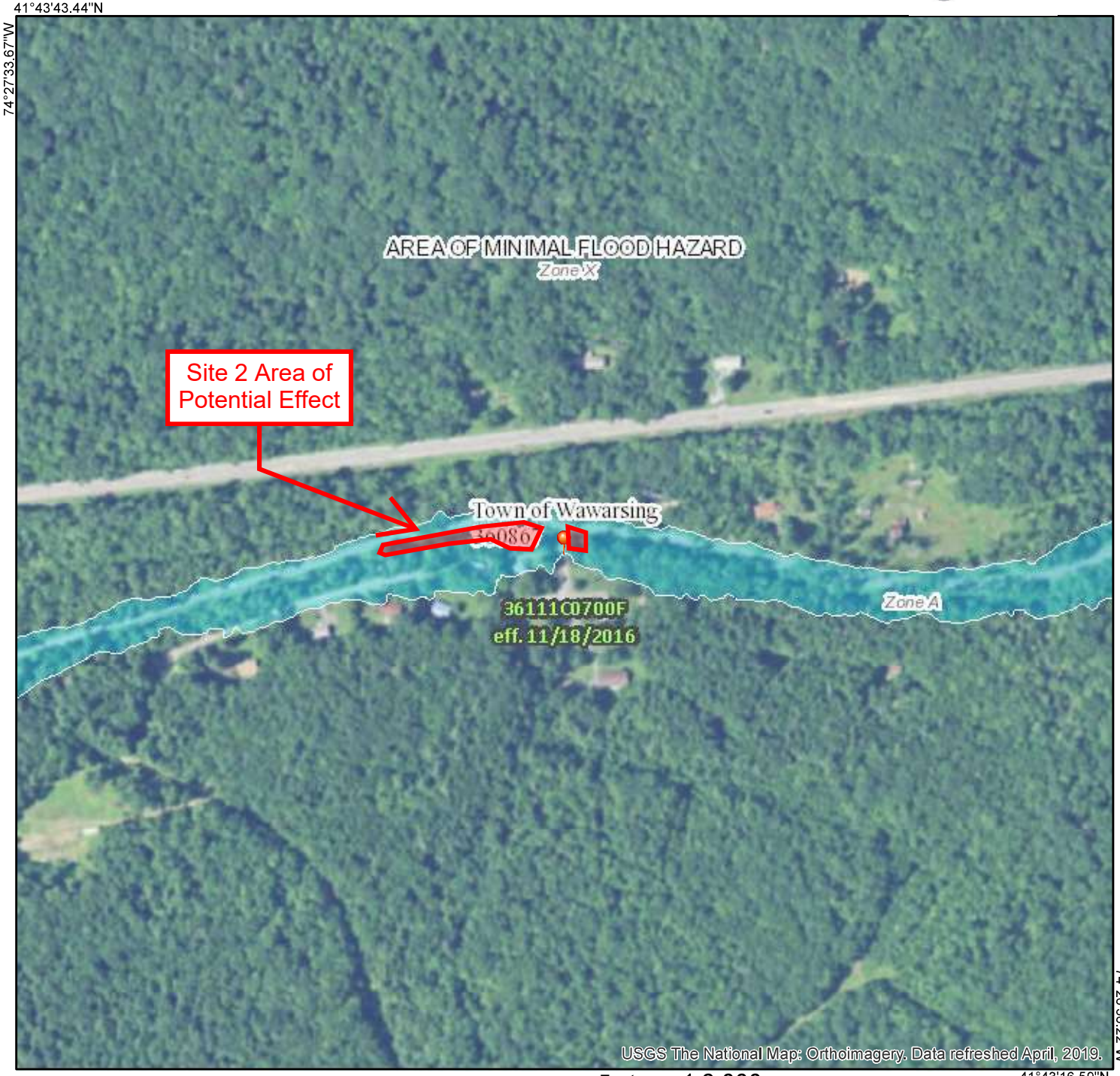
Ellenville Stream Bank Restoration Project Flood Zones

FEMA



Feet
0 250 500 1,000 1,500 2,000

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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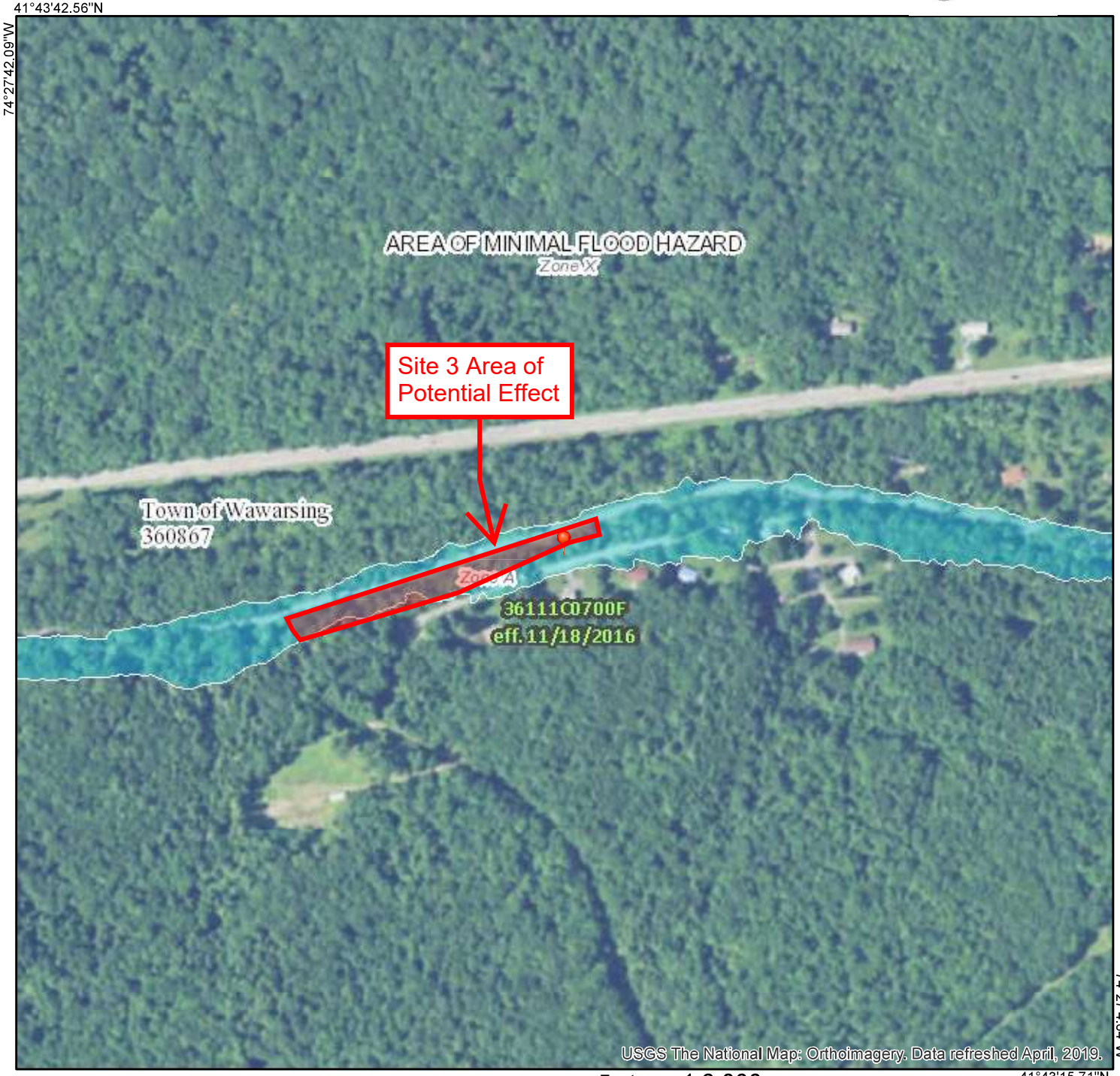
Ellenville Stream Bank Restoration Project Flood Zones

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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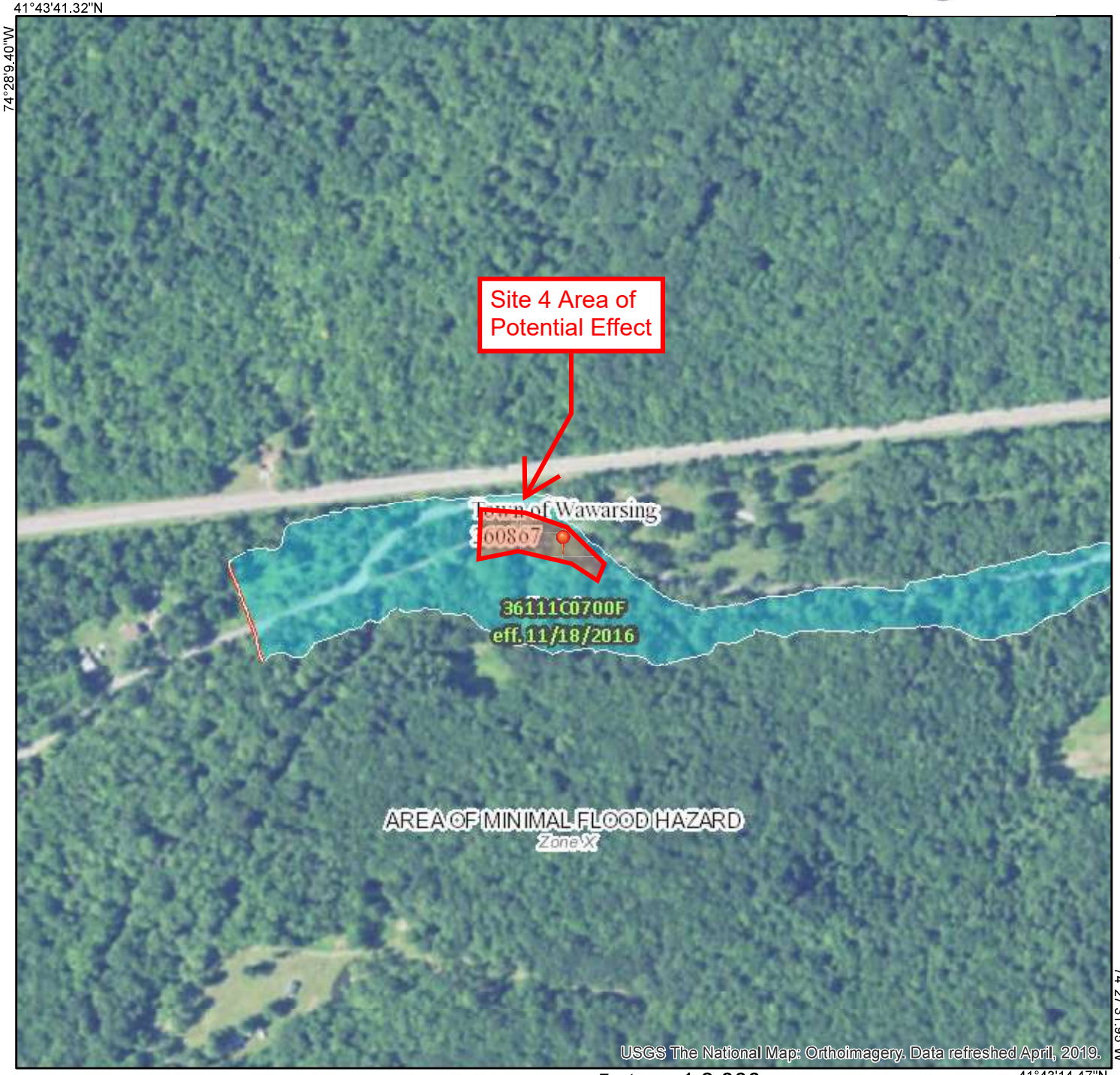
Ellenville Stream Bank Restoration Project Flood Zones

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/23/2019 at 4:05:36 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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Ellenville Stream Bank Restoration Project Flood Zones

FEMA

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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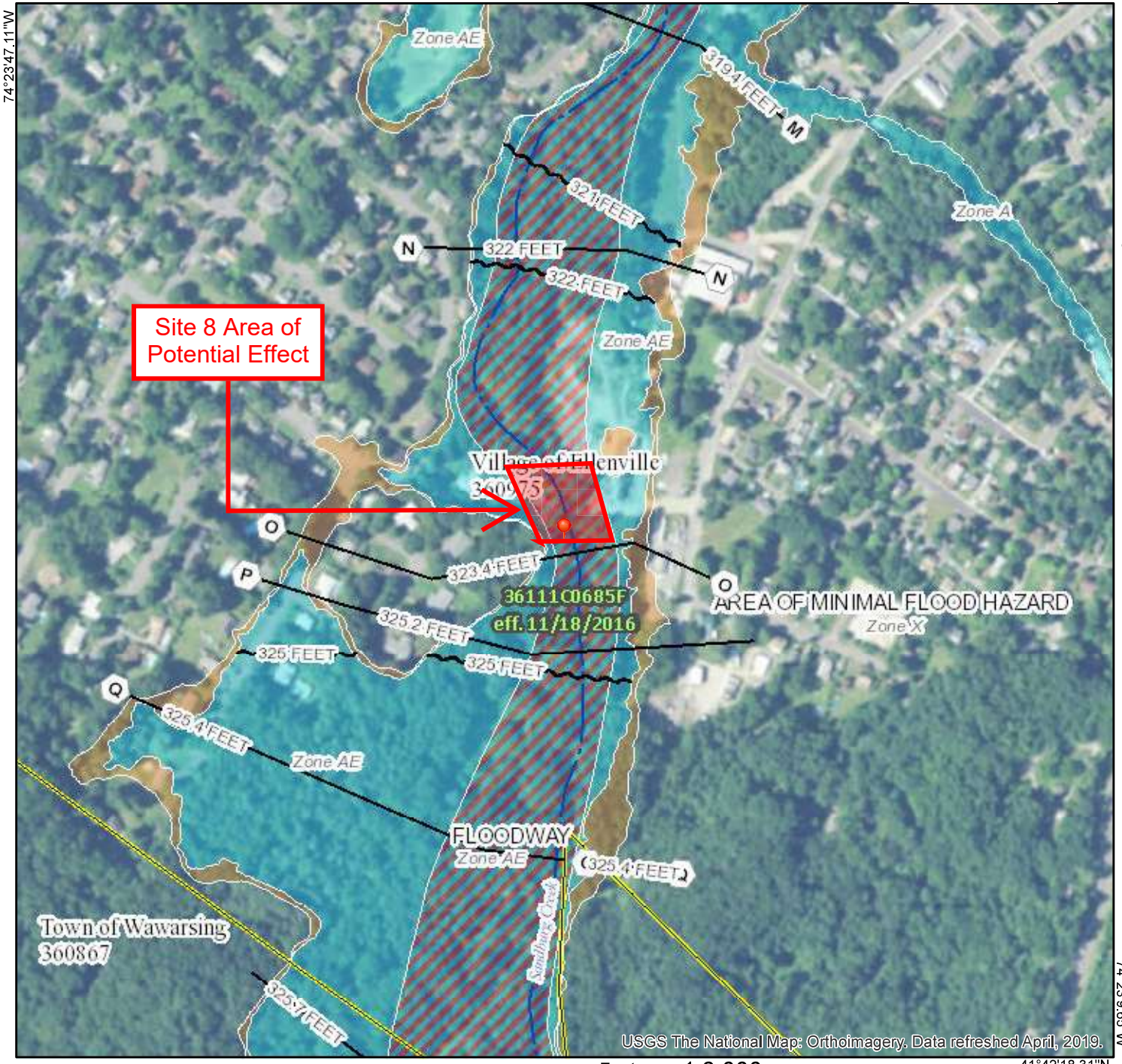
Ellenville Stream Bank Restoration Project Flood Zones

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/23/2019 at 3:23:44 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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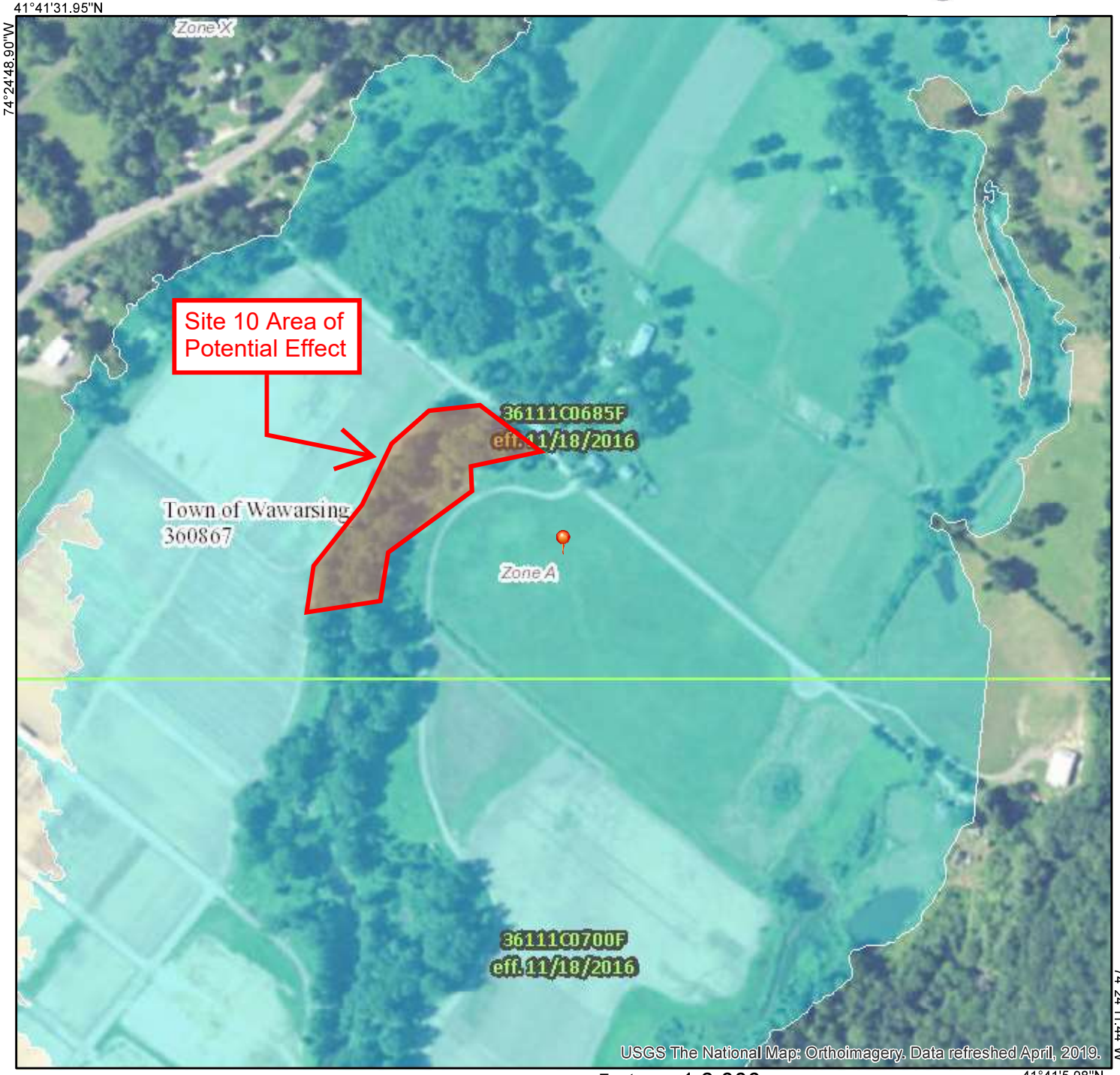
Ellenville Stream Bank Restoration Project Flood Zones

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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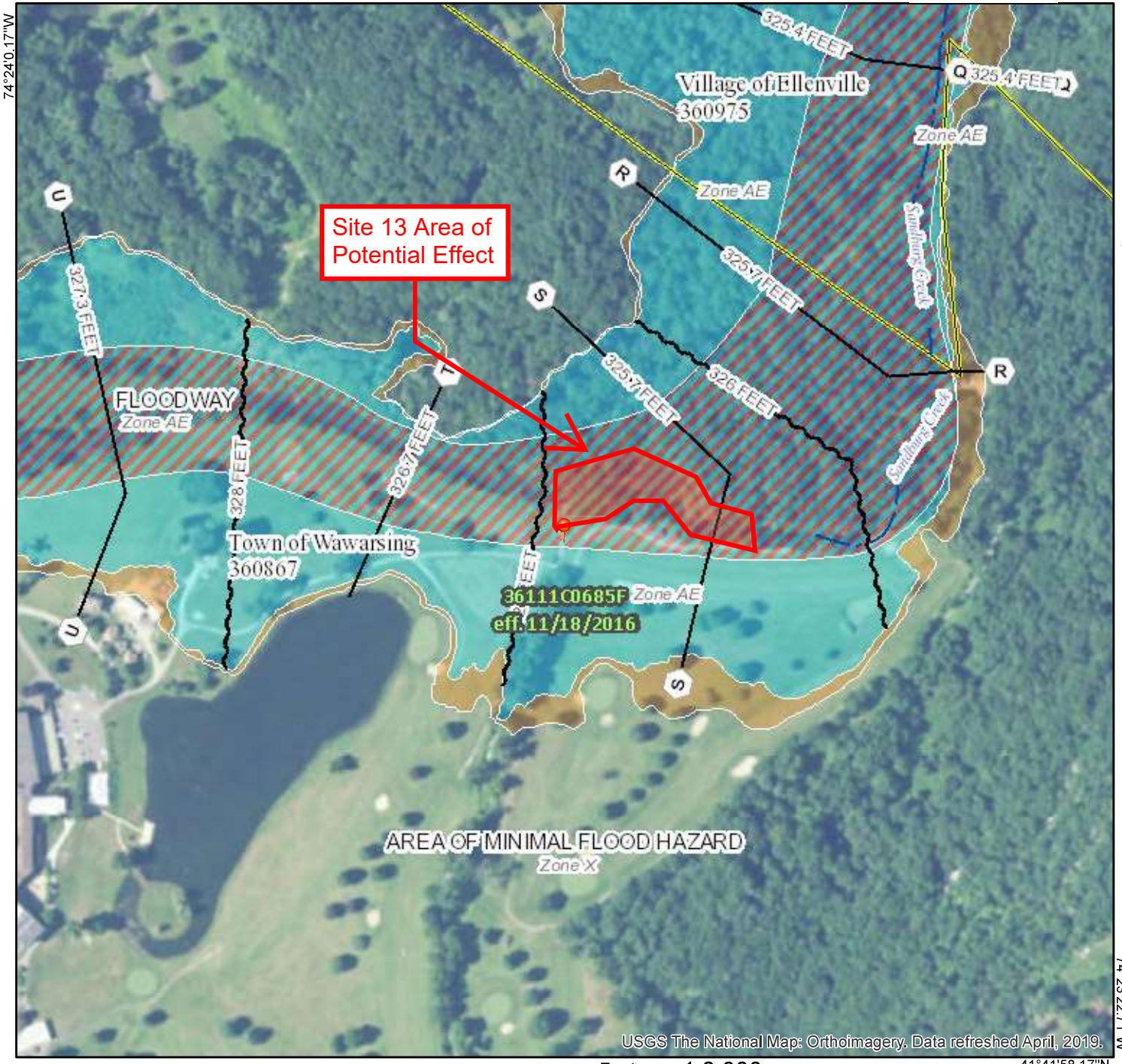
Ellenville Stream Bank Restoration Project Flood Zones

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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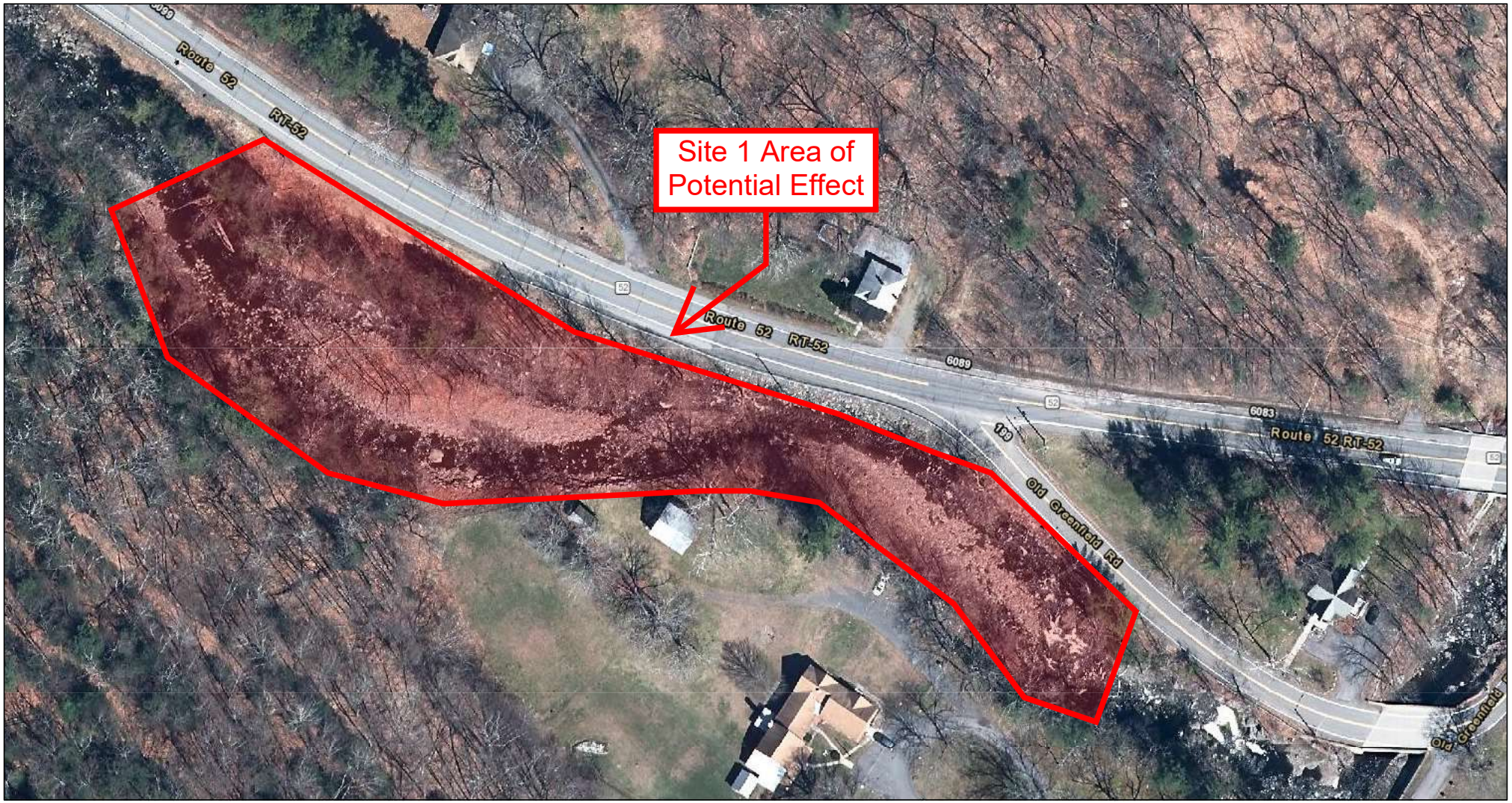
Ellenville Stream Bank Restoration Project NYSDEC Freshwater Wetlands



November 14, 2019

1:1,128

0 0.0125 0.025 0.05 mi
0 0.02 0.04 0.08 km

Layers and Legend

- State Regulated Freshwater Wetlands
- State Regulated Wetland Checkzone

NYS ITS GIS Program Office
Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

NYS Department of Environmental Conservation
Not a legal document

Ellenville Stream Bank Restoration Project NYSDEC Freshwater Wetlands

November 14, 2019

Layers and Legend

- State Regulated Freshwater Wetlands
- State Regulated Wetland Checkzone

1:1,128

0 0.0125 0.025 0.05 mi

0 0.02 0.04 0.08 km

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NYS Department of Environmental Conservation
Not a legal document

Ellenville Stream Bank Restoration Project NYSDEC Freshwater Wetlands

November 14, 2019

Layers and Legend

- ☑ State Regulated Freshwater Wetlands
- ☐ State Regulated Wetland Checkzone

1:1,128

0 0.0125 0.025 0.05 mi

0 0.02 0.04 0.08 km

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NYS Department of Environmental Conservation
Not a legal document

Ellenville Stream Bank Restoration Project NYSDEC Freshwater Wetlands

November 14, 2019

Layers and Legend

- ☑ State Regulated Freshwater Wetlands
- ☐ State Regulated Wetland Checkzone

1:1,128

0 0.0125 0.025 0.05 mi

0 0.02 0.04 0.08 km

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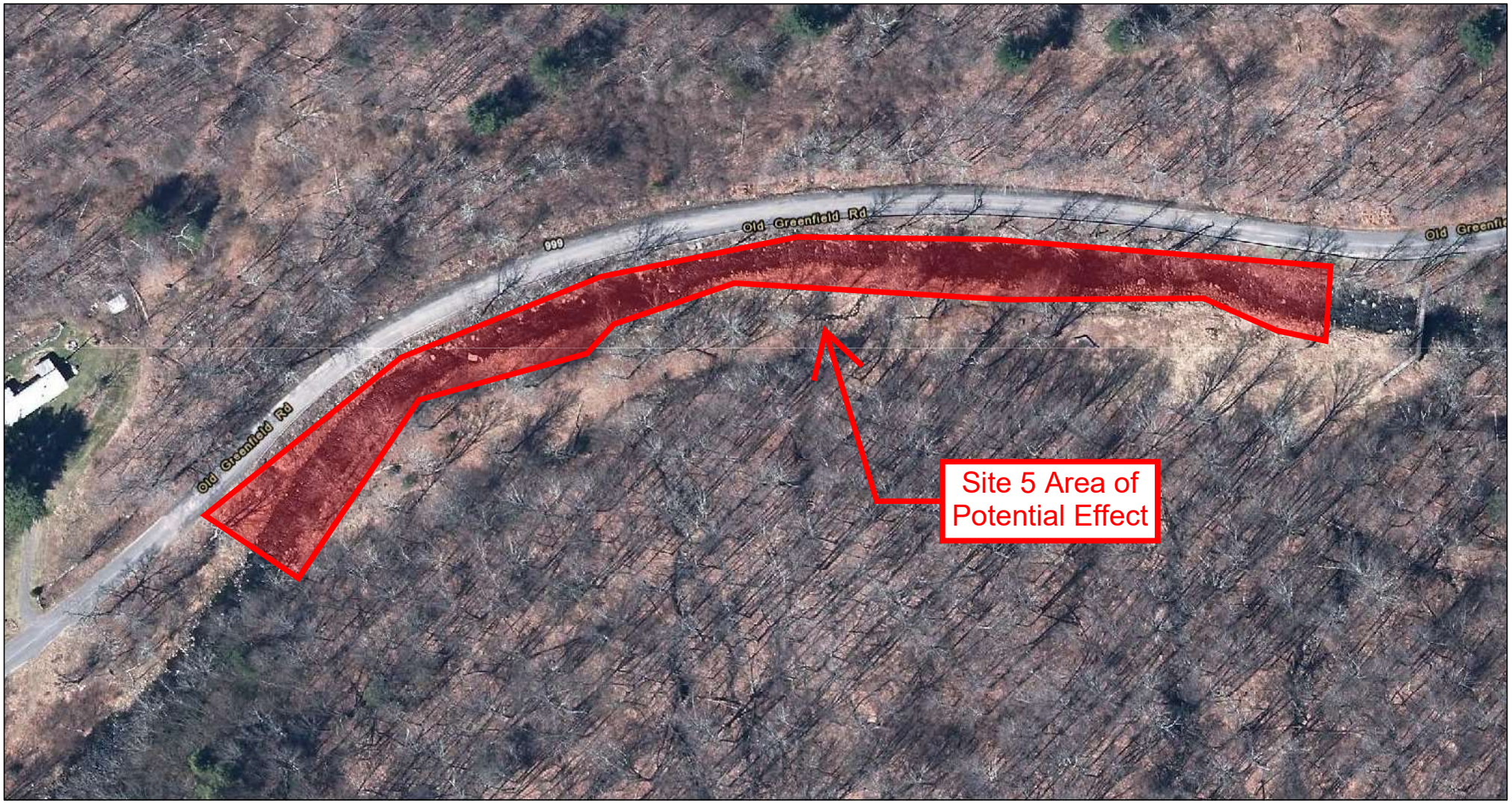
NYS Department of Environmental Conservation
Not a legal document

Ellenville Stream Bank Restoration Project NYSDEC Freshwater Wetlands



November 14, 2019

Layers and Legend

- State Regulated Freshwater Wetlands
- State Regulated Wetland Checkzone

1:1,128

0 0.0125 0.025 0.05 mi

0 0.02 0.04 0.08 km

NYS ITS GIS Program Office
Esri, HERE, Garmin, (c) OpenStreetMap contributors
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NYS Department of Environmental Conservation
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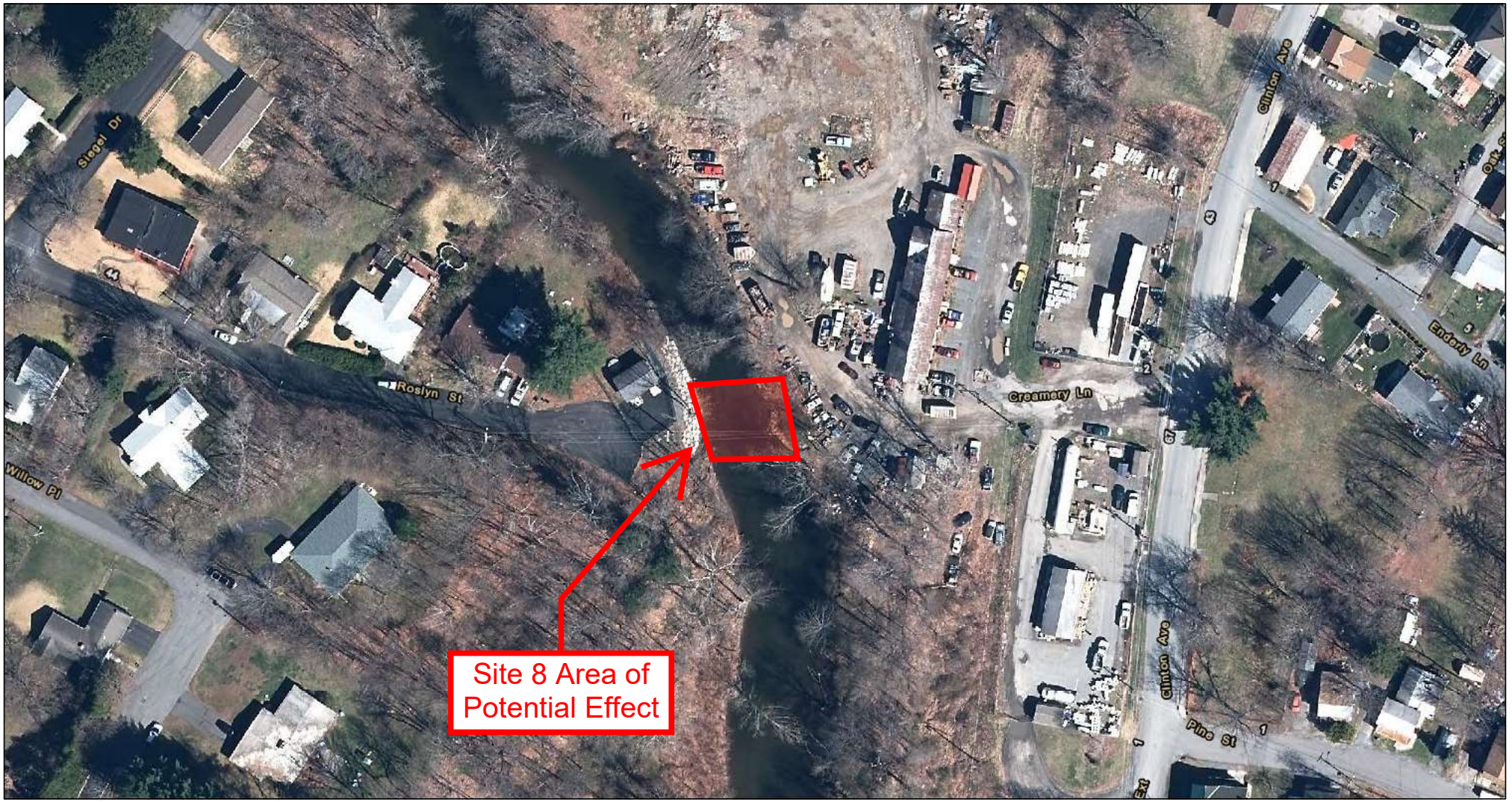
Ellenville Stream Bank Restoration Project NYSDEC Freshwater Wetlands



November 14, 2019

Layers and Legend

- State Regulated Freshwater Wetlands
- State Regulated Wetland Checkzone

1:1,128

0 0.0125 0.025 0.05 mi

0 0.02 0.04 0.08 km

NYS ITS GIS Program Office
Esri, HERE, Garmin, (c) OpenStreetMap contributors
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NYS Department of Environmental Conservation
Not a legal document

Ellenville Stream Bank Restoration Project NYSDEC Freshwater Wetlands

November 14, 2019

Layers and Legend

- State Regulated Freshwater Wetlands
- State Regulated Wetland Checkzone

1:2,257

0 0.0275 0.055 0.11 mi

0 0.0425 0.085 0.17 km

NYS ITS GIS Program Office
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Ellenville Stream Bank Restoration Project NYSDEC Freshwater Wetlands

November 14, 2019

Layers and Legend

- State Regulated Freshwater Wetlands
- State Regulated Wetland Checkzone

1:1,128

0 0.0125 0.025 0.05 mi

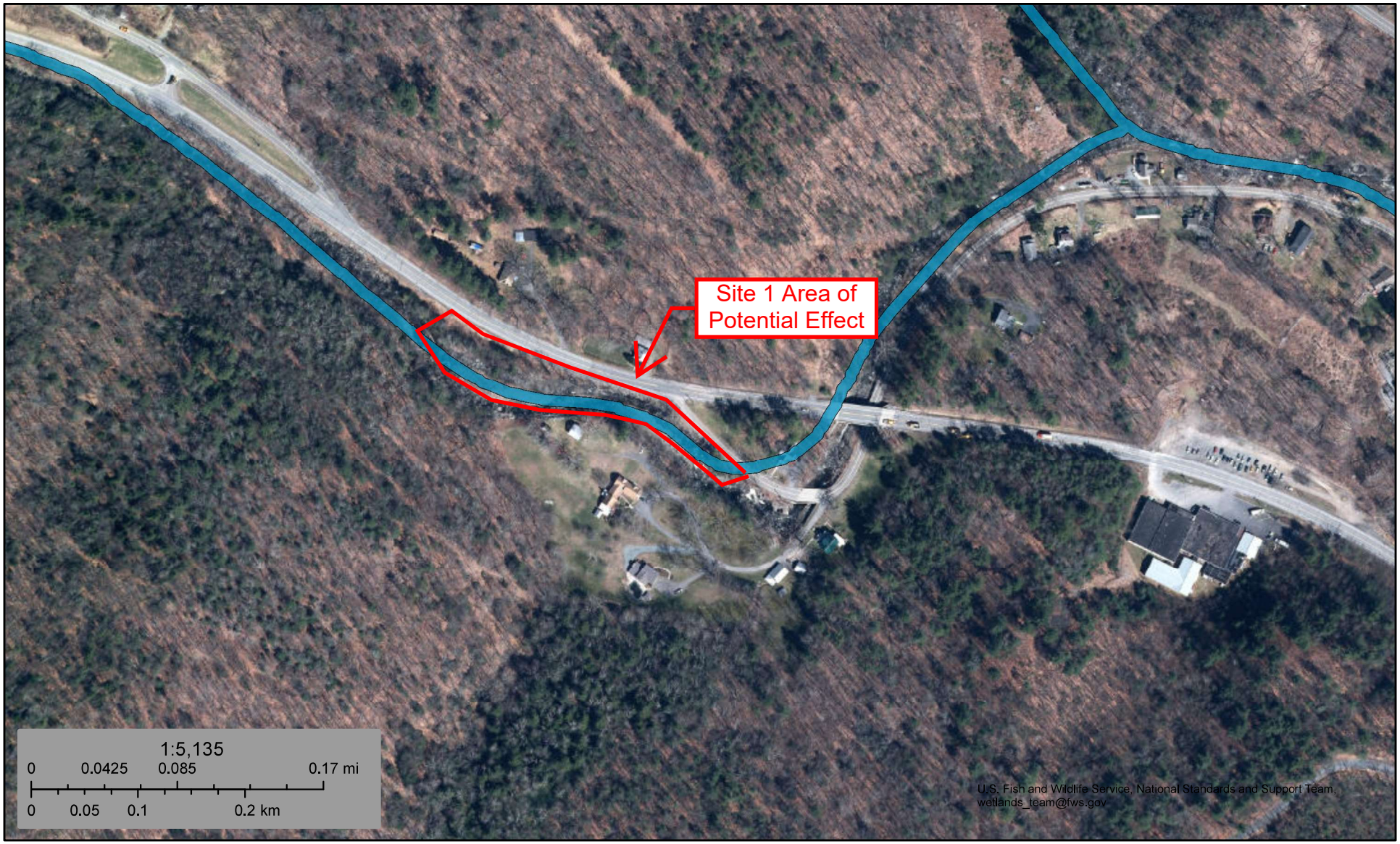
0 0.02 0.04 0.08 km

NYS ITS GIS Program Office
Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

NYS Department of Environmental Conservation
Not a legal document

U.S. Fish and Wildlife Service
National Wetlands Inventory

Ellenville Stream Bank Restoration Project



October 23, 2019

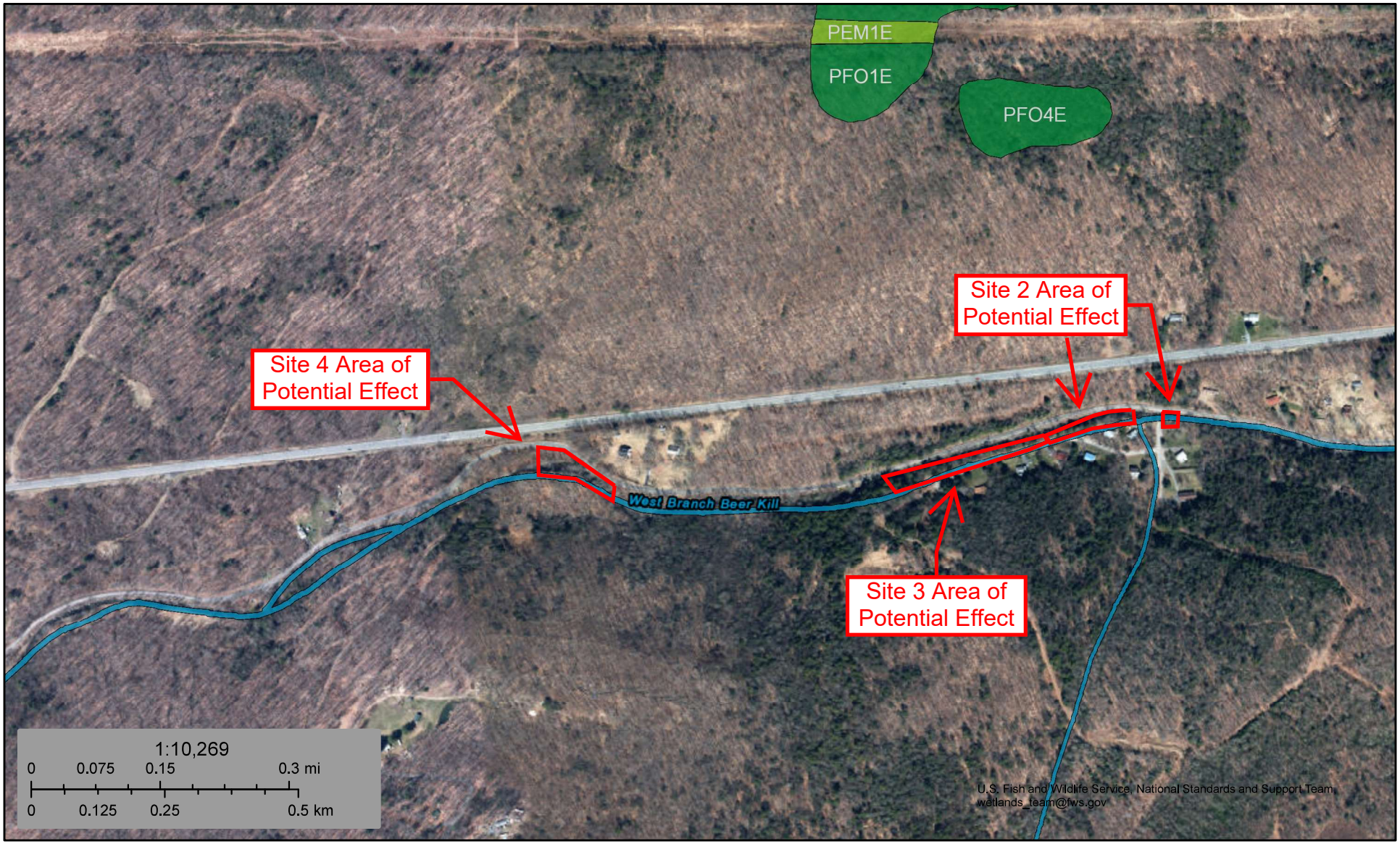
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Ellenville Stream Bank Restoration Project



October 23, 2019

Wetlands

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- Freshwater Emergent Wetland
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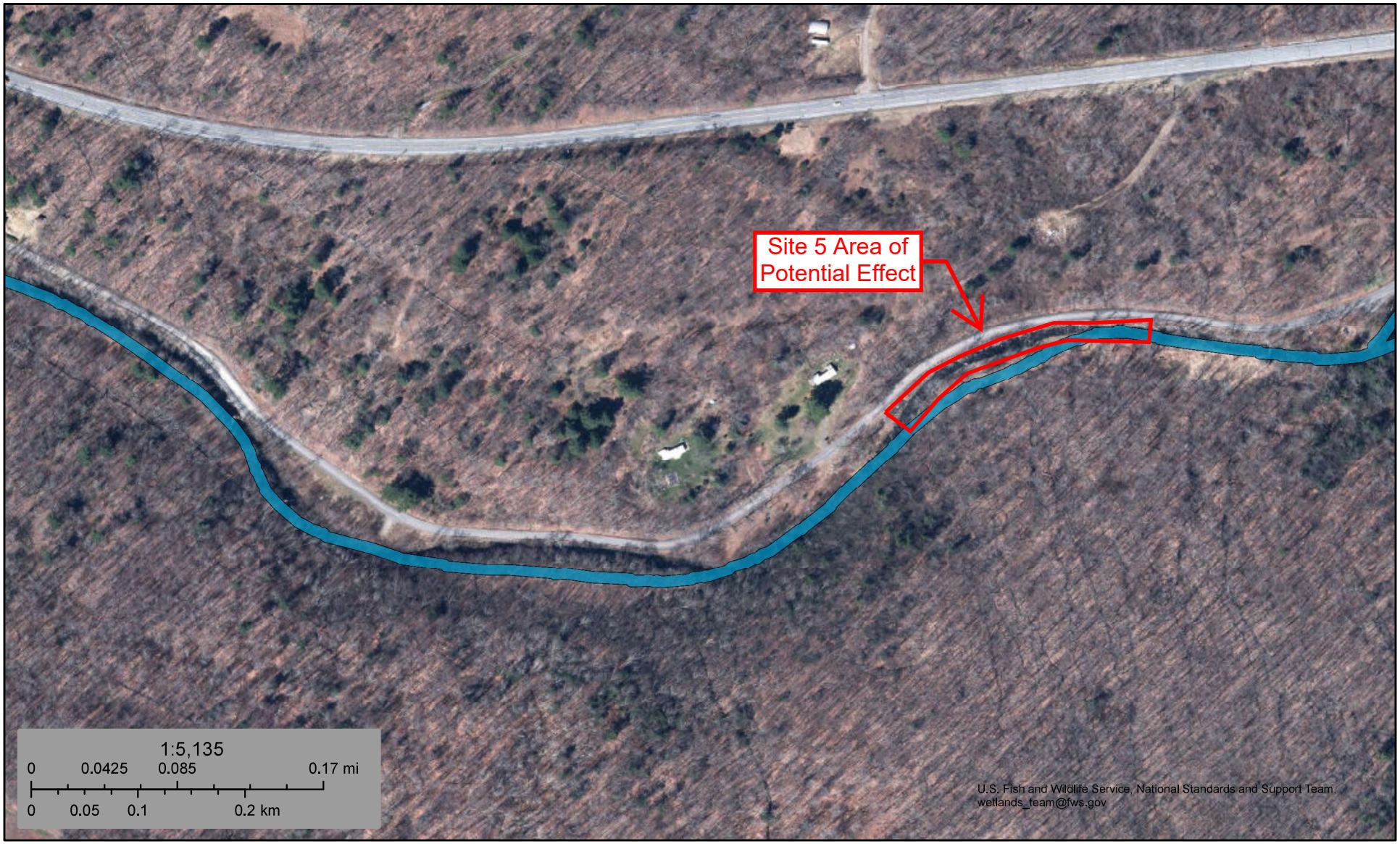
U.S. Fish and Wildlife Service
National Wetlands Inventory

Ellenville Stream Bank Restoration Project



October 23, 2019

Wetlands

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- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
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U.S. Fish and Wildlife Service
National Wetlands Inventory

Ellenville Stream Bank Restoration Project

December 4, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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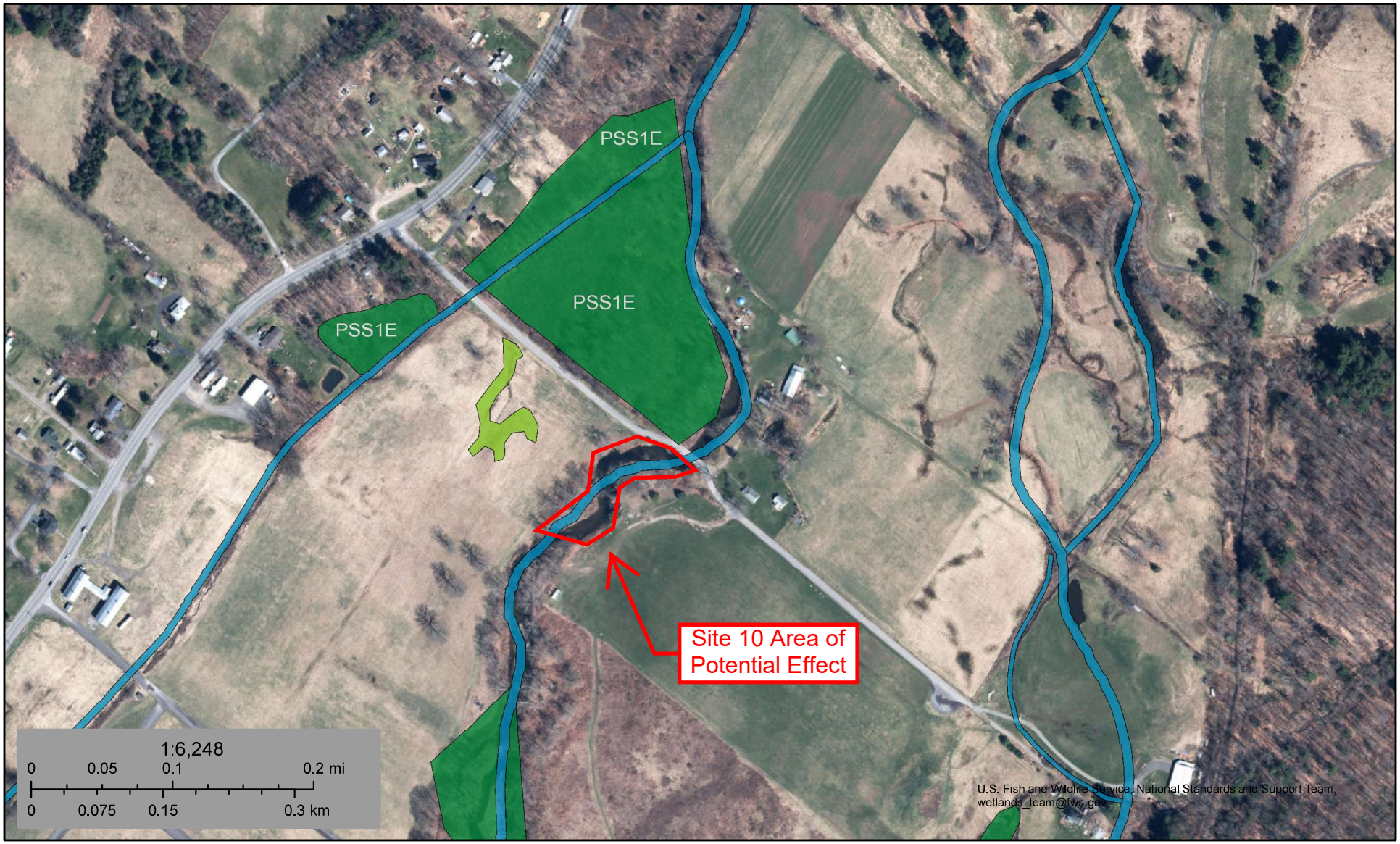
U.S. Fish and Wildlife Service
National Wetlands Inventory

Ellenville Stream Bank Restoration Project



November 13, 2019

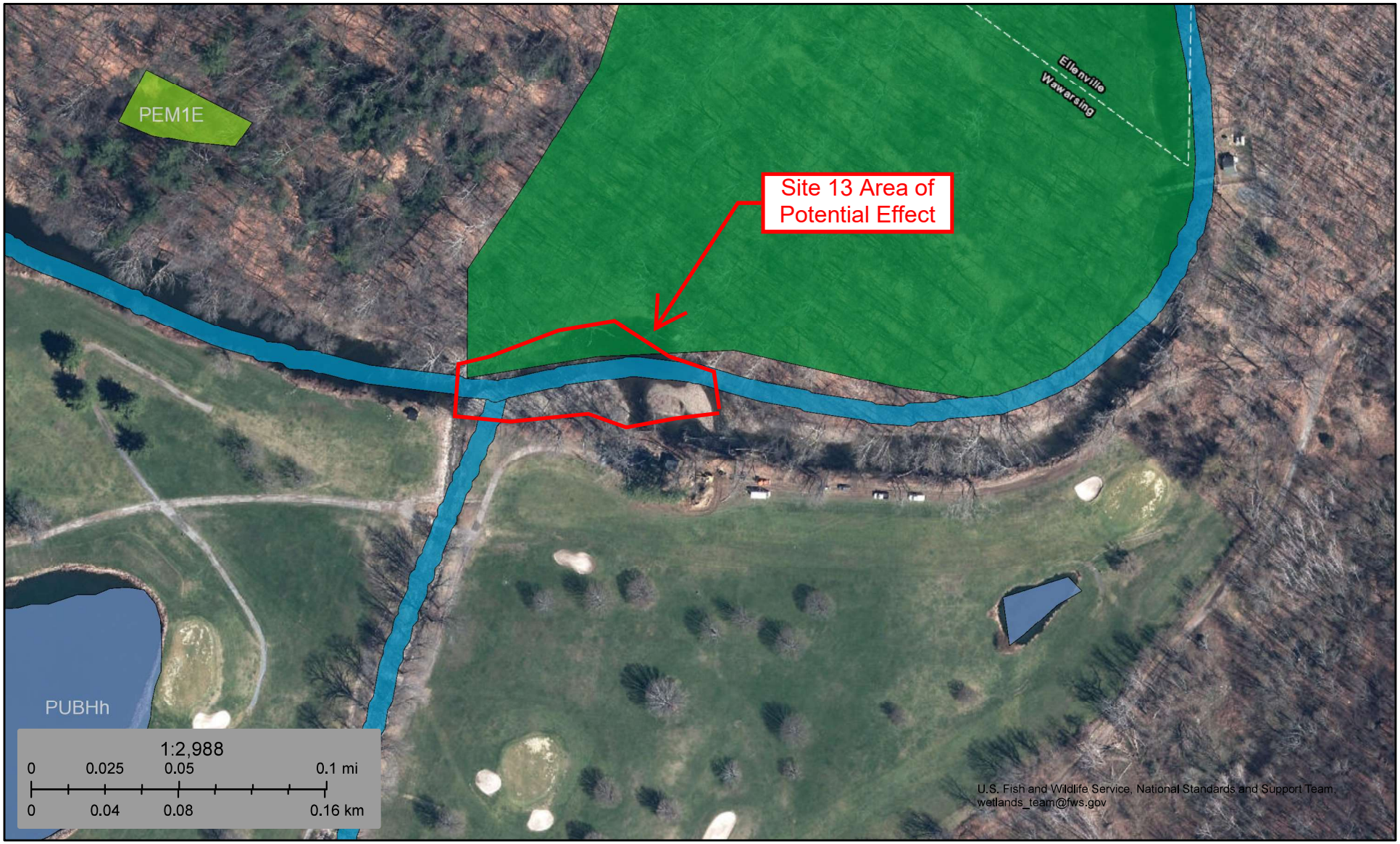
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

U.S. Fish and Wildlife Service
National Wetlands Inventory

Ellenville Stream Bank Restoration Project



October 23, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
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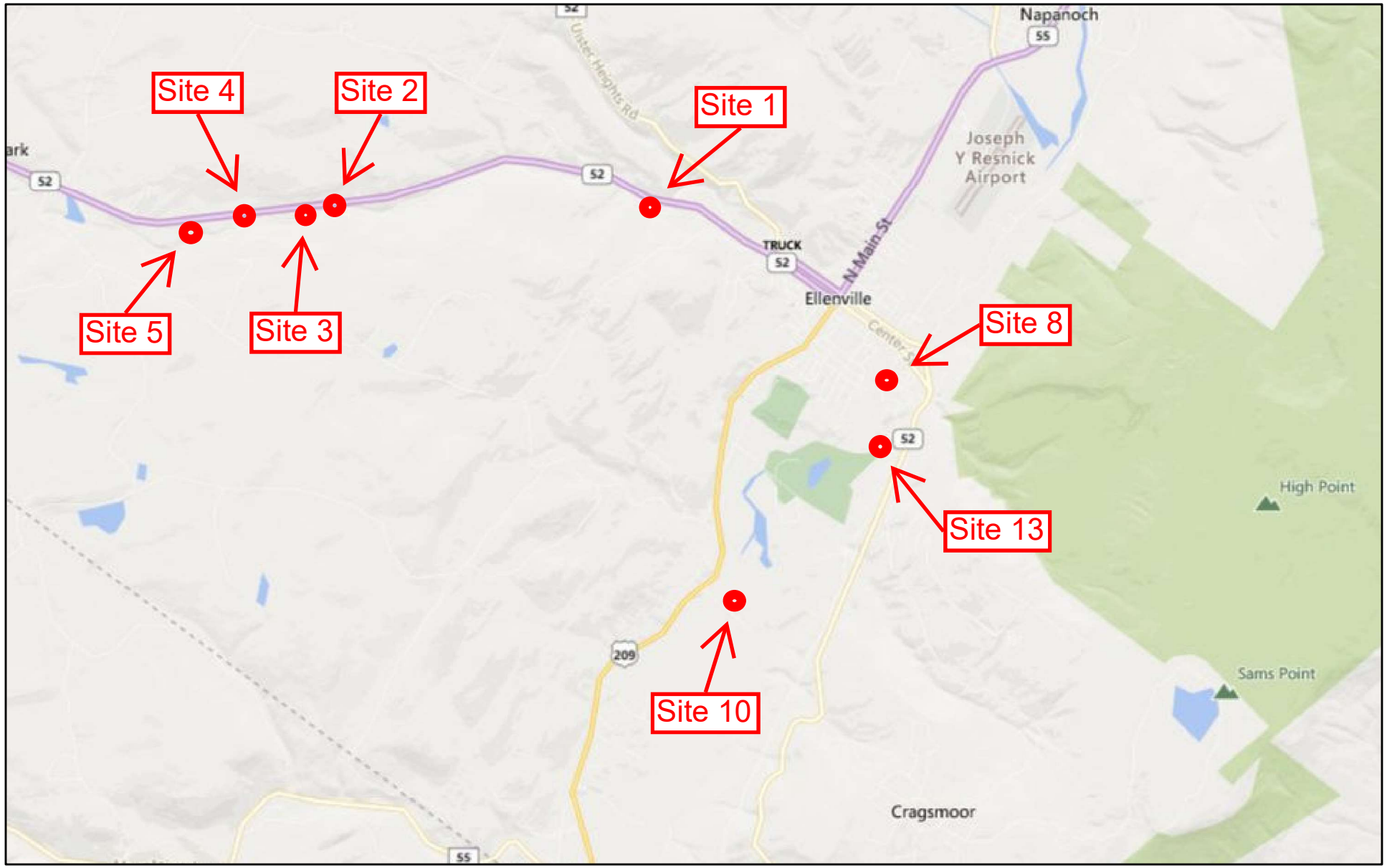
Ellenville Stream Bank Restoration Project Nonattainment Areas



January 16, 2020

1:72,224

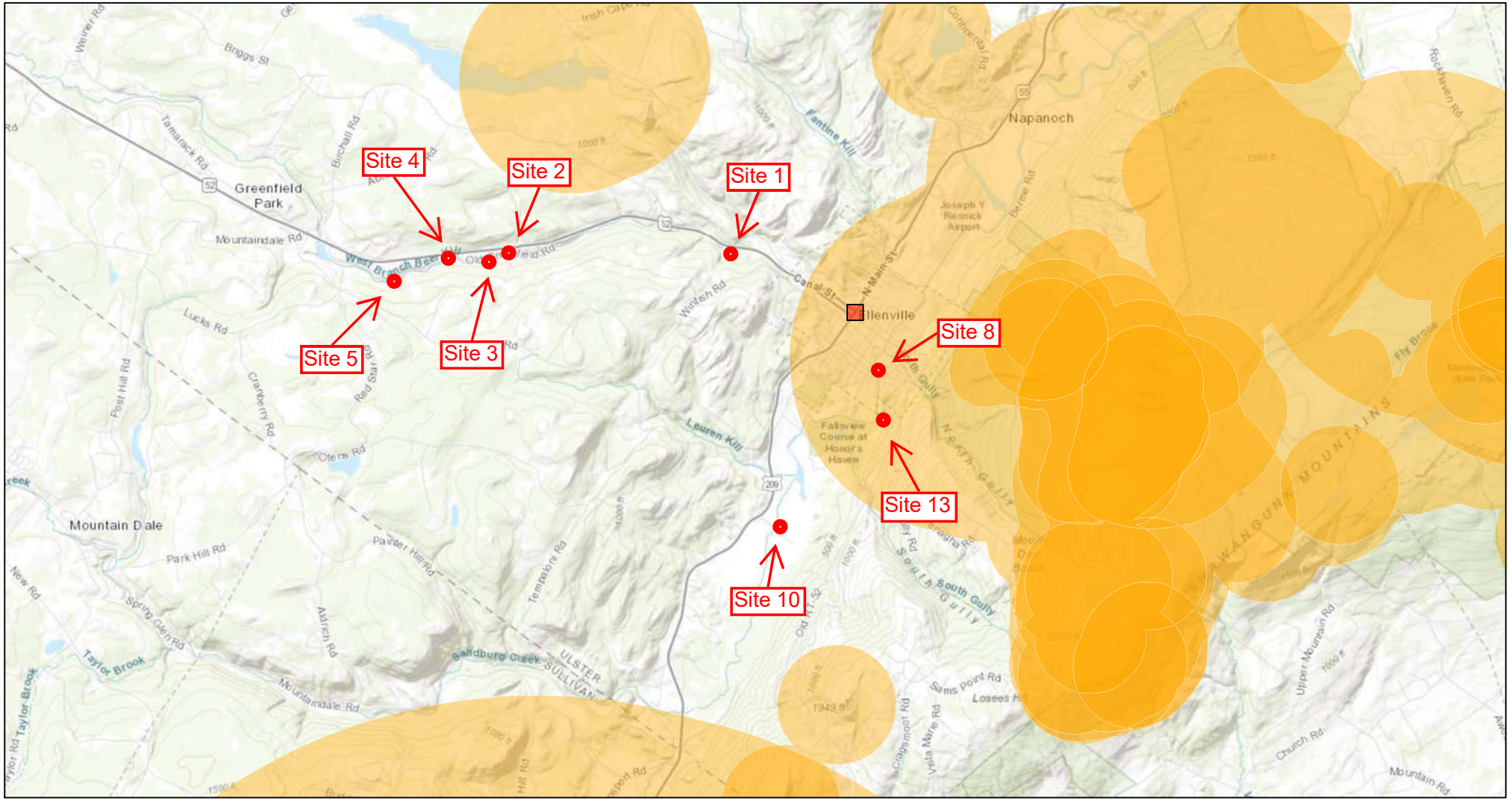
0 0.45 0.9 1.8 mi

0 0.75 1.5 3 km

Ozone 8-hr (1997 standard)	Ozone 8-hr (2008 standard)	Ozone 8-hr (2015 Standard)	Lead (2008 standard)
Maintenance (NAAQS revoked)	Maintenance	Maintenance	Maintenance
Nonattainment (NAAQS revoked)	Nonattainment	Nonattainment	Nonattainment

© 2020 Microsoft Corporation © 2019 HERE, U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS)

Ellenville Stream Bank Restoration Project Protected Species



January 16, 2020

1:72,224

0 0.5 1 2 mi

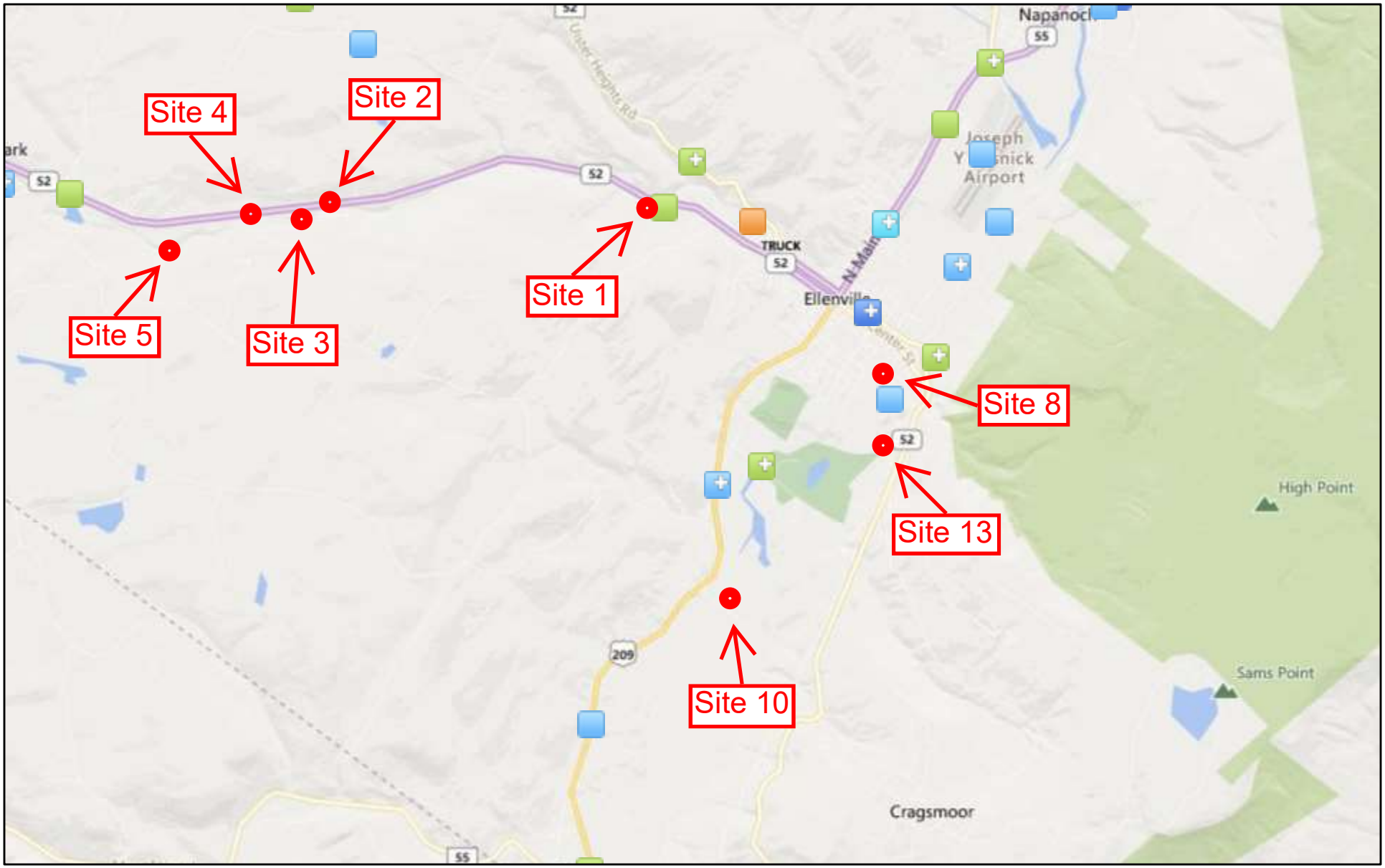
0 1 2 4 km

Rare Plants or Animals

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

NYS Department of Environmental Conservation
Not a legal document

Ellenville Stream Bank Restoration Project Remediation Sites



January 16, 2020

- Superfund (NPL)
- Toxic Releases (TRI)
- Water Dischargers (NPDES)
- Water Dischargers (NPDES)
- Air Pollution (ICIS-AIR)
- Air Pollution (ICIS-AIR)
- Hazardous Waste (RCRAInfo)
- Hazardous Waste (RCRAInfo)

1:72,224

0 0.45 0.9 1.8 mi

0 0.75 1.5 3 km

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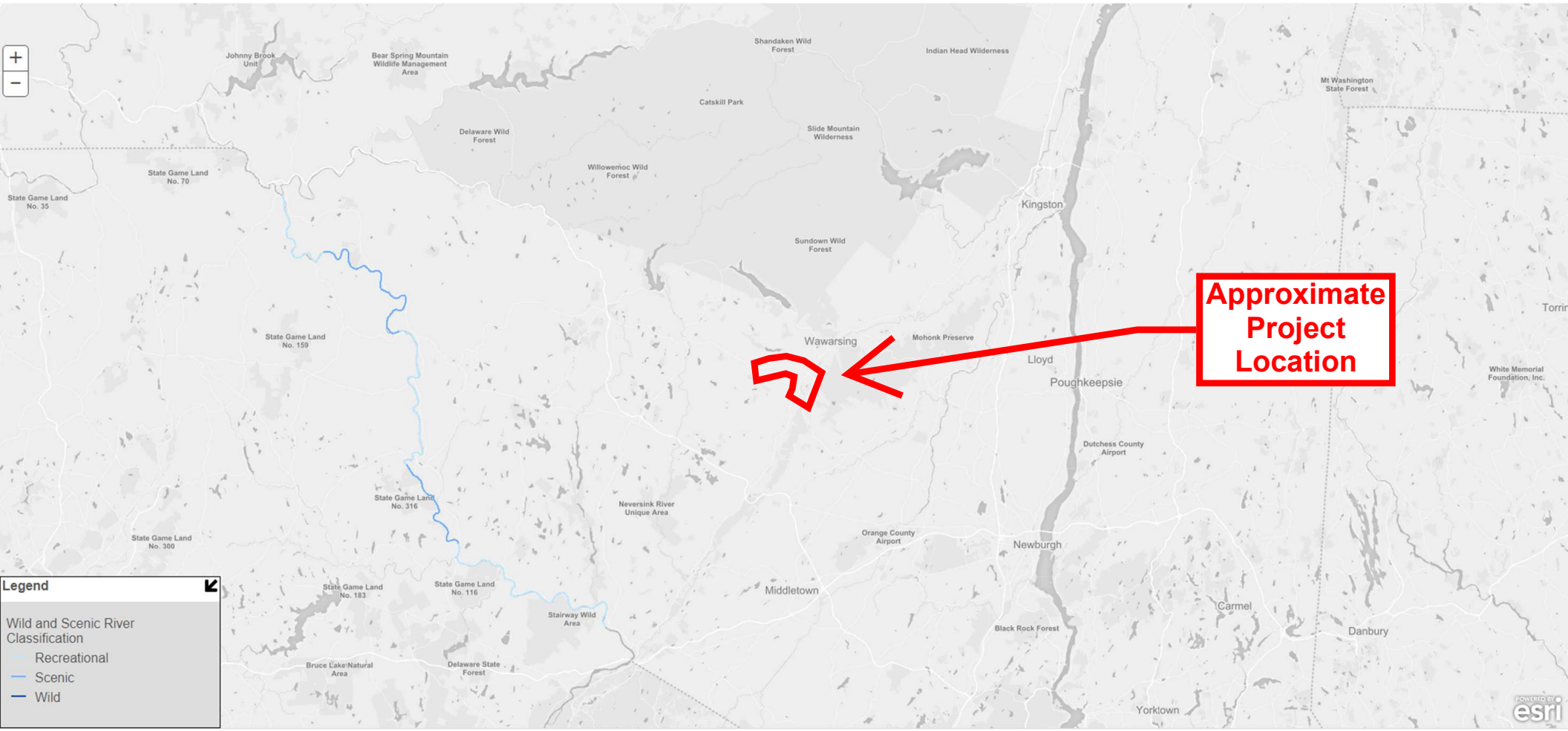
Ellenville Stream Bank Restoration Project Wild and Scenic Rivers



Appendix B

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, New York 13045

April 17, 2019

Ms. Alicia Shultz
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery
NYS Homes & Community Renewal
38-40 State Street, 408N, Hampton Plaza
Albany, NY 12207

Dear Ms. Shirley:

This responds to your April 16, 2019, letter regarding the proposed Ellenville Stream Bank Restoration Project located in the Village of Ellenville and Town of Wawarsing, Ulster County, New York. We understand that U.S. Department of Housing and Urban Development's (HUD) funding may be involved with the proposed project.

As you are aware, federal agencies have responsibilities under Section 7 of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to consult with the U.S. Fish and Wildlife Service (Service) regarding projects that may affect federally listed species or designated critical habitat, and confer with the Service regarding projects that are likely to jeopardize federally proposed species and/or adversely modify proposed critical habitat. We understand that NYS Homes & Community Renewal (NYSHCR) has been designated HUD's non-federal representative for the purposes of completing informal consultation pursuant to Section 7(a)(2) of the ESA.

On behalf of HUD, the NYSHCR determined the proposed project may affect, but is not likely to adversely affect, the federally listed endangered Indiana bat (*Myotis sodalis*) or federally listed threatened northern long-eared bat (*Myotis septentrionalis*). Given the project location, amount of tree removal, and conservation measure to conduct emergence surveys prior to their removal to ensure no bats are present, we concur with your determination. The NYSHCR also determined the project will result in no impacts to the federally listed threatened bog turtle (*Clemmys [=Glyptemys] muhlenbergii*) as there is no suitable habitat in the area. We have no further comments on this species.

No further coordination or consultation under the ESA is required with the Service at this time. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered. The most recent compilation of federally listed and proposed endangered and threatened species in New York is available for your information. Until the proposed project is complete, we recommend that you check our

website regularly to ensure that listed species presence/absence information for the proposed project is current.*

Any additional information regarding the proposed project and its potential to impact listed species should be coordinated with both this office and with the New York State Department of Environmental Conservation.

Thank you for coordinating with us. We appreciate the opportunity to review this project. Please contact Robyn Niver at 607-753-9334 if there are any questions. Future correspondence with us on this project should reference project file 17I2230.

Sincerely,

Anne D. Secord

for David A. Stilwell
Field Supervisor

*Additional information referred to above may be found on our website at: http://www.fws.gov/northeast/nyfo/es/section7.htm.

cc: NYSDEC, New Paltz, NY (Env. Permits)

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

April 16, 2019

Robyn A. Niver
Endangered Species Biologist
United States Fish and Wildlife Service
New York Field Office (Region 5)
3817 Luker Road
Cortland, New York 13045

Re: ESA/MBTA/BGEPA Consultation for the Ellenville Stream Bank Restoration Project, Ulster County, New York

Dear Ms. Niver:

The Governor's Office of Storm Recovery (GOSR), acting under the auspices of New York State Homes and Community Renewal's (HCR) Housing Trust Fund Corporation (HTFC), on behalf of the Department of Housing and Urban Development (HUD) is preparing an Environmental Assessment (EA) for the Ellenville Stream Bank Restoration Project (the "Proposed Action"). Funding is being provided by the HUD Community Development Block Grant Disaster Recovery (CDBG-DR) program.

The purpose of this letter is to provide the United States Fish and Wildlife Service (USFWS) – New York Ecological Services Field Office notice of the proposed project and to document compliance with Section 7 of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), Migratory Bird Treaty Act of 1918 (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703-712) and the Bald and Golden Eagle Protection Act of 1940 (BGEPA) (54 Stat. 240, as amended; 16 U.S.C. 668-668c). As discussed below, we have reviewed the project and found that it does not jeopardize the continued existence of ESA species or destroy or adversely modify their critical habitat.

The USFWS was consulted regarding the proposed project on July 19, 2017. On August 30, 2017, the USFWS responded that, "no further coordination or consultation under the ESA is required with the Service at this time. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered". Since that time, four locations have been removed from the original Proposed Action. Therefore, GOSR is resubmitting this consultation for consideration.

Project Description

The project involves stream bank restoration for damaged streams and stream corridors. Measures include the construction of floodplain benches (with rock and/or wood revetment) to reduce cutting at the toe of bank, lowering the height, angle and overall erosion hazard of eroding streambanks; installation of instream rock structures to provide grade control and reduce the erosive force of water upon streambanks by directing flood flows to the center of the stream channel; and reconnection of floodplains in select areas to reduce channel

confinement and the corresponding increases in flood velocity that contribute to flood severity. The stream bank restoration measures may be implemented in phases.

A total of eight sites in the project area are proposed for improvements and summarized in the table below and shown in the attached figures (**Attachments 1 and 2**).

Site Number	Site Name	Improvements
1	West Branch Beer Kill at Old Greenfield Road	Enhance bank protection along left bank toe
2	West Branch Beer Kill at Barbara Road Bridge	Replacement of gabion basket revetments, construction of cross vanes downstream of bridge
3	West Branch Beer Kill at Old Greenfield Road	Installation of rock cross vanes at upper and lower limits of project reach and transition project reach with adjacent and upstream and downstream reaches
4	West Branch Beer Kill at Old Greenfield Road	Installation of multiple cross vane structures
5	West Branch Beer Kill at Old Greenfield Road	Installation of rock cross vanes at upper and lower limits of the project reach and transition project reach with adjacent and upstream and downstream reaches
8	Sandburg Creek at Roslyn Street Pump Station	Placement of a rock cross vane downstream of the sewer crossing and further downstream
10	Sandburg Creek at Hang Glider Road	Installation of floodplain benches, rock cross vanes, and rock and rood wad/toe wood revetment along portions of the stream bank to prevent lateral bank erosion. Placement of a floodplain culvert through the western roadway bridge approach.
13	Sandburg Creek at Fallsview Pump Houses	Reconstruction and vegetation of floodplains along left and right banks, installation of rock cross vanes

Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing, including the East and West Branches of the Beer Kill, Sandburg Creek, and Rondout Creek.

This project is expected to provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town. Amongst other benefits, the Project will:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, schools emergency services, and the Ellenville Regional Hospital;
- Provide long-term protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and

- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

Compliance

Endangered Species Act

According to the United States Fish and Wildlife Service (USFWS) Information, Planning and Conservation (IPaC) online planning tool and Trust Resource List generated for the proposed project (**Attachment 3**) the Indiana Bat (*Myotis sodalist*) is listed as an endangered species and the Northern Long-eared Bat (NLEB) (*Myotis septentrionalis*) and the Bog Turtle (*Clemmys muhlenbergii*) are listed as a threatened species that can be found within the vicinity of the project area. The official species list for the proposed project indicated that there are no critical habitats in the project area.

The NYS Department of Environmental Conservation conducted a Natural Heritage database search. The search identified the Timber Rattlesnake (*Crotalus horridus*), a New York state listed threatened species, as being located at several locations within one mile of project sites in the Village of Ellenville. Individuals may travel 1.5 miles from documented locations (**Attachment 4**).

A description of each federally endangered and threatened species identified by USFWS, and the likelihood that the species occurs within the project areas, is provided below. Species' descriptions are summarized from New York State Department of Environmental Conservation (NYSDEC) fact sheets and USFWS species profiles unless otherwise referenced.

Bat Habitat/Tree Survey

Due to the potential presence of bat habitat at the project location based on IPaC results and the project scope including the removal of trees, a NYS Department of Environmental Conservation (DEC) Wildlife Biologist conducted a Phase 1 Habitat Assessment on April 2, 2019 and completed an Indiana Bat Habitat Assessment Datasheet (**Attachment 6**).

The assessment states that the majority of the project areas are in urban environments, and most tree clearing will occur between the road and a fast-moving stream. Most trees are small-medium in size, and the majority are live without roosting opportunities. However, there are 9 suitable snags (2 in site 8, 1 in site 1, 5 in site 3, and 1 in site 5). Based on this observation, the biologist recommended that emergence counts be conducted at these snags prior to removal of trees. GOSR will conduct an emergence count the night prior to tree removal.

Bat Species

The New York State Department of Environmental Conservation (NYSDEC) Division of Fish and Wildlife has reviewed available databases and has determined that the project area does not occur in the immediate vicinity of known occurrences of rare or state-listed bat species (**Attachment 5**). The major concern for bat species in relation to this project would be the destruction of potential roosts and roosting habitat that may occur if tree clearing is required. There are currently no known maternity roost trees or hibernacula known to be occupied by NLEB within the vicinity of the project locations.

Trees will be removed during the project activities. The locations of the trees are shown in the attached figures and include:

- Site 1: Tree removals will be required on the braided channel island. Approximately 50-75 trees of sapling size < 3" caliper will be removed with many located on the "island" and very few (2-3 if any) along the banks.
- Site 2: One to two small live trees will be removed along the bank between Old Greenfield Road and the creek.
- Site 3: Two trees may need to be removed along the bank between Old Greenfield Road and the creek.
- Site 4: Three tree may need to be removed along the bank between Old Greenfield Road and the creek.
- Site 5: Four trees may need to be removed along the bank between Old Greenfield Road and the creek.
- Site 8: Two to 12 trees may need to be removed along the tops of bank and within the proposed floodplain bench.
- Site 10: Four to 15 trees may need to be removed along the adjusted meander.
- Site 13: Three to 8 trees may need to be removed along the constructed floodplains including some dead tree removals from stream.

Any necessary tree removal would be required in order to restore a more sustainable stream flow path and reduce stress on the outer banks.

Indiana Bat (*Myotis sodalis*)
The Indiana Bat (IB), listed as federally endangered, is a temperate, insectivorous bat. IB hibernate in caves or mines during winter and emerge during the spring, with males dispersing and remaining solitary or forming small bachelor groups until the end of the summer, and pregnant females forming maternity colonies. Summer habitat of the IB generally includes wooded areas, where they roost under loose tree bark on dead or dying trees. The IB consumes a variety of flying insects found along rivers and other inland water bodies, and the IB is sensitive to forested habitat fragmentation and urbanization of habitat that was previously used for roosting. There no known occupied hibernacula or maturity within 2.5 miles of the Project areas, based on a record request response from the New York Natural Heritage Program (NYNHP) (**Attachment 5**).

Since the proposed project would involve tree removal within the range of potential occurrence of Indiana bat habitat, GOSR determines that this project **may affect but is not likely to adversely affect Indiana bat**. GOSR also considered the following:

- At dusk the evening before tree removal, the potential snag trees will be observed for bat emergence, and if any bats emerge, additional consultation will be conducted.
- The trees to be removed from the project site are not located within 2.5 miles of known Indiana bat occurrence.
- The trees are located adjacent to a road with significant human noise and disturbance.
- There is preferable Indiana bat habitat - forested habitat excluded from human activity - adjacent to the project area (See Figures 1 and 2).
- The trees to be removed will be clearly marked and no other trees will be removed.
- Adult bats potentially occupying the trees to be removed are likely to leave the tree during tree removal due to noise and disturbance.

Northern Long-eared Bat (NLEB) (*Myotis septentrionalis*)
The NLEB is a temperate, insectivorous bat whose life cycle can be coarsely divided into two primary phases - reproduction and hibernation. NLEB hibernate in caves or mines during winter and then emerge in early spring, with males dispersing and remain solitary until mating season at the end of the summer, and pregnant females forming maternity colonies in which to rear young. No caves or mines occur near the project site. Summer habitat of the NLEB generally includes upland and riparian forest within heavily forested landscapes. Roost trees

are usually intact forest, close to the core and away from large clearings, roads, or other sharp edges. There no known occupied hibernacula or maturity within 5miles of the Project areas, based on a record request response from the New York Natural Heritage Program (NYNHP) (**Attachment 5**).

GOSR determines that this project may affect but not likely to adversely affect the NLEB in the Project area listed under Section 7 of the Endangered Species Act based on the following:

- At dusk the evening before tree removal, the potential roost trees will be observed for bat emergence, and if any bats emerge, additional consultation will be conducted.
- The trees to be removed from the project site are located greater than 5 miles from a known NLEB occurrence (see DEC jurisdictional determination letter, Attachment 5).
- There is preferable NLEB habitat – forested habitat excluded from human activity – adjacent to the project area (see Figures 1 and 2).
- Trees to be removed will be clearly marked and no other trees will be removed.
- Adult bats, if present, likely to leave the project activity in response to noise during construction and tree removal.
- Project activities will not impact NLEB habitat or survival of NLEB and will not result in future activities, such as noise or light, that may affect the NLEB, and
- The proposed project would not jeopardize the continued existence of ESA species or destroy or adversely modify their critical habitat.

Bog Turtle (Clemmys muhlenbergii)
There is no habitat for the Bog Turtle at the project site; therefore, the Project will have no effect on this species. Bog turtles usually occur in small, discrete populations, generally occupying open-canopy, unpolluted, herbaceous sedge meadows and fens bordered by wood areas. Fens are freshwater, bog-like wetland that are a mosaic of open and shrub habitats with grasses, sedges, and small spring-fed streams (source: https://www.fws.gov/northeast/ecologicalservices/turtle/pdf/Bogturtle.pdf).

Migratory Bird Treaty Act
According to the USFWS IPaC Trust Resource Report, there are several migratory birds of concern that could potentially be affected by the proposed project. GOSR determined that the project would have no significant adverse impact on migratory birds or their habitat. It is anticipated that passerine birds would temporarily leave the area during construction due to noise and disturbance. It has been determined that the project would have no significant adverse impact on migratory birds or their habitat.

Bald and Golden Eagle Protection Act
The IPaC review process identified the bald eagle as having year-round habitat in Ulster County that may be potentially affected by activities in the project area. No nests have been identified within 5 miles of the project location. It has been determined that the project would have no impact on the Bald Eagle.

Timber Rattlesnake
The Timber Rattlesnake (*Crotalus horridus)* is a NYS listed threatened species know to occur in the project area. Timber Rattlesnakes are generally found in deciduous forests in rugged terrain. In the summer, gravid (pregnant) females seem to prefer open, rocky ledges where temperatures are higher, while the males and non-gravid females seem to prefer cooler, thicker woods where the forest canopy is more closed. Rattlers generally migrate from 1.3 to 2.5 miles (2 to 4 km) from their den each summer, with a maximum movement of 4.5 miles (7.2 km) observed.

This rattler feeds primarily on small mammals, but occasionally takes small birds, amphibians and other snakes. Based on the habitat of the rattler, the project activities will have no effect on the species.

Conclusion

The proposed project would not jeopardize the continued existence of ESA species or destroy or adversely modify their critical habitat. Additionally, trees will not be removed if bats are observed to emerge from the snag trees. USFWS will be consulted if bats are observed to emerge. On this basis, GOSR determines that this project **may affect but is not likely to adversely affect** the Indiana bat and NLEB in the Project area listed under Section 7 of the Endangered Species Act. GOSR determined that the proposed project would have no significant adverse impact on migratory birds or bald eagles. We request your concurrence with this determination. Additionally, we request to be alerted if USFWS becomes aware of a Bald or Golden Eagle nest within 660 feet of the culvert locations (see Figure 1).

GOSR also determined the project will result in no impacts to the federally listed threatened bog turtle (*Clemmys Glyptemy's muhlenbergii*) or the NYS threatened Timber Rattlesnake (Crotalus horridus) as there is no suitable habitat in the area. We have no further comments on these species.

Based on the above response from the USFWS and the most recent compilation of federally listed and proposed endangered and threatened species we conclude that the Ellenville Stream Bank Restoration Project will have no effect on the Bog Turtle and Timber Rattlesnake and is not likely to adversely affect the Indiana Bat or Northern Long-eared Bat.

We request your concurrence with our determinations. If you have questions or require additional information regarding this request, please contact me at (518) 474-0647 or Alicia.Shultz@nyshcr.org. Thank you for your time and consideration.

Sincerely,

Alicia Shultz
Senior Environmental Scientist
Governor's Office of Storm Recovery
New York State Homes and Community Renewal
38-40 State Street
Albany, New York 12207

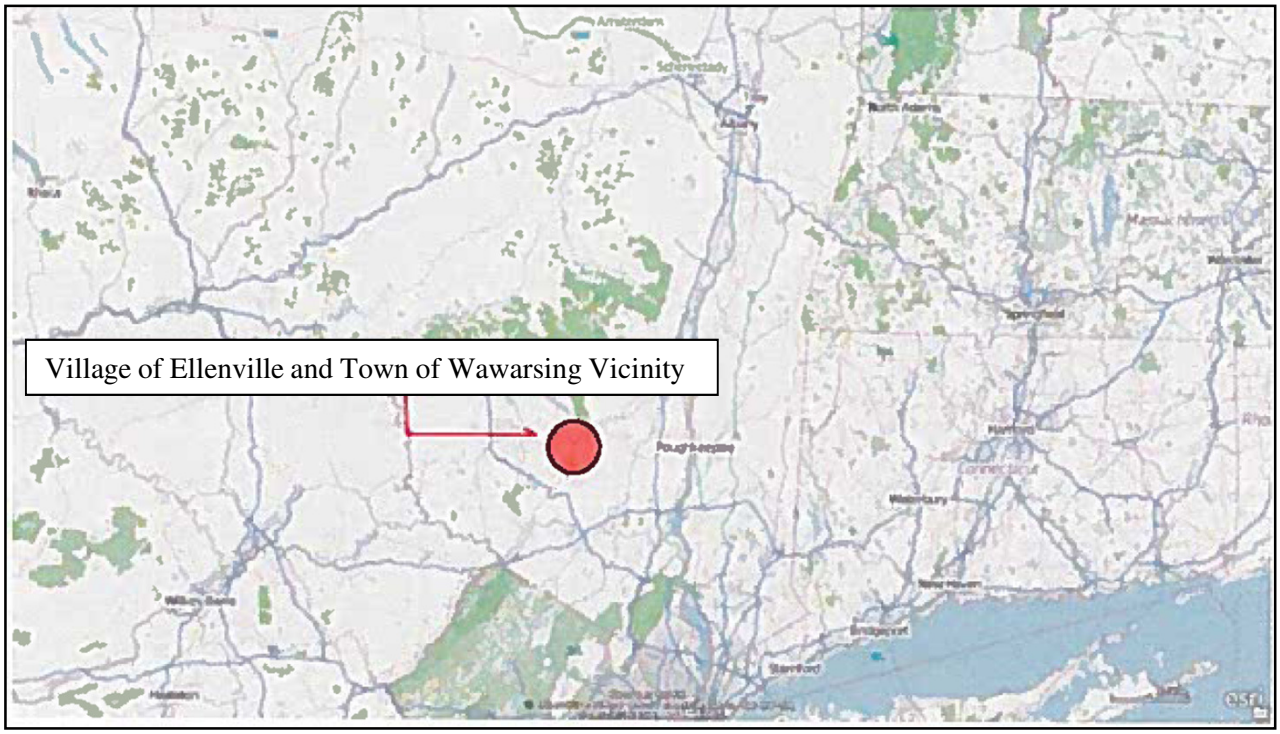
Enclosures:

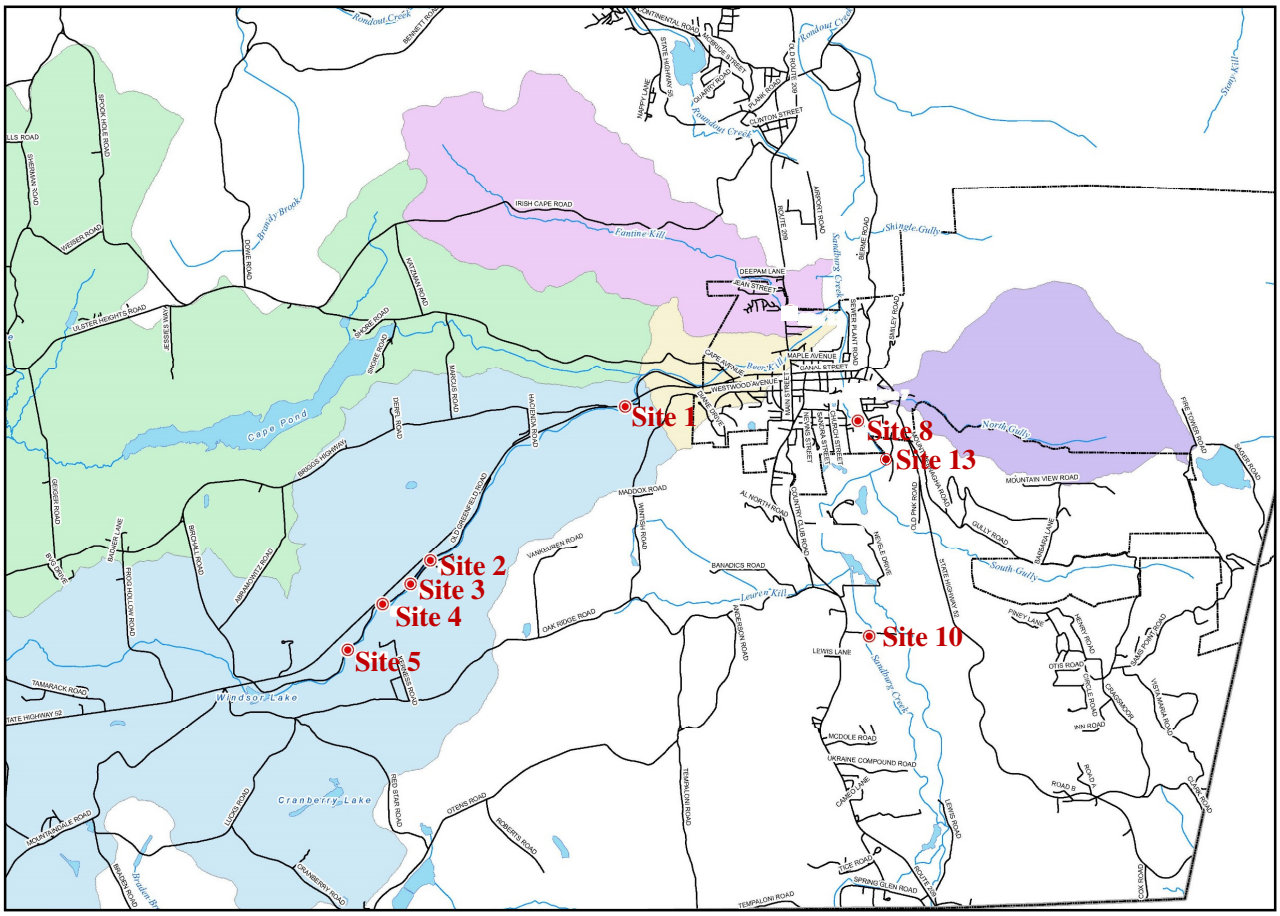
Attachment 1 – Project Location Map and Aerial Photographs
Attachment 2 – Project Proposed Condition Plans
Attachment 3 – IPaC Trust Resource Reports
Attachment 4 – NYSDEC NHP Response
Attachment 5 – NYSDEC Bat Review
Attachment 6 - Phase 1 Habitat Assessment

ATTACHMENT 1

SITE LOCATION MAP

Village of Ellenville and Town of Wawarsing – Stream Bank Restoration Project





SITE OVERVIEW AERIAL PHOTOGRAPH

Legend:

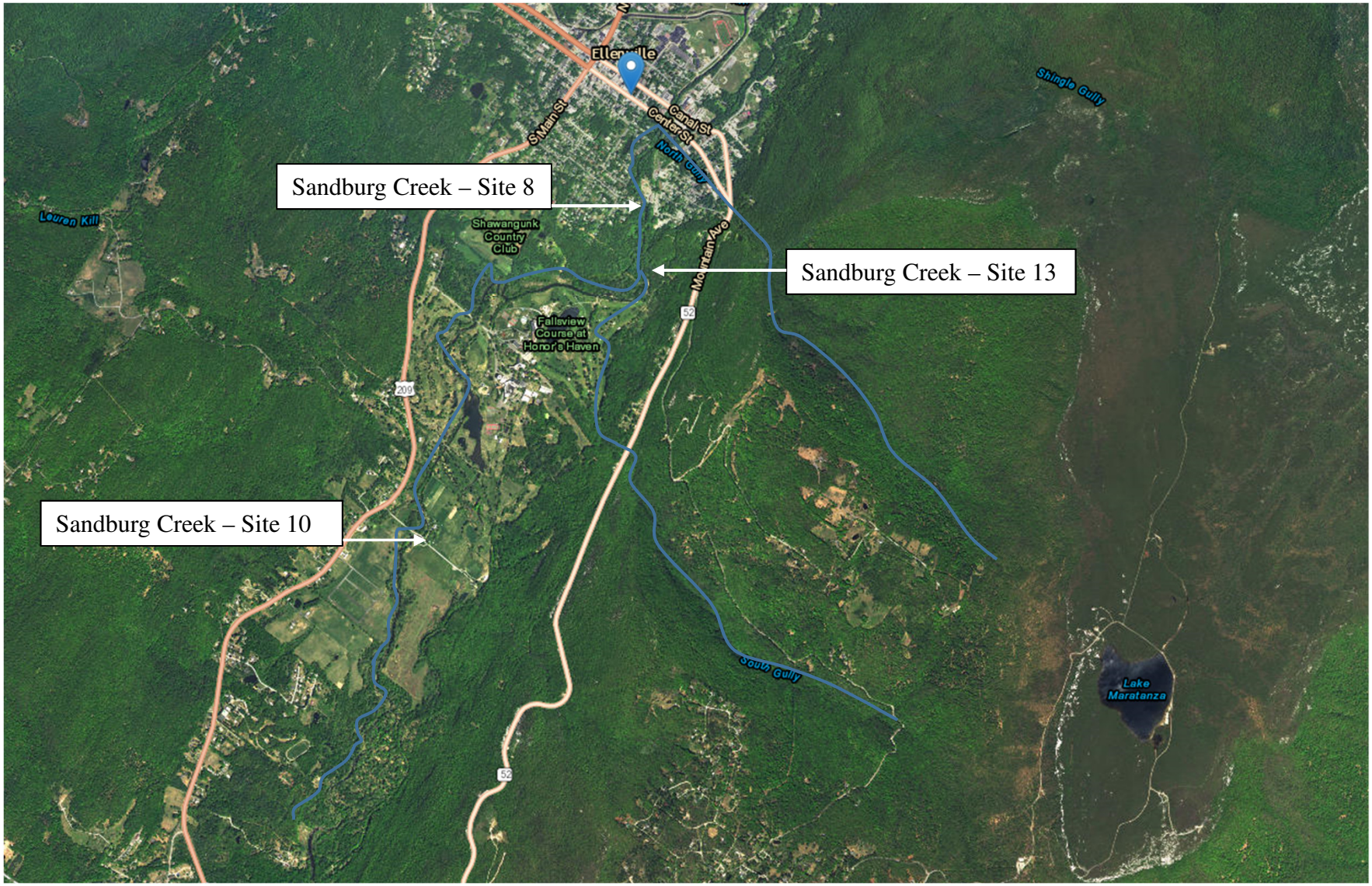
Aerial Imagery Source: Google Earth (dated April 2016)

Approximate Watercourse Location

N

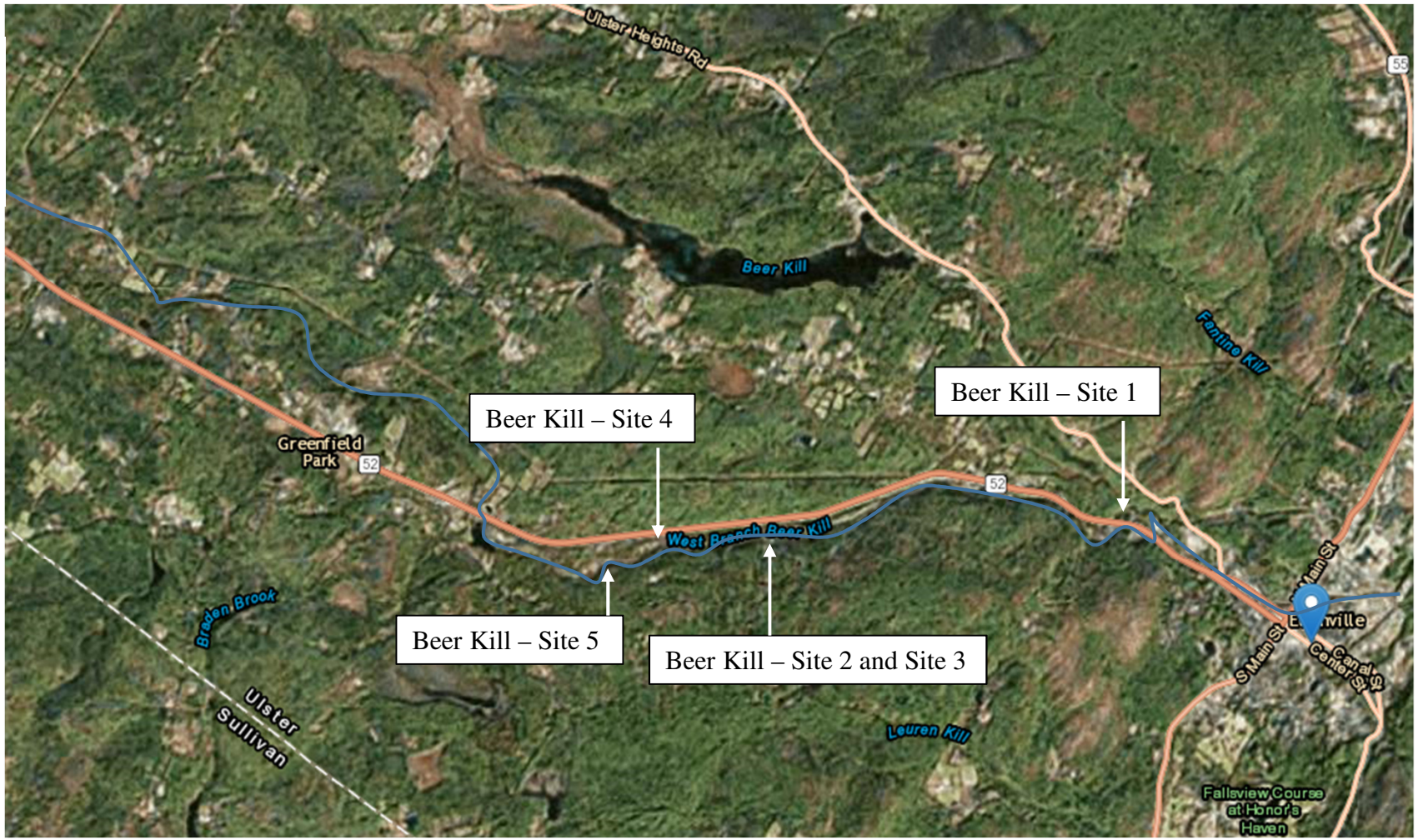
Village of Ellenville and Town of Wawarsing – Stream Bank Restoration Project

Village of Ellenville and Town of Wawarsing – Stream Bank Restoration Project
Site Aerial Photograph
Southern Portion of Project Area



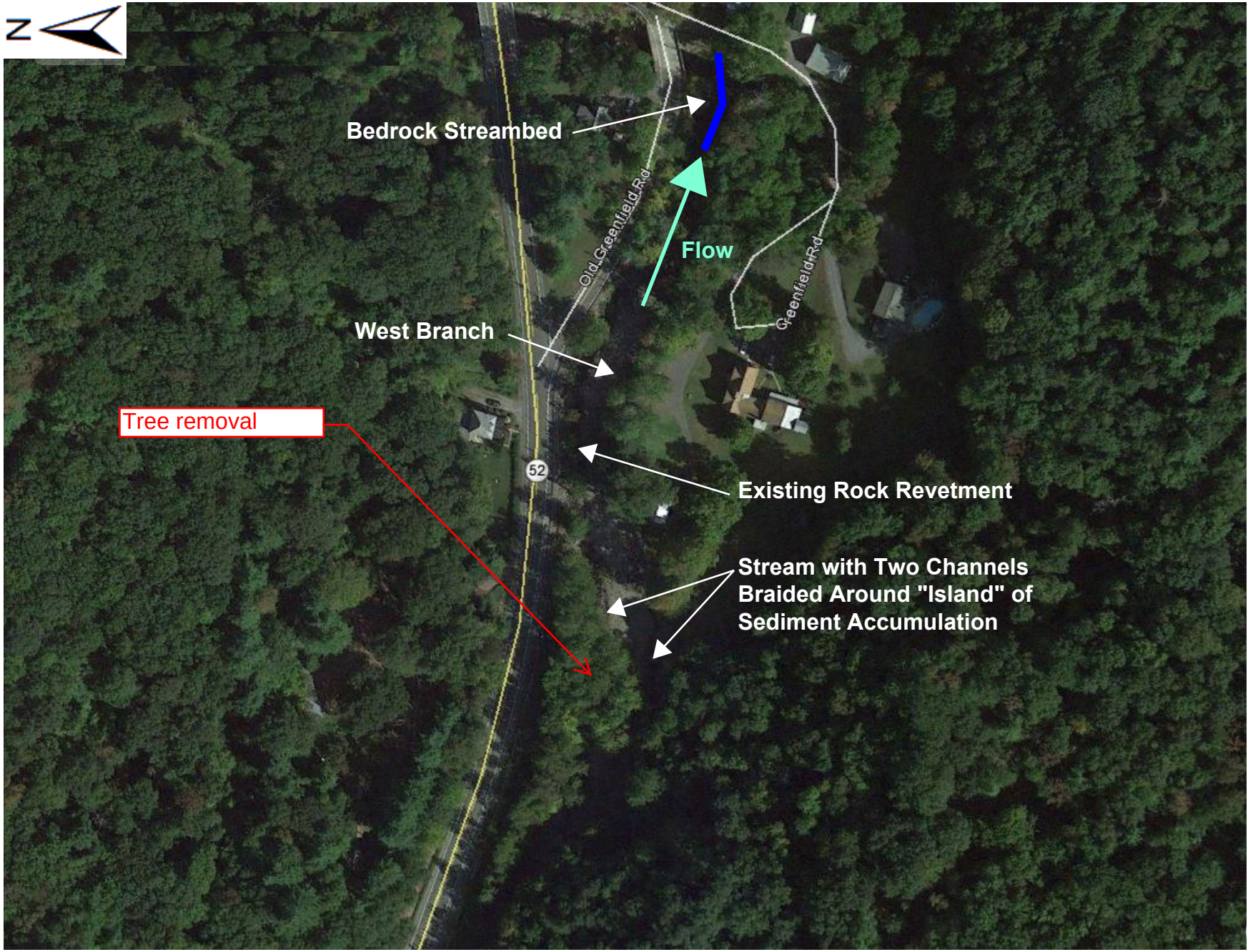
Legend:
Aerial Imagery Source: USFWS
Approximate Watercourse Location
Site locations are approximate

Village of Ellenville and Town of Wawarsing – Stream Bank Restoration Project
Site Aerial Photograph
Western Portion of Project Area

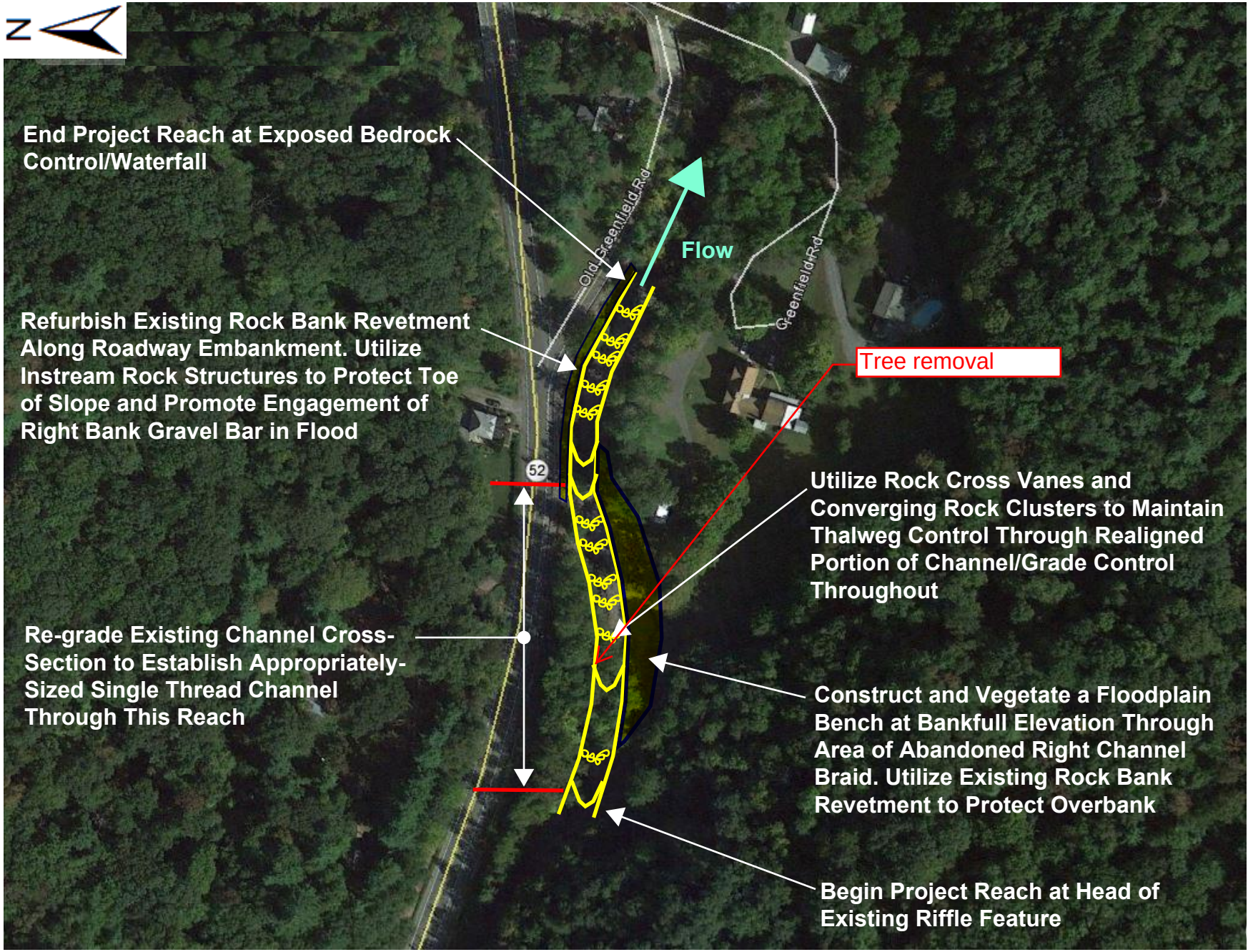


Legend:
Aerial Imagery Source: USFWS
Approximate Watercourse Location
Site locations are approximate

ATTACHMENT 2

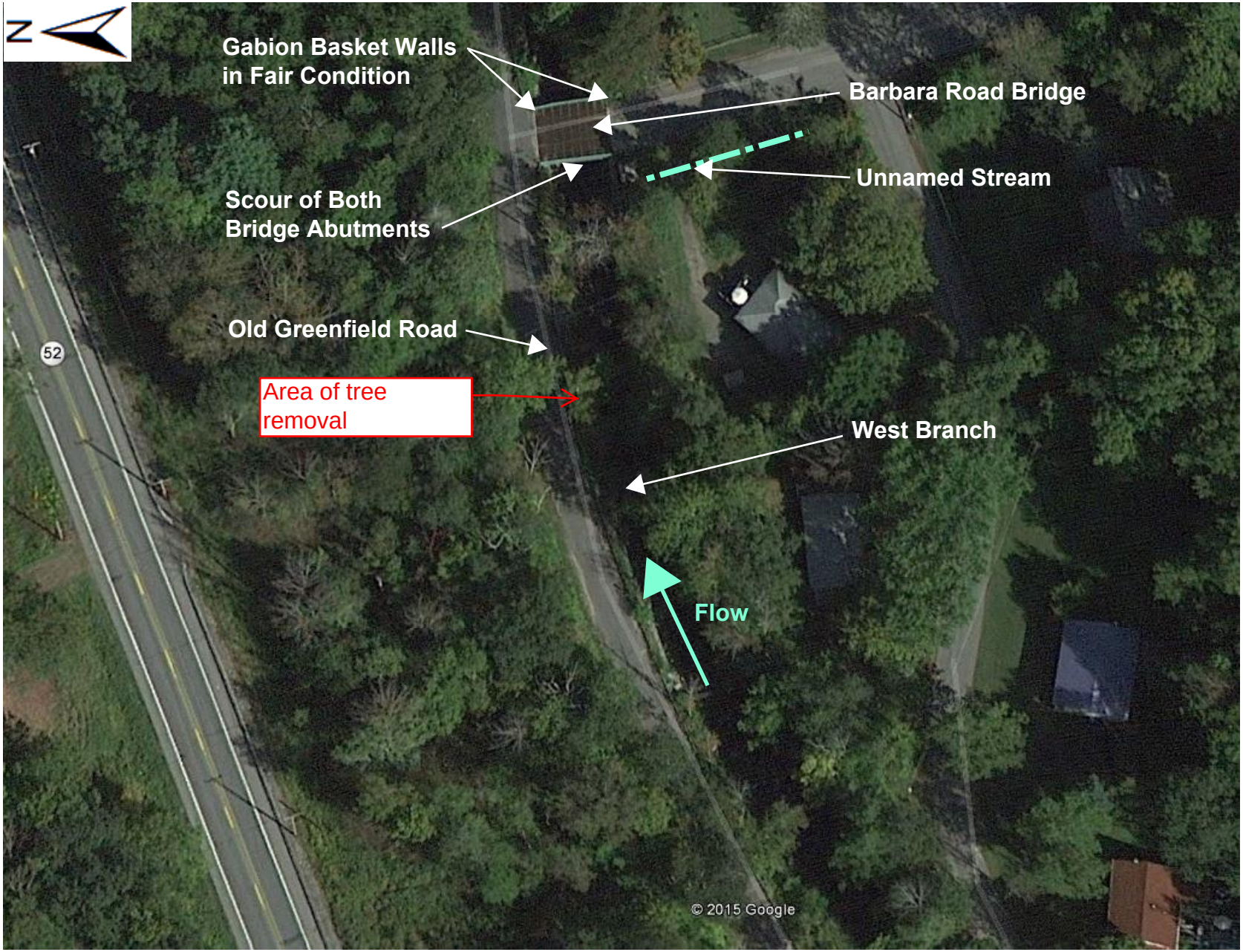


TOWN OF WAWARSING - WEST BRANCH
EXISTING CONDITIONS AT OLD GREENFIELD ROAD

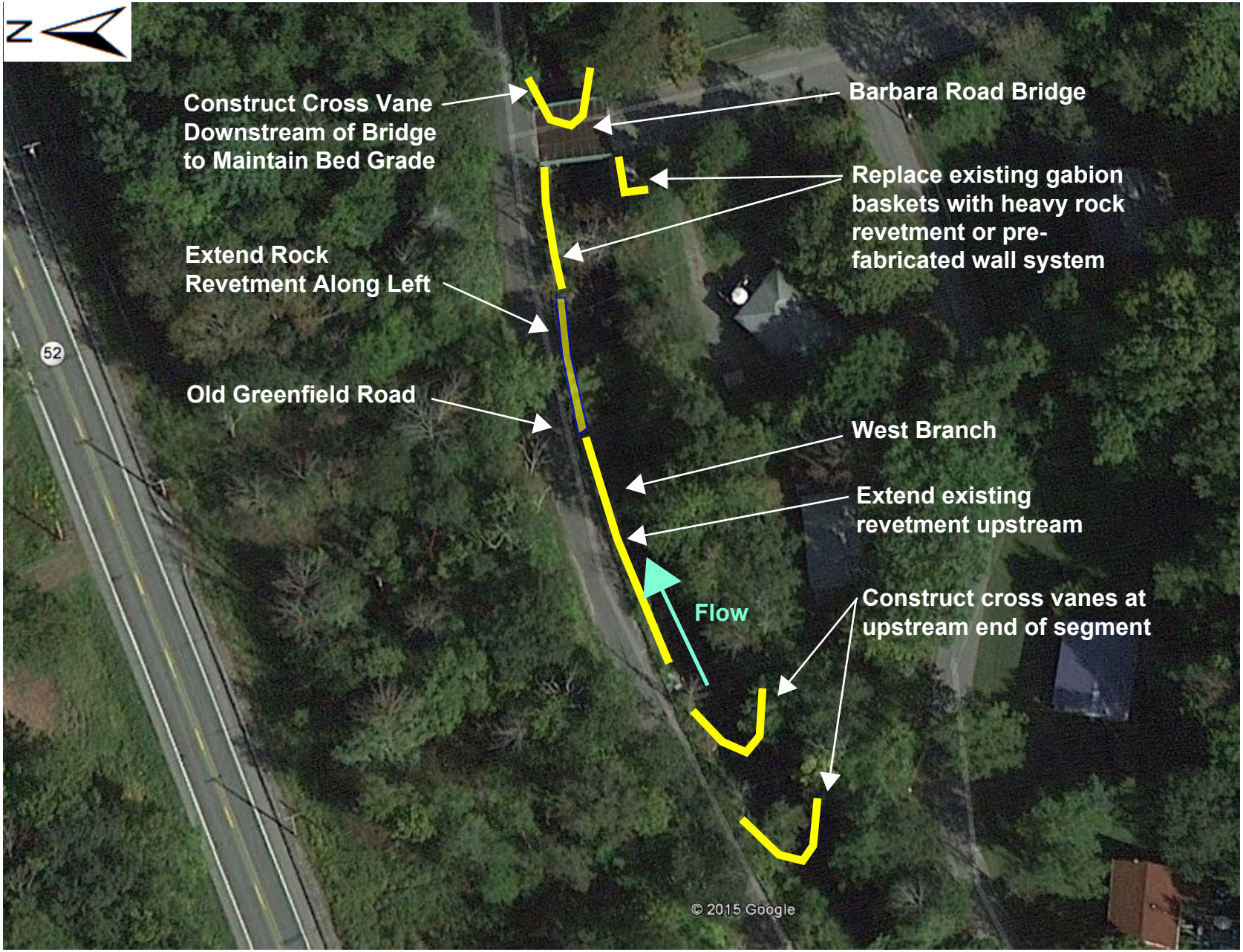


TOWN OF WAWARSING - WEST BRANCH
PROPOSED CONDITIONS AT OLD GREENFIELD ROAD

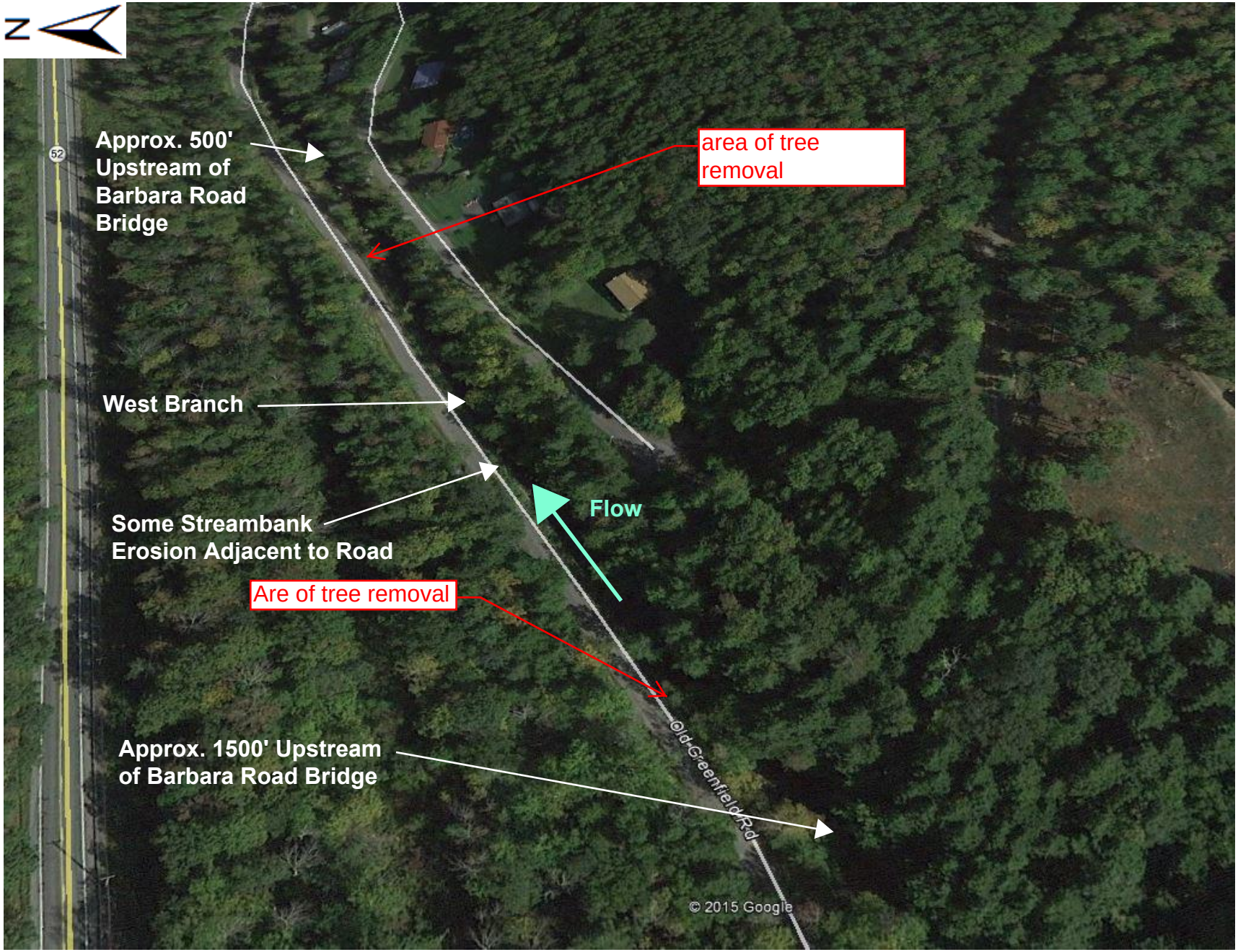
Site No. 2



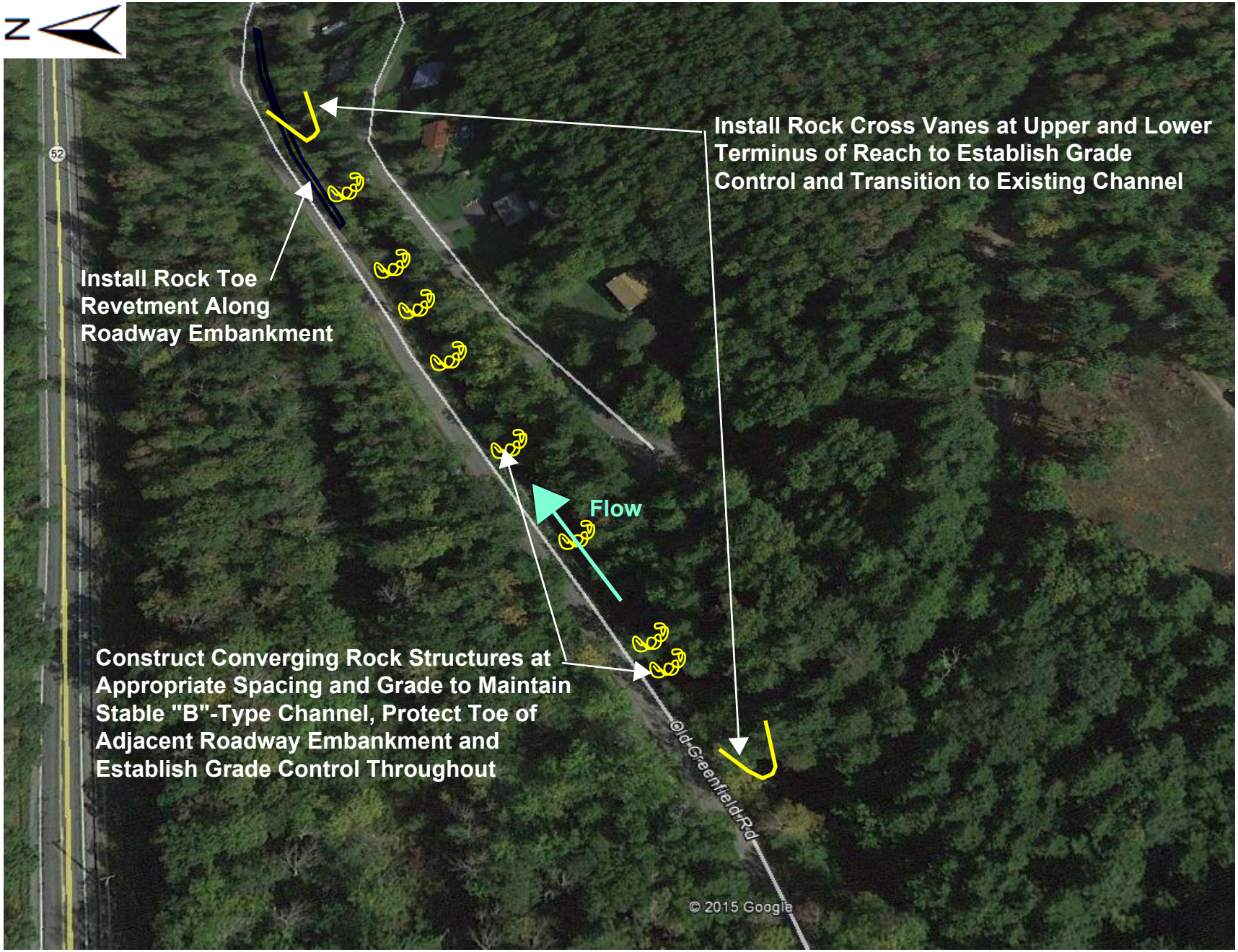
TOWN OF WAWARSING - WEST BRANCH
EXISTING CONDITIONS AT BARBARA ROAD BRIDGE



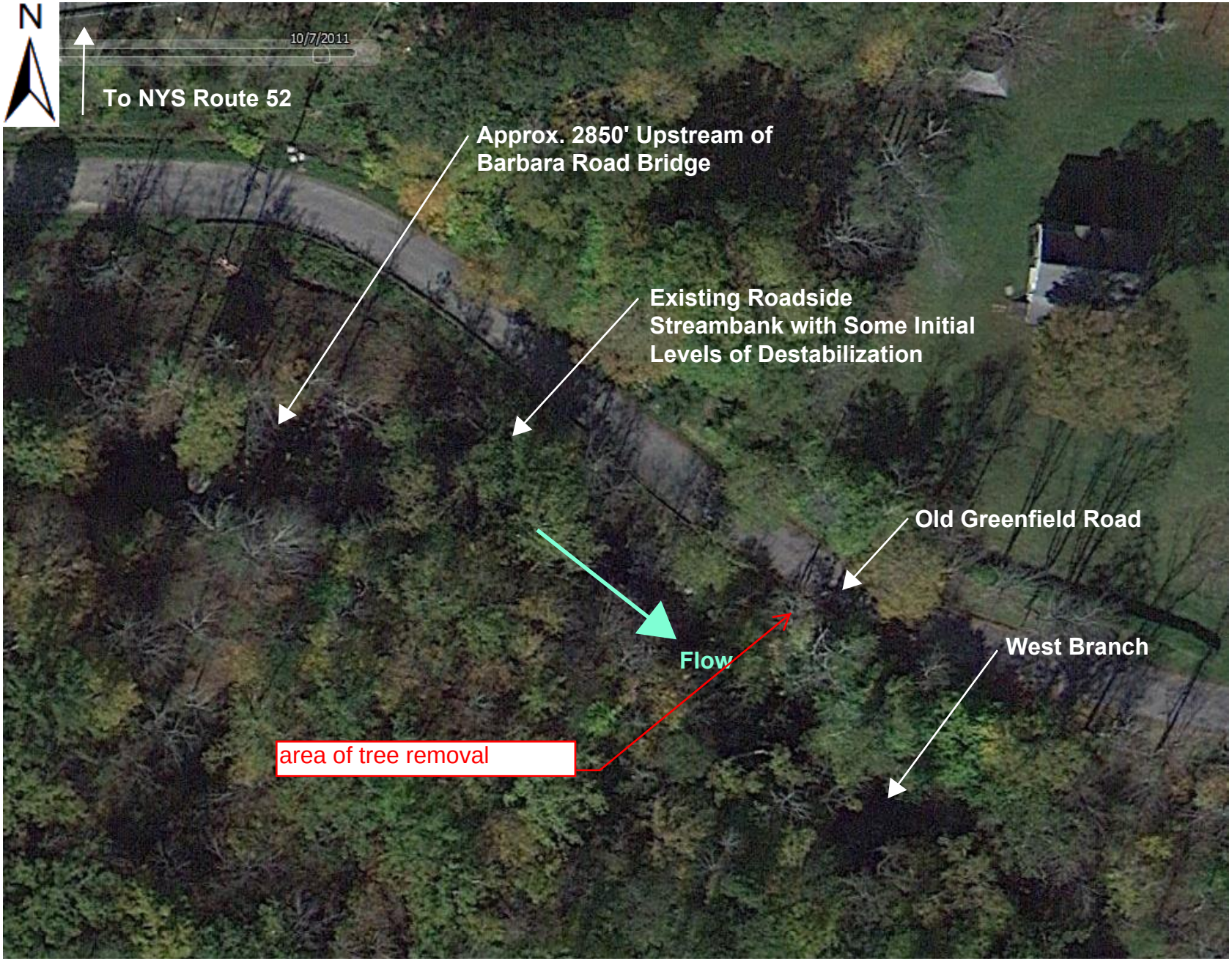
TOWN OF WAWARSING - WEST BRANCH
PROPOSED CONDITIONS AT BARBARA ROAD BRIDGE



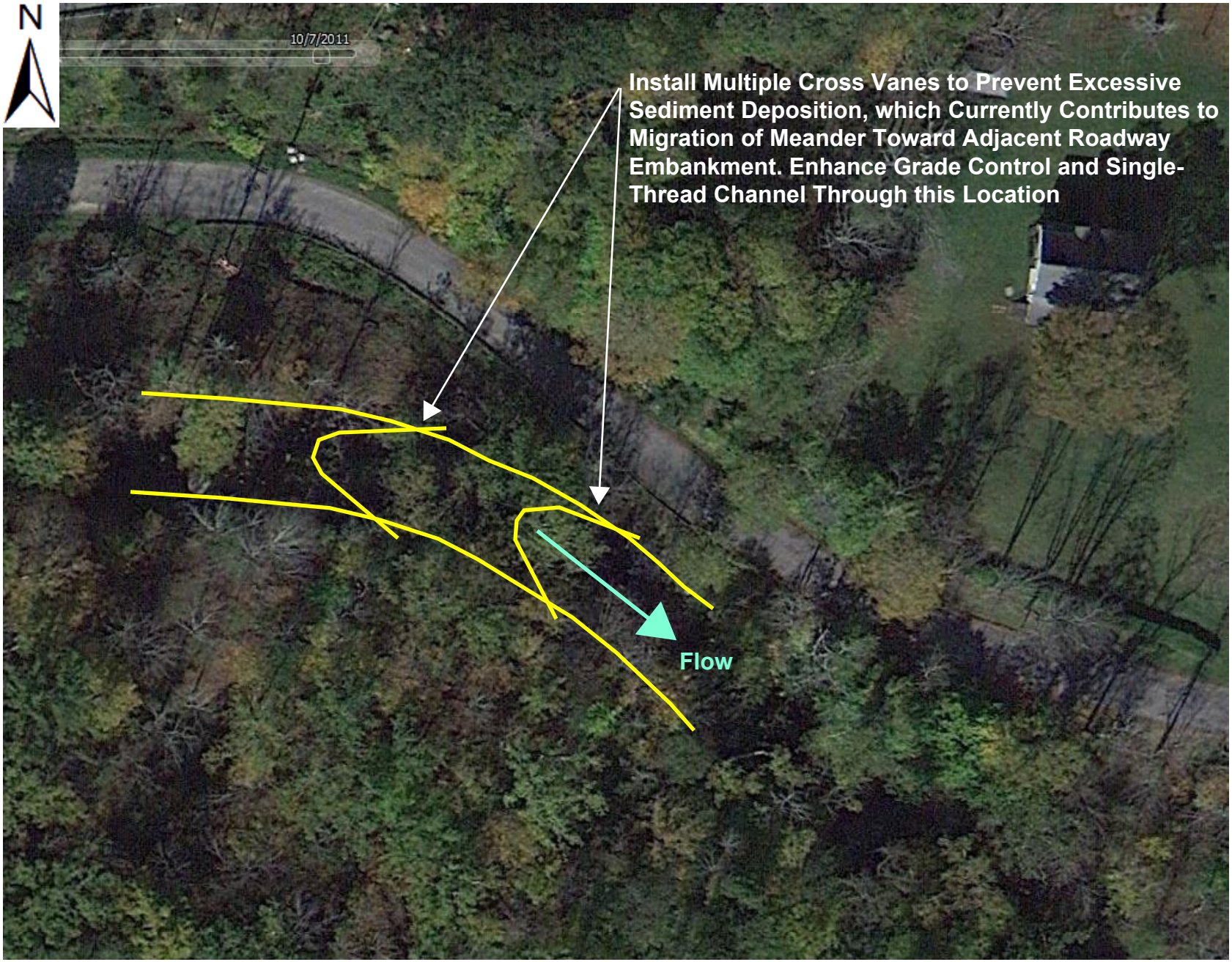
TOWN OF WAWARSING - WEST BRANCH
EXISTING CONDITIONS AT OLD GREENFIELD ROAD



TOWN OF WAWARSING - WEST BRANCH
PROPOSED CONDITIONS AT OLD GREENFIELD ROAD

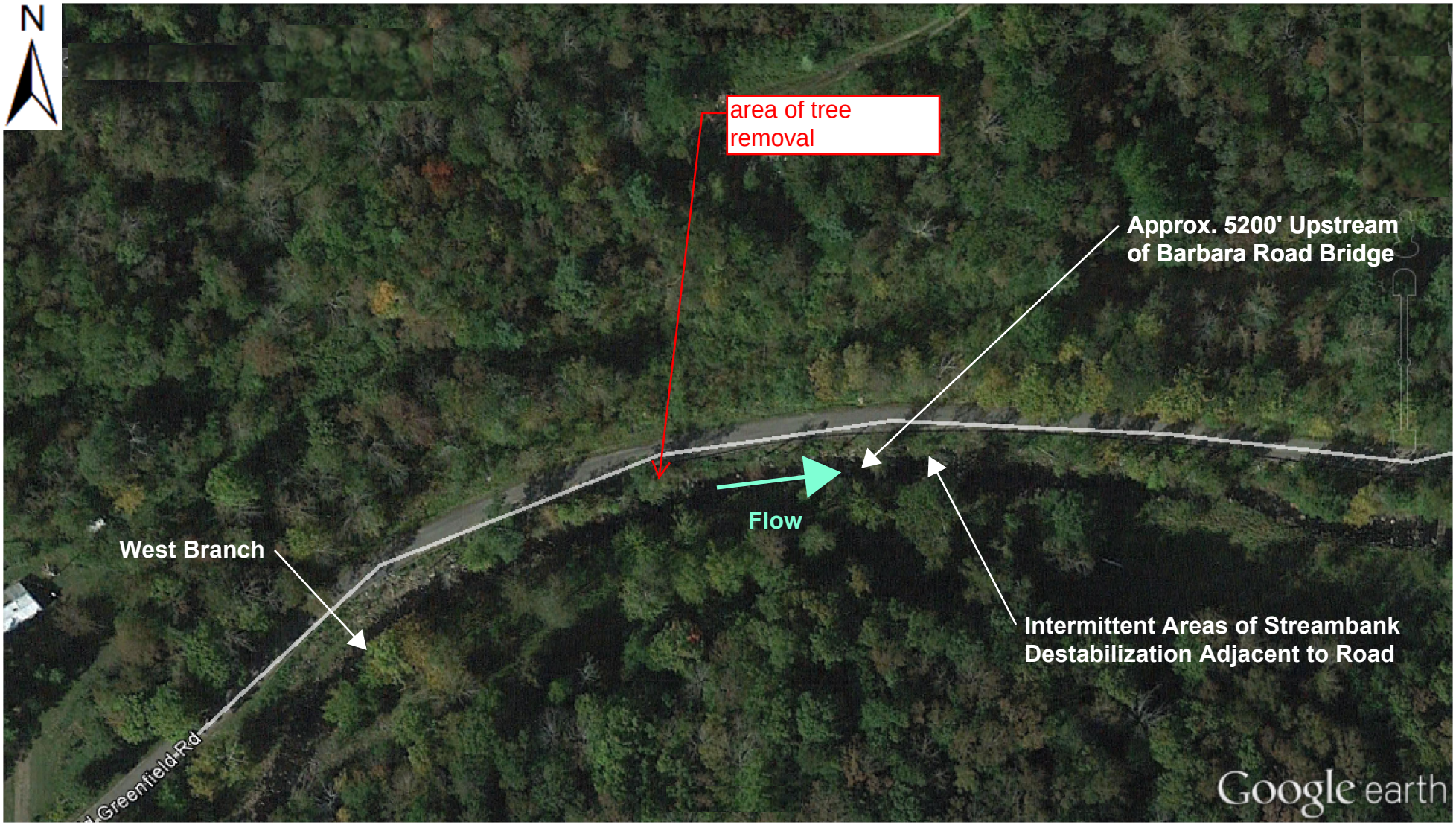


TOWN OF WAWARSING - WEST BRANCH
EXISTING CONDITIONS AT OLD GREENFIELD ROAD

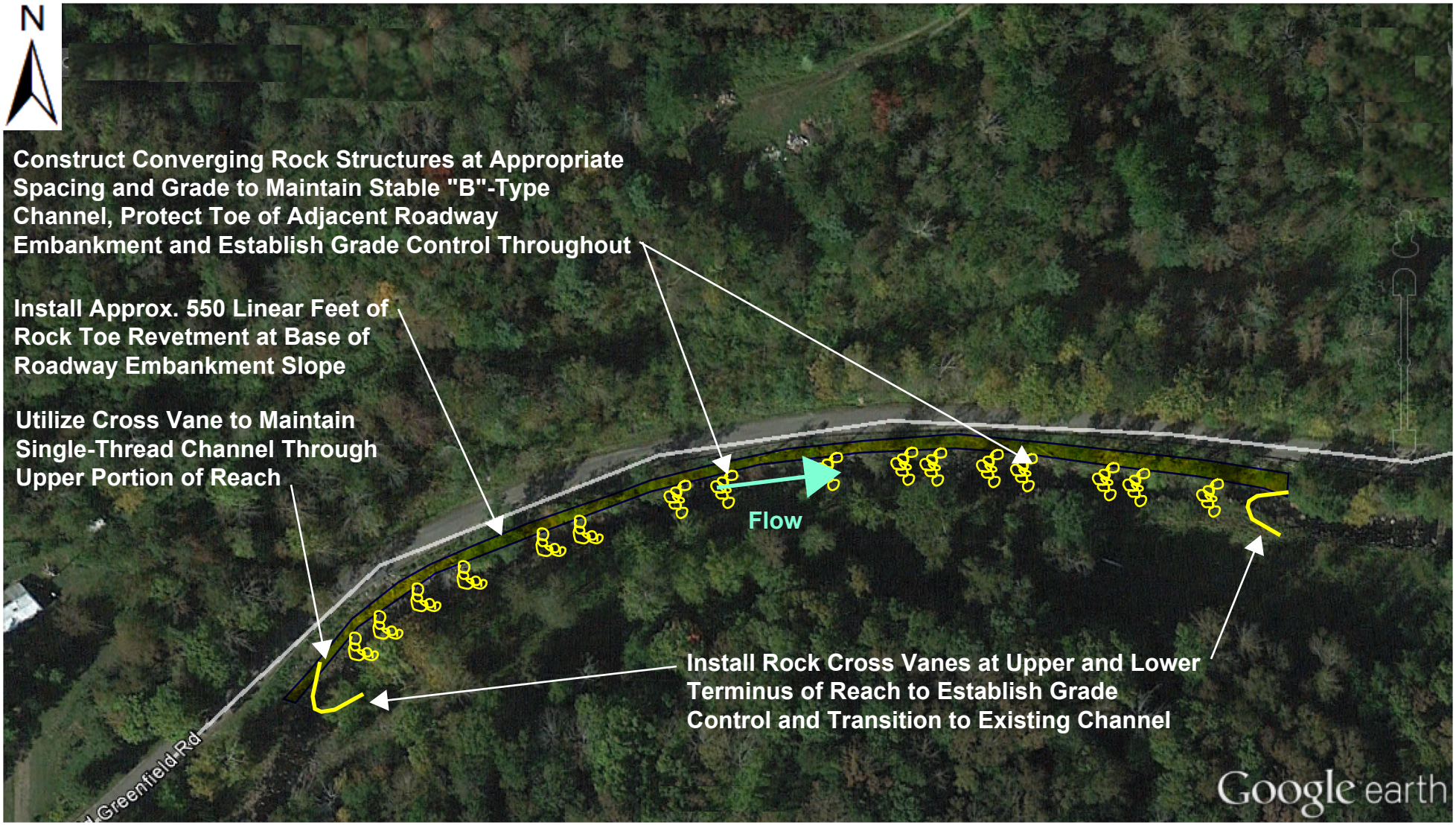


TOWN OF WAWARSING - WEST BRANCH
EXISTING CONDITIONS AT OLD GREENFIELD ROAD

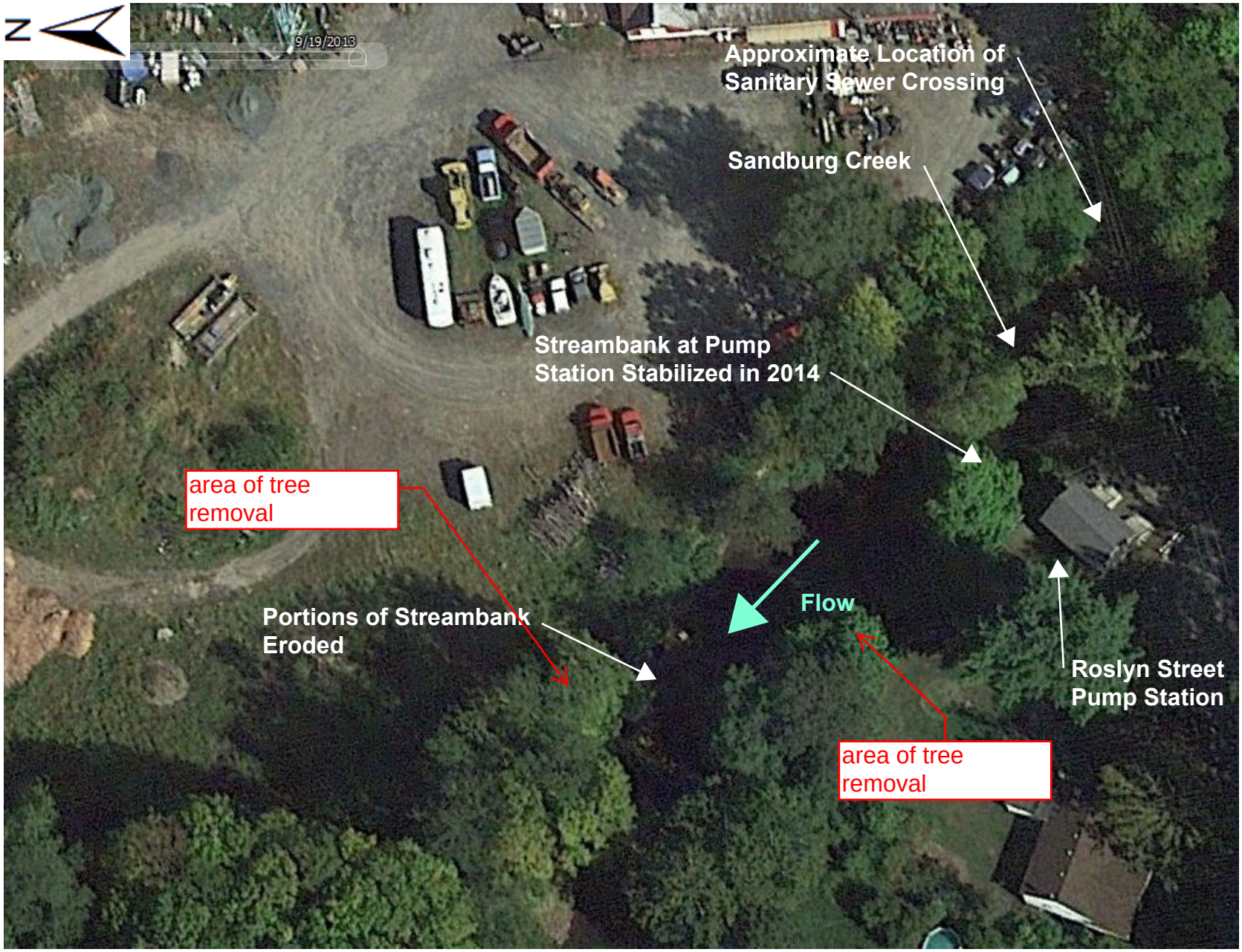
Site No. 5



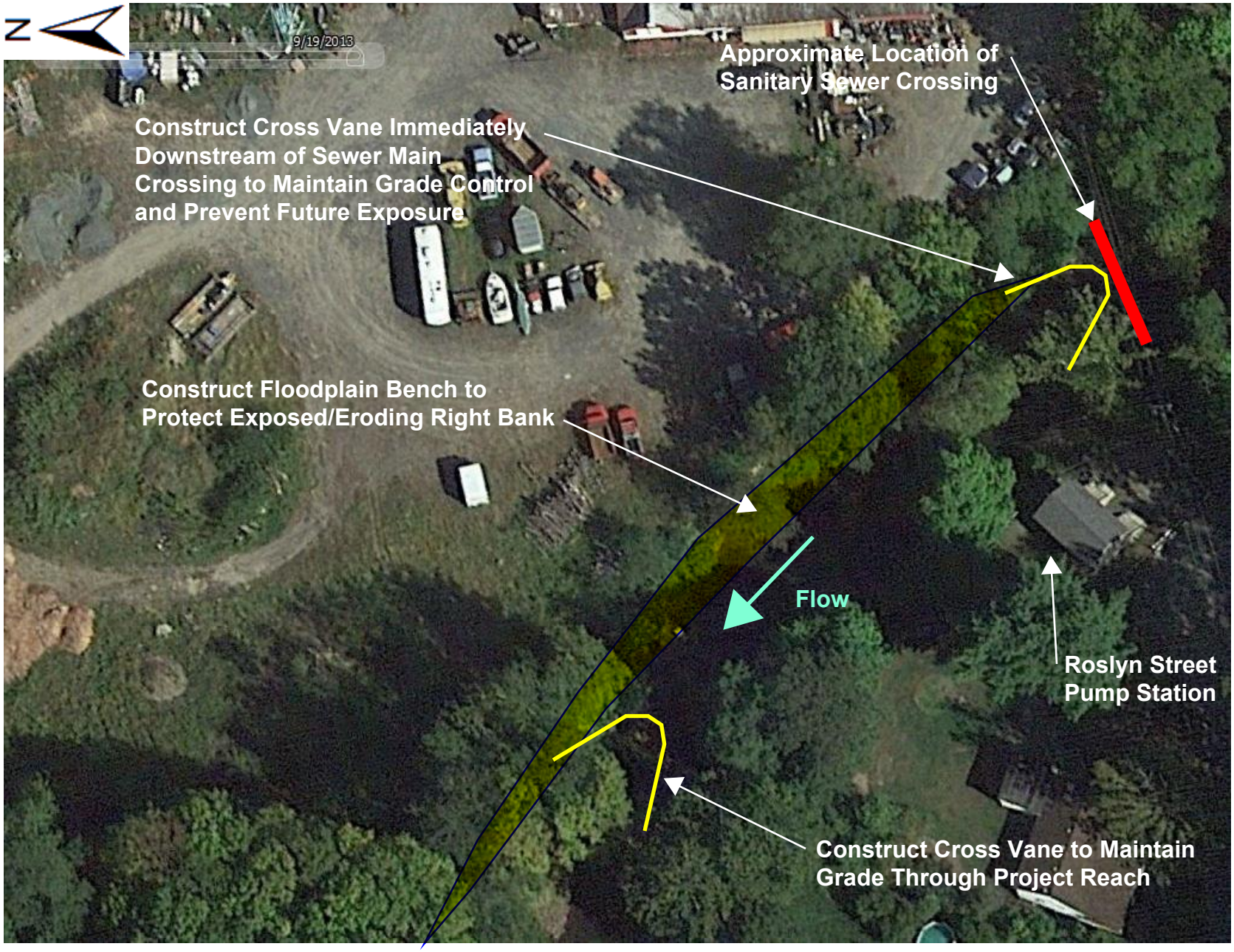
TOWN OF WAWARSING - WEST BRANCH
EXISTING CONDITIONS AT OLD GREENFIELD ROAD



TOWN OF WAWARSING - WEST BRANCH
PROPOSED CONDITIONS AT OLD GREENFIELD ROAD



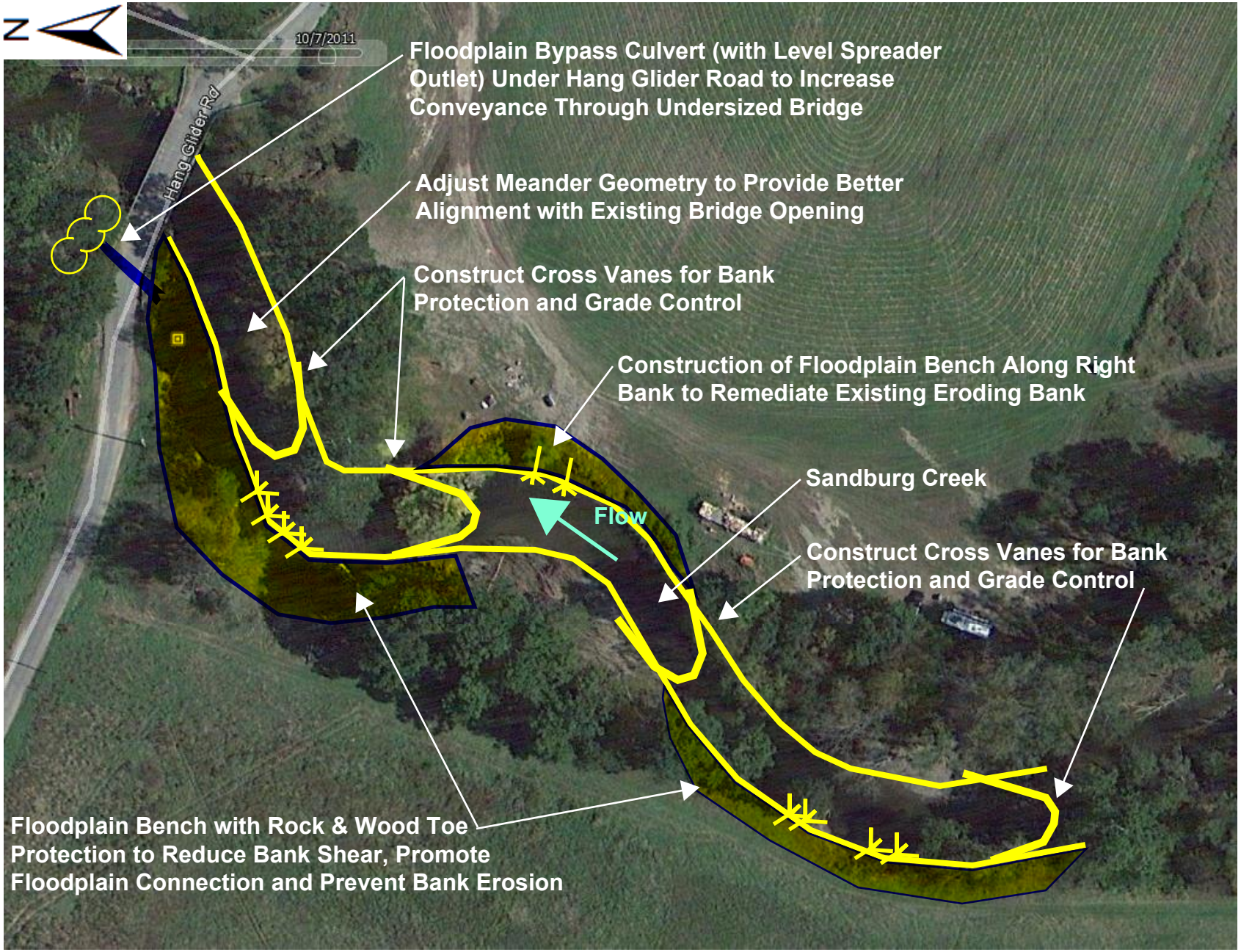
VILLAGE OF ELLENVILLE - SANDBURG CREEK
EXISTING CONDITIONS AT ROSLYN STREET PUMP STATION



VILLAGE OF ELLENVILLE - SANDBURG CREEK
PROPOSED CONDITIONS AT ROSLYN STREET PUMP STATION

Site No. 10

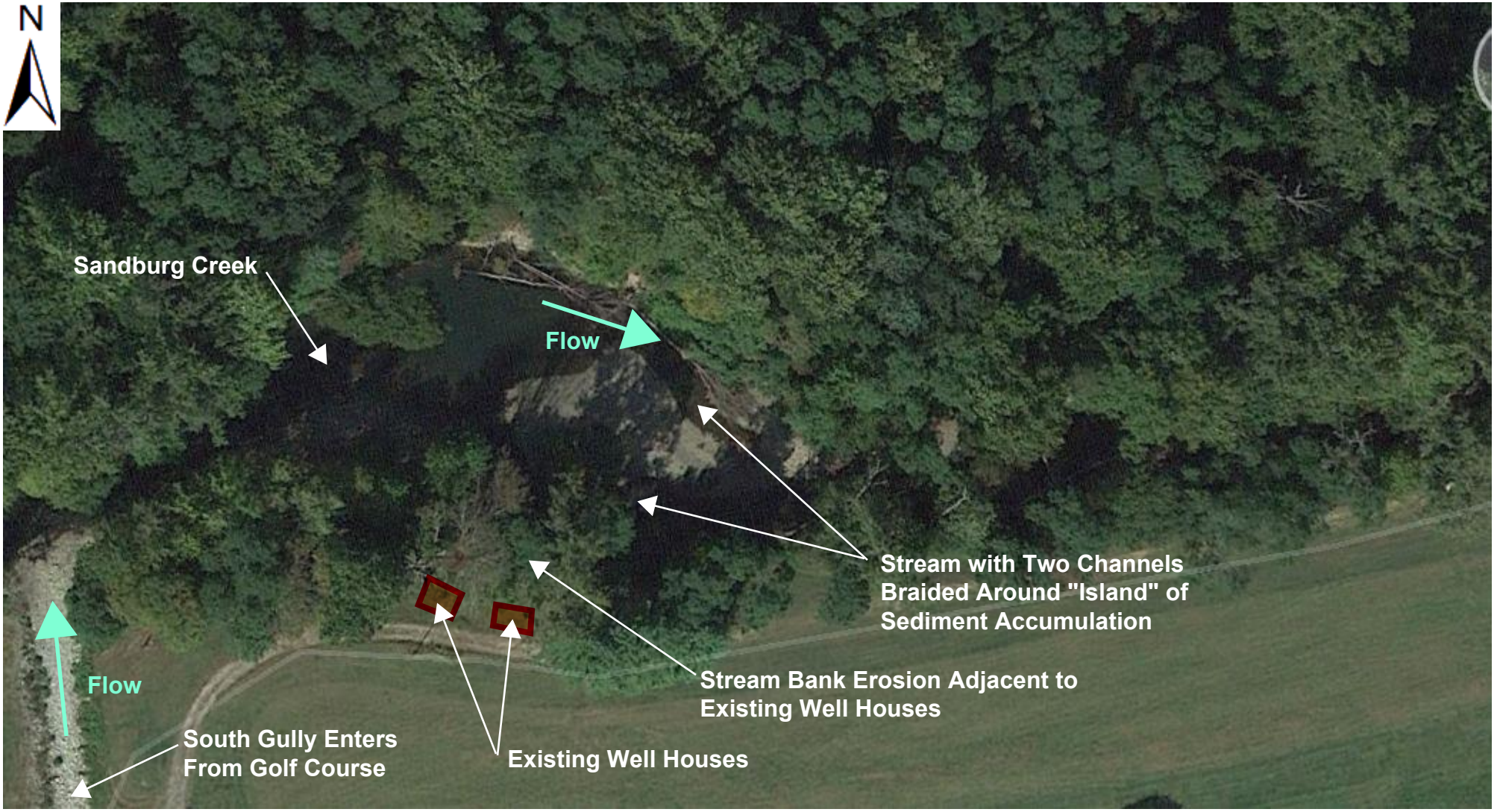
TOWN OF WAWARSING - SANDBURG CREEK
EXISTING CONDITIONS AT HANG GLIDER ROAD



TOWN OF WAWARSING - SANDBURG CREEK
PROPOSED CONDITIONS AT HANG GLIDER ROAD

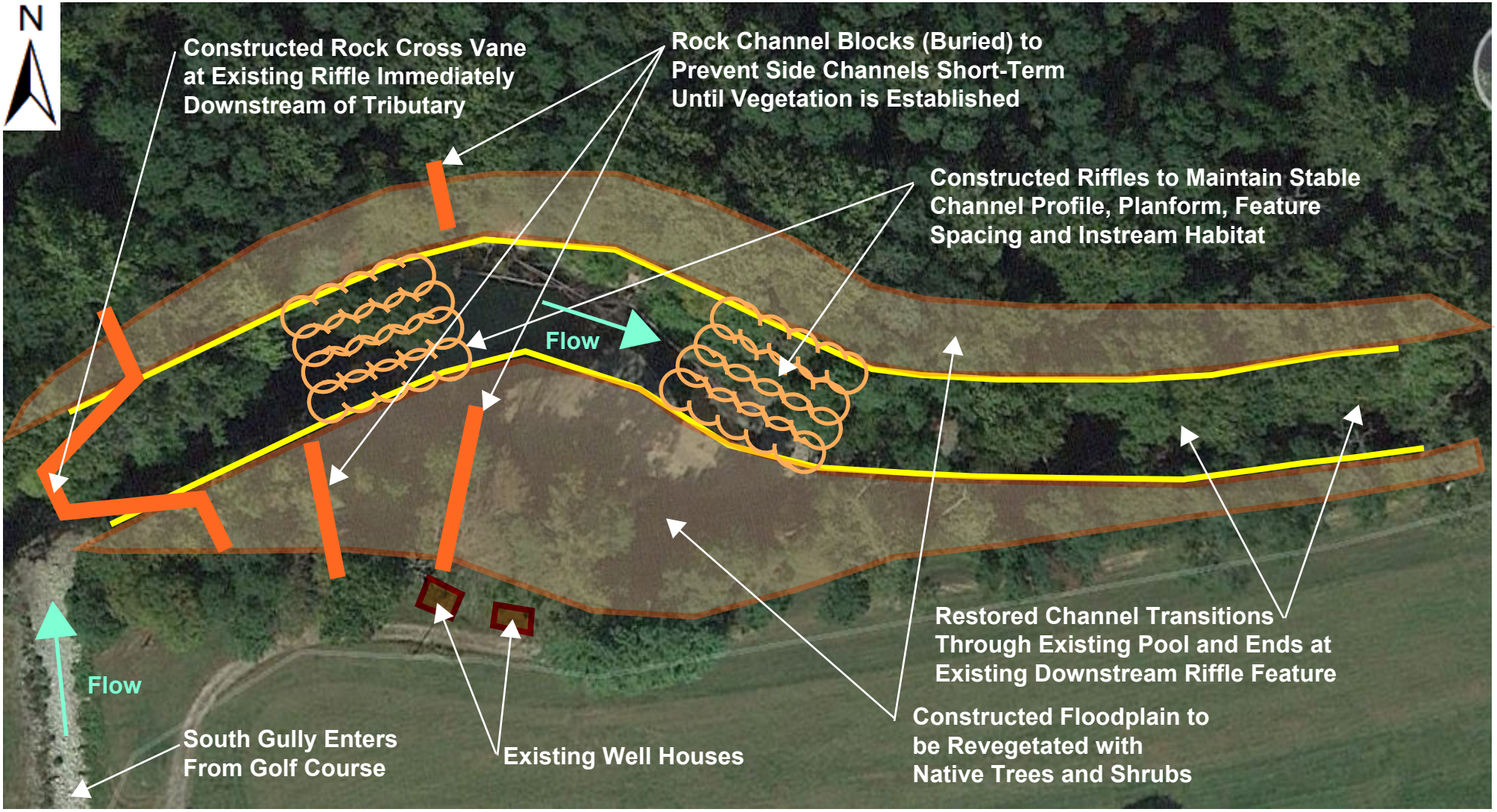
Remove Woody Debris and Large
Stump by Winching Across Stream
w/out Equipment in Stream
12/09/2016 15:20

Site No. 13



TOWN OF WAWARSING - SANDBURG CREEK
PROPOSED CONDITIONS AT FALLSVIEW WELL HOUSE

Site No. 13



TOWN OF WAWARSING - SANDBURG CREEK
PROPOSED CONDITIONS AT FALLSVIEW WELL HOUSE

ATTACHMENT 3

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9349
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To: May 17, 2017
Consultation Code: 05E1NY00-2017-SLI-2230
Event Code: 05E1NY00-2017-E-05956
Project Name: Village of Ellenville and Town of Wawarsing - Stream Bank Restoration

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (

http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

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

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9349
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2017-SLI-2230

Event Code: 05E1NY00-2017-E-05956

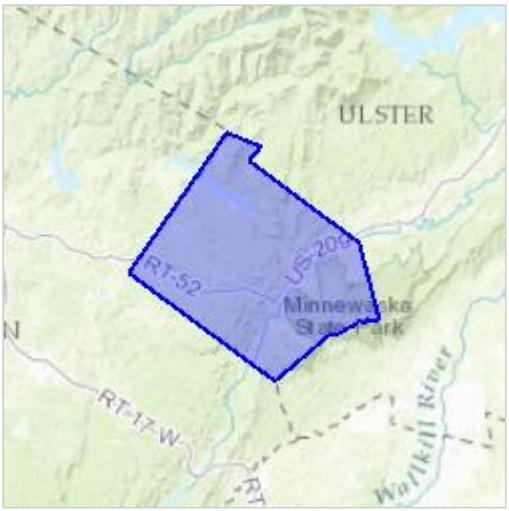
Project Name: Village of Ellenville and Town of Wawarsing - Stream Bank Restoration

Project Type: LAND - RESTORATION / ENHANCEMENT

Project Description: Stream bank Restoration

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.75968521880361N74.42449538576747W



Counties: Sullivan, NY | Ulster, NY

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Indiana Bat *(Myotis sodalis)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *(Myotis septentrionalis)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Reptiles

NAME	STATUS
Bog Turtle *(Clemmys muhlenbergii)* Population: Wherever found, except GA, NC, SC, TN, VA No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6962	Threatened

Clams

NAME	STATUS
Dwarf Wedgemussel *(Alasmidonta heterodon)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/784	Endangered

Critical habitats

There are no critical habitats within your project area.

ATTACHMENT 4

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

July 12, 2017

Lori Shirley
Governor's Office of Storm Recovery
30-40 State St., Hampton Plaza
Albany, NY 12207

Re: Ellenville Stream Bank Restoration Project
County: Ulster Town/City: Wawarsing

Dear Ms. Shirley:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur in the vicinity of the project site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYS DEC Region 3 Office, Division of Environmental Permits, at dep.r3@dec.ny.gov, (845) 256-3054.

Sincerely,

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

800

The following state-listed animals have been documented in the vicinity of the project site.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed or are candidates for federal listing.

For information about any permit considerations for the project, please contact the Permits staff at the NYSDEC Region 3 Office at dep.r3@dec.ny.gov, (845) 256-3054. For information about potential impacts of the project on these species, and how to avoid, minimize, or mitigate any impacts, contact the Region 3 Wildlife staff at Wildlife.R3@dec.ny.gov, (845) 256-3098.

The following species has been documented within .5 mile of the project sites at North Gully, and at several locations within one mile of project sites in the Village of Ellenville. Individual animals may travel 1.5 miles from documented locations.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*FEDERAL LISTING*	
Timber Rattlesnake	*Crotalus horridus*	Threatened		8389

This report only includes records from the NY Natural Heritage database.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at www.dec.ny.gov/animals/7494.html.

ATTACHMENT 5

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife
625 Broadway, 5th Floor, Albany, NY 12233-4750
P: (518) 402-8924 | F: (518) 402-8925
www.dec.ny.gov

May 18, 2017

Ms. Lori Shirley
Governor's Office of Storm Recovery
99 Washington Avenue
Suite 1224
Albany NY 12260

RE: Stream Bank Restoration Project
Town of Wawarsing and Village of Ellenville, Ulster County, NY

Dear Ms. Shirley,

We received your jurisdictional inquiry request for the Stream Bank Restoration Project in the Town of Wawarsing and Village of Ellenville, Ulster County. It is our understanding that some tree removal will have to take place at multiple locations as the stream bank is stabilized. Based on our understanding of the location of the project and the NYS Resources map created by Amanda Bailey on 5/18/2017 (attached), we have the following comments on the project:

STATE-LISTED SPECIES

All threatened or endangered species are subject to regulation under Article 11, Title 5 of the Environmental Conservation Law and a permit is required for a taking of that species pursuant to 6 NYCRR Part 182. Besides death of individuals, taking includes harassment, interference with essential behaviors, and adverse modification of habitat. **If the site is in close proximity to known occurrences of state-protected species, additional information on the proposal will be required by the appropriate regional office for a determination on the need for an incidental take permit.**

We have reviewed the available information in the New York Natural Heritage Program database on known occurrences of rare or state-listed bat species. This project area does not occur in the immediate vicinity of known occurrences of rare or state-listed bat species (see NYS Resources map, attached). The major concern for bat species in relation to this project would be the destruction of potential roosts and roosting habitat that may occur if tree clearing is required. Because this project does not take place within known occupied habitat, there are no restrictions on cutting.

The absence of data does not necessarily mean that any rare or state-listed bat species do not exist on or adjacent to the proposed site. For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence of all rare or state-listed bat species. To avoid potential take, DEC *recommends* that any tree clearing be conducted between November 1 and March 31, when bats are inactive in hibernation sites. DEC also recommends that all snag and cavity trees remain uncut, unless their removal is necessary for protection of human life and property. For more information, please refer to the DEC Northern long-eared bat protective measures guidance, available at: http://www.dec.ny.gov/animals/106090.html.

This document is only intended to address state-listed bat species. Other rare or state-listed species, natural communities or other significant habitats may exist within the project area and would require additional review. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

OTHER

USFWS Cortland Field Office

If a federal agency is involved in the project, or if federal funding is used, there are additional considerations for federally listed species. Section 7(a)(1) of the Endangered Species Act requires federal agencies to use their authorities to conserve listed species. Section 7(a)(2) requires federal agencies to consult on any action that may affect a listed species.

Other permits from this Department or other agencies may be required for projects conducted on this property now or in the future. Also, regulations applicable to the location subject to this determination occasionally are revised and you should, therefore, verify the need for permits if your project is delayed or postponed. This determination regarding the need for permits will remain effective for a maximum of one year unless you are otherwise notified. Applications may be downloaded from our website at www.dec.ny.gov under "Programs" then "Division of Environmental Permits."

Please contact this office if you have questions regarding the above information. Thank you.

Sincerely,

Amanda Bailey

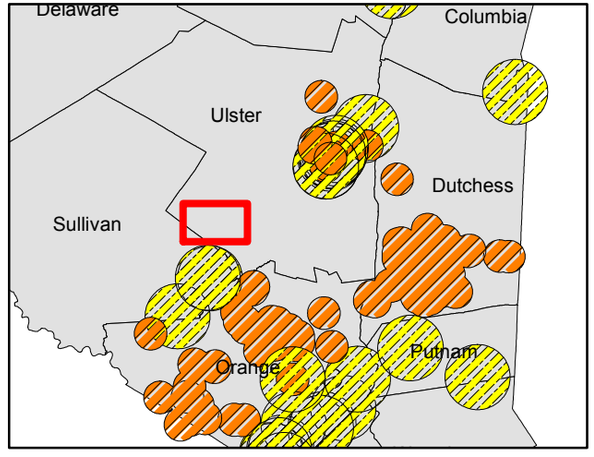
Amanda Bailey
Division of Fish and Wildlife
Amanda.bailey@dec.ny.gov
518-402-8859

Cc: Alicia Shultz, Governor's Office of Storm Recovery
Lisa Masi, NYSDEC Regional Wildlife Biologist, Region 3
Sarah Pawliczak, NYSDEC Division of Environmental Permits, Region 3
May O'Malley, NYSDEC Division of Environmental Permits

NYS Resources Map

Stream Bank Restoration Project
Town of Wawarsing & Village of Ellenville,
Ulster County

Prepared by AMB on 5/18/2017



Project locations

Bat Occurrences

Indiana Bat

Northern Long-eared Bat

Disclaimer: this map was prepared by the NYSDEC using the most current data available. It is deemed accurate but is not guaranteed. NYSDEC is not responsible for any inaccuracies in the data and does not necessarily endorse any interpretations or products derived from the data. This map may contain information that is considered sensitive and therefore the distribution of this map is strictly prohibited.

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

NEW YORK
STATE OF
OPPORTUNITY

Department of Environmental Conservation

0 0.3 0.6 1.2 1.8 2.4 Miles

1 inch = 5,000 feet

ATTACHMENT 6

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Ellenville Stream bank Restoration Project Date: 4/2/2019

Township/Range/Section: Wawarsing & Ellenville, Ulster County

Lat Long/UTM/ Zone: 548517 E // 4619492 N Surveyor: A. Bailey

Brief Project Description

Banks along several streams in Wawarsing and Ellenville, Ulster County will be stabilized at 8 locations. Some tree removal will be required during this process.

Project Area

	Total Acres	Forest Acres	Open Acres
Project	~7.3	~3.2	~4.1

	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing
Proposed Tree Removal (ac)	3.2		

Vegetation Cover Types

Pre-Project	Post-Project
Most of the project area is roadside deciduous/mixed forest bordering a stream. The surrounding area is development (sites 8, 10, 13), and f forest (sites 1-5).	This project will not change the vegetation cover of the area, as only about 3 acres will be cleared between road and stream.

Landscape within 5 mile radius

Flight corridors to other forested areas?

There is existing flight corridors, and these corridors will not be impacted by the project.

Describe Adjacent Properties (e.g. forested, grassland, commercial or residencial development, water sources)

The project borders a quick-moving stream at all sites. Sites 8, 10, and 13 are surrounded by development, sites 1-5 are surrounded by mainly deciduous/mixed forest.

Proximity to Public Land

What is the distance (mi.) from the project area to forested public lands (e.g., national or state forests, national or state parks, conservation areas, wildlife management areas)?

The project sites range from 0.5 - 4.6 miles from the Minnewaska State Park Preserve. The sites are also approximately 1-3 miles from the Oak Ridge Multiple Use Area.

Use additional sheets to assess discrete habitat types at multiple sites in a project area

Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): _____
All sites are reviewed together, as they are similar habitat.

Water Resources at Sample Site				
Stream Type	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
(# and length)			~ 1500 m	
Pools/Ponds		Open and accessible to bats?		Quick moving stream
(# and size)				
Wetlands	Permanent	Seasonal		
(approx. ac.)				

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50 ')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81=100%
	1			
Dominant Species of Mature Trees	Oak spp, Maple spp, American syracome			
% Trees w/ Exfoliating Bark	< 1%			
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	50	35	15	
No. of Suitable Snags		9		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Surrounding habitat may support Indiana bats.

Additional Comments:

The majority of the project areas are in urban environments, and most clearing will occur between the road and a fast moving stream. Most trees are small-medium in size, and the majority are live without roosting opportunities. However, there are 9 suitable snags (2 in site 8, 1 in site 1, 5 in site 3, and 1 in site 5). We recommend that emergence counts be conducted at these snags prior to removal of trees.

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

Site 1

Site 1 – potential roost, sycamore

Site 1 – potential roost, sycamore

Site 1

Site 1

Site 2

Site 2

Site 3

Site 3 – suitable snag

Site 3 – suitable snag

Site 3

Site 3

Site 3 – suitable snag

Site 3 – suitable snag

Site 3 – suitable snag

Site 3 – suitable snag

Site 5

Site 5 – suitable snag

Site 5

Site 8

Site 8

Site 8

Site 10

Site 10

Site 10

Site 8 – suitable tree

Site 8

Site 8

Site 10

Site 10

Site 10

Site 10

Appendix C

FLOODPLAIN MANAGEMENT EO 11988 AND WETLANDS PROTECTION EO 11990 DETERMINATION
COMMUNITY RECONSTRUCTION PROGRAM WITHIN NY STATE COMMUNITY DEVELOPMENT BLOCK GRANT DISASTER RECOVERY PROGRAM
ELLENVILLE STREAM BANK RESTORATION PROJECT
ULSTER COUNTY, NEW YORK

Governor's Office of Storm Recovery
U.S. Department of Housing and Urban Development Community Development Block Grant – Disaster Recovery

Introduction & Overview

The purpose of Executive Order (EO) 11988 Floodplain Management is "to avoid to the extent possible the long- and short-term adverse impacts associated with occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." The purpose of EO 11990 Protection of Wetlands is "to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative." This report contains the analysis prescribed by 24 CFR Part 55 and documents the eight-step decision making process for the Proposed Action and pertains to activities within the Special Flood Hazard Area (SFHA) as defined by the Federal Emergency Management Agency (FEMA), or its successors, pursuant to the National Flood Insurance Program (NFIP), or a successor program, whether advisory, preliminary, or final and wetland as defined by 24 CFR 55.2(b)(11).

In addition, federal agencies are required to demonstrate that consideration of all practicable alternatives has resulted in the reduction or elimination of long- and short-term adverse impacts associated with occupancy and modifications of the floodplain or wetlands. This 8-step process includes assessing all practicable alternatives and incorporating public review.

Projects located within a Special Flood Hazard Area (SFHA) are subject to Executive Order 11988. Information on where SFHAs are located is available on Flood Insurance Rate Maps (FIRMs) published by FEMA. FEMA uses engineering studies to determine the delineation of these areas or zones subject to flooding. The relevant data source for the SFHA is the latest issued FEMA data or guidance, which includes advisory data, such as Advisory Base Flood Elevations (ABFEs) or preliminary and final FIRMs.

The Governor's Office of Storm Recovery (GOSR), an office of the New York State Housing Trust Fund Corporation (HTFC), proposes to provide Community Development Block Grant – Disaster Recovery (CDBG-DR) funding from the NY Rising Community Reconstruction Program to the Village of Ellenville for the Ellenville Stream Bank Restoration Project (Proposed Action) involves the restoration of damaged streams and stream corridors for several sites within the village of Ellenville, in Ulster County, New York.

The analysis that follows focuses on floodplain and wetland impacts, as there are direct wetland impacts associated with this project. Based on the type of land use and facility and other case characteristics described herein, it is concluded that there is a reasonable basis to proceed with funding for this project/ activity within floodplain and wetland. The CDBG-DR funding is administered through the New York State Rising Community Reconstruction Program which is using bottom-up community participation and State-provided technical expertise to develop resilient and sustainable communities. Thus, alternatives preventing or impeding the development of resilient and sustainable communities are not considered reasonable alternatives.

Description of Proposed Action & Land Use

The Village of Ellenville (Village) applied for U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant (CDBG-DR) funding for design and construction of stream bank restoration improvements and resiliency measures within and along the West Branch of Beer Kill and Sandburg Creek. The Ellenville Stream Bank Restoration Project involves the restoration of damaged streams and stream corridors for several sites within the village of Ellenville, in Ulster County, New York (the Proposed Action). Stream restoration measures include channel realignments to original channel paths, removal of existing structures necessary to return stream banks to previous ground level grades, and placement of materials (soils and riprap armoring) to retain existing and future bank elevations and slopes. The flood mitigation measures include the construction of floodplain benches with rock and/or wood revetment (to reduce cutting at the toe of bank), the lowering of the height, angle and overall erosion hazard of the eroding streambanks; installation of in-stream rock structures to provide grade control and reduce the erosive force of water upon streambanks (by directing flood flows to the center of the stream channel); and the reconnection of floodplains in select areas (to reduce channel confinement and the corresponding increases in flood velocity that contribute to flood severity).

Originally, thirteen project sites were included in the proposed project. Five sites (6, 7, 9, 11 and 12) have been removed from the project scope. A total of eight (8) sites in the project area are proposed for improvements and summarized in the table below and shown in the attached figures (See Attached Figures,).

Site Designation Number	Site Name	Proposed Improvements
1	West Branch Beer Kill at Old Greenfield Road	Enhance bank protection along left bank toe
2	West Branch Beer Kill at Barbara Road Bridge	Replacement of gabion basket revetments, construction of cross vanes downstream of bridge
3	West Branch Beer Kill at Old Greenfield Road	Installation of rock cross vanes at upper and lower limits of project reach and transition project reach with adjacent and upstream and downstream reaches
4	West Branch Beer Kill at Old Greenfield Road	Installation of multiple cross vane structures
5	West Branch Beer Kill at Old Greenfield Road	Installation of rock cross vanes at upper and lower limits of the project reach and transition project reach with adjacent and upstream and downstream reaches

8	Sandburg Creek at Roslyn Street Pump Station	Installation of rip rap stone armoring on the east side of the creek, downstream of the sewer crossing in order to achieve streambank stabilization
10	Sandburg Creek at Hang Glider Road	Installation of floodplain benches, rock cross vanes, and rock and rood wad/toe wood revetment along portions of the stream bank to prevent lateral bank erosion. Placement of a floodplain culvert through the western roadway bridge approach.
13	Sandburg Creek at Fallsview Pump Houses	Reconstruction and vegetation of floodplains along left and right banks, installation of rock cross vanes.

Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing, including the West Branches of the Beer Kill, and Sandburg Creek.

This Project is expected to provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town. Amongst other benefits, the Project will:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, school emergency services, and the Ellenville Regional Hospital;
- Provide long-term flood protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

New York State has experienced a number of storms (e.g., Hurricane Irene, Tropical Storm Lee, Hurricane Sandy) that have caused substantial damage over the last decade. As a result, this trend has increased the need for streambank restoration for Beer Kill and Sandburg Creek, in the Village of Ellenville to support the storm-stricken communities.

The lands surrounding the Proposed Action include residential areas or open forested land. Ellenville is largely a built-out community, with few large natural areas left in the Village. Some of the sites are located in the Shawangunk Mountains Scenic Byway, an 88-mile byway encircling the northern Shawangunk Mountains. The byway is a state awarded designation based on the significance of the scenic, natural, historic and recreational resources in the region.

Applicable Regulatory Procedure Per EO 11988 and EO 11990

The Proposed Action corresponds with a noncritical action not excluded under 24 CFR §55.12(b) or (c), and the use is a functionally dependent use. Funding is permissible for the use in the floodplain and wetland if the proposed action is processed under §55.20 and the findings of the determination are affirmative to suggest that the project may proceed. The Proposed Action would have both temporary and permanent effects on floodplains and wetlands.

Step 1. **Determine Whether the Proposed Action is Located in the 100-year Floodplain (500-year for Critical Actions) or results in New Construction in Wetlands.**

Approximately 2.8 acres of West Branch of Beer Kill river channel will be modified and approximately 1.4 acres of Sandburg Creek river channel will be modified. According to the Flood Insurance Rate Map (FIRM) panel 3611C0685F effective November 18, 2016 and panel 36111C0700F effective November 18, 2016, Sites 1, 2, 3, 4, 8, and 10 are located in Special Flood Hazard Area. Sites 8 and 13 are located in a Regulatory Floodway.

The Proposed Activity will result in temporary impacts to an estimated 7.5 acres of 100-Year Floodplain (temporary roads and staging area) and will result in permanent impacts to 1.9 acres of 100-Year Floodplain. Permanent impacts will consist of vegetated floodplain bench, rip-rap, revetment wall, rock flood toe revetment, rock flood grade control and permanent gravel access roads. The appropriate permits will be obtained in accordance with 6NYCRR Part 608, Protection of Waters Program; 6NYCRR Part 661, NYSDEC stormwater discharge from construction activities regulations, and Section 401 of the Clean Water Act. A Stormwater Pollution Prevention Plan (SWPPP) will be prepared for the Project.

No wetland under NYSDEC jurisdiction are located within the project areas. Sites 1, 2, 3, 4, and 5 which include the river channel of West Branch Beer Kill, are identified as a National Wetland Inventory (NWI) Riverine wetland (West Branch Beer Kill). Sites 8, 10 and 13, including the river channel of Sandburg Creek, are identified as a NWI Riverine wetland (Sandburg Creek). A NWI Freshwater Forested/Shrub wetland is located on the north bank of Sandburg Creek in the area of site 13.

Step 2. Initiate Public Notice for Early Review of Proposal.
Because the proposed action is located within wetlands, GOSR published an early notice, that allowed for the public and public agencies to provide input on the decision to provide funding for the proposed action. The early public notice and 15-day comment period is complete.

"Early Notice of a Proposed Activity in Floodplain" was published in the *Shawangunk Journal* newspaper on January 16, 2020, with the 15-day period expiring on January 31, 2020. The notice targeted local residents, including those within the floodplain. (See the attached **Early Notice** and **Affidavit of Publication**). The notice was also sent to the following state and Federal agencies on January 16, 2020: HUD; Federal Emergency Management Agency (FEMA); U.S Fish and Wildlife Service (USFWS); U.S. Environmental Protection Agency (EPA); NYSDEC; NY State Historic

Preservation Office (SHPO); NYS Office of Parks, Recreation and Historic Preservation; NYS Department of Transportation (DOT); and the NYS Division of Homeland Security & Emergency Services. The notice was also sent to agencies within the Village of Ellenville and Town of Wawarsing. GOSR has not received comments in response to the Early Notice.

Step 3. **Identify and Evaluate Practicable Alternatives to Locating the Proposed Action in a 100-year Floodplain (or 500-year Floodplain if a Critical Action) or Wetland.**
The New York State Rising Community Reconstruction Program is structured to provide eligible communities' resources and expertise to build projects resilient to future flooding events.

The primary alternative for the current proposed action is the "No Action" alternative. Not undertaking the Proposed Action would not be consistent with the goals and objectives of the Ulster County Communities New York Rising Community Reconstruction Plan, in which it is a featured project that will provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town. The project will increase the river channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, school emergency services, and the Ellenville Regional Hospital; Provide long-term flood protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base; Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

The No Action Alternative would result in future severe flooding of the area and will cost the Village of Ellenville and Town of Wawarsing, Ulster County, New York, significantly more money in damages over time. Without an improved drainage, the area would continue to be impacted by flooding and water damage.

The above identified alternatives will be re-evaluated in response to public comments received.

Step 4. **Step 4: Identify and describe the proposed action's direct and indirect effects associated with occupying or modifying the floodplain and wetlands.**
The purpose of floodplain and wetland evaluation is to consider factors relevant to a Proposed Action's effect on the survival, quality, and beneficial function and values of floodplains and wetlands. These factors include public health (including water supply and water quality), maintenance of natural systems, cost increases attributed to construction in wetland, and other uses of wetland in the public interest.

According to the FEMA Report - A Unified National Program for Floodplain Management, two definitions commonly used in evaluating actions in a floodplain are "structural" and "nonstructural" activities. Per the report, structural activity is usually intended to mean adjustments that modify the behavior of floodwaters through the use of measures such as public works dams, levees and channel work. Non-structural is usually intended to include all other adjustments (e.g., regulations, insurance, etc.) in the way society acts when occupying or modifying a floodplain. These definitions are used in describing impacts that may arise in association with potential advancement of the Project.

There would be a negligible change in the existing impermeable surface, which would be the only long-term effect on the floodplain. The Project would not disturb the NWI wetlands.

The floodplain area in the Project sites are previously disturbed by the existing roads and residential development along these roads. No existing impermeable surfaces are associated with the Project locations and none will be created. The project actions will occur the along the banks of creeks and include bank stabilization with permeable materials such as rip rap, gravel (temporary access road), and rock revetments. Restoration/stabilization of Sandburg Creek will require some channel relocation to soften bend angles, grading the areas adjacent to the channel to create an interactive floodplain, installing cross vanes to anchor the bed elevation and to direct flow into the center of the channel away from currently eroding banks, and installing structures at critical locations along the bank to stabilize actively eroding banks and improve fish habitat. Stream barbs will be constructed in West Branch Beer Hill to establish grade control and encourage the stream to maintain single thread channel.

The project would directly contribute to the resiliency of the Village of Ellenville and the Town of Wasarsing.

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The area of disturbance would not adversely affect the natural and beneficial values of the wetlands, floodplains or properties. The resilience of these areas and the communities as a whole will be improved by these projects.

Public health, safety, and welfare, including water supply, quality, recharge, and discharge; pollution; flood and storm hazards and hazard protection; and sediment and erosion.

The Proposed Action will reduce risks of flooding provide social, health, environmental, and economic benefits to the Village and Town by reducing flooding to road and properties, eliminating damages to roads and property and providing safe access to emergency responders. The action includes measures to reduce sedimentation within the West Branch Beer Kill and Sandburg Creek. Construction activities will be conducted in accordance with Best Management Practices which include erosion control .

Maintenance of natural systems, including conservation and long-term productivity of existing flora and fauna; species and habitat diversity and stability; natural hydrologic function; wetland type; fish; wildlife; timber; and food and fiber resources.

Implementation of the Proposed Action will comply with all best management practices and permit requirements and conditions set forth in the applicable Federal, State, and local permits. Prior to construction, the appropriate permits would be obtained in accordance with 6NYCRR Part 608, Protection of Waters Program; 6NYCRR Part 661, NYSDEC stormwater discharge from construction activities regulations, and Section 401 of the Clean Water Act. An SWPPP would be prepared for the Project. The Proposed Action would adhere to the requirements of these permits, which include preventing backfill from entering the wetland or protected buffer area, using clean fill, confining equipment and materials storage to upland areas, and stabilizing disturbed soil.

A Clean Water Act Section 404 Permit will be obtained for the Proposed Activity. The proposed Activity would adhere to the conditions of this permit, which requires that steps be taken to avoid impacts to wetlands, streams and other aquatic resources; that potential impacts have been

minimized; and that compensation will be provided for all remaining unavoidable impacts.

Water quality will be protected from temporary disturbance from construction of the Proposed Action by preventing erosion, sedimentation, and the introduction of contaminants associated with construction equipment within the floodplain. Temporary erosion and sediment controls would be installed over the length of the Project. These measures would be installed prior to disturbance and would remain in place until all slopes are stabilized and revegetated as necessary.

Cost increases attributed to wetland-required new construction and mitigation measures to minimize harm to wetlands that may result from such use.
The proposed project activities will be completed in accordance with construction BMP and all applicable federal, state, and local permits and their requirements and conditions, which will be obtained prior to commencing work. Consequently, there would be no additional anticipated cost increases for mitigation measures to minimize harm to wetlands.

Other uses of wetlands in the public interest, including recreational, scientific, and cultural uses.
The Proposed Action would not change current land use or require the acquisition of additional property and would, therefore, not affect any current uses of the project area.

Step 5. **Identify methods to minimize the potential adverse impacts within a floodplain and wetland and to restore and preserve the natural and beneficial values.**
Implementation of the Proposed Action will comply with all best management practices and permit requirements and conditions set forth in the applicable Federal, State, and local permits. Best management practices following permit requirements and conditions will be implemented during the construction period and disturbed areas revegetated as appropriate once construction is completed. Water quality will be protected from temporary disturbance from construction of the Proposed Action by preventing erosion, sedimentation, and the introduction of contaminants associated with construction equipment within the floodplain. Temporary erosion and sediment controls would be installed over the length of the Project. These measures would be installed prior to disturbance and would remain in place until all slopes are stabilized and revegetated as necessary. All stockpiled soils would be protected with sediment and erosion control measures in compliance with Section 207-02 of the NYS Department of Transportation Standard Specifications. All necessary precautions would be undertaken to prevent contamination of any streams, channels or waterways by silt, sediment, fuel, solvents, lubricants, epoxy coatings, debris, concrete leachate, or any other pollutant associated with Project construction would be avoided through proper equipment maintenance and washout basins, platforms, nets, and screens for equipment cleaning. Debris or excess construction material would be immediately removed off-site.

Prior to construction, the appropriate permits would be obtained in accordance with 6NYCRR Part 608, Protection of Waters Program; 6NYCRR Part 661, NYSDEC stormwater discharge from construction activities regulations, and Section 401 of the Clean Water Act. An SWPPP would be prepared for the Project. Construction activities related to the Proposed Action would adhere to the requirements of these permits, which include preventing backfill from entering the wetland or protected buffer area, using clean fill, confining equipment and materials storage to upland areas, and stabilizing disturbed soil. A Clean Water Act Section 404 Permit will be obtained for the Proposed Activity. The proposed Activity would adhere to the conditions of this permit, which

requires that steps be taken to avoid impacts to wetlands, streams and other aquatic resources; that potential impacts have been minimized; and that compensation will be provided for all remaining unavoidable impacts.

Step 6. **Reevaluate the Alternatives and Proposed Action.**
The "no action" alternative would not address the purpose and need of the Proposed Action. Not undertaking the Project would not be consistent with the goals and objectives of the Ulster County Communities New York Rising Community Reconstruction Plan to improve drainage without negatively without resulting in worse flooding downstream. Under the No Action Alternative, the project area would continue to be subject to future severe flooding, which will cost the Village of Ellenville and Town of Wawarsing, Ulster County, New York significantly more money in damages over time. The Village and Town would continue to experience main arterial road closures, damage to public infrastructure, and flooding of commercial establishments during storm events. Construction activities will adhere to the conditions of all applicable permits, which will be obtained prior to construction. This will minimize potential temporary adverse impacts on the wetlands during construction.

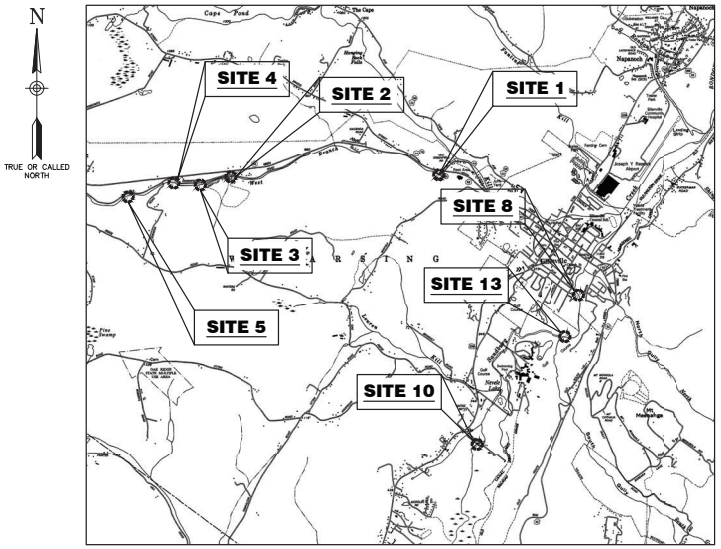
The impacts of these alternatives will be re-evaluated in response to any public comments received.

Step 7. **If the only practicable alternative is locating in a floodplain, publish a final public notice.**
It is the finding of this report that there is no practicable alternative to locating the project in the floodplain and wetlands. The location within floodplain and wetlands cannot be avoided.

A combined Notice of Intent to Release Funds (NOIRROF)/final public notice was published in the Shawangunk Journal newspaper by the Governor's Office of Storm Recovery on February 6, 2020, in compliance with Executive Orders 11988 and 11990 and 24 CFR Part 55. The final notice details the reasons why the project must be located in wetlands, a list of alternatives considered, and all mitigation measures taken to minimize adverse impacts and preserve natural and beneficial values of the wetlands. All comments received during the comment period will be addressed prior to funds being committed to the proposed project. The comment period started with the Notice of Intent to Release Funds (NOIRROF)/final public notice on February 6, 2020. The comment period for the Final Notice is 7 days, which expires at 5pm on February 13, 2020. The Final Notice was also sent to the following state and Federal agencies on February 6, 2020: the US Army Corps of Engineers, HUD, FEMA, USFWS, EPA, NYSDEC, NY SHPO, NYS Office of Parks, Recreation and Historic Preservation, NYS DOT, and the NYS Division of Homeland Security and Emergency Services. The notice was also sent to the agencies within the Town of Wallkill.

Step 8. **Implement the Proposed Action**
GOSR, operating under the auspices of the New York State Homes and Community Renewal's (NYSHCR) Housing Trust Fund Corporation, is the responsible entity. GOSR will ensure that the Proposed Action, as described above, is executed and necessary language will be included in all agreements with participating parties. Implementation of the proposed action may require additional local and state permits, which could place additional design modifications or mitigation requirements on the Project. It is acknowledged there is a continuing responsibility by the responsible entity to ensure, to the extent feasible and necessary, compliance with Steps 5 through 7.

Attachments
Site Plans
Early Notice
Affidavit of Publication



PROJECT LOCATION PLAN

NOT TO SCALE

95% DESIGN DRAWINGS

ELLENVILLE STREAM RESTORATION

VILLAGE OF ELLENVILLE AND TOWN OF WAWARSING STREAM RESTORATION PROJECT

CONTRACT 1 - GENERAL CONSTRUCTION

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VILLAGE OFFICIALS

JEFF KAPLAN	MAYOR
RAYMOND YOUNGER	DEPUTY MAYOR
JOHN GAVARIS	VILLAGE TRUSTEE
FRANCISCO OLIVERAS	VILLAGE TRUSTEE
PATRICIA STEINHOFF	VILLAGE TRUSTEE

TOWN OFFICIALS

TERRY HOUCK	SUPERVISOR
DAN JOHNSON	DEPUTY SUPERVISOR
STEPHEN BRADLEY	COUNCILMAN
ROGER BUCHWALTER	COUNCILMAN
THOMAS J. BRIGGS	COUNCILMAN

DECEMBER 2019

Barton & Loguidice

NEW YORK STATE PROFESSIONAL ENGINEERS LICENSE NO. 075248

924.068.002

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION, SURVEY, AND STAKE OUT OF PROPOSED IMPROVEMENTS. EXCESS EXCAVATED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF SITE IN A LAWFUL MANNER.
2. THE CONTRACTOR SHALL INSPECT AND FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS OF ALL AREAS OF PROPOSED WORK AND SHALL INCLUDE PROVISIONS TO AVOID CONFLICTS WITH AND/OR RESTORE SITE FEATURES IN KIND. NO SEPARATE OR ADDITIONAL PAYMENT WILL BE MADE FOR WORK REQUIRED TO AVOID CONFLICTS WITH EXISTING SURFACE FEATURES OR RESTORE THOSE WHICH ARE NOT SHOWN.
3. CONTRACTOR IS RESPONSIBLE FOR ALL SURVEY AND STAKEOUT FOR THIS PROJECT. THE CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL AS-BUILT PLANS FOR THIS PROJECT IN DIGITAL FORMAT WITH TIES TO ALL UTILITY CONNECTIONS, BENDS, VALVES, LOCATIONS, LENGTHS, OR LINES, AND ELEVATIONS ON PIPE INVERTS, RIMS, AND STRUCTURES / MANHOLES. AS-BUILT PLANS SHALL BE REVIEWED BY THE OWNER AND ENGINEER, AND THE CONTRACTOR SHALL PROVIDE ANY CORRECTION OR ADMISSIONS TO THE SATISFACTION OF THE OWNER AND ENGINEER BEFORE UTILITIES WILL BE ACCEPTED.
4. UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL DIMENSIONS SHOWN ON THE SITE DRAWINGS FOLLOW THESE CONVENTIONS:
   a. DIMENSIONS TO BUILDINGS AND RETAINING WALLS ARE TO THE EXTERIOR OF EXPOSED FACE OF THE WALL
   b. DIMENSIONS TO A CURB ARE TO THE FACE OF THE CURB
   c. DIMENSIONS TO A FENCE OR RAILING ARE TO THE CENTERLINE OF THE FENCE OR RAILING
   d. DIMENSIONS TO A MANHOLE, INLET, CLEAN OUT, PIPE BEND, VALVE, FIRE HYDRANT OR OTHER UTILITY APPURTENANCE ARE TO THE CENTER OF THE STRUCTURE
   e. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCY UPON DISCOVERY AND SHALL RECEIVE CLARIFICATION BEFORE PROCEEDING WITH CONSTRUCTION.
5. CONTRACTOR SHALL DEVELOP AND MAINTAIN A DETAILED CONSTRUCTION SCHEDULE THAT IDENTIFIES DATES AND DURATION OF ALL PORTIONS OF THE WORK. FULL TIME ACCESS ALONG ROADWAYS AND DRIVEWAYS TO ALL RESIDENTS SHALL BE ACCOMMODATED.
6. THE CONTRACTOR SHALL SUBMIT A CONSTRUCTION SEQUENCE FOR REVIEW PRIOR TO THE PRE-CONSTRUCTION MEETING. THE FOLLOWING IS A SUGGESTED SEQUENCE OF CONSTRUCTION:
   a. OBTAIN PLAN APPROVAL AND OTHER APPLICABLE STATE AND LOCAL PERMITS. THE OWNER SHALL SUBMIT THE NOTICE OF INTENT (NOI) TO OBTAIN COVERAGE UNDER GP-0-15-002 IN ACCORDANCE WITH PART II OF THE PERMIT.
   b. SCHEDULE AND HOLD A PRECONSTRUCTION MEETING WITH OWNER, ENGINEER, CONTRACTOR(S), GOVERNOR'S OFFICE OF STORM RECOVERY (GOSR) GRANT MANAGER, AND VILLAGE/TOWN AT LEAST ONE (1) WEEK PRIOR TO STARTING CONSTRUCTION.
   c. ALL CONTRACTORS AND SUBCONTRACTORS MUST COMPLETE AND EXECUTE A CONTRACTOR CERTIFICATION FORM AS INCLUDED IN THE SWPPP.
   d. MOBILIZE TO SITE AND LAYOUT ESTABLISHED LIMITS OF WORK AND BUFFER AREAS PRIOR TO STARTING CONSTRUCTION. DELINEATE LIMITS OF DISTURBANCE BY INSTALLING BARRIERS BETWEEN WORK AREA AND ENVIRONMENTALLY SENSITIVE AREAS. IDENTIFY TREES TO BE PROTECTED NEAR WORK LIMITS AND INSTALL TREE PROTECTION MEASURES. OBTAIN APPROVAL FROM OWNER PRIOR TO ANY TREE REMOVAL.
   e. ESTABLISH CONSTRUCTION ACCESS, STAGING, EQUIPMENT, LAYDOWN, TEMPORARY STOCKPILE, AND CONCRETE WASHOUT AREAS.
   f. INSTALL EROSION AND SEDIMENT CONTROL MEASURES IN PREPARATION OF THE CONSTRUCTION. ALL EROSION AND SEDIMENT CONTROL STRUCTURES (INCLUDING STABILIZED CONSTRUCTION ENTRANCES) SHALL BE IN PLACE PRIOR TO UPGRADIENT LAND DISTURBANCE.
   g. COMPLETE TREE REMOVAL, AS REQUIRED WITHIN THE LIMITS OF DISTURBANCE.
   h. COMPLETE ROUGH GRADING AND CONSTRUCTION OF ALL UTILITIES AND STRUCTURES.
   i. COMPLETE RESTORATION OF ALL DISTURBED AREAS INCLUDING PAVING, LANDSCAPE PLANTING, AND SEEDING.
   j. ONCE FINAL STABILIZATION IS ACHIEVED, REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SUBJECT TO THE APPROVAL OF THE ENGINEER.
   k. MAKE REPAIRS AS REQUIRED BY THE OWNER TO OBTAIN CERTIFICATE OF COMPLIANCE AND FILE NOTICE OF TERMINATION (NOT) IN ACCORDANCE WITH GP-0-15-002 PART V.
7. THE CONTRACTOR SHALL PREPARE A MAINTENANCE AND PROTECTION OF TRAFFIC PLAN THAT INCLUDES, BUT IS NOT LIMITED TO, AN ADVANCED WARNING SIGN LAYOUT PLAN FOR ROADWAYS AND A CONSTRUCTION SEQUENCING PLAN. THE PLAN SHALL BE SUBMITTED TO AND APPROVED BY THE OWNER PRIOR TO COMMENCING CONSTRUCTION.
8. THE CONTRACTOR SHALL COORDINATE WORK AND OBTAIN AND ADHERE TO ALL REQUIRED PERMITS INCLUDING THOSE FROM THE US ACOE, NYS DEC, VILLAGE/TOWN HWY DEPT, NYSDOT, AND ULSTER COUNTY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND INCUR THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES, ETC.
9. CONTRACTOR SHALL PROVIDE A WRITTEN PLAN TO INDICATE HOW ACTIVITIES WILL BE CONDUCTED TO AVOID OR MINIMIZE UNNECESSARY NOISE, DUST, AND VISUAL IMPACTS OF CONSTRUCTION ACTIVITIES ON SITE. MANAGE CONSTRUCTION TRAFFIC ON SITE, STAGING PROCEDURES, AND HOW CONSTRUCTION TRAFFIC EXITING AND ENTERING THE SITE WILL BE MANAGED TO AVOID UNNECESSARY IMPACT ON TRAFFIC USING LOCAL ROADS.
10. CONTRACTOR TO PROVIDE FULL TIME ACCESS ALONG ROADWAYS AND DRIVEWAYS TO OWNER.
11. THE OWNER MAY AUTHORIZE APPROPRIATE PROFESSIONALS TO OBSERVE AND MONITOR THE SITE ACTIVITIES WHEN DEEMED NECESSARY TO ENSURE COMPLIANCE WITH THE CONDITIONS OF APPROVAL OR THE PROTECTION OF ENVIRONMENTALLY SENSITIVE AREAS.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL FOR DELIVERY OF MATERIALS AND RELATED WORK.
13. THE CONTRACTOR IS RESPONSIBLE FOR ALL EXCAVATION, INCLUDING ANY ROCK OR CONCRETE EXCAVATION, STRUCTURES AND CONCRETE EXCAVATION AT THE PROJECT SITE.
14. CONTRACTOR SHALL TAKE CARE NOT TO UNDERMINE ROADWAY/DRIVEWAY PAVEMENT. ANY DISTURBED OR UNDERMINED PAVEMENT SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK.
16. CONTRACTOR SHALL REMOVE, STORE AND REPLACE SIGNS AND MAILBOXES AS NECESSARY. SIGNS AND MAILBOXES MUST REMAIN FUNCTIONAL AND ACCESSIBLE AT ALL TIMES. ALL DAMAGED SIGNS SHALL BE REPLACED IN KIND AT CONTRACTORS EXPENSE.
17. RESTORE ALL SURFACES TO AS GOOD OR BETTER CONDITION THAN BEFORE CONSTRUCTION AS SOON AS POSSIBLE FOLLOWING COMPLETION OF WORK IN ANY AREA. PROGRESS RESTORATION PROMPTLY TO MINIMIZE IMPACTS TO VEHICULAR AND PEDESTRIAN ACCESS.
18. ALL COSTS ASSOCIATED WITH PREPARING ANY STORAGE AND STAGING AREA(S) SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THIS INCLUDES, BUT IS NOT LIMITED TO, CLEARING AND GRADING, STABILIZATION OF THE WORK YARD SURFACE, CONSTRUCTION OF ALL TEMPORARY UTILITIES, ACCESS ROADS, ALL SECURITY FENCING, AND RESTORATION OF STAGING OR DISTURBED AREAS.
19. CONTRACTOR TO REPLACE PAVEMENT MARKINGS WHERE ASPHALT IS REMOVED AND REPLACED.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ANY PROPERTY LINE, SURVEY, OR RIGHT-OF-WAY MONUMENTATION DISTURBED DURING CONSTRUCTION. THE CONTRACTOR SHALL EMPLOY A NEW YORK STATE LICENSED LAND SURVEYOR TO RESTORE ALL DISTURBED MONUMENTS TO THEIR ORIGINAL LOCATION AT THE CONTRACTOR'S EXPENSE.
21. THE CONTRACTOR WILL BE REQUIRED TO REMOVE ALL SNOW AND ICE AS NEEDED AT NO ADDITIONAL COST. CONTRACTORS OPERATIONS ALONG THE HIGHWAY SHOULDERS, MUST NOT INTERFERE WITH THE OWNER'S ABILITY TO REMOVE SNOW AND PROVIDE ICE CONTROL.
22. IF ANY HAZARDOUS CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL FOLLOW THE PREVAILING FEDERAL, STATE, AND LOCAL REQUIREMENTS FOR NOTIFICATIONS, ISOLATION, REMOVAL, STORAGE AND ALL PERTINENT REGULATIONS.
23. PRIOR TO COMMENCING WORK, CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES, BUILDINGS, PAVEMENTS, AND OTHER SITE FEATURES TO REMAIN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UTILIZE A LOCATING SERVICE TO VERIFY UTILITY LOCATIONS. NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES. CONTRACTOR SHALL CONTACT DIG SAFELY NEW YORK FOR LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO THE COMMENCING OF CONSTRUCTION. IF ANY UTILITIES ARE DAMAGED DURING CONSTRUCTION, IT SHALL BE REPAIRED TO STANDARD OF AUTHORITIES HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
24. PRIOR TO START OF WORK, COORDINATE CONSTRUCTION VEHICLE ACCESS/EGRESS ROUTES, STOCKPILE AREA, AND FIELD OFFICE AREA IF REQUIRED.
25. STREAM PRACTICE LOCATIONS SHOWN ARE APPROXIMATE AND ARE TO BE CONFIRMED IN FIELD BY ENGINEER TO MINIMIZE THE REMOVAL AND DISTURBANCE AND TO AVOID SLOPES, ETC.

ENVIRONMENTAL RESOURCES NOTES:

1. CONTRACTOR SHALL IDENTIFY AND PROVIDE FENCING TO PROTECT SENSITIVE AREAS IDENTIFIED ON THE PLANS IN COORDINATION WITH THE ENGINEER AND OWNER BEFORE COMMENCING ANY WORK.
2. WORK IN WETLANDS, WATERCOURSES, AND OTHER ECOLOGICALLY SENSITIVE AREAS SHALL USE THE SPECIFIC CONSTRUCTION TECHNIQUES DESCRIBED IN THE SWPPP AND CONTRACT DOCUMENTS. PRIOR TO COMMENCING WORK, CONFIRM LIMITS OF CONSTRUCTION FENCE TO BE PLACED AT SITE WITH OWNER, ENGINEER, AND TOWN.
3. ALL TREE CLEARING ACTIVITIES ON THE SITE SHALL BE RESTRICTED TO THE PERIOD BETWEEN NOVEMBER 1 AND MARCH 31. INDIVIDUAL TREE REMOVAL FOR THE PLACEMENT OF STREAM BARBS AND CROSS VANES IS PERMITTED FOLLOWING EMERGENT BAT SURVEY THE NIGHT PRIOR TO REMOVAL. CONTACT XXX FOR NOTIFICATION OF EMERGENT BAT SURVEY.
4. TREE REMOVAL SHALL BE CONFINED TO THE DESIGNATED WORK LIMITS OR OTHER PROPERTY AS INDICATED ON THE PLANS. THE CONTRACTOR SHALL MAKE EVERY ATTEMPT TO PRESERVE ALL TREES. NO CLEARING SHALL BE COMMENCED UNLESS FIRST APPROVED BY THE ENGINEER AND OWNER. TREE REMOVALS AND CLEARING SHALL BE REVIEWED IN THE FIELD WITH THE ENGINEER AND OWNER, ANY UNAUTHORIZED DAMAGE TO LANDSCAPING OR TREES SHALL REQUIRE THEM TO BE REPLACED IN KIND AT NO ADDITIONAL COST TO THE OWNER.
5. CLEARING OF TREES SOLELY FOR STAGING OF EQUIPMENT IS NOT ACCEPTABLE. DISTURBANCE SHOULD BE LIMITED TO ONLY WHAT IS NECESSARY FOR EQUIPMENT PASSAGE AND THE CONSTRUCTION (INCLUDING MATERIALS STAGING) OF PERMANENT STRUCTURES. EXCESSIVE STAGING AREAS SHOULD BE AVOIDED.

GRADING NOTES:

1. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE FOR FIELD ADJUSTMENTS OF NEW WORK TO BLEND WITH EXISTING WORK THAT IS TO REMAIN.
2. THE CONTRACTOR SHALL STAKE OUT ALL GRADES IN THE FIELD PRIOR TO CONSTRUCTION AND NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY DISCREPANCIES WITH THE CONSTRUCTION DOCUMENTS.
3. THE CONTRACTOR SHALL CONTINUALLY MONITOR EXISTING STORM WATER AND EROSION CONTROL SYSTEMS AND PERIODICALLY CLEAN, REPAIR, AND UPGRADE AS REQUIRED.
4. GRADES WITHIN DRIP-LINE OF VEGETATION TO REMAIN SHALL NOT BE COMPACTED OR ALTERED UNLESS SO DIRECTED IN EITHER THE DRAWINGS OR SPECIFICATIONS. IN THE EVENT THIS IS UNAVOIDABLE, CONSULT THE OWNER'S REPRESENTATIVE BEFORE PROCEEDING.

UTILITY NOTES:

1. PLANS ILLUSTRATE KNOWN SUBSURFACE STRUCTURES, ABOVE GROUND STRUCTURES, AND/OR UTILITIES BELIEVED TO EXIST IN THE WORKING AREA. THE EXACT OR EVEN APPROXIMATE LOCATION OF SUCH MAY BE DIFFERENT FROM THAT SHOWN OR MAY NOT BE SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROCEED WITH GREAT CARE IN EXECUTING ANY WORK AND TO LOCATE AND PROTECT ALL UTILITIES. CONTRACTOR SHALL COMPLY WITH THE STATE OF NEW YORK DEPARTMENT OF PUBLIC SERVICE, 16 NYCRR PART 753. OBTAIN A DIG SAFELY NEW YORK STAKE OUT PRIOR TO COMMENCING CONSTRUCTION.
2. DAMAGE TO UTILITIES RESULTING FROM NEGLIGENCE OR FAILURE ON THE PART OF THE CONTRACTOR TO MAKE ACCURATE LOCATION IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING OR REPAIRING ANY DAMAGED UTILITY TO THE SATISFACTION OF THE OWNER AND ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING UTILITY POLES AS REQUIRED, INCLUDING TEMPORARILY SUPPORTING POLES DURING IMPROVEMENTS AT NO ADDITIONAL COST TO THE OWNER. COORDINATE UTILITY POLE WORK WITH LOCAL UTILITY COMPANY.
4. NO WORK SHALL BE PROGRESSED ON PRIVATE PROPERTY, OR OUTSIDE OF EASEMENTS SHOWN ON PLANS WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER.

SEQUENCING / STAGING AREA NOTES:

1. EROSION AND SEDIMENT CONTROL FEATURES SHOWN ARE CONSIDERED A MINIMUM AMOUNT OF CONTROL NECESSARY TO ENSURE WATER QUALITY IN WORK AREAS. THE INTENT IS TO CONTAIN THE INDIVIDUAL WORK AREAS WITH BARRIERS AND TURBIDITY CURTAIN AND FILTER DEWATERING VOLUME PUMPED WITH SEDIMENT BAGS AND NATURAL FILTRATION OF DRAINAGE DITCH VEGETATION WHILE DIVERTING STREAM FLOW AROUND THE WORK ZONE. ANY DEPOSITION OF SEDIMENTS IN THE OLD GREENFIELD ROAD DITCH WILL REQUIRE REMOVAL UNLESS MINUTE AS DETERMINED BY THE ENGINEER. IT IS BELIEVED THAT THE CONTAINED WORK AREAS DO NOT ALL NEED TOTAL DEWATERING TO PLACE LARGE ROCK STRUCTURES BUT WILL VARY. THE CONTRACTOR IS REQUIRED TO SUBMIT FOR OWNER'S AND ENGINEER REVIEW; THEIR OWN EROSION AND SEDIMENT CONTROL PLAN AND NARRATIVE TO SHOW CONSTRUCTION SEQUENCING, EROSION AND SEDIMENT CONTROL PRACTICES, DURATION OF USE/RE-USE, RESTORATION AND CONSTRUCTION STAGING TO ADDRESS ALL AREAS PROPOSED TO BE DISTURBED NEEDED TO CONSTRUCT THE PROJECT.
2. THE CONTRACTOR WILL BE REQUIRED TO SUBMIT A CONSTRUCTION SEQUENCING PLAN AND NARRATIVE (PARTICULARLY REGARDING THE KEYING-IN OF STREAM BARBS THROUGH THE REVETMENT WALL AT SITE 5) TO THE OWNER AND ENGINEER THAT SHOWS THE ORDER OF THE WORK, DURATION OF ALL PORTIONS AND PHASES OF THE WORK FOR EACH SITE THAT INCLUDES WHERE CONSTRUCTION STAGING, MATERIAL STORAGE, EQUIPMENT ACCESS, SANITARY FACILITIES FOR THE CREW, ANY LIGHTING OR SPECIAL NEEDS THAT WILL DISTURB THE AREA. INDICATE HOURS OF OPERATION AND MEANS OF NOTIFICATION TO PROPERTY OWNERS OF THE WORK, SCHEDULE AND IMPACTS ON TRAVEL PRIOR TO COMMENCING. RESTORE ALL PROPERTY DISTURBED TO ORIGINAL CONDITION.
3. FOR OLD GREENFIELD ROAD AND WORK AT SITES 2, 3, 4, AND 5 THE TOWN WILL ALLOW PORTIONS OF OLD GREENFIELD ROAD WEST OF BARBARA ROAD TO BE CLOSED DURING CONSTRUCTION. ROAD WILL BE ALLOWED TO CLOSE FROM 10' WEST OF BRIDGE TO 300' WEST OF WESTERLY EXTENT OF SITE 5 WORK SITE. INCLUDE MEANS OF PROTECTION IN NARRATIVES.
4. THE ROAD SURFACE MAY BE USED AS A MATERIAL STORAGE AREA IF SUFFICIENTLY PROTECTED BY STEEL PLATES, WOODEN MATTRESSES OR APPROPRIATE MEANS TO AVOID DAMAGING ROAD INFRASTRUCTURE. REPAIR ALL DAMAGES.

SURVEY NOTES:

1. SURVEY FOR SITES 1, 10, AND 13 PREPARED BY BROOKS AND BROOKS SURVEYORS, P.C.
2. SUBJECT TO ALL RIGHTS OF WAYS, COVENANTS, EASEMENTS, RESTRICTIONS, CONDITIONS AND AGREEMENTS OF RECORD.
3. SUBJECT TO WHATEVER STATE OF FACTS A COMPLETE SEARCH OF TITLE MAY REVEAL.
4. SUBSURFACE STRUCTURES NOT VISIBLE OR READILY APPARENT ARE NOT SHOWN AND THEIR LOCATION AND EXTENT ARE NOT CERTIFIED.
5. AREA SHOWN CONTAINS FEDERAL WETLAND NOT DELINEATED OR SHOWN HEREON. AREA LIES WITHIN A FEMA FLOOD ZONE AS DEPICTED ON FEMA FIRM NO. 36111C0685F EFFECTIVE DATE 18 NOVEMBER, 2016.
6. APPROXIMATE BOUNDARIES SHOWN HEREON AS PER ULSTER COUNTY GIS TAX MAPPING, AND ARE SUBJECT TO COMPLETE SURVEYS.
7. CONTOURS BASED ON FIELD SURVEY. ELEVATIONS ARE APPROXIMATE NAVD88 AS DERIVED BY RTK GPS OBSERVATIONS.

LIDAR TOPOGRAPHY NOTES:

1. PLANS FOR ALL SITES WITH THE EXCEPTION OF SITES 1, 10, AND 13 WERE PREPARED USING LIDAR TOPOGRAPHY AND ORTHOIMAGERY SOURCED FROM THE NYS GIS CLEARINGHOUSE.
2. THE NYS HIGH RESOLUTION DIGITAL ORTHOIMAGERY IS ACCURATE TO ±8-FT HORIZONTALLY AT THE 95% CONFIDENCE LEVEL FOR 2-FT RESOLUTION.

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

GENERAL NOTES

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

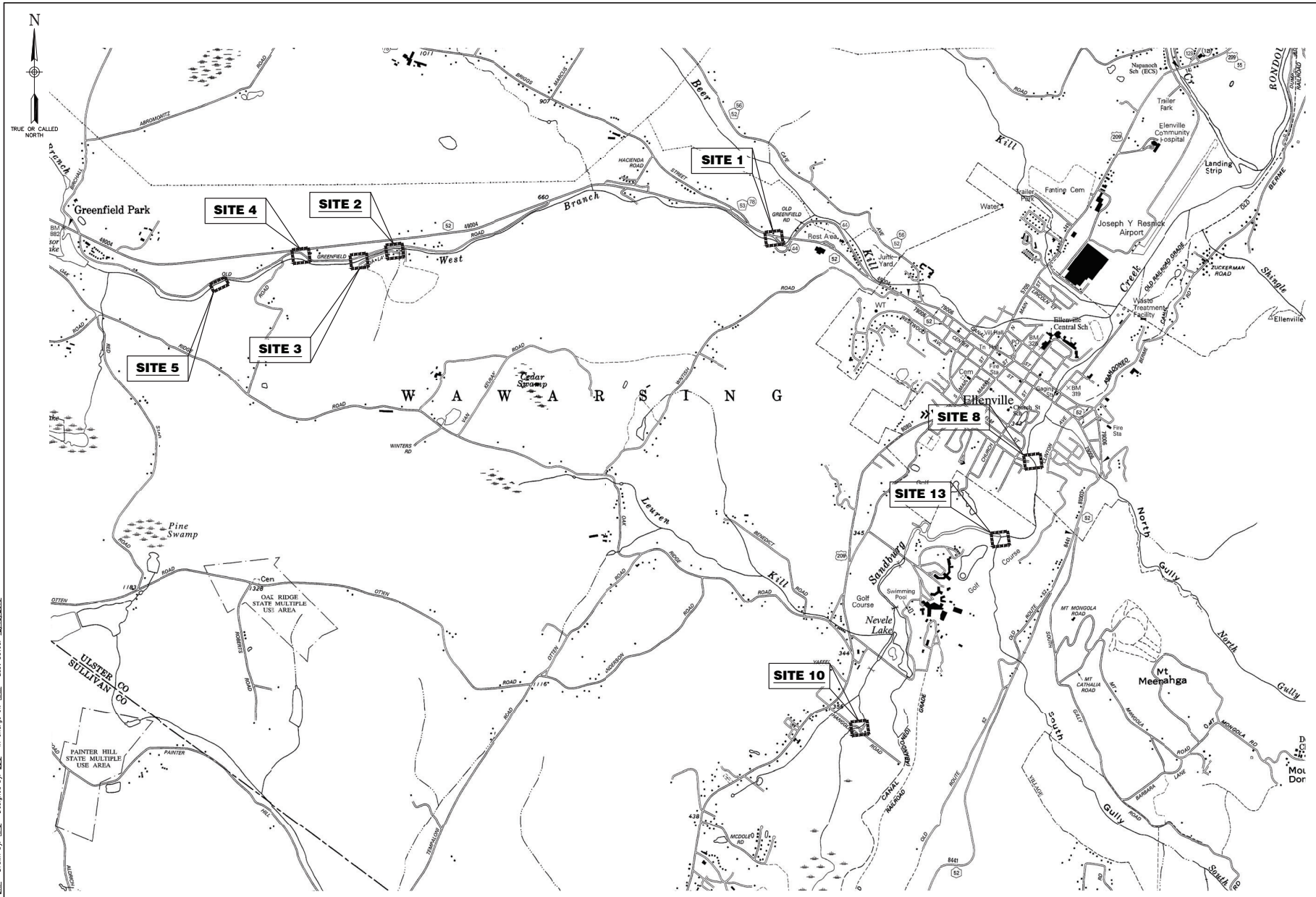
Date
DECEMBER 2019

Scale
AS SHOWN

Sheet Number
C-001

Project Number
924.068.002

Plotted: Dec 18, 2019 - 2:11PM By: WBG
File Name: 924068_1-Title.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: BEC Designed by: BDG In Charge of: RAM Last Saved: 12/18/2019



NOTE: THERE ARE NO SITES 6, 7, 9, AND 11

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

KEY MAP

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-101
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:11PM SYR By: WEG
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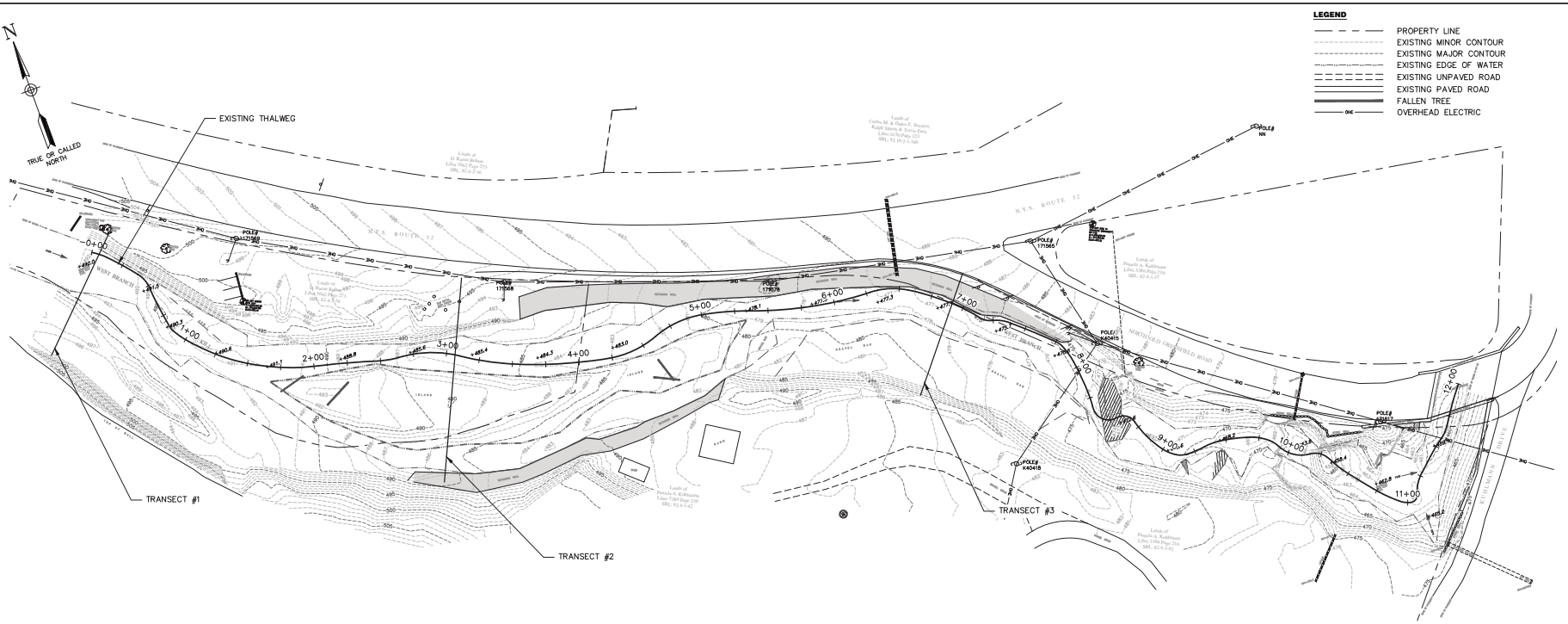
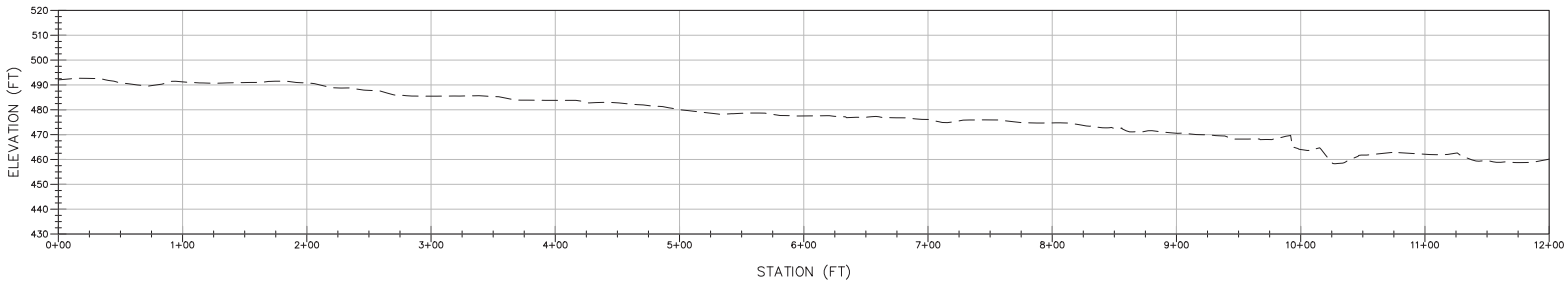
Checked by: DMF Drawn by: BEC Designed by: BDG In Charge of: RAM Last Saved: 12/18/2019



EXISTING CONDITIONS PLAN

SCALE: 1" = 40'-0"



EXISTING THALWEG PROFILE

HORIZONTAL SCALE: 1" = 50'-0"
VERTICAL SCALE: 1" = 25'-0"

1"=25' 25' 0 25' 50'
1"=40' 40' 0 40' 80'
1"=50' 50' 0 50' 100'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1
EXISTING CONDITIONS

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-111
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:11PM By: MBG
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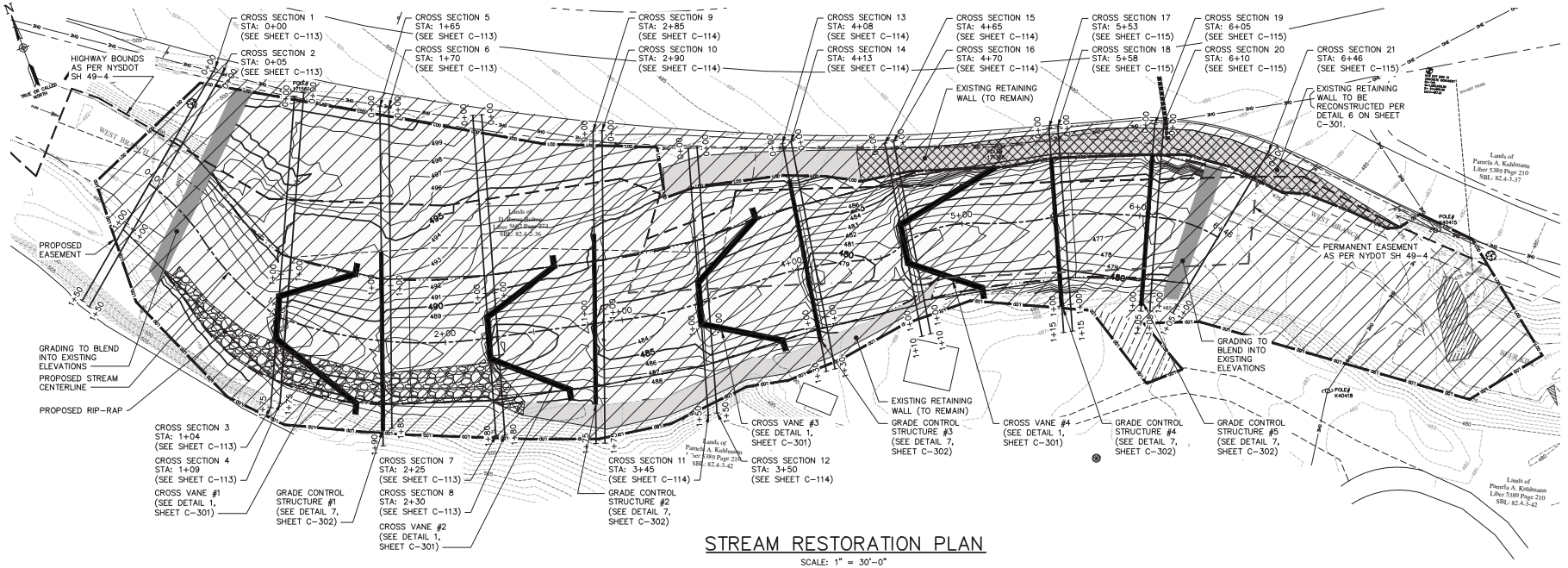
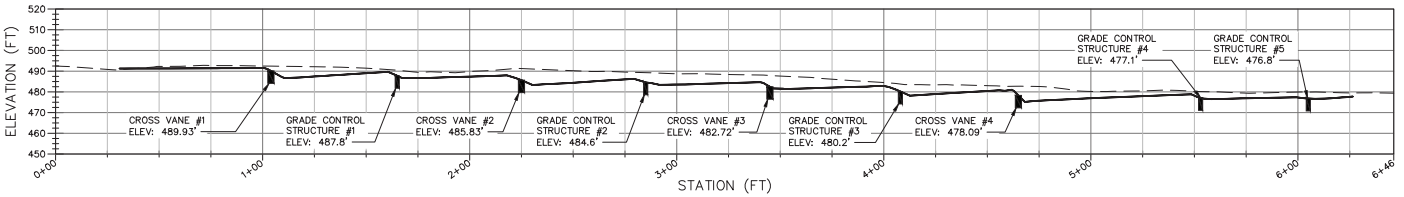


STREAM RESTORATION PLAN

SCALE: 1" = 30'-0"



PROPOSED STREAM CENTERLINE PROFILE

SCALE: 1" = 30'-0"

CROSS VANE #1 LAYOUT

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,053,628.54	514,273.56	492.59
2	1,053,634.01	514,276.03	492.59
3	1,053,683.51	514,246.19	489.93
4	1,053,694.36	514,251.10	489.93
5	1,053,705.21	514,256.02	489.93
6	1,053,702.27	514,300.26	493.63
7	1,053,707.38	514,303.41	493.63

CROSS VANE #2 LAYOUT

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,053,594.47	514,389.85	488.97
2	1,053,600.34	514,391.10	488.97
3	1,053,631.82	514,355.25	485.83
4	1,053,643.04	514,358.43	485.83
5	1,053,654.26	514,361.62	485.83
6	1,053,668.21	514,406.47	490.38
7	1,053,674.07	514,407.77	490.38

CROSS VANE #3 LAYOUT

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,053,579.37	514,512.46	485.73
2	1,053,585.37	514,512.70	485.73
3	1,053,609.63	514,473.03	482.72
4	1,053,620.85	514,476.22	482.72
5	1,053,632.07	514,479.41	482.72
6	1,053,654.80	514,521.84	486.91
7	1,053,660.80	514,521.97	486.91

CROSS VANE #4 LAYOUT

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,053,568.87	514,626.82	481.72
2	1,053,574.77	514,627.93	481.72
3	1,053,602.14	514,593.51	478.09
4	1,053,612.92	514,595.23	478.09
5	1,053,623.70	514,596.95	478.09
6	1,053,635.77	514,657.91	485.67
7	–	–	–

CROSS SECTION COORDINATES

CROSS SECTION	POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	STA: 0+00	1,053,837.49	514,265.95	502.41
	CENTERLINE	1,053,789.33	514,209.03	492.48
	END STA.	1,053,740.60	514,151.44	509.11
2	STA: 0+00	1,053,832.99	514,268.37	501.50
	CENTERLINE	1,053,785.09	514,211.76	492.28
	END STA.	1,053,736.10	514,153.86	509.24
3	STA: 0+00	1,053,807.57	514,302.41	500.11
	CENTERLINE	1,053,694.58	514,251.20	489.97
	END STA.	1,053,648.18	514,230.17	496.10
4	STA: 0+00	1,053,807.90	514,308.05	500.77
	CENTERLINE	1,053,691.29	514,255.20	487.12
	END STA.	1,053,648.51	514,235.81	495.27
5	STA: 0+00	1,053,785.70	514,345.35	500.39
	CENTERLINE	1,053,661.97	514,301.66	487.97
	END STA.	1,053,606.54	514,282.09	503.36
6	STA: 0+00	1,053,783.74	514,349.97	500.38
	CENTERLINE	1,053,659.84	514,306.21	486.71
	END STA.	1,053,614.01	514,290.03	499.28
7	STA: 0+00	1,053,763.28	514,392.59	499.34
	CENTERLINE	1,053,643.04	514,358.43	485.83
	END STA.	1,053,590.13	514,343.41	496.05

CROSS SECTION COORDINATES

CROSS SECTION	POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
8	STA: 0+00	1,053,761.92	514,397.40	499.30
	CENTERLINE	1,053,641.97	514,363.33	483.66
	END STA.	1,053,588.77	514,348.22	495.61
9	STA: 0+01	1,053,731.98	514,452.97	497.24
	CENTERLINE	1,053,630.28	514,417.06	484.74
	END STA.	1,053,566.96	514,394.70	494.69
10	STA: 0+00	1,053,730.40	514,457.72	497.05
	CENTERLINE	1,053,629.21	514,421.98	483.85
	END STA.	1,053,565.39	514,399.44	493.97
11	STA: 0+00	1,053,704.68	514,499.77	494.64
	CENTERLINE	1,053,620.85	514,476.22	482.72
	END STA.	1,053,560.27	514,459.20	496.84
12	STA: 0+00	1,053,704.15	514,504.82	494.75
	CENTERLINE	1,053,620.67	514,481.36	481.59
	END STA.	1,053,559.74	514,464.25	497.84
13	STA: 0+00	1,053,689.09	514,550.32	493.57
	CENTERLINE	1,053,619.11	514,539.14	480.37
	END STA.	1,053,560.72	514,529.82	489.37
14	STA: 0+00	1,053,688.52	514,555.29	493.51
	CENTERLINE	1,053,618.34	514,544.08	478.16
	END STA.	1,053,560.38	514,534.83	489.17

CROSS SECTION COORDINATES

CROSS SECTION	POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
15	STA: 0+00	1,053,669.48	514,604.26	491.73
	CENTERLINE	1,053,612.92	514,595.23	478.09
	END STA.	1,053,560.86	514,586.92	487.52
16	STA: 0+00	1,053,668.87	514,609.23	491.80
	CENTERLINE	1,053,614.04	514,600.48	475.41
	END STA.	1,053,560.49	514,591.92	487.55
17	STA: 0+00	1,053,646.30	514,693.74	490.52
	CENTERLINE	1,053,598.21	514,680.05	477.21
	END STA.	1,053,535.70	514,662.25	486.72
18	STA: 0+00	1,053,645.32	514,698.66	490.40
	CENTERLINE	1,053,597.24	514,684.97	476.63
	END STA.	1,053,534.72	514,667.17	486.62
19	STA: 0+00	1,053,627.91	514,750.15	489.16
	CENTERLINE	1,053,580.66	514,728.84	476.85
	END STA.	1,053,532.20	514,706.98	485.25
20	STA: 0+00	1,053,626.25	514,754.89	489.13
	CENTERLINE	1,053,578.48	514,733.34	479.94
	END STA.	1,053,530.54	514,711.72	485.09
21	STA: 0+00	1,053,591.49	514,804.78	486.77
	CENTERLINE	1,053,556.30	514,761.73	479.37
	END STA.	1,053,525.04	514,723.48	484.64

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- EXISTING PERMANENT EASEMENT
- FALLEN TREE
- OHE — OVERHEAD ELECTRIC
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPERTY BOUNDARY
- PROPOSED STREAM CENTERLINE
- PROPOSED STREAM BANK
- LOD — PROPOSED LIMIT OF DISTURBANCE
- PROPOSED PERMANENT EASEMENT
- PROPOSED TEMPORARY EASEMENT
- PROPOSED RIP-RAP

NOTE:

1. COORDINATES REFERENCE DATUM NAD83 NEW YORK STATE PLANES, CENTRAL ZONE, US SURVEY FOOT.

1"=30' 30' 0 30' 60'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019

Scale: AS SHOWN

Sheet Number: C-112

Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:17PM By: MBG
File Name: 924.068.002_Site1_C112-Restoration Plan.dwg
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 10/28/2019
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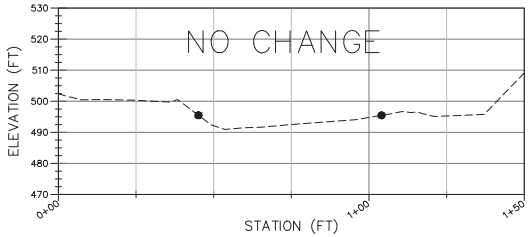
Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3

LEGEND

EXISTING GRADE

PROPOSED GRADE

TOP OF BANK



CROSS SECTION 1

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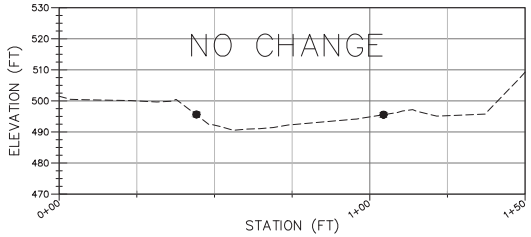

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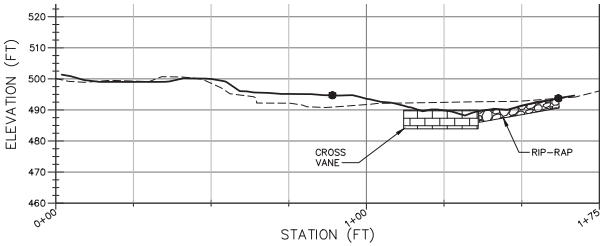

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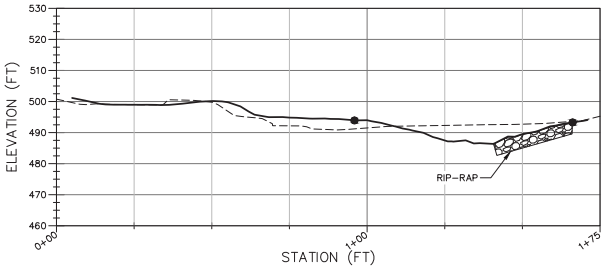

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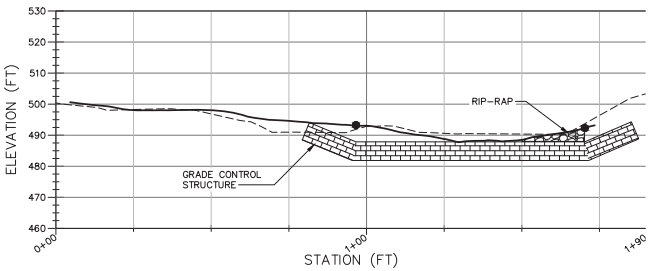

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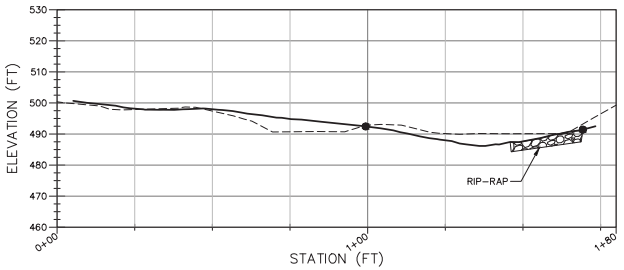
SCALE: 1" = 20'-0"



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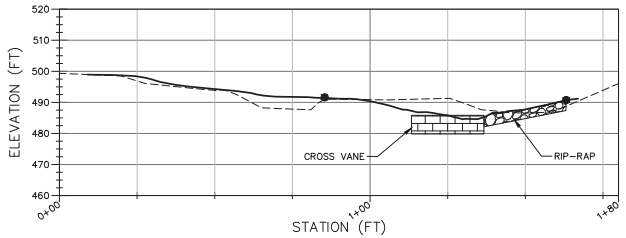

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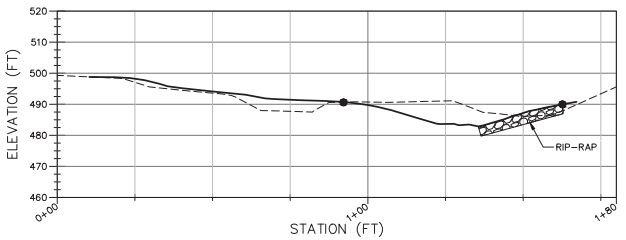


CROSS SECTION 8

SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 CROSS SECTIONS PROPOSED CONDITIONS (1 of 3)

TOWN OF WAWARSING — ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019

Scale: AS SHOWN

Sheet Number: C-113

Project Number: 924.068.002

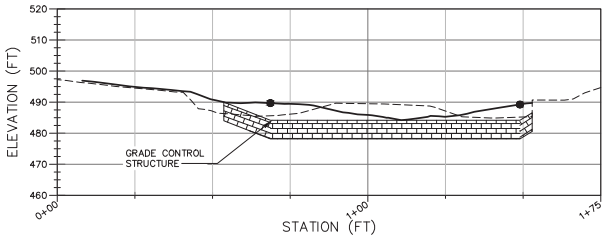
Plotted: Dec 18, 2019 - 2:11PM By: WBG
File Name: V:\0924\active\924068.002_Ellenville Stream Restoration Phase 2&3\Design\Drawings\Sheets\C113-C115-Cross Sections\924.068.002_Sht1_C113-C115-Cross Sections.dwg
Project No.: 924.068.002
Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019

LEGEND

EXISTING GRADE

PROPOSED GRADE

TOP OF BANK



CROSS SECTION 9

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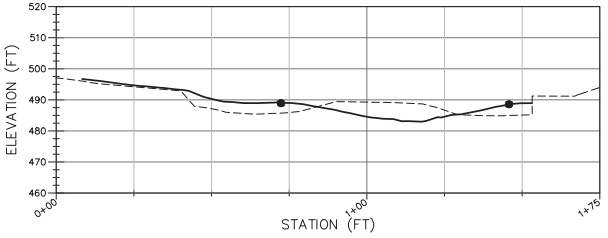

CROSS SECTION 10

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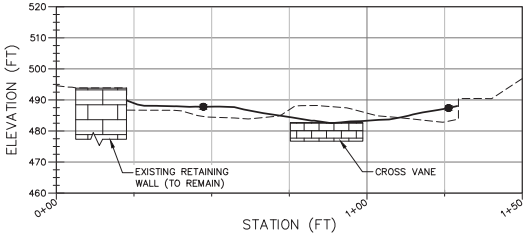
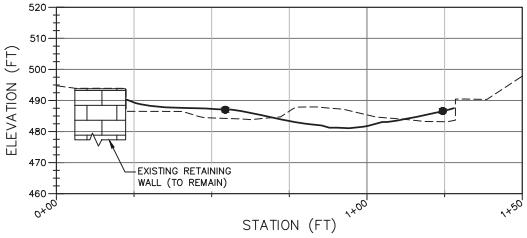


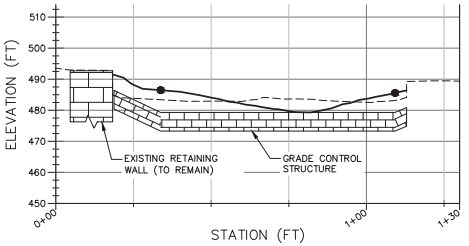
CROSS SECTION 11

SCALE: 1" = 20'-0"



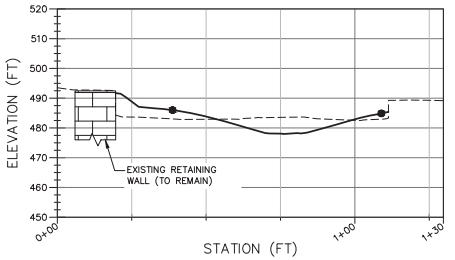
CROSS SECTION 12

SCALE: 1" = 20'-0"



CROSS SECTION 13

SCALE: 1" = 20'-0"



CROSS SECTION 14

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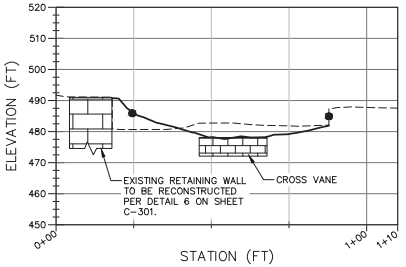
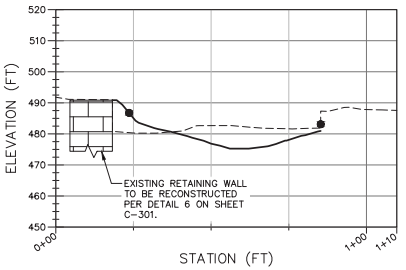


CROSS SECTION 15

SCALE: 1" = 20'-0"



CROSS SECTION 16

SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 CROSS SECTIONS PROPOSED CONDITIONS (2 OF 3)

TOWN OF WAWARSING ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019

Scale: AS SHOWN

Sheet Number: C-114

Project Number: 924.068.002

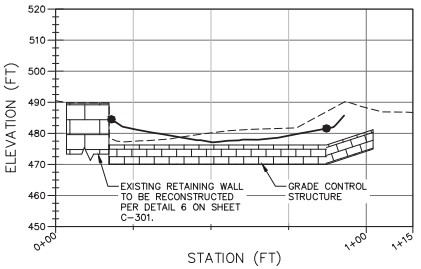
Plotted: Dec 18, 2019 - 2:11PM By: WBG
File Name: P:\Projects\924.068.002\Design\Civil\Drawings\Sheets\924.068.002_Sht1_C113-C115-Cross Sections (ID 1830177).dwg
Project No.: 924.068.002
Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019

LEGEND

EXISTING GRADE

PROPOSED GRADE

TOP OF BANK



CROSS SECTION 17

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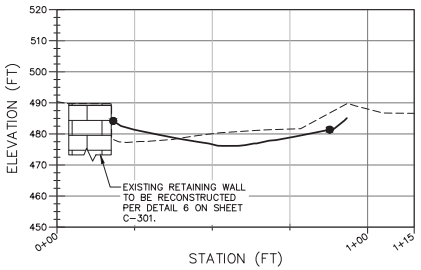

CROSS SECTION 18

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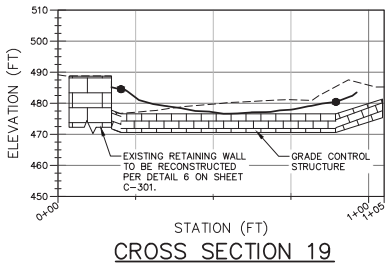
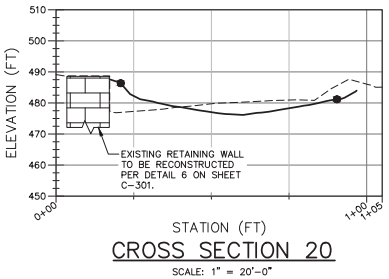


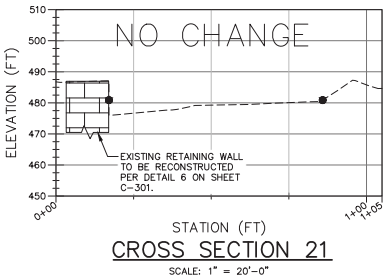
CROSS SECTION 19

SCALE: 1" = 20'-0"



CROSS SECTION 20

SCALE: 1" = 20'-0"



CROSS SECTION 21

SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 CROSS SECTIONS PROPOSED CONDITIONS (3 OF 3)

TOWN OF WAWARSING ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date
DECEMBER 2019

Scale
AS SHOWN

Sheet Number
C-115

Project Number
924.068.002

Plotted: Dec 18, 2019 - 2:11PM By: WBG
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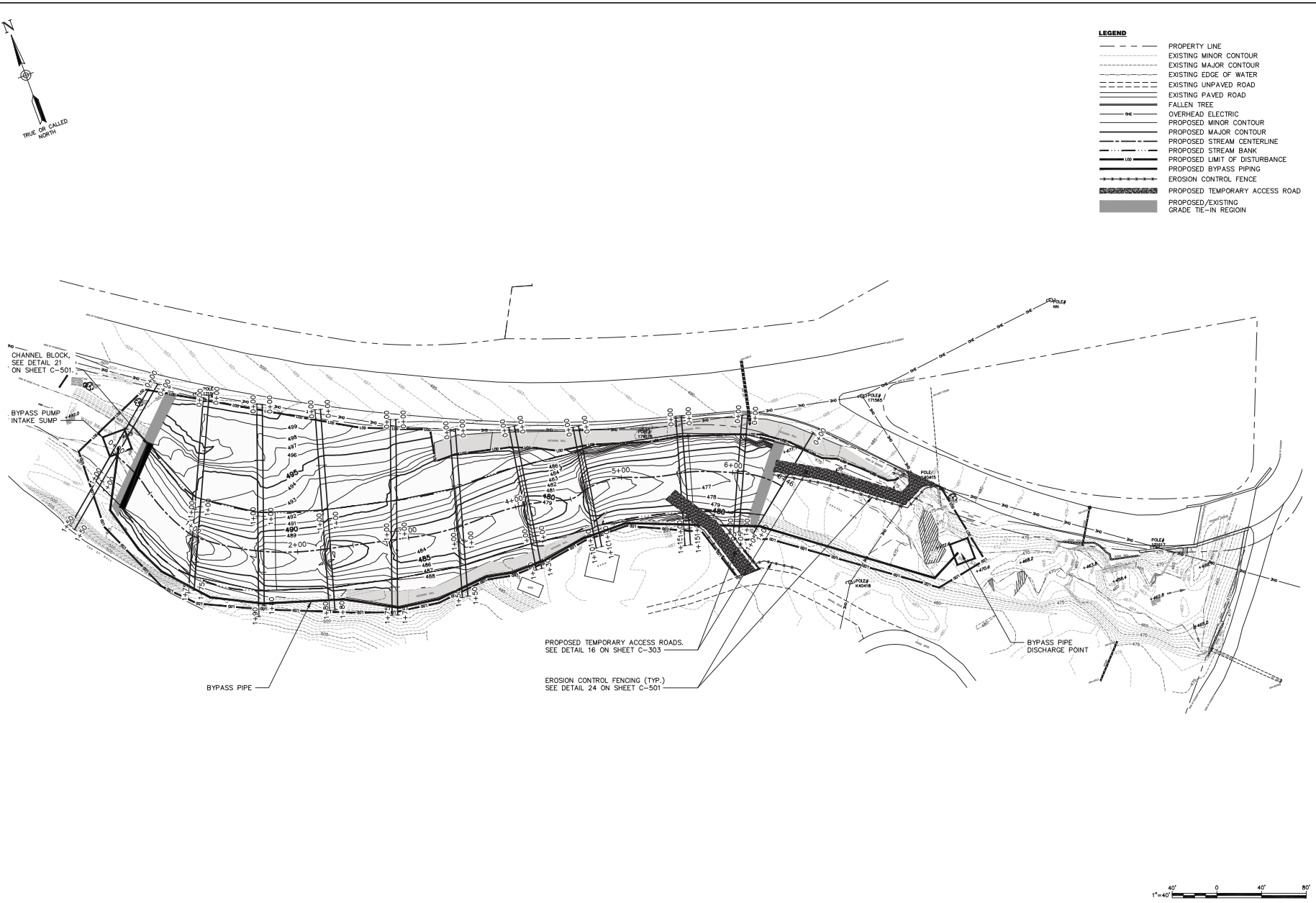
Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
924.068.002_Sht1_C113-C115-Cross Sections.dwg
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 EROSION AND SEDIMENT CONTROL PLAN

TOWN OF WAWARSING ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date
DECEMBER 2019

Scale
AS SHOWN

Sheet Number
C-116

Project Number
924.068.002

Plotted: Dec 18, 2019 - 2:12PM By: WBG
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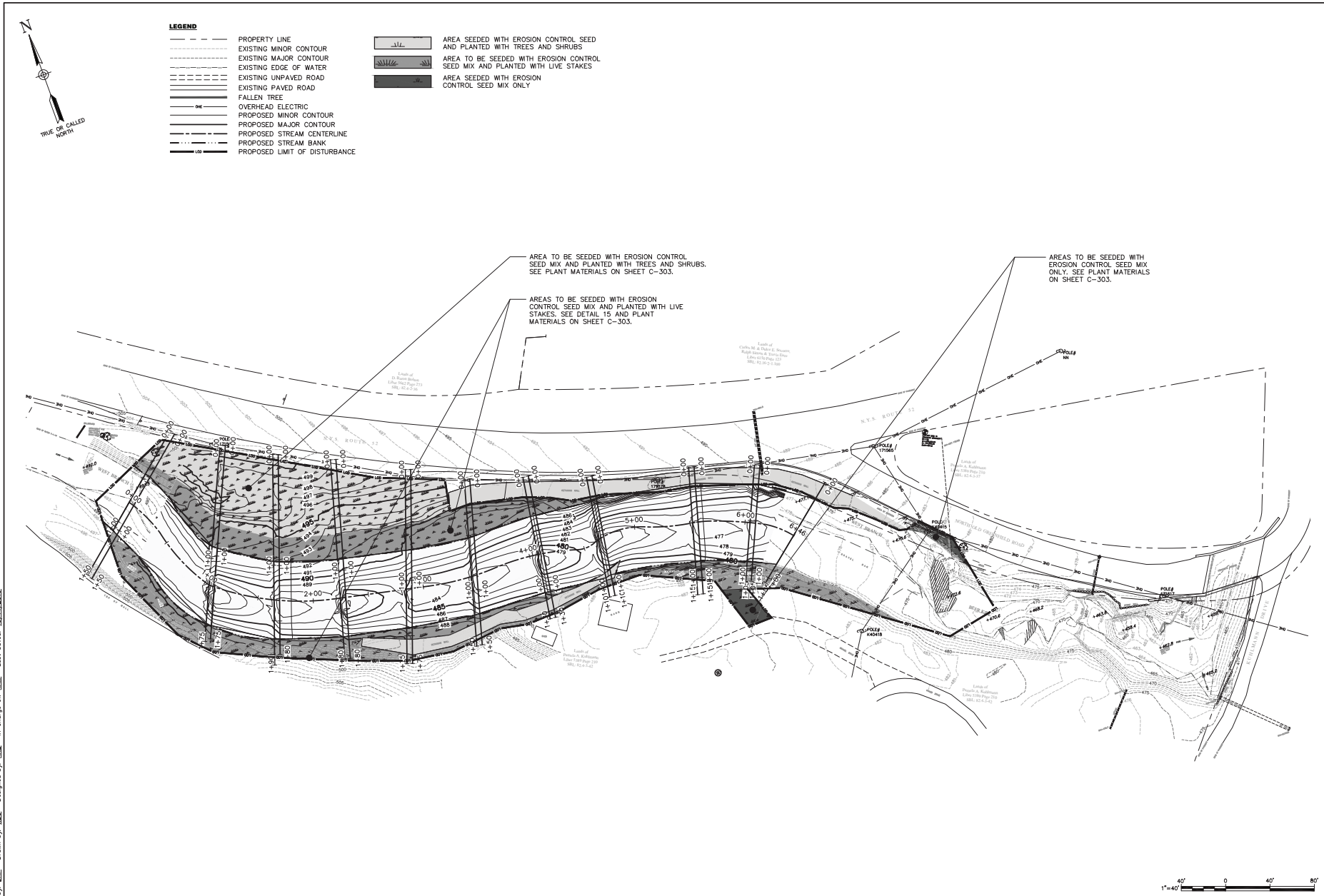
File Name: 924.068.002_Sht1_C116-EASC Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/14/2019



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1
PLANTING PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
DECEMBER 2019

Scale
AS SHOWN

Sheet Number
C-117

Project Number
924.068.002

Plotted: Dec 18, 2019 - 2:12PM By: MBG
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File Name: 924.068.002_Sht1_C117-Planting Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 10/14/2019

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- PROPERTY BOUNDARY
- EXISTING FENCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED PERMANENT EASEMENT
- STREAM BARB
- ROCKS
- GEOLOCATION MARKER
- CROSS VANE
- PROPOSED REVETMENT WALL
- EXISTING REVETMENT WALL
- PROPOSED TEMPORARY ACCESSWAY

APPROXIMATE STREAM PRACTICE LAYOUT		
POINT	NORTHING	EASTING
SB-1	1,053,271.71	504,022.52
SB-2	1,053,290.96	504,090.53
SB-3	1,053,316.12	504,166.83
SB-4	1,053,330.97	504,212.43
SB-5	1,053,340.13	504,257.30
SB-6	1,053,353.16	504,297.78
SB-7	1,053,364.05	504,347.19
W-1	1,053,346.91	504,268.87
W-2	1,053,368.37	504,358.61
CV-1	1,053,348.68	504,664.23
R-1	1,053,264.13	504,046.51
R-2	1,053,306.54	504,194.74
R-3	1,053,328.37	504,272.50
R-4	1,053,352.69	504,391.38

PERMANENT AND TEMPORARY IMAPACTS TO WATER RESOURCES	
TOTAL AREA OF DISTURBANCE (SF)	30,334
TOTAL LENGTH OF DISTURBANCE (LF)	788
TOTAL FILL BELOW OHWM (CY)	251
TOTAL CUT BELOW OHWM (CY)	197

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 2
STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-121
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:12PM By: WBG
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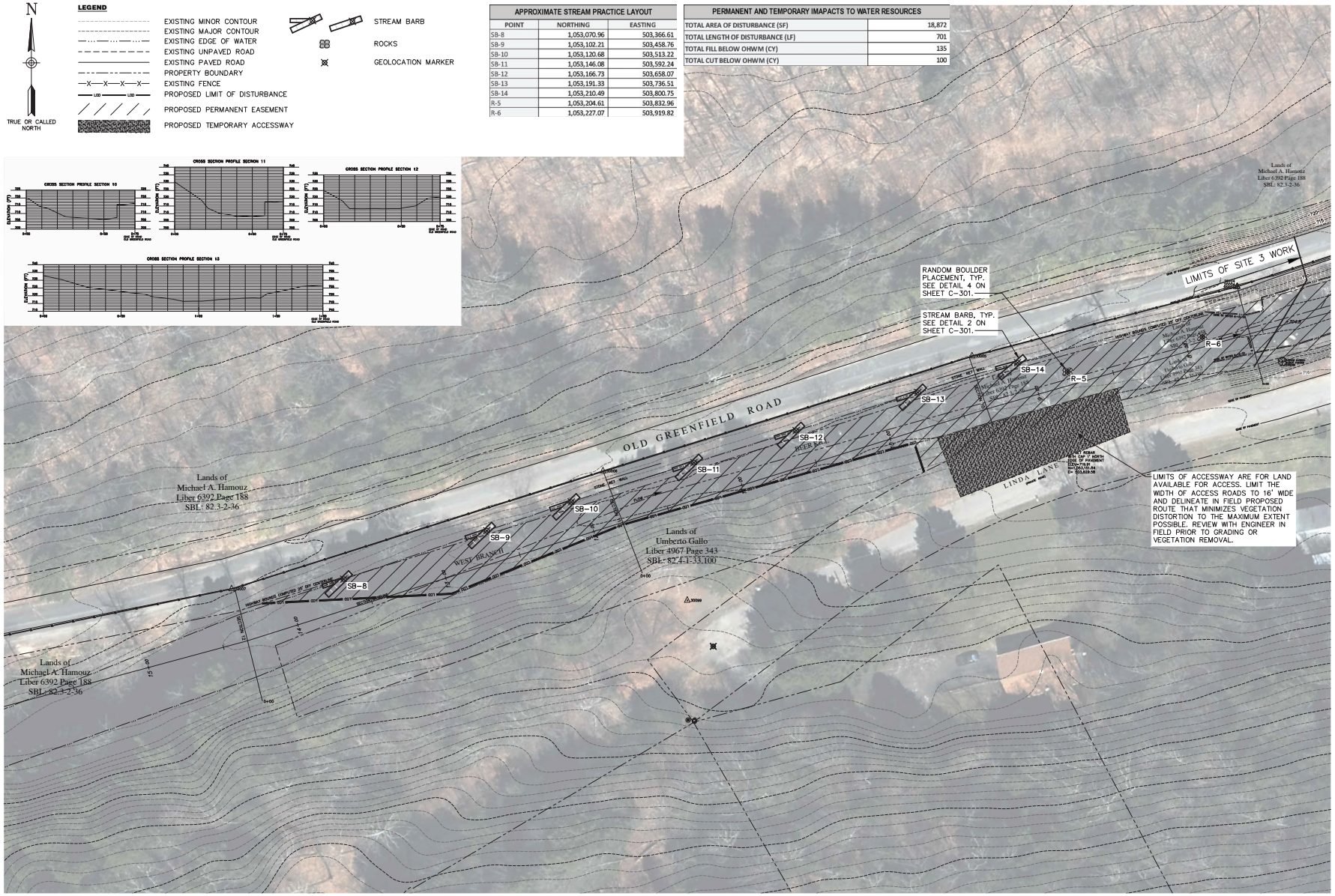

APPROXIMATE STREAM PRACTICE LAYOUT		
POINT	NORTHING	EASTING
SB-8	1,053,070.96	503,366.61
SB-9	1,053,102.21	503,458.76
SB-10	1,053,120.68	503,513.22
SB-11	1,053,146.08	503,592.24
SB-12	1,053,166.73	503,658.07
SB-13	1,053,191.33	503,736.51
SB-14	1,053,210.49	503,800.75
R-5	1,053,204.61	503,832.96
R-6	1,053,227.07	503,919.82

PERMANENT AND TEMPORARY IMAPACTS TO WATER RESOURCES	
TOTAL AREA OF DISTURBANCE (SF)	18,872
TOTAL LENGTH OF DISTURBANCE (LF)	701
TOTAL FILL BELOW OHWM (CY)	135
TOTAL CUT BELOW OHWM (CY)	100

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 3 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-131
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:12PM By: WBG
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N

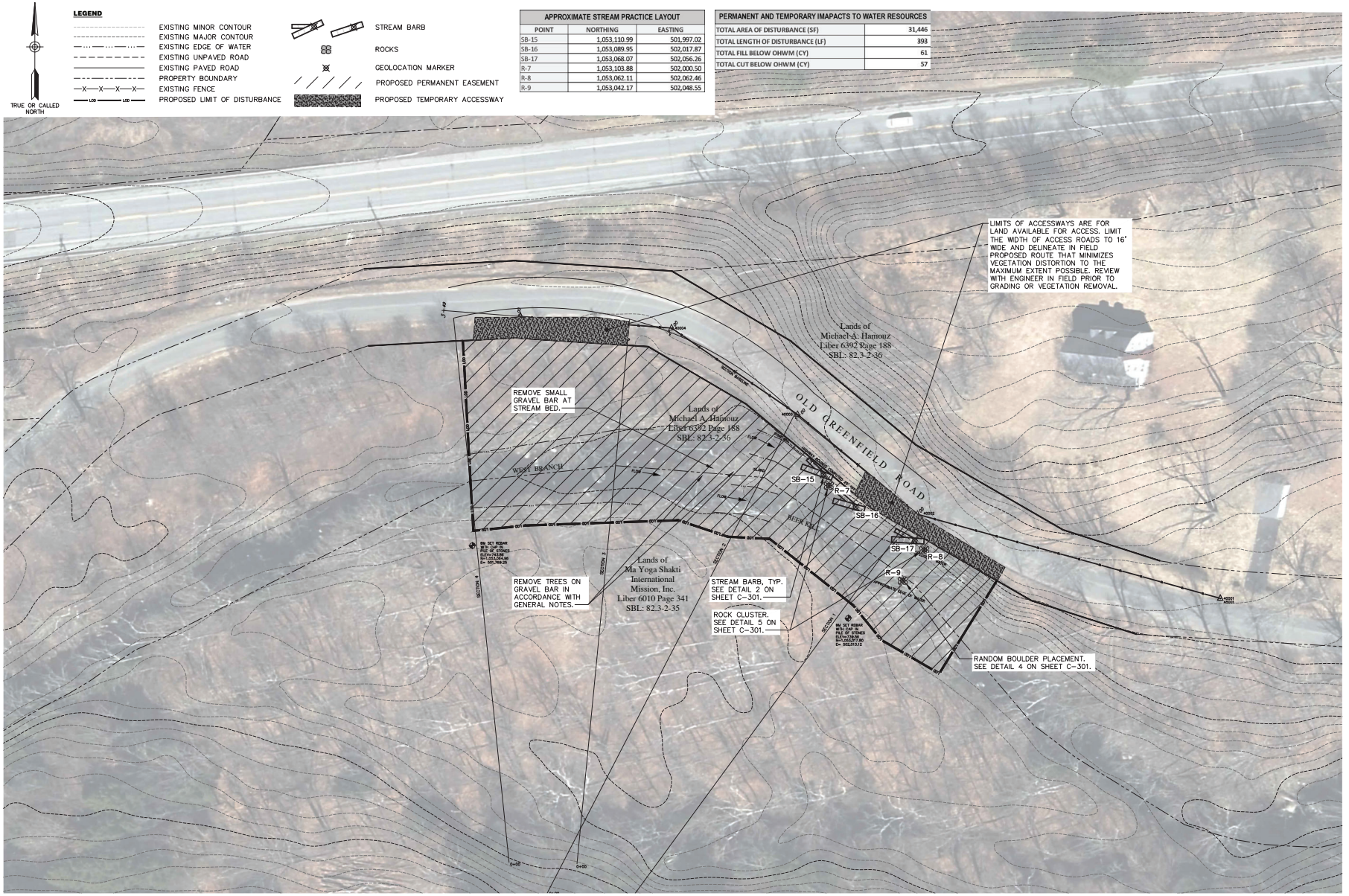
TRUE OR CALLED NORTH

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- PROPERTY BOUNDARY
- EXISTING FENCE
- PROPOSED LIMIT OF DISTURBANCE
- STREAM BARB
- ROCKS
- GEOLOCATION MARKER
- PROPOSED PERMANENT EASEMENT
- PROPOSED TEMPORARY ACCESSWAY

APPROXIMATE STREAM PRACTICE LAYOUT		
POINT	NORTHING	EASTING
SB-15	1,053,110.99	501,997.02
SB-16	1,053,089.95	502,017.87
SB-17	1,053,068.07	502,056.26
R-7	1,053,103.88	502,000.50
R-8	1,053,062.11	502,062.46
R-9	1,053,042.17	502,048.55

PERMANENT AND TEMPORARY IMAPACTS TO WATER RESOURCES	
TOTAL AREA OF DISTURBANCE (SF)	31,446
TOTAL LENGTH OF DISTURBANCE (LF)	393
TOTAL FILL BELOW OHWM (CY)	61
TOTAL CUT BELOW OHWM (CY)	57



1"=30' 30' 0 30' 60'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 4 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-141
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:12PM By: WBD
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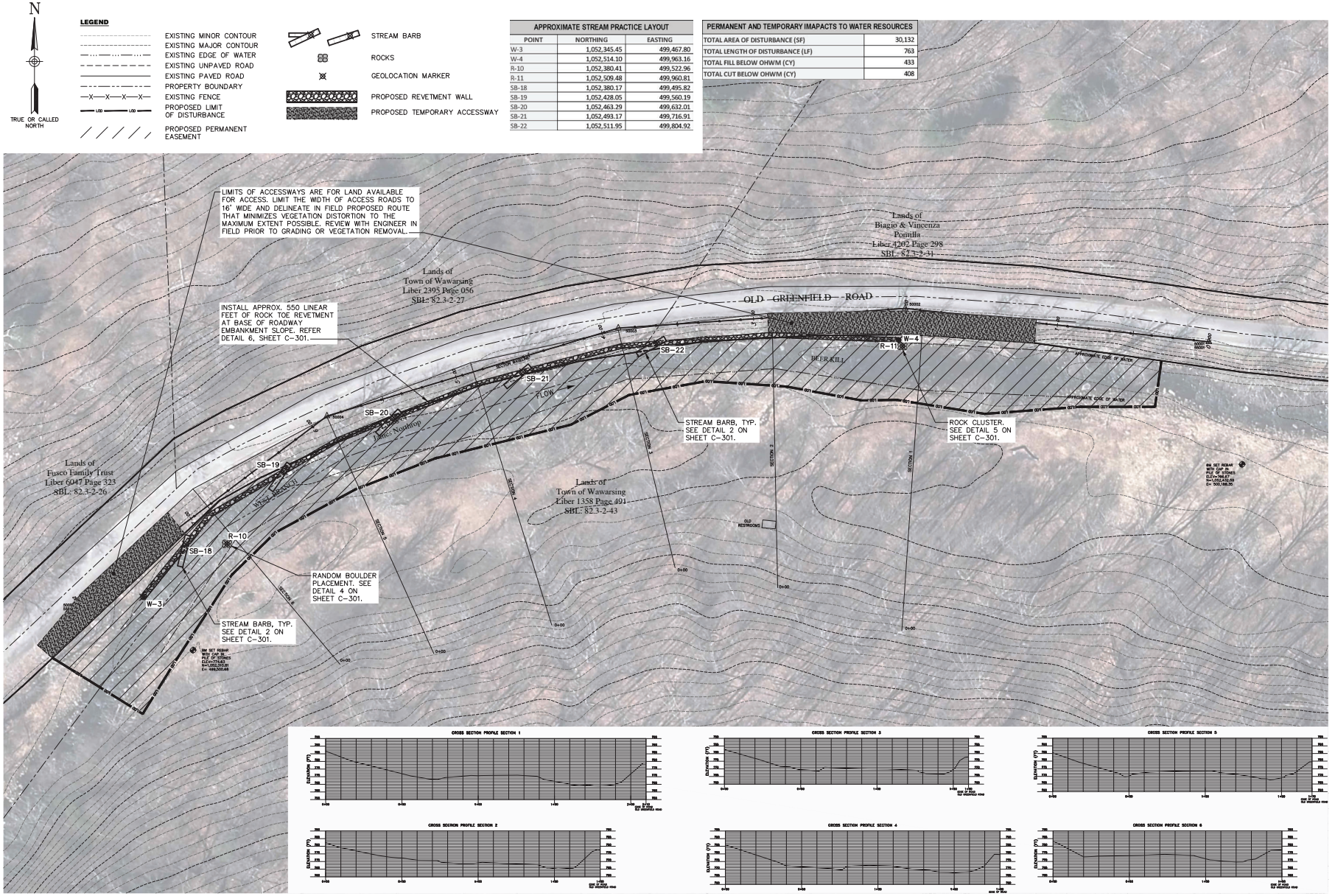

APPROXIMATE STREAM PRACTICE LAYOUT

POINT	NORTHING	EASTING
W-3	1,052,345.45	499,467.80
W-4	1,052,514.10	499,963.16
R-10	1,052,380.41	499,522.96
R-11	1,052,509.48	499,960.81
SB-18	1,052,380.17	499,495.82
SB-19	1,052,428.05	499,560.19
SB-20	1,052,463.29	499,632.01
SB-21	1,052,493.17	499,716.91
SB-22	1,052,511.95	499,804.92

PERMANENT AND TEMPORARY IMAPACTS TO WATER RESOURCES

TOTAL AREA OF DISTURBANCE (SF)	30,132
TOTAL LENGTH OF DISTURBANCE (LF)	763
TOTAL FILL BELOW OHWM (CY)	433
TOTAL CUT BELOW OHWM (CY)	408

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 5 STREAM RESTORATION PLAN

TOWN OF WAWARSING ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-151
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:13PM By: WBD
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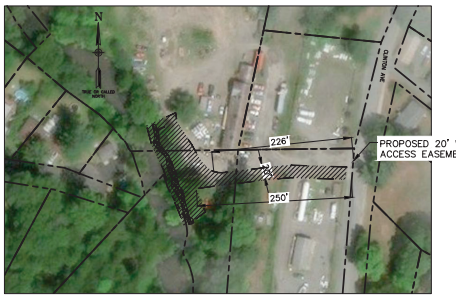
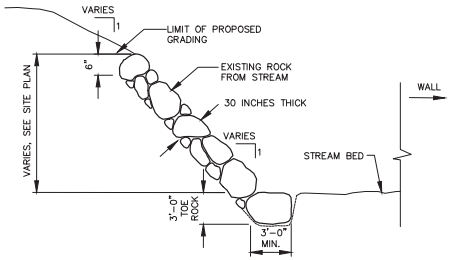


TEMPORARY ACCESS EASEMENT PLAN

SCALE 1"=100'±



HEAVY ROCK RIPRAP AND FILL DETAIL
TYPICAL CROSS-SECTION LOOKING UPSTREAM

NOT TO SCALE

LEGEND

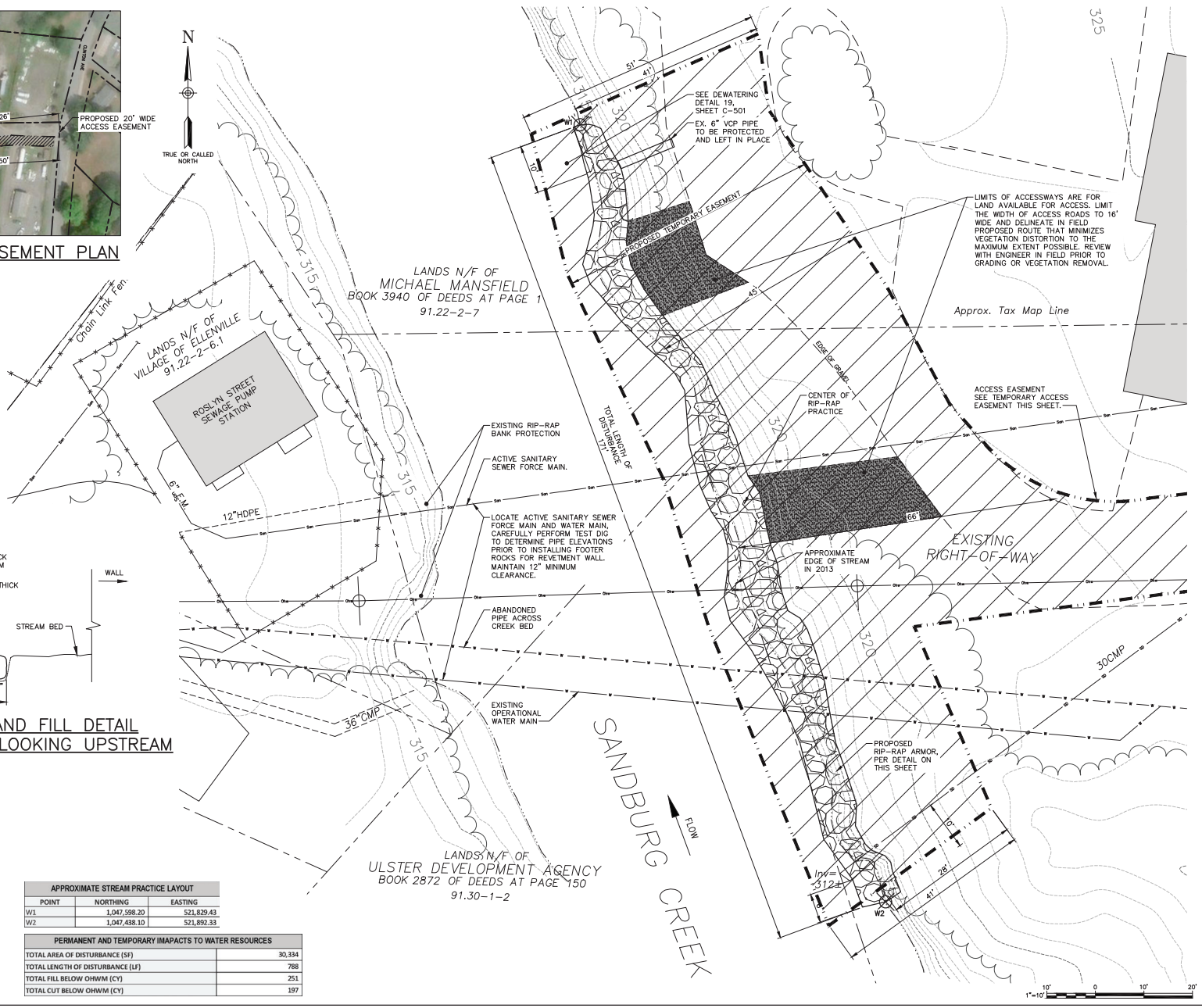
- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING EDGE OF GRAVEL
- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING STRUCTURE
- PROPOSED TEMPORARY EASEMENT
- PROPOSED TEMPORARY ACCESSWAY

NOTES:

1. THE INTENT OF RIP-RAP ARMORING IS TO STABILIZE EAST BANK OF SANDBURGH CREEK TO ELEVATION 216.0 AND LEAVE EXISTING TREES GREATER THAN 4-INCHES IN DIAMETER.
2. BASE MAP TAKEN FROM DATA PROVIDED FOR THE ROSLYN STREET PUMP STATION IMPROVEMENTS PROJECT BY AZIMUTH SURVEYING DATED AUGUST 2021, JUNE 2013, AND NOVEMBER 2013.

APPROXIMATE STREAM PRACTICE LAYOUT		
POINT	NORTHING	EASTING
W1	1,047,598.20	521,829.43
W2	1,047,438.10	521,892.33

PERMANENT AND TEMPORARY IMAPACTS TO WATER RESOURCES	
TOTAL AREA OF DISTURBANCE (SF)	30,334
TOTAL LENGTH OF DISTURBANCE (LF)	788
TOTAL FILL BELOW OHWM (CY)	251
TOTAL CUT BELOW OHWM (CY)	197



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 8
STREAM RESTORATION PLAN

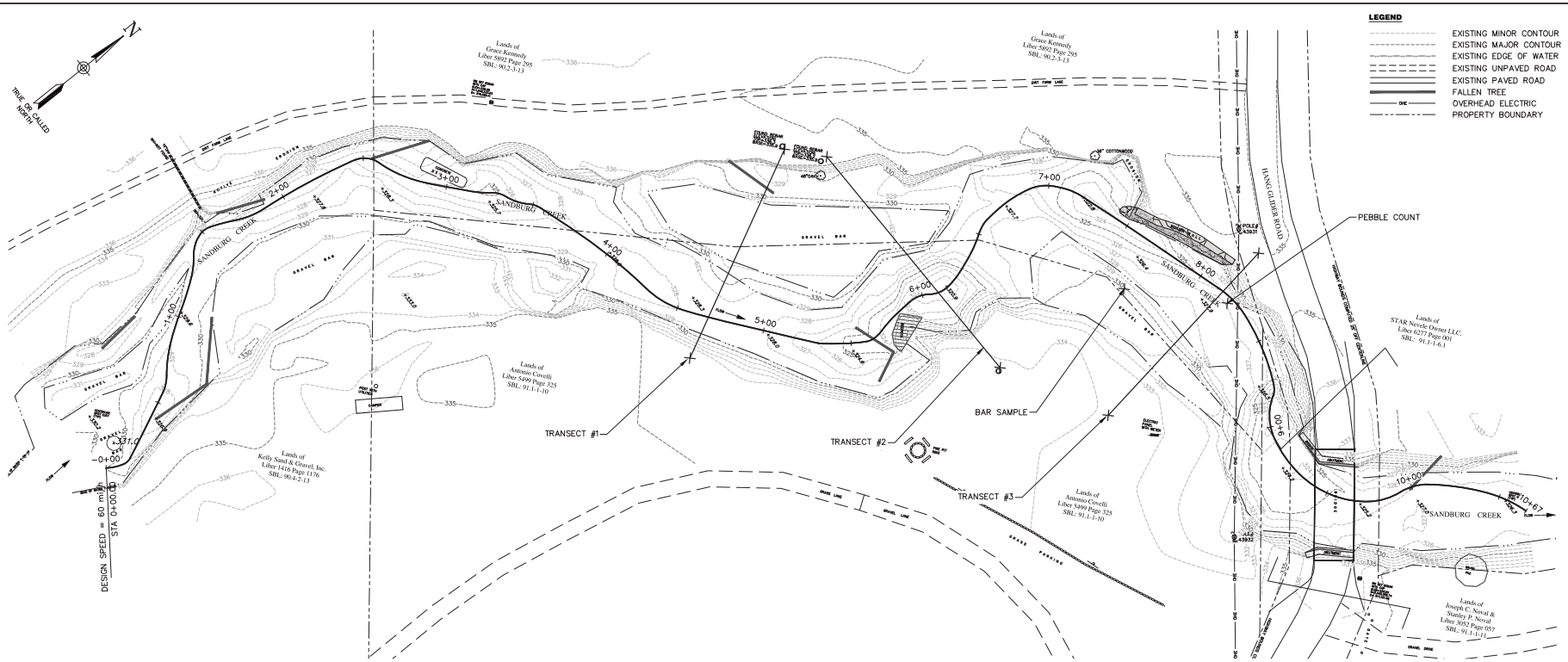
ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

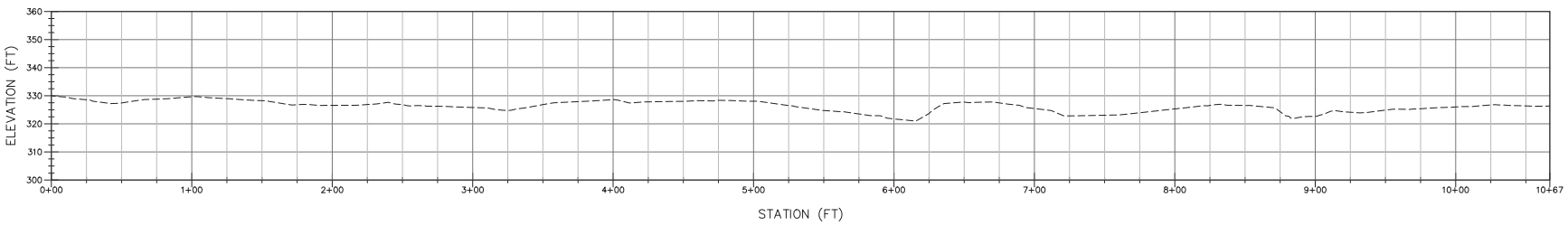
Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-161
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:17PM By: WBG
File Name: P:\Projects\924\068\Design\Civil\Plan Sheets\924068_7-Site8 (ID_1657135).dwg
Checked by: DMF Drawn by: BEC Designed by: BDG In Charge of: RAM Last Saved: 12/18/2019



EXISTING CONDITIONS PLAN

SCALE: 1" = 30'-0"



EXISTING CONDITIONS PROFILE

HORIZONTAL SCALE: 1" = 40'-0"
VERTICAL SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'
1"=30' 30' 0 30' 60'
1"=40' 40' 0 40' 80'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10
EXISTING CONDITIONS

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-171
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:13PM By: MBG
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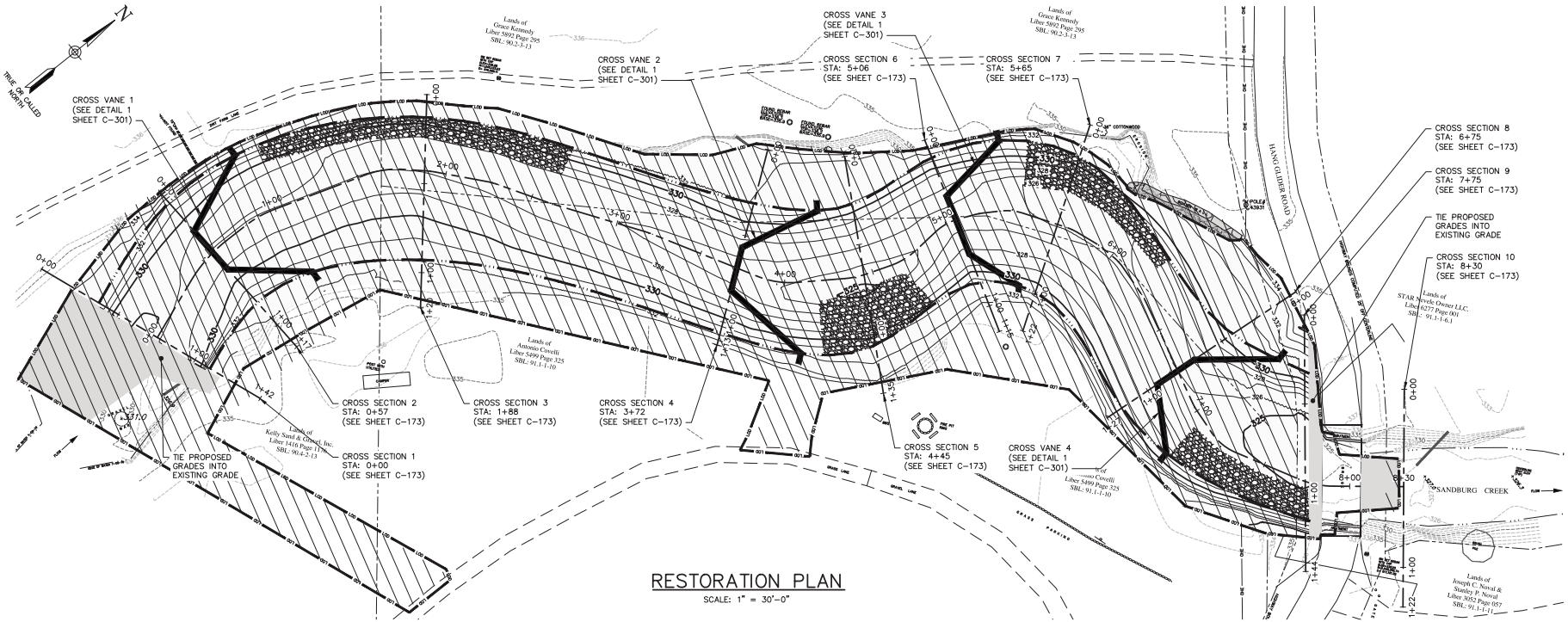
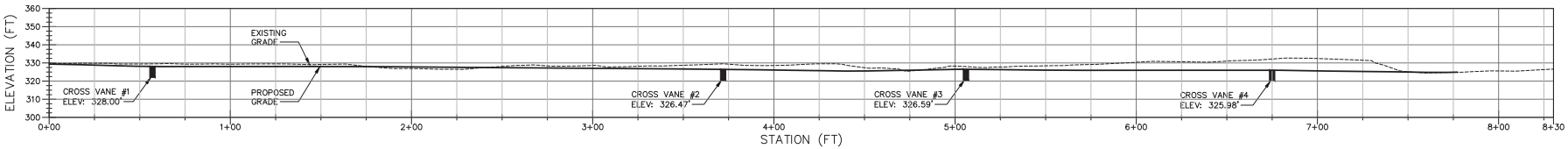
File Name: 924.068.002_Site10_C171-Existing Conditions.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019



RESTORATION PLAN

SCALE: 1" = 30'-0"



PROPOSED STREAM CENTERLINE PROFILE

SCALE: 1" = 30'-0"

CROSS VANE #1 LAYOUT (SEE DETAIL 1 ON SHEET C-301)

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,039,973.51	516,614.30	332.06
2	1,039,973.72	516,608.58	332.06
3	1,039,937.39	516,577.97	328.00
4	1,039,936.68	516,563.66	328.00
5	1,039,935.96	516,549.35	328.00
6	1,039,980.70	516,530.57	332.86
7	1,039,980.69	516,525.08	332.86

CROSS VANE #2 LAYOUT (SEE DETAIL 1 ON SHEET C-301)

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,040,154.37	516,819.33	331.88
2	1,040,159.13	516,815.68	331.88
3	1,040,150.62	516,763.57	326.47
4	1,040,160.62	516,756.07	326.47
5	1,040,170.62	516,748.58	326.47
6	1,040,216.05	516,759.04	331.09
7	1,040,219.62	516,754.21	331.09

CROSS VANE #3 LAYOUT (SEE DETAIL 1 ON SHEET C-301)

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,040,274.33	516,866.76	330.77
2	1,040,278.47	516,862.41	330.77
3	1,040,267.77	516,831.05	326.48
4	1,040,272.97	516,814.41	326.48
5	1,040,278.17	516,797.76	326.48
6	1,040,320.19	516,791.96	331.65
7	1,040,322.85	516,786.58	331.65

CROSS VANE #4 LAYOUT (SEE DETAIL 1 ON SHEET C-301)

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,040,278.48	516,988.70	328.60
2	1,040,284.35	516,987.46	328.60
3	1,040,304.49	516,954.20	326.01
4	1,040,316.94	516,955.28	326.01
5	1,040,329.40	516,956.35	326.01
6	1,040,366.59	516,985.70	330.93
7	1,040,372.43	516,984.32	330.93

CROSS SECTION	CROSS SECTION COORDINATES POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	STA: 0+00	1,039,856.00	516,512.58	335.86
	CENTERLINE	1,039,882.67	516,583.14	329.37
	END STA.	1,039,906.38	516,645.87	334.59
2	STA: 0+00	1,039,934.62	516,519.77	336.22
	CENTERLINE	1,039,936.91	516,565.36	328.00
	END STA.	1,039,940.46	516,636.17	334.54
3	STA: 0+00	1,040,085.96	516,571.09	335.52
	CENTERLINE	1,040,058.25	516,603.69	327.92
	END STA.	1,040,008.38	516,662.37	335.06
4	STA: 0+00	1,040,216.03	516,714.73	333.09
	CENTERLINE	1,040,161.04	516,755.88	326.47
	END STA.	1,040,125.27	516,782.64	334.54
5	STA: 0+00	1,040,247.28	516,744.71	332.64
	CENTERLINE	1,040,214.33	516,803.31	325.49
	END STA.	1,040,181.31	516,862.04	334.73

CROSS SECTION	CROSS SECTION COORDINATES POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
6	STA: 0+00	1,040,288.21	516,765.45	335.15
	CENTERLINE	1,040,273.86	516,811.39	326.48
	END STA.	1,040,253.79	516,875.65	334.00
7	STA: 0+01	1,040,366.01	516,816.79	334.48
	CENTERLINE	1,040,316.80	516,849.09	325.93
	END STA.	1,040,264.22	516,883.61	333.80
8	STA: 0+00	1,040,397.68	516,962.15	334.88
	CENTERLINE	1,040,318.19	516,955.31	326.01
	END STA.	1,040,270.70	516,951.23	333.83
9	STA: 0+00	1,040,393.25	516,975.27	335.11
	CENTERLINE	1,040,335.24	517,048.58	324.82
	END STA.	1,040,303.88	517,088.20	335.99
10	STA: 0+00	1,040,410.98	517,042.86	335.01
	CENTERLINE	1,040,376.59	517,085.35	326.61
	END STA.	1,040,334.04	517,137.91	334.86

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- FALLEN TREE
- OHE OVERHEAD ELECTRIC
- PROPERTY BOUNDARY
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED STREAM CENTERLINE
- PROPOSED STREAM BANK
- LOD PROPOSED LIMIT OF DISTURBANCE
- PROPOSED PERMANENT EASEMENT
- PROPOSED RIP-RAP
- PROPOSED GRADE TIE-IN REGION

NOTE:

1. COORDINATES REFERENCE DATUM NAD83 NEW YORK STATE PLANES, CENTRAL ZONE, US SURVEY FOOT.

30' 0 30' 60'
1"=30'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10 RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-172
Project Number: 924.068.002

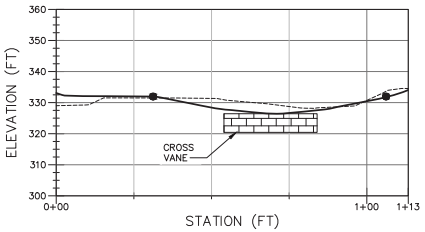
Plotted: Dec 18, 2019 - 2:17PM By: MBG
File Name: 924.068.002_Site10_C172-Restoration Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 10/28/2019

LEGEND

EXISTING GRADE

PROPOSED GRADE

TOP OF BANK



CROSS SECTION 4

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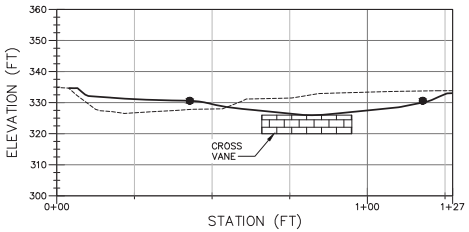

CROSS SECTION 8

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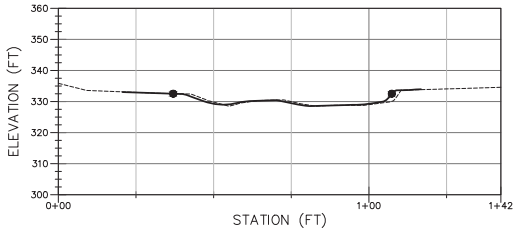
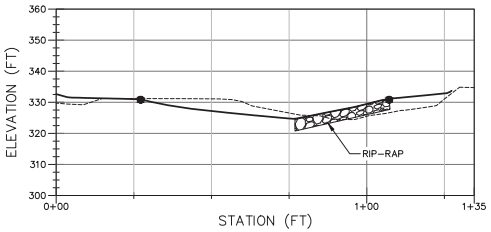


CROSS SECTION 1

SCALE: 1" = 20'-0"



CROSS SECTION 5

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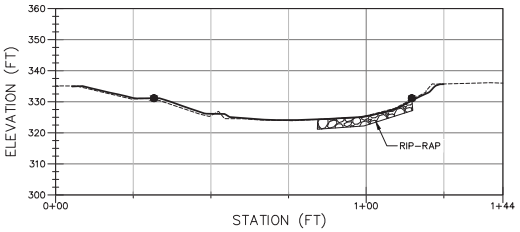
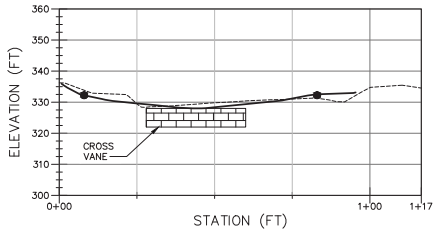


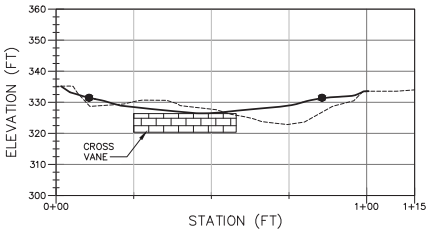
CROSS SECTION 9

SCALE: 1" = 20'-0"



CROSS SECTION 2

SCALE: 1" = 20'-0"



CROSS SECTION 6

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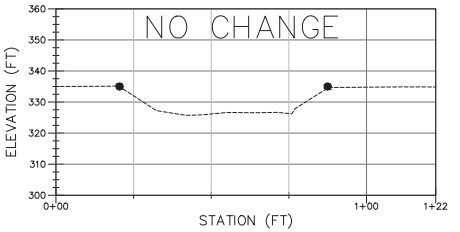
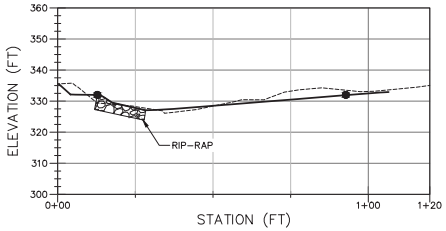


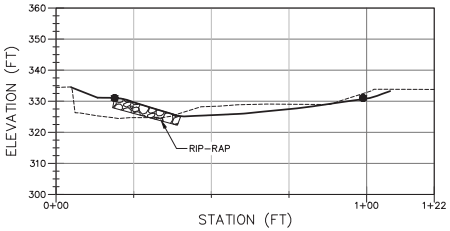
CROSS SECTION 10

SCALE: 1" = 20'-0"



CROSS SECTION 3

SCALE: 1" = 20'-0"



CROSS SECTION 7

SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10 CROSS SECTIONS PROPOSED CONDITIONS

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019

Scale: AS SHOWN

Sheet Number: C-173

Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:17PM By: MBG
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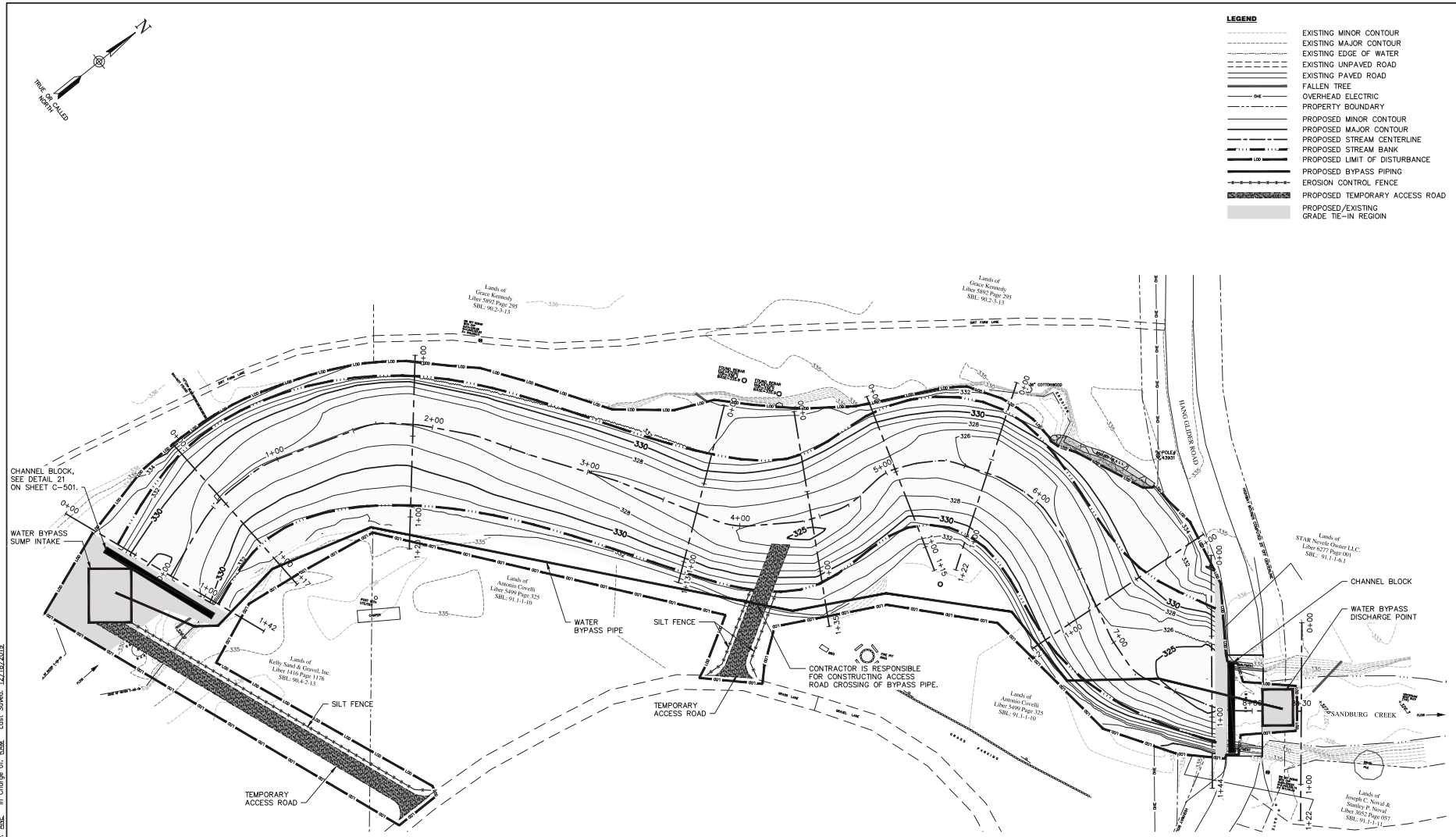
File Name: 924.068.002_Site10_C173-Cross Sections.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10
EROSION AND SEDIMENT CONTROL PLAN

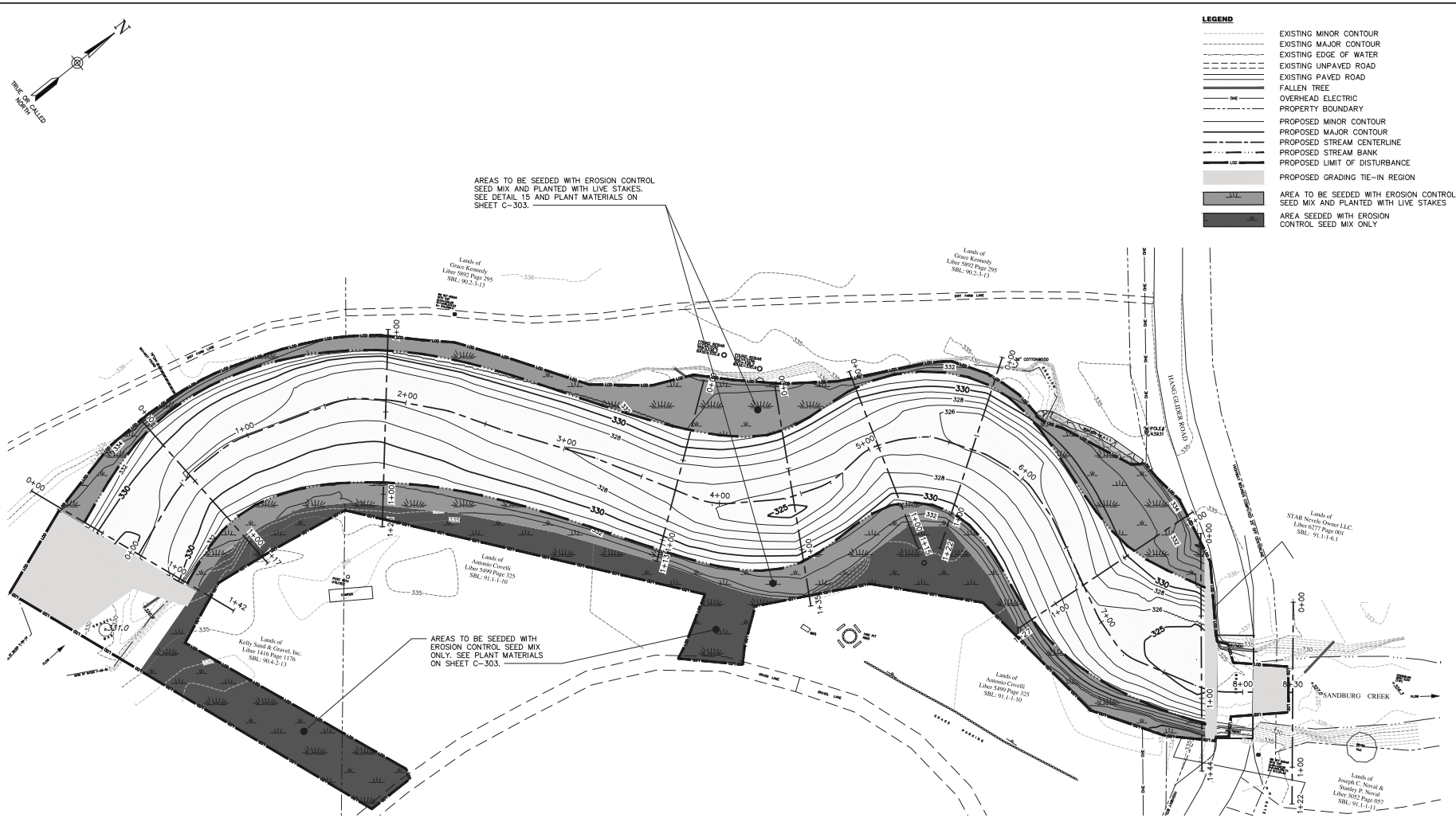
TOWN OF WAWARSING — ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-174
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:23PM By: WBG
File Name: V:\924\active\924.068.002_Site10_Ellenville\4523-8927-PROPOSED\4-PLANS\LES3000-185399\185340(2)\924.068.002_Site10_C174-E&SC Plan (3) 185340(2).dwg
Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 12/18/2019



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10 PLANTING PLAN

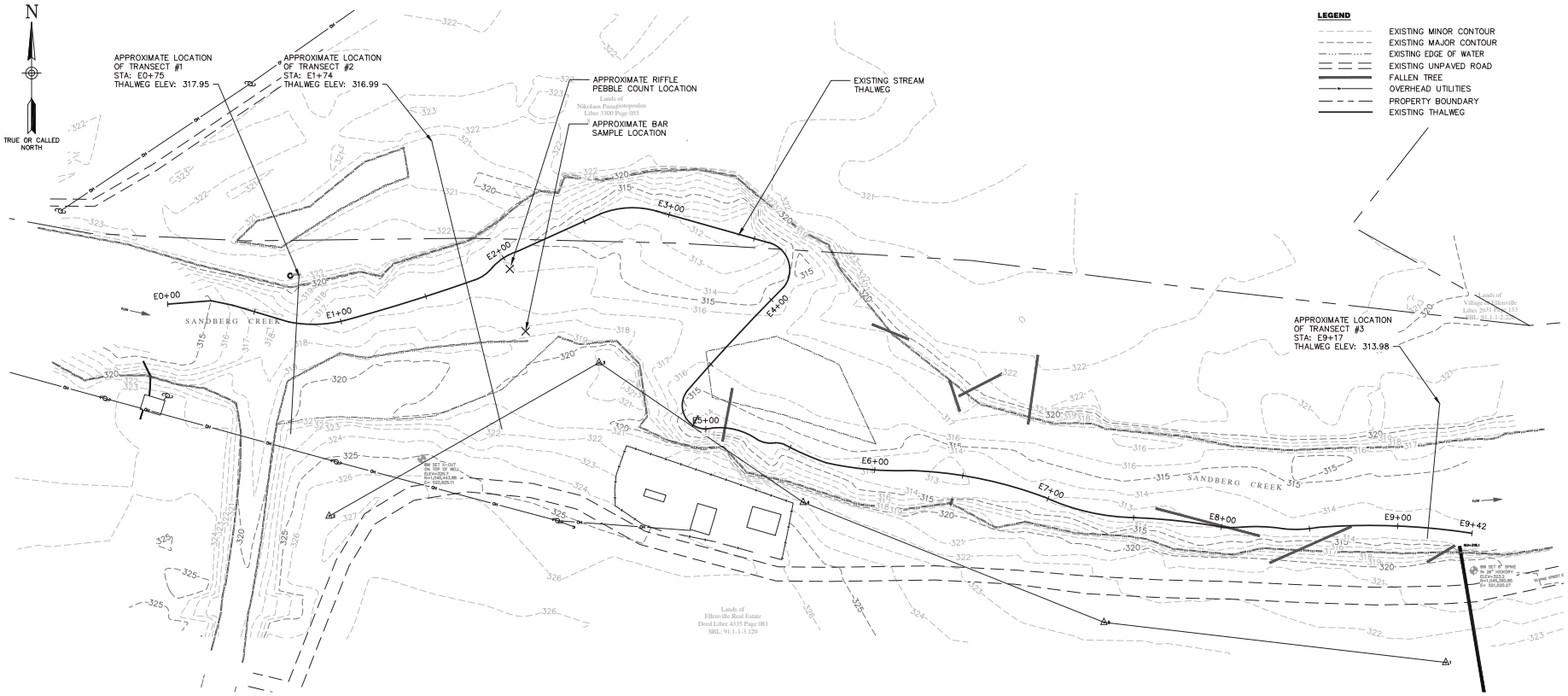
ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

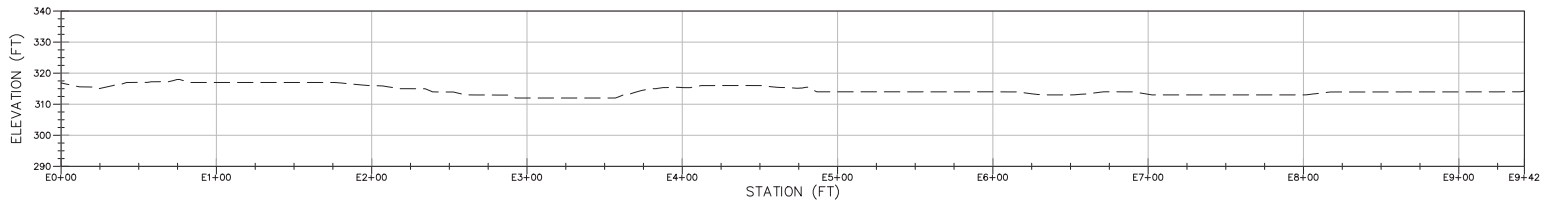
Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-175
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:19PM By: WBG
File Name: V:\924.068\CAD\427402-8527-PRP\DSG\427402-8527-PRP(DSG-44).dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 12/18/2019



EXISTING CONDITIONS PLAN

SCALE: 1" = 30'-0"



EXISTING CONDITIONS PROFILE

HORIZONTAL SCALE: 1" = 40'-0"
VERTICAL SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'
1"=30' 30' 0 30' 60'
1"=40' 40' 0 40' 80'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13
EXISTING CONDITIONS

TOWN OF WAWARSING — ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-181
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:14PM By: MBG
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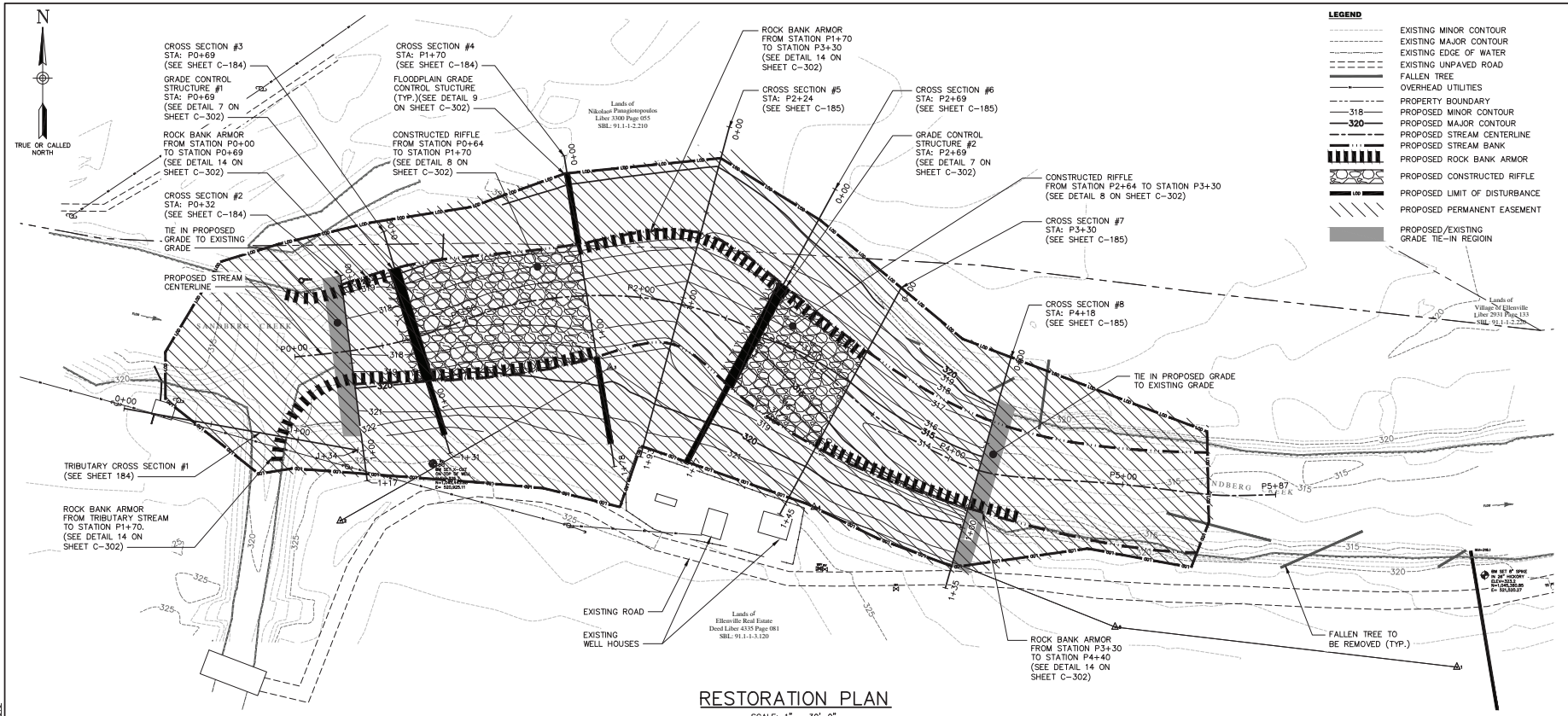
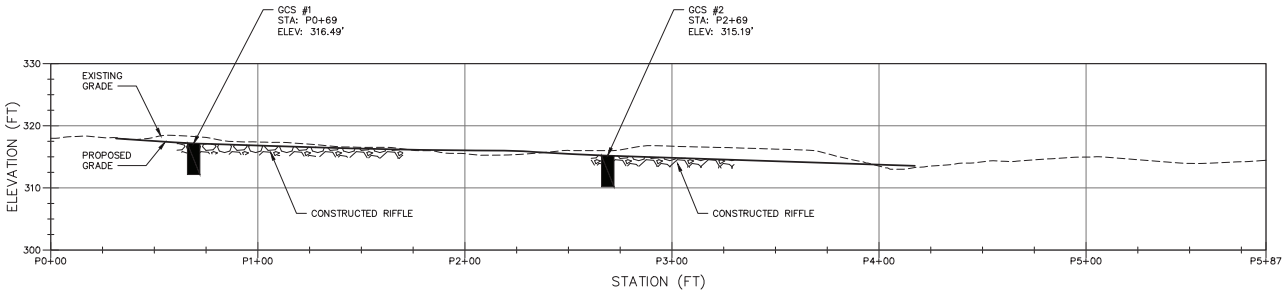
Xref: Vaults(ID 1657192)-4123-8027-4R0D5C6A4F40\(ID 1657000-1657989)\1657182\)\\924.068.002_Site13_C181-Existing Conditions.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
File Name: 924.068.002_Site13_C181-Existing Conditions.dwg
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 9/24/2019



RESTORATION PLAN

SCALE: 1" = 30'-0"

CROSS SECTION COORDINATES				
CROSS SECTION	POINT	NORTHING	EASTING	ELEV.(FT)
1	STA: 0+00	1,045,475.09	520,750.43	322.88
	CENTERLINE	1,045,459.80	520,836.12	318.99
	END STA.	1,045,451.53	520,882.42	324.45
2	STA: 0+00	1,045,550.38	520,872.78	322.00
	CENTERLINE	1,045,507.77	520,878.34	317.96
	END STA.	1,045,434.34	520,887.89	326.00
3	STA: 0+00	1,045,575.20	520,897.20	322.00
	CENTERLINE	1,045,515.32	520,915.15	317.15
	END STA.	1,045,449.91	520,934.75	324.13
4	STA: 0+00	1,045,618.13	520,999.38	322.00
	CENTERLINE	1,045,538.94	521,012.17	316.17
	END STA.	1,045,442.25	521,027.78	322.62
5	STA: 0+00	1,045,634.43	521,092.79	322.05
	CENTERLINE	1,045,534.03	521,065.73	315.98
	END STA.	1,045,447.79	521,042.48	321.72
6	STA: 0+00	1,045,599.17	521,152.67	321.27
	CENTERLINE	1,045,518.79	521,108.92	315.18
	END STA.	1,045,443.91	521,068.17	322.24
7	STA: 0+00	1,045,543.48	521,190.05	322.09
	CENTERLINE	1,045,484.63	521,158.52	314.51
	END STA.	1,045,415.26	521,121.37	324.50
8	STA: 0+00	1,045,503.82	521,252.14	322.00
	CENTERLINE	1,045,440.05	521,233.97	313.33
	END STA.	1,045,373.56	521,215.03	323.32



PROPOSED STREAM CENTERLINE PROFILE

HORIZONTAL SCALE: 1" = 30'-0"
VERTICAL SCALE: 1" = 10'-0"

10' 0 10' 20'
1"=10'
30' 0 30' 60'
1"=30'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

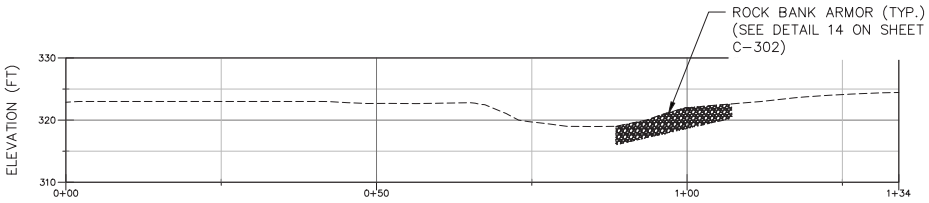
DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-183
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:14PM By: WBG
Path: Z:\Projects\924\924.068\Design\Civil\Drawings\Site13_C183-Restoration Plan.dwg
File Name: 924.068.002_Site13_C183-Restoration Plan.dwg
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/28/2019
Project No.: 924.068.002
Project Name: Ellenville Stream Restoration Phase 2&3

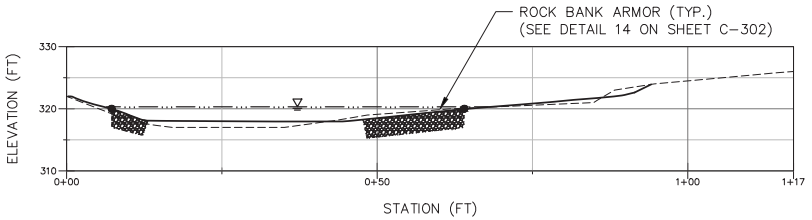
LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- TOP OF BANK
- BANKFULL WATER ELEVATION



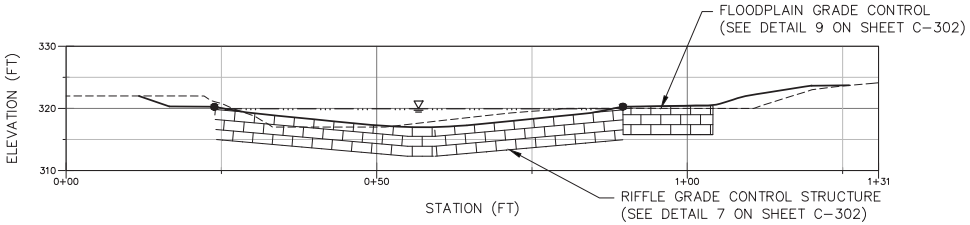
CROSS SECTION 1

SCALE: 1" = 10'-0"



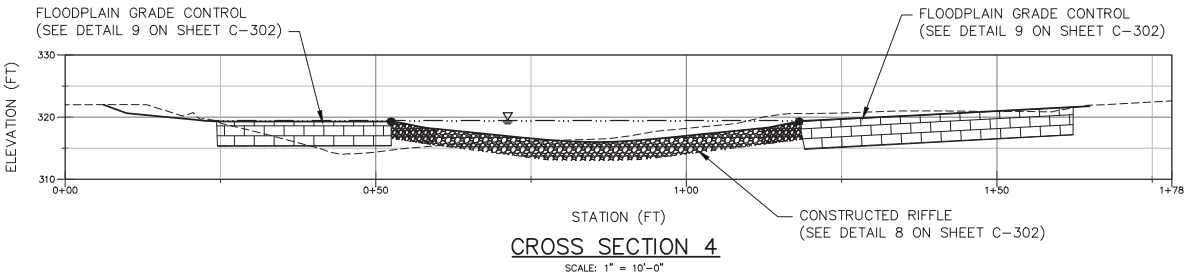
CROSS SECTION 2

SCALE: 1" = 10'-0"



CROSS SECTION 3

SCALE: 1" = 10'-0"



CROSS SECTION 4

SCALE: 1" = 10'-0"

1"=10' 10' 0 10' 20'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 CROSS SECTIONS PROPOSED CONDITIONS (1 of 2)

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

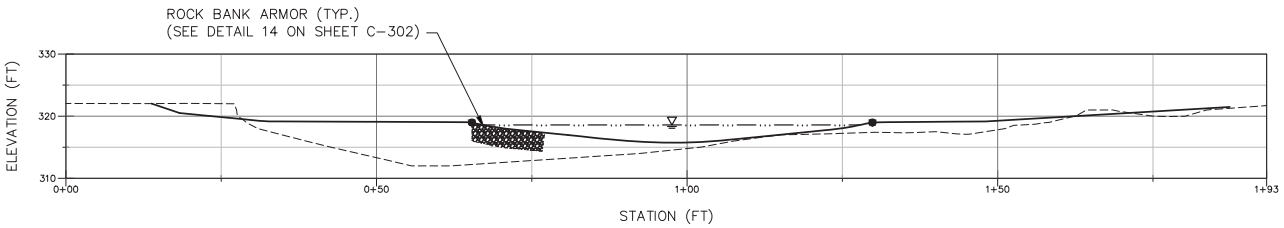
DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-184
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:14PM By: WBG
File Name: 924.068.002_Site13_Cross Sections.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/14/2019

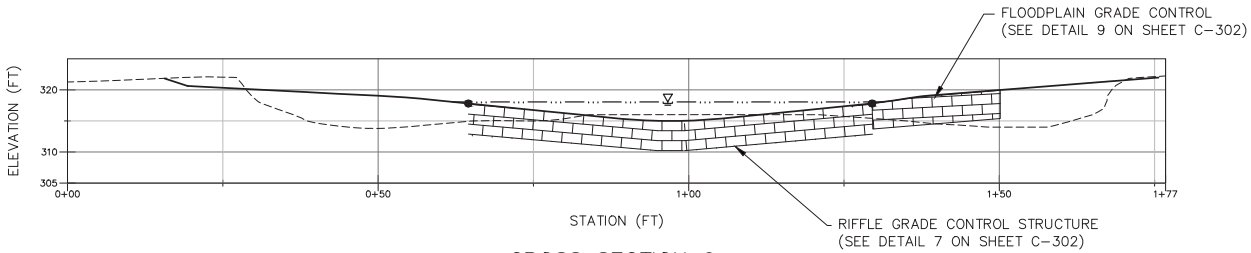
LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- TOP OF BANK
- BANKFULL WATER ELEVATION



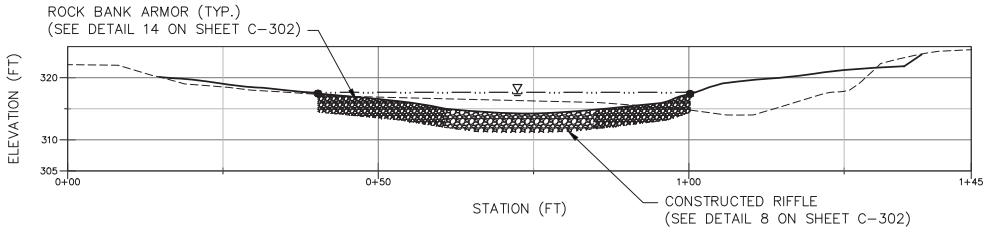
CROSS SECTION 5

SCALE: 1" = 10'-0"



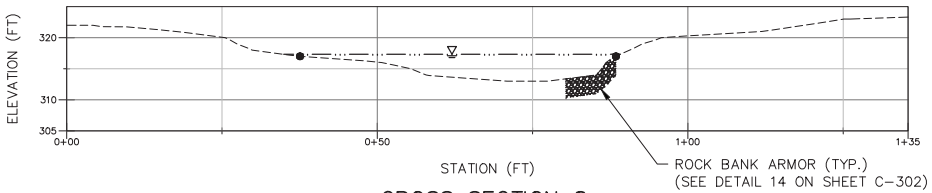
CROSS SECTION 6

SCALE: 1" = 10'-0"



CROSS SECTION 7

SCALE: 1" = 10'-0"



CROSS SECTION 8

SCALE: 1" = 10'-0"

1"=10' 10' 0 10' 20'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 CROSS SECTIONS PROPOSED CONDITIONS (2 OF 2)

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-185
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:14PM SYR By: WBG
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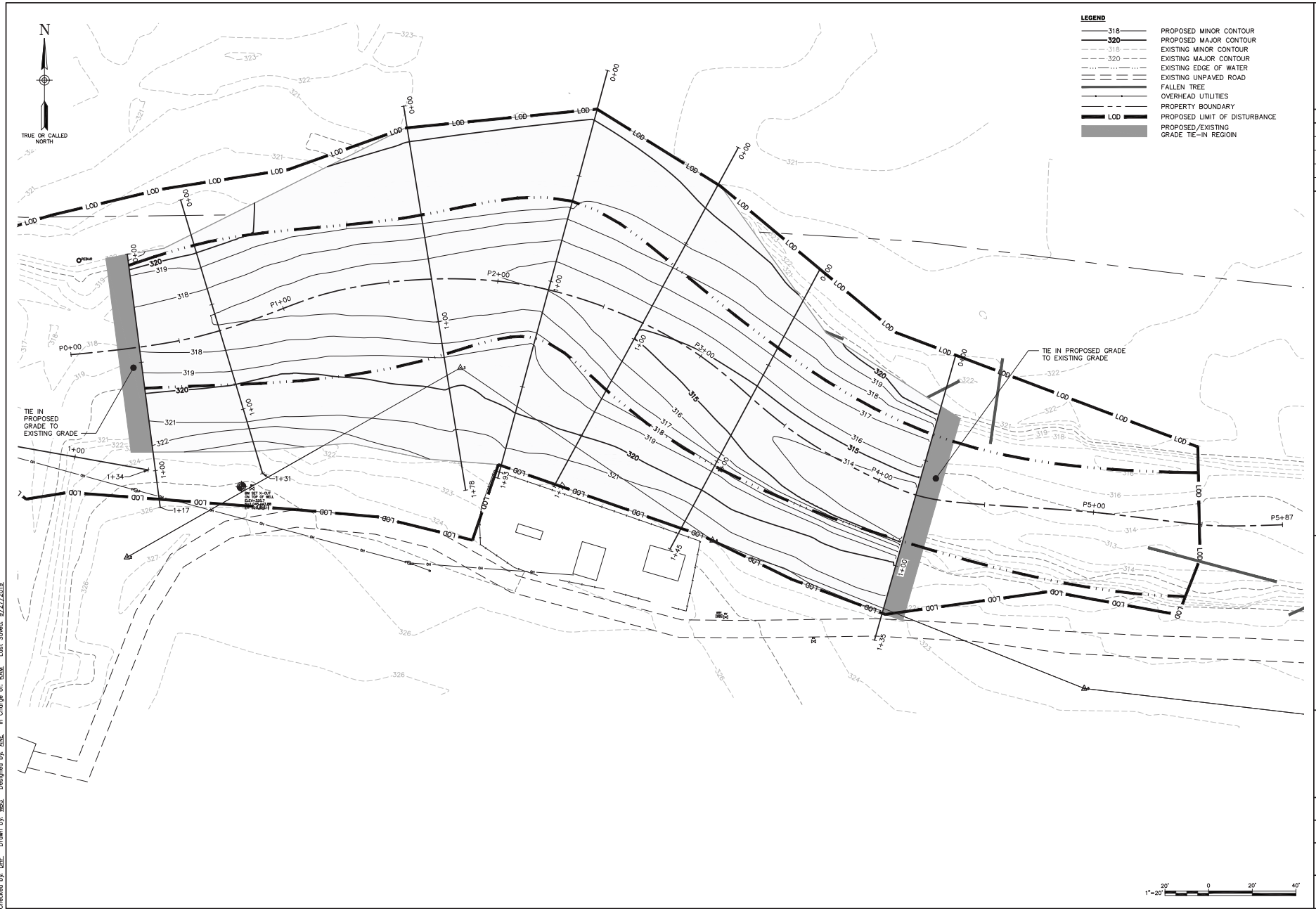
File Name: 924.068.002_Site13_Cross Sections.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: BAM Last Saved: 10/14/2019



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 GRADING PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

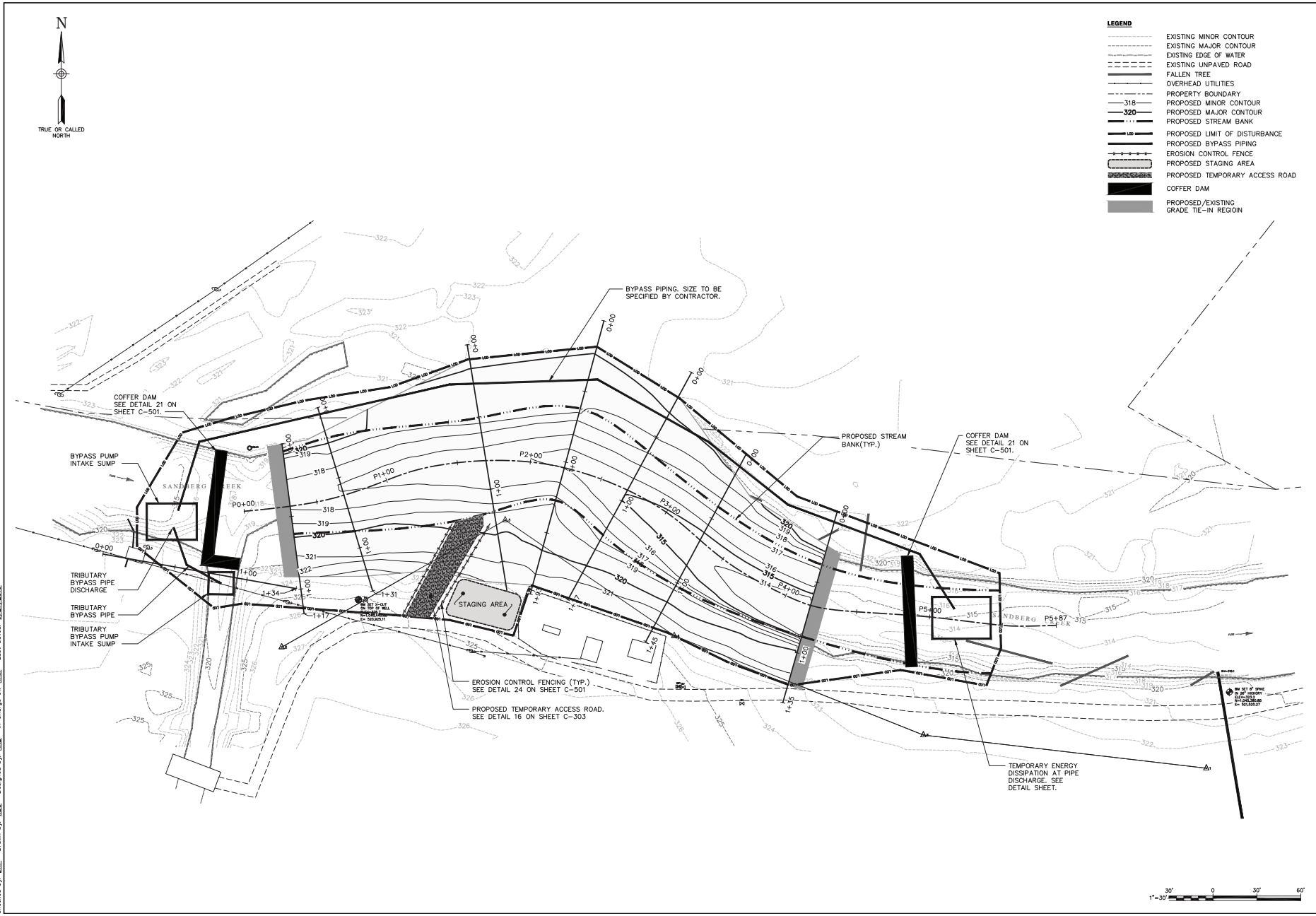
Date
DECEMBER 2019

Scale
AS SHOWN

Sheet Number
C-186

Project Number
924.068.002

Plotted: Dec 18, 2019 - 2:15PM By: MBG
Z:\B&L Vault\Projects\2017\924-068\CAD\167200-167999\167207_\924.068.002_Site13_C186-Grading Plan (ID 167207).dwg
File Name: 924.068.002_Site13_C186-Grading Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 9/21/2019



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 BYPASS PUMPING AND EROSION AND SEDIMENT CONTROL PLAN

TOWN OF WAWARSING — ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

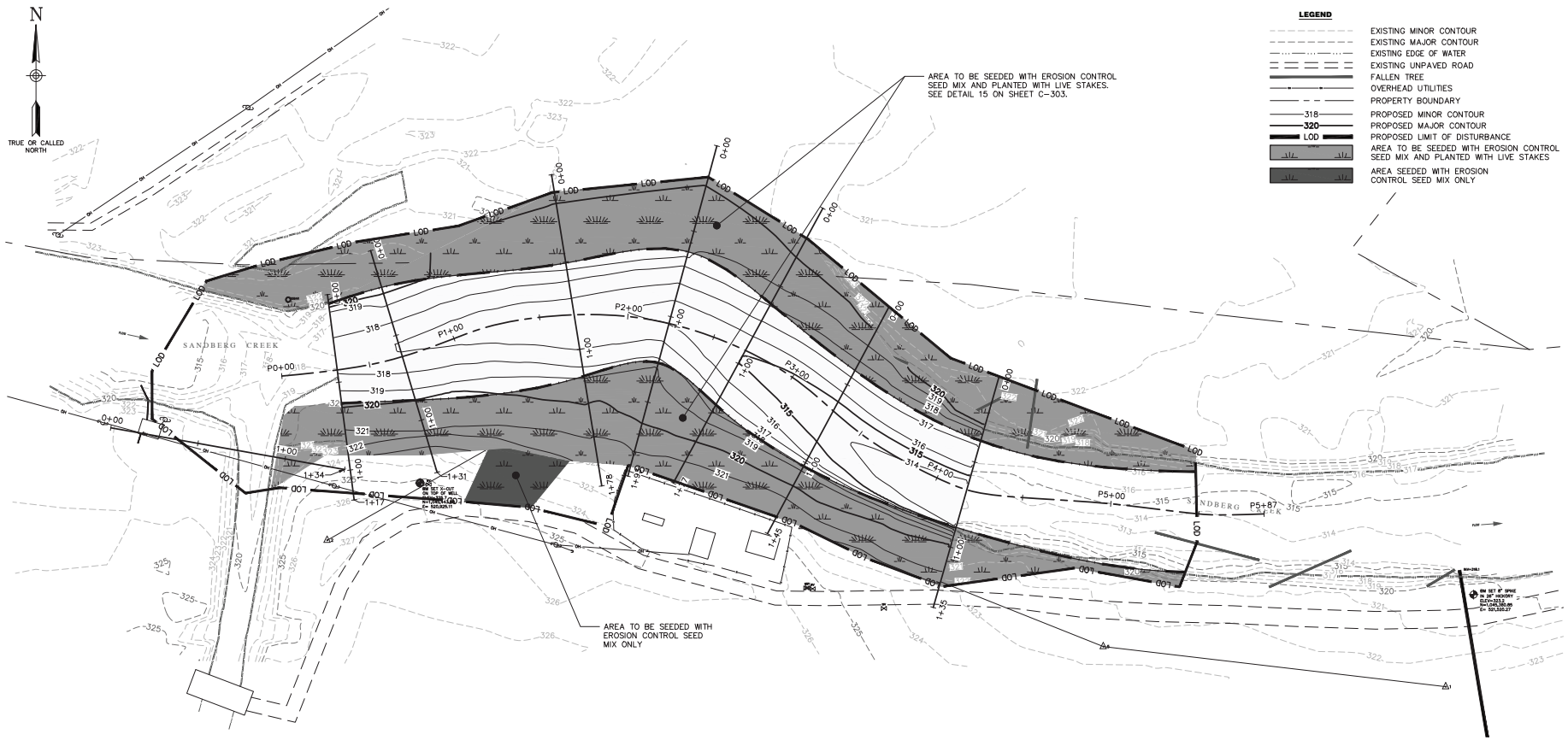
Date: DECEMBER 2019

Scale: AS SHOWN

Sheet Number: C-187

Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:15PM By: MBG
File Name: P:\Projects\924.068.002\167200-167299\167200\Civil\924.068.002_Site13_C187-Bypass Pumping and E&SC Plan (ID 167200).dwg
Project Name: Ellenville Stream Restoration Phase 2&3
Project No.: 924.068.002
Last Saved: 9/27/2019
In Charge of: RAM
Designed by: ANE
Drawn by: MBG
Checked by: DMF



SPECIFIED RIPARIAN RESTORATION SEED MIX

15%	VIRGINIA WILD RYE, PA ECOTYPE (ELYMUS VIRGINICUS, PA ECOTYPE)	2%	NEW YORK IRONWEED, PA ECOTYPE (VERNONIA NOVEBORACENSIS, PA ECOTYPE)
15%	RIVERBANK WILD RYE, PA ECOTYPE (ELYMUS RIPARIUS, PA ECOTYPE)	2%	COMMON MILKWEED, PA ECOTYPE (ASCLEPIAS SYRIACA, PA ECOTYPE)
15%	LITTLE BLUESTEM, 'CAMPER' (SCHIZACHYRIUM SCOPARIUM)	2%	SOFT RUSH (JUNCUS EFFUSUS)
15%	FOX SEDGE, PA ECOTYPE (CAREX VULPINOIDEA, PA ECOTYPE)	1%	CANADA GOLDENROD, PA ECOTYPE (SOLIDAGO CANADENSIS), PA ECOTYPE)
10%	DEER TONGUE, 'TIOGA' (PANICUM CLANDESTINUM (DICHANTHELIUM C.), 'TIOGA')	1%	WRINKLELEAF GOLDENROD, PA ECOTYPE (SOLIDAGO RUGOSA), PA ECOTYPE)
10%	BIG BLUESTEM, 'NIAGARA' (ANDROPOGON GERARDII, 'NIAGARA')	1%	SPOTTED JOE PYE WEED, PA ECOTYPE (EUPATORIUM MACULATUM, PA ECOTYPE)
3%	BLUE VERVAIN (VERBENA HASTATA)	1%	BONESET, PA ECOTYPE (EUPATORIUM PERFOLIATUM, PA ECOTYPE)
3%	BLACK-EYED SUSAN, PA ECOTYPE (RUDBECKIA HIRTA)	1%	WHITE SNAKEROOT, PA ECOTYPE (AGERATINA ALTISSIMA, PA ECOTYPE)
2%	NEW ENGLAND ASTER, PA ECOTYPE (SYMPHYOTRICHUM NOVAE-ANGLIAE)	1%	INDIANHEMP, PA ECOTYPE (APOCYNUM CANNABINUM, PA ECOTYPE)

SPECIFIED COVER CROP/TEMPORARY SEED MIX

50%	CEREAL RYE (SECALE CEREAL)
50%	OATS (AVENA SATIVA)

SPECIFIED LIVE STAKES

60%	SILKY WILLOW (SALIX SERICIA)
10%	PUSSY WILLOW (SALIX DISCOLOR)
10%	SILKY DOGWOOD (CORNUS AMOMUM)
10%	RED ELDERBERRY (SAMBUCUS RACEMOSA)
10%	BLACK ELDERBERRY (SAMBUCUS CANADENSIS)

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 PLANTING PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-188
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:15PM By: WBG
Path: Vault\924\924.068\002\4623-8927-HRUP\CAD\167200-167299\167282\924.068.002_Site13_C188-Planting Plan (ID 167282).dwg
File Name: 924.068.002_Site13_C188-Planting Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019

Governor's Office of Storm Recovery

ANDREW M. CUOMO
Governor

EARLY NOTICE OF A PROPOSED ACTIVITY
IN A 100-YEAR FLOODPLAIN
ELLENVILLE STREAM BANK RESTORATION PROJECT
ELLENVILLE, ULSTER COUNTY, NEW YORK
January 16, 2020

To: All interested Agencies, Groups, and Individuals:

This is to give notice that the Governor's Office of Storm Recovery (GOSR), an office of the New York State Housing Trust Fund Corporation (HTFC), has received an application from The Village of Ellenville to fund Ellenville Stream Bank Restoration Project (hereinafter, the "Proposed Activity") and is conducting an evaluation as required by Executive Order 11988 and Executive Order 11990 in accordance with U.S. Department of Housing and Urban Renewal (HUD) regulations (24 CFR Part 55). There are three primary purposes for this notice. First, to provide the public an opportunity to express their concerns and share information about the Proposed Activity. Second, adequate public notice is an important public education tool. The dissemination of information about floodplains and wetlands facilitates and enhances governmental efforts to reduce the risks associated with the occupancy and modification of these special areas. Third, as a matter of fairness, when the government determines it will participate in actions taking place in floodplains or wetlands, it must inform those who may be put at greater or continued risk. Funding for the Proposed Activity will be provided by the HUD Community Development Block Grant – Disaster Recovery (CDBG-DR) program for storm recovery activities in New York State.

The Ellenville Stream Bank Restoration ("Proposed Activity") is needed to address widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing caused by Hurricane Irene and Tropical Storm Lee. This Project is expected to provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town.

The Proposed Activity entails design and construction of stream bank restoration improvements within and along the West Branch of Beer Kill and Sandburg Creek at eight sites within the town of Wawarsing and village of Ellenville, in Ulster County, New York. The flood mitigation measures include the construction of floodplain benches with rock and/or wood revetment (to reduce cutting at the toe of bank), the lowering of the height, angle and overall erosion hazard of the eroding streambanks; installation of in-stream rock structures to provide grade control and reduce the erosive force of water upon streambanks (by directing flood flows to the center of the stream channel); and the reconnection of floodplains in select areas (to reduce channel confinement and the corresponding increases in flood velocity that contribute to flood severity). The stream bank restoration measures may be implemented in phases.

Some sites will require sedimentation removal to restore the natural channel and improve quality and flows. The Proposed Activity will restore severely eroded/damaged sites to be capable of withstanding large flood events. All of the eight locations are located in Riverine wetlands, river channels (Sites 1, 2, 3, 4, 5, 8, 10

and 13). Approximately 2.8 acres of West Branch of Beer Kill river channel will be modified and approximately 1.4 acres of Sandburg Creek river channel will be modified.

The Proposed Activity will result in temporary impacts to an estimated 7.5 acres of 100-Year Floodplain (temporary roads and staging area) and will result in permanent impacts to1.9 acres of 100-Year Floodplain. Permanent impacts will consist of vegetated floodplain bench, rip-rap, revetment wall, rock flood toe revetment, rock flood grade control and permanent gravel access roads. These features are described in the design plans available at https://stormrecovery.ny.gov/environmental-docs. The function of the floodplain will not change. The flow of water will be slowed and there will be no increase to impermeable surfaces, although the surfaces will change to include rip-rap, etc. Additionally, the constructed features will prevent erosion and restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality as well as reconnection of floodplains.

For the duration of the Proposed Activity site controls will be in place to minimize water quality impacts. At each site requiring in-stream entry, temporary cofferdams will be utilized to work in the dry with a turbidity curtain. For the duration of the Project Activity pollution control measures will be utilized to minimize the potential pollution releases. Pollutants such as fuels, lubricants, and wash water will not be discharged into or near streams or into natural or man-made channels. Re-fueling will be completed away from regulated resources. These measures will protect surface water and wetlands. Additionally, all work will be completed in accordance with permit conditions that include surface water and wetland protection measures.

Prior to construction, the Village of Ellenville/Town of Wawarsing must apply for and receive a Floodplain Development Permit from the appropriate local floodplain administrator.

Floodplain maps based on the FEMA Base Flood Elevation Maps and wetlands maps based on the National Wetland Inventory and New York State Department of Environmental Conservation (NYSDEC) data have been prepared and are available for review with additional information at http://www.stormrecovery.ny.gov/environmental-docs.

Any individual, group, or agency may submit written comments on the Proposed Activity or request further information by contacting Lori A. Shirley, Certifying Officer, Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, NY 12260; email: NYSCDBG_DR_ER@nyshcr.org. Standard office hours are 9:00 AM to 5:00 PM Monday through Friday. For more information call 518-474-0755. All comments received by January 31, 2020 will be considered.

Distribution List for Ellenville Stream Bank Project

FEDERAL AGENCIES

By Overnight Express

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Mr. Mike Poetzsch
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By U.S. Mail

Ms. Therese J. Fretwell, Enviro. Officer, R 1 & 2
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Ms. Robyn Niver
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New York Field Office
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Distribution List for Ellenville Stream Bank Project

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Office of Parks, Recreation and Historic Preservation
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Marlene White
Supervisor, Mitigation Projects
NYS Division of Homeland Security & Emergency Services
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Albany, NY 12242

Jeffrey Kaplan, Mayor
Village of Ellenville
2 Elting Lane
Ellenville, NY 12428

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Interim Village Manager
Village of Ellenville
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Ellenville, NY 12428

Brian A. Schug
Local Floodplain Manager
Village of Ellenville
2 Elting Lane
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Traci Jeter, Village Clerk
Village of Ellenville
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Ellenville, NY 12428

Nina Postupack
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Ulster County Office Building
244 Fair Street
Kingston, NY 12401

Distribution List for Ellenville Stream Bank Project

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Ellenville, NY 12428

Andrea Noval, Town Clerk
Town of Wawarsing
108 Canal Street
PO Box 671
Ellenville, NY 12428

Shawangunk Journal
¼ page

EARLY NOTICE OF A PROPOSED ACTIVITY
IN A 100-YEAR FLOODPLAIN
ELLENVILLE STREAM BANK RESTORATION PROJECT
ELLENVILLE, ULSTER COUNTY, NEW YORK
January 16, 2020

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Governor's Office of Storm Recovery

AFFIDAVIT OF PUBLICATION

STATE OF NEW YORK
COUNTY OF NEW YORK

Alison Bloom being duly sworn hereby declares and says, that she is the Advertising Account Executive responsible for placing the attached advertisement in: the Shawangunk Journal newspaper for Miller Advertising Agency, Inc.; located in New York, NY, and that the New York State Governor's Office of Storm Recovery advertisement, of which the annexed is a true copy, has been published in the said publication on the following issue date(s): January 16, 2020.

Alison Bloom

Subscribed to and Sworn before me

This 4th day of February, 2020

Notary Public

Donna Perez
Notary Public State Of New York
No. 01PE6151365
Qualified In New York County
Commission Expires August, 14th - 2022

New Supervisor Suggests Dissolving Ethics Board

By Karen Mattern

MAMAKATING – There's a new board in town for Mamakating. Council members who had served with retired supervisor Bill Herrmann either did not run for re-election or were defeated at the polls last November. The "old guard" may now become the loyal opposition, if the January 14 town board meeting is any indication.

The agenda item that sparked the most discussion was the proposal to eliminate the ethics board. This group monitors potential conflicts of interest that decision makers holding office in the town might have. It was established six years ago under the administration of Bill Herrmann, apparently to help root out the perceived corruption that had plagued the previous administration of Harold Baird.

The new town board, under Supervisor Janet Lybolt, is proposing to shift the function of the ethics board to the county. Lybolt reasoned that the governor had mandated shared services with a view to cut costs. She also felt that the county would be more impartial, and that they had previously handled complaints for many years.

When the floor opened up for public comments, Samara Ferris, who currently serves on the ethics board, strongly disagreed. "What is the benefit of taking the power from the people of the town?" she asked, reminding the council members that they would not be saving any money, since those who serve on the ethics board receive no pay. Shifting the function of the ethics board to the county might even be an additional cost to them.

As to the efficacy of county oversight, Holly Roche, also a member of the ethics board, had quite a dim view. "Unfortunately, the supervisor before the last one was convicted of voter fraud," she said. "This town has had major ethical issues in the past that the county did not resolve."

Councilman John Lacey agreed with Lybolt's position. "The benefit of going to the county," he said, "is to be more fair to the individual. We won't have to name-call each other, or be accused of being partial to our friends."

However, former deputy supervisor Brenda Giraldi felt strongly that the responsibility to maintain an ethical local government lies firmly in the hands of the people governed. "The ethics board is crucial to this town," she concluded.

New board members at Tuesday's meeting. Photo by Karen Mattern

Later, speaking privately, Giraldi was at a loss to understand why anyone would want to dissolve an ethics board. "What is going on behind the scenes?" she wondered.

"In the past," Ferris added, "the ethics board has been successful in weeding out corruption at no cost to the taxpayers. It has provided a direct line of communication from the people to their local government."

The public hearing on whether or not to dissolve the ethics board was scheduled for February 4, 2020 at 6 p.m.

Is It A Food Truck?

Applestone Meat's 'Grill Bar'

By Max Freebern

COTTEKILL – A new proposal by Applestone Meat Company has some folks pondering the definition of a food truck. Applestone is a 24/7 meat shop that aims to provide affordable meat to its customers at both its Stone Ridge and Hudson locations. And it recently made changes to an old site plan for a "recipe experimentation facility."

At the Marbletown Planning Board meeting on Monday, an Applestone representative explained that they want to create a "grill bar" where customers can cook the meat they purchase on-site. There are also plans for a pavilion where customers can eat their hand-cooked meals afterwards. However, their site plan is far from ready for approval.

Planning board chairman Dan Proctor explained that the company had previously submitted a draft of its plan, and pursued construction without a final approval. Proctor also claimed that the town's code enforcement officer noted that the company's new plans strayed significantly from the original plan and would need approval once again.

First, Applestone's grill bar is located in a trailer with wheels, technically making it a food truck. Board members explained that food trucks are not allowed due to a town ordinance. Also, the board was unclear of exactly what kind of food establishment it would be, and required a fully fleshed-out site plan before they could move forward. Due to the complexity of the project, Proctor also hired a professional project planner, at the expense of Applestone, to oversee the application.

"We're trying to help them move along but also make sure it is in accordance with our local codes," Proctor said.

Cutting Red Tape

The planning board also said it's willing to take up the task of issuing special use permits (SUP) to those who

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IN A 100-YEAR FLOODPLAIN
ELLENVILLE STREAM BANK RESTORATION PROJECT
ELLENVILLE, ULSTER COUNTY, NEW YORK
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Governor's Office of Storm Recovery

Governor's Office of Storm Recovery

ANDREW M. CUOMO
Governor

PUBLIC NOTICE

COMBINED FINAL NOTICE AND PUBLIC REVIEW OF A PROPOSED ACTIVITY IN A 100-YEAR FLOODPLAIN, AND NOTICE OF FINDING OF NO SIGNIFICANT IMPACT, AND NOTICE OF INTENT TO REQUEST RELEASE OF FUNDS

ELLENVILLE STREAM BANK RESTORATION PROJECT
ELLENVILLE, ULSTER COUNTY, NEW YORK

February 6, 2020

Name of Responsible Entity and Recipient: New York State Homes and Community Renewal (HCR), 38-40 State Street, Hampton Plaza, Albany, NY 12207, in cooperation with the New York State Housing Trust Fund Corporation (HTFC), of the same address. Contact: Lori A. Shirley (518) 474-0755.

Pursuant to 24 CFR Section 58.43, this combined Final Notice and Public Review of a Proposed Activity in a 100-year Floodplain and Wetland, Notice of Finding of No Significant Impact and Notice of Intent to Request Release of Funds (FONSI/NOIRROF) satisfies three separate procedural requirements for project activities proposed to be undertaken by HCR.

Project Description: The Governor's Office of Storm Recovery (GOSR), an office of HCR's HTFC, is responsible for the direct administration of the United States Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program in New York State. GOSR proposes to provide CDBG-DR funding ($2,952,677) for the design and construction of stream bank restoration improvements and resiliency measures within and along the West Branch of Beer Kill and Sandburg Creek at eight sites within the town of Wawarsing and village of Ellenville, in Ulster County, New York ("Proposed Project"). Stream restoration measures include channel realignments to original channel paths, removal of existing structures necessary to return stream banks to previous ground level grades, and placement of materials (soils and riprap armoring) to retain existing and future bank elevations and slopes. The flood mitigation measures include the construction of floodplain benches with rock and/or wood revetment (to reduce cutting at the toe of bank), the lowering of the height, angle and overall erosion hazard of the eroding streambanks; installation of in-stream rock structures to provide grade control and reduce the erosive force of water upon streambanks (by directing flood flows to the center of the stream channel); and the reconnection of floodplains in select areas (to reduce channel confinement and the corresponding increases in flood velocity that contribute to flood severity).

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Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing, including the West Branches of the Beer Kill, and Sandburg Creek. This Project is expected to provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town.

PUBLIC EXPLANATION OF A PROPOSED ACTIVITY IN A 100-YEAR FLOODPLAIN AND WETLAND

This work will be located in 100-year floodplain (SHFA Zone AE), floodway, and within federal riverine wetlands. Since the action will include new construction in wetland and floodplain, Executive Orders 11990 and 11988 require that the project not be supported if there are practicable alternatives to development in floodplain and new construction in wetlands.

The proposed mitigation actions were identified through a Flood Engineering Analysis Report (FEAR), a detailed assessment of the flooding characteristics in the Village of Ellenville and Town of Wawarsing. The analysis considered the existing flood hazards within the focus area, identified existing infrastructure elements in the community that are at risk for flood damage, evaluated potential alternatives aimed at reducing flood impacts, and described an implementation plan for prioritized alternatives. The analysis was based on field-derived data reflecting current river- and floodplain conditions. The analysis included a review of available information pertinent to the hydrologic and hydraulic functions of the Sandburg Creek, West Branch Beer Kill, North Gully, Roundout Creek, and Fantine Kill and engineering analysis required to assess the flooding characteristics within the focus area. Hydraulic assessments were completed to characterize flow and identify required mitigation and objectives for each site.

The engineering analysis identified specific mitigation for each of the 8 sites. The mitigation was selected based on the objective for each site, such as sediment deposition reduction.

The only alternative is the "No Action Alternative" which would not mitigate flash flooding and stream bank erosion after several excessive storms, if improvements are not undertaken. Sediment and debris will also continue to compromise the hydraulic capacity of the water bodies if no actions are taken. Upgrades are needed to prevent localized flooding and drainage problems. Maintaining the status quo would only contribute to continuing erosion and increased sediment deposit downstream.

Applicable permits from the New York State Department of Environmental Conservation and the United States Army Corps of Engineers will be acquired before work is commenced. The Applicant will be bound by any permit stipulations or mitigation measures listed in permits acquired for this project. Additionally, ground disturbance will be minimized by placing fabric down in areas where temporary roads will be installed.

There are three primary purposes for this notice. First, people who may be affected by activities in floodplains/ wetlands and those who have an interest in the protection of the natural environment have an opportunity to express their concerns and provide information about these areas. Second, adequate public notice is an important public education tool. The dissemination of information and request for public comment about floodplains/ wetlands can facilitate and enhance federal efforts to reduce the risks associated with the occupancy and modification of these special areas. Third, as a matter of fairness, when the federal government determines it will participate in actions taking place in floodplains/ wetlands, it must inform those who may be put at greater or continued risk.

This is to give notice that the GOSR has conducted an evaluation as required by Executive Order 11988 and Executive Order 11990 in accordance with U.S. Department of Housing and Urban Renewal (HUD) regulations under 24 CFR 55.20 Subpart C - Procedures for Making Determinations on Floodplain Management, to determine the potential effects that its activity in the floodplain and wetlands would have on the human environment. An early public notice of proposed activity within the 100-year floodplain was published by the Governor's Office of Storm Recovery on January 16, 2020, in the Shawangunk Journal. Floodplain and/or wetland maps and a draft Floodplain Management Plan are available at http://www.stormrecovery.ny.gov/environmental-docs.

FINDING OF NO SIGNIFICANT IMPACT

An Environmental Assessment (EA) for the Proposed Project has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and HUD environmental review regulations at 24 CFR Part 58. The EA is incorporated by reference into this FONSI. Subject to public comments, no further review of the Proposed Project is anticipated. HCR has determined that the EA for the project identified herein complies with the requirements of HUD environmental review regulations at 24 CFR Part 58. HCR has determined that the Proposed Project will have no significant

impact on the human environment and therefore does not require the preparation of an environmental impact statement under NEPA.

Public Review: Public viewing of the EA and Floodplain Management & Protection of Wetlands Determination Documents is available online at http://stormrecovery.ny.gov/environmental-docs and is also available in person Monday – Friday, 9:00 AM – 5:00 PM at the following address: Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, New York 12260. Contact: Lori A. Shirley (518) 474-0755.

Further information may be requested by writing to the above address, emailing NYSCDBG_DR_ER@nyshcr.org or by calling (518) 474-0755. This combined notice is being sent to individuals and groups known to be interested in these activities, local news media, appropriate local, state and federal agencies, the regional office of the U.S. Environmental Protection Agency having jurisdiction, and to the HUD Field Office, and is being published in a newspaper of general circulation in the affected community.

Public Comments on the Proposed Activity within a Floodplain and Wetland, FONSI and/or NOIRROF: Any individual, group or agency may submit written comments on the Proposed Project. The public is hereby advised to specify in their comments which "notice" their comments address. Comments should be submitted via email, in the proper format, on or before February 21, 2020 at NYSCDBG_DR_ER@nyshcr.org. Written comments may also be submitted at the following address, or by mail, in the proper format, to be received on or before February 21, 2020: Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, New York 12260. All comments must be received on or before 5pm on February 21, 2020 or they will not be considered. If modifications result from public comment, these will be made prior to proceeding with the expenditure of funds.

REQUEST FOR RELEASE OF FUNDS AND CERTIFICATION

On or about February 24, 2020, the HCR certifying officer will submit a request and certification to HUD for the release of CDBG-DR funds as authorized by related laws and policies for the purpose of implementing this part of the New York CDBG-DR program.

HCR certifies to HUD that Lori A. Shirley, in her capacity as Certifying Officer, consents to accept the jurisdiction of the U.S. federal courts if an action is brought to enforce responsibilities in relation to the environmental review process and that these responsibilities have been satisfied. HUD's approval of the certification satisfies its responsibilities under NEPA and related laws and authorities and allows GOSR to use CDBG-DR program funds.

Objection to Release of Funds: HUD will accept objections to its release of funds and GOSR's certification for a period of fifteen days following the anticipated submission date or its actual receipt of the request (whichever is later). Potential objectors may contact HUD or the GOSR Certifying Officer to verify the actual last day of the objection period.

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Objections must be prepared and submitted in accordance with the required procedures (24 CFR Part 58) and shall be addressed to Tennille Smith Parker, Director, Disaster Recovery and Special Issues Division, Office of Block Grant Assistance, U.S. Department of Housing & Urban Development, 451 7th Street SW, Washington, DC 20410, Phone: (202) 402-4649.

Lori A. Shirley
Certifying Officer
February 6, 2020

AFFIDAVIT OF PUBLICATION

STATE OF NEW YORK
COUNTY OF NEW YORK

Alison Bloom being duly sworn hereby declares and says, that she is the Advertising Account Executive responsible for placing the attached advertisement in: the Shawangunk Journal newspaper for Miller Advertising Agency, Inc.; located in New York, NY, and that the New York State Governor's Office of Storm Recovery advertisement, of which the annexed is a true copy, has been published in the said publication on the following issue date(s): February 6, 2020

Alison Bloom

Subscribed to and Sworn before me

This 20th day of February 2020

Notary Public

Donna Perez
Notary Public State Of New York
No. 01PE6151365
Qualified In New York County
Commission Expires August, 14th - 2022

PUBLIC NOTICE

COMBINED FINAL NOTICE AND PUBLIC REVIEW OF A PROPOSED ACTIVITY IN A 100-YEAR FLOODPLAIN, AND NOTICE OF FINDING OF NO SIGNIFICANT IMPACT, AND NOTICE OF INTENT TO REQUEST RELEASE OF FUNDS

ELLENVILLE STREAM BANK RESTORATION PROJECT ELLENVILLE, ULSTER COUNTY, NEW YORK

February 6, 2020

Name of Responsible Entity and Recipient: New York State Homes and Community Renewal (HCR), 38-40 State Street, Hampton Plaza, Albany, NY 12207, in cooperation with the New York State Housing Trust Fund Corporation (HTFC), of the same address. Contact: Lori A. Shirley (518) 474-0755.

Pursuant to 24 CFR Section 58.43, this combined Final Notice and Public Review of a Proposed Activity in a 100-year Floodplain and Wetland, Notice of Finding of No Significant Impact and Notice of Intent to Request Release of Funds (FONSI/NOIRROF) satisfies three separate procedural requirements for project activities proposed to be undertaken by HCR.

Project Description: The Governor's Office of Storm Recovery (GOSR), an office of HCR's HTFC, is responsible for the direct administration of the United States Department of Housing and Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) program in New York State. GOSR proposes to provide CDBG-DR funding ($2,952,677) for the design and construction of stream bank restoration improvements within and along the West Branch of Beer Kill and Sandburg Creek at eight sites within the town of Wawarsing and village of Ellenville, in Ulster County, New York ("Proposed Project"). The flood mitigation measures include the construction of floodplain benches with rock and/or wood revetment (to reduce cutting at the toe of bank), the lowering of the height, angle and overall erosion hazard of the eroding streambanks; installation of in-stream rock structures to provide grade control and reduce the erosive force of water upon streambanks (by directing flood flows to the center of the stream channel); and the reconnection of floodplains in select areas (to reduce channel confinement and the corresponding increases in flood velocity that contribute to flood severity). The stream bank restoration measures may be implemented in phases.

Some sites will require sedimentation removal to restore the natural channel and improve quality and flows. The Proposed Activity will restore severely eroded/damaged sites to be capable of withstanding large flood events. All of the eight locations are located in Riverine wetlands, river channels (Sites 1, 2, 3, 4, 5, 8, 10 and 13). Approximately 2.8 acres of West Branch of Beer Kill river channel will be modified and approximately 1.4 acres of Sandburg Creek river channel will be modified.

Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing, including the West Branches of the Beer Kill, and Sandburg Creek. This Project is expected to provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town

PUBLIC EXPLANATION OF A PROPOSED ACTIVITY IN A 100-YEAR FLOODPLAIN AND WETLAND

This work will be located in 100-year floodplain (SHFA Zone AE), floodway, and within federal riverine wetlands. Since the action will include new construction in wetland and floodplain, Executive Orders 11990 and 11988 require that the project not be supported if there are practicable alternatives to development in floodplain and new construction in wetlands.

The proposed mitigation actions were identified through a Flood Engineering Analysis Report (FEAR), a detailed assessment of the flooding characteristics in the Village of Ellenville and Town of Wawarsing. The analysis considered the existing flood hazards within the focus area, identified existing infrastructure elements in the community that are at risk for flood damage, evaluated potential alternatives aimed at reducing flood impacts, and described an implementation plan for prioritized alternatives. The analysis was based on field-derived data reflecting current river- and floodplain conditions. The analysis included a review of available information pertinent to the hydrologic and hydraulic functions of the Sandburg Creek, West Branch Beer Kill, North Gully, Roundout Creek, and Fantine Kill and engineering analysis required to assess the flooding characteristics within the focus area. Hydraulic assessments were completed to characterize flow and identify required mitigation and objectives for each site.

The engineering analysis identified specific mitigation for each of the 8 sites. The mitigation was selected based on the objective for each site, such as sediment deposition reduction.

The only alternative is the "No Action Alternative" which would not mitigate flash flooding and stream bank erosion after several excessive storms, if improvements are not undertaken. Sediment and debris will also continue to compromise the hydraulic capacity of the water bodies if no actions are taken. Upgrades are needed to prevent localized flooding and drainage problems. Maintaining the status quo would only contribute to continuing erosion and increased sediment deposit downstream.

Applicable permits from the New York State Department of Environmental Conservation and the United States Army Corps of Engineers will be acquired before work is commenced. The Applicant will be bound by any permit stipulations or mitigation measures listed in permits acquired for this project. Additionally, ground disturbance will be minimized by placing fabric down in areas where temporary roads will be installed.

There are three primary purposes for this notice. First, people who may be affected by activities in floodplains/ wetlands and those who have an interest in the protection of the natural environment have an opportunity to express their concerns and provide information about these areas. Second, adequate public notice is an important public education tool. The dissemination of information and request for public comment about floodplains/ wetlands can facilitate and enhance federal efforts to reduce the risks associated with the occupancy and modification of these special areas. Third, as a matter of fairness, when the federal government determines it will participate in actions taking place in floodplains/ wetlands, it must inform those who may be put at greater or continued risk.

This is to give notice that the GOSR has conducted an evaluation as required by Executive Order 11988 and Executive Order 11990 in accordance with U.S. Department of Housing and Urban Renewal (HUD) regulations under 24 CFR 55.20 Subpart C - Procedures for Making Determinations on Floodplain Management, to determine the potential effects that its activity in the floodplain and wetlands would have on the human environment. An early public notice of proposed activity within the 100-year floodplain was published by the Governor's Office of Storm Recovery on January 16, 2020, in the Shawangunk Journal. Floodplain and/or wetland maps and a draft Floodplain Management Plan are available at http://www.stormrecovery.ny.gov/environmental-docs.

FINDING OF NO SIGNIFICANT IMPACT

An Environmental Assessment (EA) for the Proposed Project has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and HUD environmental review regulations at 24 CFR Part 58. The EA is incorporated by reference into this FONSI. Subject to public comments, no further review of the Proposed Project is anticipated. HCR has determined that the EA for the project identified herein complies with the requirements of HUD environmental review regulations at 24 CFR Part 58. HCR has determined that the Proposed Project will have no significant impact on the human environment and therefore does not require the preparation of an environmental impact statement under NEPA.

Public Review: Public viewing of the EA and Floodplain Management & Protection of Wetlands Determination Documents is available online at http://stormrecovery.ny.gov/environmental-docs and is also available in person Monday – Friday, 9:00 AM – 5:00 PM at the following address: Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, New York 12260. Contact: Lori A. Shirley (518) 474-0755.

Further information may be requested by writing to the above address, emailing NYSCDBG_DR_ER@nyshcr.org or by calling (518) 474-0755. This combined notice is being sent to individuals and groups known to be interested in these activities, local news media, appropriate local, state and federal agencies, the regional office of the U.S. Environmental Protection Agency having jurisdiction, and to the HUD Field Office, and is being published in a newspaper of general circulation in the affected community.

Public Comments on the Proposed Activity within a Floodplain and Wetland, FONSI and/or NOIRROF: Any individual, group or agency may submit written comments on the Proposed Project. The public is hereby advised to specify in their comments which "notice" their comments address. Comments should be submitted via email, in the proper format, on or before February 21, 2020 at NYSCDBG_DR_ER@nyshcr.org. Written comments may also be submitted at the following address, or by mail, in the proper format, to be received on or before February 21, 2020: Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, New York 12260. All comments must be received on or before 5pm on February 21, 2020 or they will not be considered. If modifications result from public comment, these will be made prior to proceeding with the expenditure of funds.

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Lori A. Shirley
Certifying Officer
February 6, 2020

Governor's Office of Storm Recovery

Appendix D

NEW YORK STATE OF OPPORTUNITY. Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Commissioner

August 13, 2019

Ms. Alicia Shultz
38-40 State Street
Hampton Plaza
Albany, NY 12207

Re: HTF
GOSR- Ellenville Stream Bank Restoration-13 sites
Town of Wawarsing and Village of Ellenville, Ulster County, NY
17PR04134

Dear Ms. Shultz:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources.

SHPO has reviewed *Phase IB Archaeological and Geomorphological Survey, Ellenville Streambank Restoration of Two Sites: Sites 10 and 13, Town of Wawarsing, Ulster County, New York* (Christine Davis Consultants, July 2019).

Based upon this and previously submitted information, it is the opinion of the New York SHPO that no historic properties, including archaeological and/or historic resources, will be affected by this undertaking.

If you have any questions, please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via e-mail only

cc: Mary Barthelme and Lori Shirley, GOSR
Lauren Hayden, Louis Berger

PHASE IB ARCHAEOLOGICAL AND GEOMORPHOLOGICAL SURVEY

ELLENVILLE STREAMBANK RESTORATION OF TWO SITES: SITES 10 AND 13 TOWN OF WAWARSING, ULSTER COUNTY, NEW YORK

17PR04134

A Cultural Resource Management Report Prepared for:

TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C.

July 2019

CHRISTINE DAVIS CONSULTANTS, INC.
560 Penn Street, Verona, Pennsylvania 15147
Phone: 412/826-0443 Fax: 412/826-0458

PHASE I ARCHAEOLOGICAL AND GEOMORPHOLOGICAL SURVEY

ELLENVILLE STREAMBANK RESTORATION OF TWO SITES: SITES 10 AND 13 TOWN OF WAWARSING, ULSTER COUNTY, NEW YORK

17PR04134

BY:

CHRISTINE E. DAVIS
Principal Investigator

MINDY LABELLE
Project Manager

KIRA M. HEINRICH
Cultural Resource Manager

For final submission to:

New York State Office of Parks, Recreation and Historic Preservation
P.O. Box 189, Waterford, New York 12188-0189

MANAGEMENT SUMMARY

State Historic Preservation Office (SHPO) Project Review Number: 17PR04134

Agency:
Governor's Office of Storm Recovery (GOSR)

Phase of Survey:
Phase IB Archaeological and Geomorphological Survey

Location Information:

Location:	South of Village of Ellenville
Minor Civil Division:	Town of Wawarsing
County:	Ulster

Survey Area:

Site 10:		Site 13:	
Length:	680 ft (20,726.4 cm)	Length:	420 ft (12,801.6 cm)
Width:	170 ft (5181.6 cm)	Width:	50 ft (1,524 cm)
Depth:	39.37 ft (100 cm)	Depth:	39.37 ft (100 cm)
# of Acres Surveyed:	2.60 ac	# of Acres Surveyed:	0.53 ac

USGS 7.5 Minute Quadrangle Map:
Ellenville, NY 2016

Archaeological Survey Overview:

Number and Interval of Shovel Tests:	25 at 15 m (50 ft) intervals
Number and Size of Units:	n/a
Width of Plowed Strips:	n/a
Surface Survey Transect Interval:	n/a

Results of Archaeological Survey:

Number and Name of Prehistoric Sites Identified:	0
Number and Name of Historic Sites Identified:	0
Number and Name of Sites Recommended for Phase II/Avoidance:	0

Results of Architectural Survey:

Number of Buildings/ Structures/ Cemeteries within Project Area:	n/a
Number of Buildings/ Structures/ Cemeteries Adjacent to Project Area:	n/a
Number of Previously Determined NR Listed or Eligible Buildings/ Structures/Cemeteries/ Districts:	n/a
Number of Identified Eligible Buildings/ Structures/ Cemeteries/ Districts:	n/a

Report Authors
Christine E. Davis, Mindy LaBelle, and Kira M. Heinrich

Date of Report
July 2019

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1.0 INTRODUCTION

Historic and cultural resources are protected under Federal law through Section 106 of the National Historic Preservation Act of 1966, as amended, and implementing regulation 36 CFR 800 as revised in January of 2001; the Archaeological and Historic Preservation Act of 1974; Section 101(b)(4) of the National Environmental Policy Act of 1969; Executive Orders 11593 and 12362; 18 CFR Part 380.14; 23 CFR 771, as amended, August 28, 1987; 36 CFR 60; the guidelines developed by the Advisory Council on Historic Preservation (ACHP) published November, 26, 1980; and the amended procedures for the Protection of Historic and Cultural Properties, as set forth in 36 CFR 800.

The regulations developed under Section 106 of the National Historic Preservation Act require that prior to approval of federal funding, agencies should consider the impact of a project on any district, site, building, structure, or object that is included on, or eligible for inclusion on, the National Register of Historic Places (NRHP), and the ACHP must be given an opportunity to comment on such an undertaking. The Historic and Archeological Data Preservation Act directs Federal agencies to preserve historic and archeological data that would otherwise be lost as a result of a Federal action. A project is considered to have an adverse effect on such sensitive resources if it changes the quality of cultural characteristics that render them eligible for listing on the NRHP.

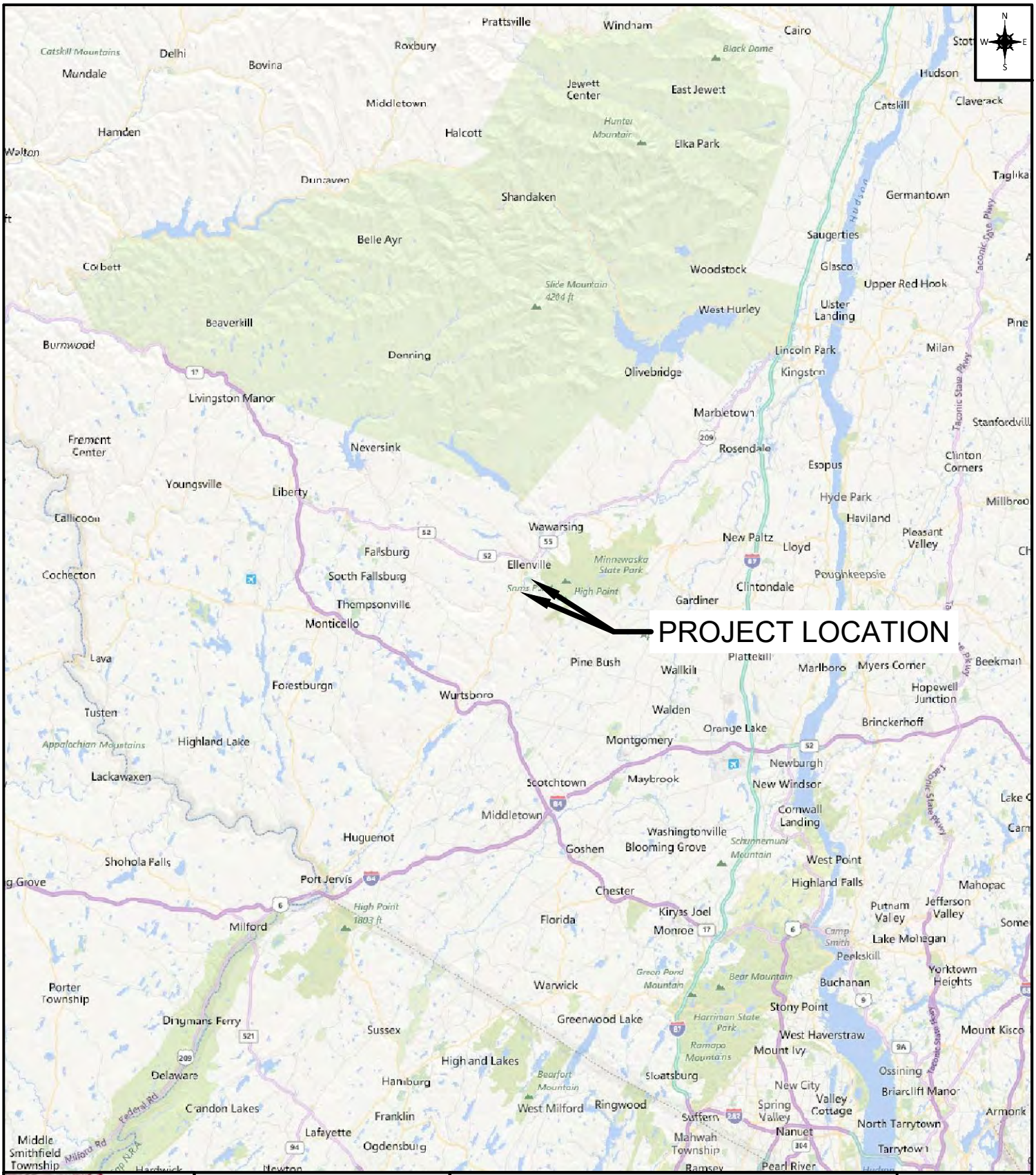
Historic properties of national, state and local significance may be nominated to the NRHP following an evaluation in accordance with an established set of criteria. The evaluation process is conducted at the state level by the New York State Historic Preservation Officer (SHPO) and at the federal level by the NRHP staff of the Department of the Interior. The National Park Service administers the National Register and has established four criteria for the evaluation of the potential significance of historic and archeological properties. These criteria are described in Title 36, Part 60 of the Code of Federal Regulations and are summarized as follows:

- Criterion A: A property is associated with historically significant events that have made a significant contribution to the broad patterns of our history. To meet this criterion, a historic property needs to have existed at the time of the important event and be associated in a significant way with the event.
- Criterion B: A property is associated with the lives of persons significant in our past.
- Criterion C: A property that embodies the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction.
- Criterion D: A property that has yielded, or may be likely to yield, information important in prehistory or history.

Archaeological studies are completed under Section 106 of the National Historic Preservation Act of 1966 as amended; the National Environmental Policy Act of 1969; the Archaeological and Historic Preservation Act of 1974; and the regulations of the ACHP 36 CFR 63 and 36 CFR 800. This technical scope of work was developed in accordance with the *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* published by the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) in 2005.

1.1 PROPOSED UNDERTAKING

Christine Davis Consultants, Inc. (CDC) was retained by Tectonic Engineering & Surveying Consultants P.C. (Tectonic) of Mountainville, New York to conduct a Phase IB Archaeological Survey for the Ellenville Streambank Restoration of Two Sites project located in the Town of Wawarsing, Ulster County, New York (Figures 1 and 2). A Phase IA Archaeological Investigation was previously completed for this project and recommended two areas for a Phase IB Survey: Site 10 along Sandburg Creek at Hang



Christine Davis Consultants
Archaeology and History
Cider Mill of Pittsburgh
560 Penn Street
Verona, PA 15147
www.ChristineDavisConsultants.com
412-826-0443

0 10 20

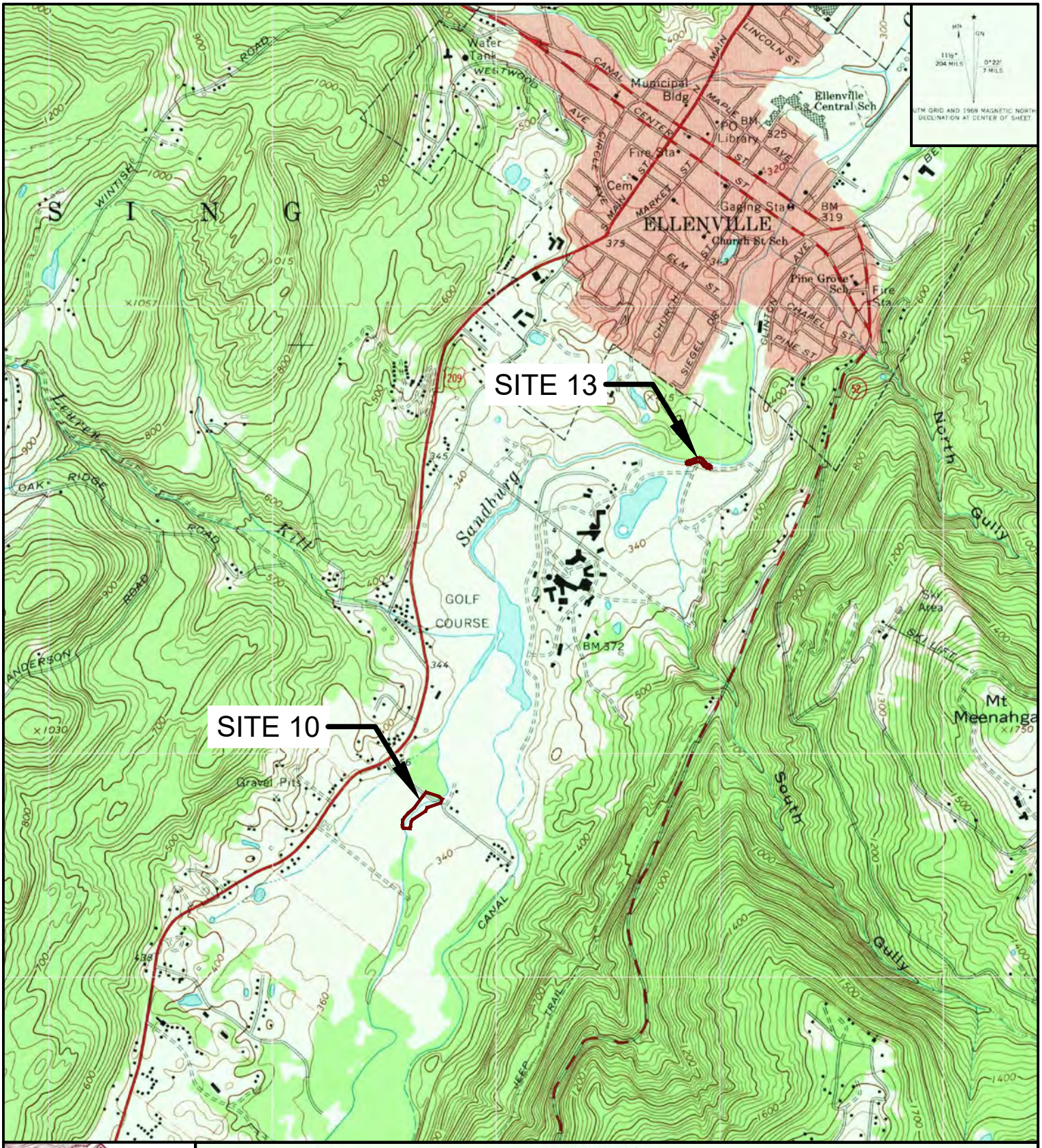
1 INCH = 10 MILES

REFERENCES:
Microsoft Corporation
Road Map 2019

Project Location
ELLENVILLE STREAMBANK RESORTATION OF TWO SITES
17PR04134
Town of Wawarsing, Ulster County, New York

PROJECT NO.
19-029

FIGURE 1



SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

Christine Davis Consultants
Archaeology and History
Cider Mill of Pittsburgh
560 Penn Street
Verona, PA 15147
www.ChristineDavisConsultants.com
412-826-0443

REFERENCES:

BARTON & LOGUIDICE
60% Design Drawings - February 2019
USGS 7.5 MINUTE QUADRANGLES
Ellenville, NY 1969

Limit of Disturbance - Sites 10 and 13
ELLENVILLE STREAMBANK RESORTATION OF TWO SITES
17PR04134
Town of Wawarsing, Ulster County, New York

PROJECT NO.
19-029

FIGURE 2

Glider Road and Site 13 along Sandburg Creek at Fallsview Pump Houses (Marcucci 2019). No further work was recommended on the remaining 11 sites that were studied in the Phase IA Survey. The current investigation includes the Phase IB Survey of Sites 10 and 13. The agency for the project is the Governor's Office of Storm Recovery (GOSR).

1.2 AREA OF POTENTIAL EFFECT (APE)

The area of potential effect (APE) consists of two discontinguous areas encompassing a total of approximately 12647.3 square (sq) meters (m) (136,134.4 sq feet (ft) or 3.13 acres (ac)) located within the Town of Wawarsing. Site 10 encompasses approximately 10,504.5 sq m (113,069.5 sq ft or 2.6 ac). Site 13 encompasses approximately 2,144.8 sq m (23,064.91 sq ft or 0.53 ac). The areas are topographically situated in floodplain environments associated with Sandburg Creek. The APE is characterized by a deciduous woodlands and herb/shrub communities.

1.3 AGENCY COORDINATION

In a letter dated June 19, 2017, OPRHP requested a Phase IA Survey be conducted for the project area. GOSR submitted the Phase IA report and in a letter dated June 5, 2019 OPRHP responded and concurred with the recommendation to complete a Phase IB Archaeological Survey for Sites 10 and 13 (Appendix II).

2.0 PHASE I FIELD SURVEY

2.1 SOILS AND GEOMORPHOLOGICAL RESULTS

Soils

The location of the project area along Sandburg Creek suggests that alluvial soils may be present within the current project area. A geomorphological survey was conducted within both Sites 10 and 13 to determine if these soils are present. Soils in Site 10 include Middlebury silt loam (Mr), Tioga fine sandy loam (Tg), and Suncook loamy fine sand (Su) while soils in Site 13 consist of Middlebury silt loam (Mr) (NRCS 2019).

Middlebury silt loam (Mr) consists of soils formed within loamy alluvium on floodplains. This soil association consists of moderately well drained soils located on slopes ranging from 0 to 2 percent. Middlebury silt loam soils have a moderate water storage capacity and a depth of approximately 6 to 24 inches to the water table. A representative soil profile for these soils consists of a silty loam horizon over a loam horizon, over a fine sandy loam horizon over a gravelly sandy loam horizon (Table 1).

Suncook loamy fine sand (Su) consists of soils formed within sandy alluvium on floodplains. This soil association consists of excessively drained soils located on slopes ranging from 0 to 3 percent. Suncook loamy fine sand soils have a low water storage capacity and a depth of approximately 36 to 72 inches to the water table. A representative soil profile for these soils consists of a loamy fine sand horizon over a loamy fine sand horizon, over a stratified loamy fine sand, over a fourth horizon of loamy fine sand (see Table 1).

Tioga fine sand (Tg) consists of soils formed loamy alluvium on floodplains. This soil association consists of well drained soils located on slopes of 0 to 3 percent. Tioga fine sand soils have a moderate water storage capacity and a depth of approximately 36 to 72 inches to the water table. A representative soil profile for these soils consists of a fine sandy loam horizon, overlying a second fine sandy loam horizon, overlying a loamy fine sand horizon, and a silt loam horizon (see Table 1).

Table 1
Project Area Soils

Name	Soil Horizon Depth	Texture, Inclusions	Slope %	Drainage	Landforms
Middlebury silty loam (Mr)	0-8 inches 8-25 inches 25-43 inches 43-60 inches	Si lo Lo F Sa Lo Gr Sa Lo	0-2	Moderately Well Drained	Floodplains
Suncook loamy fine sand (Su)	0-3 inches 3-27 inches 27-36 inches 36-53 inches	Lo F Sa Lo F Sa Lo F Sa Lo F Sa	0-3	Excessively Drained	Floodplains
Toiga fine sandy loam (Tg)	0-10 inches 10-34 inches 34-40 inches 40-65 inches	F Sa Lo F Sa Lo Lo F Sa Si Lo	0-3	Well Drained	Floodplains

Geomorphological Results

A total of six auger probes were excavated within the APE to identify the representative soil and sediment profiles present, including five auger probes in Site 10 and one auger probe in Site 13.

In Site 10, four of the five auger probes revealed intact soils developed in sandy and silty alluvium. Coarse sand and gravel channel lag representing previous active stream channels were identified 100 to 175 cm below ground surface (bgs). However, the lack of any buried A horizons within thick profiles of alluvial sand

indicates the relative instability of much of the alluvial floodplain and terrace landforms within this location. The highest potential for intact buried cultural material lies within the southwestern portion of Site 10 where a more stable T1 terrace is evident in the presence of developed B horizons above the alluvial sands. Phase IB Archaeological Survey through the excavation of Shovel Tests (STs) to the depth of the alluvial sand C1 horizons at approximately 100 to 175 cm (39.37 to 68.9 inches) bgs is recommended at Site 10.

In Site 13, the geomorphological survey revealed a combination of ground disturbance and recent alluvial deposits resulting in little to no potential for intact preserved cultural material. No further testing is necessary within Site 13 based on previous disturbance identified through the geomorphological testing. The geomorphological report is presented in its entirety in Appendix III.

2.2 FIELD METHODOLOGY

The Phase I field methodology conforms to the approach developed by the New York Archaeological Council (NYAC) (2005). Field work began with a systematic ground surface inspection of the APE for the purpose of defining any surface evidence of archaeological sites such as foundations or other extant features; of detecting any variability in topographic and soil maps; and finally to note any impact to the archaeological integrity of the APE.

Based on the results of the geomorphological survey, in potentially undisturbed areas of less than 15 percent slopes where ground surface visibility was not adequate for surface collection, the hand excavation of .5-by-.5 m (1.6 ft x 1.6 ft) STs will be conducted at 15 m (50 ft) intervals. STs will be excavated to undisturbed soil levels. Once sterile subsoil is reached, a minimum of an additional 10 cm (3.9 in) of subsoil will be excavated to confirm the natural stratigraphy of the horizon. Auger probes were conducted as part of the geomorphological survey to verify soil profiles in areas of potentially disturbed soil horizons and determine the depth of excavation.

All subsurface units will be numbered sequentially, and soil profiles will be cleaned and documented by a pedological description. All hand-excavated soils will be screened through quarter-inch hardware mesh and returned to original ground surface condition.

2.3 FIELD SURVEY RESULTS

The APE includes all areas where potential ground surface impacts will occur as part of the proposed undertaking. The APE consists of two discontiguous areas known as Sites 10 and 13 and combined they encompass approximately 12,647.3 sq m (136,134.4 sq ft or 3.13 ac). During the geomorphological survey and ground surface inspection, portions of the APE were designated as low to high probability for prehistoric archaeological sites based mainly on landform, degree of slope, wet areas, and disturbances within the APE. A portion of the APE, involving approximately 8,781.7 sq m (94,525.2 sq ft or 2.17 acres), was not tested due to the presence of disturbance caused by road and bridge construction in Site 10 and the presence of recent alluvial deposits with little to no potential for intact preserved cultural materials and disturbance caused by the construction of pump houses in Site 13.

The remainder of the APE, involving approximately 3,884.982 sq m (41,817.6 sq ft or 0.96 ac), was testable. All the testable area was located in Site 10. Testable areas were examined through the excavation of sequentially numbered STs as described below. A total of 25 STs at 15 m intervals were excavated with in the APE and all STs were negative. No additional archaeological survey is recommended for this project.

Site 10 – Sandburg Creek at Hang Glider Road

Description: Site 10 encompasses approximately 10,504.5 sq m (113,069.5 sq ft or 2.6 ac) (Figure 3; Photos 1 to 3). Approximately 3,884.9 sq m (41,817.6 sq ft or 0.96 ac) were amenable for subsurface testing; the remaining 6,619.6 sq m (71,251.9 sq ft or 1.64 ac) did not require testing due to the presence

disturbance caused by the adjacent road and bridge construction. Site 10 is generally located southwest of Hang Glider Road and is bisected by Sandburg Creek. This area is topographically situated in a floodplain characterized by sparse deciduous trees and lawn grass environments. Elevations range from 330 to 336 ft above sea level (asl).

Methodology: Field methodology consisted of the hand-excavation of STs at 15 m intervals.

Results: A series of 25 STs were hand-excavated at 15 m intervals along two transects and all STs were negative. One transect was placed north of Sandburg Creek and one was placed to the south (see Figure 3). Along both transects ST profiles document a dark brown silty loam upper horizon overlying either mottled clay and sand or directly overlying sand. Representative soil profiles are presented in Appendix IV. ST records are presented in their entirety in Appendix V.

Photo 1: Site 10, looking southeast toward Hang Glider Road.

Photo 2: Site 10, looking south at south bank of Sandburg Creek.

Photo 3: Site 10, erosion control along Sandburg Creek, looking northwest.

Christine Davis Consultants
Archaeology and History
Cider Mill of Pittsburgh
560 Penn Street
Verona, PA 15147
www.ChristineDavisConsultants.com
412-826-0443

LEGEND

APE

STP

0 20 40

1 CM = 10 METERS

REFERENCES:
BARTON & LOGUIDICE
60% Design Drawings - February 2019

Site 10 Testing
ELLENVILLE STREAMBANK RESORTATION OF TWO SITES
17PR04134
Town of Wawarsing, Ulster County, New York

PROJECT NO.
19-029

FIGURE 3

Site 13 – Sandburg Creek at Fallsview Pump Houses

Description: Site 13 encompasses approximately 2,144.8 sq m (23,064.91 sq ft or 0.53 ac) (see Figure 2; Photos 4 and 5). Based on the results of the geomorphological testing, none of Site 13 required subsurface testing due the presence of previous ground disturbance and recent alluvial deposits. Site 13 is generally located to the north of a private access road that connects Arrowhead Road and Pine Street. The site is bisected by Sandburg Creek. This area is topographically situated in a floodplain and gravel bar characterized by sparse deciduous trees and lawn grass environments. Elevations range from 320 to 325 ft asl.

Methodology: Geomorphological survey only.

Results: The results of the geomorphological survey determined that no archaeological survey would be required for Site 13 due to due the presence of previous ground disturbance and recent alluvial deposits (Appendix III).

Photo 4: Site 13 showing gravel and cobbles along stream bank, looking west.

Photo 5: Site 13 well pump house, looking east.

3.0 SUMMARY

3.1 CONCLUSIONS

The proposed undertaking involves the Ellenville Streambank Restoration of Two Sites project located in the Town of Wawarsing, Ulster County, New York. CDC was retained by Tectonic to perform a Phase IB Archaeological Survey for this project. A Phase IA Archaeological Investigation was previously completed for this project and two areas were recommended for a Phase IB Survey: Site 10 along Sandburg Creek at Hang Glider Road and Site 13 along Sandburg Creek at Fallsview Pump Houses (Marcucci 2019). No further work was recommended on the remaining 11 sites that were studied in the Phase IA Survey. The current investigation includes the Phase IB Survey of Sites 10 and 13. The agency for the project is the Governor's Office of Storm Recovery (GOSR).

The Phase IB Archaeological Survey was conducted for this project in June of 2019. Together Sites 10 and 13 encompass a total of approximately 12,647.3 square (sq) meters (m) (136,134.4 sq feet (ft) or 3.13 acres (ac)). The area amenable for testing encompassed approximately 3,884.982 sq m (41,817.6 sq ft or 0.96 ac). All testable areas were located in Site 10. Both sites are topographically situated in floodplains associated with Sandburg Creek. Both Site 10 and Site 13 are characterized by sparse deciduous trees and lawn grasses.

A total of 12,647.3 sq m (136,134.4 sq ft or 3.13 ac) were not amenable for Phase I testing. Site 10 included a portion that was not tested due to disturbance caused by the adjacent road and bridge construction. This area encompassed 6,619.6 sq m (71,251.9 sq ft or 1.64 ac). No testing at all was conducted in Site 13 due to the presence of recent alluvial deposits with little to no potential for intact preserved cultural materials and disturbance caused by the construction of pump houses. Site 13 included approximately 2,142.8 sq m (23,064.91 sq ft or 0.53 ac).

The area amenable for Phase IB testing was all located in Site 10 and included approximately 3,884.982 sq m (41,817.6 sq ft or 0.96 ac). A total of 25 STs at 15 m intervals were hand excavated and all STs were negative. No archaeological resources were identified within the APE.

3.2 RECOMMENDATIONS

No archaeological resources were identified within the APE as a result of the Phase IB Archaeological Survey. No further work is recommended for this project area.

4.0 REFERENCES

Marcucci, Derrick J.
2019 Phase IA Archaeological Investigation of the Ellenville & Wawarsing Stream Bank Restoration of Nine Sites Project (OPRHP # 17PR04134). Prepared by Landmark Archaeology, Altamont, New York for Louis Berger US, Inc., Morristown, NJ. On file at the NY State Historic Preservation Office.

Natural Resources Conservation Service
2019 The Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx> (accessed on July 10, 2019).

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2000 *Cultural Resource Standards Handbook-Guidance for Understanding and Applying the New York State Standards for Cultural Resource Investigations.*
2005 *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State.*

APPENDIX I
PHOTOGRAPH DIRECTION KEY

Site 10 (Google 2018)

Site 13 (Google 2018)

APPENDIX II
AGENCY COORESPONDENCE

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Commissioner

June 05, 2019

Ms. Alicia Shultz
38-40 State Street
Hampton Plaza
Albany, NY 12207

Re: HTF
GOSR- Ellenville Stream Bank Restoration-13 sites
Town of Wawarsing and Village of Ellenville, Ulster County, NY
17PR04134

Dear Ms. Shultz:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources.

SHPO has reviewed *Phase IA Archaeological Investigation of the Ellenville & Wawarsing Stream Bank Restoration of Nine Sites Project* (Landmark Archaeology, May 2019).

Based on the information provided, we concur with the report's conclusions and recommendations. Please conduct a Phase IB investigation of project sites 10 and 13. Testing should examine the full depth of potentially culture-bearing deposits within the project's Area of Potential Effects (APE).

If you have any questions, please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via e-mail only

cc: Mary Barthelme and Lori Shirley, GOSR
Lauren Hayden, Louis Berger

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

June 19, 2017

Mary Barthelme
Governor's Office of Storm Recovery
99 Washington Ave, Suite 1224
Albany, NY 12231

Re: HTF/ GOSR/ HUD CDBG-DR
Ellenville & Wawarsing Stream Bank Restoration of 13 sites/ Ulster County
17PR04134

Dear Ms. Barthelme:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Title 54, Section 306108 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/ Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based on environmental setting and proximity to recorded sites, the proposed project is archaeologically sensitive. However, the proposed actions may or may not have the potential to affect archaeological resources depending on their specific locations, extents, methods of construction, evidence of prior disturbance, and other factors. Therefore, this office recommends that a Phase IA background and sensitivity assessment be conducted. This investigation should include field visits to each proposed project location and, as warranted, limited stratigraphic examination to assess the nature and extent of potentially culture-bearing deposits.
SHPO will provide further comments regarding this project once the results of the Phase IA investigation have been reviewed.

The SHPO also will require a map of the APE of each site and an assessment of any above-ground structures that are adjacent to or within 100 feet of the APE's.

If I can be of further assistance, contact me at (518) 268-2187 or Larry.moss@parks.ny.gov
Sincerely,

L Moss

Larry K Moss, Historic Preservation Technical Specialist
CC: Lori Shirley, NYSHCR

Delaware Tribe Historic Preservation Representatives
P.O. Box 64
Pocono Lake, PA 18347
sbachor@delawaretribe.org

June 22, 2017

Governor's Office of Storm Recovery
25 Beaver St
New York, NY 10004

Re: Section 106 Compliance for the Ellenville Stream Bank Restoration Project (Ulster County, New York)

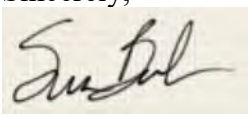
Ms. Shirley,

Thank you for sending the Delaware Tribe additional information regarding the above referenced project. Our review indicates that there could be culturally significant areas within the project zone. We request subsurface testing. This testing should include areas that will be used as staging.

In the event a concentration of artifacts and/or in the unlikely event any human remains are accidentally unearthed during the project that all work is halted until the Delaware Tribe of Indians is informed of the inadvertent discovery and a qualified archaeologist can evaluate the find.

We appreciate your cooperation and look forward to working together on our shared interests in preserving Delaware cultural heritage. If you have any questions, feel free to contact this office by phone at (610) 761-7452 or by e-mail at sbachor@delawaretribe.org..

Sincerely,



Susan Bachor
Delaware Tribe Historic Preservation Representative

APPENDIX III
GEOMORPHOLOGICAL REPORT

CHRISTINE DAVIS CONSULTANTS, INC.
560 Penn Street, Verona, Pennsylvania 15147
Phone: 412/826-0443 Fax: 412/826-0458

GEOMORPHOLOGICAL SURVEY

ELLENVILLE STREAMBANK RESTORATION OF TWO SITES
ULSTER COUNTY, NEW YORK

BY:

JOSHUA M. PFARR
Principal Investigator/Geomorphologist
Christine Davis Consultants, Inc.

ABSTRACT

A Geomorphological Survey was conducted for the proposed Ellenville Streambank Restoration of Two Sites project in Ulster County, New York. Christine Davis Consultants, Inc. (CDC) was retained to perform cultural resource investigations for the project.

The area of potential effect (APE) for this project involves approximately 12,647.3 square (sq) meters (m) (136,134.4 sq feet (ft) or 3.13 acres (ac)). It is topographically situated on terrace and floodplain environments within the Hudson Lowlands section of the Valley and Ridge Physiographic Province.

The field survey was conducted in June of 2019. Geomorphological field methodology involved the evaluation of soils and sediments within hand excavated auger probes. The auger probes revealed areas of ground disturbance as well as intact soils developed in alluvial sand and silt.

Based on the results of the Geomorphological Survey, Shovel Tests will be sufficient for a Phase IB Archaeological Survey for Site 10 only. No further archaeological survey is recommended for Site 13.

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1.0 INTRODUCTION

1.1 PROPOSED UNDERTAKING

The proposed undertaking involves Ellenville Streambank Restoration of Two Sites project located in Ulster County, New York. Christine Davis Consultants, Inc. (CDC) was retained to perform cultural resource investigations for this project.

1.2 AREA OF POTENTIAL EFFECT (APE)

The proposed project includes the restoration and stabilization of the channel of Sandburg Creek. The project will encompass a total size of 12,647.3 sq m (136,134.4 sq ft or 3.13 ac). The APE is located between U.S. Highway 209 and NY S.R. 52 south of the village of Ellenville, NY (Figure 1). The APE is situated on stream terraces and floodplains situated west of the Shawangunk Ridge. The APE lies at a nominal elevation range of 320 to 340 ft above sea level (asl).

1.3 PURPOSE OF INVESTIGATION

The objectives of the geomorphological survey are to determine the relative age of the landforms and soils within the APE and to determine the maximum depth of excavation required for the recovery of cultural material during the Phase I Archaeological Survey. The alluvial soils and sediments along Sandburg Creek will be the focus of the study.

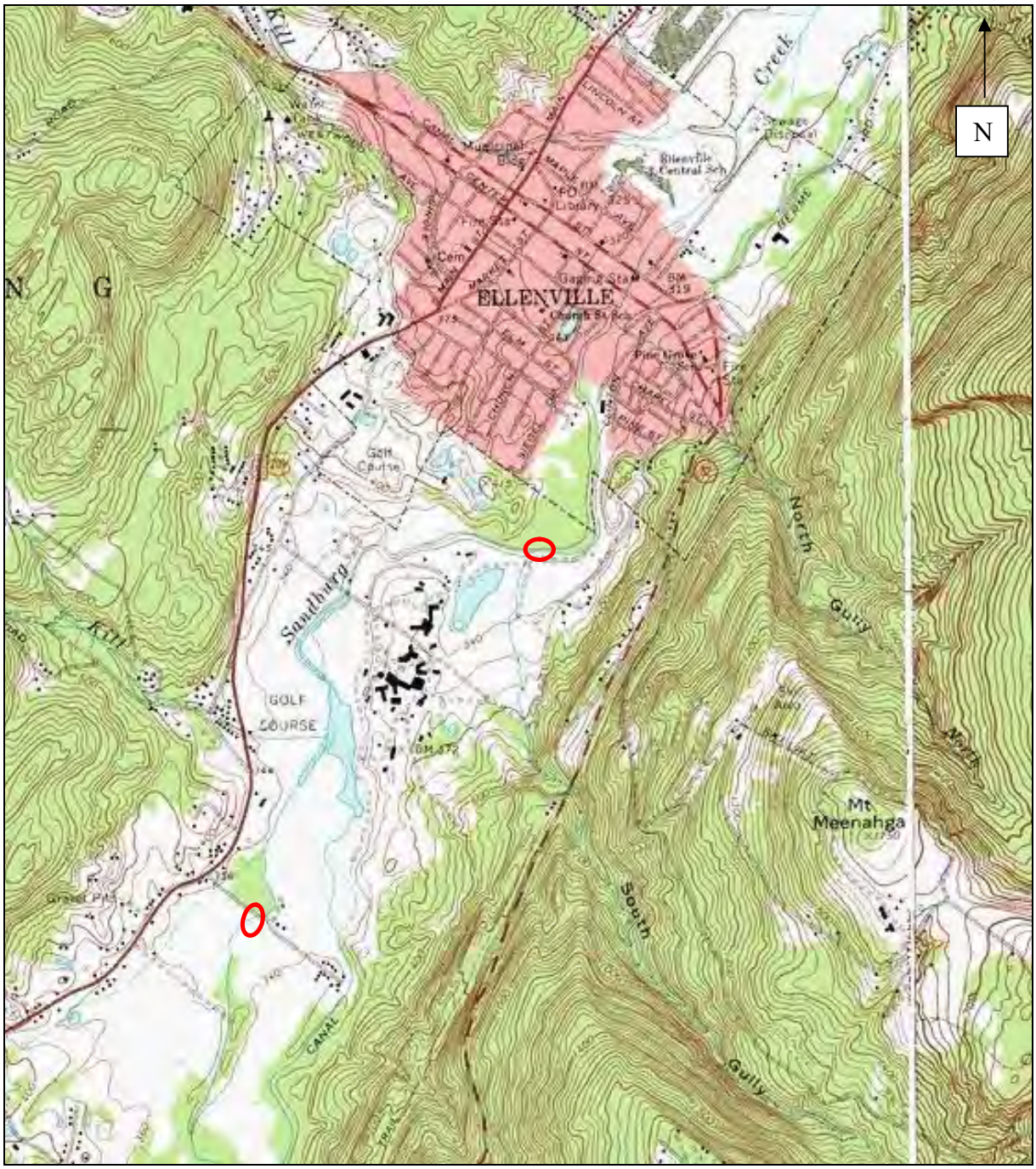

FIGURE 1: PROJECT LOCATIONS, ELLENVILLE AND NAPANOCH, NY 7.5' USGS MAPS (TOPOQUEST 2019)

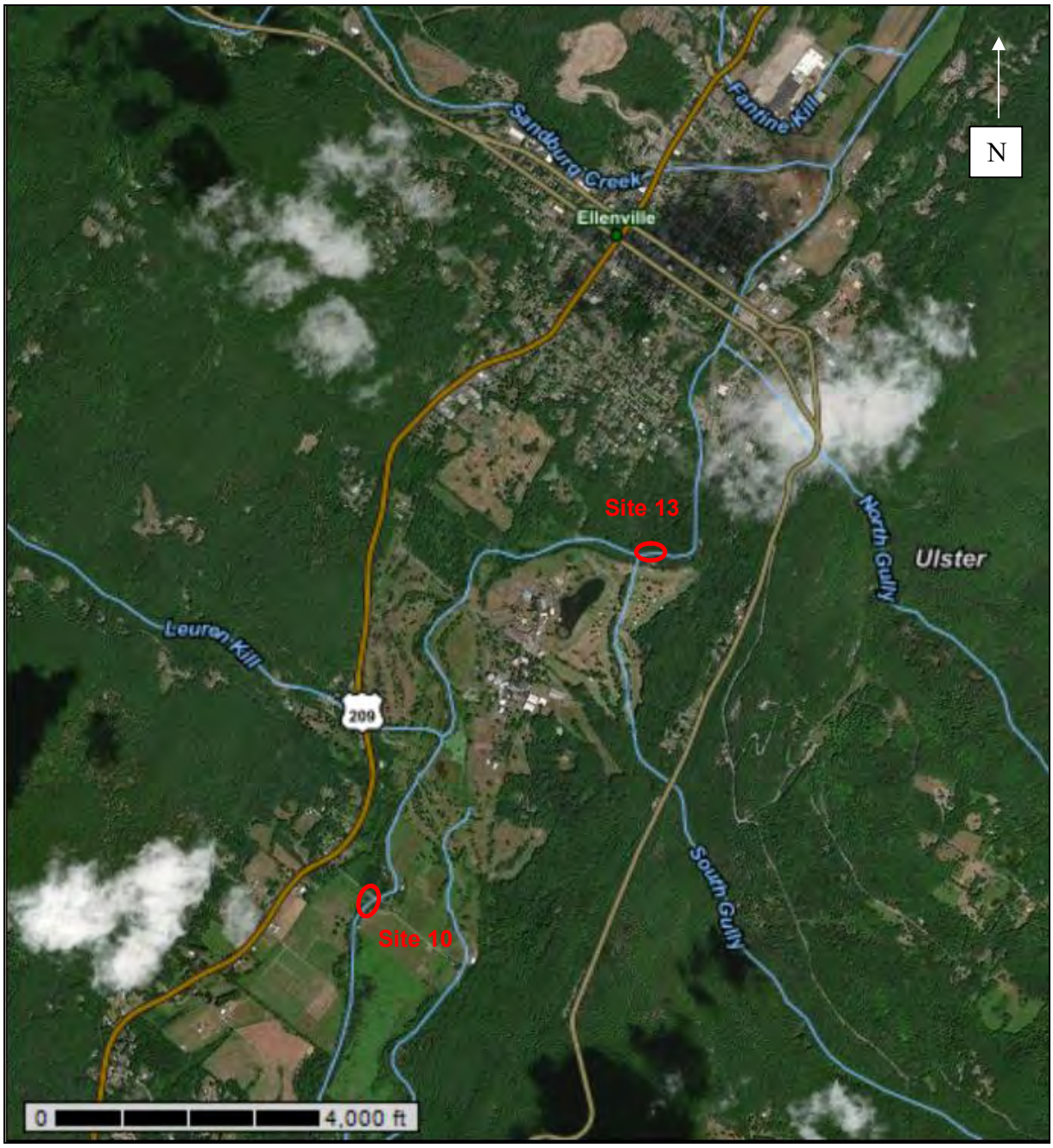

FIGURE 2: AREAS OF POTENTIAL EFFECT (NRCS 2019)

2.0 ENVIRONMENTAL BACKGROUND

2.1 BEDROCK GEOLOGY AND PHYSIOGRAPHY

The bedrock of Ulster County is composed largely of folded and faulted sedimentary rocks of Ordovician, Silurian, and Devonian age such as the Oneonta, Undifferentiated Hamilton Group, Normanskill, and Austin Glen formations (USDA 1979; USGS 2019). These shales, sandstones, conglomerates, and limestones have been greatly altered by the erosion of glaciers and streams in the Rondout Valley watershed forming wide, flat valley bottoms. The predominant sedimentary material in the vicinity of the APE is alluvial and glaciolacustrine in origin, deposited by the melting Pleistocene glaciers and subsequent streams.

The Phase I study area is situated in the Hudson Lowlands section of the Valley and Ridge physiographic province (USDA 1979). This section is characterized by low to moderately high linear ridges and linear stream valleys along the Hudson River valley, such as the Rondout Valley region. The present-day courses of these streams are the result of the Pleistocene glaciation New York. Elevations in the vicinity of the APE range from approximately 320 to 1,750 ft asl. Figure 3 is a Light Detection and Ranging (LiDaR) elevation map of the project location (NYS 2019).

2.2 CLIMATE

Climatic conditions in Ulster County include cold winters and moderately warm to hot summers. Precipitation is adequate and well distributed. The average winter temperature for most of the county is 26 degrees Fahrenheit (F). The average summer temperature is 69 degrees F. The total annual precipitation is 24 inches (USDA 1979).

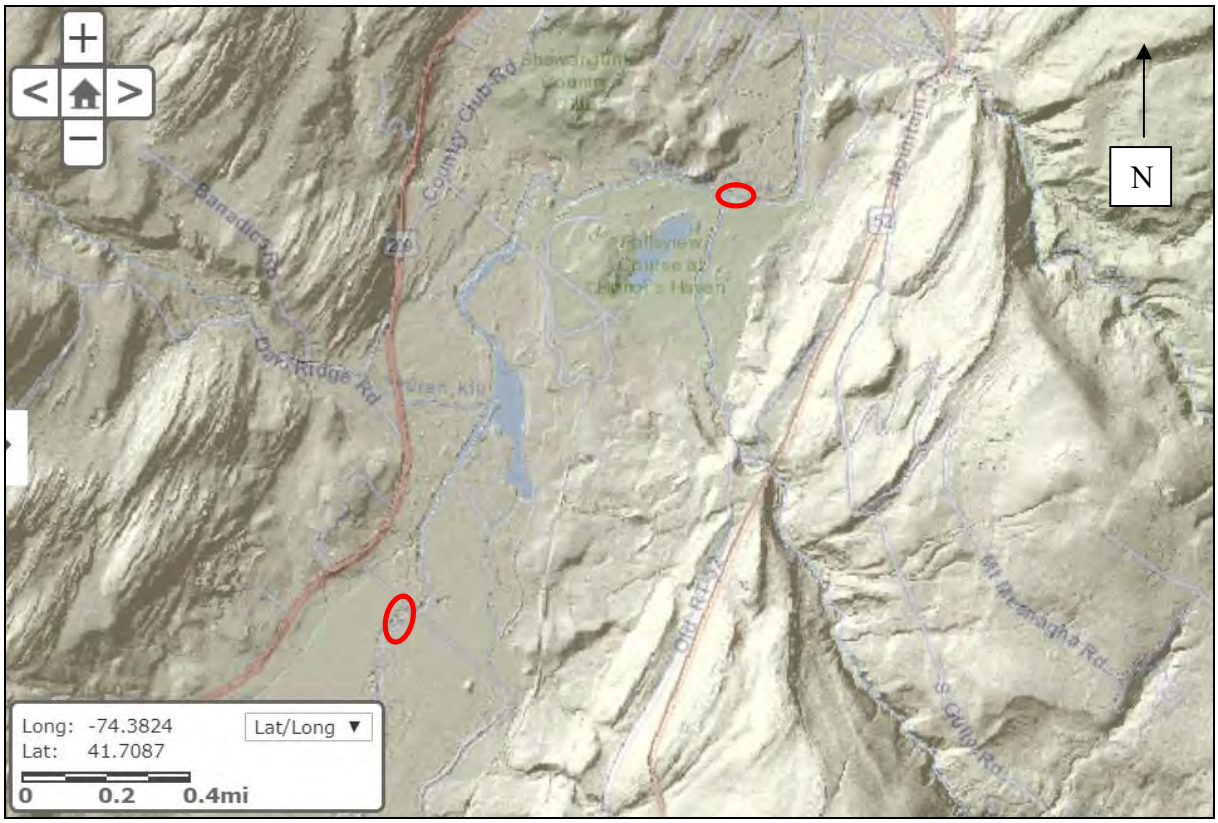

FIGURE 3: LIDAR MAP OF PROJECT LOCATIONS (NYS 2019)

2.3 SOILS

Soils in the project area derived from the Hoosic-Schoharie-Chenango general soil association unit. These are dominantly gently-sloping, deep, somewhat excessively drained to moderately well drained soils in valleys and on plains. The soils within the APE are mapped as Middlebury silt loam (Mr), Suncook loamy fine sand (Su), and Tioga fine sandy loam (Tg) (Figures 4 and 5) (USDA 1979; NRCS 2019).

Middlebury silt loam is deep, moderately well drained to somewhat poorly drained soil located on floodplains with slopes of 0 to 2 percent. This soil is formed in alluvium derived from predominantly shale and sandstone. The typical soil profile consists of the following: Ap silt loam; B1 silt loam; B2 loam; B3 fine sandy loam; C1 fine sandy loam; C2 sandy loam; C3 gravelly sandy loam.

Suncook loamy fine sand is deep, excessively drained soil located on floodplains with slopes of 0 to 3 percent. This soil is formed in recent sandy alluvium. The typical soil profile consists of a loamy fine sand A horizon over multiple loamy fine sand to fine sand C horizons.

Tioga fine sandy loam is deep, well drained soil located on floodplains with slopes of 0 to 3 percent. This soil is formed in alluvium derived from sandstone, siltstone, and shale. The typical soil profile consists of the following: Ap fine sandy loam; B1 fine sandy loam; B2 very fine sandy loam; C1 loamy fine sand; C2 silt loam; C3 fine sandy loam.

FIGURE 4: SOIL MAP OF SITE 10 PROJECT LOCATION (NRCS 2019)

FIGURE 5: SOIL MAP OF SITE 13 PROJECT LOCATION (NRCS 2019)

3.0 GEOMORPHOLOGICAL FIELD SURVEY

3.1 FIELD METHODOLOGY

A series of six auger probes were hand excavated within the APE to identify the representative soil and sediment profiles present along Sandburg Creek in two locations, Site 10 and Site 13. The contents of these auger tests were examined for structure, color, and texture in order to determine the potential for buried historic or prehistoric cultural resources. Surface reconnaissance was also conducted to identify any areas of previous ground disturbance.

3.2 FIELD SURVEY RESULTS

Five auger probes (AP) were excavated at Site 10, located south of the Hang Glider Road crossing of Sandburg Creek (Figure 6; Photos 1 to 4). AP 1 near the northwest corner of the APE approximately 10 m south of Hang Glider Road. This probe revealed a mixture of fill sands revealing ground disturbance likely associated with the construction of the road and bridge. Furthermore, the margins of the Sandburg Creek channel were composed T00 zones of recent alluvial gravels as well as some erosion control boulders (see Photo 3).

AP 2 was excavated on the T1 terrace south of AP 1 on the western bank of Sandburg Creek (see Figure 6). The soil and sediment profile began with a 20 cm thick brown fine sandy loam to loamy sand granular A horizon at the ground surface. The A horizon was followed by a 115 cm thick brown loamy sand C1 horizon alluvial deposit. A 23 cm thick dark gray coarse sand C2 deposit followed. The auger probe terminated in coarse sand and gravel channel lag (C3) at a depth of 158 cm below ground surface (bgs).

AP 3 was excavated on the T1 terrace southwest of AP 2 on the western bank of Sandburg Creek (see Figure 6) at a height of approximately 150 cm above the T00 floodplain. The soil and sediment profile began with a 20 cm thick brown sandy loam moderate granular A horizon at the ground surface. The A horizon was underlain by a 36 cm thick dark yellowish brown fine sandy loam to silt loam moderate subrounded blocky Bw1 horizon. Beneath the Bw1 horizon was a 24 cm thick Bw2 horizon composed of mottled light grayish brown and dark yellowish-brown silty clay loam with weak subrounded blocky structure. The first C horizon composed of light gray loamy sand was encountered at 80 cm bgs. The auger probe terminated at coarse sand and gravel channel lag at a depth of 100 cm bgs.

AP 4 was excavated on the T1 terrace near the southwest corner of the APE (see Figure 6). The soil and sediment profile began with a 19 cm thick brown sandy loam A horizon with a weak granular structure. Beneath the A horizon was a 26 cm thick yellowish brown fine sandy loam to silt loam weak to moderate subrounded blocky B1 horizon. The B1 horizon was followed by a 25 cm thick mottled light gray and yellowish-brown silty clay loam Bw2 horizon with a moderate subangular blocky structure. The auger probe terminated in a light gray loamy sand C horizon that extended to a depth of 100 cm bgs.

AP 5 was excavated on the T1 terrace on the eastern bank of Sandburg Creek (see Figure 6). The soil and sediment profile began with a 40 cm thick brown sandy loam granular A horizon at the ground surface. The A horizon was underlain by a 55 cm thick dark yellowish brown fine loamy sand C1 horizon. An 80 cm thick series of gray and yellowish-brown sand C horizons (C2-C4) followed. The auger probe terminated in gravel channel lag at a depth of 175 cm bgs.

Surface reconnaissance of Site 13 revealed a combination of ground disturbance and recent alluvial deposits resulting in little to no potential for intact preserved cultural material. The sandy and gravelly contents of AP 6 confirmed the lack of intact soil on the terrace south of Sandburg Creek (Figure 7). The construction of pump houses adjacent to the APE is the likely cause of the disturbed soils (Photo 5). Substantial fill deposits composed of cobbles, gravels, sands, and small amounts of silt were visible in the cut bank adjacent to recent alluvial gravels on the T00 floodplain (Photo 6).

The soil and sediment profiles for four undisturbed auger probes are presented below in Figures 8 and 9.

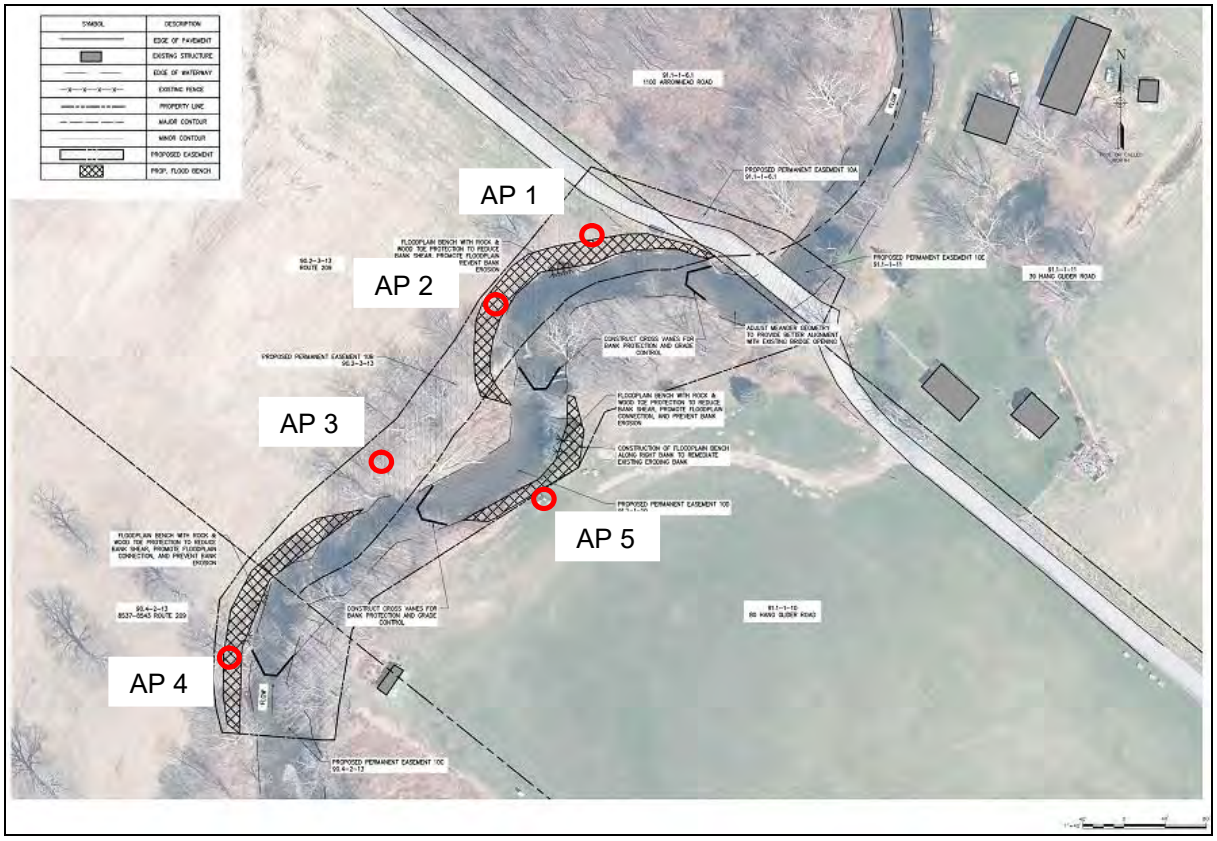

FIGURE 6: SITE 10 AUGER PROBE LOCATIONS

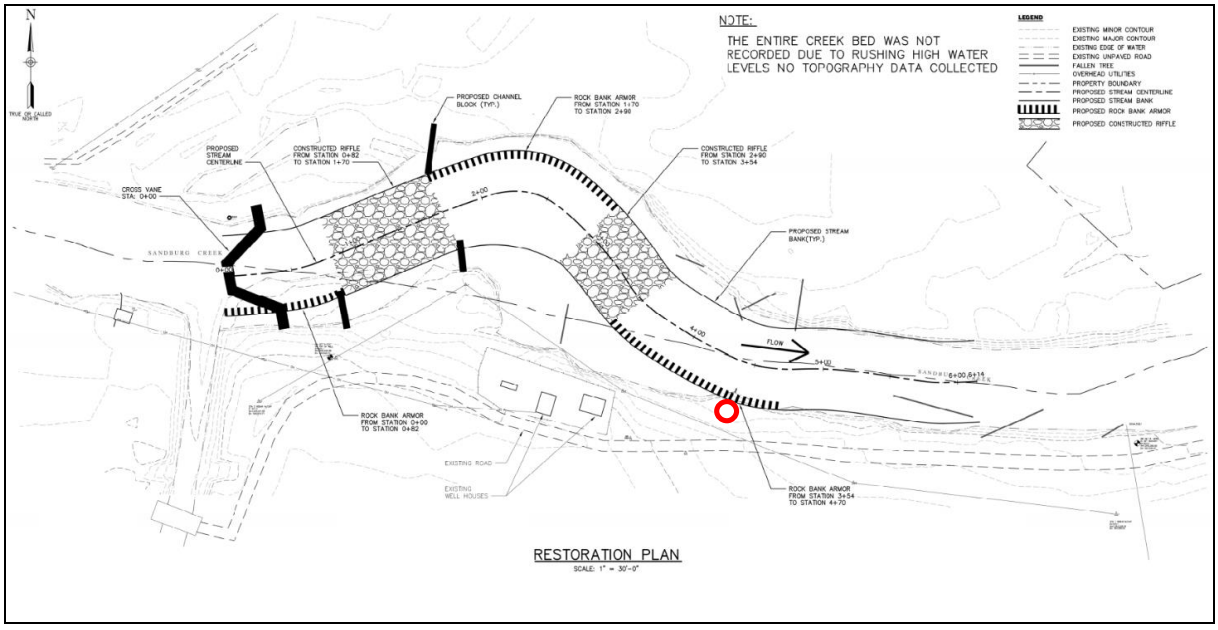

FIGURE 7: SITE 13 RESTORATION PLAN WITH AP 6 LOCATION

PHOTO 1: SANDBURG CREEK AT HANG GLIDER ROAD LOOKING NORTHWEST

PHOTO 2: SITE 10 SANDBURG CREEK LOOKING WEST

PHOTO 3: SITE 10 EAST BANK T00 WITH EROSION CONTROL LOOKING NORTH

PHOTO 4: SITE 10 LOOKING NORTHEAST

PHOTO 5: SITE 13, PUMP HOUSES, LOOKING EAST

PHOTO 6: SITE 13 T00 FLOODPLAIN OF SANDBURG CREEK, LOOKING EAST

Soil and Sediment Profile: Auger Probe 2 Description	Depth, Horizon, and Munsell Color
Brown Sandy Loam to Loamy Sand	0-20 cm A horizon 10YR 4/3
Brown Loamy Sand	20-135 cm C1 Horizon 10YR 5/3
Dark Gray Coarse Sand	135-158 cm C2 Horizon 10YR 4/1
Gray Sand & Gravel	158+ cm C3 Horizon 10YR 5/1

Soil and Sediment Profile: Auger Probe 3 Description	Depth, Horizon, and Munsell Color
Brown Sandy Loam	0-20 cm A Horizon 10YR 4/3
Dark Yellowish Brown Fine Sandy Loam to Silt Loam	20-56 cm Bw1 Horizon 10YR 4/6
Grayish Brown & Dark Yellowish Brown Silty Clay Loam	56-80 cm Bw2 Horizon 10YR 6/2 & 4/4
Light Gray Loamy Sand	80-100 cm C1 Horizon 10YR 7/2
Light Gray Coarse Sand & Gravel	100+ cm C2 Horizon 10YR 7/2

FIGURE 8: AP 2 & AP 3 SOIL AND SEDIMENT PROFILES

Soil and Sediment Profile: Auger Probe 4	Depth, Horizon, and Munsell Color
Description	
Brown Sandy Loam	0-19 cm A Horizon 10YR 4/3
Yellowish Brown Fine Sandy Loam to Silt Loam	19-45 cm B1 Horizon 10YR 5/6
Light Gray & Yellowish Brown Silty Clay Loam	45-70 cm Bw2 Horizon 10YR 7/2 & 5/4
Light Gray Loamy Sand	70+ cm C1 Horizon 10YR 7/2

Soil and Sediment Profile: Auger Probe 5	Depth, Horizon, and Munsell Color
Description	
Brown Sandy Loam	0-40 cm A Horizon 10YR 4/3
Dark Yellowish Brown Loamy Sand	40-95 cm C1 Horizon 10YR 4/6
Grayish Brown Sand	95-130 cm C2 Horizon 10YR 5/2
Gray & Yellowish Brown Loamy Sand	130-150 cm C3 Horizon 10YR 6/1 & 5/8
Light Gray Coarse Sand	150-175 cm C4 Horizon 10YR 7/2
Gravel	175+ cm C5 Horizon

FIGURE 9: AP 4 & AP 5 SOIL AND SEDIMENT PROFILES

4.0 CONCLUSIONS AND RECOMMENDATIONS

The proposed undertaking involves the Ellenville Stream Restoration of Two Sites located in the Town of Wawarsing, Ulster County, New York. Based on the results of the Phase IA Archaeological Survey, two sites out of the 13 that were included in the survey were determined to need additional archaeological survey: Sites 10 and 13. Christine Davis Consultants, Inc. (CDC) was retained to perform the Phase IB Archaeological Survey for this project.

The Geomorphological field survey was conducted for this project in June 2019. Field methodology involved the analysis of hand excavated auger probes to evaluate the potential for buried cultural resources. The APE is approximately 12,647.3 sq m (136,134.4 sq ft or 3.13 ac) in size.

At Site 10 four of five auger probes revealed intact soils developed in sandy and silty alluvium. Coarse sand and gravel channel lag representing previous active stream channels were identified 100 to 175 cm below ground surface. However, the lack of any buried A horizons within thick profiles of alluvial sand indicates the relative instability of much of the alluvial floodplain and terrace landforms within Site 10. The highest potential for intact buried cultural material lies within the southwestern portion of Site 10 where a more stable T1 terrace is evident in the presence of developed B horizons above the alluvial sands. **Phase IB Archaeological Survey at Site 10 can be accomplished through the excavation of shovel test probes to the depth of the alluvial sand C1 horizons.**

The lack of any intact soil visible at the ground surface or in AP 6 at Site 13 indicates the potential for intact buried cultural material to be extremely low. The extensive ground disturbance located on the landform adjacent to the T00 gravels removed any potential for intact historic or prehistoric cultural resources. **No further archaeological survey is recommended for Site 13.**

5.0 REFERENCES

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APPENDIX IV
SOIL PROFILES

Soil & Sediment Profile: STP 1-6	Depth
Description	
Dark Brown Silty Loam	0-37 cm No Cultural Material
Light Brown Clay	37-83 cm No Cultural Material
Gray Sand	83+ cm No Cultural Material

Soil & Sediment Profile: STP 2-9	Depth
Description	
Dark Brown Sandy Silty Loam	0-91 cm No Cultural Material
Gray Sand	91+ cm No Cultural Material

APPENDIX V
SHOVEL TEST RECORDS

ELLENVILLE STREAMBANK RESTORATION OF TWO SITES,
TOWN OF WAWARSING, ULSTER COUNTY
SHOVEL TEST RECORDS FOR SITE 10

Test	Depth-cm	Soil Profile Description	Artifact Summary
ST 1-1	0-19	Brown sandy loam	NCM
	19-45	Yellowish brown fine sandy loam	NCM
	45-70	Light gray and yellowish brown mottled silty clay loam	NCM
	70+	Light gray loamy sand	NCM
ST 1-2	0-36	Loamy gravel	NCM
ST 1-3	0-48	Dark brown silty loam	NCM
	48-87	Gray clay	NCM
	87+	Sand	NCM
ST 1-4	0-45	Dark brown silty loam	NCM
	45-83	Gray and brown mottled clay	NCM
	83+	Gray sand	NCM
ST 1-5	0-50	Dark brown silty loam	NCM
	50-85	Gray and brown mottled clay	NCM
	85+	Sand	NCM
ST 1-6	0-37	Dark brown silty loam	NCM
	37-83	Light brown clay	NCM
	83+	Gray sand	NCM
ST 1-7	0-3	Dark brown silty loam	NCM
	3+	Dark gray dense gravel	NCM
ST 1-8	0-70	Dark brown silty loam	NCM
	70-93	Gray clay	NCM
	93+	Sand	NCM
ST 1-9	0-84	Dark brown silty loam	NCM
	84	Root impasse	NCM
ST 1-10	0-56	Dark brown sand	NCM
	56-100	Light brown/gray sand	NCM
ST 1-11	0-54	Dark brown sand	NCM
	54-103	Light brown/gray sand	NCM
ST 1-12	0-40	Dark brown silty loam	NCM
	40-85	Light gray rocky sand	NCM
	85+	Sand	NCM
ST 2-1	0-60	Dark brown silty loam	NCM
	60	Root impasse	NCM
ST 2-2	0-67	Dark brown silty loam	NCM
	67+	Gravel	NCM
ST 2-3	-	Dense gravel at surface	NCM

ST 2-4	0-94	Dark brown silty loam	NCM
	94+	Sand	NCM
ST 2-5	0-52	Dark brown sandy silty loam	NCM
	52	Root impasse	NCM
ST 2-6	0-75	Dark brown sandy silty loam	NCM
	75-83	Light brown silty loam	NCM
	83+	Gray sand	NCM
ST 2-7	0-67	Dark brown sandy silty loam	NCM
	67-90	Yellowish brown silty loam	NCM
	90+	Gray sand	NCM
ST 2-8	0-73	Dark brown silty loam	NCM
	73-83	Gray sand	NCM
ST 2-9	0-90	Dark brown sandy silty loam	NCM
	90-91	Gray sand	NCM
ST 2-10	0-70	Dark brown silty loam	NCM
	70-83	Light brownish yellow silty loam	NCM
	83+	Sand	NCM
ST 2-11	0-31	Dark brown sandy silty loam	NCM
	31	Root impasse	NCM
ST 2-12	0-70	Dark brown silty loam	NCM
	70-80	Gray sandy silty loam	NCM
	80+	Gray sand	NCM
ST 2-13	0-56	Dark brown silty loam	NCM
	56-90	Gray sandy silty loam	NCM
	90+	Gray sand	NCM

NCM = No Cultural Material

Phase IA Archaeological Investigation of the Ellenville & Wawarsing Stream Bank Restoration of Nine Sites Project

OPRHP# 17PR04134

Prepared for:
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LA# 430

May 2019

MANAGEMENT SUMMARY

SHPO Project Review Number: 17PR04134
Federal Agencies:
State Agencies: HTF/GOSR/HUD CDBG-DR

Phase of Study: Phase IA

Location:
Minor Civil Division: Town of Wawarsing, Village of Ellenville
County: Ulster County

USGS 7.5' Quadrangle Map: Ellenville, NY (2013) and Kerhonkson, NY (2013)

Survey Area

Project Site	Length		Width		Area
1	270.8 m	888.5 ft	50.6 m	166 ft	2.04 ac
2	211.8 m	694.9 ft	12.3 m	40.4 ft	0.56 ac
3	176.4 m	578.7 ft	11.6 m	38.1 ft	0.44 ac
4	87.9 m	288.4 ft	22.6 m	74.1 ft	0.28 ac
5	174.3 m	571.9 ft	10.7 m	35.1 ft	0.41 ac
8	17.9 m	58.7 ft	17 m	55.8 ft	0.075 ac
10	210.8 m	691.6 ft	83.6 m	274.3 ft	2.61 ac
12	4.1 m	13.5 ft	4.1 m	13.5 ft	0.003 ac
13	189.8 m	622.7 ft	84.6 m	277.6 ft	3.05 ac

Archaeological Survey Overview
Total and Interval of Shovel Tests: n/a
Width of Plowed Strips: n/a
Surface Survey Transect Interval: n/a

Results of Archaeological Survey
Number and name of prehistoric sites identified: 0
Number and name of historic sites identified: 0
Sites Recommended for Phase IB/Avoidance: 2

Report Author(s): Derrick (Dirk) Marcucci, RPA

Date of Report: May 2019

1. INTRODUCTION

This condensed report presents the results of a Phase IA archaeological literature review and archaeological sensitivity assessment conducted by Landmark Archaeology, Inc. for the proposed Ellenville Stream Bank Restoration Project located in Village of Ellenville and Town of Wawarsing, New York (Figure 1). The Phase IA study was conducted by Landmark Archaeology, Inc., who was retained as a consultant by Louis Berger U.S. Inc., A WSP Company. The project examined nine (9) locations where stream bank restoration is proposed due to damaged streams and stream corridors (Figure 1).

All Phase IA work was conducted in accordance with guidelines established in *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York* by the New York Archaeological Council (NYAC 2000) and adopted by the Office of Parks, Recreation and Historic Preservation (OPRHP).

The Phase IA study included background research and a site visit. The site visit was completed in May, 2019 and performed by Derrick J. Marcucci, RPA, (Principal Investigator) and two field technicians. Background research for the investigation was collected and analyzed by Sydney Snyder. This report was prepared by Derrick J. Marcucci. All field notes, photographs, and records associated with the project are on file at Landmark Archaeology, Inc., 6242 Hawes Road, Altamont, New York.

2. DESCRIPTION OF THE UNDERTAKING

Based on documents provided by the NYS prepared by Barton & Loguidice (2019) the project:

> …involves stream bank restoration for damaged streams and stream corridors. Measures include the construction of floodplain benches (with rock and/or wood revetment) to reduce cutting at the toe of bank, lowering the height, angle and overall erosion hazard of eroding hazard of eroding rock structures to provide grade control and reduce the erosive force of water upon streambanks by directing flood flows to the center of the stream channel; and reconnecting of floodplains in select areas to reduce channel confinement and the corresponding increases in flood velocity that contribute to flood severity. The stream bank restoration measures may be implemented in phases. A total of thirteen sites in the project area were originally proposed for improvements. Four sites have been removed due to budget constraints.

The nine (9) site/locations are summarized below in Table 1 which lists site/project names, municipality and proposed improvements. As the table indicates, the Area of Potential Effect (APE) for the projects range in size from 0.003 to 3.05 acres. Disturbance for all but two (10 and 13) of the project areas is confined to active stream channels without soil development or associated stable landforms

Table 1
Site/Location Summary

Site Number	Site Name	Municipality	APE Size* acres	Improvements
1	West Branch Beer Kill at Old Greenfield Road	Town of Wawarsing	2.04	Enhance bank protection along left bank toe
2	West Branch Beer Kill at Barbara Road Bridge	Town of Wawarsing	0.56	Replacement of gabion basket revetments, construction of cross vanes downstream of bridge

3	West Branch Beer Kill at Old Greenfield Road Town of Wawarsing	Town of Wawarsing	0.44	Installation of rock cross vanes at upper and lower limits of project reach and transition project reach with adjacent and upstream and downstream reaches
4	West Branch Beer Kill at old Greenfield Road	Town of Wawarsing	0.28	Installation of multiple cross vane structures
5	West Branch Beer Kill at old Greenfield Road	Town of Wawarsing	0.41	Installation of rock cross vanes at upper and lower limits of project reach and transition project reach with adjacent and upstream and downstream reaches
6	removed	-		-
7	removed	-		-
8	Sandburg Creek at Roslyn Street Pump Station	Village of Ellenville	0.075	Placement of a rock cross vane downstream of the sewer crossing and further downstream
9	removed	-		-
10	Sandburg Creek at Hang Glider Road	Town of Wawarsing	2.61	Installation of floodplain benches, rock cross vanes, and rock and wood revetment along portions of the stream bank to prevent lateral bank erosion. Placement of a floodplain culvert through the western roadway bridge approach.
11	removed	-		-
12	Sandburg and Rondout Creeks at Airport Road	Town of Wawarsing	0.003	Stump removal. Monitoring and reduction in sediment load from upstream sources
13	Sandburg Creek at Fallsview Pump Houses	Town of Wawarsing	3.05	Reconstruction and vegetation of floodplains along left and right banks, installation of rock cross vanes

*Area of Potential Affect

3. ENVIRONMENTAL SETTING

The project areas are in southern Ulster County in the Hudson Lowland physiographic region in the Valley and Ridge province of New York (Isachsen et al 2000: 4). Landforms in this region are typically broad and gently rolling valleys surrounded by mountains (Isachsen et al 2000:4). Bedrock is comprised of shale, siltstone, sandstone, limestone, and dolostone. The entire county was covered by the Wisconsian glaciation which started to retreat about ca. 14,000 years ago. Most of the county is blanketed by a ground moraine that was deposited directly from the base of the melting ice sheet. Most soils formed directly in glacial or glacial-related deposits. Streams in the county generally flow north towards the Hudson (Tornes: 1979:3).

Soils information is summarized below in Table 2. The table indicates that several locations have two soil associations correlating to different landforms (e.g., hillslopes, benches, etc.).

Table 2
Soil Summary Information

Site	Soil Name	Symbol	Slope	Drainage Class	Parent Material	Landform
1	Arnot-Lordstown-Rock outcrop complex	ARD	15-25%	Somewhat excessively drained, moderately well drained, and well drained	Glacial till	Ridges, benches, hills
1	Hoosic gravelly loam	HgD	15-25%	Somewhat excessively drained	Glacial outwash	Terraces, kames
2, 3	Castile gravelly silt loam	CgB	3-8%	Moderately well drained	Glacial outwash	Terraces, valley trains
2, 5	Lackawanna and Swartswood very bouldery soils	LCD	15-20%	Well drained	Loamy till	Hills, mountains
4, 10, 13	Middlebury silt loam	Mr	0-2%	Moderately well drained and somewhat poorly drained	Loamy alluvium	Flood plains
4	Valois very bouldery soils	VAB	3-8%	Well drained	Loamy till	Moraines, valleysides
8, 10	Tioga fine sandy loam	Tg	0-3%	Well drained	Alluvium	Flood plains
10, 12	Suncook loamy fine sand	Su	0-3%	Excessively drained	Sandy alluvial deposits	Flood plains
13	Wayland silt loam	Wb	<1%	Poorly drained	Alluvium	Flood plains

Tornes (1974)

Brief descriptions for each of the nine (9) site/location areas are listed below:

Site 1: West Branch of Beer Kill at Old Greenfield Road

At this location, the West Branch Beer Kill flows west through Site 1 south of Rt. 52 and its intersection with Old Greenfield Road. Cutbanks along the stream are steep and boulder strewn and bedrock is exposed in the streams base. A nineteenth century residence and several outbuildings occupy land adjacent to the project area along most of its southern edge. Several twentieth century and modern houses are found north of Rt. 52 and east of the project area. Project activities are confined to the active stream channel.

Site 2: West Branch at Barbara Bridge

The West Branch Kill enters Site 2 upstream from the Barbara Road Bridge. The stream's channel is entrenched about 2 to 3 meters below ground surface and Old Greenfield Road forms it's eastern embankment along the streams left banks. The banks of the stream are comprised of thin soils over boulders. A small cluster of modern houses sits just north of the location on the west side of the stream. Project activities are confined to the active stream channel.

Site 3: West Branch at Barbara Bridge

This site is located upstream from Site 2 and is also laterally confined by the Old Greenfield Road embankment. The banks of the stream are comprised of thin soils over boulders. There are a series of modern residences on the west side of the stream along Linda Lane which runs parallel to the stream. Project activities are confined to the active stream channel at Site 3.

Site 4: West Branch Beer Kill
Site 4 is located about 1600-feet upstream from Site 3. Like Site 3, the stream borders the western edges of Old Greenfield Road. The left bank of the stream is high along the southern part of the site, extending 3 to 4 meters in height from the road edge to the stream. The stream is bedrock controlled and its banks are comprised of cobble and boulders. A twentieth century house sits north of the site along its eastern limits. At Site 4, project plans indicate that project activities are confined to the active stream channel.

Site 5: West Branch Beer Kill
Site 5 is located approximately 3000-feet upstream of Site 4**.** The stream is similar from Site 4 in that its left banks are formed along the roadway embankment. Cobbles are strewn along the streams right banks with no soil development. An abandoned park, known as Kanfer Park, is adjacent to the western limits of the project area. No standing structures are within sight of the site. Project activities are confined to the active stream channel at Site 5.

Site 8: Sandburg Creek at Roslyn Street Pump Station
This location is at the Roslyn Street Pump Station where the street dead ends at the creek. Boulders have been positioned along the banks of the stream to curb erosion. Several modern houses line Roslyn Street near the project area. The northern banks of the stream lie adjacent to the rear of a twentieth century barn, currently used as propane filling station. At this location, project activities are confined to the active stream channel.

Site 10: Sandburg Creek at Hang Glider Road
Sandburg Creek flows north at Site 10. The stream is entrenched in two or more meters of alluvium, and a broad floodplain flanks both sides of the stream. A ca. 1930-40s house sits near the project area along the northern limits where the bridge crosses Sandburg Creek. The APE extends onto floodplain alluvial deposits on both sides of the stream.

Site 12: Sandburg and Rondout Creeks at Airport Road
The stream is entrenched in two or more meters of glacial-lacustrine deposits at this location. Proposed actions at this location include tree removal by hand or backhoe. There are no standing structures near the project area. Project activities do not extend beyond the limit of the active channel.

Site 13: Fallsview Well House
Portions of this project site on the south side of the stream are located in a golf course where a gully enters Sandburg Creek. Two pump houses are in the project area. The stream is entrenched in two meter of alluvium along its south banks near the pump houses. Cobbles are strewn on much of the stream's bed and shore lines. Project activities will extend onto the alluvial floodplain south of Sandburg Creek.

4. PHASE IA RESEARCH

Phase IA research included a site files search utilizing the Cultural Resources Information System (CRIS) maintained at the OPRHP. The search determined if archaeological sites or National Register of Historic Places (NRHP) properties were recorded within or near the project area. Other information obtained from CRIS included whether or not previous archaeological investigations have occurred within or near the project area. Phase IA research also examined historic maps to identify land use history and potential for historic resources within the project area.

NRHP Properties
The CRIS indicated that no NRHP or NRE properties are located within or adjacent to any of the nine project areas

Archaeological Sites

CRIS records show no previously recorded archaeological sites are located within or adjacent to the project areas. The closest archaeological site to any of the project areas is the Masonry Wall Site (OPRHP 11141.00012) which is located approximately 0.03 miles northeast of Site 8.

Table 3
Previously Recorded Sites within One Mile of the Site Locations

Project Site	OPRHP #	NYSM #	Reported By	Site Identifier/Description	Time Period
8	11141.000004		Dumont Archaeological Surveys (DAS)	Leipold Site	Prehistoric (Woodland)
8	11141.000019		DAS	Sunray Site	Historic
8	11141.000009		DAS	D&H Lock 30	Historic (pre 1875)
8	11141.000010		DAS	Ruins 1 Site	Historic (c. 1800-1935)
8	11141.000011		DAS	Ruins 2 Site	Historic (late 19th-early 20th century)
8	N/A	5056	N/A	N/A	N/A
8	N/A	8647	N/A	N/A	N/A
8, 10, 13	11119.000014		DAS	Nevele West Site	Prehistoric (Archaic)
8, 13	11119.000013		DAS	Nevele East Site	Prehistoric (Archaic)
8, 13	11119.000025		DAS	Country Club Site	Prehistoric (Early Woodland)
8, 13	11119.000018		DAS	Harris III	Prehistoric
8, 13	11119.000024		DAS	Harris II	Prehistoric
8, 13	11119.000023		DAS	Harris I	Prehistoric
8, 13	11119.000034		DAS	Harris IV	Prehistoric (Late Archaic c. 2000 B.C.)
8, 13	11141.00012		DAS	Masonry Wall Site	Historic (c.1850-1900)
8, 13	11141.000001		DAS	Meinhold-Yarrow Distillery	Historic (late 19th-early 20th century)
8, 13	11141.000006		DAS	D&H Aqueduct	Historic (pre 1875)
8, 13	11141.000018		DAS	Cabin Site	Historic
8, 13	11141.000002		DAS	Mine and Mine Shaft	Historic (1852-1907)
8, 13	11141.000008		DAS	Mill St. Complex	Historic (post 1900)
8, 13	11141.000007		DAS	Cass Site	Prehistoric (Archaic) and Historic (c. 1821)
8, 13	11141.000196		Joseph E. Diamond	D&H Canal Company Dry Dock	Historic (c. 1900-1915)
8, 13	11141.000003		DAS	D&H Lock 31	Historic (pre 1875)
8, 13	11141.000005		DAS	Ellenville Glassworks	Historic (pre 1875)
10, 13	11119.000020		DAS	Griswold Site	Prehistoric
12	11119.000016		Daniel W. DeMicco	Unnamed Site	Prehistoric
12	11119.000322		Joseph E. Diamond	Resnick Airport 2014	Prehistoric
12	11119.000284		Joseph E. Diamond	Wawarsing Airport Site	Prehistoric (c. 5500 B.C–contact)
12	11119.000068		Joseph E. Diamond	Napanoch Prison Site	Prehistoric
12	11119.000037		DAS	Weir Structures and Lock Tenders House Site	Historic (mid-19th century)
12	11119.000036		DAS	Locus 3 Seatler Site	Prehistoric
12	11119.000035		DAS	Lime Kiln Remains Site	Historic (after 1870)
12	11119.000038		DAS	Locus 2 Seatler Site	Prehistoric
12	11119.000026		Jeanette Collamer and Karen Hartgen	Mill Ruins	Historic (19th century)
12	11119.000015		DAS	Locus One (Jamesway) Site	Prehistoric (3600 B.C-2400 B.C)
12	11119.000033		DAS	Bevier Site	Historic (mid-18th century)
12	11119.000304		STRATA CRM, LLC.	Ellenville Hospital Precontact and Historic Site	Prehistoric and Historic (18th-20th century)
12	N/A	8646	N/A	N/A	N/A

Previous Cultural Resources Investigations

According to OPRHP records, one archaeological investigation has been completed that encompassed portions of Site 13's APE (Morton and Carretta, 2012). This phase IA investigation did not identify any archaeological sites and recommended no further work. The same survey also considered lands approximately 0.25 miles southwest of Site 8.

Table 4
Archaeological Investigations within One Mile of the Site Locations

Project Site	Survey Title	Year	Consultant	Proximity to Project Area	Recommendations/Sites Identified
1, 2, 3, 4, 5, 12	Phase 1 Cultural Resources Survey WH-1 and WH-2 Transmission Lines Rebuild Project	2015	Environmental Design and Research	North of project sites	No further work
1, 8, 13	Village of Ellenville Water System Improvements, Phase 1A Cultural Resource Survey, Village of Ellenville and Town of Wawarsing, Ulster County	2012	Fisher Associates	East and southeast of project site	No further work
1, 8	Phase I Cultural Resources Survey, Site Assessment and Site Identification Phases Proposed Osterhoudt Mine Site, Village of Ellenville, Town of Wawarsing, Ulster County, New York	2010	Columbia Heritage, Ltd.	East of project site	No further work
2, 3	Abbreviated Phase I Cultural Resources Survey for the Napanock Cellular Tower Project, Wawarsing Township, Ulster County, New York	2007	Environment and Archaeology, LLC.	Southeast of project sites	No further work
8	Archaeological Phase I Cultural Resources Survey for Telecommunications Facility, NY-1209, Ellenville, New York	2016	Sims and Associates, LLC.	North of project site	No further work
8, 10, 13	Nevele Resort Casino and Spa Phase IA Literature Review and Sensitivity Analysis & Phase IB Archaeological Field Reconnaissance Survey and Assessment of Intersection and Building Assessment of Route 209 and Route 172	2014	CITY/SCAPE	Southwest of project site 8 North of project site 10	Avoidance of D&H towpath, no further work
8, 12	Phase 1A/1B Archeological Investigation & Phase II Site Evaluation, Ellenville Senior Apartments, Town of Wawarsing, Ulster County, New York	2007	STRATA CRM, LLC.	Southwest of project site	Ellenville Hospital Precontact and Historic Site
12	Phase I Cultural Resource Investigation, Resnick Airport Improvements, Town of Wawarsing, Ulster County, New York.	2014	Joseph E. Diamond	Southwest of project site	Resnick Airport 2014 Site
12	Phase IA/IB Archaeological Investigation, Future Wawarsing Subdivision, Town of Wawarsing, Ulster County, New York	2008	STRATA CRM, LLC.	West of project site	No further work

Historic Maps

Historic maps reviewed during the Phase IA study included the years 1853 (Tillson and Brink 1853; Figure 5-7), 1880 (Beers 1880; Figures 8-10), and 1906 (USGS 1906; Figures 11-13). The three maps show no historic structures within any of the project areas. However, structures are depicted nearby in several locations. Due to the scale it was drawn, very few structures are depicted on the 1880 Beers map. All

three historic maps illustrate the West Branch Beer Kill, Rondout Creek and Sandburg Creek in similar alignments to their present day-routes.

Site 1:
On the 1853 map, no structures are shown immediately adjacent to the project area; however, a structure labeled "S. Haste" is depicted east of the project area on the West Branch Beer Kill near its intersection with Old Greenfield Road (see Figure 7). In 1906, a structure is shown in the location of the "S. Haste" house and another is depicted adjacent to the project area (see Figure 13).

Sites 2 and 3:
No structures are depicted within or adjacent to the project area on the 1853, 1880, or 1906 historic maps (see Figures 5, 8, and 11).

Sites 4 and 5:
The 1853 map shows a sawmill ("S.M.") located between the two sites on the south side of the West Branch Beer Kill. A chair factory ("Chair Facty") is depicted to the west of Site 5 along Old Greenfield Road (see Figure 5). In 1906 the sawmill and chair factory are no longer illustrated; however, a structure is shown in the current location of the house at 736 Old Greenfield Road (see Figure 11).

Site 8:
No structures are shown adjacent to the project area on the 1853 map. A pond is depicted to the east of the project area with a sawmill ("S.M") illustrated between the pond and the Delaware and Hudson (D&H) Canal (see Figure 6). There are no adjacent structures on the 1906 map (see Figure 12).

Site 10:
No structures are depicted within or adjacent to the project area on the 1853, 1880, or 1906 historic maps (see Figures 6, 9, and 12).

Site 12:
The 1853 map shows four structures to the west of the project area along the west side of River Street (see Figure 7). The 1906 map shows only two structures in this location (see Figure 13).

Site 13:
The 1853 map shows four structures south of the project area between the Sandburg Creek and the D&H Canal (see Figure 6). The 1906 map does not depict any structures in the location of the four shown on the 1853 map or any other structures within or adjacent to the project area (see Figure 12).

Site Visit

A site visit to all nine project areas was conducted on May 6, 2019. Derrick (Dirk) J. Marcucci, RPA supervised the reconnaissance and was accompanied by a crew chief and one field technician. The project areas were walked, cutbanks examined for the presence of soil development and cultural materials, and all standing structures within approximately 100-150 feet of the project areas were photographed.

5. RECOMMENDATIONS

Information summarizing the results of investigation is shown below in Table 5. As the Table indicates, based on the Phase IA field reconnaissance, two of the nine sites have potential for the presence of archaeological sites. According to project plans, ground disturbance will occur on alluvial landforms that have potential for buried archaeological materials for Site/Locations 10 and 13. Phase IB fieldwork is recommended for Sites 10 and 13. Sites 1-5, 8 and 12 have no archaeological potential and no additional work appears warranted for these locations. At these locations, project plans indicate that disturbances

are confined to the active stream channel and banks which have no significant soil development or stable landforms that would encapsulate archaeological materials.

Table 5
Results of Investigation Summary

Site Number	**archaeological potential	Adjacent Structures Present	Photographs #	Figures #
1*	No	Yes	1-8	4, 7, 10, 13, 14
2*	No	Yes	9-18	2, 5, 8, 11, 15
3*	No	Yes	9-18	2, 5, 8, 11, 15
4*	No	Yes	19-21	2, 5, 8, 11, 16
5*	No	No	22, 23	2, 5, 8, 11, 17
6	n/a			
7	n/a			
8*	No	Yes	24-27	3, 6, 9, 12, 18
9	n/a			
10**	Yes	Yes	28-32	3, 6, 9, 12, 19
11	n/a			
12*	No	No	33	4, 7, 10, 13, 20
13**	Yes	No	34-36	3, 6, 9, 12, 21

*APE is confined to modern stream channel ** APE extends onto floodplain/terraces

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FIGURES

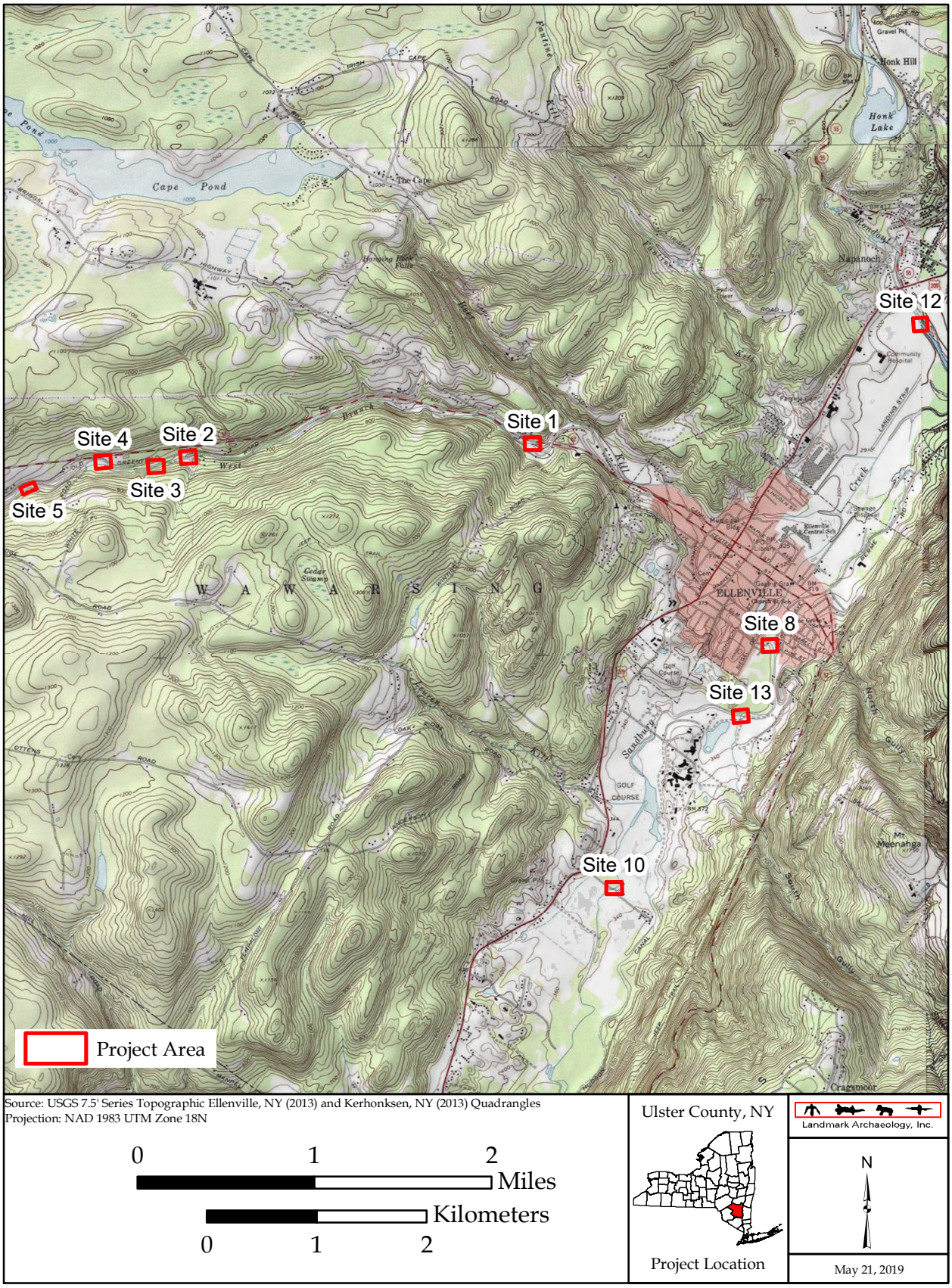


Figure 1: Project Locations and Topographic Features

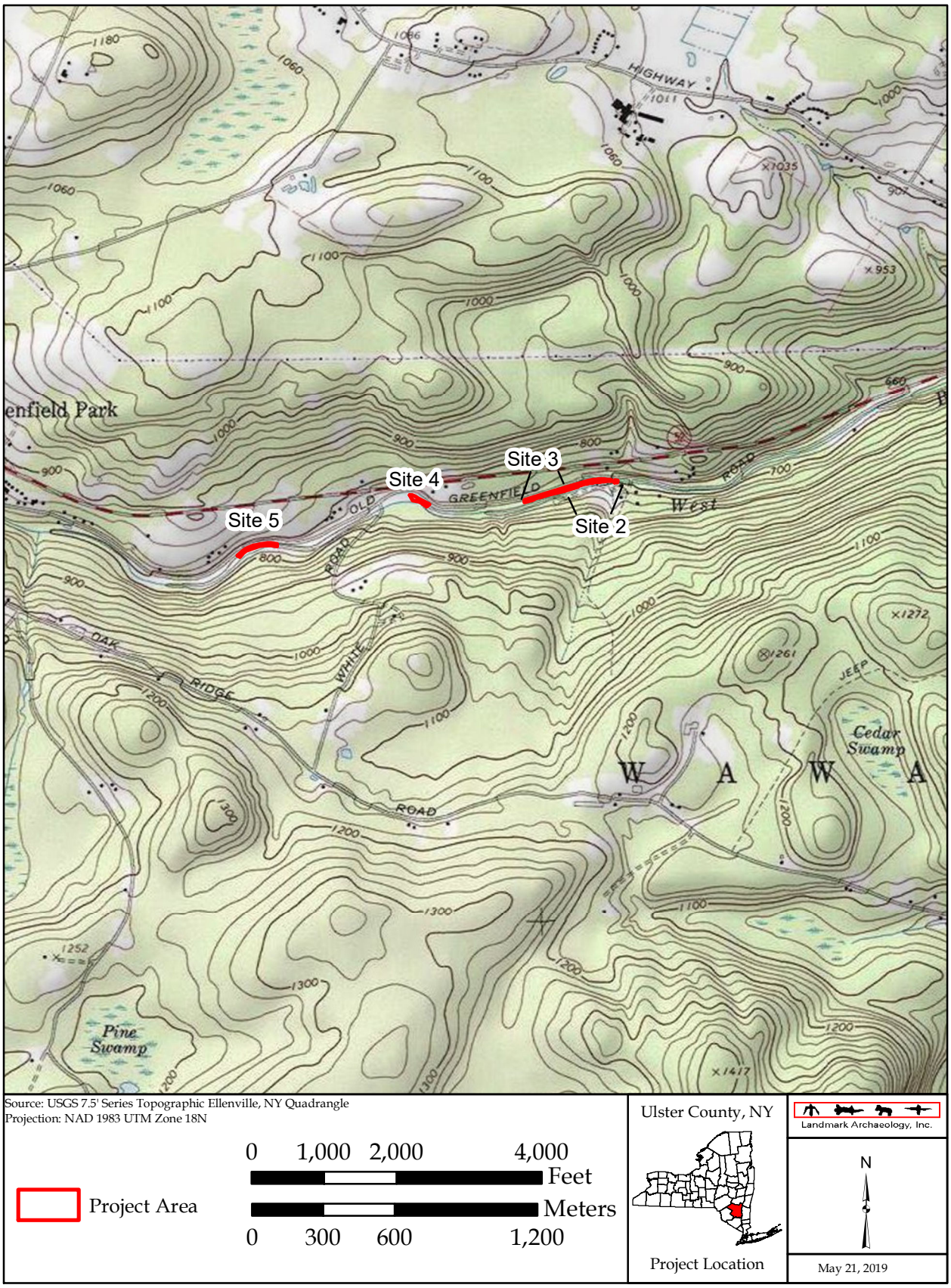


Figure 2: Project Area and Topographic Features, Sites 2, 3, 4 and 5

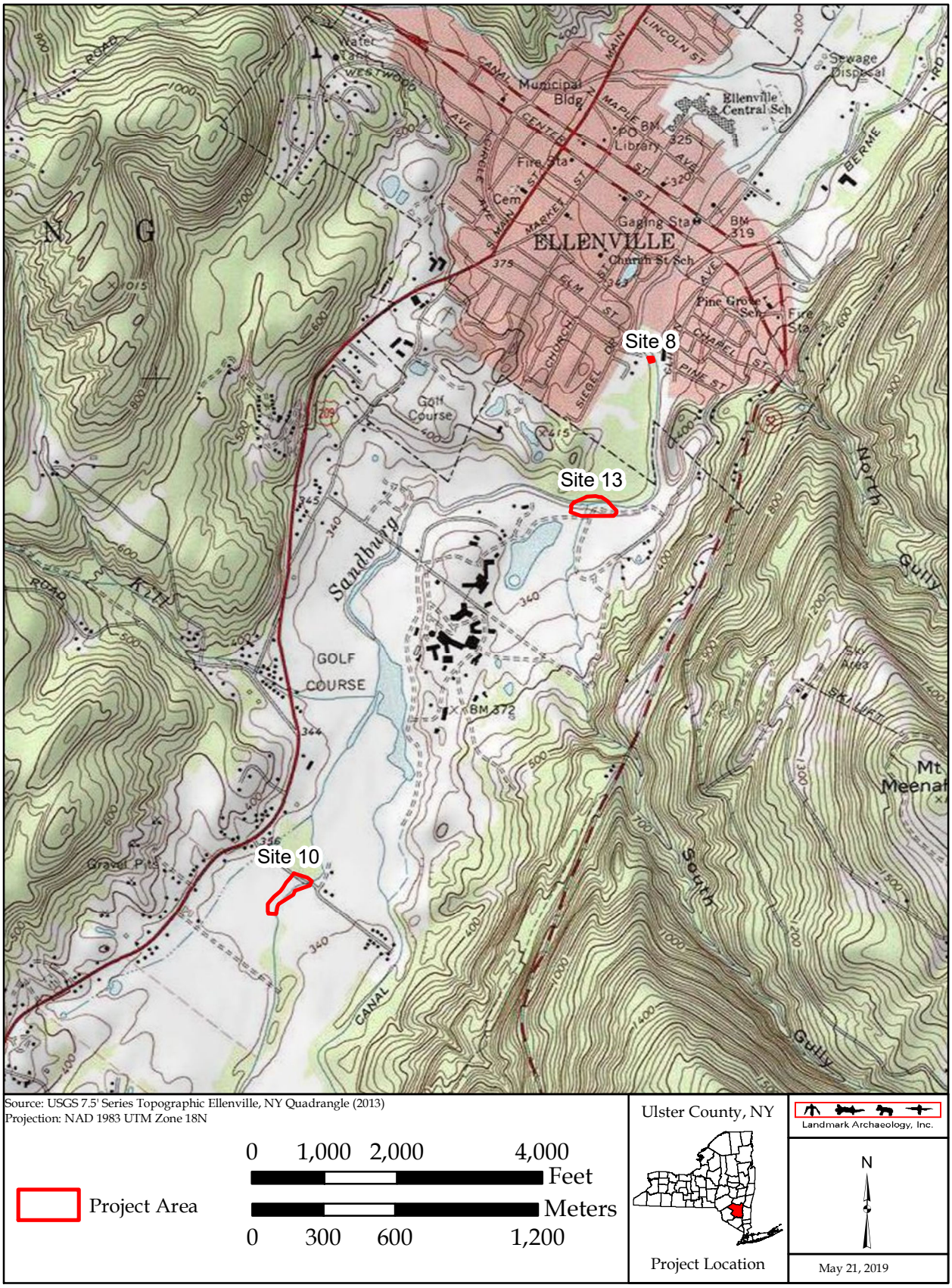


Figure 3: Project Area and Topographic Features, Sites 8, 10 and 13

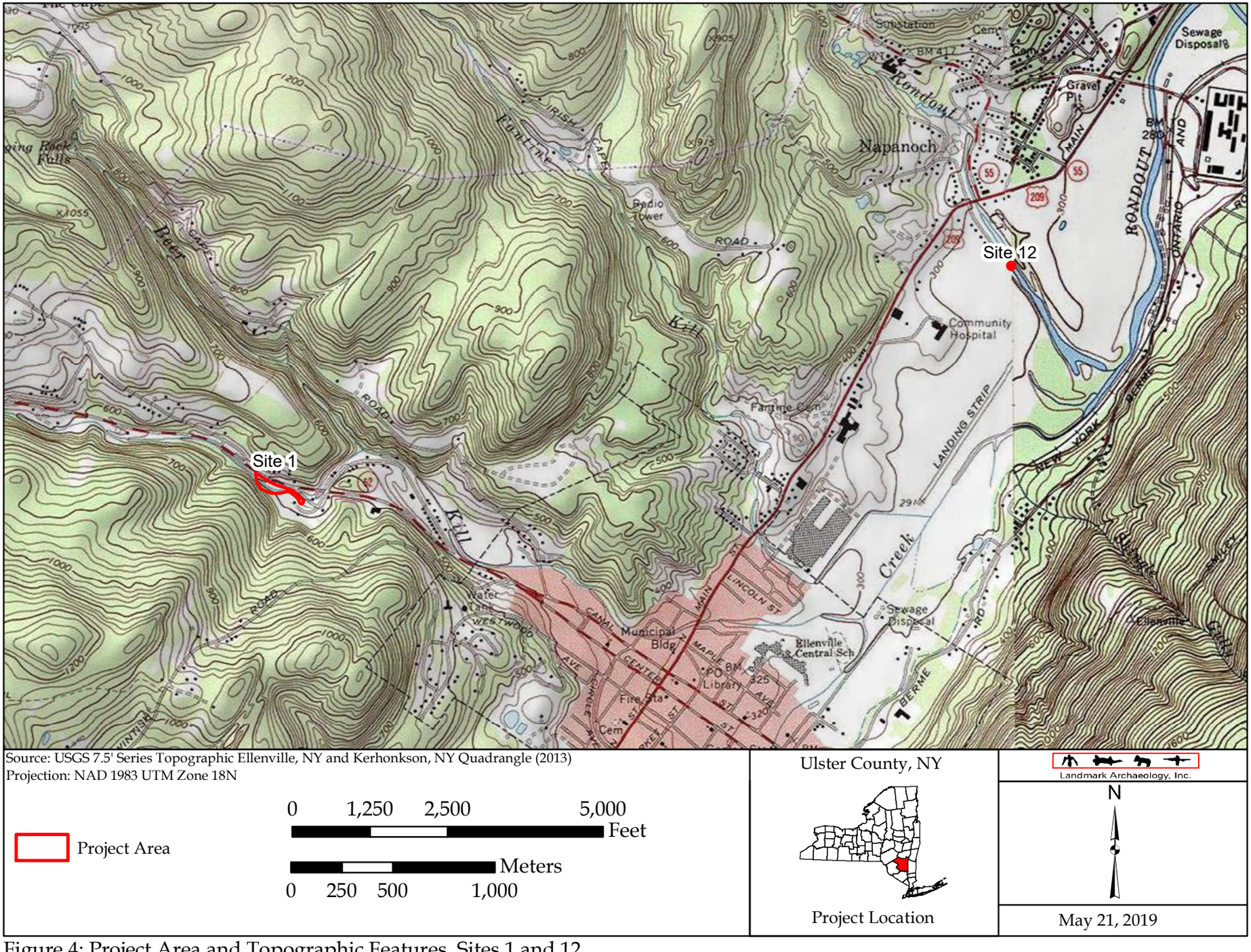


Figure 4: Project Area and Topographic Features, Sites 1 and 12

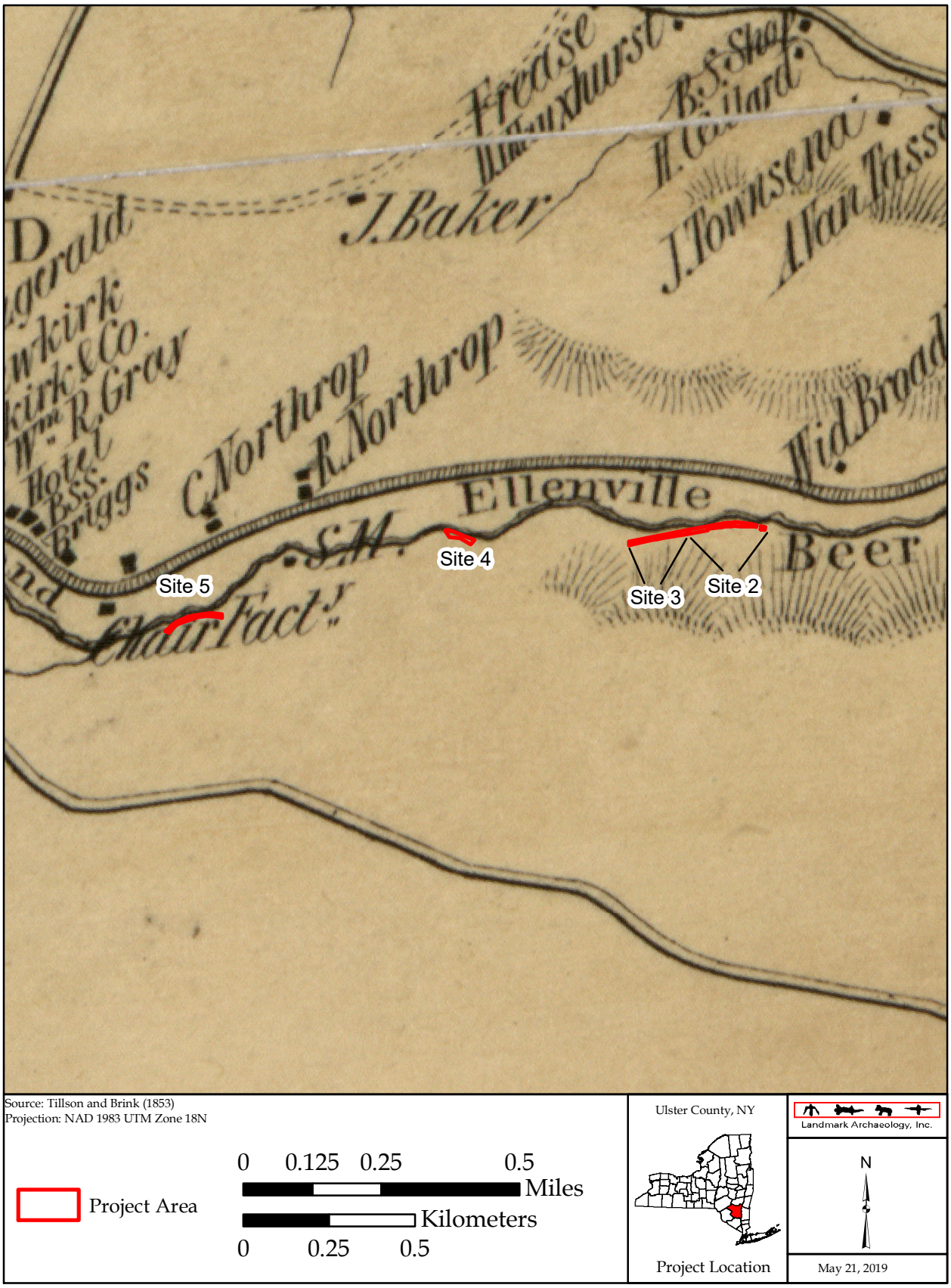


Figure 5: Project Sites 2, 3, 4 and 5, 1853

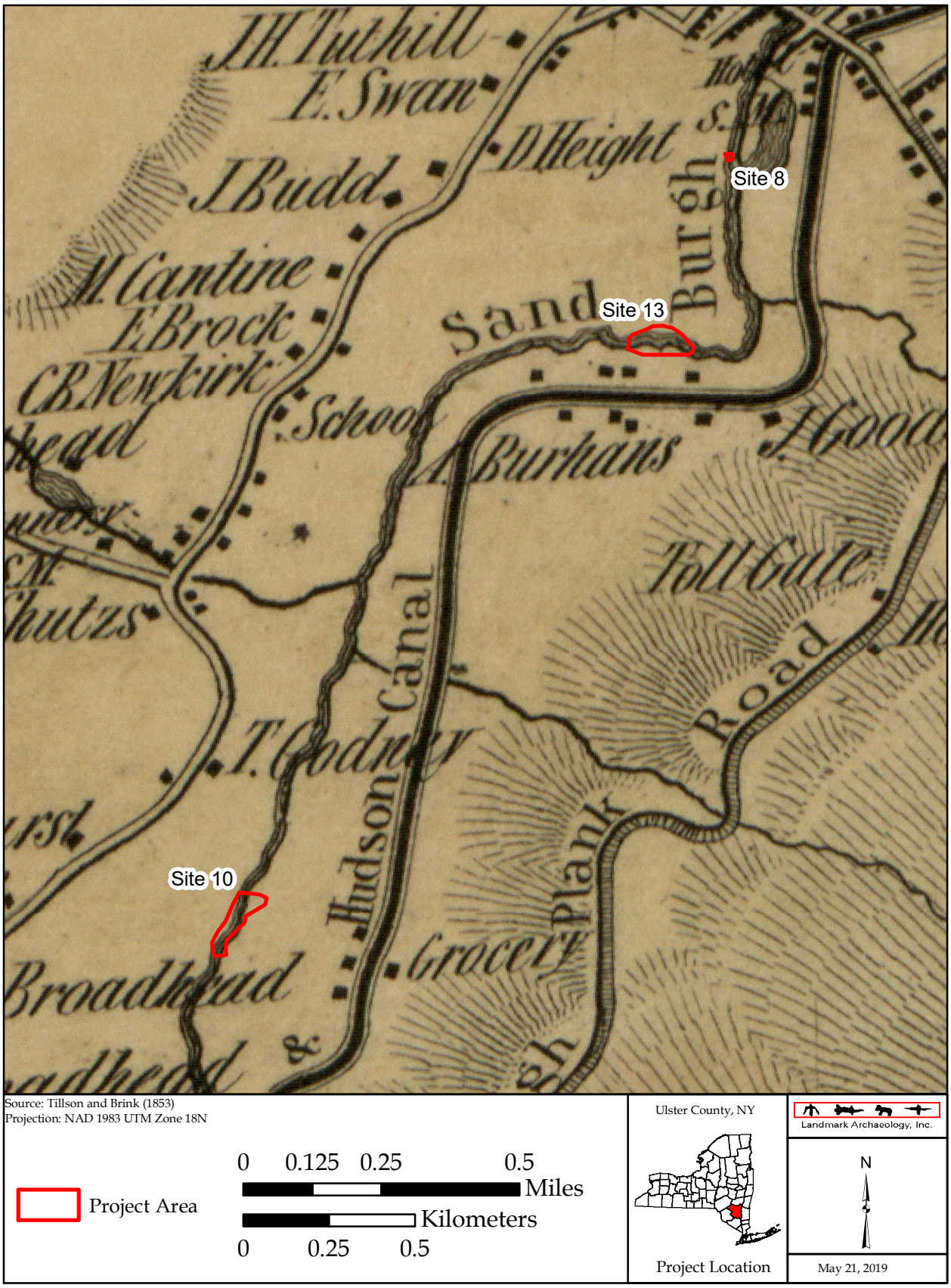


Figure 6: Project Sites 8, 10 and 13, 1858

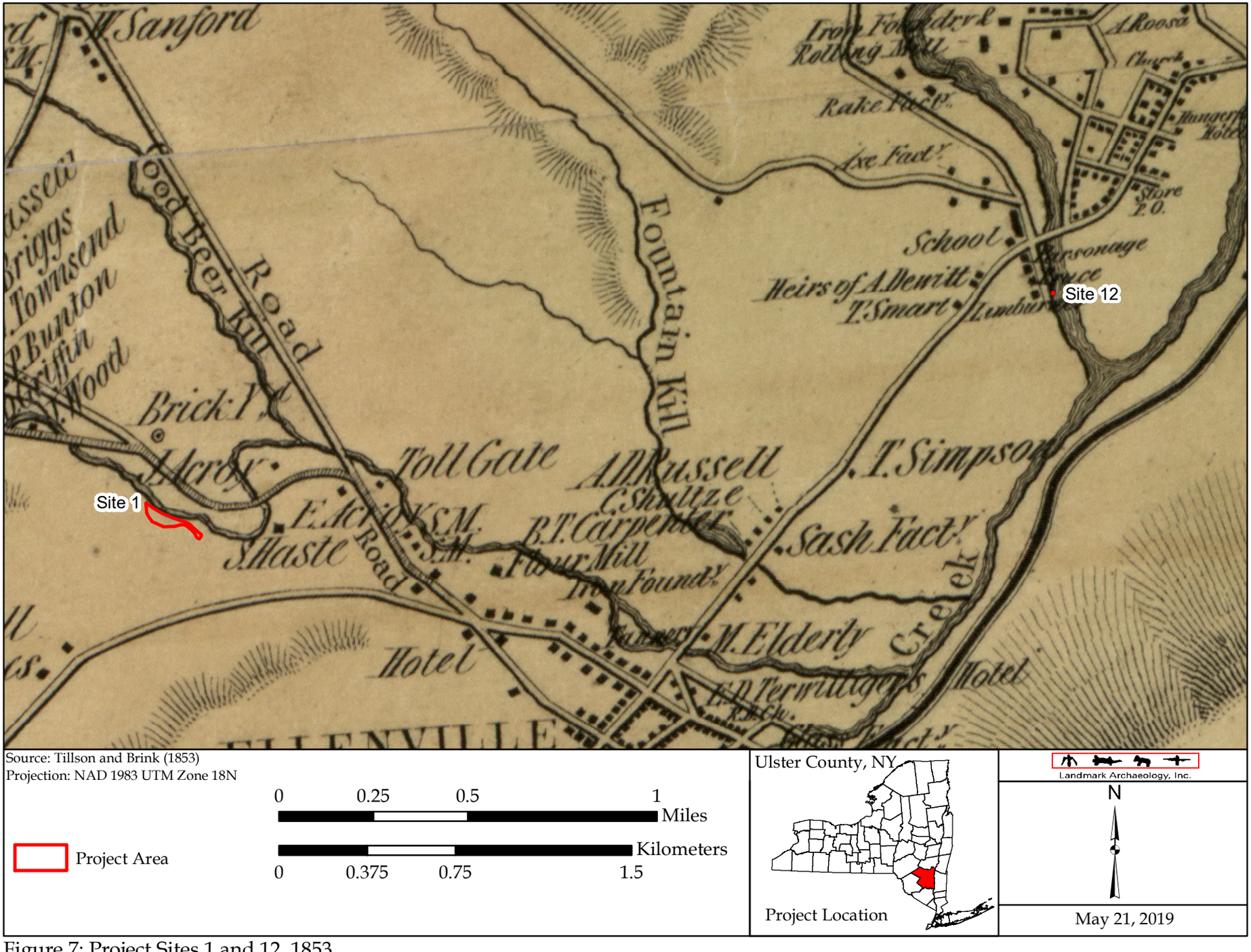


Figure 7: Project Sites 1 and 12, 1853

Figure 8: Project Sites 2, 3, 4 and 5, 1880

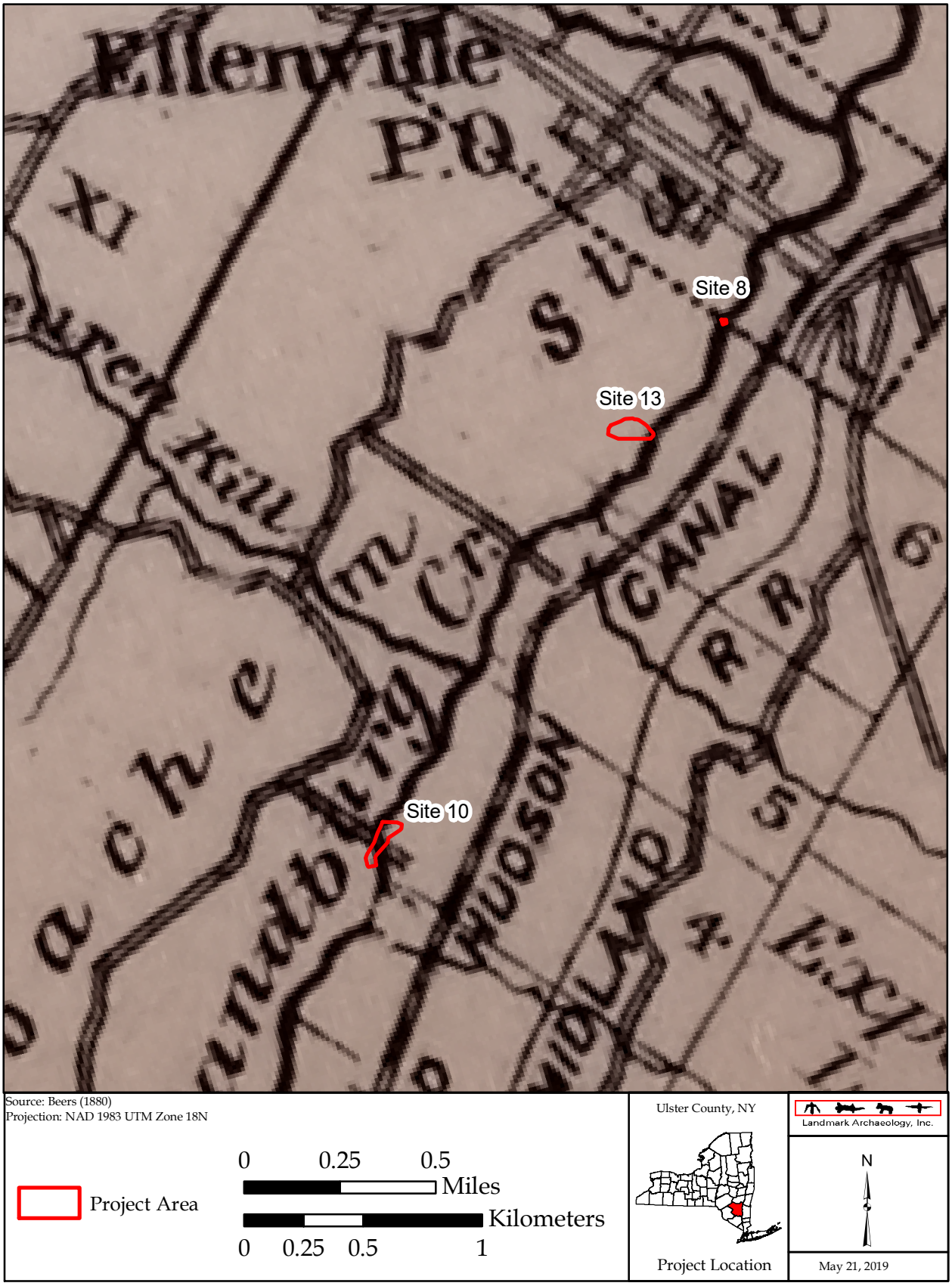


Figure 9: Project Sites 8, 10 and 13, 1880

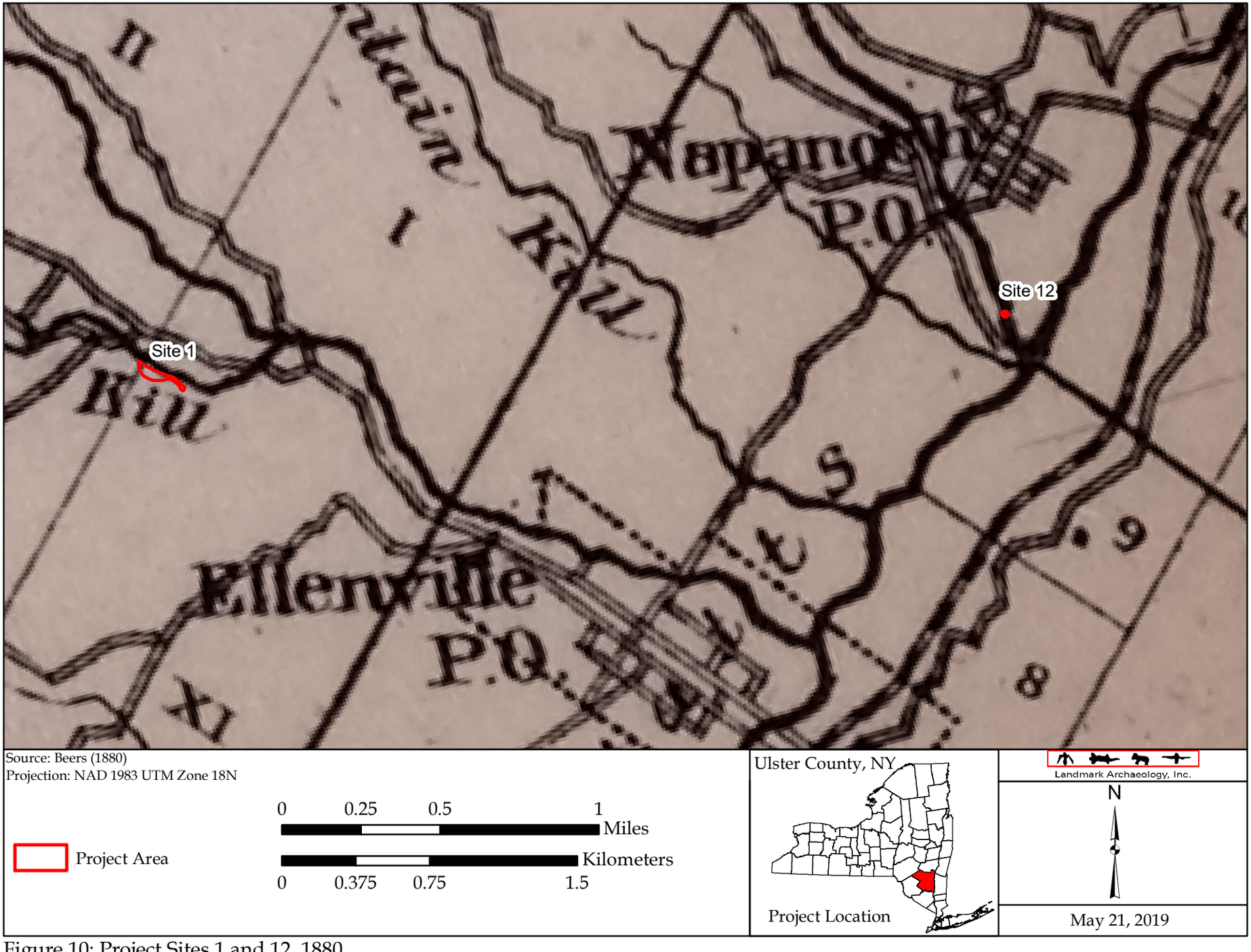


Figure 10: Project Sites 1 and 12, 1880

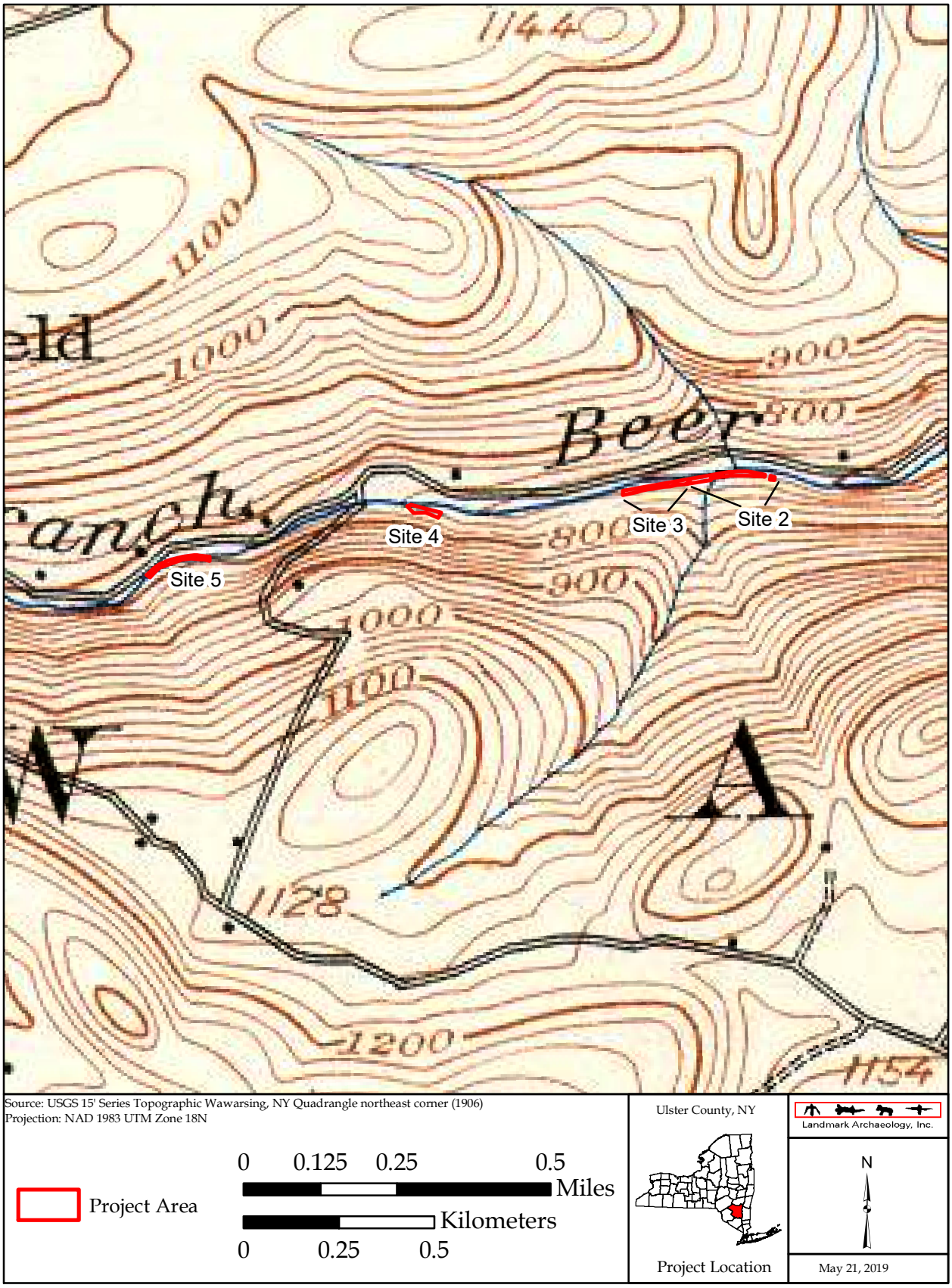


Figure 11: Project Site 2, 3, 4 and 5, 1906

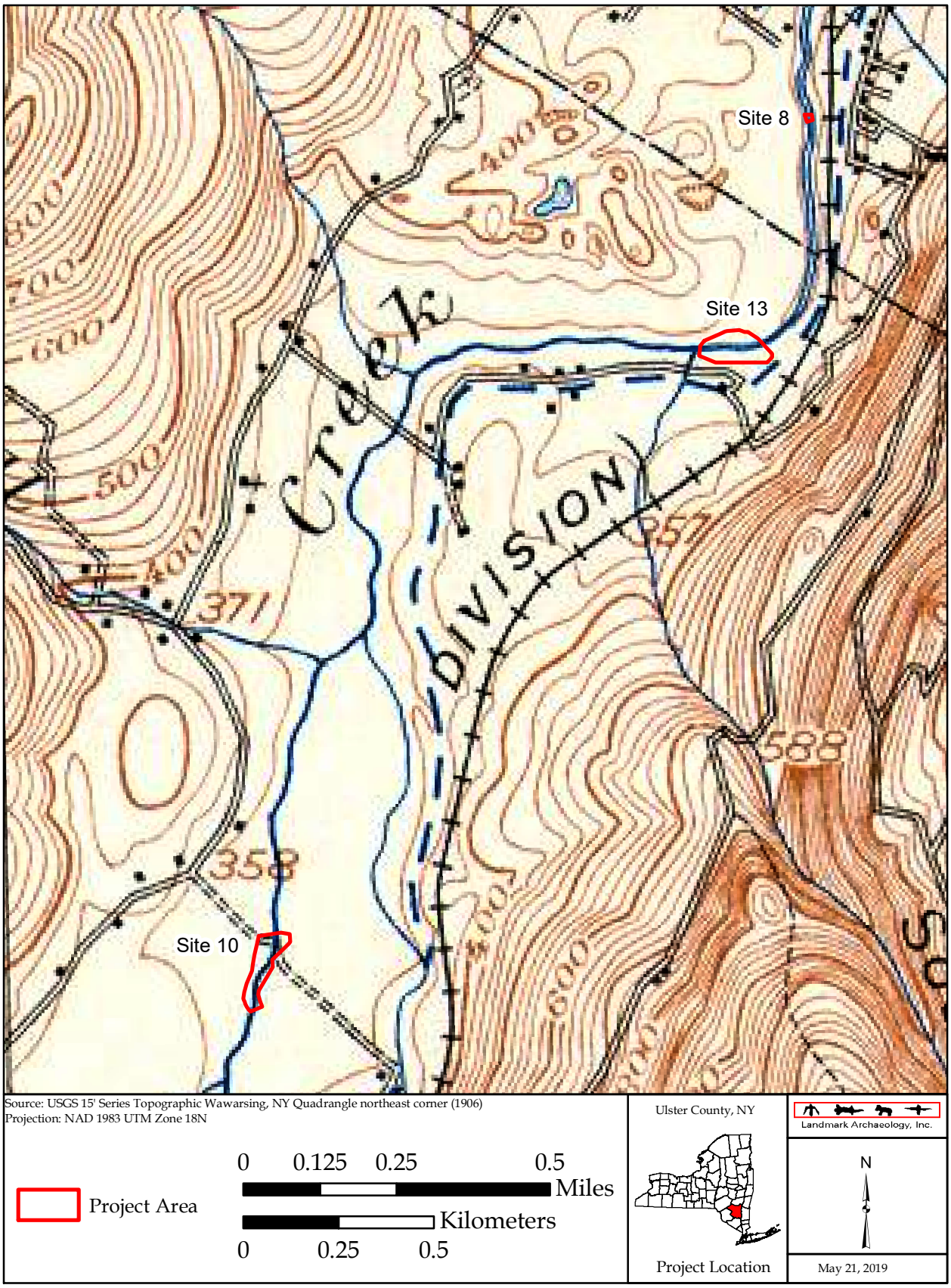


Figure 12: Project Sites 8, 10 and 13, 1906

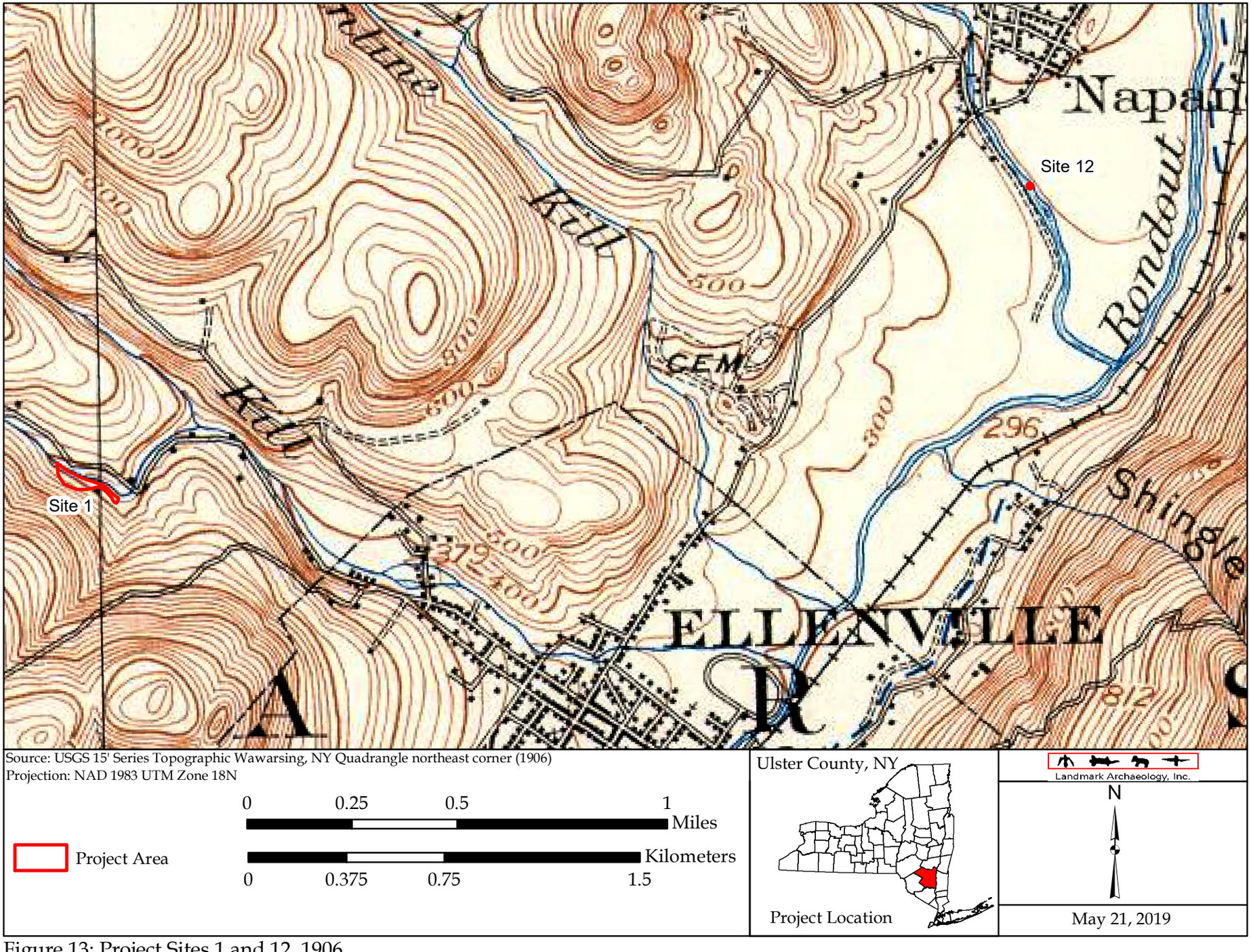


Figure 13: Project Sites 1 and 12, 1906

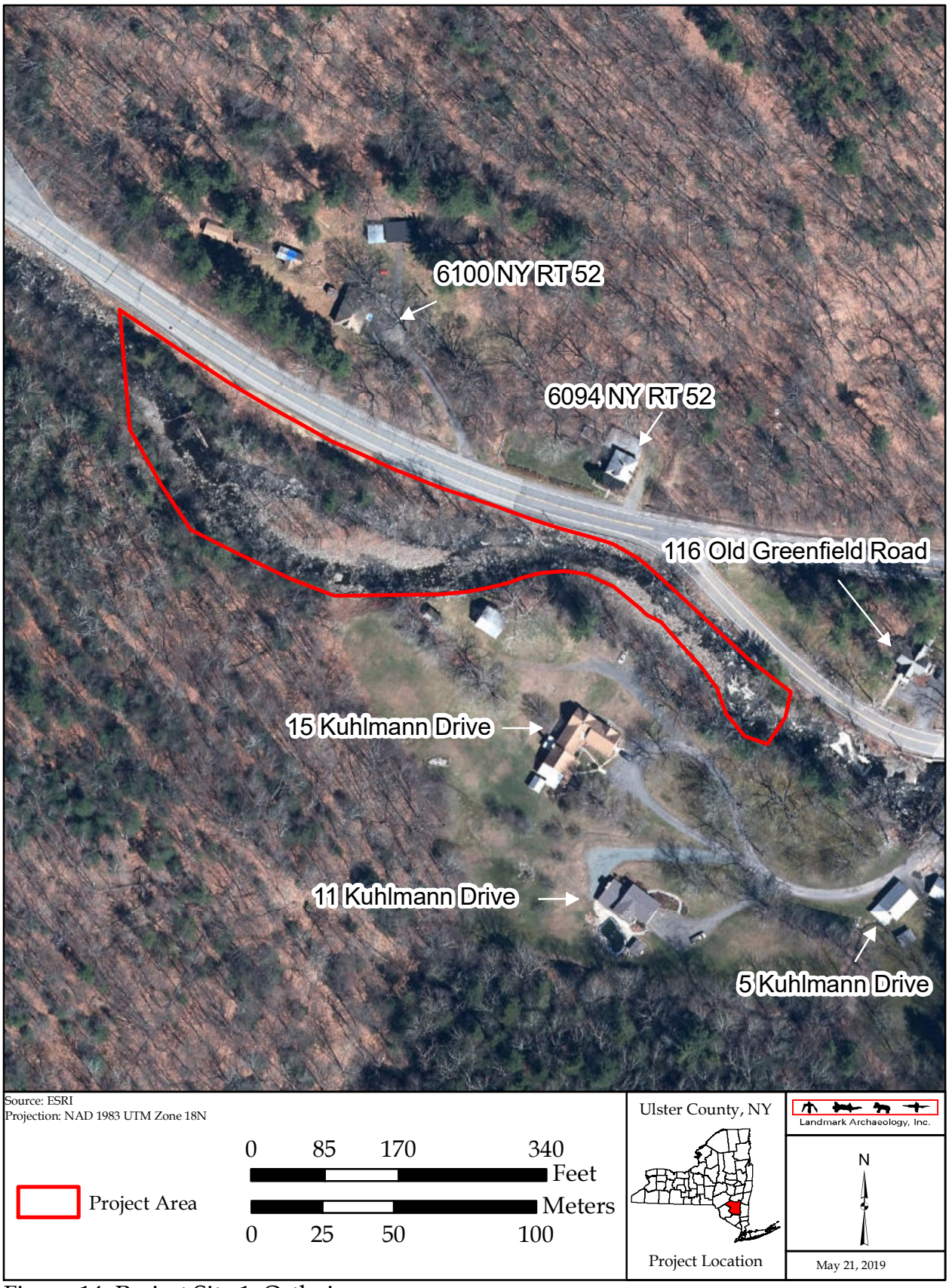


Figure 14: Project Site 1, Orthoimagery

Figure 15: Project Sites 2 and 3, Orthoimagery

Figure 16: Project Site 4, Orthoimagery

Figure 17: Project Site 5, Orthoimagery

Figure 18: Project Site 8, Orthoimagery

Figure 19: Project Site 10, Orthoimagery

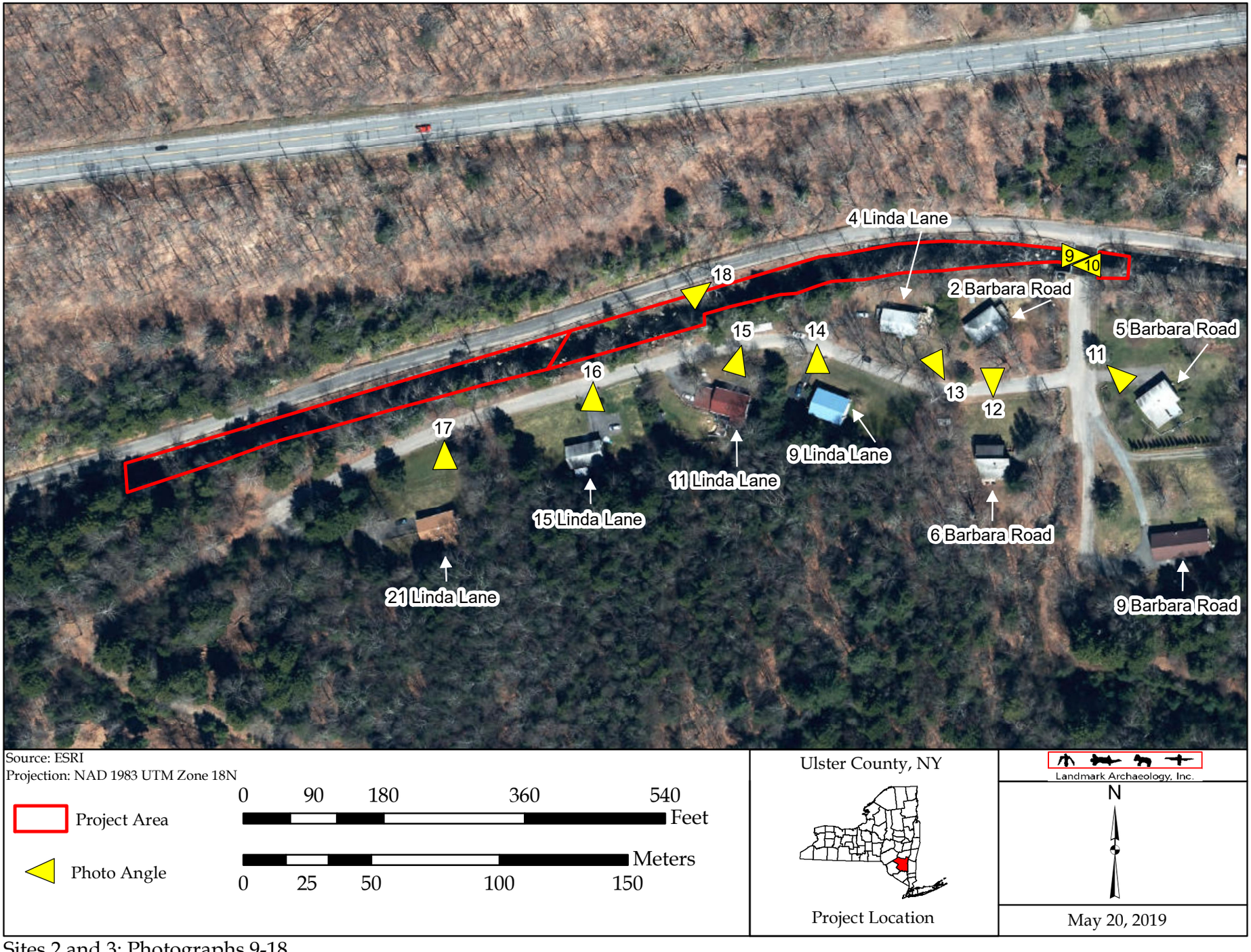
Figure 20: Project Site 12, Orthoimagery

Figure 21: Project Site 13, Orthoimagery

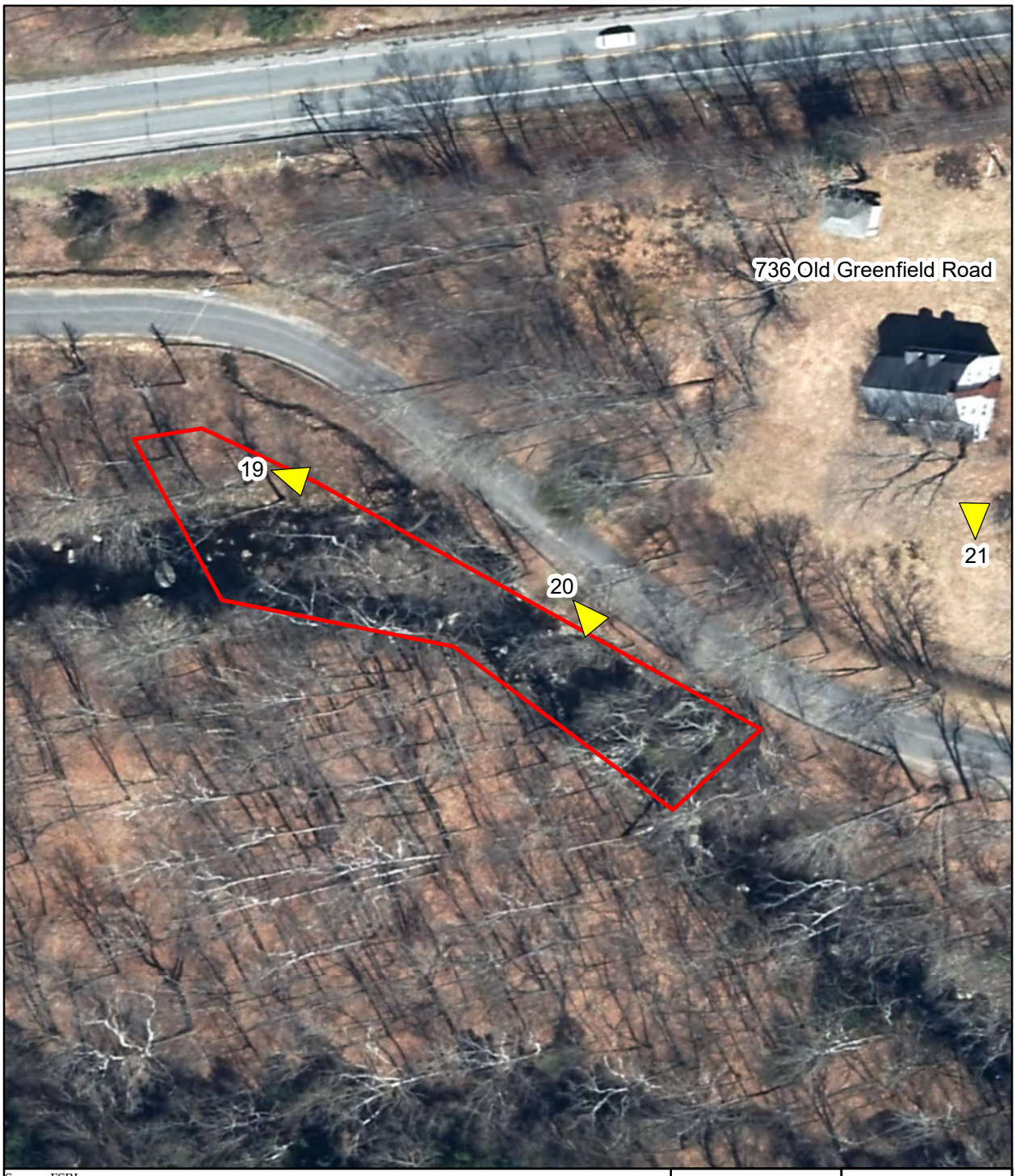
Photographs

APPENDIX A

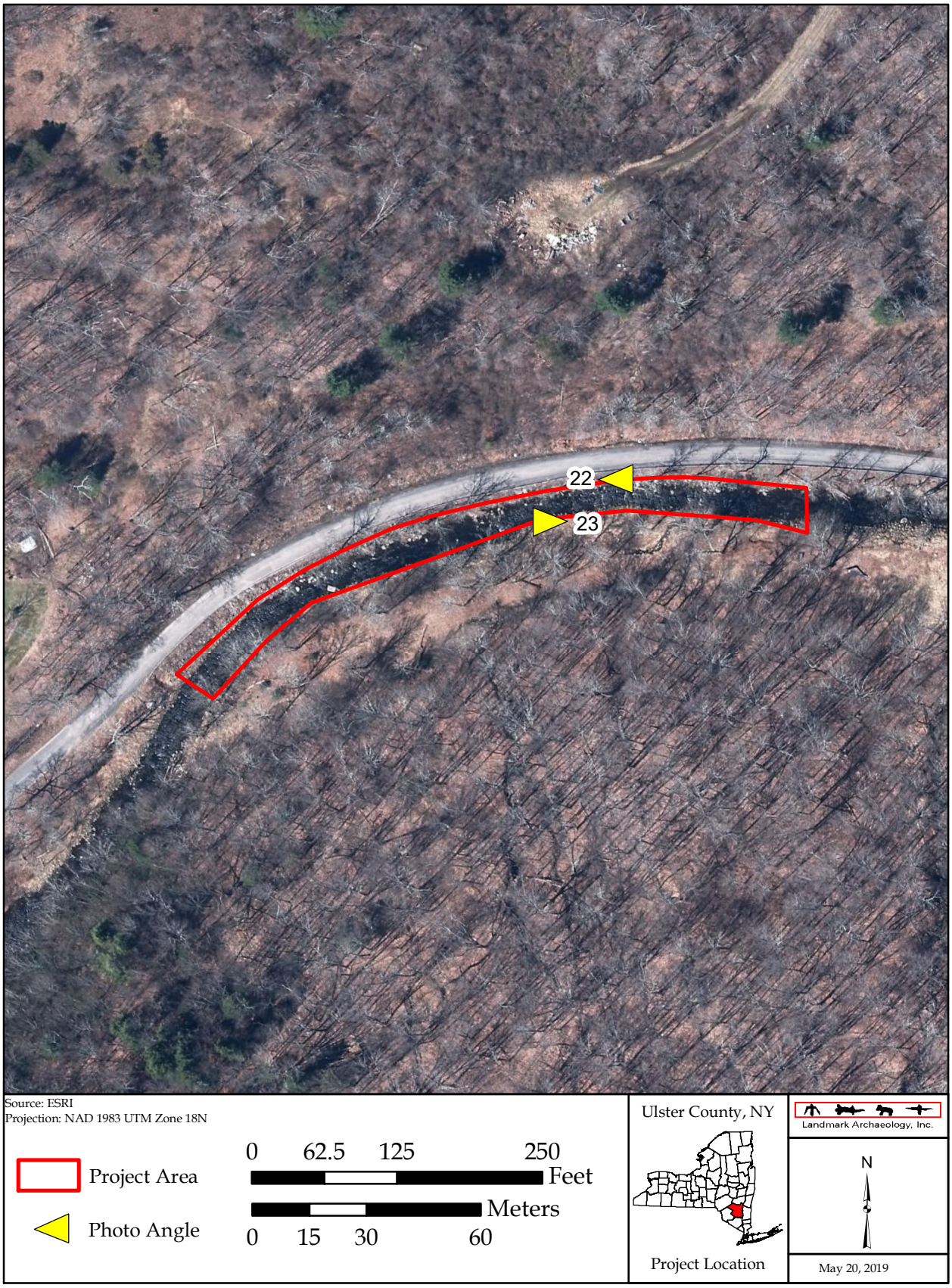
Site 1: Photographs 1-8



Sites 2 and 3: Photographs 9-18

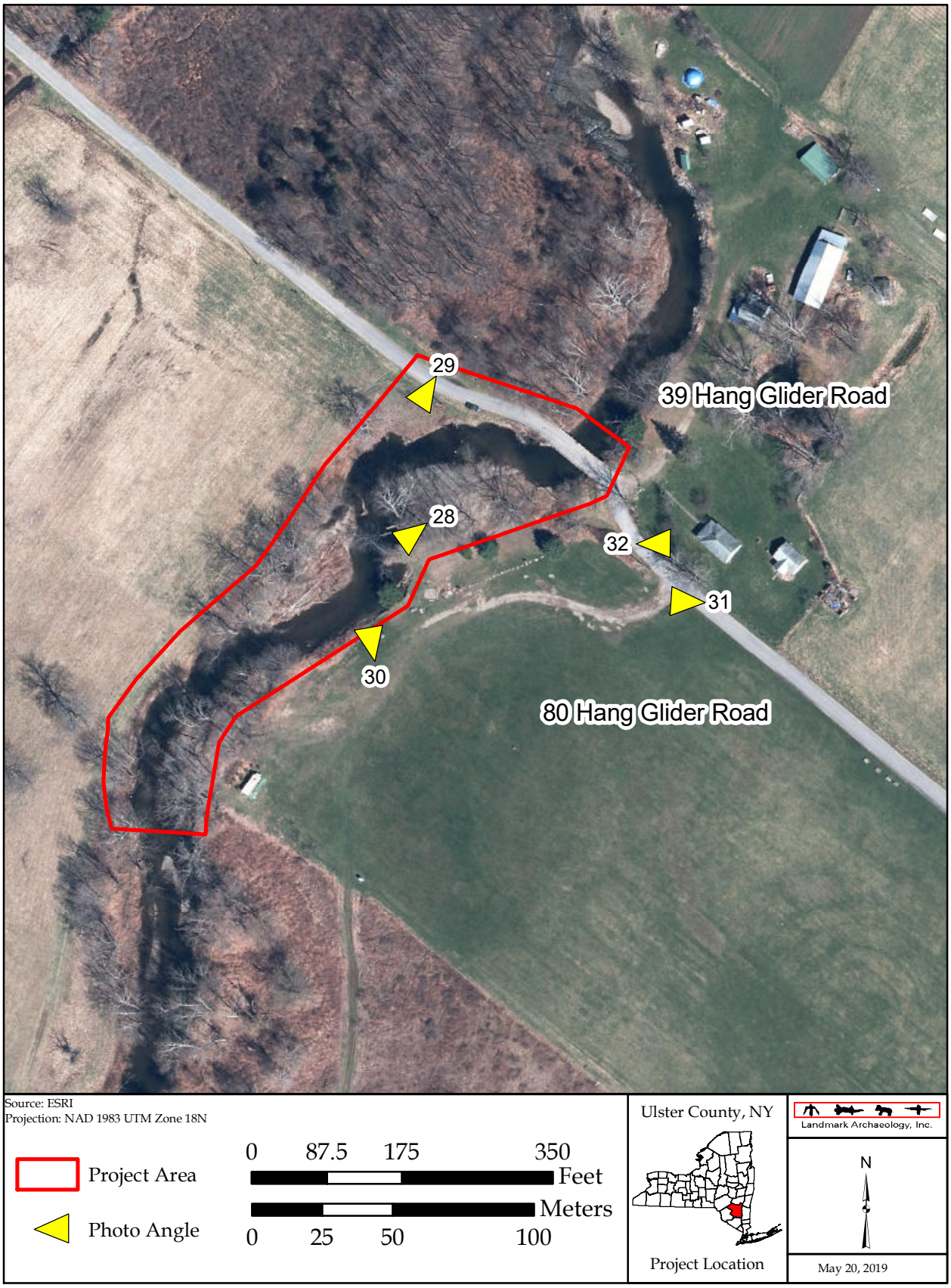


Site 4: Photographs 19-21

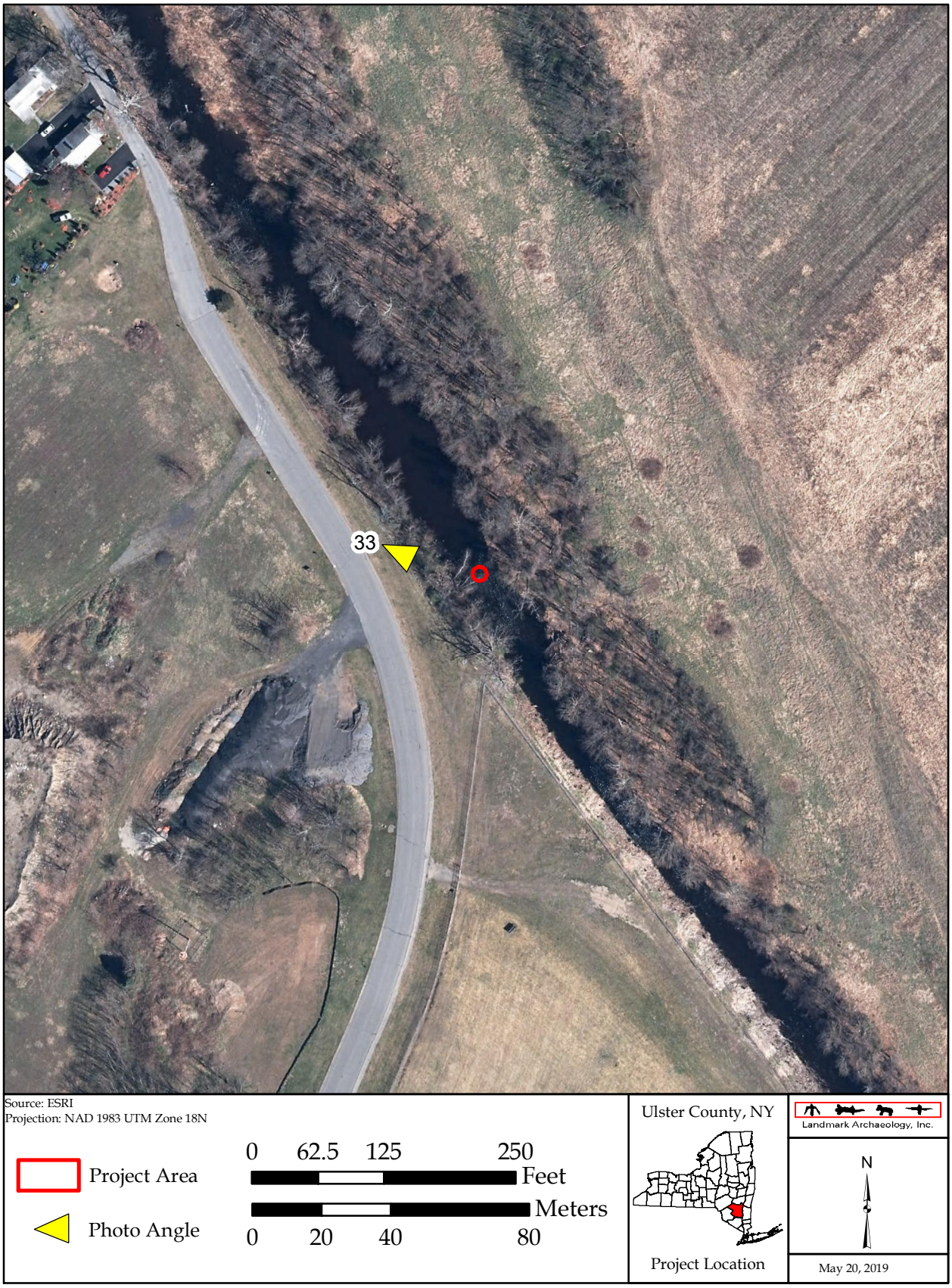


Site 5: Photographs 22 and 23

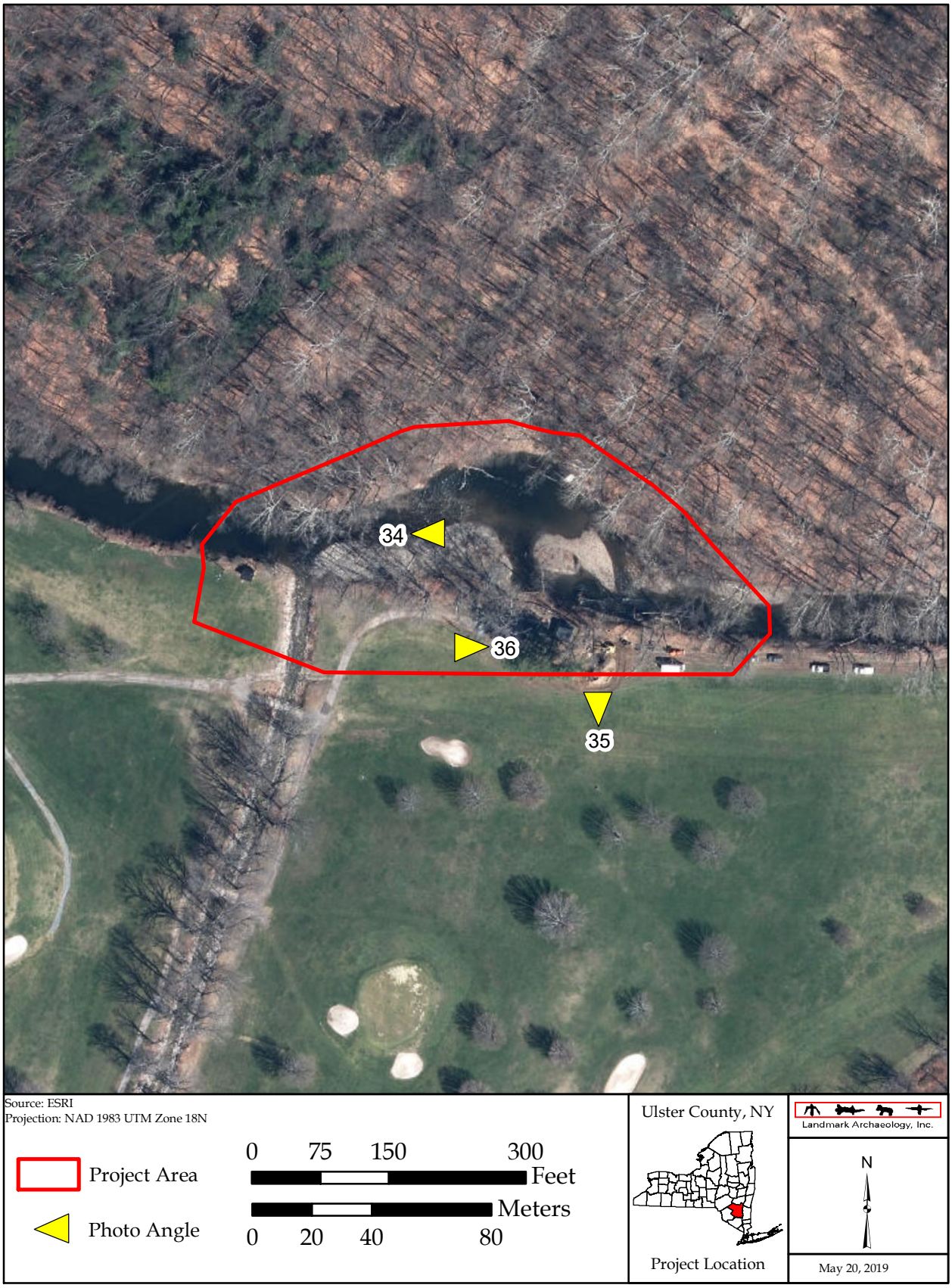
Site 8: Photographs 24-27



Site 10: Photographs 28-32



Site 12: Photograph 33



Site 13: Photographs 34-36

Photograph 1: Project Site 1, View to Northwest

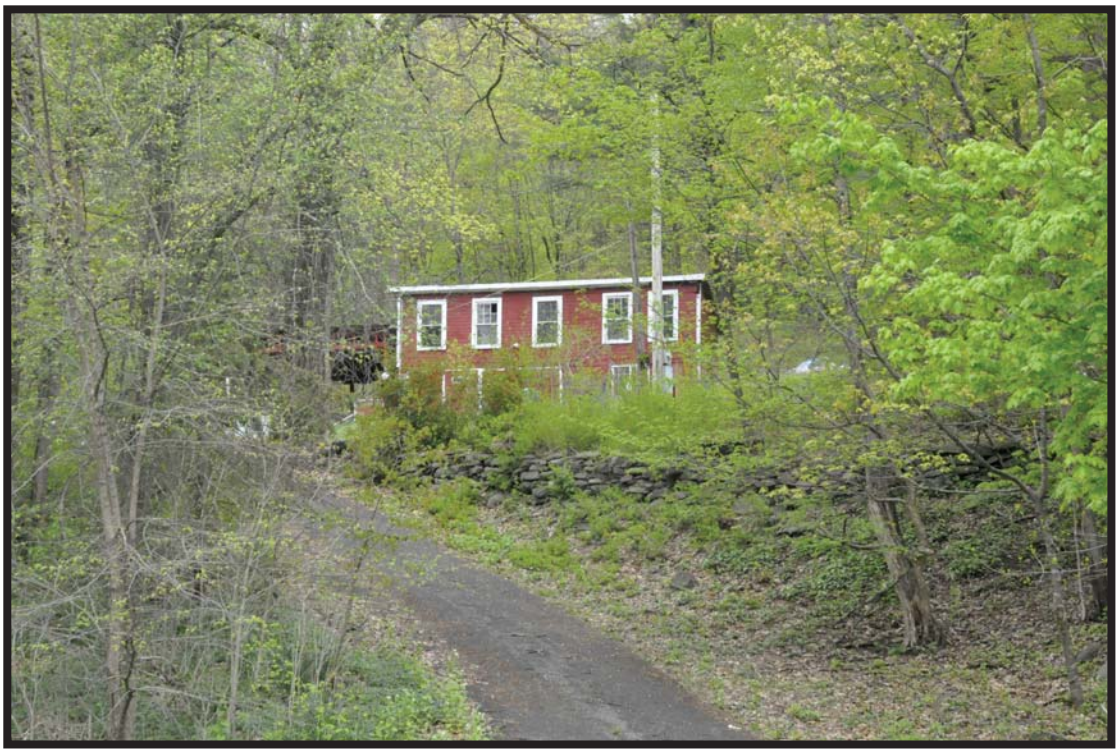
Photograph 2: Project Site 1, View to South

Photograph 3: Project Site 1, View to West

Photograph 4: Project Site 1, View to Southeast

Photograph 5: 116 Old Greenfield Road, Adjacent to Project Site 1, View to East

Photograph 6: 15 Kuhlmann Drive, Adjacent to Project Site 1, View to Southwest



Photograph 7: 6100 NY Rt. 52, Adjacent to Project Site 1,
View to Northeast

Photograph 8: 6094 NY Rt. 52, Adjacent to Project Site 1,
View to Northeast

Photograph 9: Project Sites 2 and 3, View to West

Photograph 10: Project Sites 2 and 3, View to East

Photograph 11: 5 Barbara Road, Adjacent to Project Sites 2 and 3, View to Southeast

Photograph 12: 2 Barbara Road, Adjacent to Project Sites 2 and 3, View to North

Photograph 13: 4 Linda Lane, Adjacent to Project Sites 2 and 3, View to North

Photograph 14: 9 Linda Lane, Adjacent to Project Sites 2 and 3, View to South

Photograph 15: 11 Linda Lane, Adjacent to Project Sites 2 and 3, View to South

Photograph 16: 15 Linda Lane, Adjacent to Project Sites 2 and 3, View to South

Photograph 17: 21 Linda Lane, Adjacent to Project Sites 2 and 3, View to South

Photograph 18: Project Sites 2 and 3, View to Southeast

Photograph 19: Project Site 4, View to East

Photograph 20: Project Site 4, View to Southeast

Photograph 21: 736 Old Greenfield Road, Adjacent to Project Site 4, View to North

Photograph 22: Project Site 5, View to East

Photograph 23: Project Site 5, View to West

Photograph 24: 39 Roslyn Street, Adjacent to Project Site 8, View to North

Photograph 25: 37 Roslyn Street, Adjacent to Project Site 8, View to Northwest

Photograph 26: Project Site 8, View to Northeast

Photograph 27: 47 Clinton Avenue, Adjacent to Project Site 8, View to West

Photograph 28: Project Site 10, View to Southwest

Photograph 29: Project Site 10, View to Southwest

Photograph 30: Project Site 10, View to North

Photograph 31: 80 Hang Glider Road, Adjacent to Project Site 10, View to West

Photograph 32: 39 Hang Glider Road, Adjacent to Project Site 10, View to East

Photograph 33: Project Site 12, View to Southeast

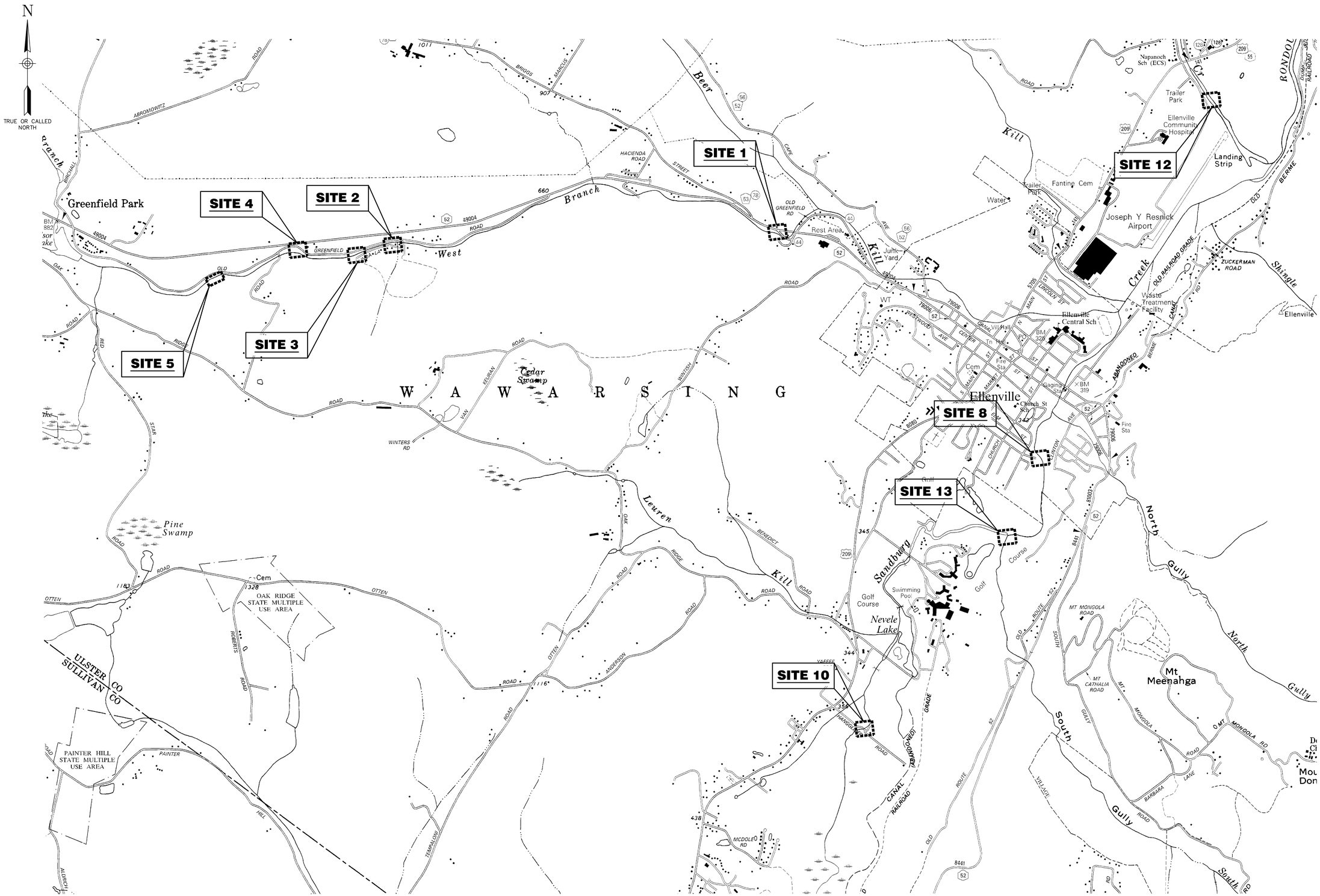
Photograph 34: Project Site 13, View to East

Photograph 35: Project Site 13, View to North

Photograph 36: Project Site 13, View to West

Project Plans

APPENDIX B



NOTE: THERE ARE NO SITES 6, 7, 9, AND 11

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

KEY MAP

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: FEBRUARY 2019

Scale: AS SHOWN

Sheet Number: C101

Project Number: 924.068.002

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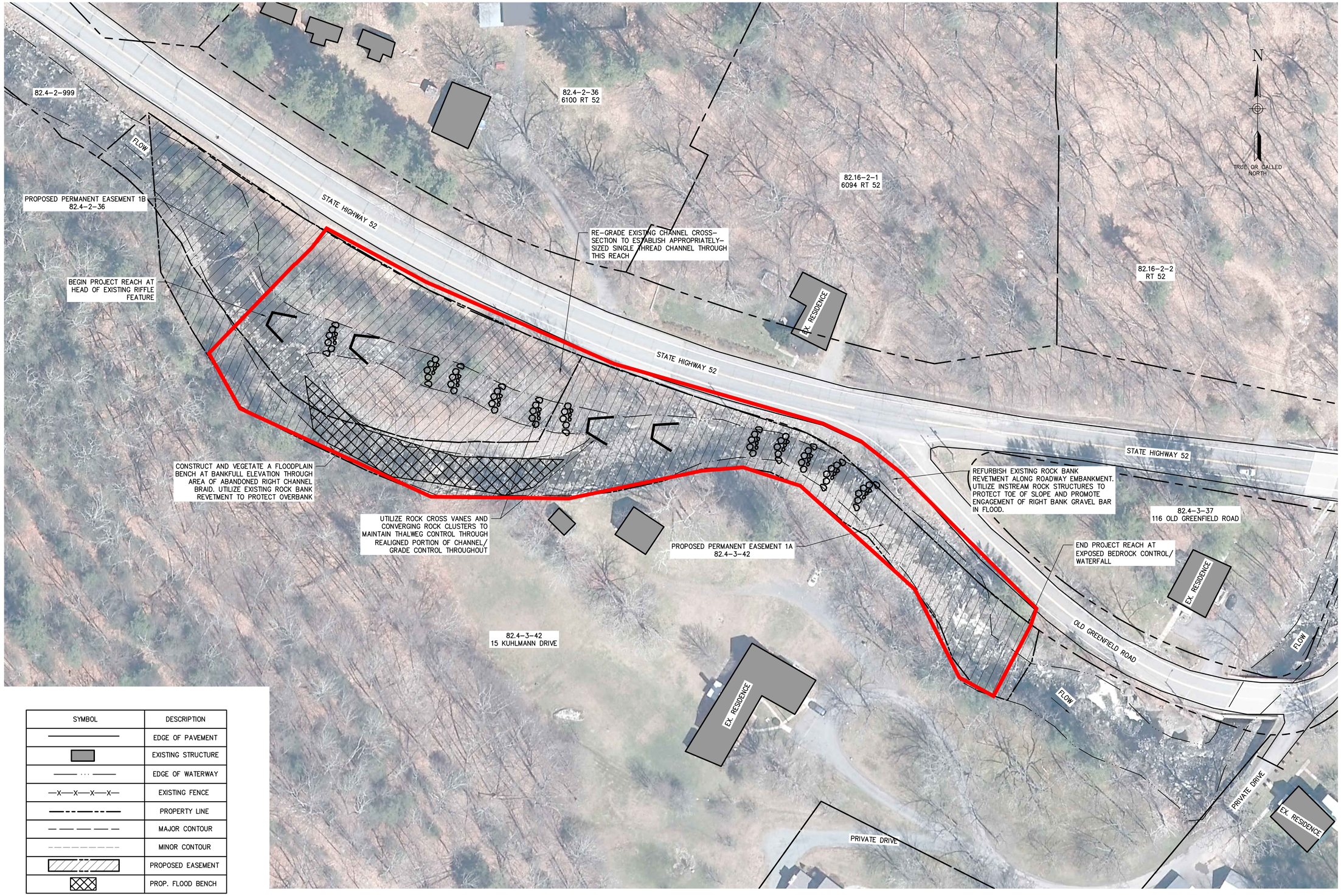

SYMBOL	DESCRIPTION
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	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT
	PROP. FLOOD BENCH

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 30% DESIGN
STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C111

Project Number
924.068.002

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Checked by: DHF Drawn by: RPC Designed by: ANE In Charge of: RAM Last Saved: 2/27/2019

SYMBOL	DESCRIPTION
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	EXISTING STRUCTURE
	EDGE OF WATERWAY
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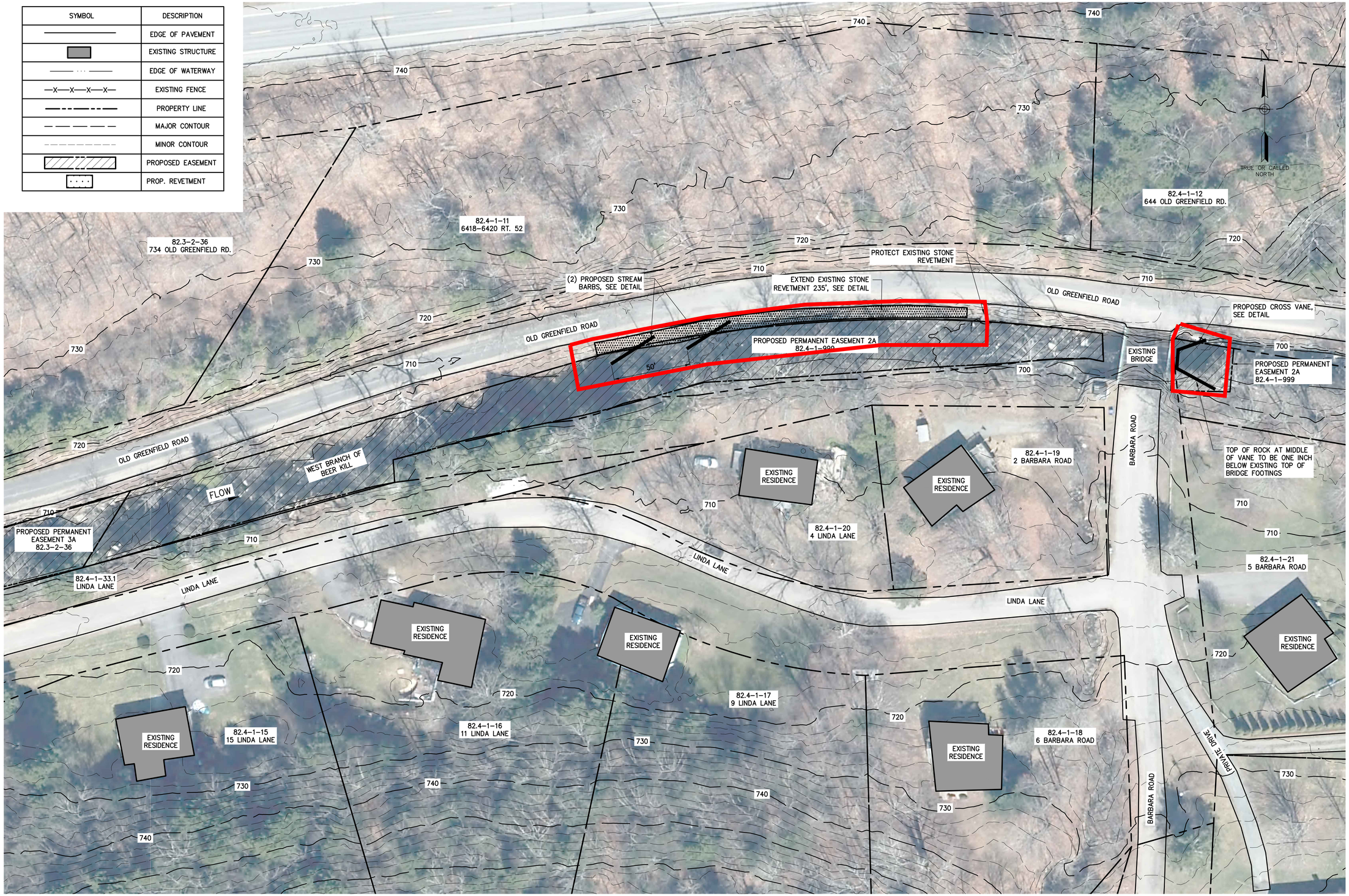
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT
	PROP. REVETMENT



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 2 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

STREAM

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C121

Project Number
924.068.002

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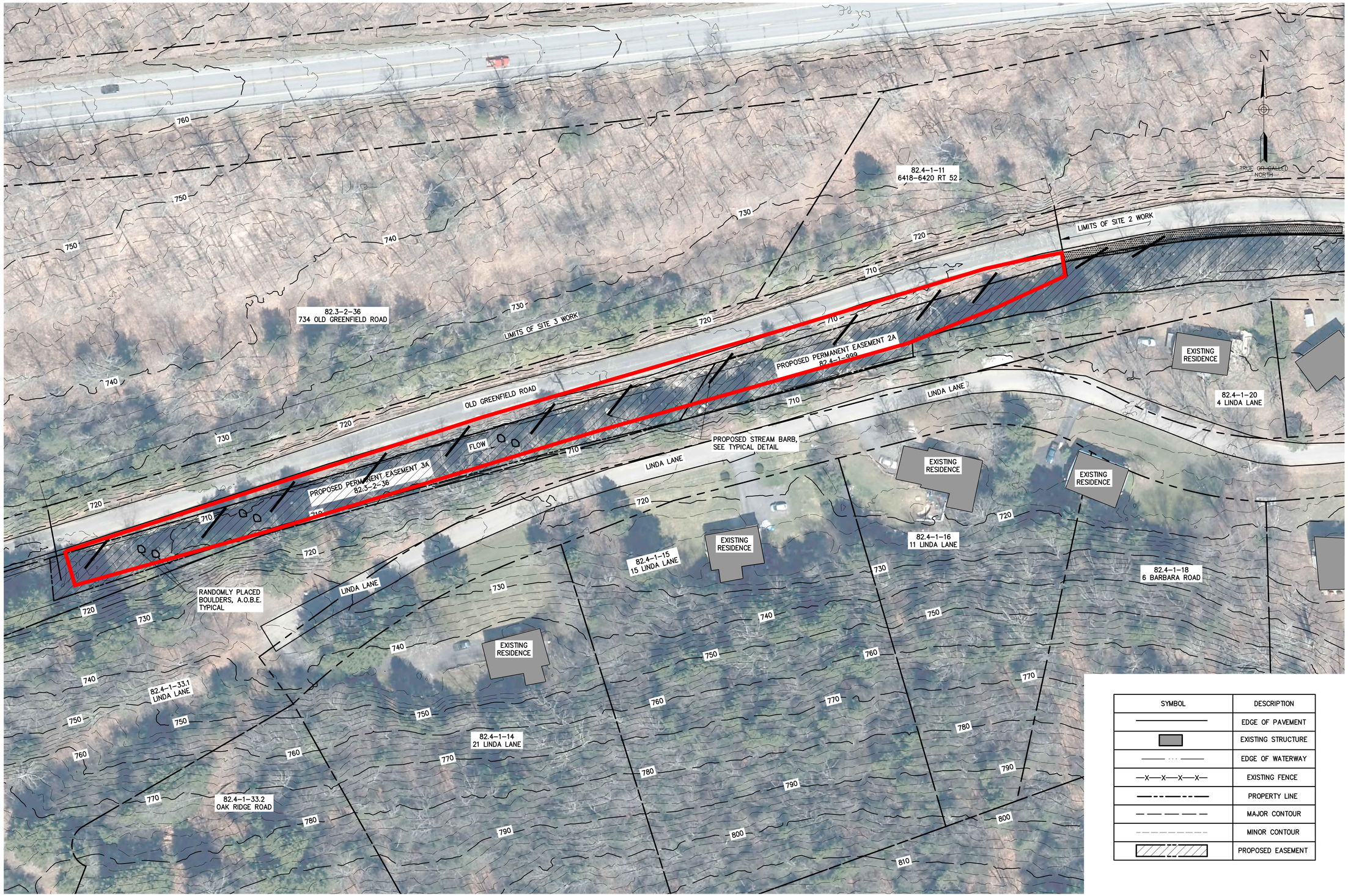

SYMBOL	DESCRIPTION
	EDGE OF PAVEMENT
	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT

40' 0 40' 80'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 3 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

STREAM

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C131

Project Number
924.068.002

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SYMBOL	DESCRIPTION
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	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 4 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C141

Project Number
924.068.002

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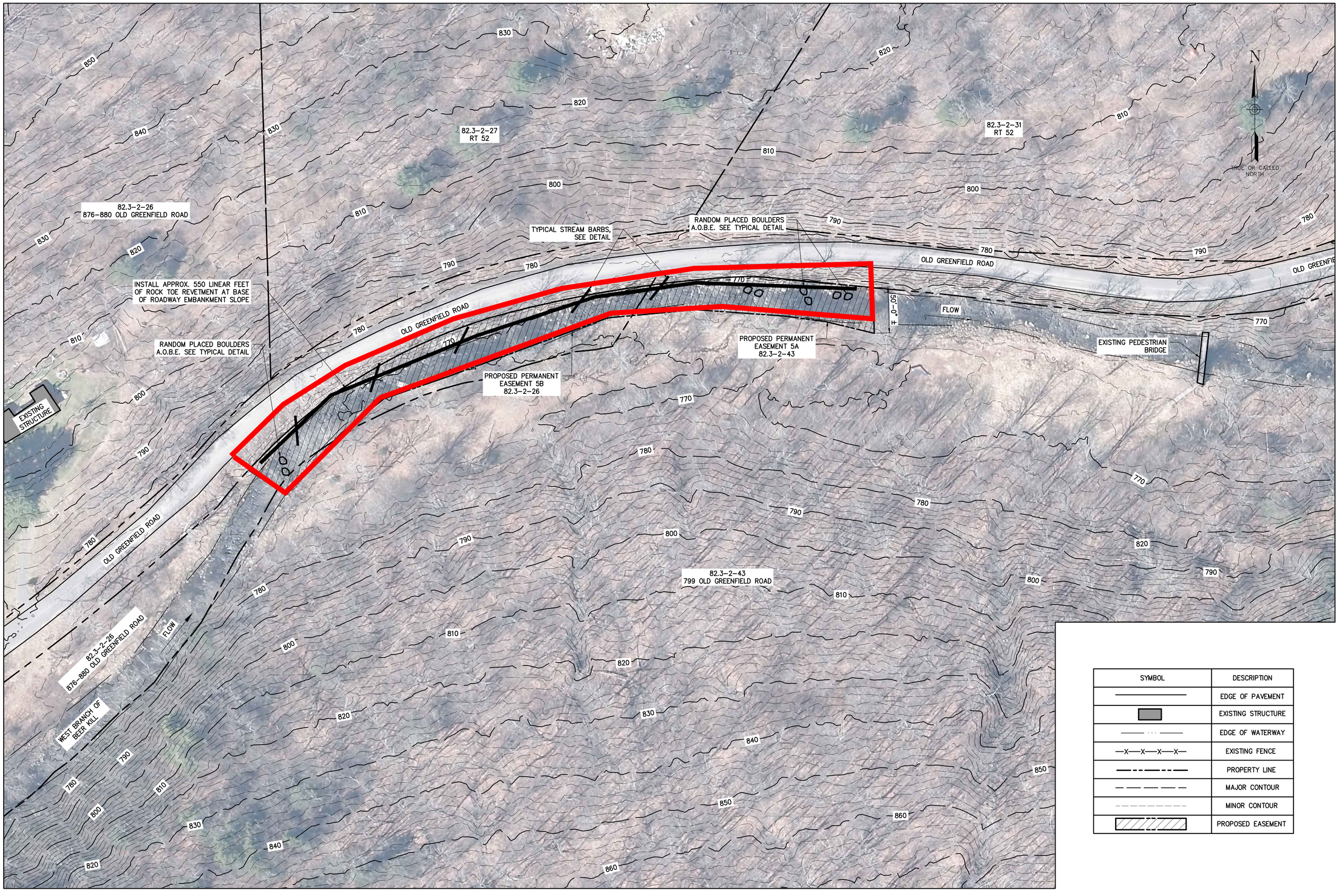
Checked by: DHF Drawn by: RPC Designed by: BDG In Charge of: RAM Last Saved: 2/27/2019



SYMBOL	DESCRIPTION
	EDGE OF PAVEMENT
	EXISTING STRUCTURE
	EDGE OF WATERWAY
	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT

10' 0 40' 80'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 5
STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C151

Project Number
924.068.002

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SYMBOL	DESCRIPTION
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	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT

10' 0 10' 20'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 8
STREAM RESTORATION PLAN

TOWN OF WAWARSING ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C161

Project Number
924.068.002

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SYMBOL	DESCRIPTION
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	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT
	PROP. FLOOD BENCH

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10 30% DESIGN STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C171

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:46PM By: rpc
File Name: 924068_8-Site10.dwg Project No.: 924.068.002
Checked by: DHF Drawn by: REC Designed by: ANE In Charge of: RAM Last Saved: 2/27/2019
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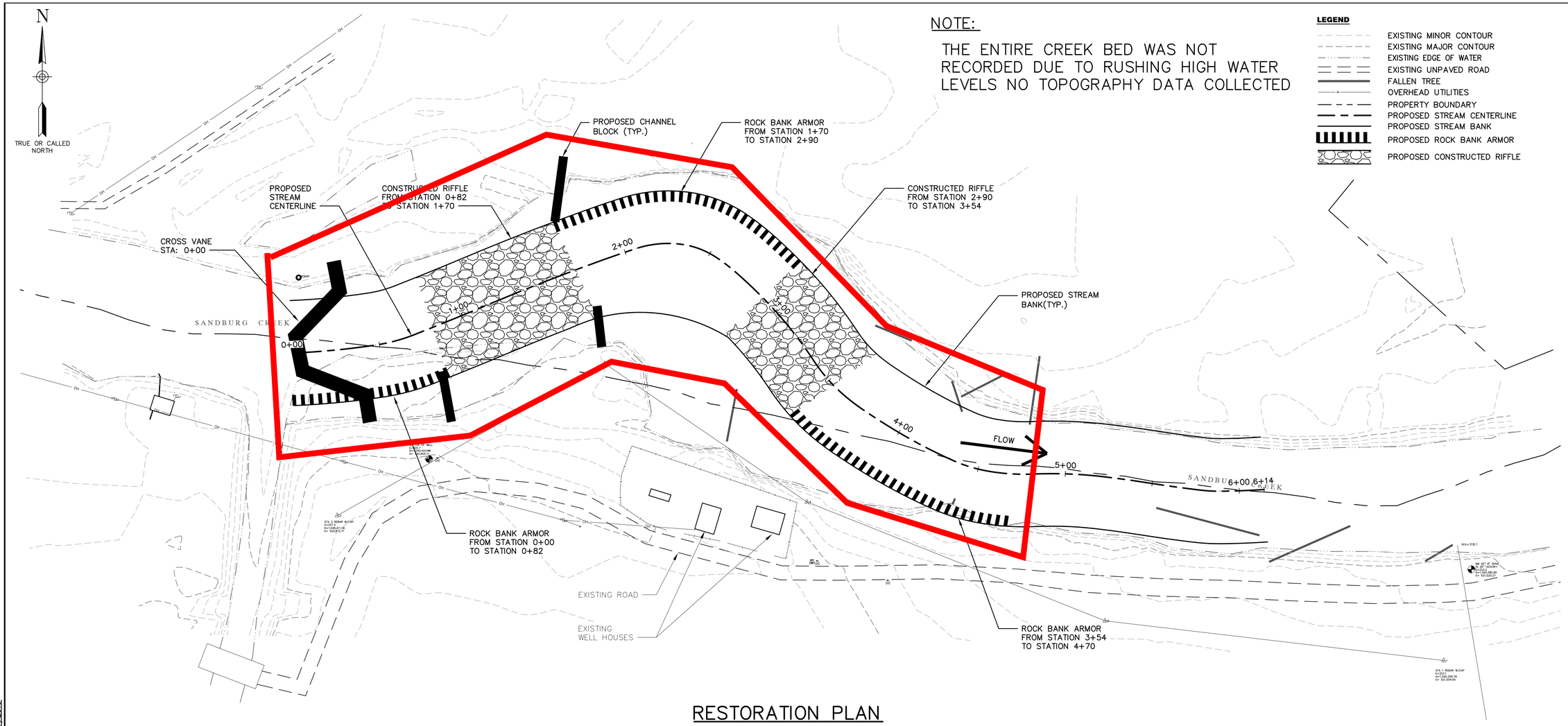
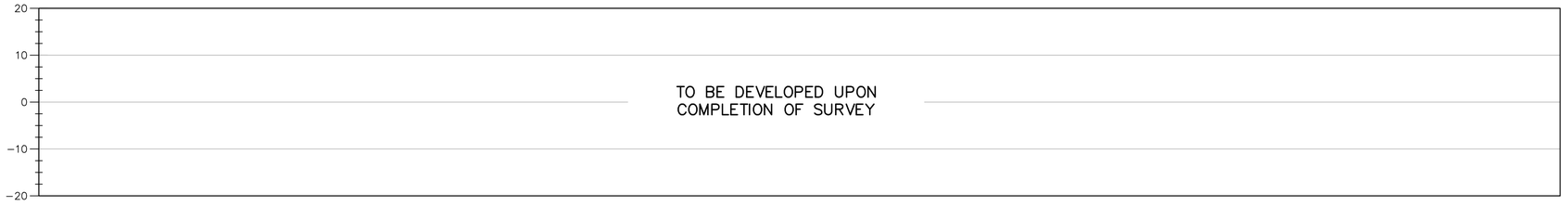


RESTORATION PLAN

SCALE: 1" = 30'-0"



RESTORATION PROFILE

HORIZONTAL SCALE: 1" = 30'-0"
VERTICAL SCALE: 1" = 15'-0"

15' 0 15' 30'
1"=15'

30' 0 30' 60'
1"=30'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C192

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:47PM By: rrc
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File Name: 924068_9-Site13-C-902-Restoration Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DHF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 2/27/2019

NEW YORK STATE OF OPPORTUNITY. Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Commissioner

August 13, 2019

Ms. Alicia Shultz
38-40 State Street
Hampton Plaza
Albany, NY 12207

Re: HTF
GOSR- Ellenville Stream Bank Restoration-13 sites
Town of Wawarsing and Village of Ellenville, Ulster County, NY
17PR04134

Dear Ms. Shultz:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources.

SHPO has reviewed *Phase IB Archaeological and Geomorphological Survey, Ellenville Streambank Restoration of Two Sites: Sites 10 and 13, Town of Wawarsing, Ulster County, New York* (Christine Davis Consultants, July 2019).

Based upon this and previously submitted information, it is the opinion of the New York SHPO that no historic properties, including archaeological and/or historic resources, will be affected by this undertaking.

If you have any questions, please don't hesitate to contact me.

Sincerely,

Philip A. Perazio, Historic Preservation Program Analyst - Archaeology Unit
Phone: 518-268-2175
e-mail: philip.perazio@parks.ny.gov via e-mail only

cc: Mary Barthelme and Lori Shirley, GOSR
Lauren Hayden, Louis Berger

Appendix E

Delaware Tribe Historic Preservation Representatives
P.O. Box 64
Pocono Lake, PA 18347
sbachor@delawaretribe.org

June 22, 2017

Governor's Office of Storm Recovery
25 Beaver St
New York, NY 10004

Re: Section 106 Compliance for the Ellenville Stream Bank Restoration Project (Ulster County, New York)

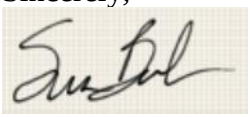
Ms. Shirley,

Thank you for sending the Delaware Tribe additional information regarding the above referenced project. Our review indicates that there could be culturally significant areas within the project zone. We request subsurface testing. This testing should include areas that will be used as staging.

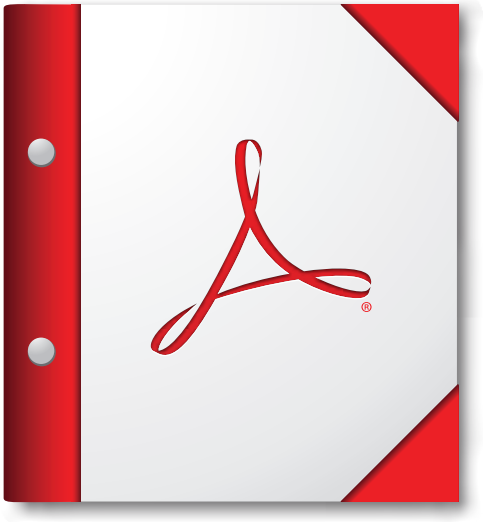
In the event a concentration of artifacts and/or in the unlikely event any human remains are accidentally unearthed during the project that all work is halted until the Delaware Tribe of Indians is informed of the inadvertent discovery and a qualified archaeologist can evaluate the find.

We appreciate your cooperation and look forward to working together on our shared interests in preserving Delaware cultural heritage. If you have any questions, feel free to contact this office by phone at (610) 761-7452 or by e-mail at sbachor@delawaretribe.org..

Sincerely,



Susan Bachor
Delaware Tribe Historic Preservation Representative



For the best experience, open this PDF portfolio in Acrobat X or Adobe Reader X, or later.

Get Adobe Reader Now!

Governor's Office of Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

June 16, 2017

Kerry Holton, President
Delaware Nation
P.O. Box 825
Anadarko, OK 73005

Re: Section 106 Compliance for the Ellenville Stream Bank Restoration Project (Ulster County, New York)

Dear President Kerry Holton:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR), an office of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"), is serving as the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and inviting this discussion with your Nation to respond with any concerns or comments.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case-by-case basis. In accordance with Section 101(d)(6)(B) of the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470a), and its implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, this letter serves as notification of the proposed action. This consultation is being sent to the Delaware Nation, Delaware Tribe of Indians, Mohawk Nation, Saint Regis Mohawk Tribe, and Stockbridge-Munsee Community Band of Mohicans.

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- North Gully from Ida Lane wall to Sandburg Creek (1,600').

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The project involves stream bank restoration for damaged streams and stream corridors. Measures include the construction of floodplain benches (with rock and/or wood revetment) to reduce cutting at the toe of bank, lowering the height, angle and overall erosion hazard of eroding streambanks; installation of instream rock structures to provide grade control and reduce the erosive force of water upon streambanks by directing flood flows to the center of the stream channel; and reconnection of floodplains in select areas to reduce channel confinement and the corresponding increases in flood velocity that contribute to flood severity. The stream bank restoration measures may be implemented in phases. A total of thirteen sites in the project area are proposed for improvements.

This project is expected to provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town. Amongst other benefits, the project will:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, schools emergency services, and the Ellenville Regional Hospital;
- Provide long-term protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

With this letter, GOSR respectfully submits for your review the attached documentation for the proposed project(s) described herein. GOSR initiated consultation with the New York State Historic Preservation Office and no comments have been received to date. If the Area of Potential Effect encompasses historic properties of religious or cultural significance to your Nation, please respond within 30 days or sooner. Additionally, please indicate if there are other sources of information or other parties, Nations, Tribes, or members of the public you believe should be included in the consultation process. Please respond by email or in writing to the address listed below.

Ms. Lori Shirley
Director, Bureau of Environmental Services
New York State Homes & Community Renewal
38-40 State St.,408N, Hampton Plaza
Albany, NY 12207

If you have any questions or require additional information regarding this request, please feel free to contact me at (518) 474-0755 or Lori.Shirley@stormrecovery.ny.gov. Thank you for your time and consideration.

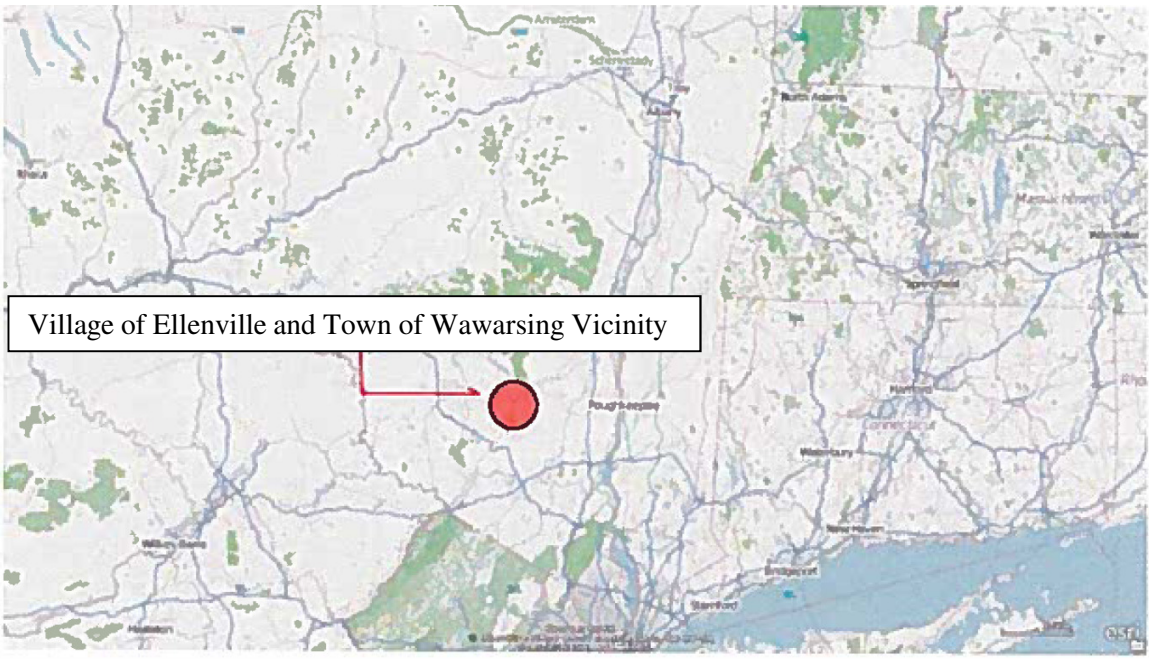
Sincerely,

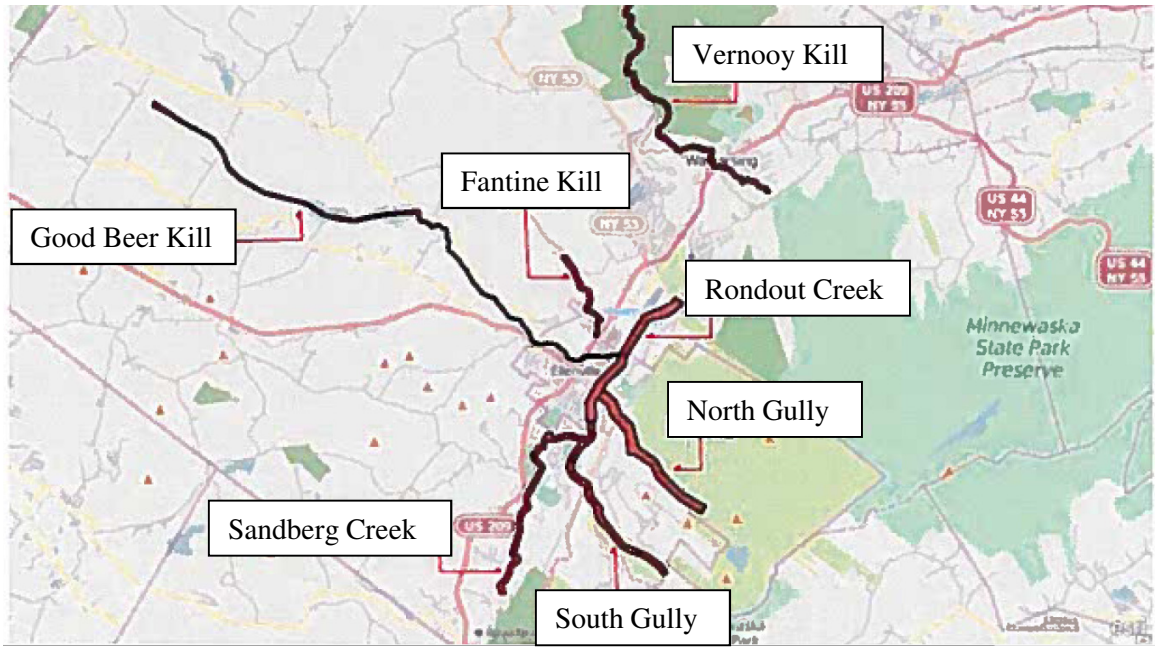
Lori A. Shirley
Director
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery

Enclosures:
Attachment 1: Site Location Map
Attachment 2: Site Aerial Photographs (Northern, Eastern, Southern and Western Portions)

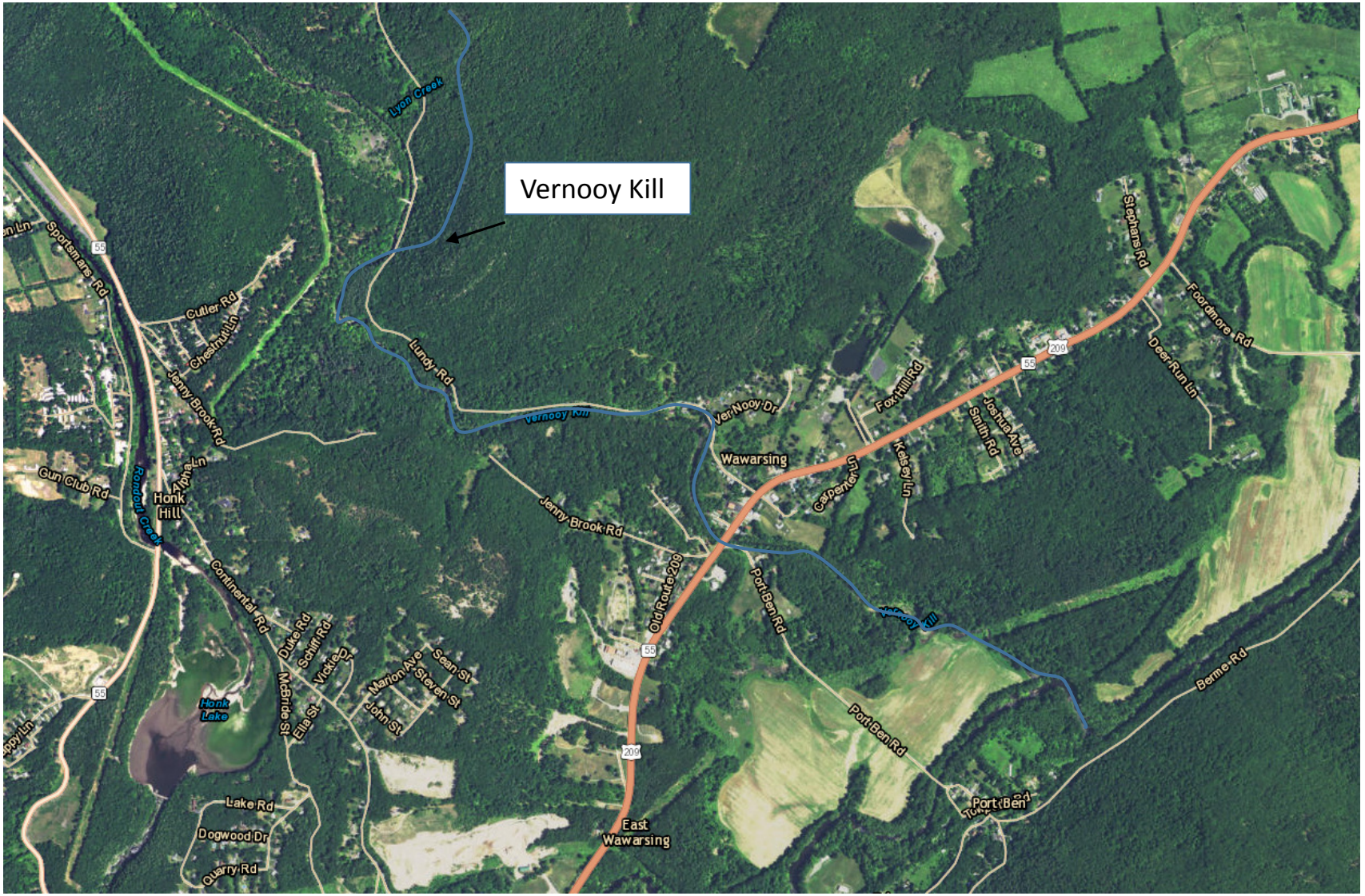
Electronic letter sent to:
Kim Penrod, Director of Cultural Resources/Section 106
Delaware Nation
P.O. Box 825
Anadarko, OK 73005

FIGURE 1
SITE LOCATION MAP





SITE AERIAL PHOTOGRAPH
Northern Portion of Project Area



Legend:
Aerial Imagery Source: USFWS
Approximate Watercourse Location
Site locations are approximate

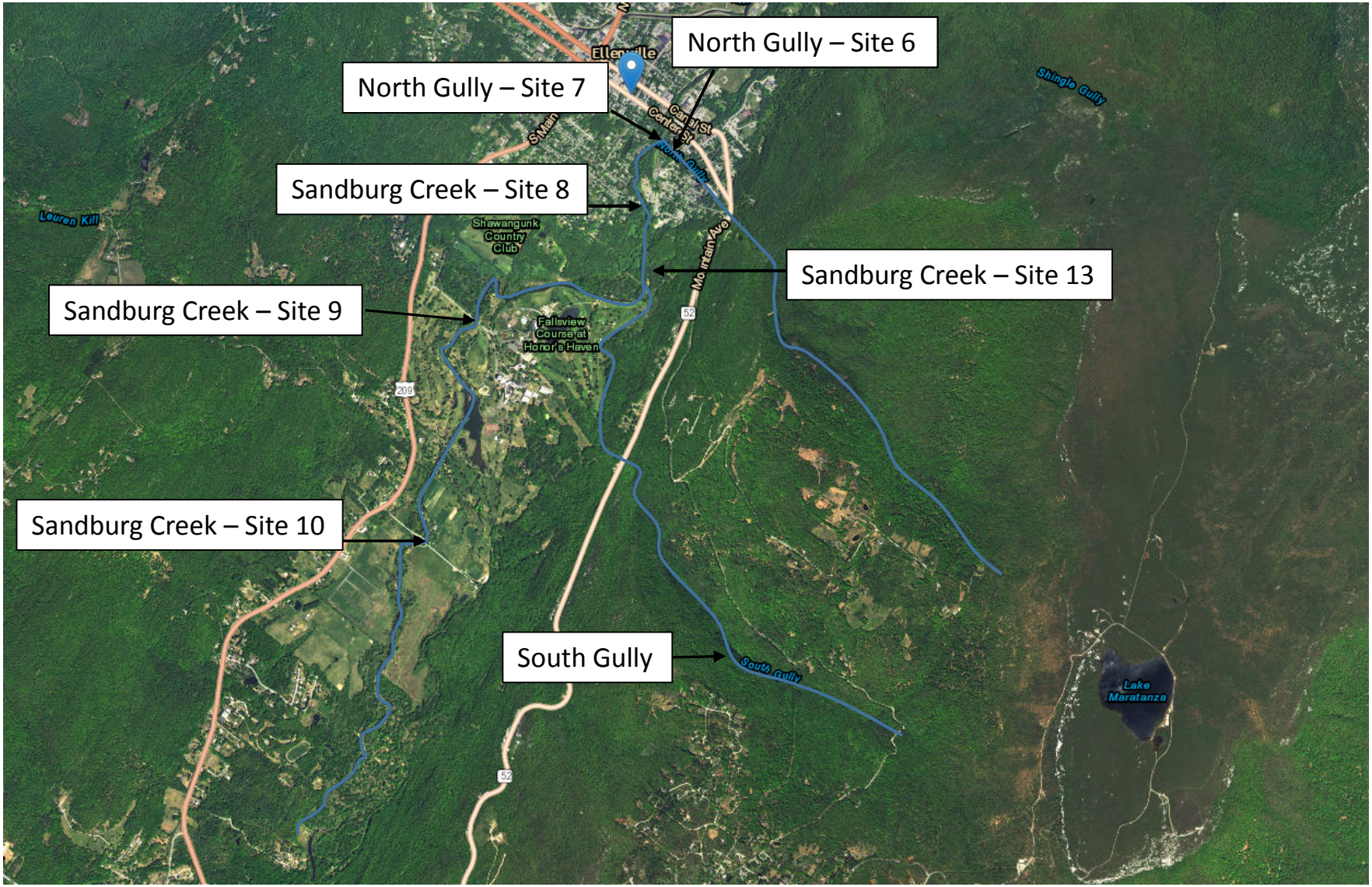
Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

SITE AERIAL PHOTOGRAPH
Eastern Portion of Project Area

Legend:
Aerial Imagery Source: USFWS
Approximate Watercourse Location
Site locations are approximate

Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

SITE AERIAL PHOTOGRAPH
Southern Portion of Project Area



Legend:
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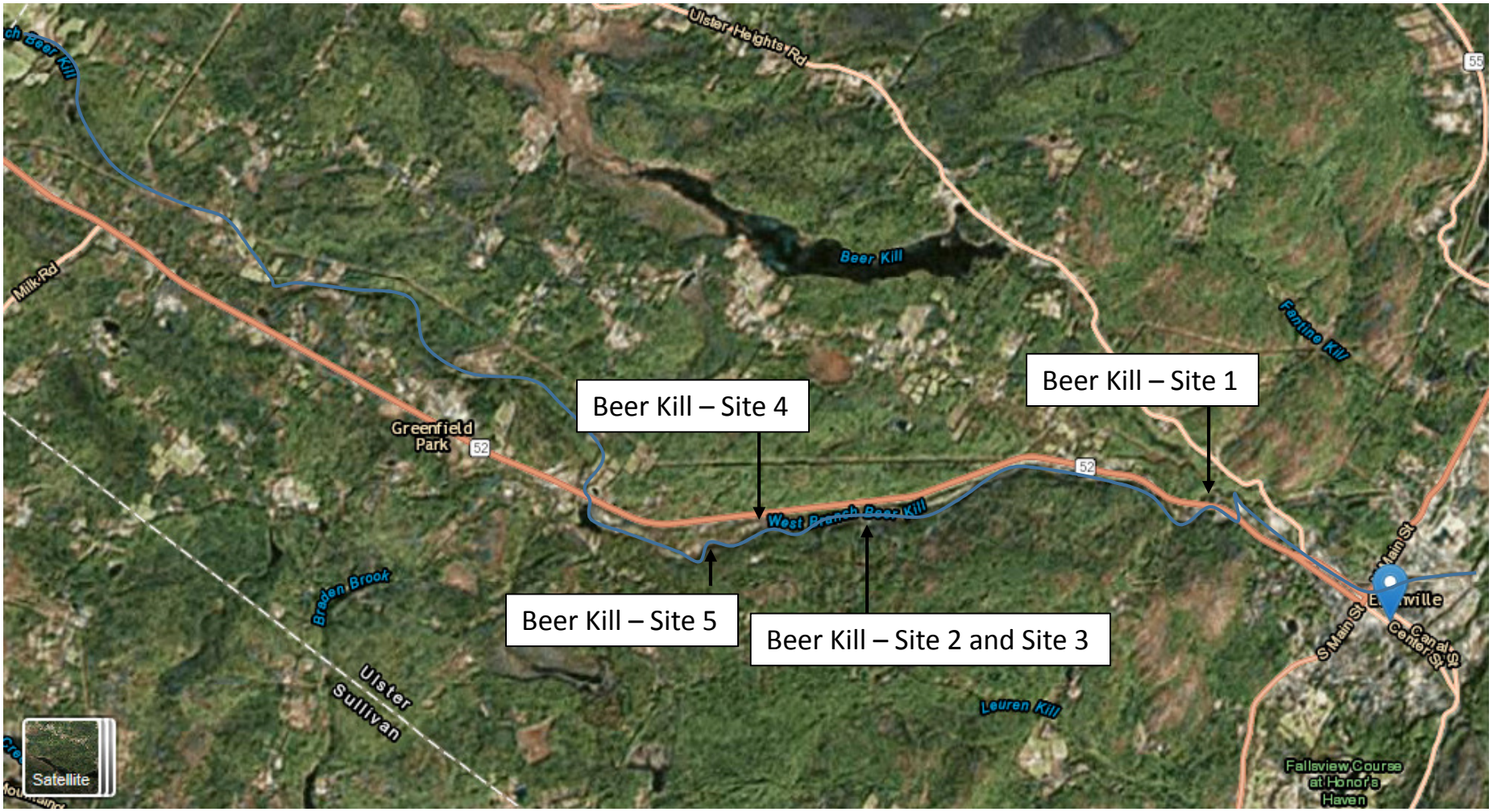
Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

SITE AERIAL PHOTOGRAPH
Western Portion of Project Area



Legend:
Aerial Imagery Source: USFWS
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N

Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

Governor's Office of Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

June 16, 2017

Chet Brooks, Chief
Delaware Tribe of Indians, Delaware Tribal Headquarters
5100 Tuxedo Blvd
Bartlesville, OK 74006

Re: Section 106 Compliance for the Ellenville Stream Bank Restoration Project (Ulster County, New York)

Dear Chief Chet Brooks:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR), an office of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"), is serving as the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and inviting this discussion with your Tribe to respond with any concerns or comments.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case-by-case basis. In accordance with Section 101(d)(6)(B) of the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470a), and its implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, this letter serves as notification of the proposed action. This consultation is being sent to the Delaware Nation, Delaware Tribe of Indians, Mohawk Nation, Saint Regis Mohawk Tribe, and Stockbridge-Munsee Community Band of Mohicans.

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- Rondout Creek from Route 209 to Airport Road culvert (2,600'); and
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Proposed Project Description: Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing, including the East and West Branches of the Beer Kill, Sandburg Creek, Rondout Creek, North Gully, and Fantine Kill.

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- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

With this letter, GOSR respectfully submits for your review the attached documentation for the proposed project(s) described herein. GOSR initiated consultation with the New York State Historic Preservation Office and no comments have been received to date. If the Area of Potential Effect encompasses historic properties of religious or cultural significance to your Tribe, please respond within 30 days or sooner. Additionally, please indicate if there are other sources of information or other parties, Nations, Tribes, or members of the public you believe should be included in the consultation process. Please respond by email or in writing to the address listed below.

Ms. Lori Shirley
Director, Bureau of Environmental Services
New York State Homes & Community Renewal
38-40 State St.,408N, Hampton Plaza
Albany, NY 12207

If you have any questions or require additional information regarding this request, please feel free to contact me at (518) 474-0755 or Lori.Shirley@stormrecovery.ny.gov. Thank you for your time and consideration.

Sincerely,

Lori A. Shirley
Director
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery

Enclosures:
Attachment 1: Site Location Map
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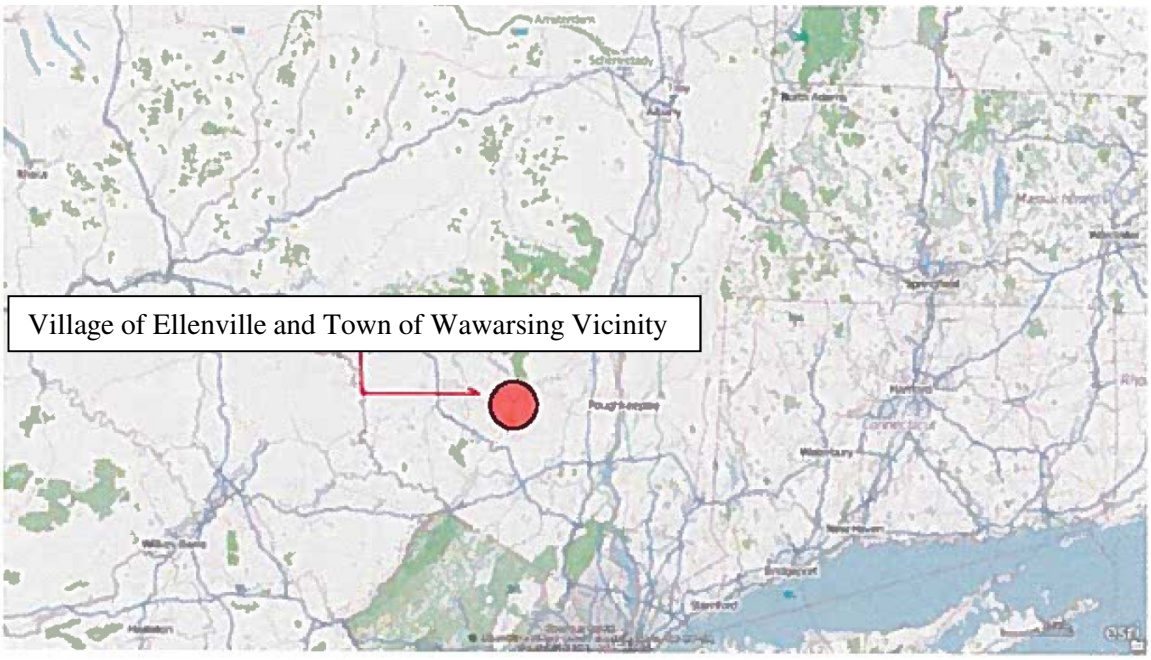
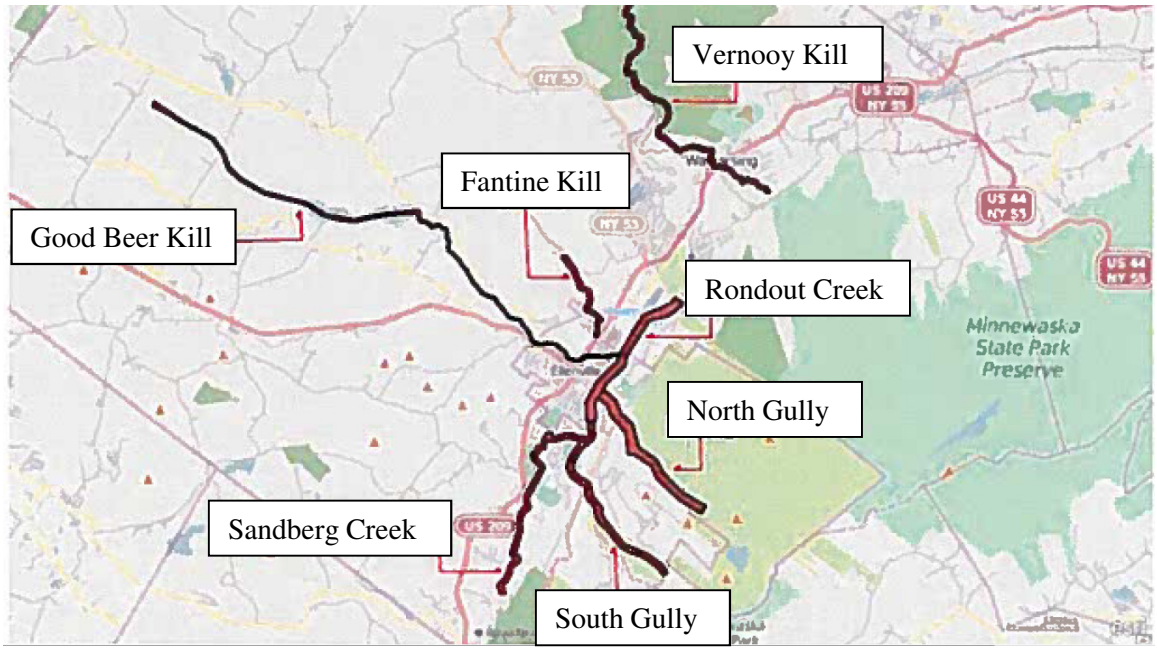
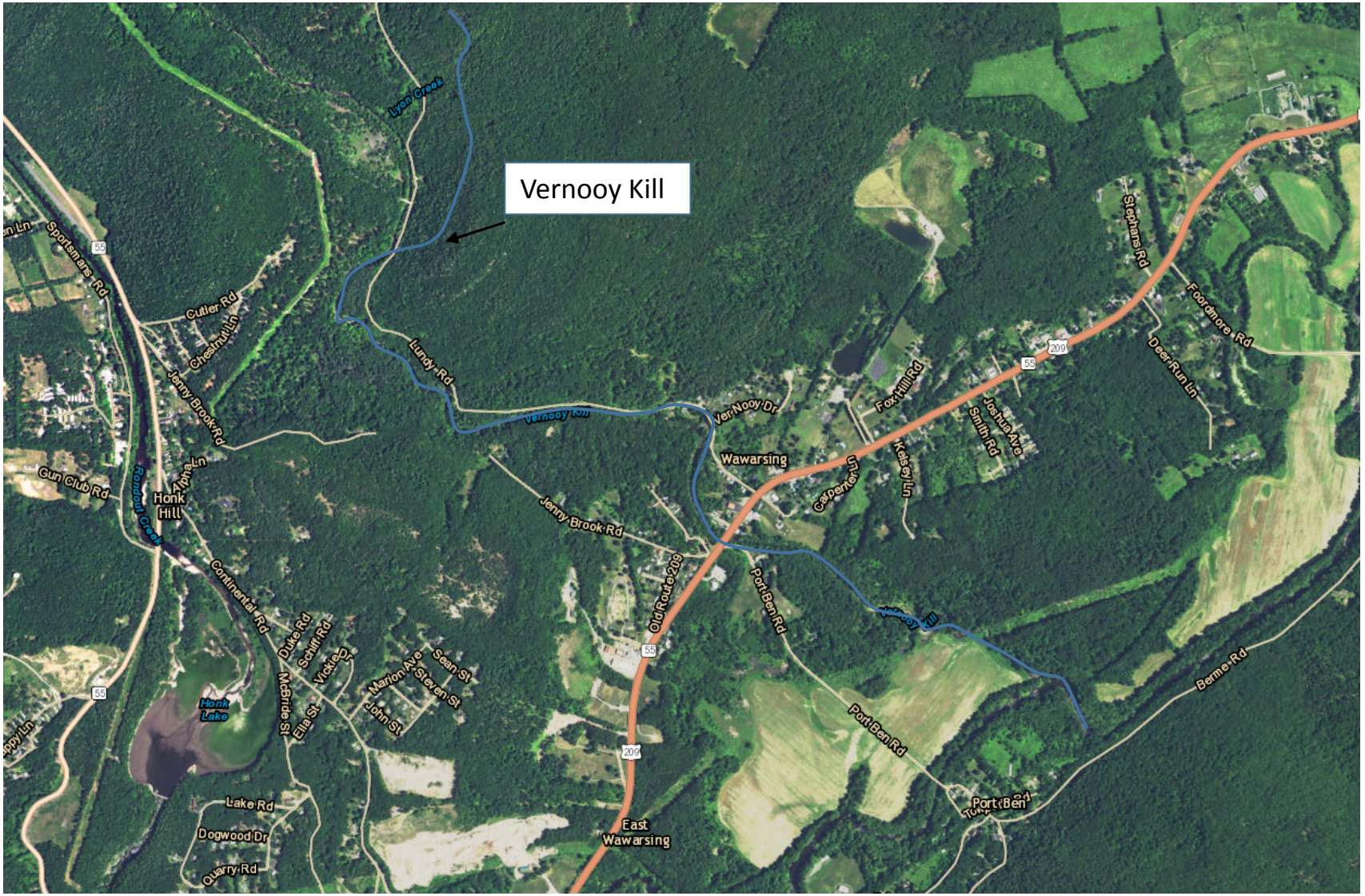
Electronic letter sent to:
Susan Bachor
Delaware Tribe of Indians Historic Preservation Representative
P.O. Box 64
Pocono Lake, PA 73005

FIGURE 1
SITE LOCATION MAP





SITE AERIAL PHOTOGRAPH
Northern Portion of Project Area



Legend:
Aerial Imagery Source: USFWS
Approximate Watercourse Location
Site locations are approximate

Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

SITE AERIAL PHOTOGRAPH
Eastern Portion of Project Area

Legend:
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Approximate Watercourse Location
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Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

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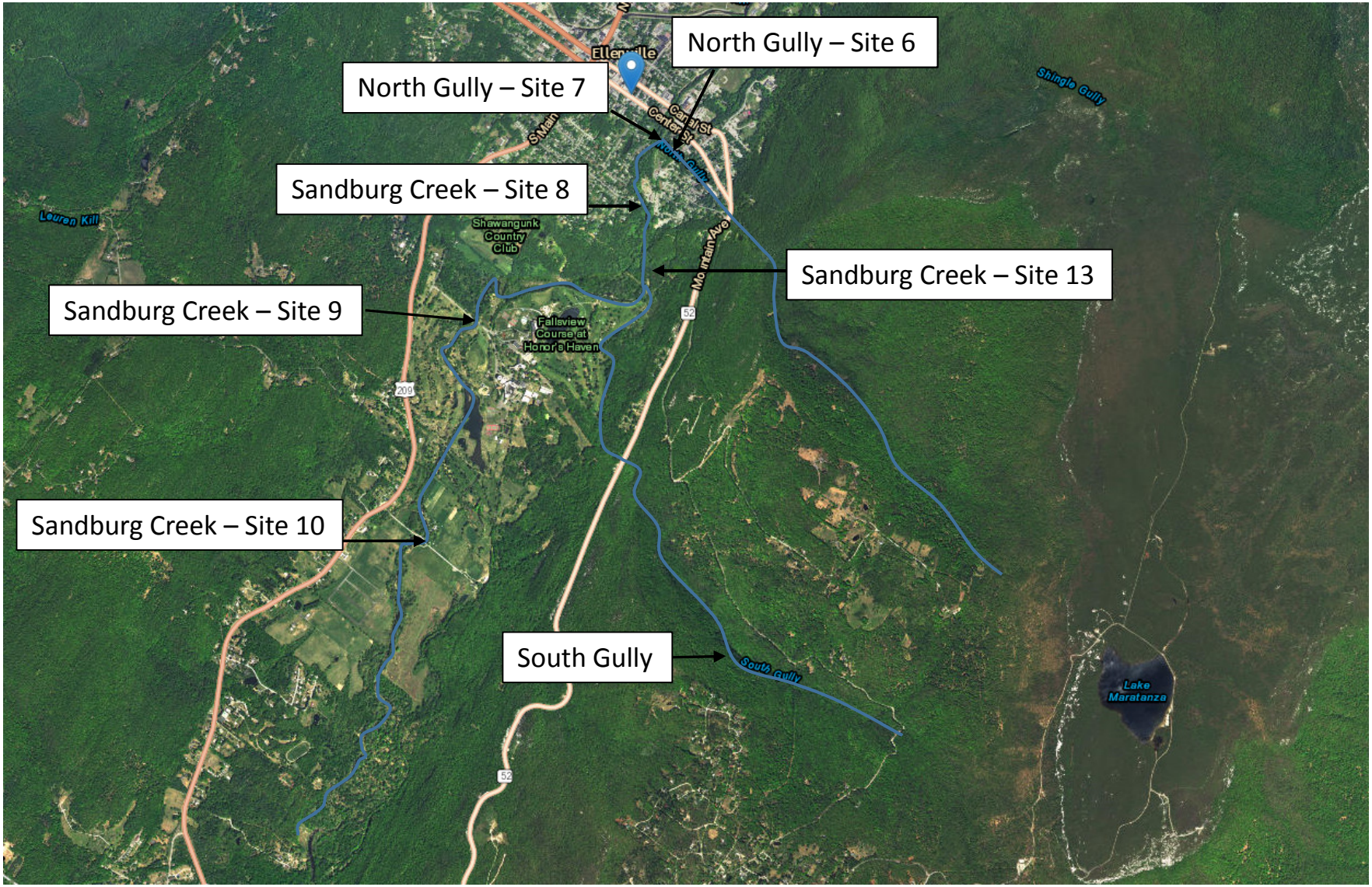

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Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

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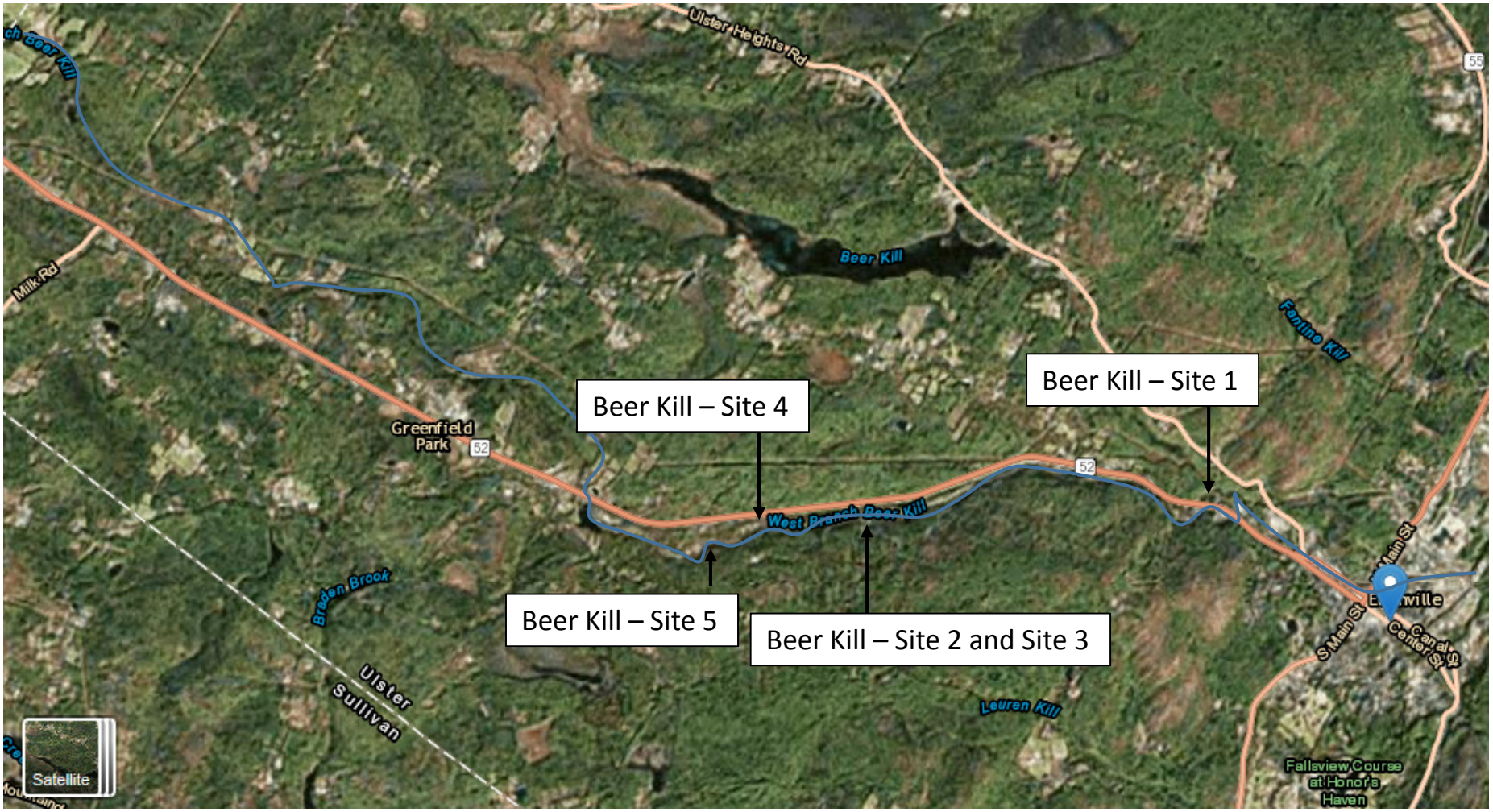

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Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

June 16, 2017

Mohawk Nation Council of Chiefs
Of Haudenosaunee Six Nations Confederacy
Akwesasne Territory Box 336
Via Rooseveltown, NY 13683-0366

Re: Section 106 Compliance for the Ellenville Stream Bank Restoration Project (Ulster County, New York)

Dear Mohawk Nation Council of Chiefs:

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Director, Bureau of Environmental Services
New York State Homes & Community Renewal
38-40 State St.,408N, Hampton Plaza
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Sincerely,

Lori A. Shirley
Director
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery

Enclosures:
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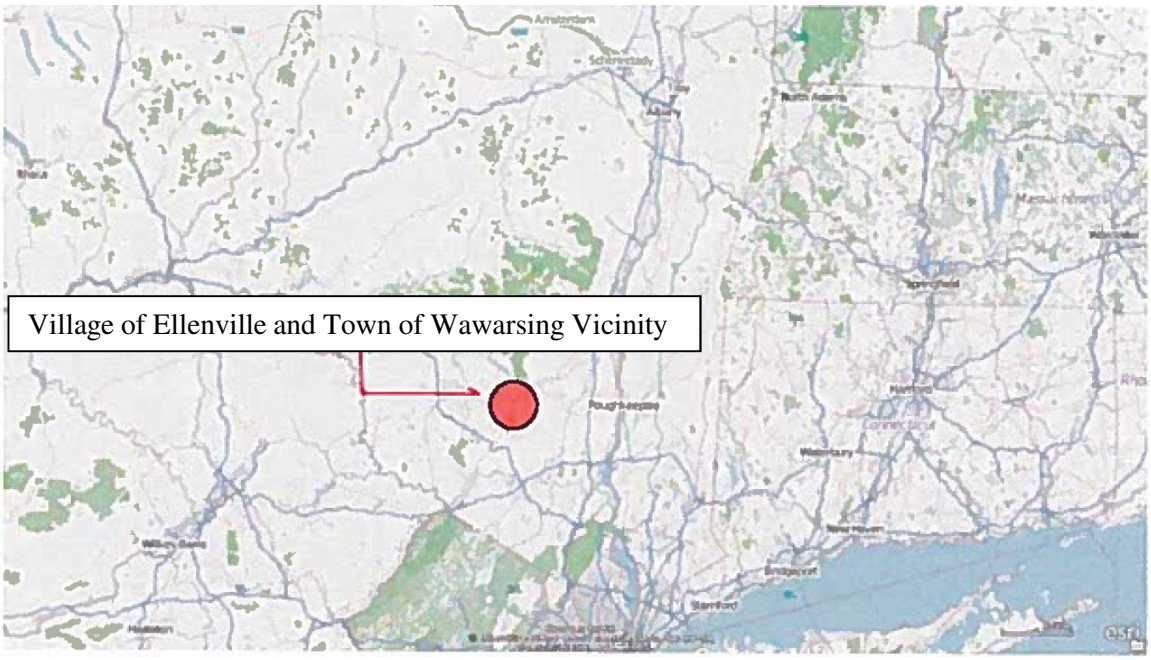
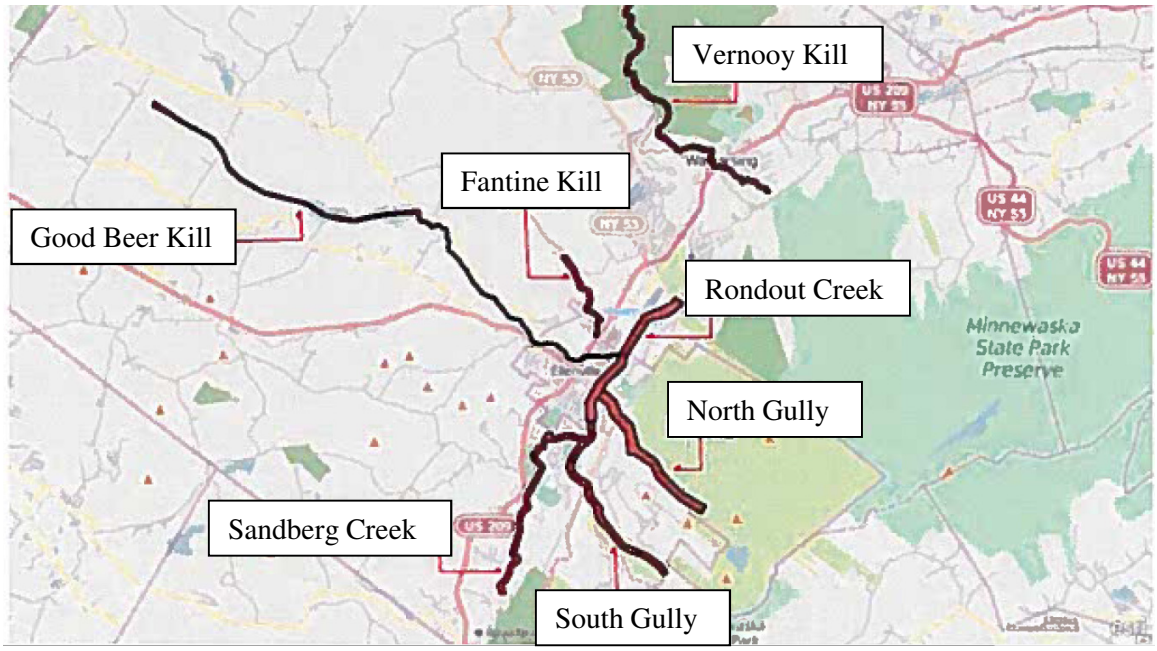
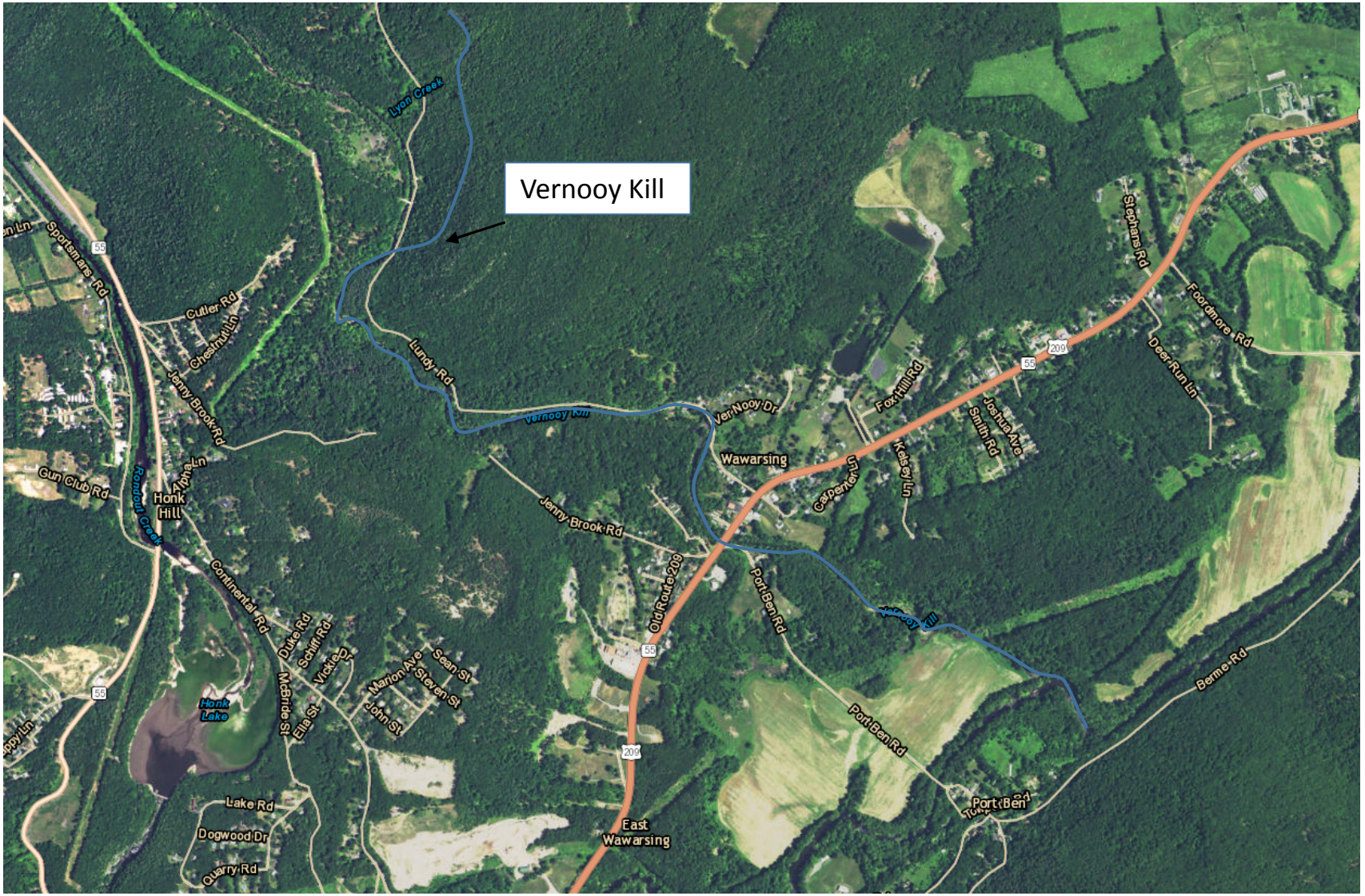
Attachment 2: Site Aerial Photographs (Northern, Eastern, Southern and Western Portions)

FIGURE 1
SITE LOCATION MAP





SITE AERIAL PHOTOGRAPH
Northern Portion of Project Area



Legend:
Aerial Imagery Source: USFWS
Approximate Watercourse Location
Site locations are approximate

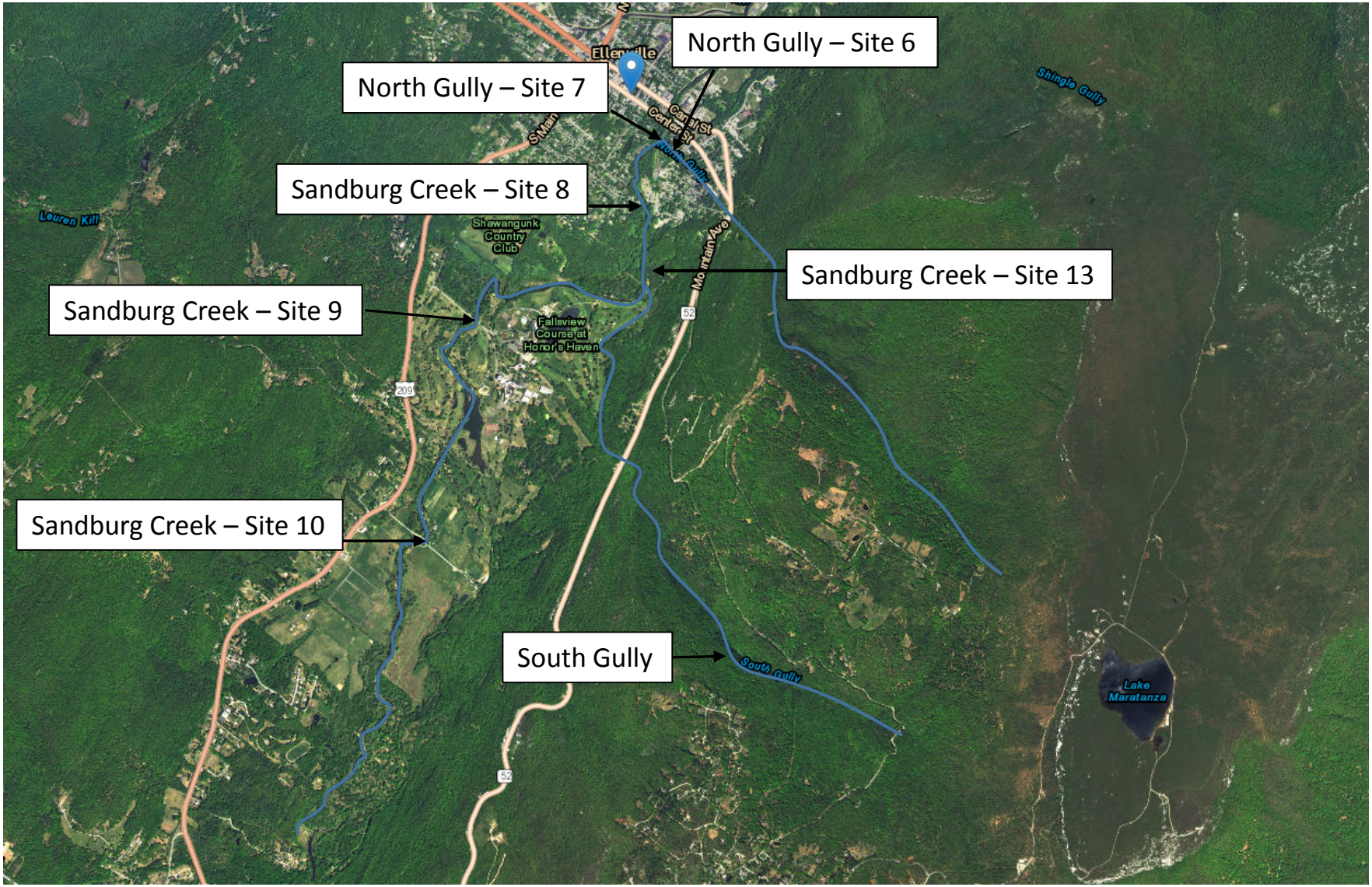
Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

SITE AERIAL PHOTOGRAPH
Eastern Portion of Project Area

Legend:
Aerial Imagery Source: USFWS
Approximate Watercourse Location
Site locations are approximate

Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

SITE AERIAL PHOTOGRAPH
Southern Portion of Project Area



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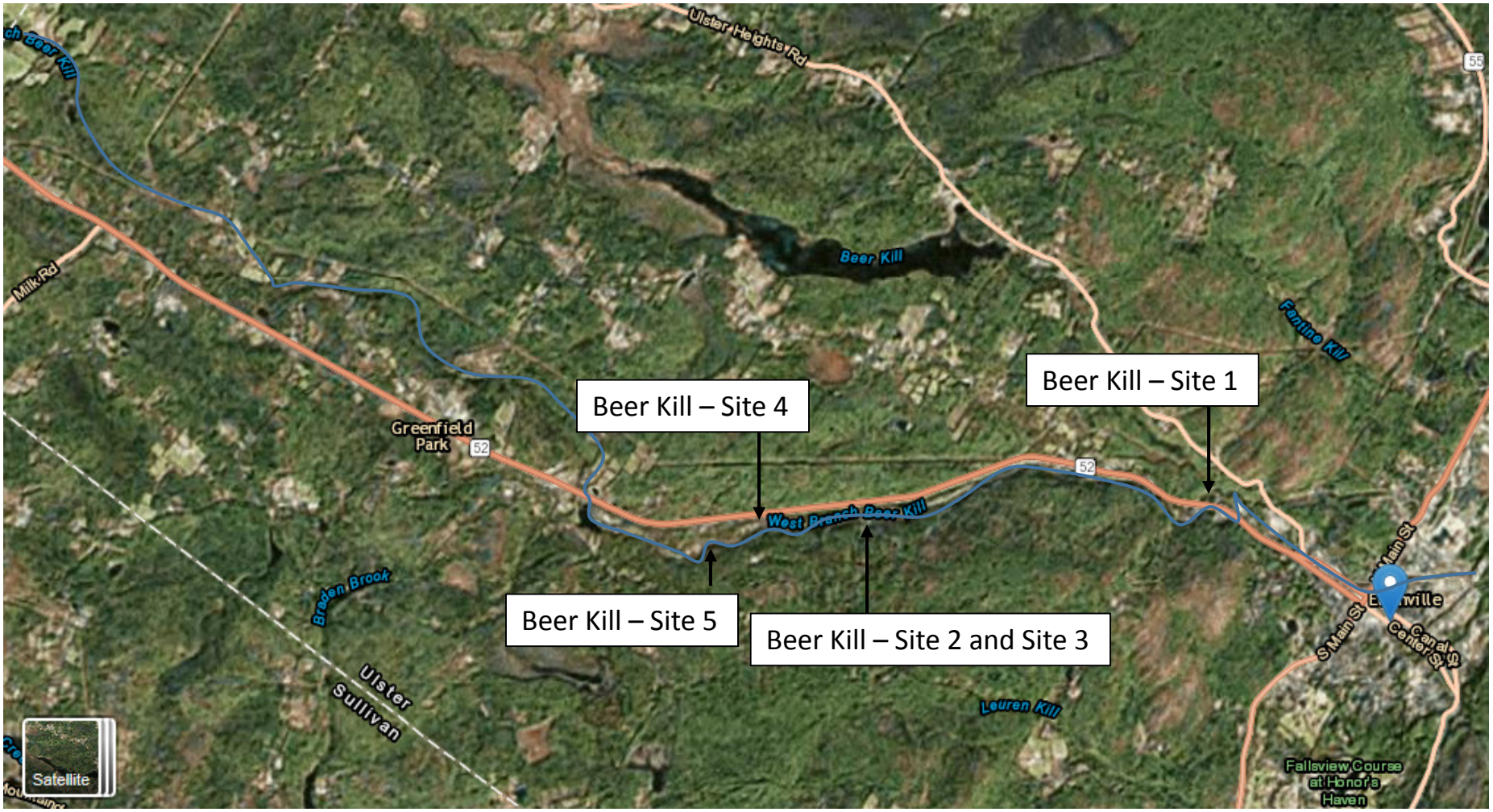
Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

SITE AERIAL PHOTOGRAPH
Western Portion of Project Area



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Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

June 16, 2017

Ron LaFrance, Jr.; Paul Thompson; and Beverly Cook, Chiefs
St. Regis Mohawk Tribe
412 State Route 37
Akwesasne, NY 13655

Re: Section 106 Compliance for the Ellenville Stream Bank Restoration Project (Ulster County, New York)

Dear Chiefs of the St. Regis Mohawk Tribe:

Pursuant to the Disaster Relief Appropriations Act, 2013 (Public Law 113-2) and the Housing and Community Development Act (42 U.S.C. § 5301 et seq.), the Governor's Office of Storm Recovery (GOSR), an office of New York State Homes and Community Renewal's Housing Trust Fund Corporation as a recipient of Community Development Block Grant – Disaster Recovery ("CDBG-DR") funds from the United States Department of Housing and Urban Development ("HUD"), is serving as the entity responsible for compliance with the HUD environmental review procedures set forth in 24 CFR Part 58. GOSR is acting on behalf of HUD in providing the enclosed project information and inviting this discussion with your Tribe to respond with any concerns or comments.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case-by-case basis. In accordance with Section 101(d)(6)(B) of the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470a), and its implementing regulations, 36 Code of Federal Regulations (CFR) Part 800, this letter serves as notification of the proposed action. This consultation is being sent to the Delaware Nation, Delaware Tribe of Indians, Mohawk Nation, Saint Regis Mohawk Tribe, and Stockbridge-Munsee Community Band of Mohicans.

Area of Potential Effect: The Area of Potential Effect (APE) is located at 13 sites in the Village of Ellenville and the Town of Wawarsing. They include:

Village of Ellenville:

- Sandburg Creek from Village line at west to confluence with Beer Kill (3,100');
- Beer Kill from Sandburg Creek to Route 209 (2,800');
- Fantine Kill from confluence with Sandburg Creek to Route 209 (2,500'); and
- North Gully from Ida Lane wall to Sandburg Creek (1,600').

Town of Wawarsing:

- West Branch Beer Kill from Briggs Highway to Barbara Road bridge (13,000');

- Rondout Creek from Route 209 to Airport Road culvert (2,600'); and
- Sandburg Creek from Arrowhead Road to the Village line (3,400').

Proposed Project Description: Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing, including the East and West Branches of the Beer Kill, Sandburg Creek, Rondout Creek, North Gully, and Fantine Kill.

The project involves stream bank restoration for damaged streams and stream corridors. Measures include the construction of floodplain benches (with rock and/or wood revetment) to reduce cutting at the toe of bank, lowering the height, angle and overall erosion hazard of eroding streambanks; installation of instream rock structures to provide grade control and reduce the erosive force of water upon streambanks by directing flood flows to the center of the stream channel; and reconnection of floodplains in select areas to reduce channel confinement and the corresponding increases in flood velocity that contribute to flood severity. The stream bank restoration measures may be implemented in phases. A total of thirteen sites in the project area are proposed for improvements.

This project is expected to provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town. Amongst other benefits, the project will:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, schools emergency services, and the Ellenville Regional Hospital;
- Provide long-term protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

With this letter, GOSR respectfully submits for your review the attached documentation for the proposed project(s) described herein. GOSR initiated consultation with the New York State Historic Preservation Office and no comments have been received to date. If the Area of Potential Effect encompasses historic properties of religious or cultural significance to your Tribe, please respond within 30 days or sooner. Additionally, please indicate if there are other sources of information or other parties, Nations, Tribes, or members of the public you believe should be included in the consultation process. Please respond by email or in writing to the address listed below.

Ms. Lori Shirley
Director, Bureau of Environmental Services
New York State Homes & Community Renewal
38-40 State St.,408N, Hampton Plaza
Albany, NY 12207

If you have any questions or require additional information regarding this request, please feel free to contact me at (518) 474-0755 or Lori.Shirley@stormrecovery.ny.gov. Thank you for your time and consideration.

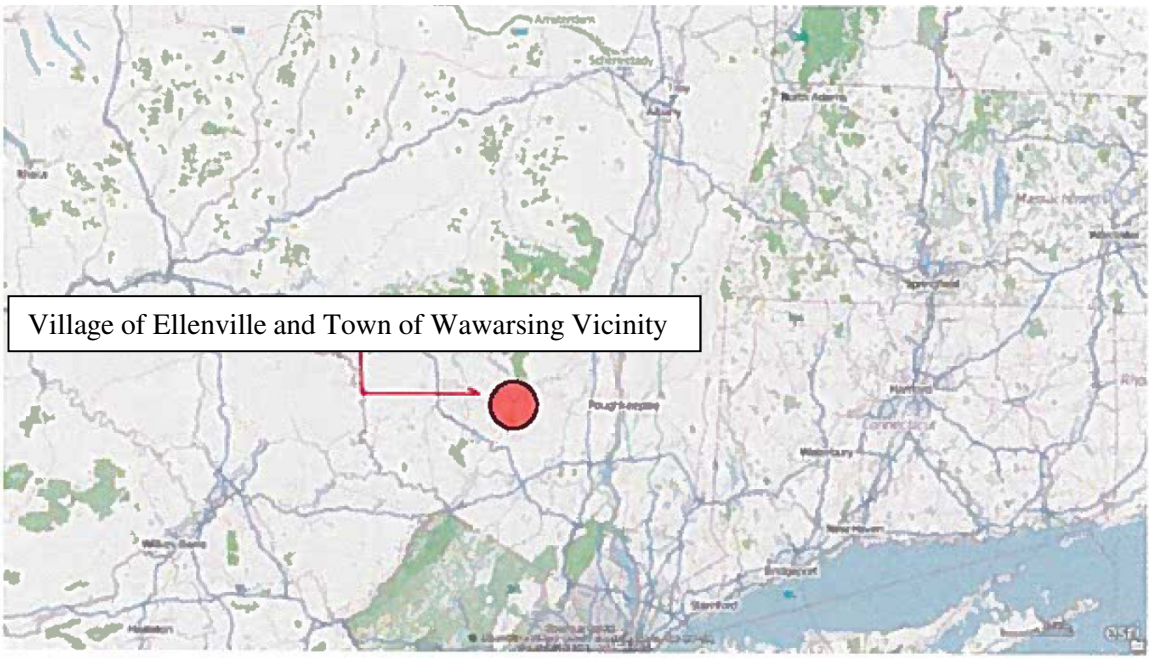
Sincerely,

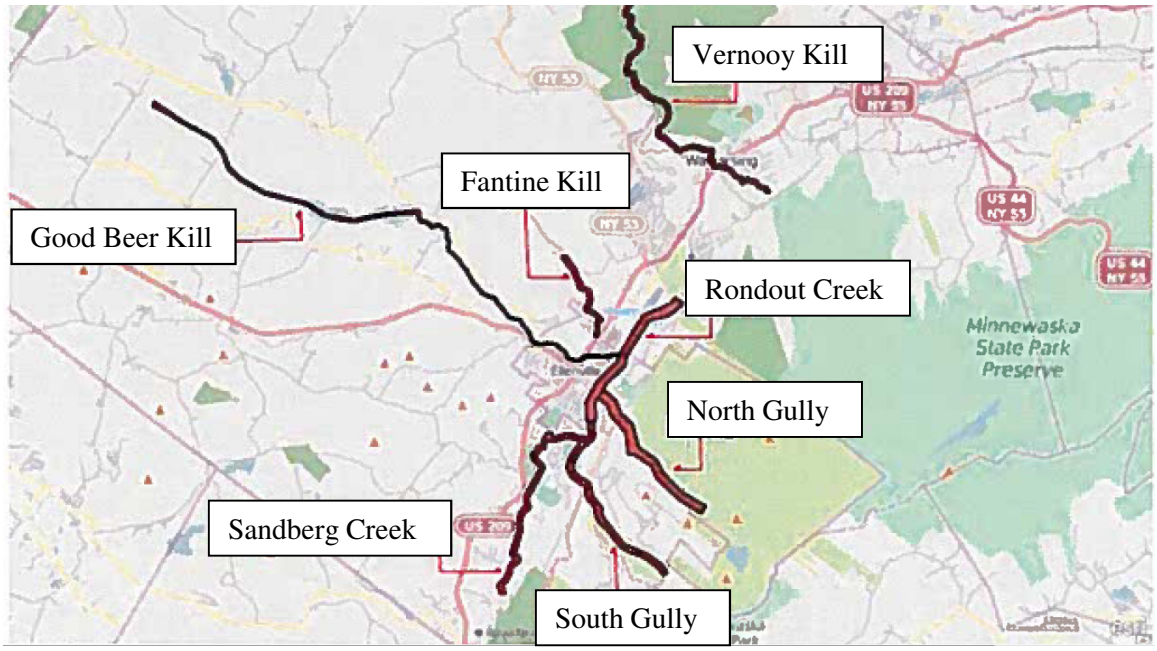
Lori A. Shirley
Director
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery

Enclosures:
Attachment 1: Site Location Map
Attachment 2: Site Aerial Photographs (Northern, Eastern, Southern and Western Portions)

Electronic letter sent to:
Arnold Printup
Saint Regis Mohawk Tribe, THPO
412 State Route 37
Akwesasne, NY 13655

FIGURE 1
SITE LOCATION MAP





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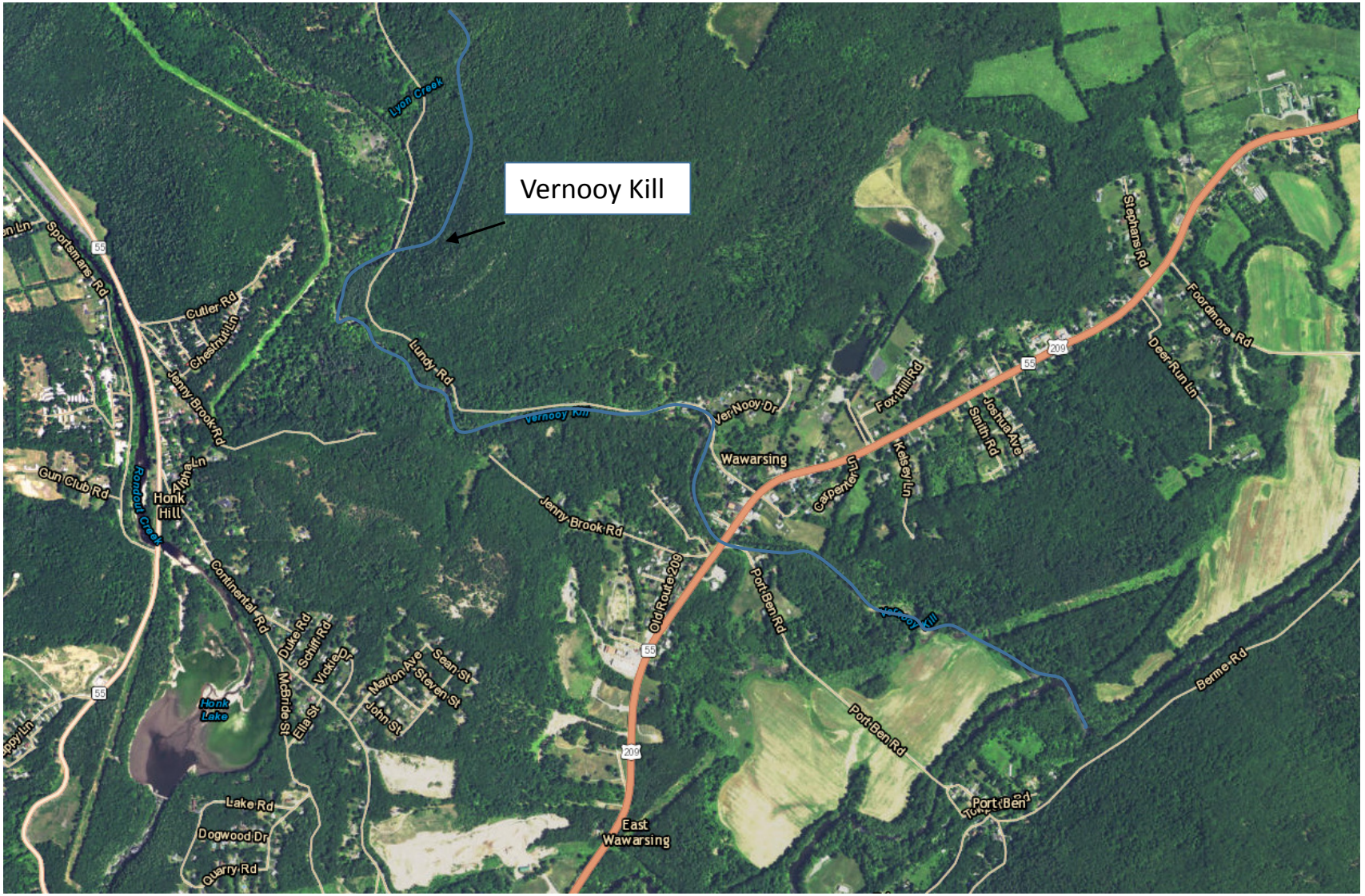

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Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

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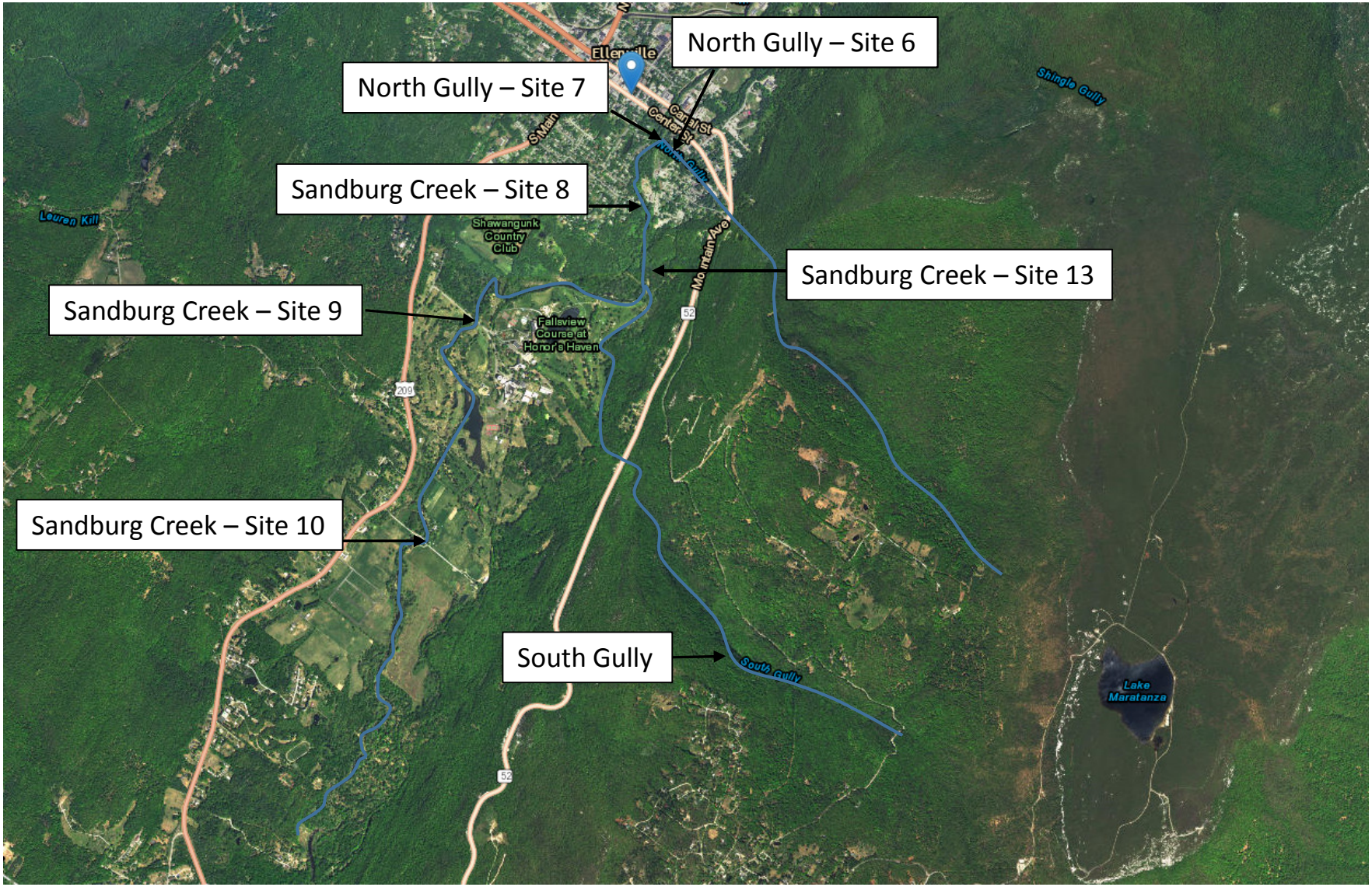

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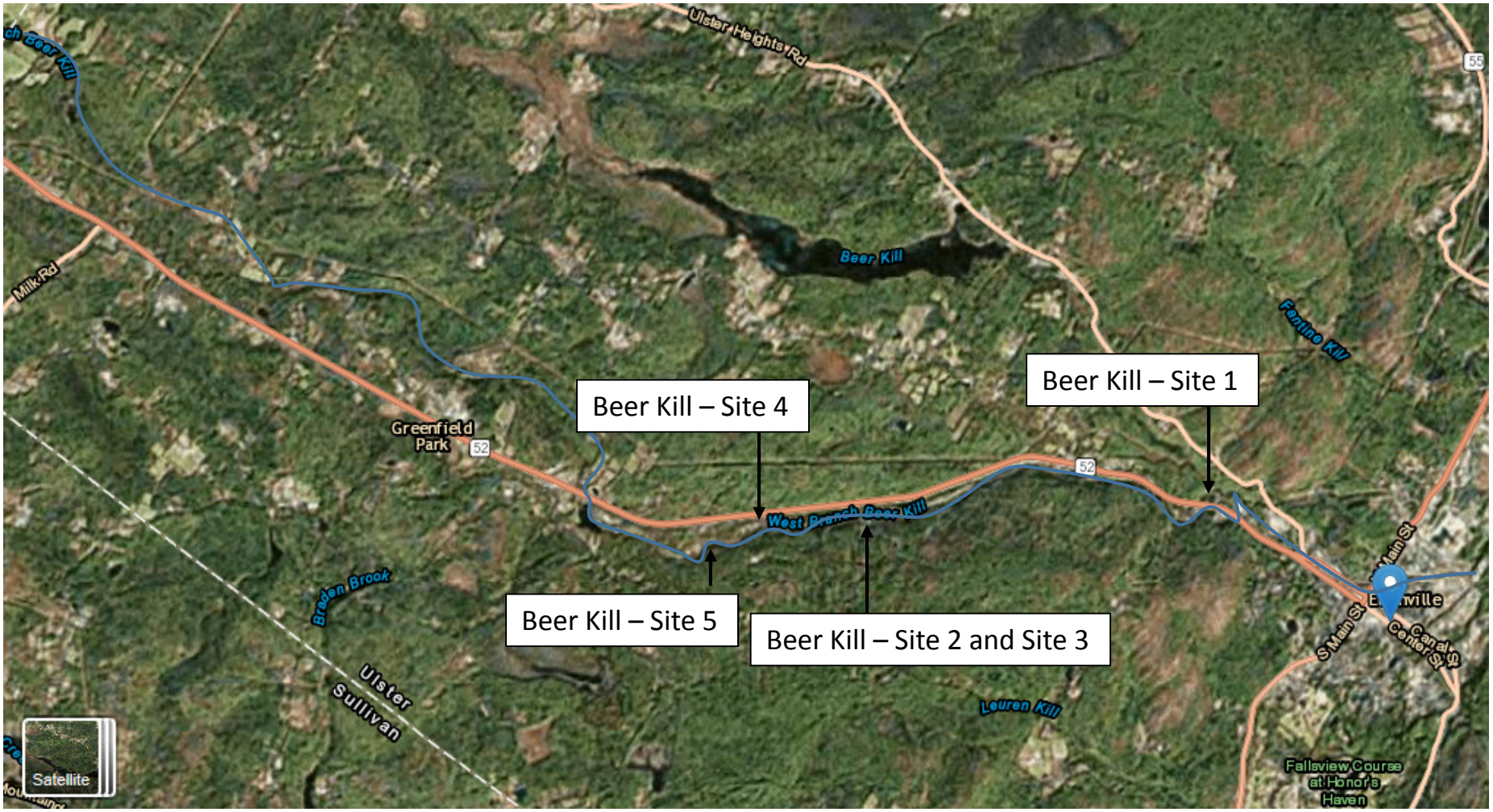

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Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

Governor's Office of Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

June 16, 2017

Shannon Holsey, President
Stockbridge-Munsee Community, Band of the Mohicans
N8476 Moh He Con Nuck Road
Bowler, WI 54416

Re: Section 106 Compliance for the Ellenville Stream Bank Restoration Project (Ulster County, New York)

Dear President Shannon Holsey:

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Director, Bureau of Environmental Services
New York State Homes & Community Renewal
38-40 State St.,408N, Hampton Plaza
Albany, NY 12207

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Sincerely,

Lori A. Shirley
Director
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery

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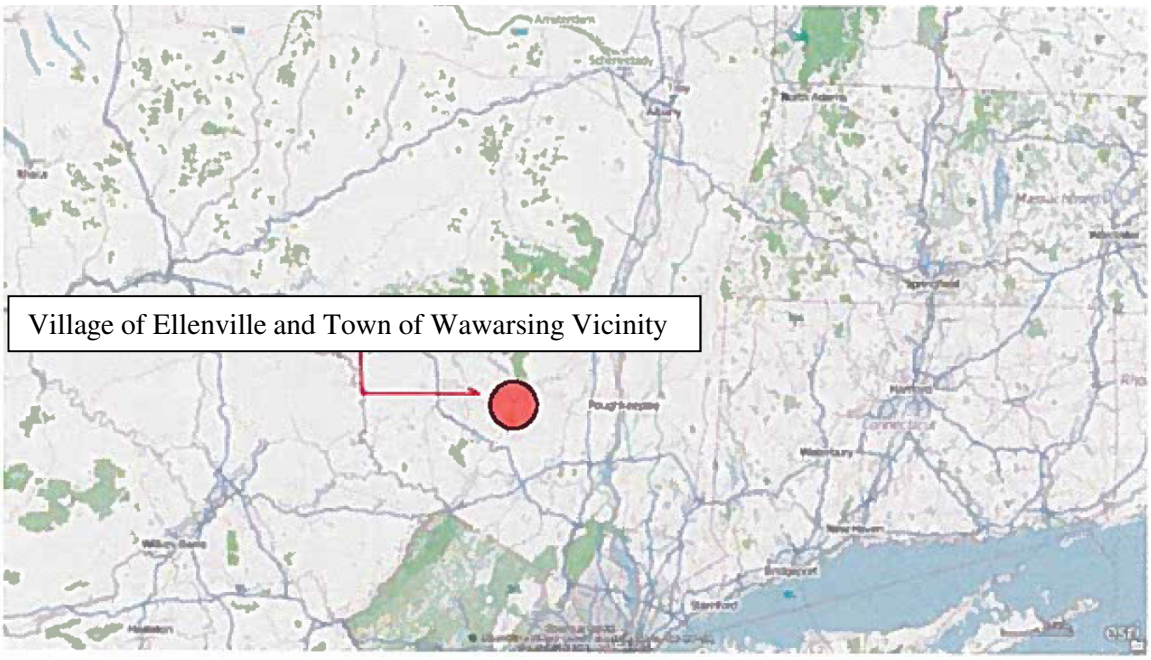
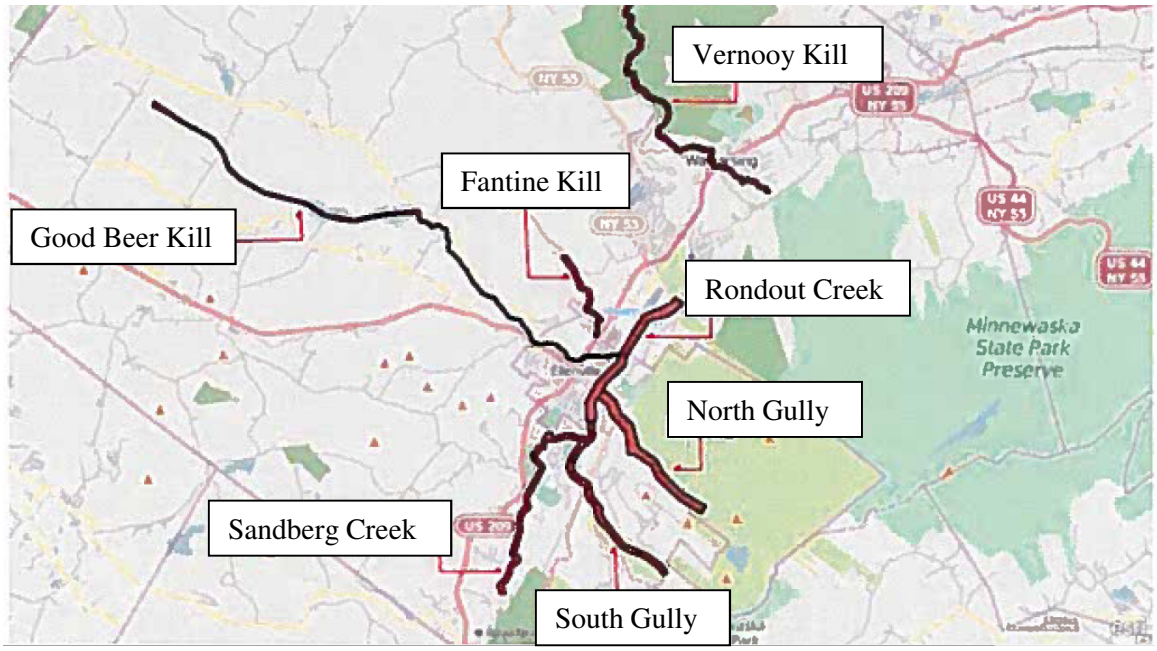
Attachment 2: Site Aerial Photographs (Northern, Eastern, Southern and Western Portions)

Electronic letter sent to:
Bonney Hartley
THPO, New York Office
Stockbridge-Munsee Community, Band of the Mohicans
65 1st Street
Troy, NY 12180

FIGURE 1
SITE LOCATION MAP





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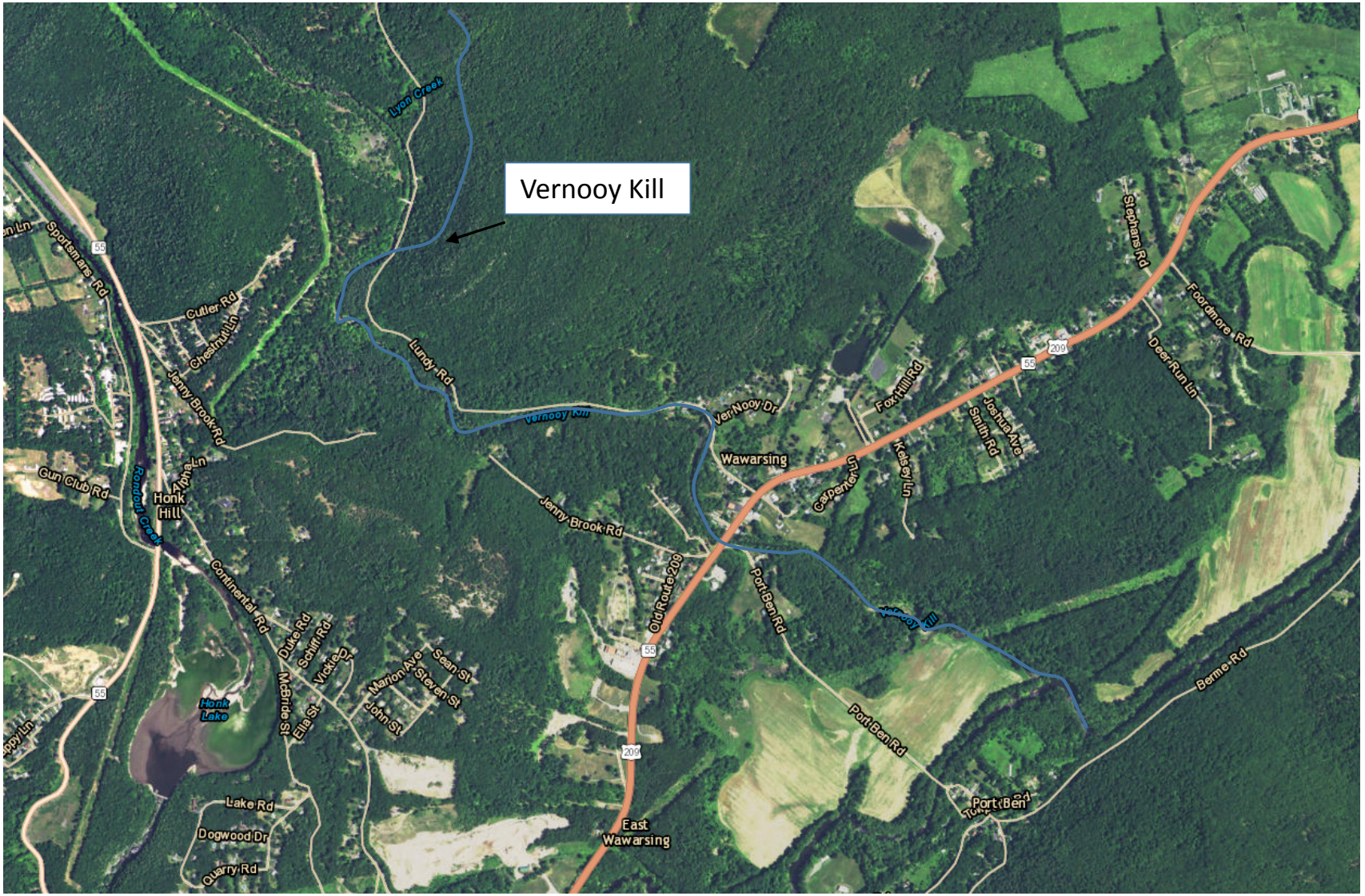

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Village of Ellenville and Town of Wawarsing – Stream Bank Restoration

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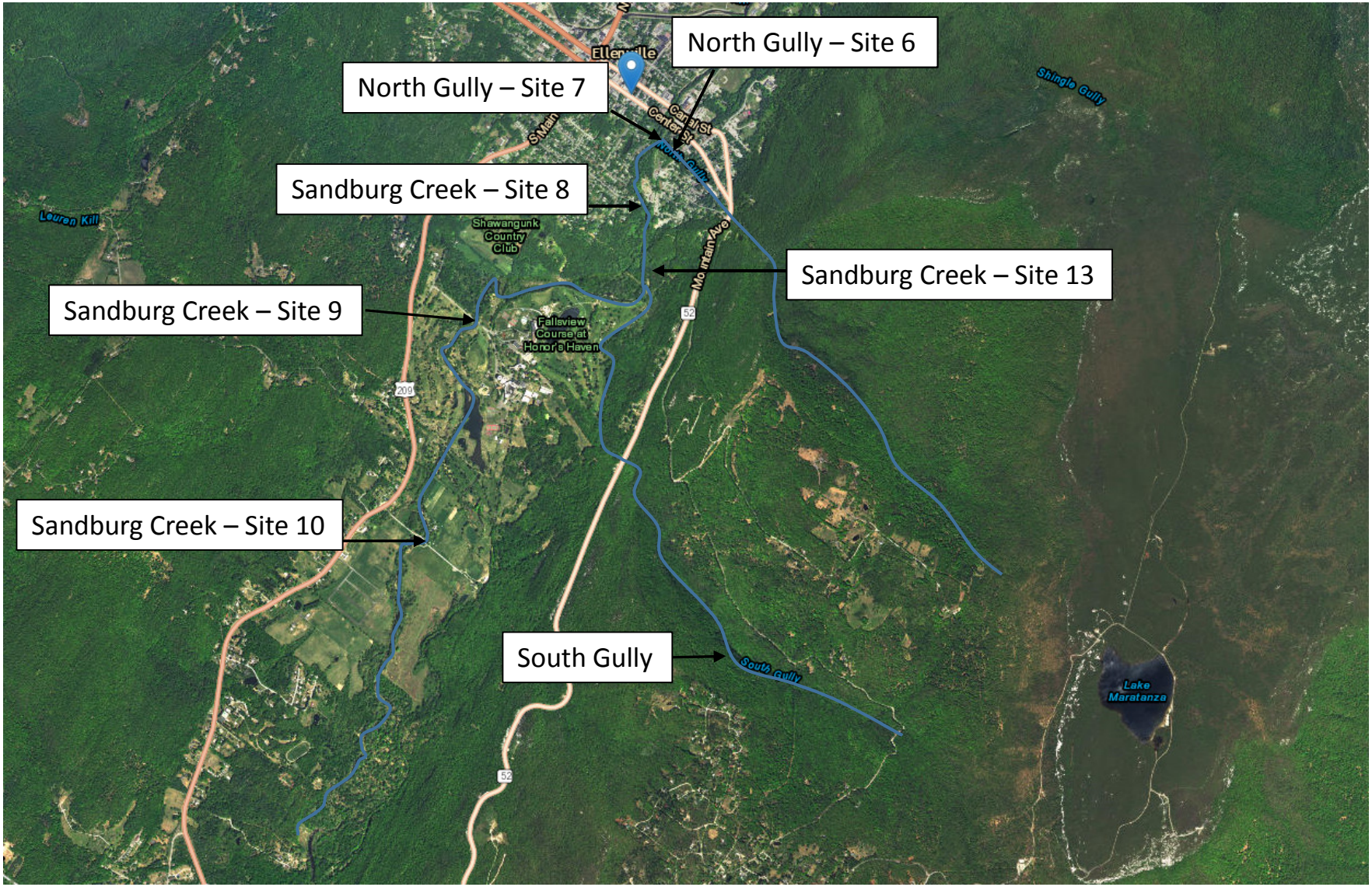

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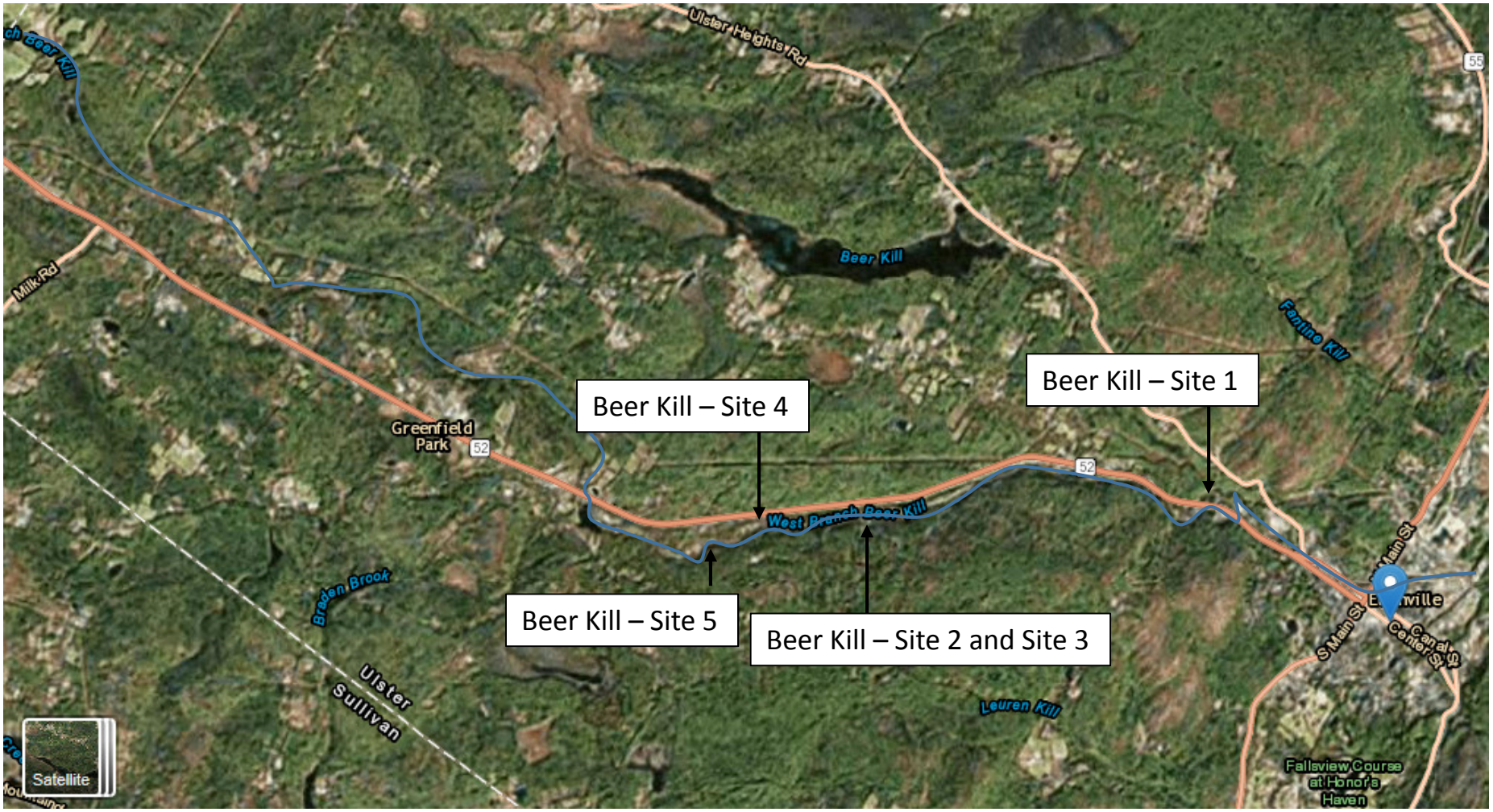

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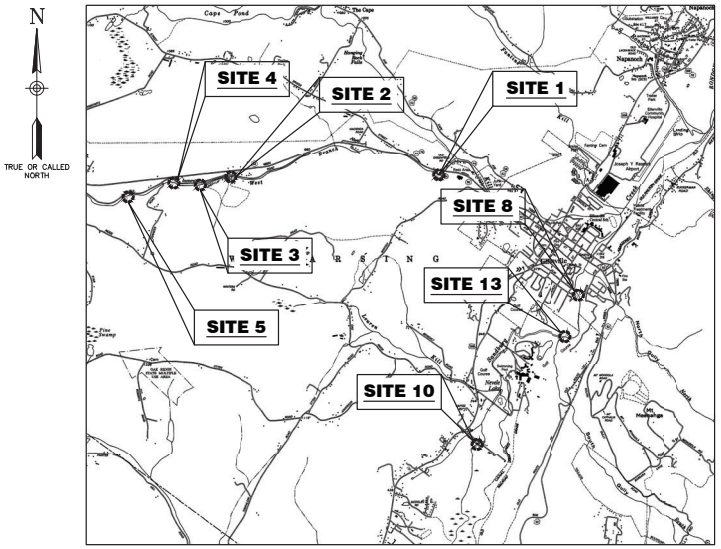

PROJECT LOCATION PLAN

NOT TO SCALE

95% DESIGN DRAWINGS

ELLENVILLE STREAM RESTORATION

VILLAGE OF ELLENVILLE AND TOWN OF WAWARSING STREAM RESTORATION PROJECT

CONTRACT 1 - GENERAL CONSTRUCTION

INDEX OF DRAWINGS

SHEET NO.	SHEET TITLE
-	COVER SHEET
C-001	GENERAL NOTES
C-101	KEY MAP
C-111	SITE 1 EXISTING CONDITIONS
C-112	SITE 1 RESTORATION PLAN
C-113	SITE 1 CROSS SECTIONS - PROPOSED CONDITIONS (1 OF 3)
C-114	SITE 1 CROSS SECTIONS - PROPOSED CONDITIONS (2 OF 3)
C-115	SITE 1 CROSS SECTIONS - PROPOSED CONDITIONS (3 OF 3)
C-116	SITE 1 EROSION AND SEDIMENT CONTROL PLAN
C-117	SITE 1 PLANTING PLAN
C-121	SITE 2 STREAM RESTORATION PLAN
C-131	SITE 3 STREAM RESTORATION PLAN
C-141	SITE 4 STREAM RESTORATION PLAN
C-151	SITE 5 STREAM RESTORATION PLAN
C-161	SITE 8 STREAM RESTORATION PLAN
C-171	SITE 10 EXISTING CONDITIONS
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C-173	SITE 10 CROSS SECTIONS - PROPOSED CONDITIONS
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C-175	SITE 10 PLANTING PLAN
C-181	SITE 13 EXISTING CONDITIONS
C-182	NOT USED
C-183	SITE 13 RESTORATION PLAN
C-184	SITE 13 CROSS SECTIONS - PROPOSED CONDITIONS (1 OF 2)
C-185	SITE 13 CROSS SECTIONS - PROPOSED CONDITIONS (2 OF 2)
C-186	SITE 13 GRADING PLAN
C-187	SITE 13 BYPASS PUMPING AND EROSION AND SEDIMENT CONTROL PLAN
C-188	SITE 13 PLANTING PLAN
C-301	DETAILS (SHEET 1 OF 3)
C-302	DETAILS (SHEET 2 OF 3)
C-303	DETAILS (SHEET 3 OF 3)
C-501	EROSION AND SEDIMENT CONTROL DETAILS

VILLAGE OFFICIALS

JEFF KAPLAN	MAYOR
RAYMOND YOUNGER	DEPUTY MAYOR
JOHN GAVARIS	VILLAGE TRUSTEE
FRANCISCO OLIVERAS	VILLAGE TRUSTEE
PATRICIA STEINHOFF	VILLAGE TRUSTEE

TOWN OFFICIALS

TERRY HOUCK	SUPERVISOR
DAN JOHNSON	DEPUTY SUPERVISOR
STEPHEN BRADLEY	COUNCILMAN
ROGER BUCHWALTER	COUNCILMAN
THOMAS J. BRIGGS	COUNCILMAN

DECEMBER 2019

Barton & Loguidice

NEW YORK STATE PROFESSIONAL ENGINEERS LICENSE NO. 075248

924.068.002

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION, SURVEY, AND STAKE OUT OF PROPOSED IMPROVEMENTS. EXCESS EXCAVATED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF SITE IN A LAWFUL MANNER.
2. THE CONTRACTOR SHALL INSPECT AND FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS OF ALL AREAS OF PROPOSED WORK AND SHALL INCLUDE PROVISIONS TO AVOID CONFLICTS WITH AND/OR RESTORE SITE FEATURES IN KIND. NO SEPARATE OR ADDITIONAL PAYMENT WILL BE MADE FOR WORK REQUIRED TO AVOID CONFLICTS WITH EXISTING SURFACE FEATURES OR RESTORE THOSE WHICH ARE NOT SHOWN.
3. CONTRACTOR IS RESPONSIBLE FOR ALL SURVEY AND STAKEOUT FOR THIS PROJECT. THE CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL AS-BUILT PLANS FOR THIS PROJECT IN DIGITAL FORMAT WITH TIES TO ALL UTILITY CONNECTIONS, BENDS, VALVES, LOCATIONS, LENGTHS, OR LINES, AND ELEVATIONS ON PIPE INVERTS, RIMS, AND STRUCTURES / MANHOLES. AS-BUILT PLANS SHALL BE REVIEWED BY THE OWNER AND ENGINEER, AND THE CONTRACTOR SHALL PROVIDE ANY CORRECTION OR ADMISSIONS TO THE SATISFACTION OF THE OWNER AND ENGINEER BEFORE UTILITIES WILL BE ACCEPTED.
4. UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL DIMENSIONS SHOWN ON THE SITE DRAWINGS FOLLOW THESE CONVENTIONS:
   a. DIMENSIONS TO BUILDINGS AND RETAINING WALLS ARE TO THE EXTERIOR OF EXPOSED FACE OF THE WALL
   b. DIMENSIONS TO A CURB ARE TO THE FACE OF THE CURB
   c. DIMENSIONS TO A FENCE OR RAILING ARE TO THE CENTERLINE OF THE FENCE OR RAILING
   d. DIMENSIONS TO A MANHOLE, INLET, CLEAN OUT, PIPE BEND, VALVE, FIRE HYDRANT OR OTHER UTILITY APPURTENANCE ARE TO THE CENTER OF THE STRUCTURE
   e. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCY UPON DISCOVERY AND SHALL RECEIVE CLARIFICATION BEFORE PROCEEDING WITH CONSTRUCTION.
5. CONTRACTOR SHALL DEVELOP AND MAINTAIN A DETAILED CONSTRUCTION SCHEDULE THAT IDENTIFIES DATES AND DURATION OF ALL PORTIONS OF THE WORK. FULL TIME ACCESS ALONG ROADWAYS AND DRIVEWAYS TO ALL RESIDENTS SHALL BE ACCOMMODATED.
6. THE CONTRACTOR SHALL SUBMIT A CONSTRUCTION SEQUENCE FOR REVIEW PRIOR TO THE PRE-CONSTRUCTION MEETING. THE FOLLOWING IS A SUGGESTED SEQUENCE OF CONSTRUCTION:
   a. OBTAIN PLAN APPROVAL AND OTHER APPLICABLE STATE AND LOCAL PERMITS. THE OWNER SHALL SUBMIT THE NOTICE OF INTENT (NOI) TO OBTAIN COVERAGE UNDER GP-0-15-002 IN ACCORDANCE WITH PART II OF THE PERMIT.
   b. SCHEDULE AND HOLD A PRECONSTRUCTION MEETING WITH OWNER, ENGINEER, CONTRACTOR(S), GOVERNOR'S OFFICE OF STORM RECOVERY (GOSR) GRANT MANAGER, AND VILLAGE/TOWN AT LEAST ONE (1) WEEK PRIOR TO STARTING CONSTRUCTION.
   c. ALL CONTRACTORS AND SUBCONTRACTORS MUST COMPLETE AND EXECUTE A CONTRACTOR CERTIFICATION FORM AS INCLUDED IN THE SWPPP.
   d. MOBILIZE TO SITE AND LAYOUT ESTABLISHED LIMITS OF WORK AND BUFFER AREAS PRIOR TO STARTING CONSTRUCTION. DELINEATE LIMITS OF DISTURBANCE BY INSTALLING BARRIERS BETWEEN WORK AREA AND ENVIRONMENTALLY SENSITIVE AREAS. IDENTIFY TREES TO BE PROTECTED NEAR WORK LIMITS AND INSTALL TREE PROTECTION MEASURES. OBTAIN APPROVAL FROM OWNER PRIOR TO ANY TREE REMOVAL.
   e. ESTABLISH CONSTRUCTION ACCESS, STAGING, EQUIPMENT, LAYDOWN, TEMPORARY STOCKPILE, AND CONCRETE WASHOUT AREAS.
   f. INSTALL EROSION AND SEDIMENT CONTROL MEASURES IN PREPARATION OF THE CONSTRUCTION. ALL EROSION AND SEDIMENT CONTROL STRUCTURES (INCLUDING STABILIZED CONSTRUCTION ENTRANCES) SHALL BE IN PLACE PRIOR TO UPGRADIENT LAND DISTURBANCE.
   g. COMPLETE TREE REMOVAL, AS REQUIRED WITHIN THE LIMITS OF DISTURBANCE.
   h. COMPLETE ROUGH GRADING AND CONSTRUCTION OF ALL UTILITIES AND STRUCTURES.
   i. COMPLETE RESTORATION OF ALL DISTURBED AREAS INCLUDING PAVING, LANDSCAPE PLANTING, AND SEEDING.
   j. ONCE FINAL STABILIZATION IS ACHIEVED, REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SUBJECT TO THE APPROVAL OF THE ENGINEER.
   k. MAKE REPAIRS AS REQUIRED BY THE OWNER TO OBTAIN CERTIFICATE OF COMPLIANCE AND FILE NOTICE OF TERMINATION (NOT) IN ACCORDANCE WITH GP-0-15-002 PART V.
7. THE CONTRACTOR SHALL PREPARE A MAINTENANCE AND PROTECTION OF TRAFFIC PLAN THAT INCLUDES, BUT IS NOT LIMITED TO, AN ADVANCED WARNING SIGN LAYOUT PLAN FOR ROADWAYS AND A CONSTRUCTION SEQUENCING PLAN. THE PLAN SHALL BE SUBMITTED TO AND APPROVED BY THE OWNER PRIOR TO COMMENCING CONSTRUCTION.
8. THE CONTRACTOR SHALL COORDINATE WORK AND OBTAIN AND ADHERE TO ALL REQUIRED PERMITS INCLUDING THOSE FROM THE US ACOE, NYS DEC, VILLAGE/TOWN HWY DEPT, NYSDOT, AND ULSTER COUNTY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND INCUR THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES, ETC.
9. CONTRACTOR SHALL PROVIDE A WRITTEN PLAN TO INDICATE HOW ACTIVITIES WILL BE CONDUCTED TO AVOID OR MINIMIZE UNNECESSARY NOISE, DUST, AND VISUAL IMPACTS OF CONSTRUCTION ACTIVITIES ON SITE. MANAGE CONSTRUCTION TRAFFIC ON SITE, STAGING PROCEDURES, AND HOW CONSTRUCTION TRAFFIC EXITING AND ENTERING THE SITE WILL BE MANAGED TO AVOID UNNECESSARY IMPACT ON TRAFFIC USING LOCAL ROADS.
10. CONTRACTOR TO PROVIDE FULL TIME ACCESS ALONG ROADWAYS AND DRIVEWAYS TO OWNER.
11. THE OWNER MAY AUTHORIZE APPROPRIATE PROFESSIONALS TO OBSERVE AND MONITOR THE SITE ACTIVITIES WHEN DEEMED NECESSARY TO ENSURE COMPLIANCE WITH THE CONDITIONS OF APPROVAL OR THE PROTECTION OF ENVIRONMENTALLY SENSITIVE AREAS.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL FOR DELIVERY OF MATERIALS AND RELATED WORK.
13. THE CONTRACTOR IS RESPONSIBLE FOR ALL EXCAVATION, INCLUDING ANY ROCK OR CONCRETE EXCAVATION, STRUCTURES AND CONCRETE EXCAVATION AT THE PROJECT SITE.
14. CONTRACTOR SHALL TAKE CARE NOT TO UNDERMINE ROADWAY/DRIVEWAY PAVEMENT. ANY DISTURBED OR UNDERMINED PAVEMENT SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK.
16. CONTRACTOR SHALL REMOVE, STORE AND REPLACE SIGNS AND MAILBOXES AS NECESSARY. SIGNS AND MAILBOXES MUST REMAIN FUNCTIONAL AND ACCESSIBLE AT ALL TIMES. ALL DAMAGED SIGNS SHALL BE REPLACED IN KIND AT CONTRACTORS EXPENSE.
17. RESTORE ALL SURFACES TO AS GOOD OR BETTER CONDITION THAN BEFORE CONSTRUCTION AS SOON AS POSSIBLE FOLLOWING COMPLETION OF WORK IN ANY AREA. PROGRESS RESTORATION PROMPTLY TO MINIMIZE IMPACTS TO VEHICULAR AND PEDESTRIAN ACCESS.
18. ALL COSTS ASSOCIATED WITH PREPARING ANY STORAGE AND STAGING AREA(S) SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THIS INCLUDES, BUT IS NOT LIMITED TO, CLEARING AND GRADING, STABILIZATION OF THE WORK YARD SURFACE, CONSTRUCTION OF ALL TEMPORARY UTILITIES, ACCESS ROADS, ALL SECURITY FENCING, AND RESTORATION OF STAGING OR DISTURBED AREAS.
19. CONTRACTOR TO REPLACE PAVEMENT MARKINGS WHERE ASPHALT IS REMOVED AND REPLACED.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ANY PROPERTY LINE, SURVEY, OR RIGHT-OF-WAY MONUMENTATION DISTURBED DURING CONSTRUCTION. THE CONTRACTOR SHALL EMPLOY A NEW YORK STATE LICENSED LAND SURVEYOR TO RESTORE ALL DISTURBED MONUMENTS TO THEIR ORIGINAL LOCATION AT THE CONTRACTOR'S EXPENSE.
21. THE CONTRACTOR WILL BE REQUIRED TO REMOVE ALL SNOW AND ICE AS NEEDED AT NO ADDITIONAL COST. CONTRACTORS OPERATIONS ALONG THE HIGHWAY SHOULDERS, MUST NOT INTERFERE WITH THE OWNER'S ABILITY TO REMOVE SNOW AND PROVIDE ICE CONTROL.
22. IF ANY HAZARDOUS CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL FOLLOW THE PREVAILING FEDERAL, STATE, AND LOCAL REQUIREMENTS FOR NOTIFICATIONS, ISOLATION, REMOVAL, STORAGE AND ALL PERTINENT REGULATIONS.
23. PRIOR TO COMMENCING WORK, CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES, BUILDINGS, PAVEMENTS, AND OTHER SITE FEATURES TO REMAIN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UTILIZE A LOCATING SERVICE TO VERIFY UTILITY LOCATIONS. NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES. CONTRACTOR SHALL CONTACT DIG SAFELY NEW YORK FOR LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO THE COMMENCING OF CONSTRUCTION. IF ANY UTILITIES ARE DAMAGED DURING CONSTRUCTION, IT SHALL BE REPAIRED TO STANDARD OF AUTHORITIES HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
24. PRIOR TO START OF WORK, COORDINATE CONSTRUCTION VEHICLE ACCESS/EGRESS ROUTES, STOCKPILE AREA, AND FIELD OFFICE AREA IF REQUIRED.
25. STREAM PRACTICE LOCATIONS SHOWN ARE APPROXIMATE AND ARE TO BE CONFIRMED IN FIELD BY ENGINEER TO MINIMIZE THE REMOVAL AND DISTURBANCE AND TO AVOID SLOPES, ETC.

ENVIRONMENTAL RESOURCES NOTES:

1. CONTRACTOR SHALL IDENTIFY AND PROVIDE FENCING TO PROTECT SENSITIVE AREAS IDENTIFIED ON THE PLANS IN COORDINATION WITH THE ENGINEER AND OWNER BEFORE COMMENCING ANY WORK.
2. WORK IN WETLANDS, WATERCOURSES, AND OTHER ECOLOGICALLY SENSITIVE AREAS SHALL USE THE SPECIFIC CONSTRUCTION TECHNIQUES DESCRIBED IN THE SWPPP AND CONTRACT DOCUMENTS. PRIOR TO COMMENCING WORK, CONFIRM LIMITS OF CONSTRUCTION FENCE TO BE PLACED AT SITE WITH OWNER, ENGINEER, AND TOWN.
3. ALL TREE CLEARING ACTIVITIES ON THE SITE SHALL BE RESTRICTED TO THE PERIOD BETWEEN NOVEMBER 1 AND MARCH 31. INDIVIDUAL TREE REMOVAL FOR THE PLACEMENT OF STREAM BARBS AND CROSS VANES IS PERMITTED FOLLOWING EMERGENT BAT SURVEY THE NIGHT PRIOR TO REMOVAL. CONTACT XXX FOR NOTIFICATION OF EMERGENT BAT SURVEY.
4. TREE REMOVAL SHALL BE CONFINED TO THE DESIGNATED WORK LIMITS OR OTHER PROPERTY AS INDICATED ON THE PLANS. THE CONTRACTOR SHALL MAKE EVERY ATTEMPT TO PRESERVE ALL TREES. NO CLEARING SHALL BE COMMENCED UNLESS FIRST APPROVED BY THE ENGINEER AND OWNER. TREE REMOVALS AND CLEARING SHALL BE REVIEWED IN THE FIELD WITH THE ENGINEER AND OWNER, ANY UNAUTHORIZED DAMAGE TO LANDSCAPING OR TREES SHALL REQUIRE THEM TO BE REPLACED IN KIND AT NO ADDITIONAL COST TO THE OWNER.
5. CLEARING OF TREES SOLELY FOR STAGING OF EQUIPMENT IS NOT ACCEPTABLE. DISTURBANCE SHOULD BE LIMITED TO ONLY WHAT IS NECESSARY FOR EQUIPMENT PASSAGE AND THE CONSTRUCTION (INCLUDING MATERIALS STAGING) OF PERMANENT STRUCTURES. EXCESSIVE STAGING AREAS SHOULD BE AVOIDED.

GRADING NOTES:

1. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE FOR FIELD ADJUSTMENTS OF NEW WORK TO BLEND WITH EXISTING WORK THAT IS TO REMAIN.
2. THE CONTRACTOR SHALL STAKE OUT ALL GRADES IN THE FIELD PRIOR TO CONSTRUCTION AND NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY DISCREPANCIES WITH THE CONSTRUCTION DOCUMENTS.
3. THE CONTRACTOR SHALL CONTINUALLY MONITOR EXISTING STORM WATER AND EROSION CONTROL SYSTEMS AND PERIODICALLY CLEAN, REPAIR, AND UPGRADE AS REQUIRED.
4. GRADES WITHIN DRIP-LINE OF VEGETATION TO REMAIN SHALL NOT BE COMPACTED OR ALTERED UNLESS SO DIRECTED IN EITHER THE DRAWINGS OR SPECIFICATIONS. IN THE EVENT THIS IS UNAVOIDABLE, CONSULT THE OWNER'S REPRESENTATIVE BEFORE PROCEEDING.

UTILITY NOTES:

1. PLANS ILLUSTRATE KNOWN SUBSURFACE STRUCTURES, ABOVE GROUND STRUCTURES, AND/OR UTILITIES BELIEVED TO EXIST IN THE WORKING AREA. THE EXACT OR EVEN APPROXIMATE LOCATION OF SUCH MAY BE DIFFERENT FROM THAT SHOWN OR MAY NOT BE SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROCEED WITH GREAT CARE IN EXECUTING ANY WORK AND TO LOCATE AND PROTECT ALL UTILITIES. CONTRACTOR SHALL COMPLY WITH THE STATE OF NEW YORK DEPARTMENT OF PUBLIC SERVICE, 16 NYCRR PART 753. OBTAIN A DIG SAFELY NEW YORK STAKE OUT PRIOR TO COMMENCING CONSTRUCTION.
2. DAMAGE TO UTILITIES RESULTING FROM NEGLIGENCE OR FAILURE ON THE PART OF THE CONTRACTOR TO MAKE ACCURATE LOCATION IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING OR REPAIRING ANY DAMAGED UTILITY TO THE SATISFACTION OF THE OWNER AND ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING UTILITY POLES AS REQUIRED, INCLUDING TEMPORARILY SUPPORTING POLES DURING IMPROVEMENTS AT NO ADDITIONAL COST TO THE OWNER. COORDINATE UTILITY POLE WORK WITH LOCAL UTILITY COMPANY.
4. NO WORK SHALL BE PROGRESSED ON PRIVATE PROPERTY, OR OUTSIDE OF EASEMENTS SHOWN ON PLANS WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER.

SEQUENCING / STAGING AREA NOTES:

1. EROSION AND SEDIMENT CONTROL FEATURES SHOWN ARE CONSIDERED A MINIMUM AMOUNT OF CONTROL NECESSARY TO ENSURE WATER QUALITY IN WORK AREAS. THE INTENT IS TO CONTAIN THE INDIVIDUAL WORK AREAS WITH BARRIERS AND TURBIDITY CURTAIN AND FILTER DEWATERING VOLUME PUMPED WITH SEDIMENT BAGS AND NATURAL FILTRATION OF DRAINAGE DITCH VEGETATION WHILE DIVERTING STREAM FLOW AROUND THE WORK ZONE. ANY DEPOSITION OF SEDIMENTS IN THE OLD GREENFIELD ROAD DITCH WILL REQUIRE REMOVAL UNLESS MINUTE AS DETERMINED BY THE ENGINEER. IT IS BELIEVED THAT THE CONTAINED WORK AREAS DO NOT ALL NEED TOTAL DEWATERING TO PLACE LARGE ROCK STRUCTURES BUT WILL VARY. THE CONTRACTOR IS REQUIRED TO SUBMIT FOR OWNER'S AND ENGINEER REVIEW; THEIR OWN EROSION AND SEDIMENT CONTROL PLAN AND NARRATIVE TO SHOW CONSTRUCTION SEQUENCING, EROSION AND SEDIMENT CONTROL PRACTICES, DURATION OF USE/RE-USE, RESTORATION AND CONSTRUCTION STAGING TO ADDRESS ALL AREAS PROPOSED TO BE DISTURBED NEEDED TO CONSTRUCT THE PROJECT.
2. THE CONTRACTOR WILL BE REQUIRED TO SUBMIT A CONSTRUCTION SEQUENCING PLAN AND NARRATIVE (PARTICULARLY REGARDING THE KEYING-IN OF STREAM BARBS THROUGH THE REVETMENT WALL AT SITE 5) TO THE OWNER AND ENGINEER THAT SHOWS THE ORDER OF THE WORK, DURATION OF ALL PORTIONS AND PHASES OF THE WORK FOR EACH SITE THAT INCLUDES WHERE CONSTRUCTION STAGING, MATERIAL STORAGE, EQUIPMENT ACCESS, SANITARY FACILITIES FOR THE CREW, ANY LIGHTING OR SPECIAL NEEDS THAT WILL DISTURB THE AREA. INDICATE HOURS OF OPERATION AND MEANS OF NOTIFICATION TO PROPERTY OWNERS OF THE WORK, SCHEDULE AND IMPACTS ON TRAVEL PRIOR TO COMMENCING. RESTORE ALL PROPERTY DISTURBED TO ORIGINAL CONDITION.
3. FOR OLD GREENFIELD ROAD AND WORK AT SITES 2, 3, 4, AND 5 THE TOWN WILL ALLOW PORTIONS OF OLD GREENFIELD ROAD WEST OF BARBARA ROAD TO BE CLOSED DURING CONSTRUCTION. ROAD WILL BE ALLOWED TO CLOSE FROM 10' WEST OF BRIDGE TO 300' WEST OF WESTERLY EXTENT OF SITE 5 WORK SITE. INCLUDE MEANS OF PROTECTION IN NARRATIVES.
4. THE ROAD SURFACE MAY BE USED AS A MATERIAL STORAGE AREA IF SUFFICIENTLY PROTECTED BY STEEL PLATES, WOODEN MATTRESSES OR APPROPRIATE MEANS TO AVOID DAMAGING ROAD INFRASTRUCTURE. REPAIR ALL DAMAGES.

SURVEY NOTES:

1. SURVEY FOR SITES 1, 10, AND 13 PREPARED BY BROOKS AND BROOKS SURVEYORS, P.C.
2. SUBJECT TO ALL RIGHTS OF WAYS, COVENANTS, EASEMENTS, RESTRICTIONS, CONDITIONS AND AGREEMENTS OF RECORD.
3. SUBJECT TO WHATEVER STATE OF FACTS A COMPLETE SEARCH OF TITLE MAY REVEAL.
4. SUBSURFACE STRUCTURES NOT VISIBLE OR READILY APPARENT ARE NOT SHOWN AND THEIR LOCATION AND EXTENT ARE NOT CERTIFIED.
5. AREA SHOWN CONTAINS FEDERAL WETLAND NOT DELINEATED OR SHOWN HEREON. AREA LIES WITHIN A FEMA FLOOD ZONE AS DEPICTED ON FEMA FIRM NO. 36111C0685F EFFECTIVE DATE 18 NOVEMBER, 2016.
6. APPROXIMATE BOUNDARIES SHOWN HEREON AS PER ULSTER COUNTY GIS TAX MAPPING, AND ARE SUBJECT TO COMPLETE SURVEYS.
7. CONTOURS BASED ON FIELD SURVEY. ELEVATIONS ARE APPROXIMATE NAVD88 AS DERIVED BY RTK GPS OBSERVATIONS.

LIDAR TOPOGRAPHY NOTES:

1. PLANS FOR ALL SITES WITH THE EXCEPTION OF SITES 1, 10, AND 13 WERE PREPARED USING LIDAR TOPOGRAPHY AND ORTHOIMAGERY SOURCED FROM THE NYS GIS CLEARINGHOUSE.
2. THE NYS HIGH RESOLUTION DIGITAL ORTHOIMAGERY IS ACCURATE TO ±8-FT HORIZONTALLY AT THE 95% CONFIDENCE LEVEL FOR 2-FT RESOLUTION.

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

GENERAL NOTES

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

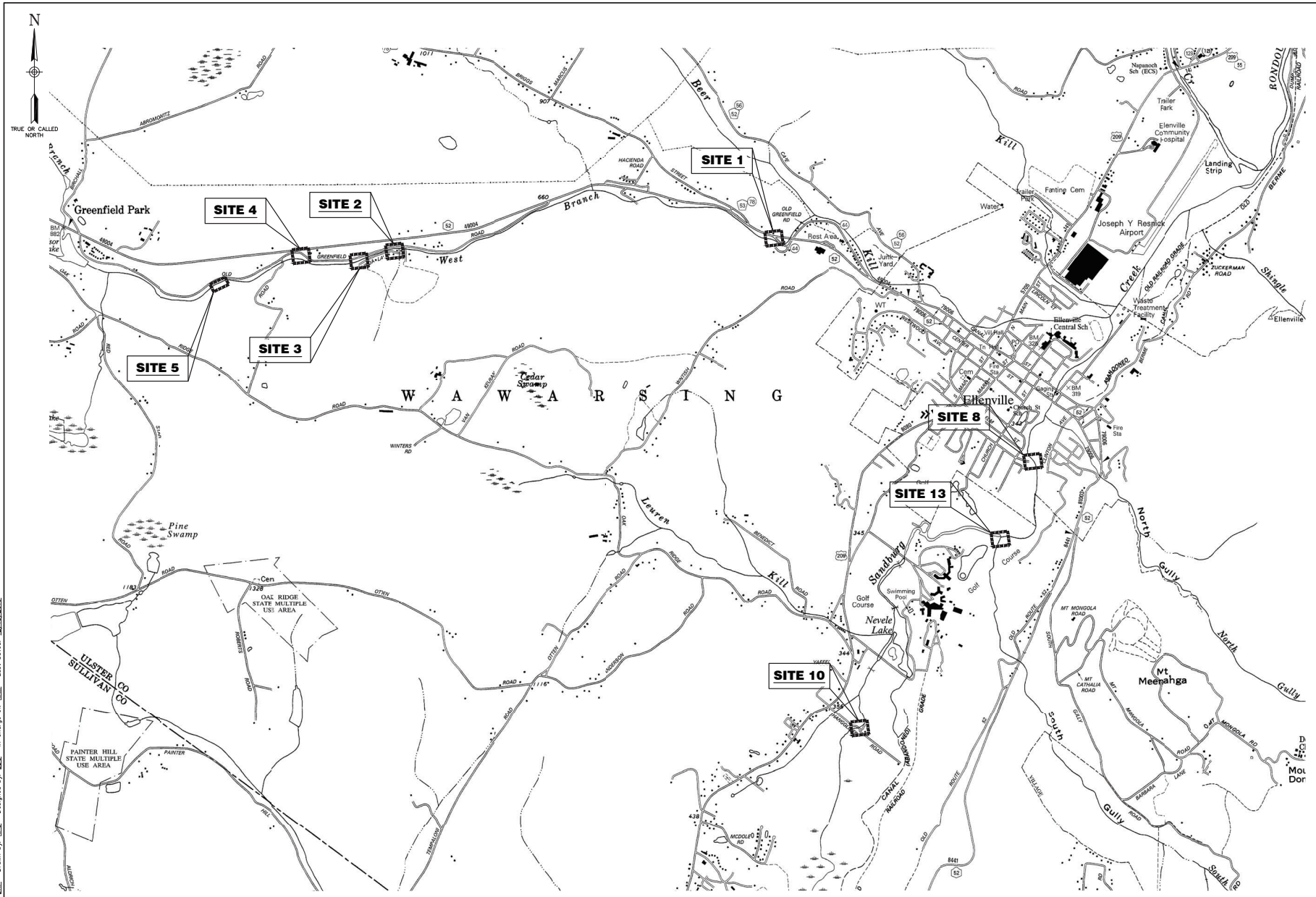
Date
DECEMBER 2019

Scale
AS SHOWN

Sheet Number
C-001

Project Number
924.068.002

Plotted: Dec 18, 2019 - 2:11PM By: WBG
File Name: 924068_1-Title.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: BEC Designed by: BDG In Charge of: RAM Last Saved: 12/18/2019



NOTE: THERE ARE NO SITES 6, 7, 9, AND 11

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

KEY MAP

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-101
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:11PM SYR By: WEG
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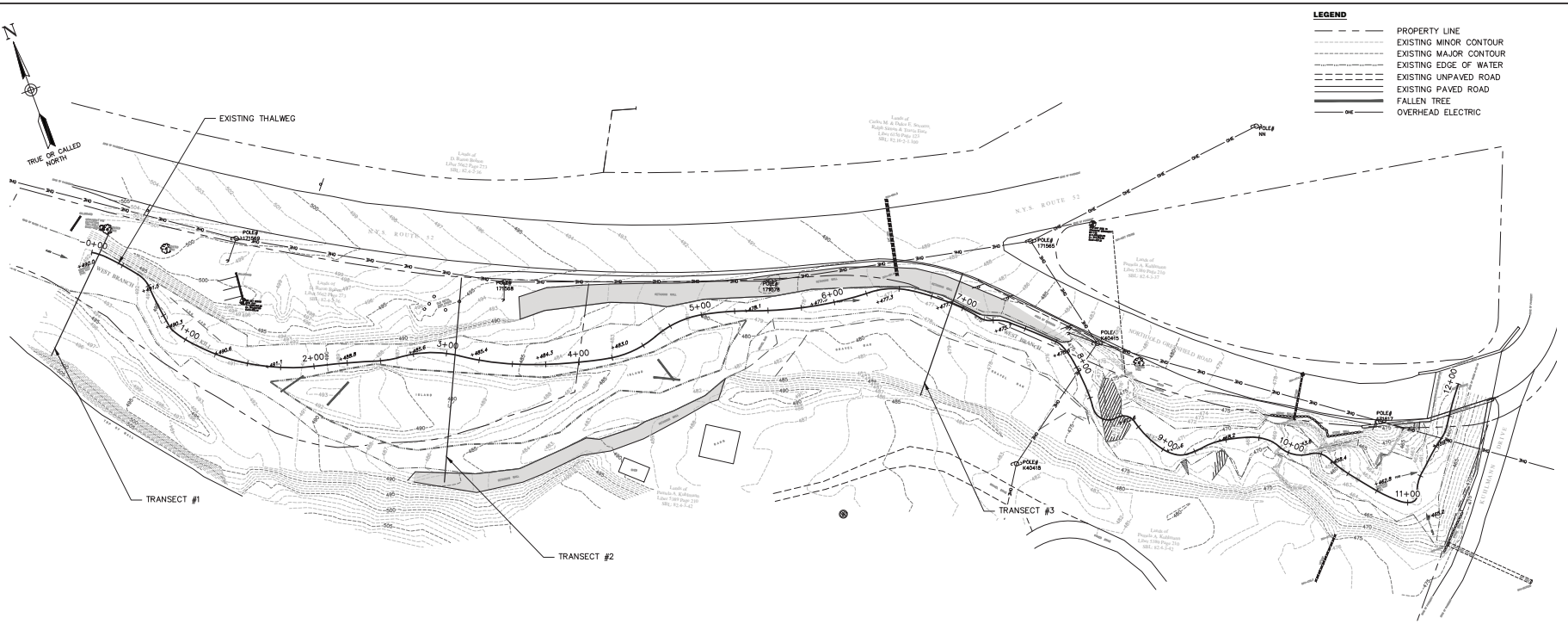
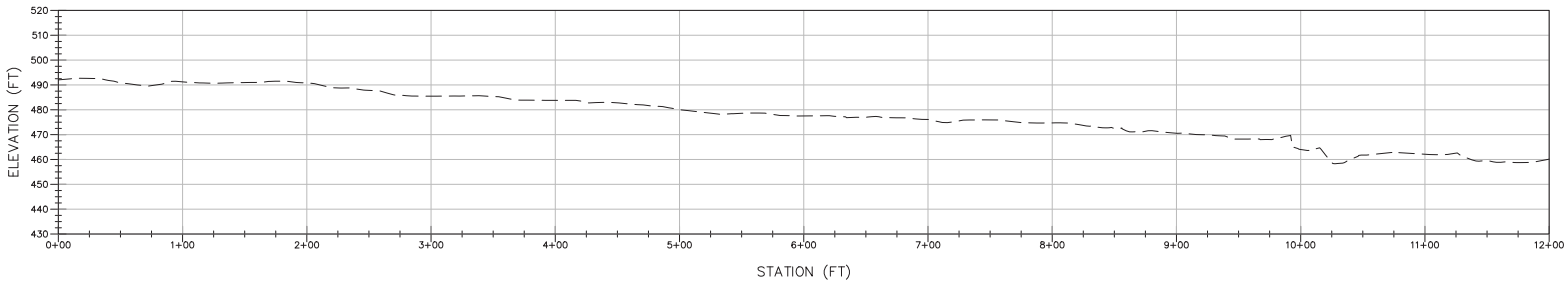


EXISTING CONDITIONS PLAN

SCALE: 1" = 40'-0"



EXISTING THALWEG PROFILE

HORIZONTAL SCALE: 1" = 50'-0"
VERTICAL SCALE: 1" = 25'-0"

1"=25' 25' 0 25' 50'
1"=40' 40' 0 40' 80'
1"=50' 50' 0 50' 100'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1
EXISTING CONDITIONS

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-111
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:11PM By: MBG
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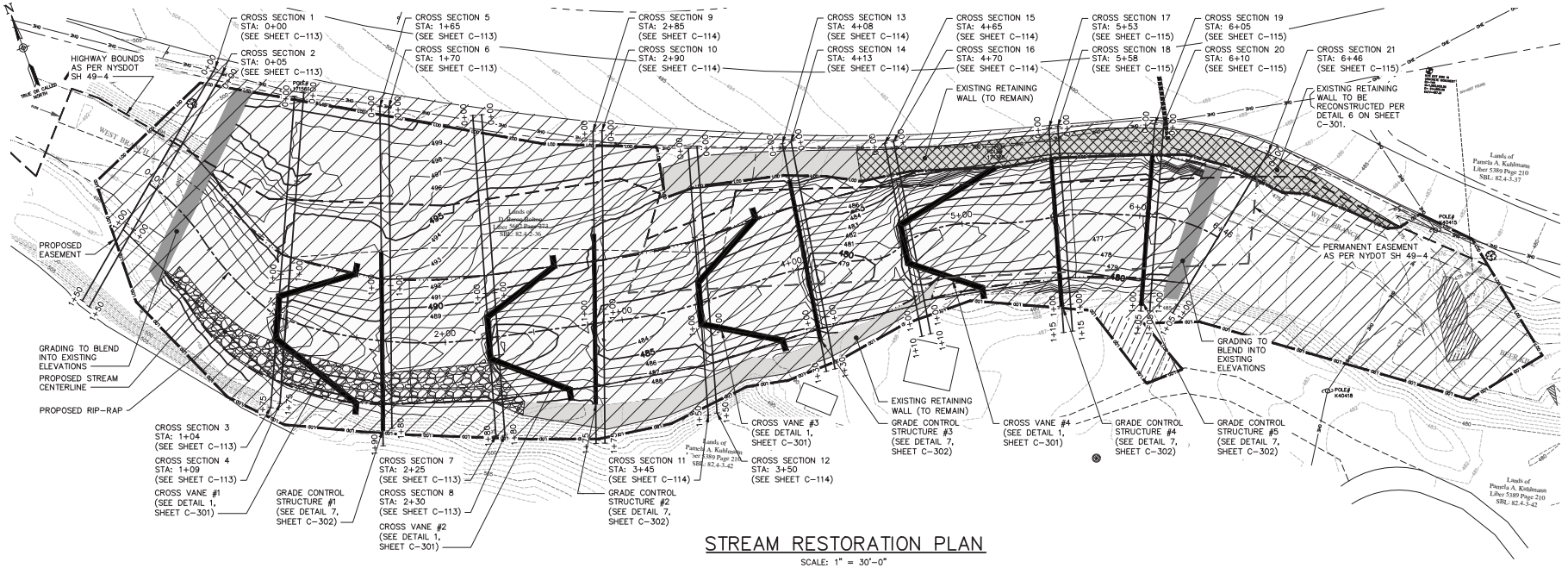
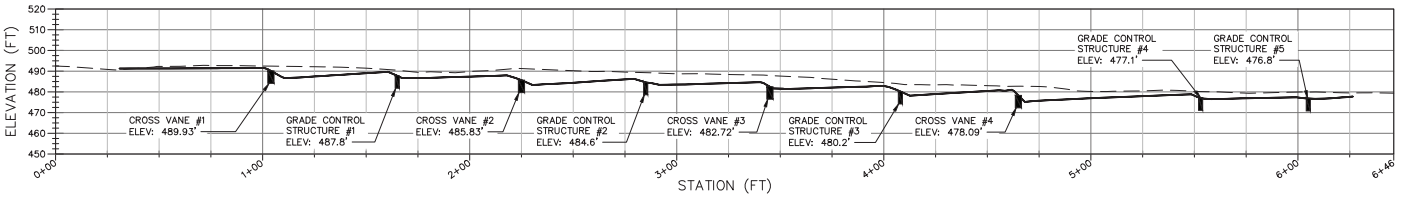
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: BAM Last Saved: 9/24/2019



STREAM RESTORATION PLAN

SCALE: 1" = 30'-0"



PROPOSED STREAM CENTERLINE PROFILE

SCALE: 1" = 30'-0"

CROSS VANE #1 LAYOUT

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,053,628.54	514,273.56	492.59
2	1,053,634.01	514,276.03	492.59
3	1,053,683.51	514,246.19	489.93
4	1,053,694.36	514,251.10	489.93
5	1,053,705.21	514,256.02	489.93
6	1,053,702.27	514,300.26	493.63
7	1,053,707.38	514,303.41	493.63

CROSS VANE #2 LAYOUT

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,053,594.47	514,389.85	488.97
2	1,053,600.34	514,391.10	488.97
3	1,053,631.82	514,355.25	485.83
4	1,053,643.04	514,358.43	485.83
5	1,053,654.26	514,361.62	485.83
6	1,053,668.21	514,406.47	490.38
7	1,053,674.07	514,407.77	490.38

CROSS VANE #3 LAYOUT

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,053,579.37	514,512.46	485.73
2	1,053,585.37	514,512.70	485.73
3	1,053,609.63	514,473.03	482.72
4	1,053,620.85	514,476.22	482.72
5	1,053,632.07	514,479.41	482.72
6	1,053,654.80	514,521.84	486.91
7	1,053,660.80	514,521.97	486.91

CROSS VANE #4 LAYOUT

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,053,568.87	514,626.82	481.72
2	1,053,574.77	514,627.93	481.72
3	1,053,602.14	514,593.51	478.09
4	1,053,612.92	514,595.23	478.09
5	1,053,623.70	514,596.95	478.09
6	1,053,635.77	514,657.91	485.67
7	–	–	–

CROSS SECTION COORDINATES

CROSS SECTION	POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	STA: 0+00	1,053,837.49	514,265.95	502.41
	CENTERLINE	1,053,789.33	514,209.03	492.48
	END STA.	1,053,740.60	514,151.44	509.11
2	STA: 0+00	1,053,832.99	514,268.37	501.50
	CENTERLINE	1,053,785.09	514,211.76	492.28
	END STA.	1,053,736.10	514,153.86	509.24
3	STA: 0+00	1,053,807.57	514,302.41	500.11
	CENTERLINE	1,053,694.58	514,251.20	489.97
	END STA.	1,053,648.18	514,230.17	496.10
4	STA: 0+00	1,053,807.90	514,308.05	500.77
	CENTERLINE	1,053,691.29	514,255.20	487.12
	END STA.	1,053,648.51	514,235.81	495.27
5	STA: 0+00	1,053,785.70	514,345.35	500.39
	CENTERLINE	1,053,661.97	514,301.66	487.97
	END STA.	1,053,606.54	514,282.09	503.36
6	STA: 0+00	1,053,783.74	514,349.97	500.38
	CENTERLINE	1,053,659.84	514,306.21	486.71
	END STA.	1,053,614.01	514,290.03	499.28
7	STA: 0+00	1,053,763.28	514,392.59	499.34
	CENTERLINE	1,053,643.04	514,358.43	485.83
	END STA.	1,053,590.13	514,343.41	496.05

CROSS SECTION COORDINATES

CROSS SECTION	POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
8	STA: 0+00	1,053,761.92	514,397.40	499.30
	CENTERLINE	1,053,641.97	514,363.33	483.66
	END STA.	1,053,588.77	514,348.22	495.61
9	STA: 0+01	1,053,731.98	514,452.97	497.24
	CENTERLINE	1,053,630.28	514,417.06	484.74
	END STA.	1,053,566.96	514,394.70	494.69
10	STA: 0+00	1,053,730.40	514,457.72	497.05
	CENTERLINE	1,053,629.21	514,421.98	483.85
	END STA.	1,053,565.39	514,399.44	493.97
11	STA: 0+00	1,053,704.68	514,499.77	494.64
	CENTERLINE	1,053,620.85	514,476.22	482.72
	END STA.	1,053,560.27	514,459.20	496.84
12	STA: 0+00	1,053,704.15	514,504.82	494.75
	CENTERLINE	1,053,620.67	514,481.36	481.59
	END STA.	1,053,559.74	514,464.25	497.84
13	STA: 0+00	1,053,689.09	514,550.32	493.57
	CENTERLINE	1,053,619.11	514,539.14	480.37
	END STA.	1,053,560.72	514,529.82	489.37
14	STA: 0+00	1,053,688.52	514,555.29	493.51
	CENTERLINE	1,053,618.34	514,544.08	478.16
	END STA.	1,053,560.38	514,534.83	489.17

CROSS SECTION COORDINATES

CROSS SECTION	POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
15	STA: 0+00	1,053,669.48	514,604.26	491.73
	CENTERLINE	1,053,612.92	514,595.23	478.09
	END STA.	1,053,560.86	514,586.92	487.52
16	STA: 0+00	1,053,668.87	514,609.23	491.80
	CENTERLINE	1,053,614.04	514,600.48	475.41
	END STA.	1,053,560.49	514,591.92	487.55
17	STA: 0+00	1,053,646.30	514,693.74	490.52
	CENTERLINE	1,053,598.21	514,680.05	477.21
	END STA.	1,053,535.70	514,662.25	486.72
18	STA: 0+00	1,053,645.32	514,698.66	490.40
	CENTERLINE	1,053,597.24	514,684.97	476.63
	END STA.	1,053,534.72	514,667.17	486.62
19	STA: 0+00	1,053,627.91	514,750.15	489.16
	CENTERLINE	1,053,580.66	514,728.84	476.85
	END STA.	1,053,532.20	514,706.98	485.25
20	STA: 0+00	1,053,626.25	514,754.89	489.13
	CENTERLINE	1,053,578.48	514,733.34	479.94
	END STA.	1,053,530.54	514,711.72	485.09
21	STA: 0+00	1,053,591.49	514,804.78	486.77
	CENTERLINE	1,053,556.30	514,761.73	479.37
	END STA.	1,053,525.04	514,723.48	484.64

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- EXISTING PERMANENT EASEMENT
- FALLEN TREE
- OHE — OVERHEAD ELECTRIC
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPERTY BOUNDARY
- PROPOSED STREAM CENTERLINE
- PROPOSED STREAM BANK
- LOD — PROPOSED LIMIT OF DISTURBANCE
- PROPOSED PERMANENT EASEMENT
- PROPOSED TEMPORARY EASEMENT
- PROPOSED RIP-RAP

NOTE:

1. COORDINATES REFERENCE DATUM NAD83 NEW YORK STATE PLANES, CENTRAL ZONE, US SURVEY FOOT.

1"=30' 30' 0 30' 60'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019

Scale: AS SHOWN

Sheet Number: C-112

Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:17PM By: MBG
File Name: 924.068.002_Site1_C112-Restoration Plan.dwg
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 10/28/2019
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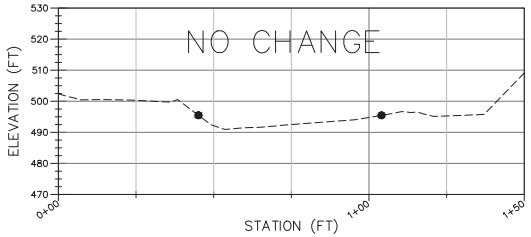
Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3

LEGEND

EXISTING GRADE

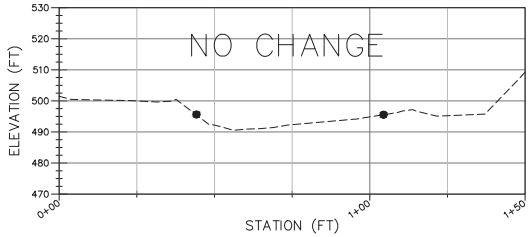
PROPOSED GRADE

TOP OF BANK



CROSS SECTION 1

SCALE: 1" = 20'-0"



CROSS SECTION 2

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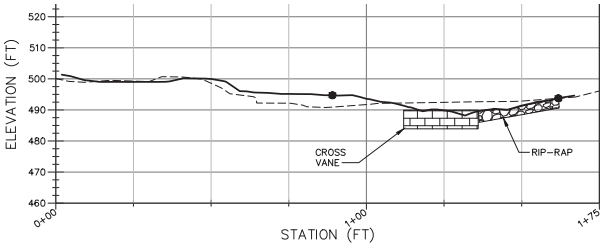

CROSS SECTION 3

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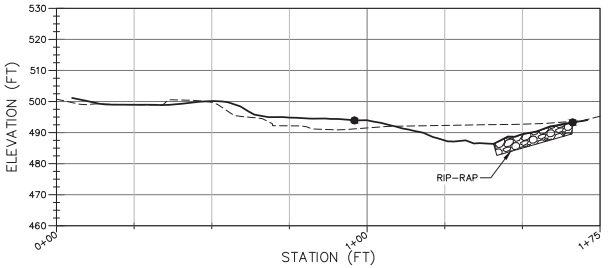
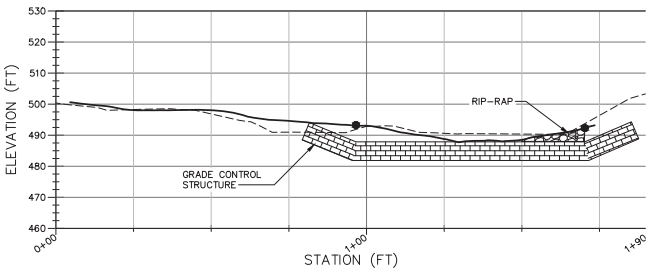


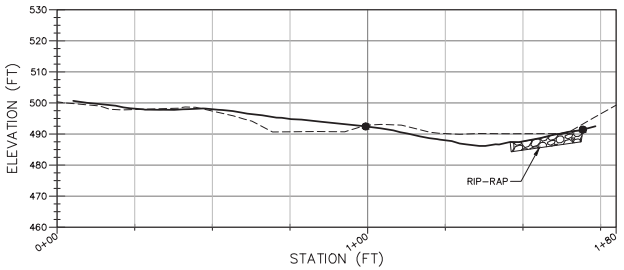
CROSS SECTION 4

SCALE: 1" = 20'-0"



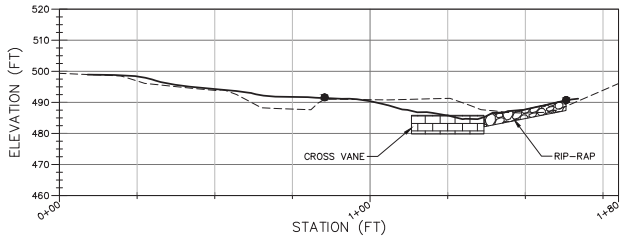
CROSS SECTION 5

SCALE: 1" = 20'-0"



CROSS SECTION 6

SCALE: 1" = 20'-0"



CROSS SECTION 7

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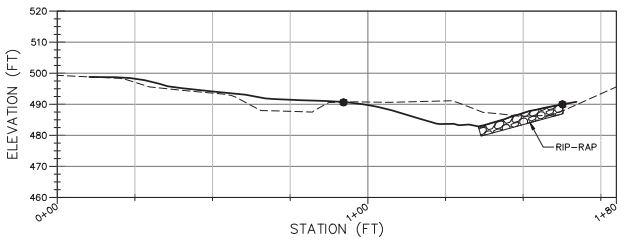


CROSS SECTION 8

SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 CROSS SECTIONS PROPOSED CONDITIONS (1 of 3)

TOWN OF WAWARSING — ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019

Scale: AS SHOWN

Sheet Number: C-113

Project Number: 924.068.002

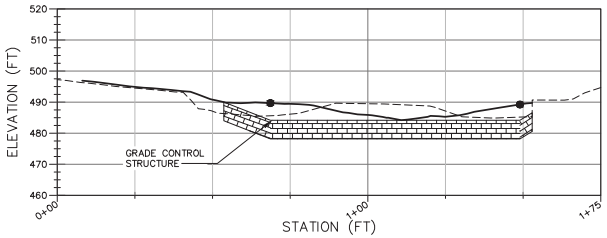
Plotted: Dec 18, 2019 - 2:11PM By: WBG
File Name: V:\0924\active\924068.002_Ellenville Stream Restoration Phase 2&3\Design\Drawings\Sheets\C113-C115-Cross Sections\924.068.002_Sht1_C113-C115-Cross Sections.dwg
Project No.: 924.068.002
Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019

LEGEND

EXISTING GRADE

PROPOSED GRADE

TOP OF BANK



CROSS SECTION 9

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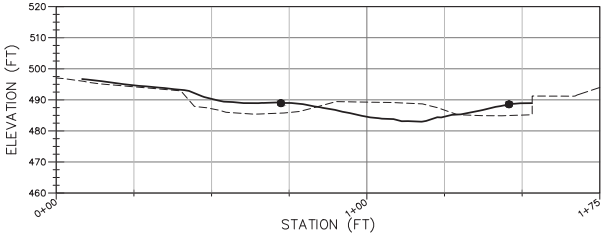
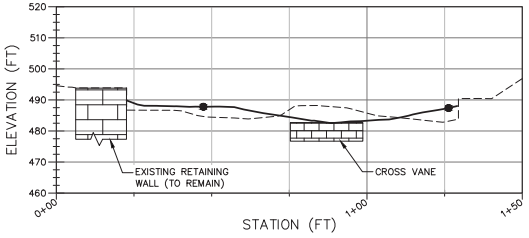


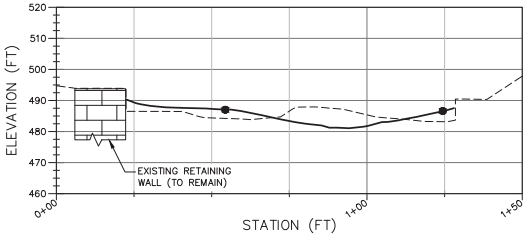
CROSS SECTION 10

SCALE: 1" = 20'-0"



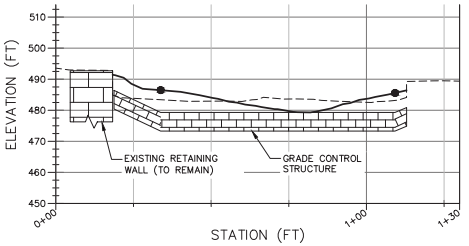
CROSS SECTION 11

SCALE: 1" = 20'-0"



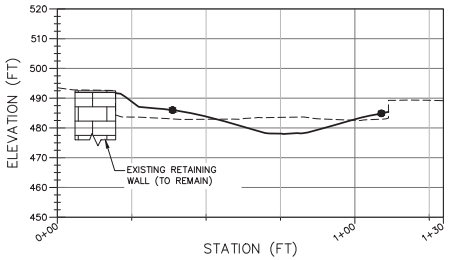
CROSS SECTION 12

SCALE: 1" = 20'-0"



CROSS SECTION 13

SCALE: 1" = 20'-0"



CROSS SECTION 14

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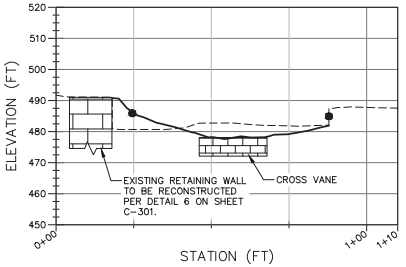
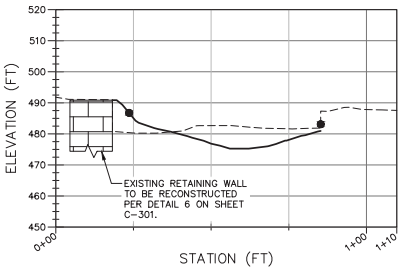


CROSS SECTION 15

SCALE: 1" = 20'-0"



CROSS SECTION 16

SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 CROSS SECTIONS PROPOSED CONDITIONS (2 OF 3)

TOWN OF WAWARSING ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019

Scale: AS SHOWN

Sheet Number: C-114

Project Number: 924.068.002

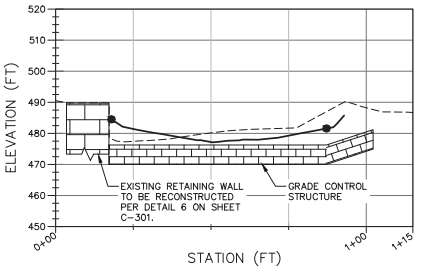
Plotted: Dec 18, 2019 - 2:11PM By: WBG
File Name: P:\Projects\924.068.002\Design\Civil\Drawings\Sheets\924.068.002_Sht1_C113-C115-Cross Sections (ID 1830177).dwg
Project No.: 924.068.002
Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019

LEGEND

EXISTING GRADE

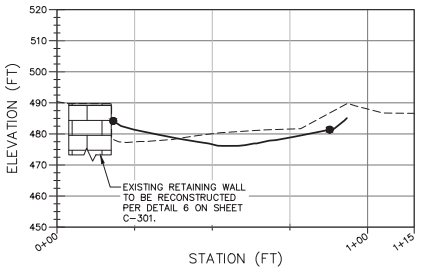
PROPOSED GRADE

TOP OF BANK



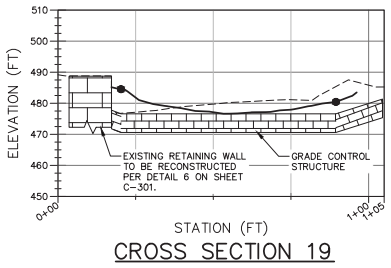
CROSS SECTION 17

SCALE: 1" = 20'-0"



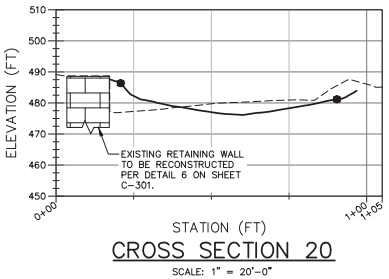
CROSS SECTION 18

SCALE: 1" = 20'-0"



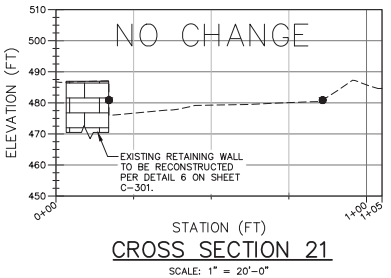
CROSS SECTION 19

SCALE: 1" = 20'-0"



CROSS SECTION 20

SCALE: 1" = 20'-0"



CROSS SECTION 21

SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 CROSS SECTIONS PROPOSED CONDITIONS (3 OF 3)

TOWN OF WAWARSING ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date
DECEMBER 2019

Scale
AS SHOWN

Sheet Number
C-115

Project Number
924.068.002

Plotted: Dec 18, 2019 - 2:11PM By: WBG
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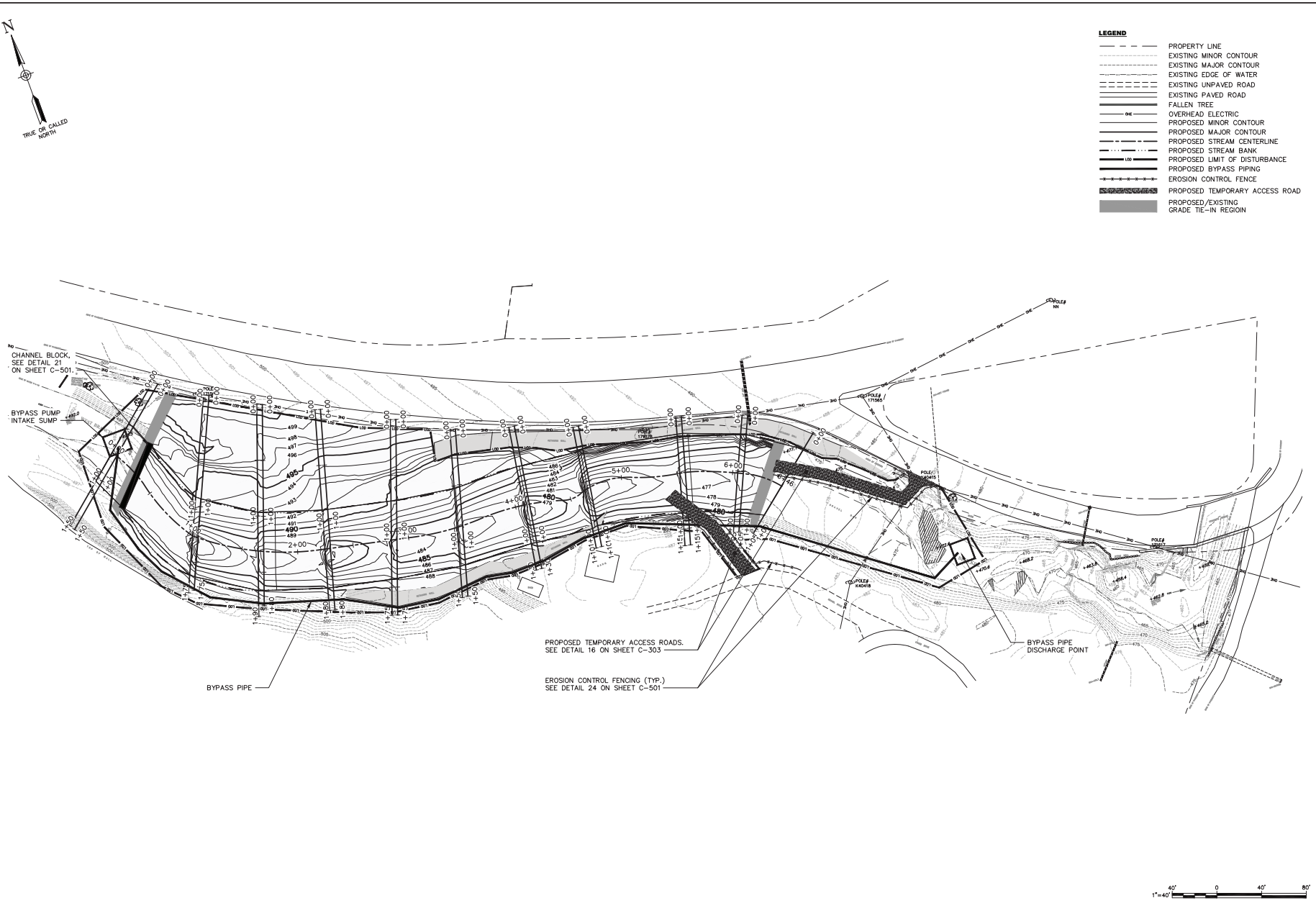
Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
924.068.002_Sht1_C113-C115-Cross Sections.dwg
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 EROSION AND SEDIMENT CONTROL PLAN

TOWN OF WAWARSING ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date
DECEMBER 2019

Scale
AS SHOWN

Sheet Number
C-116

Project Number
924.068.002

Plotted: Dec 18, 2019 - 2:12PM By: WBG
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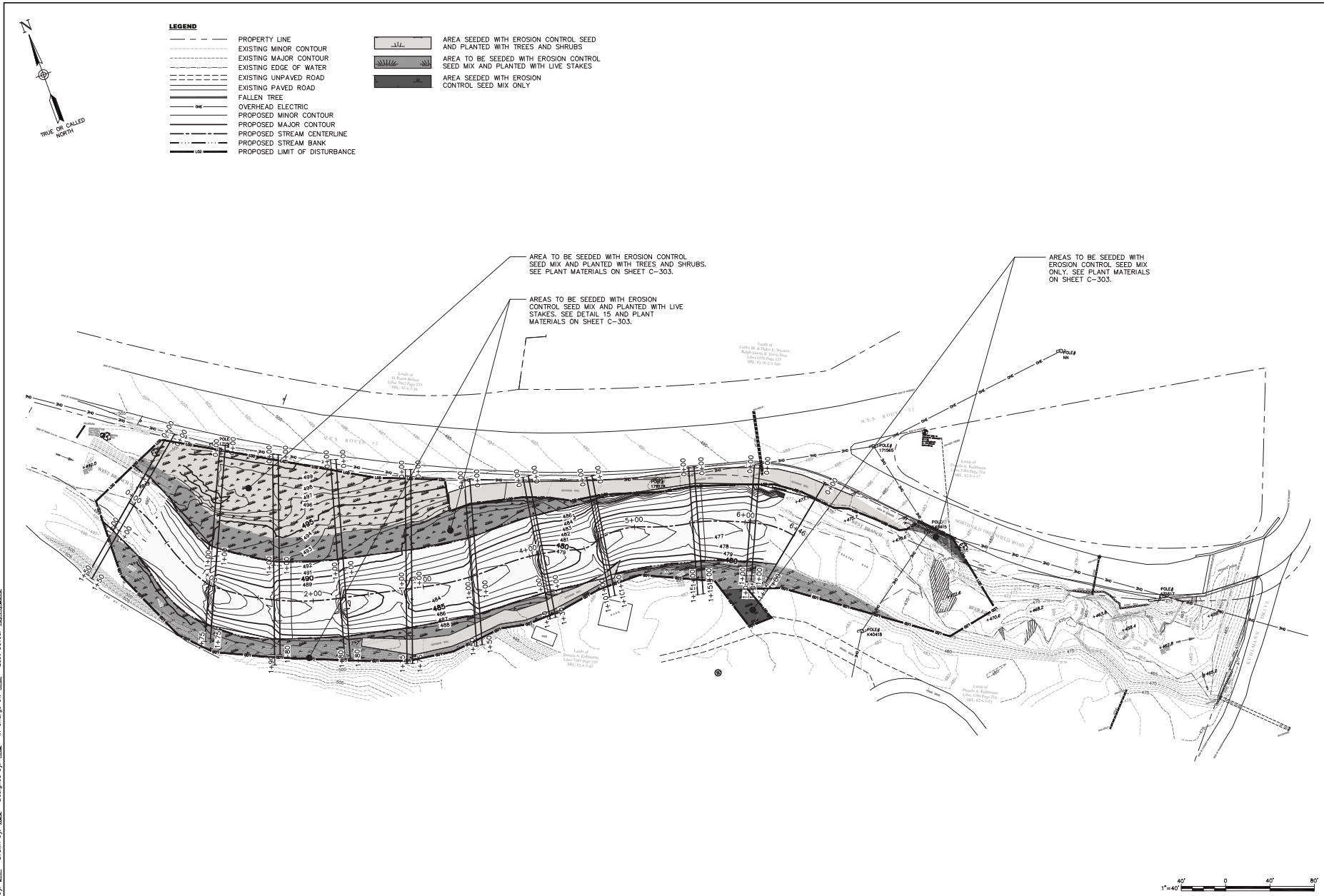
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/14/2019



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1
PLANTING PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
DECEMBER 2019

Scale
AS SHOWN

Sheet Number
C-117

Project Number
924.068.002

Plotted: Dec 18, 2019 - 2:12PM By: MBG
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File Name: 924.068.002_Sht1_C117-Planting Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 10/14/2019

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- PROPERTY BOUNDARY
- EXISTING FENCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED PERMANENT EASEMENT
- STREAM BARB
- ROCKS
- GEOLOCATION MARKER
- CROSS VANE
- PROPOSED REVETMENT WALL
- EXISTING REVETMENT WALL
- PROPOSED TEMPORARY ACCESSWAY

APPROXIMATE STREAM PRACTICE LAYOUT		
POINT	NORTHING	EASTING
SB-1	1,053,271.71	504,022.52
SB-2	1,053,290.96	504,090.53
SB-3	1,053,316.12	504,166.83
SB-4	1,053,330.97	504,212.43
SB-5	1,053,340.13	504,257.30
SB-6	1,053,353.16	504,297.78
SB-7	1,053,364.05	504,347.19
W-1	1,053,346.91	504,268.87
W-2	1,053,368.37	504,358.61
CV-1	1,053,348.68	504,664.23
R-1	1,053,264.13	504,046.51
R-2	1,053,306.54	504,194.74
R-3	1,053,328.37	504,272.50
R-4	1,053,352.69	504,391.38

PERMANENT AND TEMPORARY IMAPACTS TO WATER RESOURCES	
TOTAL AREA OF DISTURBANCE (SF)	30,334
TOTAL LENGTH OF DISTURBANCE (LF)	788
TOTAL FILL BELOW OHWM (CY)	251
TOTAL CUT BELOW OHWM (CY)	197

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 2
STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-121
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:12PM By: WBG
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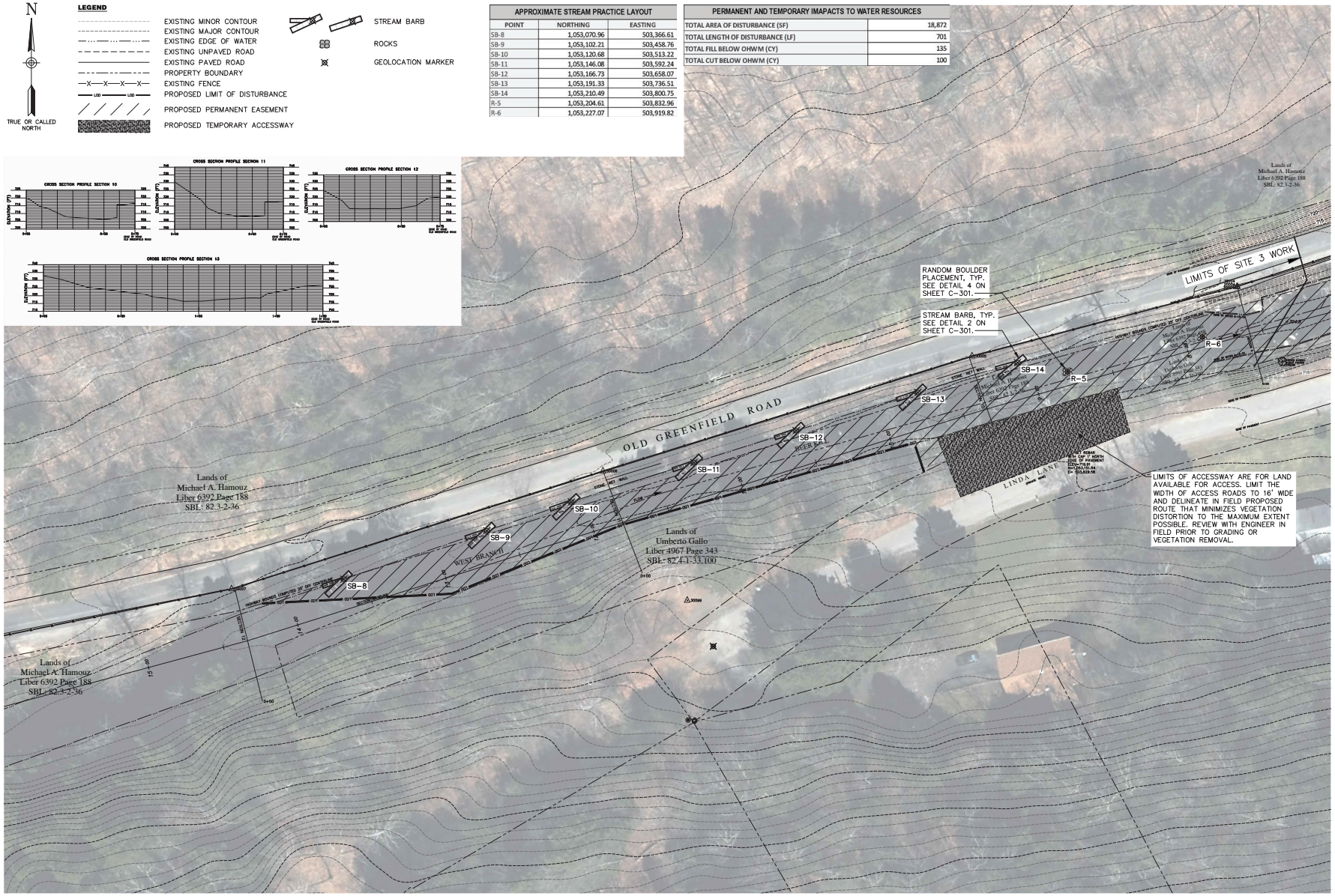


APPROXIMATE STREAM PRACTICE LAYOUT		
POINT	NORTHING	EASTING
SB-8	1,053,070.96	503,366.61
SB-9	1,053,102.21	503,458.76
SB-10	1,053,120.68	503,513.22
SB-11	1,053,146.08	503,592.24
SB-12	1,053,166.73	503,658.07
SB-13	1,053,191.33	503,736.51
SB-14	1,053,210.49	503,800.75
R-5	1,053,204.61	503,832.96
R-6	1,053,227.07	503,919.82

PERMANENT AND TEMPORARY IMAPACTS TO WATER RESOURCES	
TOTAL AREA OF DISTURBANCE (SF)	18,872
TOTAL LENGTH OF DISTURBANCE (LF)	701
TOTAL FILL BELOW OHWM (CY)	135
TOTAL CUT BELOW OHWM (CY)	100

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 3 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-131
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:12PM By: WBG
Z:\BL Vault\VDET\742-1CIT-44823-89277-98105\456144\V\185000-185399\185366\V\V\924.068.002_Sheet2-5_SPD_Site Plans (ID 185366).dwg

N

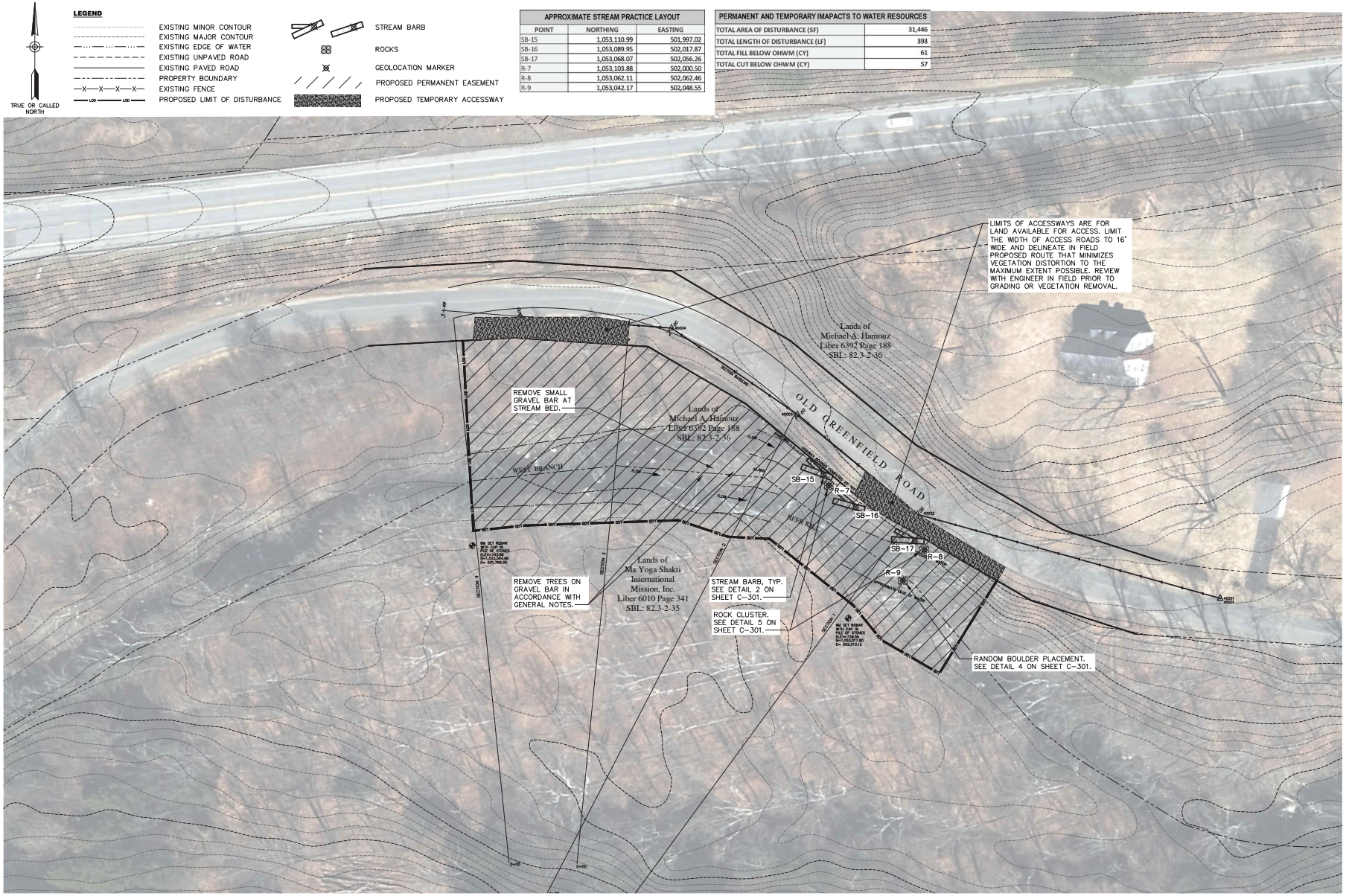
TRUE OR CALLED NORTH

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- PROPERTY BOUNDARY
- EXISTING FENCE
- PROPOSED LIMIT OF DISTURBANCE
- STREAM BARB
- ROCKS
- GEOLOCATION MARKER
- PROPOSED PERMANENT EASEMENT
- PROPOSED TEMPORARY ACCESSWAY

APPROXIMATE STREAM PRACTICE LAYOUT		
POINT	NORTHING	EASTING
SB-15	1,053,110.99	501,997.02
SB-16	1,053,089.95	502,017.87
SB-17	1,053,068.07	502,056.26
R-7	1,053,103.88	502,000.50
R-8	1,053,062.11	502,062.46
R-9	1,053,042.17	502,048.55

PERMANENT AND TEMPORARY IMAPACTS TO WATER RESOURCES	
TOTAL AREA OF DISTURBANCE (SF)	31,446
TOTAL LENGTH OF DISTURBANCE (LF)	393
TOTAL FILL BELOW OHWM (CY)	61
TOTAL CUT BELOW OHWM (CY)	57



1"=30' 30' 0 30' 60'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 4 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-141
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:12PM By: WBD
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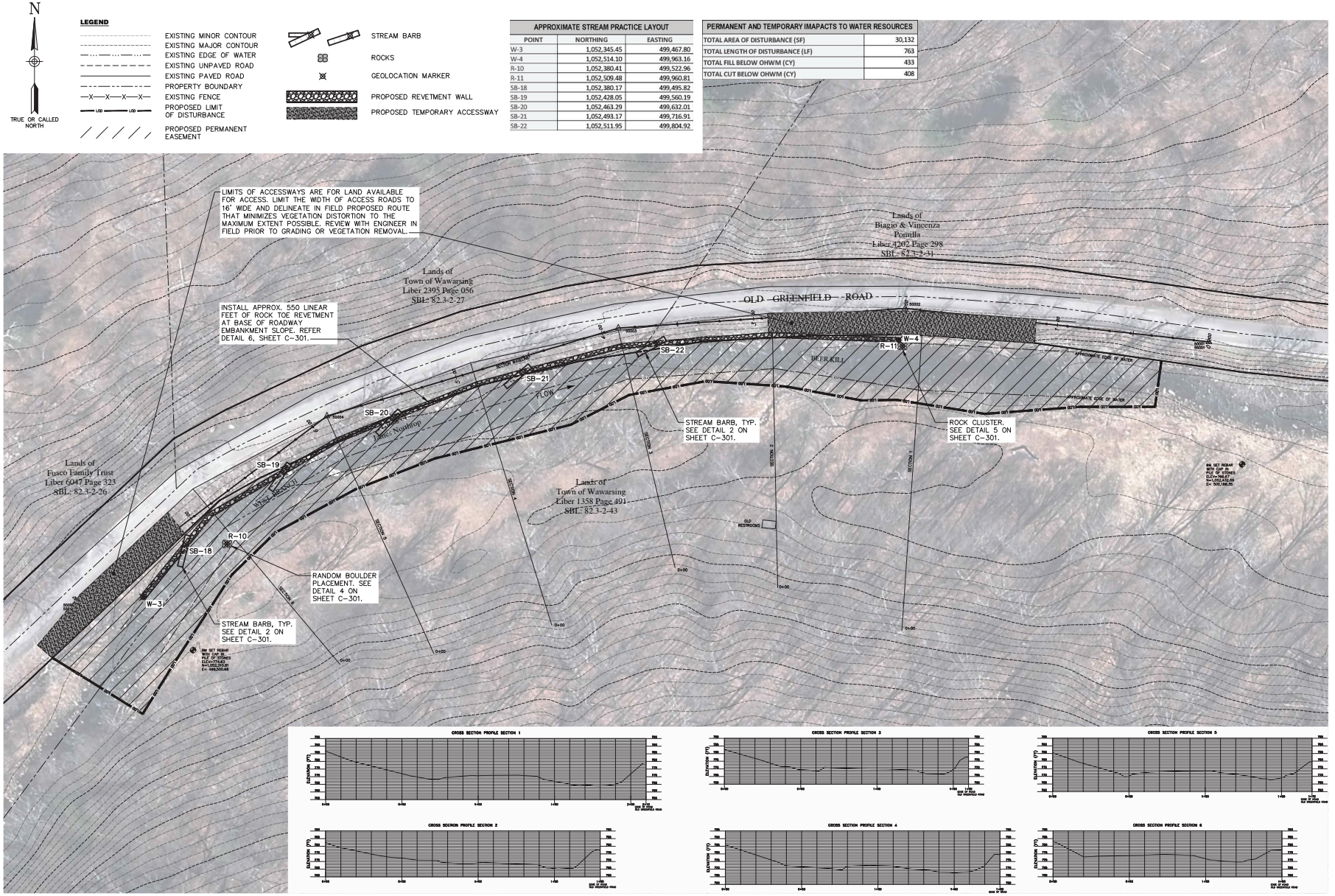

APPROXIMATE STREAM PRACTICE LAYOUT

POINT	NORTHING	EASTING
W-3	1,052,345.45	499,467.80
W-4	1,052,514.10	499,963.16
R-10	1,052,380.41	499,522.96
R-11	1,052,509.48	499,960.81
SB-18	1,052,380.17	499,495.82
SB-19	1,052,428.05	499,560.19
SB-20	1,052,463.29	499,632.01
SB-21	1,052,493.17	499,716.91
SB-22	1,052,511.95	499,804.92

PERMANENT AND TEMPORARY IMAPACTS TO WATER RESOURCES

TOTAL AREA OF DISTURBANCE (SF)	30,132
TOTAL LENGTH OF DISTURBANCE (LF)	763
TOTAL FILL BELOW OHWM (CY)	433
TOTAL CUT BELOW OHWM (CY)	408

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 5 STREAM RESTORATION PLAN

TOWN OF WAWARSING ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-151
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:13PM By: WBD
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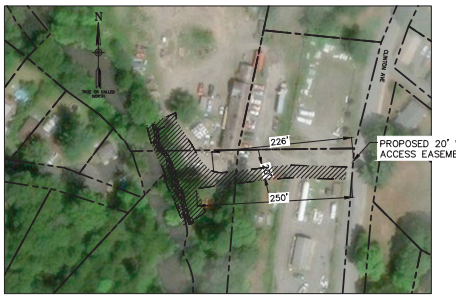
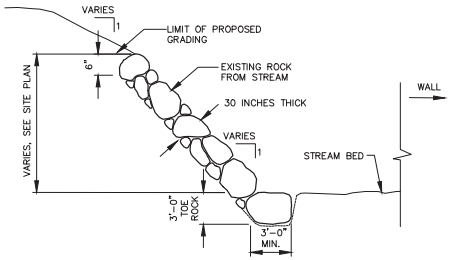


TEMPORARY ACCESS EASEMENT PLAN

SCALE 1"=100'±



HEAVY ROCK RIPRAP AND FILL DETAIL
TYPICAL CROSS-SECTION LOOKING UPSTREAM

NOT TO SCALE

LEGEND

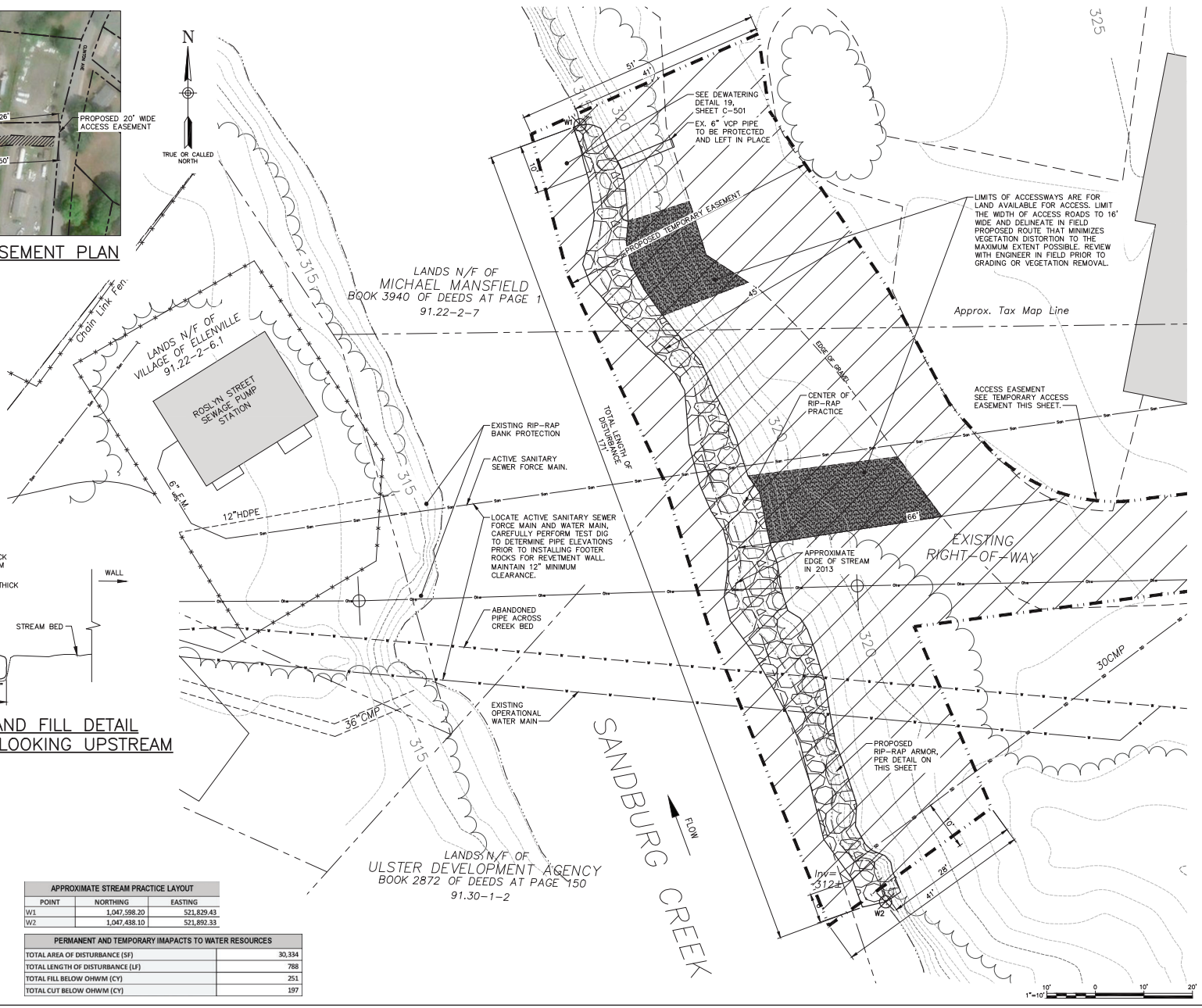
- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING EDGE OF GRAVEL
- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING STRUCTURE
- PROPOSED TEMPORARY EASEMENT
- PROPOSED TEMPORARY ACCESSWAY

NOTES:

1. THE INTENT OF RIP-RAP ARMORING IS TO STABILIZE EAST BANK OF SANDBURGH CREEK TO ELEVATION 216.0 AND LEAVE EXISTING TREES GREATER THAN 4-INCHES IN DIAMETER.
2. BASE MAP TAKEN FROM DATA PROVIDED FOR THE ROSLYN STREET PUMP STATION IMPROVEMENTS PROJECT BY AZIMUTH SURVEYING DATED AUGUST 2021, JUNE 2013, AND NOVEMBER 2013.

APPROXIMATE STREAM PRACTICE LAYOUT		
POINT	NORTHING	EASTING
W1	1,047,598.20	521,829.43
W2	1,047,438.10	521,892.33

PERMANENT AND TEMPORARY IMAPACTS TO WATER RESOURCES	
TOTAL AREA OF DISTURBANCE (SF)	30,334
TOTAL LENGTH OF DISTURBANCE (LF)	788
TOTAL FILL BELOW OHWM (CY)	251
TOTAL CUT BELOW OHWM (CY)	197



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 8
STREAM RESTORATION PLAN

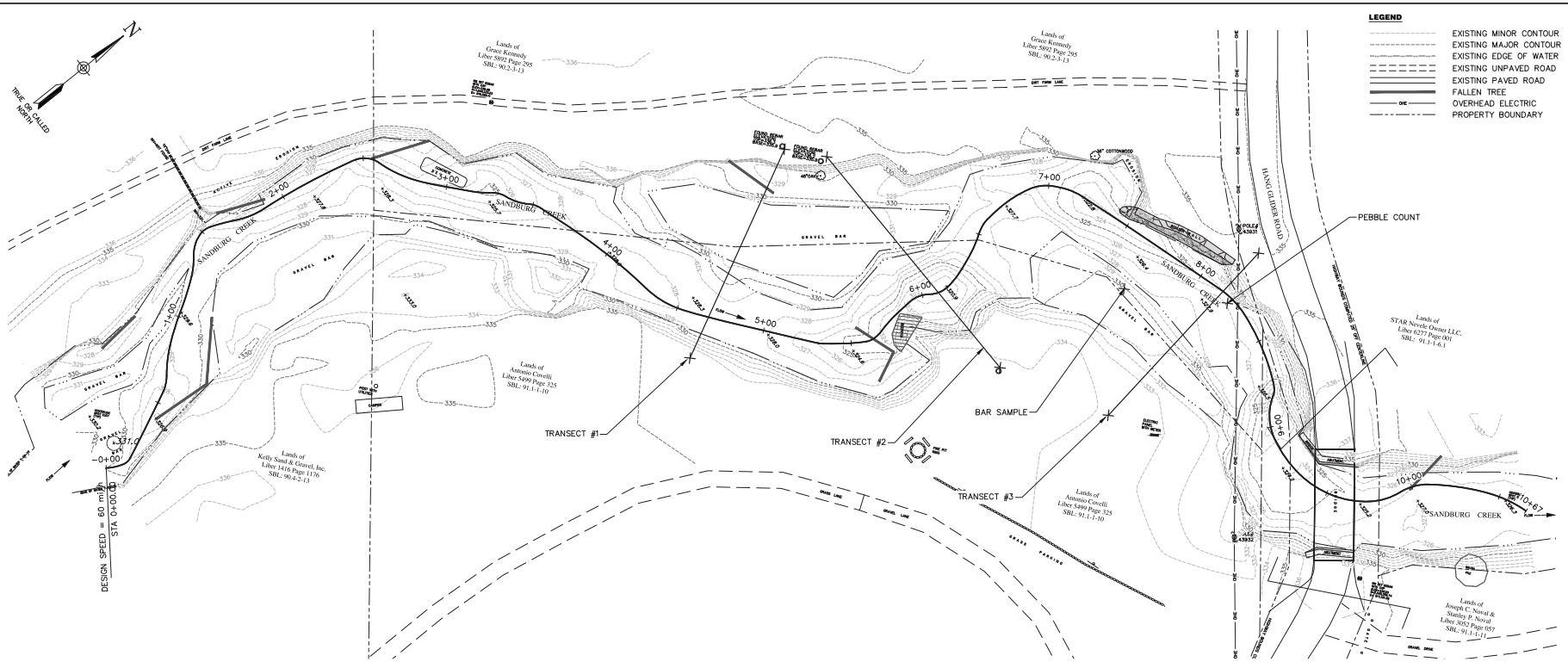
ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

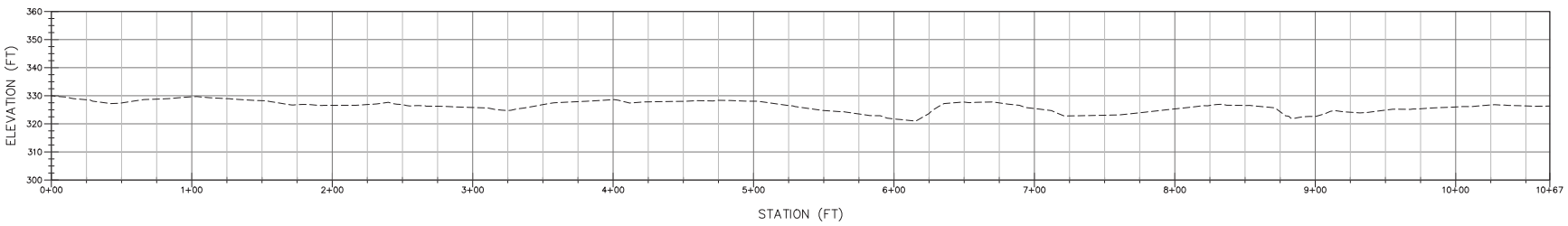
Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-161
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:17PM By: WBG
File Name: P:\Projects\924\068\Design\Civil\Plan Sheets\924068_7-Site8 (ID_1657135).dwg
Checked by: DMF Drawn by: BEC Designed by: BDG In Charge of: RAM Last Saved: 12/18/2019



EXISTING CONDITIONS PLAN

SCALE: 1" = 30'-0"



EXISTING CONDITIONS PROFILE

HORIZONTAL SCALE: 1" = 40'-0"
VERTICAL SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'
1"=30' 30' 0 30' 60'
1"=40' 40' 0 40' 80'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10
EXISTING CONDITIONS

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-171
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:13PM By: MBG
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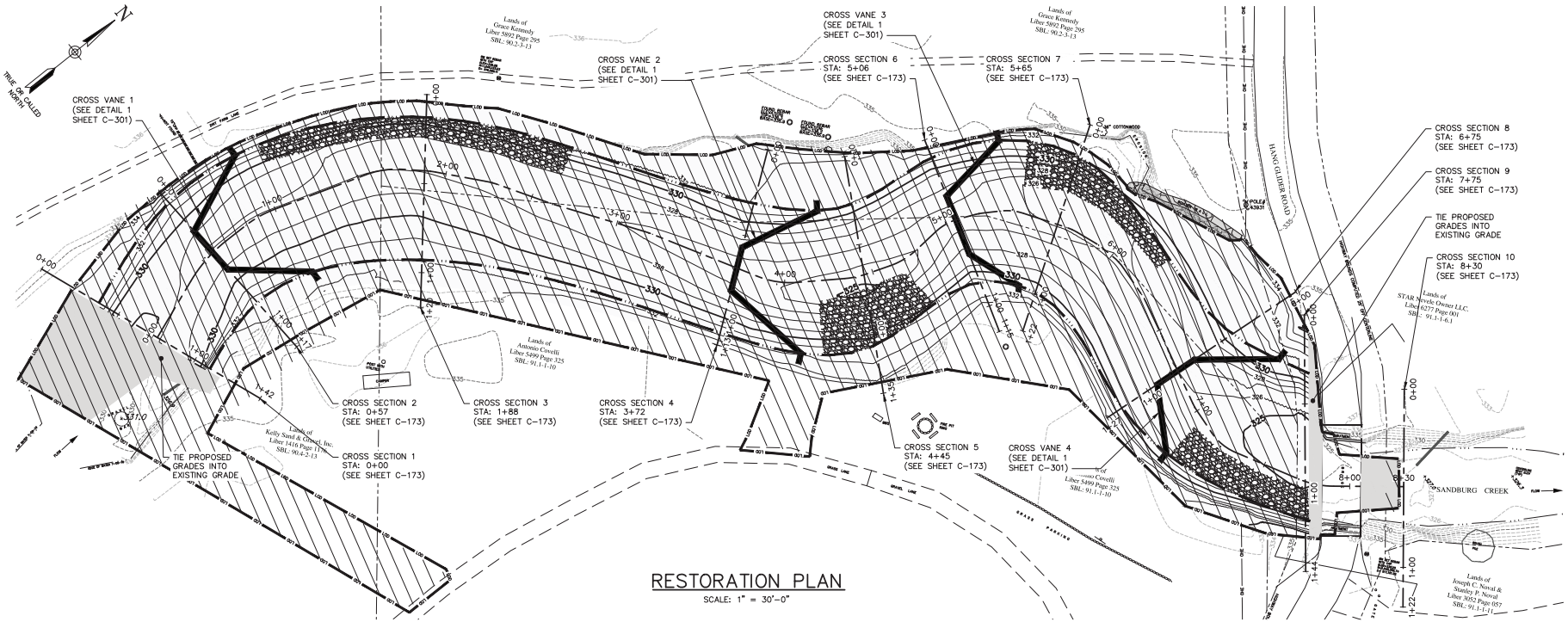
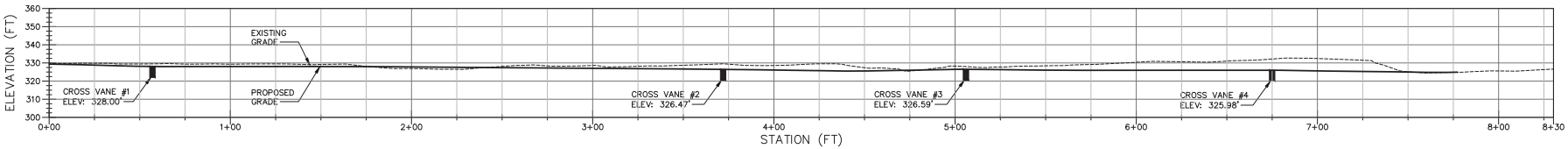
File Name: 924.068.002_Site10_C171-Existing Conditions.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019



RESTORATION PLAN

SCALE: 1" = 30'-0"



PROPOSED STREAM CENTERLINE PROFILE

SCALE: 1" = 30'-0"

CROSS VANE #1 LAYOUT (SEE DETAIL 1 ON SHEET C-301)

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,039,973.51	516,614.30	332.06
2	1,039,973.72	516,608.58	332.06
3	1,039,937.39	516,577.97	328.00
4	1,039,936.68	516,563.66	328.00
5	1,039,935.96	516,549.35	328.00
6	1,039,980.70	516,530.57	332.86
7	1,039,980.69	516,525.08	332.86

CROSS VANE #2 LAYOUT (SEE DETAIL 1 ON SHEET C-301)

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,040,154.37	516,819.33	331.88
2	1,040,159.13	516,815.68	331.88
3	1,040,150.62	516,763.57	326.47
4	1,040,160.62	516,756.07	326.47
5	1,040,170.62	516,748.58	326.47
6	1,040,216.05	516,759.04	331.09
7	1,040,219.62	516,754.21	331.09

CROSS VANE #3 LAYOUT (SEE DETAIL 1 ON SHEET C-301)

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,040,274.33	516,866.76	330.77
2	1,040,278.47	516,862.41	330.77
3	1,040,267.77	516,831.05	326.48
4	1,040,272.97	516,814.41	326.48
5	1,040,278.17	516,797.76	326.48
6	1,040,320.19	516,791.96	331.65
7	1,040,322.85	516,786.58	331.65

CROSS VANE #4 LAYOUT (SEE DETAIL 1 ON SHEET C-301)

POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	1,040,278.48	516,988.70	328.60
2	1,040,284.35	516,987.46	328.60
3	1,040,304.49	516,954.20	326.01
4	1,040,316.94	516,955.28	326.01
5	1,040,329.40	516,956.35	326.01
6	1,040,366.59	516,985.70	330.93
7	1,040,372.43	516,984.32	330.93

CROSS SECTION	CROSS SECTION COORDINATES POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
1	STA: 0+00	1,039,856.00	516,512.58	335.86
	CENTERLINE	1,039,882.67	516,583.14	329.37
	END STA.	1,039,906.38	516,645.87	334.59
2	STA: 0+00	1,039,934.62	516,519.77	336.22
	CENTERLINE	1,039,936.91	516,565.36	328.00
	END STA.	1,039,940.46	516,636.17	334.54
3	STA: 0+00	1,040,085.96	516,571.09	335.52
	CENTERLINE	1,040,058.25	516,603.69	327.92
	END STA.	1,040,008.38	516,662.37	335.06
4	STA: 0+00	1,040,216.03	516,714.73	333.09
	CENTERLINE	1,040,161.04	516,755.88	326.47
	END STA.	1,040,125.27	516,782.64	334.54
5	STA: 0+00	1,040,247.28	516,744.71	332.64
	CENTERLINE	1,040,214.33	516,803.31	325.49
	END STA.	1,040,181.31	516,862.04	334.73

CROSS SECTION	CROSS SECTION COORDINATES POINT	NORTHING (FT)	EASTING (FT)	ELEV.(FT)
6	STA: 0+00	1,040,288.21	516,765.45	335.15
	CENTERLINE	1,040,273.86	516,811.39	326.48
	END STA.	1,040,253.79	516,875.65	334.00
7	STA: 0+01	1,040,366.01	516,816.79	334.48
	CENTERLINE	1,040,316.80	516,849.09	325.93
	END STA.	1,040,264.22	516,883.61	333.80
8	STA: 0+00	1,040,397.68	516,962.15	334.88
	CENTERLINE	1,040,318.19	516,955.31	326.01
	END STA.	1,040,270.70	516,951.23	333.83
9	STA: 0+00	1,040,393.25	516,975.27	335.11
	CENTERLINE	1,040,335.24	517,048.58	324.82
	END STA.	1,040,303.88	517,088.20	335.99
10	STA: 0+00	1,040,410.98	517,042.86	335.01
	CENTERLINE	1,040,376.59	517,085.35	326.61
	END STA.	1,040,334.04	517,137.91	334.86

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- EXISTING PAVED ROAD
- FALLEN TREE
- OHE OVERHEAD ELECTRIC
- PROPERTY BOUNDARY
- PROPOSED MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED STREAM CENTERLINE
- PROPOSED STREAM BANK
- LOD PROPOSED LIMIT OF DISTURBANCE
- PROPOSED PERMANENT EASEMENT
- PROPOSED RIP-RAP
- PROPOSED GRADE TIE-IN REGION

NOTE:

1. COORDINATES REFERENCE DATUM NAD83 NEW YORK STATE PLANES, CENTRAL ZONE, US SURVEY FOOT.

30' 0 30' 60'
1"=30'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10 RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-172
Project Number: 924.068.002

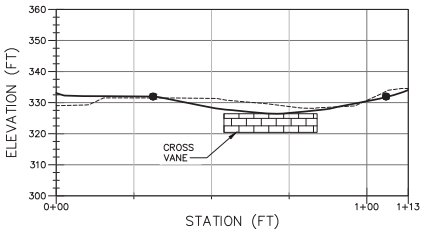
Plotted: Dec 18, 2019 - 2:17PM By: MBG
File Name: 924.068.002_Site10_C172-Restoration Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 10/28/2019

LEGEND

EXISTING GRADE

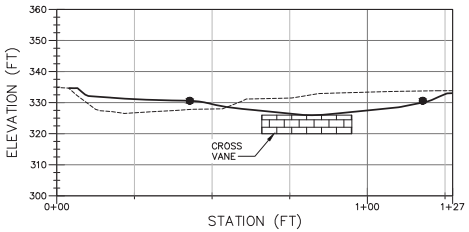
PROPOSED GRADE

TOP OF BANK



CROSS SECTION 4

SCALE: 1" = 20'-0"



CROSS SECTION 8

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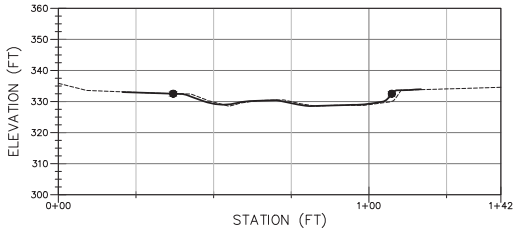
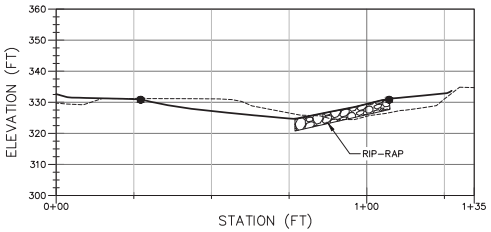


CROSS SECTION 1

SCALE: 1" = 20'-0"



CROSS SECTION 5

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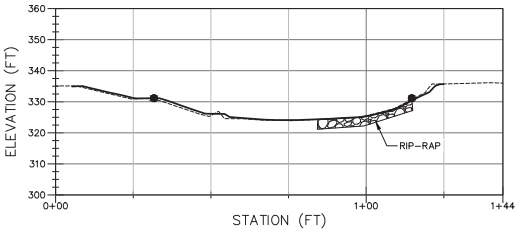
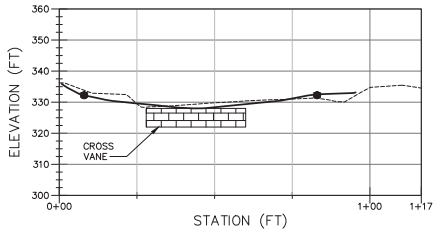


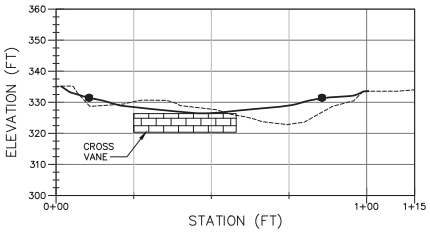
CROSS SECTION 9

SCALE: 1" = 20'-0"



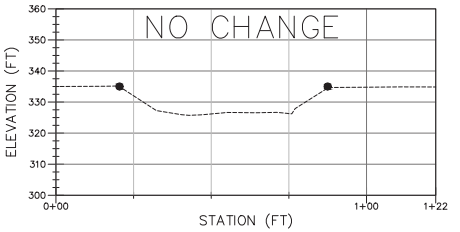
CROSS SECTION 2

SCALE: 1" = 20'-0"



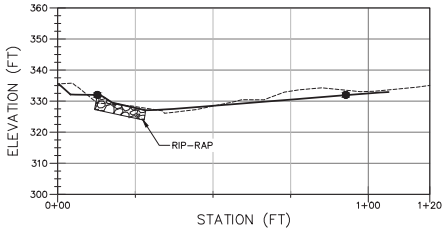
CROSS SECTION 6

SCALE: 1" = 20'-0"



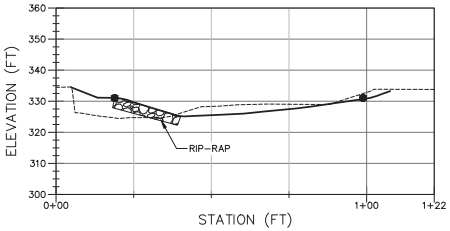
CROSS SECTION 10

SCALE: 1" = 20'-0"



CROSS SECTION 3

SCALE: 1" = 20'-0"



CROSS SECTION 7

SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10 CROSS SECTIONS PROPOSED CONDITIONS

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019

Scale: AS SHOWN

Sheet Number: C-173

Project Number: 924.068.002

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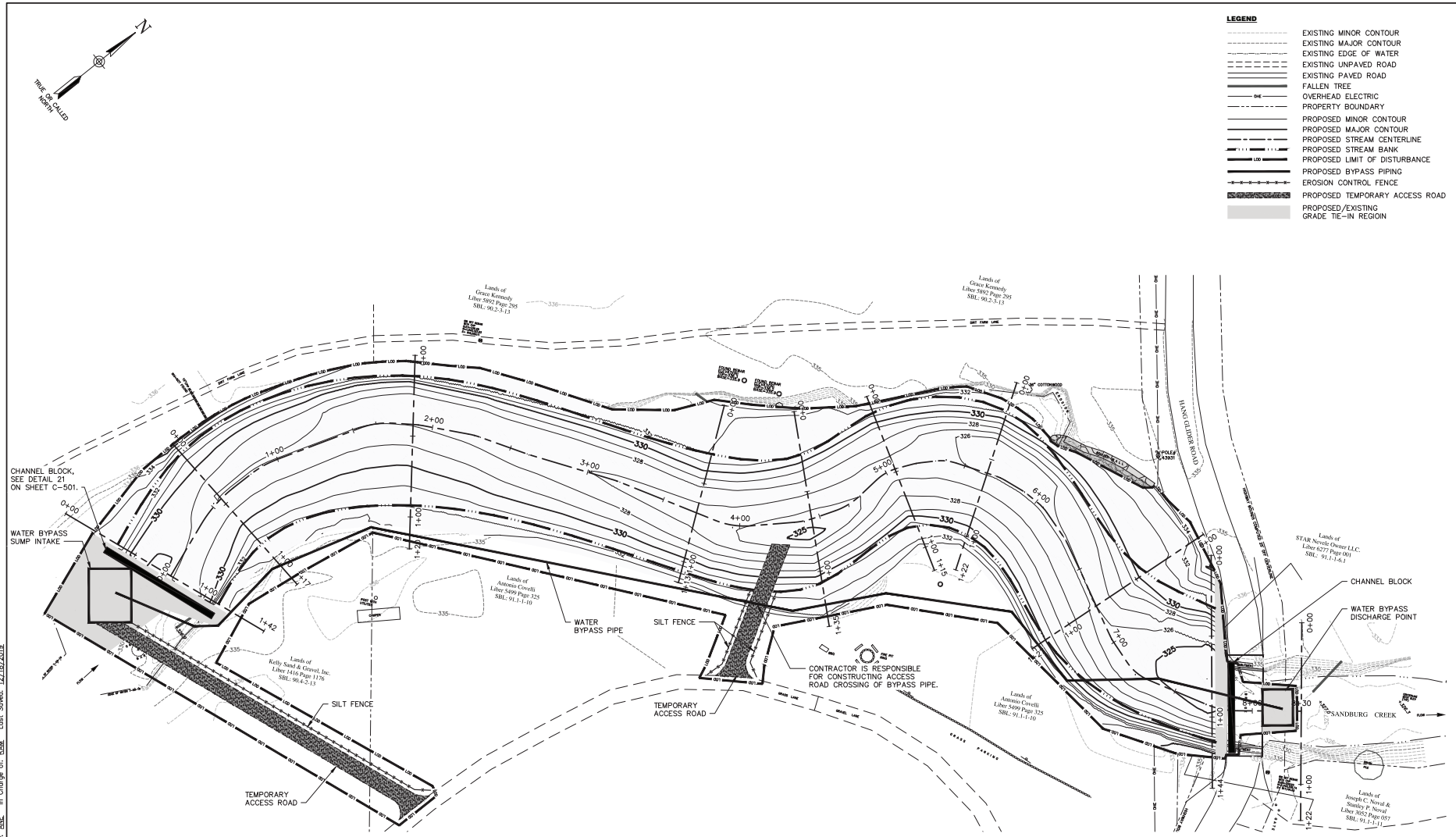
File Name: 924.068.002_Site10_C173-Cross Sections.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10
EROSION AND SEDIMENT CONTROL PLAN

TOWN OF WAWARSING — ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-174
Project Number: 924.068.002

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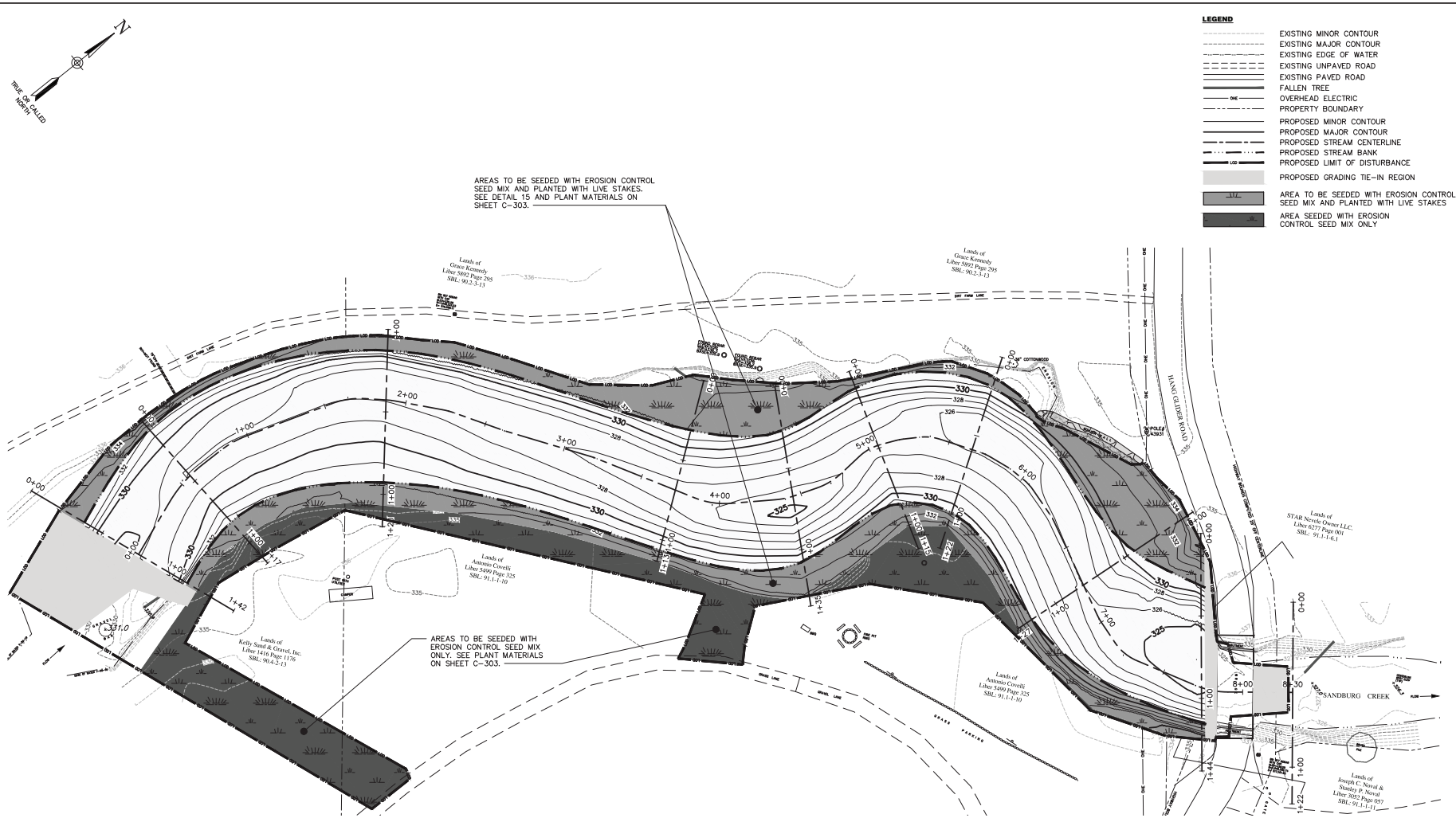

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10 PLANTING PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-175
Project Number: 924.068.002

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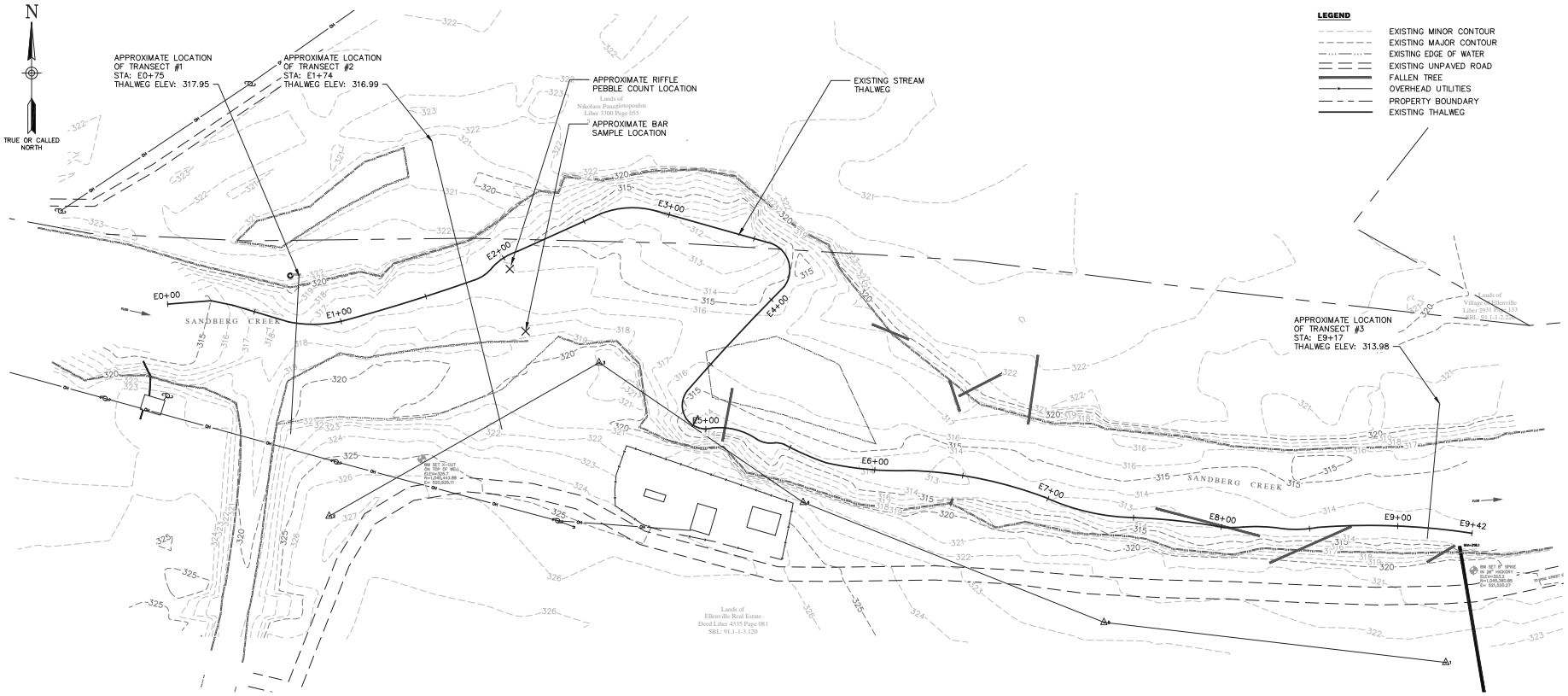
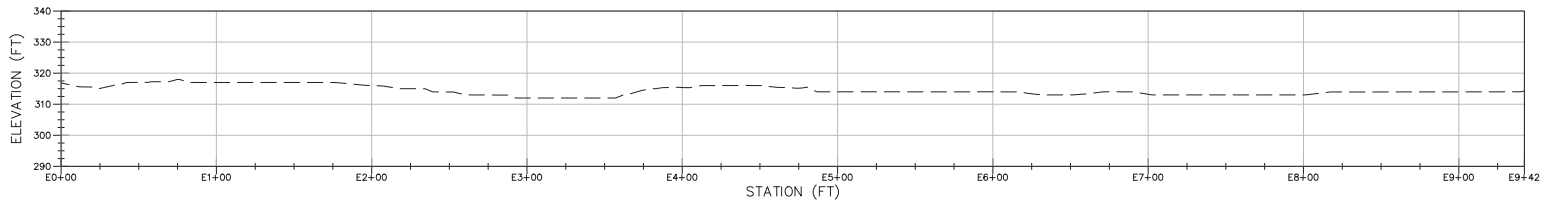
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 12/18/2019



EXISTING CONDITIONS PLAN

SCALE: 1" = 30'-0"



EXISTING CONDITIONS PROFILE

HORIZONTAL SCALE: 1" = 40'-0"
VERTICAL SCALE: 1" = 20'-0"

1"=20' 20' 0 20' 40'
1"=30' 30' 0 30' 60'
1"=40' 40' 0 40' 80'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13
EXISTING CONDITIONS

TOWN OF WAWARSING — ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-181
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:14PM By: MBG
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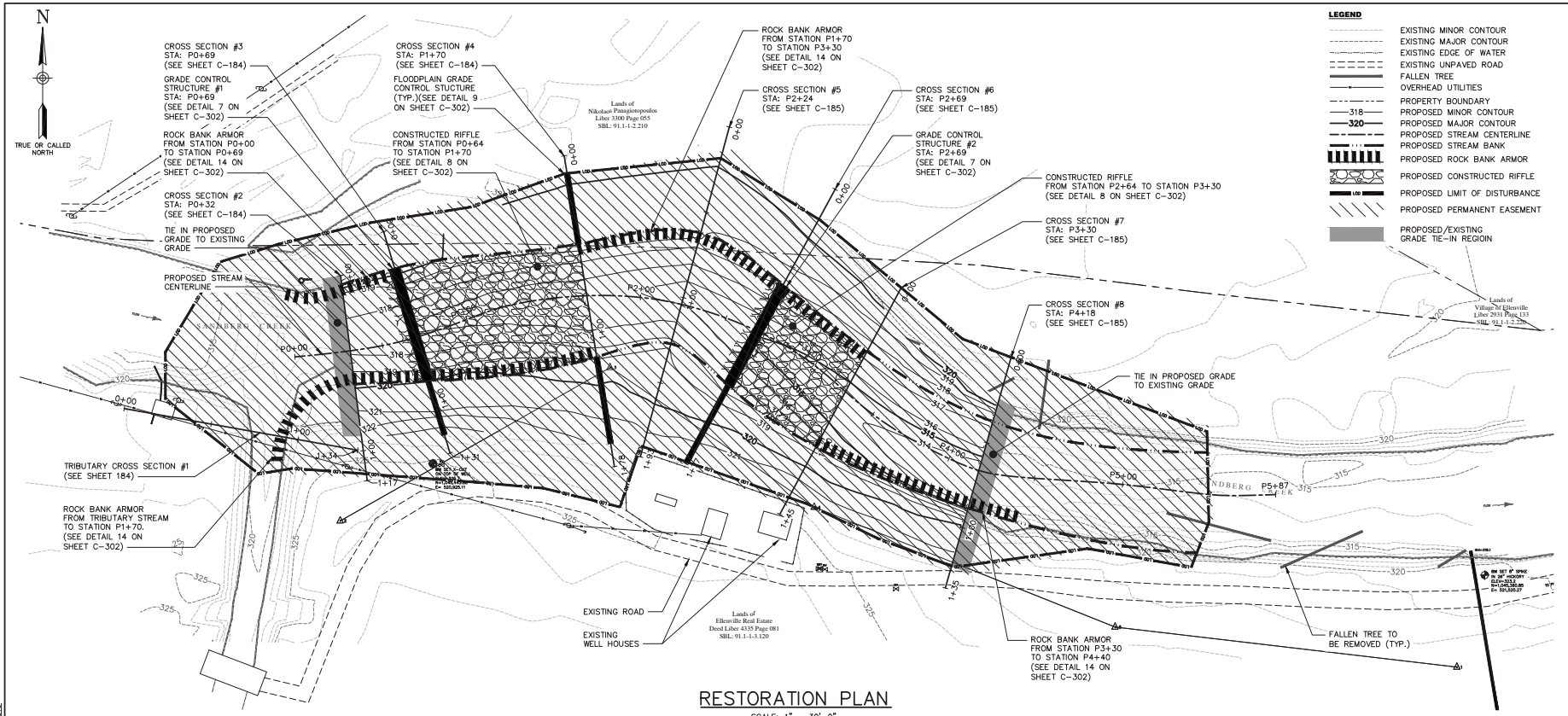
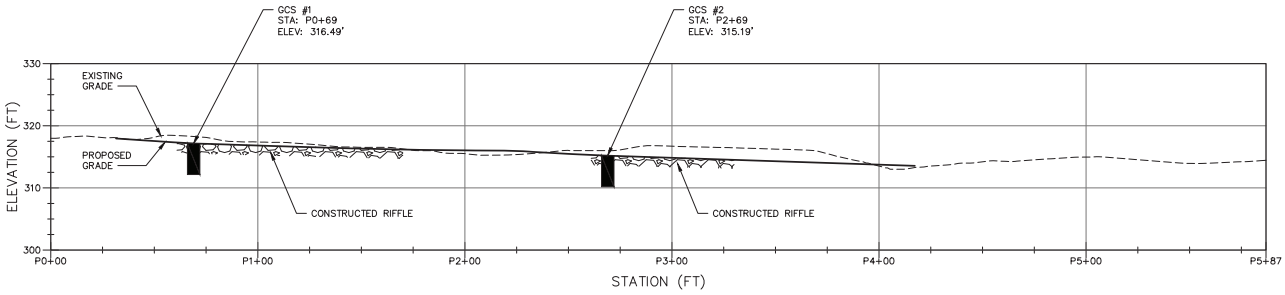
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 9/24/2019



RESTORATION PLAN

SCALE: 1" = 30'-0"

CROSS SECTION COORDINATES				
CROSS SECTION	POINT	NORTHING	EASTING	ELEV.(FT)
1	STA: 0+00	1,045,475.09	520,750.43	322.88
	CENTERLINE	1,045,459.80	520,836.12	318.99
	END STA.	1,045,451.53	520,882.42	324.45
2	STA: 0+00	1,045,550.38	520,872.78	322.00
	CENTERLINE	1,045,507.77	520,878.34	317.96
	END STA.	1,045,434.34	520,887.89	326.00
3	STA: 0+00	1,045,575.20	520,897.20	322.00
	CENTERLINE	1,045,515.32	520,915.15	317.15
	END STA.	1,045,449.91	520,934.75	324.13
4	STA: 0+00	1,045,618.13	520,999.38	322.00
	CENTERLINE	1,045,538.94	521,012.17	316.17
	END STA.	1,045,442.25	521,027.78	322.62
5	STA: 0+00	1,045,634.43	521,092.79	322.05
	CENTERLINE	1,045,534.03	521,065.73	315.98
	END STA.	1,045,447.79	521,042.48	321.72
6	STA: 0+00	1,045,599.17	521,152.67	321.27
	CENTERLINE	1,045,518.79	521,108.92	315.18
	END STA.	1,045,443.91	521,068.17	322.24
7	STA: 0+00	1,045,543.48	521,190.05	322.09
	CENTERLINE	1,045,484.63	521,158.52	314.51
	END STA.	1,045,415.26	521,121.37	324.50
8	STA: 0+00	1,045,503.82	521,252.14	322.00
	CENTERLINE	1,045,440.05	521,233.97	313.33
	END STA.	1,045,373.56	521,215.03	323.32



PROPOSED STREAM CENTERLINE PROFILE

HORIZONTAL SCALE: 1" = 30'-0"
VERTICAL SCALE: 1" = 10'-0"

10' 0 10' 20'
1"=10'
30' 0 30' 60'
1"=30'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 RESTORATION PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-183
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:14PM By: WBG
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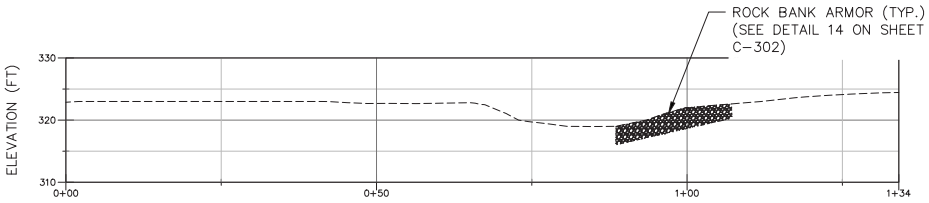
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/28/2019
Project No.: 924.068.002
Project Name: Ellenville Stream Restoration Phase 2&3

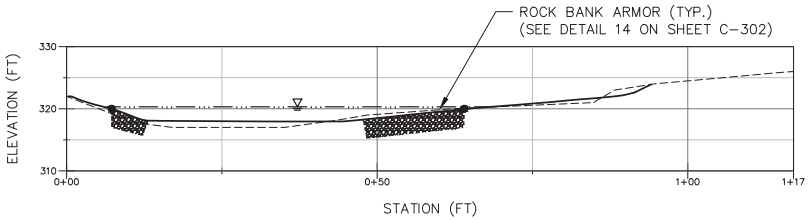
LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- TOP OF BANK
- BANKFULL WATER ELEVATION



CROSS SECTION 1

SCALE: 1" = 10'-0"



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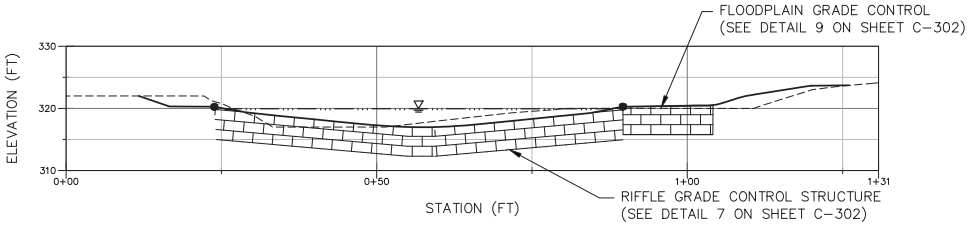

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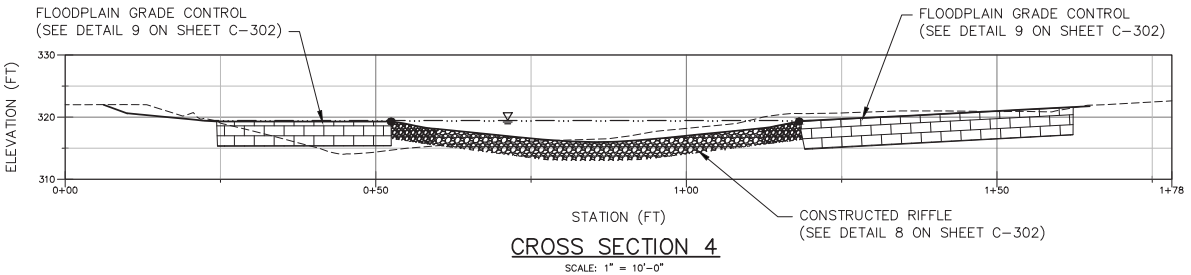

CROSS SECTION 4

SCALE: 1" = 10'-0"

1"=10' 10' 0 10' 20'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 CROSS SECTIONS PROPOSED CONDITIONS (1 of 2)

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-184
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:14PM By: WBG
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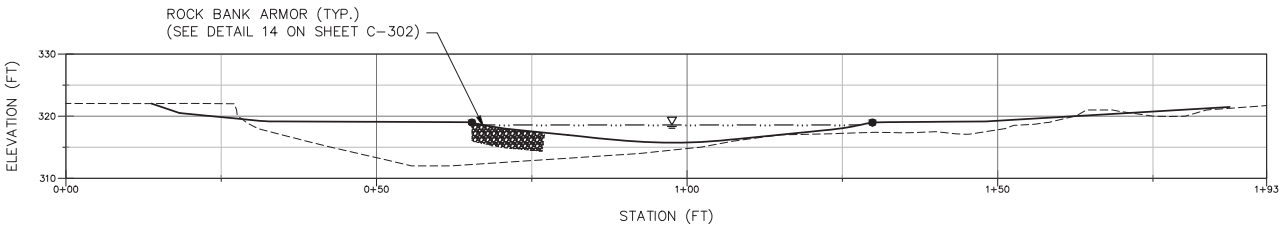
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/14/2019

LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- TOP OF BANK
- BANKFULL WATER ELEVATION



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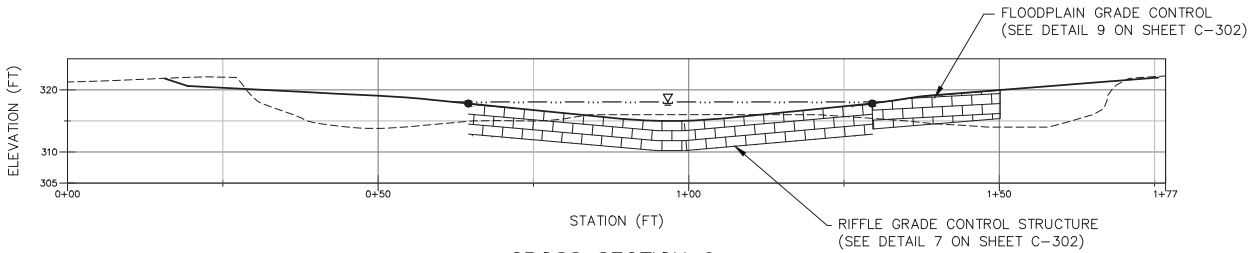
SCALE: 1" = 10'-0"



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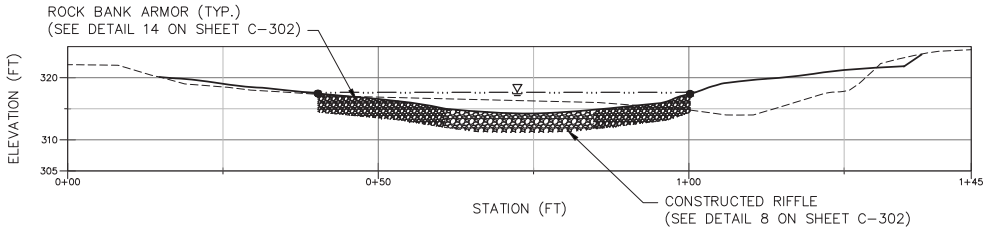
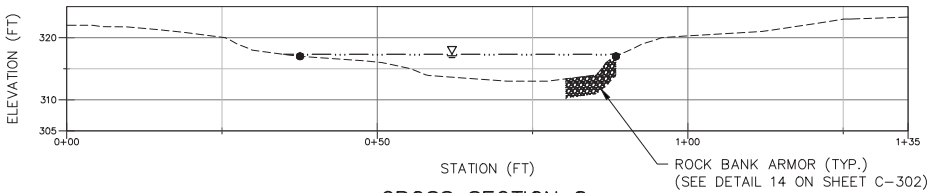


CROSS SECTION 7

SCALE: 1" = 10'-0"



CROSS SECTION 8

SCALE: 1" = 10'-0"

1"=10' 10' 0 10' 20'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 CROSS SECTIONS PROPOSED CONDITIONS (2 OF 2)

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-185
Project Number: 924.068.002

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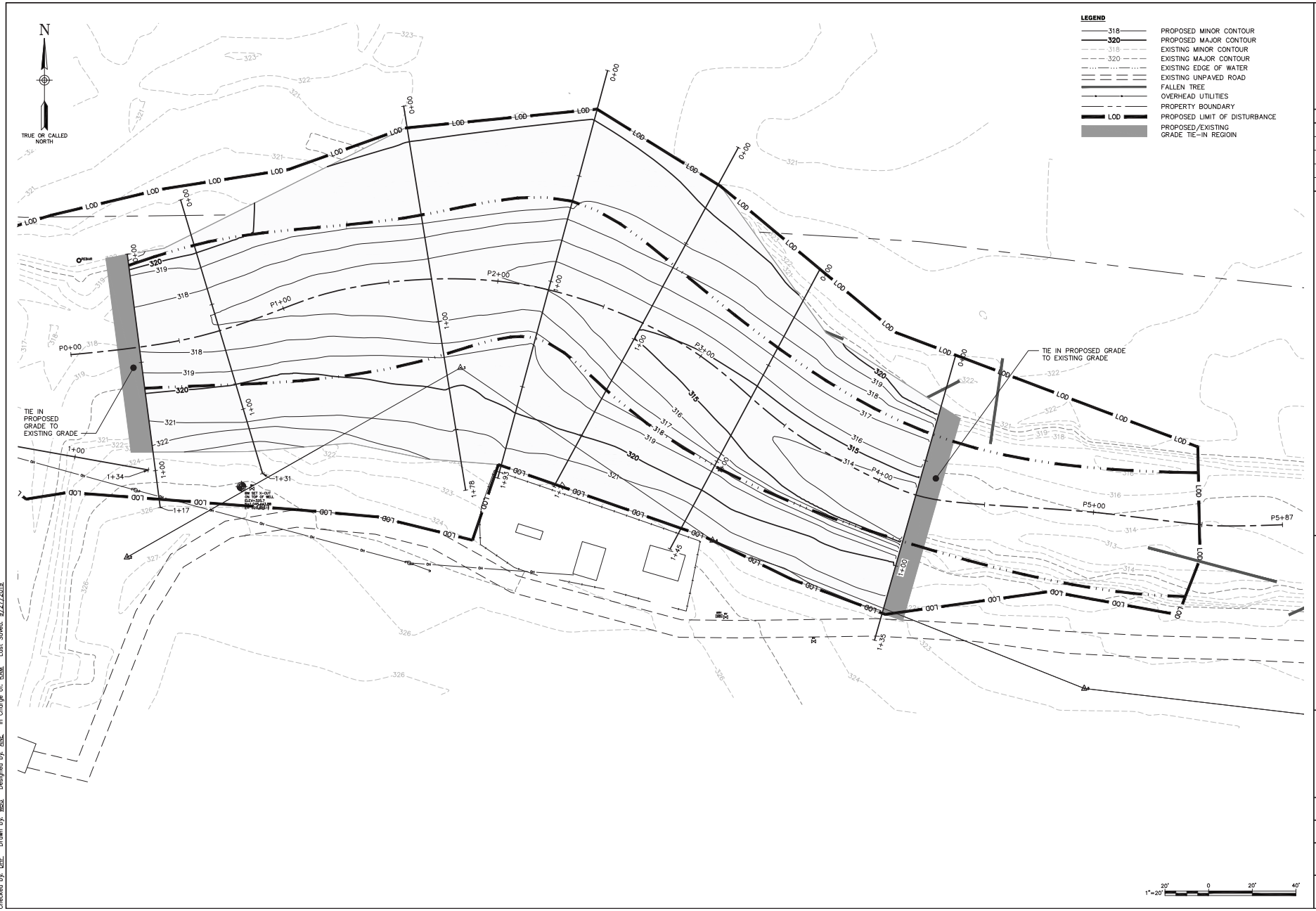
File Name: 924.068.002_Site13_Cross Sections.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: BAM Last Saved: 10/14/2019



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 GRADING PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
DECEMBER 2019

Scale
AS SHOWN

Sheet Number
C-186

Project Number
924.068.002

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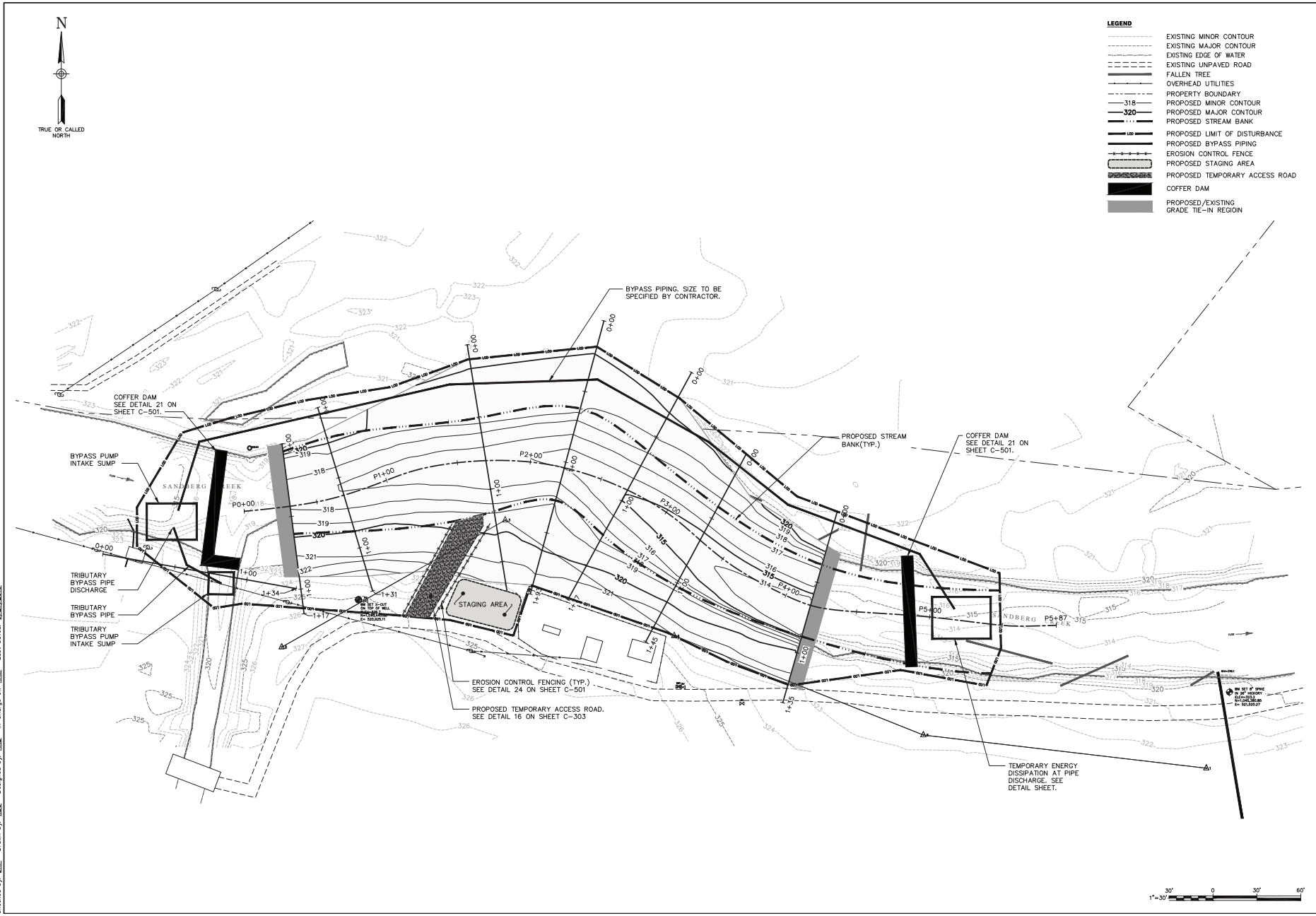
File Name: 924.068.002_Site13_C186-Grading Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: MBG Designed by: ANE In Charge of: RAM Last Saved: 9/21/2019



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 BYPASS PUMPING AND EROSION AND SEDIMENT CONTROL PLAN

TOWN OF WAWARSING — ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date: DECEMBER 2019

Scale: AS SHOWN

Sheet Number: C-187

Project Number: 924.068.002

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Project Name: Ellenville Stream Restoration Phase 2&3
Project No.: 924.068.002
Last Saved: 9/27/2019
In Charge of: RAM
Designed by: ANE
Drawn by: MBG
Checked by: DMF

ATTACHMENT 2

Design Report (60% Submission)

Ellenville-Wawarsing Stream Restoration Project

Prepared for

Village of Ellenville

2 Elting Court
Ellenville, New York

and

Town of Wawarsing

108 Canal Street
P.O. Box 671
Ellenville, New York

Revision 0
February 2019

Barton&Loguidice

Barton&Loguidice

Ellenville-Wawarsing Stream Restoration Project
Ulster County, New York

Design Report (60% Submission)

February 2019

Prepared for

Village of Ellenville
2 Elting Court
Ellenville, New York 12428

and

Town of Wawarsing
108 Canal Street
P.O. Box 671
Ellenville, New York 12428

Prepared by

Barton & Loguidice, D.P.C.
15 North Chestnut Street, Suite 201
New Paltz, New York 12561

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Barton&Loguidice

1.0 PROJECT INTRODUCTION AND BACKGROUND

Governor Andrew M. Cuomo established the New York Rising Community Reconstruction (NYRCR) program to provide additional rebuilding and revitalization assistance to communities damaged by Super-storm Sandy, Hurricane Irene, and Tropical Storm Lee. The Governor's Office of Storm Recovery (GOSR) is managing the NYRCR program in partnership with the NYS Department of State (DOS). Additional support has been provided through the Regional Economic Development Council's (REDC) State Agency Review Teams.

Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing, including the East and West Branches of the Beer Kill, Sandburg Creek, Roundout Creek, North Gully, and Fantine Kill.

The Village of Ellenville and Town of Wawarsing joined with eight other communities to complete a New York Rising Community Reconstruction Plan in 2014. One of the reconstruction and resiliency strategies identified was to optimize regional coordination and communication to better mitigate flooding, plan for future disasters, and protect communities. To implement this strategy, the plan proposed the Stream Bank Restoration Project to study and restore severely deteriorated stream banks and beds. This project was undertaken to provide risk reduction as well as social, health, environmental, and economic benefits to the Village and Town, with an aim to:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, schools, emergency services, and the Ellenville Regional Hospital;
- Provide long-term protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting improvements to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

In May 2015, the GOSR announced funding for the design of the Stream Bank Restoration Project, with the Village of Ellenville as the lead sub recipient. The Town of Wawarsing has coordinated with the Village of Ellenville to determine the most effective methods for improving/restoring damaged streams. Barton and Loguidice, DPC (B&L) was engaged to complete the project, which concentrates on targeted improvements to selected sections of watercourses in the following stream corridors:

<u>Village of Ellenville:</u>

- Sandburg Creek from Village line at west to confluence with Beer Kill (3,100');
- Beer Kill from Sandburg Creek to Route 209 (2,800');
- Fantine Kill from confluence with Sandburg Creek to Route 209 (2,500');
- North Gully from Ida Lane wall to Sandburg Creek (1,600');

Town of Wawarsing:

- West Branch Beer Kill from Briggs Highway to Barbara Road bridge (13,000');
- Roundout Creek from Route 209 to Airport Road culvert (2,600'); and
- Sandburg Creek from Hang Glider Road to the Village line (10,300').

As part of Phase I of this project, the stream corridors were studied extensively between 2015 and 2018, and presented in B&L's June 2018 Flood Engineering Analysis Report (FEAR). The FEAR provides a detailed assessment of the flooding characteristics in the Village of Ellenville and Town of Wawarsing, including details of:

- Existing conditions (i.e., land use, drainage patterns, soils, FEMA flood delineations, etc.);
- Flood hazards within the focus area;
- Infrastructure elements in the community that are at risk for flood damage;
- Potential alternatives aimed at reducing flood impacts; and
- Implementation plan for prioritized alternatives.

The analysis was based on field-derived data reflecting river- and floodplain conditions. The FEAR also includes a review of available information pertinent to the hydrologic and hydraulic functions of the Sandburg Creek, West Branch Beer Kill, North Gully, Roundout Creek, and Fantine Kill and engineering analysis required to assess the flooding characteristics within the focus area.

This 60% Design Report has been completed as part of Phase II of the project, Design and Contract Documents.

1.1. Project Sites and Location

The scope of the Phase I Flood Analysis for the Ellenville-Wawarsing Stream Restoration Project included thirteen (13) sites, as presented in the FEAR. Based on GOSR/Village/Town priorities, and considering parallel projects and budget constraints, Phase II of the project, Design and Contract Documents is limited to the following nine (9) sites:

- Site 1: West Branch at Old Greenfield Rd
- Site 2: West Branch at Barbara Rd Bridge
- Site 3: West Branch at Barbara Rd Bridge
- Site 4: West Branch Beer Kill
- Site 5: West Branch Beer Kill
- Site 8: Sandburg Creek at Roslyn Street Pump Station
- Site 10: Sandburg Creek at Hang Glider Road
- Site 12: Sandburg and Roundout Creeks at Airport Road
- Site 13: Fallsview Well House

A map of site locations is presented Appendix A.

If funds are available, the other four sites may be completed pending approval to move forward by GOSR/Village/Town.

1.2. Design Approach

The stream characteristics and recommended mitigation varies drastically for the nine sites. Each site is generally categorized within one of two design types, based on the characteristics of the stream.

The first category, generally consists of smaller, more stable streams, sometimes protected and/or bounded by a roadway, often within straight reaches where energy can be controlled with simple stream restoration features such as rock clusters, cross-vanes or stream barbs. Design of these sites does not require full topographic survey of the stream bed or complex hydraulic modelling. These sites include Sites 2 to 5, 8 and 12.

The second category, referred to herein as the 'Natural Channel Design' sites, includes the remaining Sites 1, 10 and 13. These sites tend to be part of winding reaches with high energy flows, where re-grading of channel cross-sections and construction of vegetated floodplain benches are required to prevent uncontrolled future channel widening or expansion scour at these sites. The design approach for these sites includes a full topographic survey within the stream bed to inform the geomorphic assessment, as well as HEC-RAS modelling of pre- and post- construction flood elevations.

The following sections present the existing conditions and proposed designs for each of the nine sites, documenting elements for each based on the relevant design approach.

1.3. Hydrologic Assessment

A catchment-wide hydrologic analysis was completed as part of Phase 1 of the project. B&L developed a HydroCAD model based on available information, including all thirteen sites, presenting existing/proposed conditions, and identifying at-risk structures within and adjacent to active stream/floodplain corridors. Refer to Appendix A of the FEAR, revised June 2018, for details and findings of the hydrological assessment.

2.0 EXISTING CONDITIONS AND SITE ASSESSMENT

2.1. Site 1: West Branch of Beer Kill at Old Greenfield Rd

2.1.1. Site Description

The West Branch Beer Kill flows west through Site 1 south of Rt 52 and its intersection with Old Greenfield Road. Aggrading conditions induced by deposition of sediment from upstream bed and bank erosion have contributed to channel avulsion and repetitive flooding of the residential property located along the right bank (south side of channel). Channel avulsion has resulted in a high channel width/depth ratio in the upper segment, which will likely contribute to future channel widening and continued erosion along the right streambank. Through the lower portion of this site, the channel slope and velocity appear to increase as primary flow runs along the base of the existing roadway embankment. A sizeable gravel berm was constructed along the right bank opposite the embankment to protect the residential property to the south from storm flows. The channel confinement along the base of the road embankment contributes to a high erosion hazard and threat to the road (Figure 1).

Figure 1: West Branch of Beer Creek at Old Greenfield Rd (Site 1)

2.1.2. Site Soils

Soils data obtained from the NRCS Web Soil Survey was used to determine the types of soils mapped within the project site limits. The primary soil type mapped within the project area of Site 1 is Arnot-Lordstown-Rock outcrop complex (ARD). Arnot soils consist of shallow, somewhat excessively to moderately well drained soils formed in loamy till. Bedrock is at depths of 10 to 20 inches. Slopes range from 0 to 70%. The Lordstown series consists of moderately deep, well drained soils formed in till and cryoturbated (mixed materials from various horizons of the soil down to the bedrock due to freezing and thawing) material derived from siltstone and sandstone on bedrock controlled landforms of glaciated dissected plateaus. They are nearly level to very steep soils on hillsides and hilltops in glaciated bedrock controlled uplands. Slope ranges from 0 to 90%.

2.1.3. Site Survey

Brooks & Brooks Land Surveyors, P.C. (B&B) of Highland, NY have not yet been able to perform a topographic survey of the site and expects to complete it in the Spring 2019. Barton & Loguidice (B&L) performed field work for a geomorphic assessment in May 2018 that included surveying three riffle cross-sections, and a longitudinal profile of the channel thalweg (deepest portion of the channel) through the project reach to define the current morphological characteristics of the stream channel. Channel cross-sections are used to identify channel characteristics and dimensions based upon the bankfull water elevation determined from field observations of topographic breaks in the channel banks. The locations of the cross-sections and the stream stationing for the long profile will be shown on Sheet C-101 in the Drawing Set once the survey is completed. The geomorphic cross-sections are provided in Exhibit C-1 in Appendix C; however, the cross sections are not yet tied in to a vertical datum since the instrument survey has not yet been completed.

The longitudinal profile surveyed through West Branch Beer Creek in the project area included approximately a 900 ft reach upstream of the waterfall at the downstream limit of the site. The longitudinal profile indicated a bankfull water surface slope of 0.023 feet (ft)/ft. Six riffles and six pools were identified in the project reach. Riffle lengths ranged from 12 ft to 171 ft (average [avg] 51 ft), and riffle spacing ranged from 22 ft to 323 ft (159 ft avg). Pool lengths ranged from 12 ft to 100 ft (avg 56 ft), and pool spacing ranged from 20 ft to 219 ft (59 ft avg). Pool depths ranged from 0.5 ft to 2.4 ft (avg 1.3 ft) below the water surface elevation. Data summaries and a graphical presentation of the longitudinal profile are provided in Exhibit C-2 in Appendix C.

Channel dimensions and features identified from the three cross sections collected during the geomorphic assessment are summarized in Table 2-1.

Table 2-1: Cross Section Summary (Site 1)

Riffle Cross Sections	Bankfull Width (ft)	Mean Bankfull Depth (ft)	Max Bankfull Depth (ft)	Bankfull Cross Sectional Area (sq ft)
1	49	1.88	2.81	92.3
2	125.9	5.88	9.0	740
3	94.2	7.15	10.16	673.4
Average	89.7	4.97	7.32	501.9

2.1.4. Geomorphic Assessment

Pebble Counts / Bar Samples

Due to the steep grade of the channel in Site 1 and observations of bedrock outcroppings and predominantly boulder substrate, a pebble count was not performed. In addition, the steep topography limited opportunities for point bar formation, so a bar sample was not collected.

Stream Classification

Planimetric and geometric data collected from West Branch Beer Kill were used to classify the stream using the stream classification methodology developed by Rosgen (1996). The classification was based on field-identified channel characteristics. Depending on which cross section was used for classification, the classification of West Branch Beer Creek varied between a B3 and F3. The difference between these classifications are related to the width of the floodprone area, which is defined as the water surface width at twice the maximum bankfull water depth. The field collected cross sections did not extend far enough to capture the floodprone area width, therefore Rivermorph uses the maximum length of the cross section as the default floodprone area width. The floodprone area width will be defined upon receipt of the survey data for Site 1 and the classification of West Branch Beer Creek will be determined at that time and reported in the next design document.

Shear Stress & Sediment Competence

Geomorphic assessment of the project site utilizes pebble count data from riffle features and gravel bars for sediment competence calculations to characterize bedload available to a stream. The large cobble/boulder/bedrock substrate observed in the Creek and the relatively steep segment slope (0.02 ft/ft) and mean depth (5.0 ft) were used to estimate a dimensionless shear stress of 0.025, which indicated a mean bankfull water depth of 3.37 ft and a channel slope of 0.013 ft/ft were capable of mobilizing bed material. These calculations were also done using dimensional shear stress and the results were consistent between the calculations using the Colorado and Shields curves (4.0-4.8 ft mean depth; 0.016-0.019 ft/ft channel slope), and indicated adequate energy to mobilize particles up to 585 mm in diameter. The current step/pool system of the channel in Site 1 functions well to attenuate storm water velocity, but the steps are composed of large rock. These results indicate a high energy system that will require large rock in the restored channel to stabilize the bed. A summary of the sediment competence calculations for Site 1 is presented in Exhibit C-3 in Appendix C.

2.1.5. Hydrologic and Hydraulic Assessment

Bankfull Discharge

The bankfull elevation is defined as the elevation on the bank where flow fills the channel to the top and flooding begins in the adjacent floodplain. The bankfull stage and discharge are consistent morphological indices that relate to the formation, maintenance, and dimensions of a channel as it exists under the current climatic regime. Estimation of the bankfull discharge is the first step in designing natural channels. Bankfull channel width and depth are calculated based on the bankfull water elevation determined from the bankfull flow.

The bankfull discharge (Q_{bkf}) for West Branch Beer Kill in Site 1 was estimated using bankfull indicators observed in the field and discharge estimates generated in USGS' StreamStats program. Bankfull field indicators and features defining channel dimensions, slope, and relative roughness that were incorporated in the estimation process in the Rivermorph software using Friction Factor/Relative Roughness (u/u*), Roughness Coefficient from Jarrett, the Limerinos equation, and the Darcy–Weisbach Equation. Four bankfull discharge estimates were generated using the average bankfull channel characteristics from cross-section #1. These values ranged from 1,150 cubic

feet per second (cfs) to 1,294 cfs, with an average bankfull discharge of 1,200 cfs. Discharge was also calculated using channel dimensions derived from cross section #3, which proved to be a poor representation for discharge calculations, resulting in an estimated average discharge of 8,850 cfs. A summary of the discharge calculations from cross section #1 is presented in Exhibit C-4 in Appendix C.

The StreamStats program applies regional regression equations to the drainage area of a specific point on a stream to generate a range of storm flows, including the bankfull storm. The regression equations used in StreamStats were derived from USGS' Region 4 Bankfull Discharge and Channel Characteristics of Streams in New York State (Mulvihill et al., 2009). The drainage area (DA) of West Branch Beer Kill at Site 1 was identified by StreamStats as 19.7 square miles is size. The regression equation used to calculate bankfull discharge by drainage area in Region 4 is:

$$117.2*(DA)^{0.780}$$

Using this equation, the bankfull discharge based on the 19.7 sq mi drainage area was calculated to be 1,198 cfs as reported in StreamStats (1,200 cfs), with prediction intervals ranging from 208 to 6,920 cfs. StreamStats output is presented in Exhibit C-5 in Appendix C.

StreamStats also generated discharges for a range of storm events based on the drainage area of the project site and an unregulated condition. Table 2-2 summarizes the reported flows for the various storm events.

Table 2-2: StreamStats Flood Frequency Analysis for West Branch Beer Kill – Site 1	
Storm Frequency	Discharge (cfs)
1.25-year	433
1.5-year	538
2-year	690
5-year	1,170
10-year	1,580
25-year	2,200
50-year	2,750
100-year	3,370

The frequency of occurrence of a bankfull storm event varies, but is typically associated with a 1.25 to 2 year storm. The USGS (Mulvihill et al., 2009) reported the bankfull discharge to closely approximate the 2-year storm in USGS Region 3, which includes the project area, but can range between the 1.25-year and 3.25-year storm events. A summary of the bankfull discharges evaluated to determine the design bankfull discharge for the project are provided in Table 2-3.

Table 2-3: Summary of Evaluated Bankfull Discharges					
	Rivermorph Estimate from Stream Features at Cross-Section 3	StreamStats Bankfull	StreamStats 1.5-Yr Storm	StreamStats 2-Yr Storm	StreamStats 5-Yr Storm
Discharge (cfs)	1,200	1,200 (208 to 6,920)	538	690	1,170

The bankfull discharge represents the most accurate estimate of site-specific discharge due to the use of observed and measured features that define the parameters that are used to calculate discharge. Four different empirical methods were applied to the site features and the results were consistent, and consistently lower than the StreamStats output. Although there is some uncertainty in the field-derived features, there is a high degree of confidence in the bankfull indicators and elevations measured in the field that were used to calculate bankfull discharge.

Therefore, the design for the restoration of West Branch Beer Kill at Site 1 will use the 1,200 cfs derived from site features and empirical equations.

HEC-RAS Modeling

The USGS HEC-RAS model is typically used to validate the bankfull discharge estimate by running the bankfull discharge through the surveyed channel dimensions and topography to compare the elevation of the bankfull storm in the channel to the field-identified bankfull features. Bankfull is typically field identified by interpreting major breaks in the bank slope that were created by bankfull storm events. Since channel topography has not yet been surveyed due to high water conditions, the HEC-RAS model cannot be run to evaluate/verify bankfull discharge. Once channel survey is completed, the model will be run and the identified bankfull discharge will be evaluated and confirmed or revised.

2.2. Site 2: West Branch at Barbara Rd Bridge

2.2.1. Site Description

West Branch Beer Kill enters Site 2 upstream of Barbara Road Bridge. The channel is laterally-confined (entrenched) due to proximity to the Old Greenfield Road embankment along the left bank, resulting in elevated flood velocity and propensity for excessive bank erosion and bed scour. Sizeable rock revetment along left bank and substantial channel widening along right bank immediately downstream of the bridge indicates a history of expansion scour at this location. Bank revetments upstream of the bridge are comprised of gabion baskets. (Figure 2)

Figure 2: Upstream from Barbara Rd Bridge

2.2.2. Site Soils

Soils data obtained from the NRCS Web Soil Survey was used to determine the types of soils mapped within the project site limits. The soils mapping for Site 2 is presented in Appendix D. The primary soil types mapped within the project area of Site 2 are Castile gravelly silt loam (CgB) and Lackawanna and Swartswood soils (LCD). Castile parent material consists of gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone. Soils are moderately well drained with the restrictive layer at depths of more than 80 inches. Slopes range from 3 to 8%. The LCD series consists of moderately steep, very bouldery soils. Top layers consist of well drained flaggy silt loam and gravelly fine sandy loam to gravelly sandy loam. Slope ranges from 15 to 25%.

2.2.3. Channel/Hydraulic Assessment

The stream restoration design for Site 2 is based on 2' contours available publically from LIDAR data for Ulster County. B&L performed field work for the channel assessment in February 2018 to define the current characteristics of the stream channel. It was observed that flood velocities along this section of stream are increased due to the laterally confined channel along the left bank. This results in excessive bank erosion and bed scour in this area. Substantial channel widening is seen immediately downstream of the bridge indicating a history of expansion scour at this location. The bridge span is undersized to accommodate flows corresponding to significant flood events. The bridge

and gabion headwalls are at peril and may incur significant damages if any larger flooding events occur and noted scour levels at bridge foundation elements increases.

2.3. Site 3: West Branch Beer Kill

2.3.1. Site Description

West Brach Beer Kill enters Site 3 approximately 750' upstream of Site 2. The stream channel in this location is laterally confined (entrenched) and pinned against the Old Greenfield Road embankment. The primary processes posing risk to this segment of the roadway are lateral cutting of the channel against the toe of the roadway embankment, and lowering of the bed elevation, attributable to the confined condition of the channel and corresponding elevated flood velocities. These conditions have impacted the streambank at the edge of Old Greenfield Road. Refer Figure 3.

Figure 3: West Branch Beer Kill (Site 3)

2.3.2. Site Soils

Soils data obtained from the NRCS Web Soil Survey was used to determine the types of soils mapped within the site limits. The soils mapping for Site 3 is presented in Appendix E. The primary soil types mapped within Site 3 are Castile gravelly silt loam (CgB) and Lackawanna and Swartswood soils (LCD). Castile parent material consists of gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone. Soils are moderately well drained with the restrictive layer at depths of more than 80 inches. Slopes range from 3 to 8%. The LCD series consists of moderately steep, very bouldery soils. Top layers consist of well drained flaggy silt loam and gravelly fine sandy loam to gravelly sandy loam. Slope ranges from 15 to 25%.

2.3.3. Channel Assessment

The stream restoration design for Site 3 is based on 2' contours available publically from LIDAR data for Ulster County. B&L performed field work for the channel assessment in February 2018 to define the current characteristics of the stream channel. It was observed that the stream channel is laterally confined in this area and pinned against the roadway establishment. The scouring against the toe of the roadway embankment causes the lowering of the bed elevation, attributable to elevated flood velocities.

2.4. Site 4: West Branch Beer Kill

2.4.1. Site Description

West Brach Beer Kill enters Site 4 approximately 1600' upstream of Site 3. Localized deposition of sediment at the point where the channel encroaches upon the roadway embankment (left bank) is inducing channel braiding and lateral migration of the channel in the direction of the embankment. If left to continue, progressive movement of the channel in this direction will eventually lead to undermining of the embankment. These conditions have impacted the streambank at the edge of Old Greenfield Road. (Figure 4)

Figure 4: West Branch Beer Kill (Site 4)

2.4.2. Site Soils

Soils data obtained from the NRCS Web Soil Survey was used to determine the types of soils mapped within the site limits. The soils mapping for Site 4 is presented in Appendix F. The primary soil type mapped within Site 4 is Middlebury silt loam (Mr), with a thin length of Valois very bouldery soils, gently sloping (VAB) adjacent to Old Greenfield Road. Middlebury parent material consist of loamy alluvium predominantly from areas of shale and sandstone with some lime-bearing material. Soils are moderately well drained with the restrictive layer at depths of more than 80 inches. Slopes range from 0 to 2%. The VAB series parent material consists of loamy till derived mainly from sandstone, siltstone and shale. Soils are well drained with slope ranging from 3 to 8%.

2.4.3. Channel Assessment

The stream restoration design for Site 4 is based on 2' contours available publically from LIDAR data for Ulster County. B&L performed field work for the channel assessment in February 2018 to define the current characteristics of the stream channel. It was observed that there is localized deposition of sediment along the channel, which is causing channel braiding and lateral migration of the channel towards the roadway embankment. Without stabilization, this will continually worsen, leading to undermining of the roadway embankment.

2.5. Site 5: West Branch Beer Kill

2.5.1. Site Description

West Brach Beer Kill enters Site 5 approximately 3000' upstream of Site 4. Similar to Site 3, the stream channel is laterally confined (entrenched) and pinned against the roadway embankment. The primary processes posing risk to this segment of the roadway are lateral cutting of the channel against the toe of the roadway embankment, and lowering of bed elevation attributable to the confined condition of the channel and corresponding elevated flood velocities. These conditions have impacted the streambank at the edge of Old Greenfield Road. (Figure 5)

Figure 5: West Branch Beer Kill (Site 5)

2.5.2. Site Soils

Soils data obtained from the NRCS Web Soil Survey was used to determine the types of soils mapped within the site limits. The soils mapping for Site 5 is presented in Appendix G. The soil type mapped within Site 4 is entirely Lackawanna and Swartswood soils, moderately steep (LCD). Parent material is loamy till derived mainly from reddish sandstone, siltstone and shale. Soils are moderately well drained with frangipan at 17 to 36 inches. Slopes range from 15 to 25%.

2.5.3. Channel Assessment

The stream restoration design for Site 5 is based on 2' contours available publically from LIDAR data for Ulster County. B&L performed field work for the channel assessment in February 2018 to define the current characteristics of the stream channel. It was observed that the stream channel is laterally confined and pinned against the roadway establishment. The scouring against the toe of the roadway embankment causes the lowering of the bed elevation. This attributes to elevated flood velocities.

2.6. Site 8: Sandburg Creek at Roslyn Street Pump Station

2.6.1. Site Description

The Sandburg Creek enters Site 8 upstream of the Roslyn Street Sewage Pump Station. The existing sewer crossing of Sandburg Creek at the Roslyn St. pump station is at risk of exposure if the ongoing trend of lowering base elevation (bed scour) continues. Partial exposure of the concrete encasement protecting the sewer line is visible adjacent to the right bank. (Figure 6)

Figure 6: Sandburg Creek at Roslyn Street Pump Station

2.6.2. Site Soils

Soils data obtained from the NRCS Web Soil Survey was used to determine the types of soils mapped within the site limits. The soils mapping for Site 8 is presented in Appendix H. The soil type mapped within Site 8 is Tioga fine sandy loam (Tg). The parent material for this soil type is loamy alluvium, with a typical profile of fine sandy loam to 34-inches, loamy fine sand to 40-inches, and silt loam to 65-inches. Soils are well drained with the restrictive layer at depths of more than 80 inches. Slopes range from 0 to 3%.

2.6.3. Channel Assessment

The stream restoration design for Site 8 is based on 2' contours available publically from LIDAR data for Ulster County. B&L performed field work for the channel assessment in February 2018 to define the current characteristics of the stream channel. It was observed that the existing sewer crossing of Sandburg Creek at the Roslyn St. pump station is at risk of exposure, if the ongoing trend of lowering base elevation (bed scour) continues. Partial exposure of the concrete encasement protecting the sewer line is visible adjacent to the right bank. This area has also seen a large amount of fill in previous years.

2.7. Site 10: Sandburg Creek at Hang Glider Road

2.7.1. Site Description

As Sandburg Creek approaches Hang Glider Road in Site 10, it flows through two very sharp meanders that have severely skewed the alignment of the existing channel planform in relation to the bridge crossing. These sharp bends create an exacerbated backwater condition during flooding, which results in overtopping the road, as well as accelerated erosion of the left bank upstream of the bridge. The lateral erosion of this bank continues to increase the angle and misalign the channel and the bridge approach. Two deep pools have formed at the sharp bends and the right bank at the further upstream bend was previously armored with rock to prevent the channel from cutting a direct channel to the bridge. (Figure 7)

Figure 7: Sandburg Creek at Hang Glider Road

2.7.2. Soils Data

Soils data obtained from the NRCS Web Soil Survey was used to determine the types of soils mapped within the project site limits. The primary soil type mapped within the project area of Site 10 is Tioga fine sandy loam (Tg). Tioga soils consist of very deep, well drained soils formed in alluvium on higher positions in floodplains. This soil exhibits moderate or moderately rapid permeability in the surface layer, and moderate to rapid permeability in the underlying material. Slope ranges from 0 to 3%.

2.7.3. Site Survey

B&B has not yet been able to perform a topographic survey of the site, which is expected in Spring 2019. B&L performed field work for a geomorphic assessment in May 2018 that included surveying two riffle and one pool cross-section, and a longitudinal profile of the channel thalweg through the project reach to define the current morphological characteristics of the stream channel. The locations of the cross-sections and the stream stationing for the long profile will be shown on Sheet C-701 in the Drawing Set once the survey is completed. The geomorphic cross-sections are provided in Exhibit I-1 in Appendix I; however, the cross sections are not yet tied in to a vertical datum since the instrument survey has not yet been completed.

The longitudinal profile surveyed through Sandburg Creek in the project area included the portion of the channel upstream of the Hang Glider Road Bridge for a distance of approximately 850 ft to the head of an upstream riffle. The longitudinal profile indicated a bankfull water surface slope of 0.003 ft/ft. Five riffles and four pools were identified in the project reach. Riffle lengths ranged from 10 ft to 120 ft (avg 51 ft), and riffle spacing ranged from 54 ft to 279 ft (178 ft avg). Pool lengths ranged from 69 ft to 214 ft (avg 120 ft), and pool spacing ranged from 207 ft to 282 ft (245 ft avg). Pool depths ranged from 4.0 ft to greater than 6 ft (Avg 4.8 ft) below the water surface elevation; however, three of the pools were too deep to wade and obtain accurate measurements of depth. Data summaries and a graphical presentation of the longitudinal profile are provided in Exhibit I-2 in Appendix I.

Channel dimensions and features identified from the three cross sections collected during the geomorphic assessment are summarized in Table 2-4. The dry secondary channel in cross section #2 was excluded from bankfull width determinations due to its formation due to lateral scour.

Table 2-4: Cross Section Summary (Site 10)

Cross Section	Bankfull Width (ft)	Mean Bankfull Depth (ft)	Max Bankfull Depth (ft)	Bankfull Cross Sectional Area (sq ft)
1 (Riffle)	69	2.51	3.86	172.7
2 (Pool)	95.8	3.41	6.37	327
3 (Riffle)	51	3.01	4.2	153.5
Riffle Average	60	2.76	4.03	163.1

2.7.4. Geomorphic Assessment

Pebble Counts / Bar Samples

Geomorphic assessment of the project site included collection of pebble count data from one riffle and bar sample particle size distribution from one point bar for sediment competence calculations. Pebble count and bar sample data were collected during field efforts in May 2018. Riffle substrate particle distribution from the riffle at cross section #3 exhibited a D_{50} of 38.5 mm and D_{84} of 62.4 mm. The bar sample particle distribution exhibited a D_{50} of 17.4 mm and D_{84} of 46.6 mm. Pebble count and bar sample results are provided in Exhibit I-3 of Appendix I and the sample locations are shown on Sheet C-701.

Stream Classification

Planimetric and geometric data collected from Sandburg Creek were used to classify the stream using the stream classification methodology developed by Rosgen (1996). The classification was based on field-identified channel characteristics and discharge data generated by USDA's StreamStats program. Using average values obtained from the two riffle cross sections established on the site, Sandburg Creek at Site 10 was classified as a C4 stream. The stream classification worksheet for Site 10 is provided in Exhibit I-4 of Appendix I.

C4 streams are slightly entrenched, meandering, gravel-dominated, riffle/pool channels with a well-developed floodplain. C4 streams typically have slopes of less than 2% and have a high width/depth ratio. The riffle/pool spacing typically average 5-7 bankfull channel widths in length. The streambanks of C4 streams are generally composed of unconsolidated, heterogeneous, non-cohesive alluvial materials that are finer than the gravel-dominated bed material, which makes them susceptible to accelerated bank erosion. Lateral channel adjustment is controlled by riparian vegetation and point bars and other depositional features are usually present. C4 streams are very susceptible to incision and lateral migration as a result of direct channel disturbances and changes in the flow and sediment loads of the watershed.

Shear Stress & Sediment Competence

Geomorphic assessment of the project site utilizes pebble count data from riffle features and gravel bars for sediment competence calculations to characterize bedload available to the stream through the project reach. The site-specific particle sizes, segment slope (0.003 ft/ft) and mean depth (2.21 ft) were used to calculate a dimensionless shear stress of 0.018, which indicated a mean bankfull water depth of 2.94 ft and a channel slope of 0.0039 ft/ft were required to mobilize bed material. The similarity in these calculated water depth and channel slope values to the actual site parameters indicates a relatively stable condition, but a potential for aggrading conditions due to a shallower slope and lower mean water depth than required to mobilize substrate. These calculations were also done using dimensional shear stress and the results were consistent with the calculations using the Colorado curve (2.62 mean depth; 0.0036 ft/ft channel slope), also supporting a relatively stable channel with a potential for aggradation. A summary of the sediment competence calculations for Site 10 is presented in Exhibit I-5 in Appendix I.

2.7.5 Hydrologic and Hydraulic Assessment

Bankfull Discharge

The bankfull discharge (Q_{bkf}) for Sandburg Creek in Site 10 was estimated using bankfull indicators observed in the field and discharge estimates generated in USGS' StreamStats program. Bankfull field indicators and features defining channel dimensions, slope, and relative roughness that were incorporated in the estimation process in the Rivermorph software using Friction Factor/Relative Roughness (u/u*), the Limerinos equation, and the Darcy–Weisbach Equation. Four bankfull discharge estimates were generated using the average bankfull channel characteristics from cross-section #3. These values ranged from 703 cfs to 800 cfs, with an average bankfull discharge of 764 cfs. A summary of these discharge calculations is presented in Exhibit I-6 in Appendix I.

The StreamStats program applies regional regression equations to the drainage area of a specific point on a stream to generate a range of storm flows, including the bankfull storm. The drainage area (DA) of Sandburg Creek in Site 10 was identified by StreamStats as 40.5 square miles is size. The regression equation used to calculate bankfull discharge by drainage area in Region 4 is:

$$117.2*(DA)^{0.780}$$

Using this equation, the bankfull discharge based on the 40.5 sq mi drainage area was calculated to be 2102 cfs, as reported in StreamStats (2,100 cfs), with prediction intervals ranging from 375 to 11,800 cfs. StreamStats output is presented in Exhibit I-7 in Appendix I.

StreamStats also generated discharges for a range of storm events based on the drainage area of the project site and an unregulated condition. Table 2-5 summarizes the reported flows for the various storm events.

Table 2-5: StreamStats Flood Frequency Analysis for Sandburg Creek (Site 10)	
Storm Frequency	Discharge (cfs)
1.25-year	982
1.5-year	1,210
2-year	1,550
5-year	2,570
10-year	3,450
25-year	4,760
50-year	5,890
100-year	7,160

The frequency of occurrence of a bankfull storm event varies, but is typically associated with a 1.25 to 2 year storm. The USGS (Mulvihill et al., 2009) reported the bankfull discharge to closely approximate the 2-year storm in USGS Region 3, which includes the project area, but can range between the 1.25-year and 3.25-year storm events. A summary of the bankfull discharges evaluated to determine the design bankfull discharge for the project are provided in Table 2-6.

Table 2-6: Summary of Evaluated Bankfull Discharges (Site 10)					
	Rivermorph Estimate from Stream Features at Cross-Section 3	StreamStats Bankfull	StreamStats 1.25-Yr Storm	StreamStats 1.5-Yr Storm	StreamStats 2-Yr Storm
Discharge (cfs)	764	2,100 (375 – 11,800)	982	1,210	1,550

The bankfull discharge represents the most accurate estimate of site-specific discharge due to the use of observed and measured features that define the parameters that are used to calculate discharge. Four different empirical methods were applied to the site features and the results were consistent, and consistently lower than the StreamStats output. Although there is some uncertainty in the field-derived features, there is a high degree of confidence in the bankfull indicators and elevations measured in the field that were used to calculate bankfull discharge.

Therefore, the design for the restoration of Sandburg Creek at Site 10 will use the 764 cfs derived from site features and empirical equations.

HEC-RAS Modeling

The USGS HEC-RAS model is typically used to validate the bankfull discharge estimate by running the bankfull discharge through the surveyed channel dimensions and topography to compare the elevation of the bankfull storm in the channel to the field-identified bankfull features. Bankfull is typically field identified by interpreting major breaks in the bank slope that were created by bankfull storm events. Since channel topography has not yet been surveyed due to high water conditions, the HEC-RAS model cannot be run to evaluate/verify bankfull discharge. Once channel survey is completed, the model will be run and the identified bankfull discharge will be evaluated and confirmed or revised.

2.8. Site 12: Sandburg and Roundout Creeks at Airport Road

2.8.1. Site Description

Roundout Creek enters Site 12 near Airport Road, approximately 2500' upstream of the confluence with the Sandburg Creek. This confluence, east of Airport, exhibits sediment deposition conditions and has compromised free discharge from principal airport culvert to Sandburg Creek. (Figure 8)

Figure 8: Sandburg and Roundout Creeks at Airport Road

2.8.2. Site Soils

Soils data obtained from the NRCS Web Soil Survey was used to determine the types of soils mapped within the site limits. The soils mapping for Site 12 is presented in Appendix J. The soil type mapped within Site 12 is Suncook loamy fine sand (Su). The parent material for this soil type is sandy alluvium derived mainly from varying amounts of sandstone, conglomerate, granite, gneiss and quartzite. Soils are excessively drained with the restrictive layer at depths of more than 80 inches. Slopes range from 0 to 3%.

2.8.3. Channel Assessment

B&L performed field work for the channel assessment in May 2018 to define the current characteristics of the stream channel. It was observed that sediment deposition has compromised free discharge from principal airport culvert to Sandburg Creek. It was also observed that a stump measuring approximately 60" in diameter is causing disruption to the stream's flow.

2.9. Site 13: Fallsview Well House

2.9.1. Site Description

This stream segment is impacted by the delivery of large quantities of sediment from the adjoining South Gully, which meets Sandburg Creek at the upper limit of the project reach. Existing conditions exhibit evidence of significant channel braiding and avulsion attributable to the deposition of large volumes of bedload, most likely derived from bed and bank erosion from South Gully. Over-widening of the channel has occurred immediately adjacent to the location of the existing pump houses, reducing sediment transport capability and promoting continued deposition of sediment as a result of the increased width/depth ratio. Furthermore, lateral migration of the right channel braid has vastly accelerated erosion of the right bank and threatens the longevity of the recently retrofitted pump houses that are perched atop this actively-eroding streambank (Figure 9)

Figure 9: Fallsview Well House

2.9.2. Soils Data

Soils data obtained from the NRCS Web Soil Survey was used to determine the types of soils mapped within the project site limits. The only soil type mapped within the project area of Site 13 is Middlebury silt loam (Mr). Middlebury soils consist of very deep,

moderately well drained nearly level soils formed in recent alluvium. This soil occurs on floodplains and exhibit moderate permeability in the surface layer, subsoil, and upper part of the substratum, and rapid or moderately rapid in the lower part of the substratum. Slope ranges from 0 to 3%.

2.9.3. Site Survey

B&B performed a topographic survey of the site in 2018, but was unable to collect channel bathymetry due to high water levels. A 1-foot interval contour map of the project site was prepared and is presented as Sheet 901 in the Drawing Set. B&L performed field work for a geomorphic assessment in May 2018 that included surveying three riffle cross-sections and a longitudinal profile of the channel thalweg through the project reach to define the current morphological characteristics of the stream channel. Channel cross-sections are used to identify channel characteristics and dimensions based upon the bankfull water elevation determined from field observations of topographic breaks in the channel banks. The locations of the cross-sections and the stream stationing for the long profile are shown on Sheet 901 in the Drawing Set. The cross-sections and longitudinal profile are provided in Exhibit K-1 in Appendix K.

The longitudinal profile surveyed through Sandburg Creek in the project area included the portion of the channel downstream of South Gully for a distance of 760 ft to the head of a riffle. The longitudinal profile indicated a bankfull water surface slope of 0.005 ft/ft. Four riffles and four pools were identified in the project reach. Riffle lengths ranged from 18 ft to 39 ft (Avg. 28 ft), and riffle spacing ranged from 99 ft to 373 ft (193 ft avg). Pool lengths ranged from 33 ft to 234 ft (avg 107 ft), and pool spacing ranged from 27 ft to 172 ft (104 ft avg). Pool depths ranged from 2.0 ft to 4.4 ft (avg 2.9 ft) below the water surface elevation. Data summaries and a graphical presentation of the longitudinal profile are provided in Exhibit K-2 in Appendix K.

Channel dimensions and features identified from the three riffle cross sections collected during the geomorphic assessment are summarized in Table 2-7.

Table 2-7: Cross Section Summary (Site 13)

Riffle Cross Sections	Bankfull Width (ft)	Mean Bankfull Depth (ft)	Max Bankfull Depth (ft)	Bankfull Cross Sectional Area (sq ft)
1	73.8	1.78	4.04	131.7
2	60.1	2.1	2.7	126.2
3	61	1.91	3.09	116.5
Average	65.0	1.93	3.3	124.8

2.9.4. Geomorphic Assessment

Pebble Counts / Bar Samples

Geomorphic assessment of the project site included collection of pebble count data from one riffle and bar sample particle size distribution from one point bar for sediment competence calculations. Pebble count and bar sample data were collected during field efforts in May 2018. Riffle substrate particle distribution exhibited a D_{50} of 91 mm and D_{84} of 159 mm. The bar sample particle distribution exhibited a D_{50} of 15 mm and D_{84} of 56 mm. Pebble count and bar sample results are provided in Exhibit K-3 of Appendix K and the sample locations are shown on Sheet C-901.

Stream Classification

Planimetric and geometric data collected from Sandburg Creek were used to classify the stream using the stream classification methodology developed by Rosgen (1996). The classification was based on field-identified channel characteristics and discharge data generated by USDA's StreamStats program. Using average values obtained from the three riffle cross sections established on the site, Sandburg Creek at Site 13 was classified as an F3 stream. F3 streams are cobble dominated, entrenched, meandering channels that are deeply incised in gentle terrain. The top of bank elevations are typically much greater than the bankfull elevation, resulting in the entrenched classification. The incised condition of the F3 stream results in the abandonment of the floodplain. These streams normally develop riffle/pool bed features and have high width/depth ratios. F3 streams are not stable due to the lack of interaction with the floodplain, which concentrates storm flows within the channel and results in lateral erosion (high width/depth ratio) and incision (further extending the

disconnection from the floodplain). The stream classification worksheet is provided in Exhibit K-4 of Appendix K.

Shear Stress & Sediment Competence

Geomorphic assessment of the project site utilizes pebble count data from riffle features and gravel bars for sediment competence calculations to characterize bedload available to the stream through the project reach. The site-specific particle sizes, segment slope (0.005 ft/ft) and mean depth (1.9 ft) were used to calculate a dimensionless shear stress of 0.017, which indicated a mean water depth of 1.5 ft and a channel slope of 0.0039 ft/ft were required to mobilize bed material. The similarity of these calculated water depth and channel slope values to the actual site parameters indicates a stable channel (capable of moving its sediment without significant degradation or aggradation. These calculations were also done using dimensional shear stress and the results were consistent with the calculations using the Colorado curve (1.34 ft mean depth; 0.0035 ft/ft channel slope), also supporting a stable channel conclusion. A summary of the sediment competence calculations for Site 13 is presented in Exhibit K-5 in Appendix K.

2.9.5. Hydrologic and Hydraulic Assessment

Bankfull Discharge

The bankfull discharge (Q_{bkf}) for Sandburg Creek in the project area was estimated using bankfull indicators observed in the field and discharge estimates generated in USGS' StreamStats program. Bankfull field indicators and features defining channel dimensions, slope, and relative roughness that were incorporated in the estimation process in the Rivermorph software using Friction Factor/Relative Roughness (u/u*), Roughness Coefficient assuming Manning's 'n' based upon stream type, Roughness Coefficient assuming Manning's 'n' from Jarrett (USGS), the Limerinos equation, and the Darcy–Weisbach Equation. Five bankfull discharge estimates were generated using the average bankfull channel characteristics from the cross-sections. These values ranged from 643 cfs to 856 cfs, with an average bankfull discharge of 787 cfs. A summary of these discharge calculations is presented in Exhibit K-6 in Appendix K.

The StreamStats program applies regional regression equations to the drainage area of a specific point on a stream to generate a range of storm flows, including

the bankfull storm. The drainage area (DA) of Sandburg Creek in the project area was identified by StreamStats as 49.7 square miles is size. The regression equation used to calculate bankfull discharge by drainage area in Region 3 is:

$$117.2*(DA)^{0.780}$$

Using this equation, the bankfull discharge based on the 49.7 sq mi drainage area was calculated to be 2,467 cfs, as reported in StreamStats (2,470 cfs), with prediction intervals ranging from 418 to 14,500 cfs. StreamStats output is presented in Exhibit K-7 in Appendix K.

StreamStats also generated discharges for a range of storm events based on the drainage area of the project site and an unregulated condition. Table 2-8 summarizes the reported flows for the various storm events.

Table 2-8: StreamStats Flood Frequency Analysis for Sandburg Creek (Site 13)

Storm Frequency	Discharge (cfs)
1.25-year	1,230
1.5-year	1,510
2-year	1,930
5-year	3,190
10-year	4,270
25-year	5,870
50-year	7,250
100-year	8,800

The frequency of occurrence of a bankfull storm event varies, but is typically associated with a 1.25 to 2 year storm. The USGS (Mulvihill et al., 2009) reported the bankfull discharge to closely approximate the 2-year storm in USGS Region 3, which includes the project area, but can range between the 1.25-year and 3.25-year storm events.

A summary of the bankfull discharges evaluated to determine the design bankfull discharge for the project are provided in Table 2-9.

Table 2-9: Summary of Evaluated Bankfull Discharges (Site 13)					
	Rivermorph Estimate from Stream Features at Cross-Section 3	StreamStats Bankfull	StreamStats 1.25-Yr Storm	StreamStats 1.5-Yr Storm	StreamStats 2-Yr Storm
Discharge (cfs)	787	2,470 (418 – 14,500)	1,230	1,510	1,930

The bankfull discharge represents the most accurate estimate of site-specific discharge due to the use of observed and measured features that define the parameters that are used to calculate discharge. Five different empirical methods were applied to the site features and the results were consistent, and consistently lower than the StreamStats output. Although there is some uncertainty in the field-derived features, there is a high degree of confidence in the bankfull indicators and elevations measured in the field that were used to calculate bankfull discharge. Therefore, the design for the restoration of Sandburg Creek at Site 13 will use the 787 cfs derived from site features and empirical equations.

HEC-RAS Modeling

The USGS HEC-RAS model is typically used to validate the bankfull discharge estimate by running the bankfull discharge through the surveyed channel dimensions and topography to compare the elevation of the bankfull storm in the channel to the field-identified bankfull features. Bankfull is typically field identified by interpreting major breaks in the bank slope that were created by bankfull storm events. Since channel topography has not yet been surveyed due to high water conditions, the HEC-RAS model cannot be run to evaluate/verify bankfull discharge. Once channel survey is completed in Spring 2019, the model will be run and the identified bankfull discharge will be evaluated and confirmed or revised.

3.0 PROPOSED DESIGN

3.1. Site 1: West Branch Beer Kill at Old Greenfield Rd

3.1.1. Project Objectives & Constraints

Aggrading conditions induced by deposition of sediment from upstream bed and bank erosion have contributed to channel avulsion and repetitive flooding of the residential property located along the right bank (south side of channel). Width/depth ratio is too high through this upper segment of the proposed project reach, likely contributing to future channel widening and impacts to the right streambank. Through the lower portion of this site, the channel has been pinned along the left bank against the existing roadway embankment. Construction of a sizeable gravel berm along the right bank contributes to confinement of flood flows and high erosion hazard along the roadway embankment.

3.1.2. Design Components

To alleviate these issues it is proposed to regrade the existing channel cross section in this area to establish an appropriately sized single thread channel. Rock cross vanes will be utilized throughout the regraded portion of the channel to maintain appropriate thalweg and grade control. A vegetated floodplain bench will be constructed at bankfull elevation along the right channel to provide overbank flood protection for the previously flooded property to the south side of the channel. The conceptual restoration design is illustrated on Sheet C-102 in Appendix A. The design remains conceptual since survey is not yet complete for the channel, and actual dimensions and elevations cannot yet be identified.

Based on information collected to date, the preliminary design for the restored channel in Site 1 will be similar to the dimensions summarized in Table 3-1.

Table 3-1: Preliminary Design Channel Dimensions (Site 1)

Bankfull Width (ft)	Mean Bankfull Depth (ft)	Max Bankfull Depth (ft)	Bankfull Cross Sectional Area (sq ft)
90	5	7.3	500

3.1.3. Hydraulic Modeling

Once the channel dimensions, channel location, structure locations, and structure dimensions are finalized upon receipt of the channel survey, the HEC-RAS model will be run to evaluate the ability of the restored channel to convey the bankfull storm at the designed top of bank, and if the water elevation of a 100-year storm remains similar or is lower compared to the pre-restoration elevation. Design channel dimensions of width and depth can be revised until the model confirms that the design conveys the bankfull storm at the appropriate elevation.

3.1.4. Excavation and Grading

The new topographic surface created by the restored channel and floodplain design will be overlaid over the pre-disturbance topography of Site 1 to determine the amount of cutting and filling that will be required to attain the design conditions. This information is useful in determining if additional fill will be required to be imported or if a locations will need to be identified for the disposal of excess material. This information will be developed upon receipt of the survey information for the channel and finalization of the design.

3.2. Site 2: West Branch at Barbara Rd Bridge

3.2.1. Project Objectives & Constraints

The overall goal at this site is to slow and control stream flow in order to prevent further erosion along the southern edge of Old Greenfield Road. In addition to controlling the stream's flow, the slope along Old Greenfield Road will be shored up to ensure longevity at this site. Due to its designation as a trout stream, this site, as with all other sites involved in this project, will have a time restriction where work can only be performed between May 1 and September 30. During the pre-application meeting NYSDEC indicated a concern for the cross-vanes then proposed that span across the width of the stream. Based on these concerns we have proposed to utilize stream barbs on the Old Greenfield road side that do not disturb the entire width of the stream.

3.2.2. Design Components

It is proposed to construct a cross vane just downstream of the Barbara Road Bridge to maintain bed grade and protect the bridge foundation from flood flows that have partially scoured its footings. Existing gabion baskets near the bridge will be retained. Existing rock revetment wall will be extended along the left bank adjacent to Old Greenfield Road. Two stream barbs are also proposed. Refer Sheet C-201 in Appendix A.

3.2.3. Excavation and Grading

Site 2 will only see full width stream bed excavation for the installation of a proposed cross vane downstream of the bridge. It will also see localized excavation and grading along the southern edge of Old Greenfield Road at the toe of slope and along the slope itself for the purpose of setting rock structures and minimizing disturbance.

3.3. Site 3: West Branch Beer Kill

3.3.1. Project Objectives & Constraints

The overall goal at this site is to slow and control stream flow in order to prevent further erosion along the southern edge of Old Greenfield Road. Due to the nature of the stream's flow, the bank is experiencing some severe erosion that, if left uninterrupted, will cause major issues to the roadway. By managing the streams flow and shoring up the slope, the site will be greatly improved for years to come. Due to its designation as a trout stream, this site, as with all other sites involved in this project, will have a time restriction where work can only be performed between May 1 and September 30.

During the pre-application meeting NYSDEC indicated a concern for the cross-vanes then proposed that span across the width of the stream. Based on these concerns we have proposed to utilize stream barbs on the Old Greenfield road side that do not disturb the entire width of the stream.

3.3.2. Design Components

10 stream barbs are proposed to be constructed along the stream bank adjacent to Old Greenfield Road to control flood flows as well as help protect the roadway embankment. Isolated areas of randomly placed boulders are proposed at the toe of slope to provide additional stability and control of stream energy. Refer Sheet C-301 in Appendix A.

3.3.3. Excavation and Grading

Site 4 will see localized excavation and grading at the toe of the slope at strategic areas along the southern edge of Old Greenfield Road, as well as along the slope itself. This will allow for the setting of rock structures to protect the toe of slope and minimizing disturbance.

3.4. Site 4: West Branch Beer Kill

3.4.1. Project Objectives & Constraints

The overall goal at this site is to slow and control stream flow in order to prevent further erosion along the southern edge of Old Greenfield Road. Due to the stream flowing directly at Old Greenfield Road, the bank is experiencing some severe erosion that, if left uninterrupted, will cause major issues to the roadway. By managing the streams flow and shoring up the slope, the site will be greatly improved for years to come. Due to its designation as a trout stream, this site, as with all other sites involved in this project, will have a time restriction where work can only be performed between May 1 and September 30.

During the pre-application meeting NYSDEC indicated a concern for the cross-vanes then proposed that span across the width of the stream. Based on these concerns we have proposed to utilize stream barbs on the Old Greenfield road side that do not disturb the entire width of the stream.

3.4.2. Design Component

Multiple cross vanes are proposed to be installed to prevent the excessive sediment deposition that currently causes the migration of meander toward the adjacent roadway embankment. The cross vanes will also aide in enhancing grade control and a single thread channel through this problem area. Refer Sheet C-401 in Appendix A.

3.4.3. Excavation and Grading

Site 4 will see localized excavation and grading at the toe of the slope along the southern edge of Old Greenfield Road, as well as along the slope itself. This will allow for the setting of rock structures to protect the slope and strategic spacing and tree preservation to extent possible to minimize disturbance.

3.5. Site 5: West Branch Beer Kill

3.5.1. Project Objectives & Constraints

The overall goal at site 5 is to slow and control stream velocity in order to prevent further erosion along the southern edge of Old Greenfield Road. Due to the stream energy directed against Old Greenfield Road, the bank is experiencing some severe erosion that, if left uninterrupted, will cause major issues to the roadway. By managing the streams flow and stabilizing the toe of slope, the site will be greatly improved. Due

to its designation as a trout stream, this site, as with all other sites involved in this project, will have a time restriction where work can only be performed between May 1 and September 30.

During the pre-application meeting NYSDEC indicated a concern for the cross-vanes then proposed that span across the width of the stream. Based on these concerns we have proposed to utilize stream barbs on the Old Greenfield road side that do not disturb the entire width of the stream.

3.5.2. Design Components

Stream barbs will be installed at strategic locations within this area to establish grade control and provide transition to the existing channel. This also encourages the stream to maintain a single thread channel thought the upper portion of the area as well. Approximately 550 LF of rock toe revetment will be installed at the base of the roadway embankment to reduce scouring of the embankment. Randomly placed boulders will be placed all along the stream bank to protect the roadway embankment and establish grade control throughout. Refer Sheet C-501 in Appendix A.

3.5.3. Excavation and Grading

Site 5 will see localized excavation and grading at the toe of the slope along the southern edge of Old Greenfield Road, as well as along the slope itself. This will allow for the setting of rock structures to protect the slope and minimizing disturbance.

3.6. Site 8: Sandburg Creek at Roslyn Street Pump Station

3.6.1. Project Objectives & Constraints

The overall goal at site 8 is to slow and control stream flow in order to prevent any damage to an existing force main that crosses the stream at this location. Since the objective at this site is to promote the longevity of the existing force main, it will be important that work crews exercise extreme caution when operating equipment at this site to ensure no damage to the main occurs.

3.6.2. Design Components

The installation of a cross vane immediately downstream of the sewer main crossing is proposed to maintain grade control and prevent future exposure of the pipe. Refer Sheet C-601 in Appendix A.

3.6.3. Excavation and Grading

Site 2 will see full width stream bed excavation for the installation of a proposed cross vane.

3.7. Site 10: Sandburg Creek at Hang Glider Road

3.7.1. Project Objectives & Constraints

Natural channel design will be utilized at Site 10 to design an appropriate planform for the channel upstream of the bridge crossing that allows for better alignment with the bridge to reduce floodwater backup and overtopping of Hang Glider Road. Aspects of the design, based upon an understanding of stable channel planform, cross section and slope characteristics, will include reclaiming eroded bank areas through construction of floodplain benches; utilizing rock cross vanes to maintain the realigned planform, establishing bed elevation control and stable bed feature (riffle/pool) spacing; and placing rock and root wad / toe wood revetment along portions of the stream bank to prevent lateral bank erosion. As the design for this site progresses, the size of the Hang Glider Road bridge crossing will be evaluated for effectiveness at passing the design storm event. If the crossing is found to be undersized, recommendations may be made to replace the bridge, or add conveyance through the installation of a culvert in the floodplain of the Creek through the western roadway bridge approach.

3.7.2. Design Components

Design for the restoration/stabilization of Sandburg Creek at Site 10 involves some channel relocation to soften bend angles, grading the areas adjacent to the channel to create an interactive floodplain, installing cross vanes to anchor the bed elevation and to direct flow into the center of the channel away from currently eroding banks, and installing structures at critical locations along the bank to stabilize actively eroding banks and improve fish habitat. Refer Sheet C-802 in Appendix A for a conceptual stream restoration plan. Details of the locations and dimensions of these structures will be finalized in the subsequent design report utilizing the stream channel survey data to finalize the design.

Based on information collected to date, the channel in Site 10 will be constructed in the project reach to similar dimensions summarized in Table 3-2.

Table 3-2: Preliminary Design Channel Dimensions (Site 10)

Bankfull Width (ft)	Mean Bankfull Depth (ft)	Max Bankfull Depth (ft)	Bankfull Cross Sectional Area (sq ft)
60	2.21	3.53	144.6

3.7.3. Hydraulic Modeling – Proposed

Once the channel dimensions, channel location, structure locations, and structure dimensions are finalized upon receipt of the channel survey, the HEC-RAS model will be run to evaluate the ability of the restored channel to convey the bankfull storm at the designed top of bank, and if the water elevation of a 100-year storm remains similar or is lower compared to the pre-restoration elevation. Design channel dimensions of width and depth can be revised until the model confirms that the design conveys the bankfull storm at the appropriate elevation.

Excavation and Grading - Proposed

The new topographic surface created by the restored channel and floodplain design will be overlaid over the pre-disturbance topography of Site 10 to determine the amount of cutting and filling that will be required to attain the design conditions. This information is useful in determining if additional fill will be required to be imported or if a locations will need to be identified for the disposal of excess material. This information will be developed upon receipt of the survey information for the channel and finalization of the design.

3.8. Site 12: Sandburg and Roundout Creeks at Airport Road

3.8.1. Project Objectives & Constraints

Site 12 stump removal operations are required to work from the streambank on the south side and not enter the stream itself with construction equipment.

3.8.2. Design Components

Remove stump via skidding out of streambed and remove from site entirely. See Sheet C-801 in Appendix A.

3.8.3. Excavation and Grading

Minimal to none. Contractor can access streambed and remove any rutting from skidding stumps with hand-tools or long reach excavator from south bank.

3.9. Site 13: Fallsview Well House

3.9.1. Project Objectives & Constraints

Site 13 will be restored and stabilized using natural channel design applications to appropriately size a single thread channel through the over-widened portion of this reach. Following the design of channel dimensions, adjacent former channel areas will be graded to create and vegetate interactive floodplains along the left and right banks through the restored reach. Instream structures, consisting of a rock cross vane and constructed riffles will be utilized to maintain the dimensions of the single-thread channel, reduce the risk of streambank erosion and/or avulsion across the newly reconstructed floodplain, maintain suitable grade control through the project reach, and enhance instream habitat values associated with the stream resource.

The most critical aspect of the project will be restoration of an appropriate channel cross-section, profile and planform to allow for transport of significant sediment loads, delivered from South Gully to this segment of the Sandburg Creek during high-water events, without attributing to channel aggrading or degrading. Secondly, the development of an extensive, vegetated floodplain between the restored channel and the pump houses will provide an additional element of protection from damages associated with lateral meander migration, streambank erosion, and bank failure.

3.9.2. Design Components

Design for the restoration/stabilization of Sandburg Creek at Site 13 involves the narrowing of the channel to its stable dimensions, grading the areas adjacent to the channel to create an interactive floodplain, constructing riffles for grade control, and installing structures in the floodplain to prevent development of secondary channels. In addition a cross vane will be installed just downstream of the confluence with South Gully to direct flow into the center of the channel and protect the outer (left looking downstream) bank from erosion from stormwater entering from South Gully. Refer Sheet C-902 in Appendix A for a conceptual stream restoration plan. Details of the locations and dimensions of these structures will be provided in the subsequent design report utilizing the stream channel survey data to finalize the design. Based on information collected to date, the channel will be constructed to similar dimensions to stable riffle features in the project reach, as summarized in Table 3-3.

Table 3-3: Preliminary Channel Dimensions (Site 13)

Bankfull Width (ft)	Mean Bankfull Depth (ft)	Max Bankfull Depth (ft)	Bankfull Cross Sectional Area (sq ft)
65.0	1.9	3.3	124.8

3.9.3. Hydraulic Modeling - Proposed

Once the channel dimensions, channel location, structure locations, and structure dimensions are finalized upon receipt of the channel survey, the HEC-RAS model will be run to evaluate the ability of the restored channel to convey the bankfull storm at the designed top of bank, and if the water elevation of a 100-year storm remains similar or is lower compared to the pre-restoration elevation. Design channel dimensions of width and depth can be revised until the model confirms that the design conveys the bankfull storm at the appropriate elevation.

3.9.4. Excavation and Grading – Proposed

The new topographic surface created by the restored channel and floodplain design will be overlaid over the pre-disturbance topography of Site 13 to determine the amount of cutting and filling that will be required to attain the design conditions. This information is useful in determining if additional fill will be required to be imported or if a locations will need to be identified for the disposal of excess material. This information will be developed upon receipt of the survey information for the channel and finalization of the design.

4.0 REGULATORY REQUIREMENTS

4.1. Jurisdictional Water Resources

This project is located within the Lower Hudson River (Rondout River, Rondout Creek, and Wallkill River watershed - 6 NYCRR Part 855) recognized under Title 6, Chapter 10 in the New York Codes, Rules, and Regulations (NYCRR). The project will occur at 9 sites along four stream resources mapped within the Lower Hudson River Drainage Basin. The site number, waterway, stream classification, nearest roadway, and municipality are detailed in Table 4-1.

Table 4-1: Jurisdictional Water Resources

Site #	Name and Waters Index Number	Class	Nearest Road	Municipality
1	West Branch Beer Kill, H-139-14-38-3-1	B(TS)	Old Greenfield Road @ Kuhlman Drive	Town of Wawarsing
2	West Branch Beer Kill, H-139-14-38-3-1	B(TS)	Old Greenfield Road @ Barbara Road	Town of Wawarsing
3	West Branch Beer Kill, H-139-14-38-3-1	B(TS)	Old Greenfield Road	Town of Wawarsing
4	West Branch Beer Kill, H-139-14-38-3-1	B(TS)	Old Greenfield Road	Town of Wawarsing
5	West Branch Beer Kill, H-139-14-38-3-1	B(TS)	Old Greenfield Road	Town of Wawarsing
8	Sandburg Creek, H-139-14-38	B(T)	Roslyn Street	Village of Ellenville
10	Sandburg Creek, H-139-14-38	B(TS)	Hang Glider Road	Town of Wawarsing
12	Rondout Creek, H-139-14	B(T)	Airport Road	Town of Wawarsing
13	Sandburg Creek, H-139-14-38	B(T)	Private Drive (Fallsview Well House)	Town of Wawarsing

4.2. Wetlands

Desktop reviews of available freshwater wetland mapping resources were completed for the project area. No wetlands mapped by the New York State Department of Environmental Conservation (NYSDEC) are present within or adjacent to the project area. A review of U.S. Fish and Wildlife Service National Wetland Inventory (NWI) mapping identified no areas of wetland within the project location sites. A site visit was performed by B&L on December 12, 2018 to evaluate wetland presence and to characterize the wildlife habitat of the project area. No wetland resources were identified during the field delineation effort.

4.3. Threatened and Endangered Species

4.3.1. United States Fish and Wildlife Service

The United States Fish and Wildlife Services' (USFWS') Information for Planning and Consultation site (IPaC) reported three threatened or endangered species: the threatened northern long-eared bat (NLEB) (Myotis septentrionalis), the endangered Indiana bat (IBat) (Myotis sodalis), and the threatened bog turtle (Clemmys muhlenbergii). In accordance with the 2016 USFWS' Range-wide Indiana Bat Summer Survey Guidelines (this document also applies to NLEBs), suitable roosting and foraging habitat for the IBat and NLEB includes mixed age stands of trees greater than 3 inches diameter at breast height (DBH), with foraging habitat frequently containing areas of open water or open travel corridors. Man-made structures such as bridges also provide suitable habitat. These habitat requirements were observed within and adjacent to the proposed project area. Any necessary tree clearing is proposed to occur outside of the Conservation Cutting Window and therefore impacts to this species will occur. Tree clearing will be minimized to the maximum extent practicable at each site.

The bog turtle prefers spring-fed wetlands with deep, soft "mucky" organic soils, into which they can burrow. Suitable habitat often also contains tussock-forming herbaceous vegetation dominated by various sedge species. No wetlands were identified within or immediately adjacent to the limits of the proposed project corridor. In accordance with the FHWA Species – Specific Key for Bog Turtle, the assumption is being made that bog turtle habitat does not exist within or adjacent to the project corridor.

4.3.2. New York State

The NYSDEC ERM reported no rare species, but did make note of a significant natural community around Sites #6 - #13: chestnut oak forest. This community was also reported by the New York Nature Explorer. The sites selected for stabilization are not located within forested areas and therefore no impact will occur to this resource.

The New York State Breeding Bird Atlas (BBA) reported eight NYS species of special concern, listed in Table 4-2.

Table 4-2: Breeding Bird Atlas (BBA) Identified Species

Common Name	Scientific Name	NY Status
Red-shouldered hawk	Buteo lineatus	Protected-Special Concern
Grasshopper sparrow	Ammodramus savannarum	Protected-Special Concern
Whip-poor-will	Caprimulgus vociferus	Protected-Special Concern
Osprey	Pandion haliaetus	Protected-Special Concern
Sharp-shinned hawk	Accipiter striatus	Protected-Special Concern
Cooper's hawk	Accipiter cooperii	Protected-Special Concern
Northern goshawk	Accipiter gentilis	Protected-Special Concern
Golden-winged warbler	Vermivora chrysoptera	Protected-Special Concern

It is possible that any of these species would utilized the project sites and adjacent areas. However, beyond temporary construction disturbance, no impacts will occur to the habitat quality or species itself. Post construction, the streams will function better ecologically and may benefit certain of the species listed above due to improved habitat.

The GOSR is currently coordinating with USFWS to achieve concurrence determinations in support of the project and all such information will be included in the GOSR provided Environmental Clearance Package.

4.4. Historical and Archeological Resources

The GOSR coordinated with New York State Office of Parks, Recreation, and Historic Preservation's (NYSOPRHP) State Historic Preservation Office (SHPO) to determine the projects potential impact on cultural resources. Coordination is ongoing to achieve impact determinations in support of the project and all such information will be included in the GOSR provided Environmental Clearance Package.

4.5. Permit Requirements

The anticipated permitting requirements are presented on Table 4-3

Table 4-3: Permitting Requirements

Site Number	Permits Anticipated
1 - West Branch at Old Greenfield Rd	• Protection of Waters Permit (NYSDEC) • Time Restriction for cold water trout fisheries (Oct 1st – April 30th) (Able to work in stream May 1st – Sept. 30th) • Time Restriction for tree clearing (tree removal to be between November 1st to March 31st) • Article 15 Stream Disturbance Permit • USACOE Section 404 Clean Water Act • NYSDEC Section 404 Water Quality Certification
2 - West Branch at Barbara Rd Bridge	• Protection of Waters Permit (NYSDEC) • Time Restriction for cold water trout fisheries (Oct 1st – April 30th) (Able to work in stream May 1st – Sept. 30th) • Article 15 Stream Disturbance Permit • USACOE Section 404 Clean Water Act • NYSDEC Section 404 Water Quality Certification
3, 4, 5 - West Branch Upstream of Barbara Rd Bridge	• Protection of Waters Permit (NYSDEC) • Time Restriction for cold water trout fisheries (Oct 1st – April 30th) (Able to work in stream May 1st – Sept. 30th) • Article 15 Stream Disturbance Permit • USACOE Section 404 Clean Water Act • NYSDEC Section 404 Water Quality Certification
8 - Sandburg Creek at Roslyn St. PS	• Protection of Waters Permit (NYSDEC) • Time Restriction for cold water trout fisheries (Oct 1st – April 30th) (Able to work in stream May 1st – Sept. 30th) • Article 15 Stream Disturbance Permit • USACOE Section 404 Clean Water Act • NYSDEC Section 404 Water Quality Certification • Additional Evaluation for potential impacts on Timber Rattlesnake (NYSDEC), State Listed Species Permit
10 - Hang Glider Rd	• Protection of Waters Permit (NYSDEC) • Time Restriction for cold water trout fisheries (Oct 1st – April 30th) (Able to work in stream May 1st – Sept. 30th) • Time Restriction for tree clearing (tree removal to be between November 1st to March 31st) • Article 15 Stream Disturbance Permit • USACOE Section 404 Clean Water Act • NYSDEC Section 404 Water Quality Certification
12 - Roundout Creek at Resnick Airport	• Time Restriction for cold water trout fisheries (Oct 1st – April 30th) (Able to work in stream May 1st – Sept. 30th)
13 - (Fallsview Pump House)	• Protection of Waters Permit (NYSDEC) • Time Restriction for cold water trout fisheries (Oct 1st – April 30th) (Able to work in stream May 1st – Sept. 30th) • Additional Evaluation for potential impacts on Timber Rattlesnake (NYSDEC), State Listed Species Permit • Article 15 Stream Disturbance Permit • USACOE Section 404 Clean Water Act • NYSDEC Section 404 Water Quality Certification

5.0 PROJECT CONSTRUCTION AND IMPLEMENTATION

5.1. Construction Management

Upon completion of the 100% project site design, B&L will assist in preparing a bid package for advertisement to prospective contractors. The bid package will include construction documents, specifications, and contract drawings to support preparation of bids. Upon request, B&L can provide a list of qualified vendors specializing in slope stabilization and/or natural channel restoration work to distribute bid advertisements.

B&L will facilitate a pre-bid meeting onsite for prospective bidders of the work. The pre-bid meeting allows an opportunity for prospective bidders to review the site firsthand, and to as questions. Responses to questions will be prepared in the form of an Addendum to the advertisement, and would be distributed to all prospective bidders.

Prior to the commencement of work, a pre-construction meeting should be held onsite with the successful bidder. The purpose of the pre-construction meeting is to review prevailing site conditions, design standards, applicable permit conditions and constraints to be met in the construction process, construction sequencing, and erosion/sedimentation and stormwater control measures (such as channel dewatering and soil stabilization), as well as to review any questions or concerns held by the contractor. The pre-construction meeting is an opportunity to clearly identify site constraints (such as the need to maintain compatibility with other aspects of site design on the property) with the contractor prior to the start of work.

Various aspects of the natural stable channel design approach, including installation of the types of structures contained in a natural stream channel design, requires specialized knowledge and understanding of the concepts and theory behind the function of the constructed elements. It is our experience that this type of work requires close supervision by someone with natural stream channel design experience to ensure proper installation of the design, to ensure continuity of the stream system as the restoration work progresses, and to address field changes needed to adapt the design to unforeseen conditions on the site in a manner that remains consistent with other components of the river restoration design. In order for channels to function in a stable fashion post-construction, all components of the constructed channel must be properly installed with high attention to precision and seamlessly compatible with the adjoining landscape and other aspects of the design, so that the stream performs as a stable, integrated system. Additional aspects of construction inspection include addressing concerns from the Contractor, as needed, and to ensure continued compliance with permit conditions and mitigation measures to avoid impacts to adjacent jurisdictional resources.

B&L's natural channel design team, or its suitably qualified MWBE sub-consultant, will complete construction observation for this project. This individual will be familiar with natural channel design to ensure the proper installation of the designed structures and prescribed field

modifications. This individual will also be instrumental in ensuring that construction materials and techniques meet project specifications. Typically, this individual is routinely onsite during critical aspects of the construction process to provide support and technical assistance to the Contractor's equipment operator or full-time site construction manager/foreman.

5.2. Construction Sequence and Phasing/Timeline

The general sequence of construction will be as follows:

1) Mobilization
2) Tree removal will be in accordance with permit conditions
3) Install required E&S controls and dewatering bypass system
4) Beginning at the upper limit of the project reach, create relocated channel and install natural channel design elements. All construction activities associated with these elements shall progress in a continuous downstream direction.
5) Upon removal of dewatering bypass channel, perform remaining work outside of wetted stream channel to the elevations and grades specified. Install all specified plant/stabilization materials along all disturbed areas.
6) Complete all remaining aspects of site stabilization and plantings as necessary, including restoration of construction access road, staging areas, etc.
7) Demobilization

5.3. Dewatering

Realignment and reconstruction of channels will occur in a dewatered condition. The most appropriate approach to creating a dry work area is to divert water around individual work segments from upstream to downstream with piping that takes advantage of the existing grade to convey water by gravity. Using this method, the full cross-section and design floodplain/flood prone grades can be created and instream structures such as stream barbs and cross-vanes could be constructed in a dry environment. Dewatering will be limited to those areas which could be constructed within a few days to reduce the risk of conflict with a high-water event midway through construction of a given element.

Constructed elements built in the dry will be stabilized prior to removal of dewater elements and re-engagement of streamflow, both to ensure proper resiliency and function of the element as well as to reduce any associated erosion or sedimentation.

5.4. Erosion and Sediment Control

Specific Erosion and Sedimentation (E&S) controls applicable to this project will be shown in the Contract Drawings. Silt fencing will be installed around construction entrances, staging areas,

and work areas disturbing the ground surface. In addition, the groundwater pumping system will discharge potentially turbid water from work areas through filters and onto vegetated land for supplemental filtering before it eventually runs back into stream channels. E&S control will be specified on the Contract Drawings based on the requirements of the final design layout.

5.5. Re-Vegetation /Planting Plan

Plantings of native vegetation are a key component of the design for stream restoration projects. A planting table/plan for project sites will be included in the contract documentation. A native riparian seed mix will be applied to streambank and overbank areas in the immediate riparian corridor constructed or disturbed during implementation of the project. A cover crop of oats/cereal rye will also be prescribed in order to maximize the rate of vegetation establishment to protect and stabilize disturbed soils. Native live stake shrubs will be utilized along the constructed floodplain bench and overbank floodplains in non-agricultural areas. The embankment will be stabilized with a similar seed mix as used on the floodplain benches.

Objectives of the planting plan are to:

- Provide initial vegetative coverage of exposed/disturbed areas, both for the purpose of E&S control as well as to deter intrusion of invasive and non-native species into the recently-disturbed construction area.
- Enhance stability of the constructed/stabilized embankments, streambanks and floodplain benches
- Utilize native species plantings in the herbaceous and shrub strata, prescribing vegetation with suitable shade and moisture tolerances in the areas prescribed to maximize successful establishment and long-term vigor of plantings
- Utilize plantings to introduce root depth and density as contributions to long-term streambank stability.
- Promote establishment of native vegetation species that provide food and/or habitat values for native wildlife and pollinators monitoring plan.

5.6. Post-Construction Monitoring

The monitoring of stream restoration projects after their completion is an important aspect of ensuring the long-term success of such projects. The proposed natural stream channel design approach provides the initial framework for the river to return to a stable condition and function. Because streams are dynamic systems, newly-completed restoration projects typically experience a period of short-term adjustment to the reconfigured design form imposed upon it, namely in response to the first few high flow events to occur post-construction. Many times, these adjustments are reflected in minor, localized changes to the constructed channel

planform, cross-section, and/or profile. Commonly, these modifications occur within the range of design parameters identified for the restored segment of channel, meaning that although differing slightly from the design, the adjusted condition still reflects the stable condition. Occurrences such as an exceptionally-high streamflow event, unusually wet springtime conditions (including rain-over-snow runoff events), accumulations of sediment or woody debris, etc., can cause some physical aspects of the channel to deviate from the stable range of design parameters. If left unaddressed, these more extensive adjustments to post-construction flood events can ultimately threaten the stability and performance of the constructed channel and jeopardize the security of adjacent structures and elements of interest in close proximity to the stream. Periodic follow-up (post-construction) monitoring is used to evaluate stream conditions and trends in channel adjustment to the constructed form as well as compatibility of those changes to the acceptable (stable) range of design parameters.

Post-construction monitoring identifies any potential problem areas that may develop before they threaten the successful long-term performance of the channel, and help to develop adaptive modifications to correct these conditions, to fine-tune the stream to its optimal stable condition over the term of the monitoring period. Post-construction monitoring provides a tool for utilizing short-term adaptive maintenance to ensure long-term sustainability of the stable, restored river segment. Because effective sediment transport and enhanced vertical stability / grade control is a specific goal of many restoration projects, post-construction monitoring is typically geared toward evaluating field indicators of the prevailing sediment transport regime, establishing projected trends, and recommending adaptive measures if necessary to maximize sediment efficiency. A period of short-term post-construction monitoring is recommended for the purposes of maximizing performance and longevity of the stream realignment / restoration project, particularly in regard to long-term project objectives. Post-construction monitoring and maintenance will be performed in accordance with the conditions included in state and federal regulatory permits obtained for each project.

6.0 COST ESTIMATE

The 60% Design Cost Estimate is presented in Table 6-1. At this stage of design, the construction estimates shown below include a 20% contingency.

Table 6-1: Opinion of Probable Cost

Site	60% Design Estimate	Remarks
1: West Branch Beer Kill at Old Greenfield Road	$ 520,000	Site survey mapping incomplete
2: West Branch Beer Kill at Barbara Road Bridge	$ 250,000	
3: West Branch Beer Kill at Old Greenfield Road	$ 290,000	
4: West Branch Beer Kill at Old Greenfield Road	$ 140,000	
5: West Branch Beer Kill at Old Greenfield Road	$ 180,000	
8: Sandburg Creek at Roslyn Street Pump Station	$ 70,000	
10: Sandburg Creek at Hang Glider Road	$ 550,000	Site survey mapping incomplete
13: Sandburg Creek at Fallsview Pump Houses	$ 410,000	Streambed survey incomplete
Construction Subtotal	**$ 2,410,000**	
Design, Permitting, and Bidding Services	$ 198,000	
Construction Administration Services	$ 49,400	
Construction Observation Services	$ 68,000	
Project Total	**$ 2,730,000**	

REFERENCES

1. Harman, W., R. Starr. 2011. Natural Channel Design Review Checklist. US Fish and Wildlife Service, Chesapeake Bay Field Office, Annapolis, MD and US Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, Wetlands Division. Washington, D.C. EPA 843-B-12-005.

2. Mulvihill, C.I., Baldigo, B.P., Miller, S.J., and Dekoskie, D. 2009. Bankfull Discharge and Channel Characteristics of Streams in New York State. U.S. Geologic Survey Scientific Investigations Report 2009-5144, 51 p.

3. United States Department of Agriculture (USDA). 2009. Engineering Field Handbook Part 650, Chapter 16, Wisconsin Supplement 580-13: Reference Reach Data-Average Values for Stable Streams. Natural Resource Conservation Service

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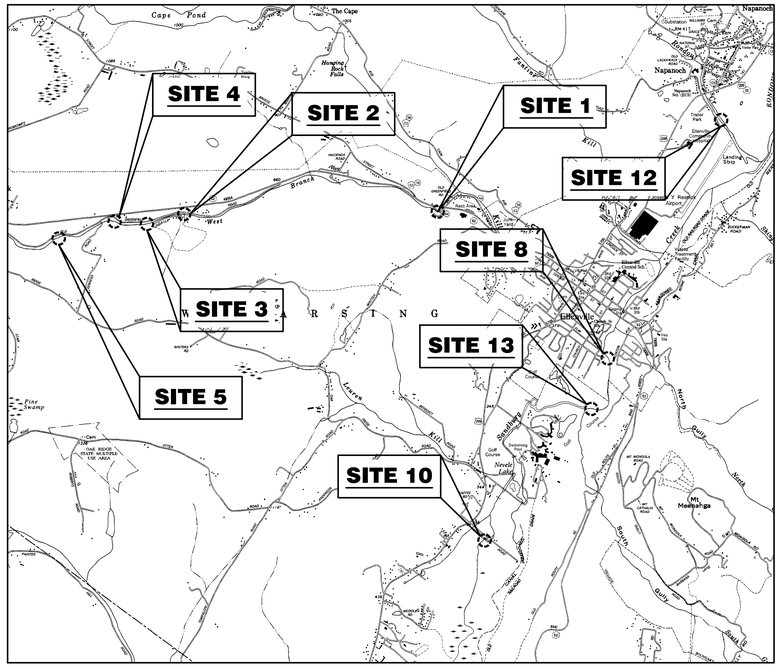
APPENDIX A

DESIGN DRAWINGS



PROJECT LOCATION PLAN

NOT TO SCALE

INDEX OF DRAWINGS

SHEET No.	TITLE
-	COVER SHEET
C001	GENERAL NOTES
C101	KEY MAP
C111	SITE 1 - STREAM RESTORATION PLAN
C121	SITE 2 - STREAM RESTORATION PLAN
C131	SITE 3 - STREAM RESTORATION PLAN
C141	SITE 4 - STREAM RESTORATION PLAN
C151	SITE 5 - STREAM RESTORATION PLAN
C161	SITE 8 - STREAM RESTORATION PLAN
C171	SITE 10 - STREAM RESTORATION PLAN
C181	SITE 12 - STREAM RESTORATION PLAN
C191	SITE 13 - EXISTING PLAN
C192	SITE 13 - RESTORATION PLAN
C193	SITE 13 - GRADING PLAN
C194	SITE 13 - BYPASS PUMPING & ESC PLAN
C195	SITE 13 - PLANTING PLAN
C196	SITE 13 - CROSS SECTIONS
C301	TYPICAL SECTIONS & DETAILS - 1
C302	TYPICAL SECTIONS & DETAILS - 2
C501	EROSION & SEDIMENT CONTROL NOTES & DETAILS

60% DESIGN DRAWINGS

ELLENVILLE STREAM RESTORATION

VILLAGE OF ELLENVILLE AND TOWN OF WAWARSING STREAM RESTORATION PROJECT

CONTRACT 1 - GENERAL CONSTRUCTION

VILLAGE OFFICIALS

JEFF KAPLAN ..... MAYOR
RAYMOND YOUNGER ..... DEPUTY MAYOR
JOHN GAVARIS ..... VILLAGE TRUSTEE
FRANCISCO OLIVERAS ..... VILLAGE TRUSTEE
PATRICIA STEINHOFF ..... VILLAGE TRUSTEE

TOWN OFFICIALS

TERRY HOUCK ..... SUPERVISOR
DAN JOHNSON ..... DEPUTY SUPERVISOR
STEPHEN BRADLEY ..... COUNCILMAN
ROGER BUCHWALTER ..... COUNCILMAN
THOMAS J. BRIGGS ..... COUNCILMAN

FEBRUARY 2019

Barton & Loguidice

NEW YORK STATE PROFESSIONAL ENGINEERS LICENSE NO. 075248

924.068.002

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION, SURVEY, AND STAKE OUT OF PROPOSED IMPROVEMENTS. EXCESS EXCAVATED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFF SITE IN A LAWFUL MANNER.
2. THE CONTRACTOR SHALL INSPECT AND FAMILIARIZE HIMSELF WITH EXISTING CONDITIONS OF ALL AREAS OF PROPOSED WORK AND SHALL INCLUDE PROVISIONS TO AVOID CONFLICTS WITH AND/OR RESTORE SITE FEATURES IN KIND. NO SEPARATE OR ADDITIONAL PAYMENT WILL BE MADE FOR WORK REQUIRED TO AVOID CONFLICTS WITH EXISTING SURFACE FEATURES OR RESTORE THOSE WHICH ARE NOT SHOWN.
3. CONTRACTOR IS RESPONSIBLE FOR ALL SURVEY AND STAKEOUT FOR THIS PROJECT. THE CONTRACTOR IS ALSO RESPONSIBLE FOR FINAL AS-BUILT PLANS FOR THIS PROJECT IN DIGITAL FORMAT WITH TIES TO ALL UTILITY CONNECTIONS, BENDS, VALVES, LOCATIONS, LENGTHS, OR LINES, AND ELEVATIONS ON PIPE INVERTS, RIMS, AND STRUCTURES / MANHOLES. AS-BUILT PLANS SHALL BE REVIEWED BY THE OWNER AND ENGINEER, AND THE CONTRACTOR SHALL PROVIDE ANY CORRECTION OR ADMISSIONS TO THE SATISFACTION OF THE OWNER AND ENGINEER BEFORE UTILITIES WILL BE ACCEPTED.
4. UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL DIMENSIONS SHOWN ON THE SITE DRAWINGS FOLLOW THESE CONVENTIONS:
   a. DIMENSIONS TO BUILDINGS AND RETAINING WALLS ARE TO THE EXTERIOR OF EXPOSED FACE OF THE WALL
   b. DIMENSIONS TO A CURB ARE TO THE FACE OF THE CURB
   c. DIMENSIONS TO A FENCE OR RAILING ARE TO THE CENTERLINE OF THE FENCE OR RAILING
   d. DIMENSIONS TO A MANHOLE, INLET, CLEAN OUT, PIPE BEND, VALVE, FIRE HYDRANT OR OTHER UTILITY APPURTENANCE ARE TO THE CENTER OF THE STRUCTURE
   e. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCY UPON DISCOVERY AND SHALL RECEIVE CLARIFICATION BEFORE PROCEEDING WITH CONSTRUCTION.
5. CONTRACTOR SHALL DEVELOP AND MAINTAIN A DETAILED CONSTRUCTION SCHEDULE THAT IDENTIFIES DATES AND DURATION OF ALL PORTIONS OF THE WORK. FULL TIME ACCESS ALONG ROADWAYS AND DRIVEWAYS TO ALL RESIDENTS SHALL BE ACCOMMODATED.
6. THE CONTRACTOR SHALL SUBMIT A CONSTRUCTION SEQUENCE FOR REVIEW PRIOR TO THE PRE-CONSTRUCTION MEETING. THE FOLLOWING IS A SUGGESTED SEQUENCE OF CONSTRUCTION:
   a. OBTAIN PLAN APPROVAL AND OTHER APPLICABLE STATE AND LOCAL PERMITS. THE OWNER SHALL SUBMIT THE NOTICE OF INTENT (NOI) TO OBTAIN COVERAGE UNDER GP-0-15-002 IN ACCORDANCE WITH PART II OF THE PERMIT.
   b. SCHEDULE AND HOLD A PRECONSTRUCTION MEETING WITH OWNER, ENGINEER, CONTRACTOR(S), GOVERNOR'S OFFICE OF STORM RECOVERY (GOSR) GRANT MANAGER, AND VILLAGE/TOWN AT LEAST ONE (1) WEEK PRIOR TO STARTING CONSTRUCTION.
   c. ALL CONTRACTORS AND SUBCONTRACTORS MUST COMPLETE AND EXECUTE A CONTRACTOR CERTIFICATION FORM AS INCLUDED IN THE SWPPP.
   d. MOBILIZE TO SITE AND LAYOUT ESTABLISHED LIMITS OF WORK AND BUFFER AREAS PRIOR TO STARTING CONSTRUCTION. DELINEATE LIMITS OF DISTURBANCE BY INSTALLING BARRIERS BETWEEN WORK AREA AND ENVIRONMENTALLY SENSITIVE AREAS. IDENTIFY TREES TO BE PROTECTED NEAR WORK LIMITS AND INSTALL TREE PROTECTION MEASURES. OBTAIN APPROVAL FROM OWNER PRIOR TO ANY TREE REMOVAL.
   e. ESTABLISH CONSTRUCTION ACCESS, STAGING, EQUIPMENT, LAYDOWN, TEMPORARY STOCKPILE, AND CONCRETE WASHOUT AREAS.
   f. INSTALL EROSION AND SEDIMENT CONTROL MEASURES IN PREPARATION OF THE CONSTRUCTION. ALL EROSION AND SEDIMENT CONTROL STRUCTURES (INCLUDING STABILIZED CONSTRUCTION ENTRANCES) SHALL BE IN PLACE PRIOR TO UPGRADIENT LAND DISTURBANCE.
   g. COMPLETE TREE REMOVAL, AS REQUIRED WITHIN THE LIMITS OF DISTURBANCE.
   h. COMPLETE ROUGH GRADING AND CONSTRUCTION OF ALL UTILITIES AND STRUCTURES.
   i. COMPLETE RESTORATION OF ALL DISTURBED AREAS INCLUDING PAVING, LANDSCAPE PLANTING, AND SEEDING.
   j. ONCE FINAL STABILIZATION IS ACHIEVED, REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SUBJECT TO THE APPROVAL OF THE ENGINEER.
   k. MAKE REPAIRS AS REQUIRED BY THE OWNER TO OBTAIN CERTIFICATE OF COMPLIANCE AND FILE NOTICE OF TERMINATION (NOT) IN ACCORDANCE WITH GP-0-15-002 PART V.
7. THE CONTRACTOR SHALL PREPARE A MAINTENANCE AND PROTECTION OF TRAFFIC PLAN THAT INCLUDES, BUT IS NOT LIMITED TO, AN ADVANCED WARNING SIGN LAYOUT PLAN FOR ROADWAYS AND A CONSTRUCTION SEQUENCING PLAN. THE PLAN SHALL BE SUBMITTED TO AND APPROVED BY THE OWNER PRIOR TO COMMENCING CONSTRUCTION.
8. THE CONTRACTOR SHALL COORDINATE WORK AND OBTAIN AND ADHERE TO ALL REQUIRED PERMITS INCLUDING THOSE FROM THE US ACOE, NYS DEC, VILLAGE/TOWN HWY DEPT, NYSDOT, AND ULSTER COUNTY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND INCUR THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES, ETC.
9. CONTRACTOR SHALL PROVIDE A WRITTEN PLAN TO INDICATE HOW ACTIVITIES WILL BE CONDUCTED TO AVOID OR MINIMIZE UNNECESSARY NOISE, DUST, AND VISUAL IMPACTS OF CONSTRUCTION ACTIVITIES ON SITE, MANAGE CONSTRUCTION TRAFFIC ON SITE, STAGING PROCEDURES, AND HOW CONSTRUCTION TRAFFIC EXITING AND ENTERING THE SITE WILL BE MANAGED TO AVOID UNNECESSARY IMPACT ON TRAFFIC USING ROUTE 299 AND LOCAL ROADS.
10. CONTRACTOR TO PROVIDE FULL TIME ACCESS ALONG ROADWAYS AND DRIVEWAYS TO OWNER.
11. THE OWNER MAY AUTHORIZE APPROPRIATE PROFESSIONALS TO OBSERVE AND MONITOR THE SITE ACTIVITIES WHEN DEEMED NECESSARY TO ENSURE COMPLIANCE WITH THE CONDITIONS OF APPROVAL OR THE PROTECTION OF ENVIRONMENTALLY SENSITIVE AREAS.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL FOR DELIVERY OF MATERIALS AND RELATED WORK.
13. THE CONTRACTOR IS RESPONSIBLE FOR ALL EXCAVATION, INCLUDING ANY ROCK OR CONCRETE EXCAVATION, STRUCTURES AND CONCRETE EXCAVATION AT THE PROJECT SITE.
14. CONTRACTOR SHALL TAKE CARE NOT TO UNDERMINE ROADWAY/DRIVEWAY PAVEMENT. ANY DISTURBED OR UNDERMINED PAVEMENT SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK.
16. CONTRACTOR SHALL REMOVE, STORE AND REPLACE SIGNS AND MAILBOXES AS NECESSARY. SIGNS AND MAILBOXES MUST REMAIN FUNCTIONAL AND ACCESSIBLE AT ALL TIMES. ALL DAMAGED SIGNS SHALL BE REPLACED IN KIND AT CONTRACTORS EXPENSE.
17. RESTORE ALL SURFACES TO AS GOOD OR BETTER CONDITION THAN BEFORE CONSTRUCTION AS SOON AS POSSIBLE FOLLOWING COMPLETION OF WORK IN ANY AREA. PROGRESS RESTORATION PROMPTLY TO MINIMIZE IMPACTS TO VEHICULAR AND PEDESTRIAN ACCESS.
18. ALL COSTS ASSOCIATED WITH PREPARING ANY STORAGE AND STAGING AREA(S) SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THIS INCLUDES, BUT IS NOT LIMITED TO, CLEARING AND GRADING, STABILIZATION OF THE WORK YARD SURFACE, CONSTRUCTION OF ALL TEMPORARY UTILITIES, ACCESS ROADS, ALL SECURITY FENCING, AND RESTORATION OF STAGING OR DISTURBED AREAS.
19. CONTRACTOR TO REPLACE PAVEMENT MARKINGS WHERE ASPHALT IS REMOVED AND REPLACED.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ANY PROPERTY LINE, SURVEY, OR RIGHT-OF-WAY MONUMENTATION DISTURBED DURING CONSTRUCTION. THE CONTRACTOR SHALL EMPLOY A NEW YORK STATE LICENSED LAND SURVEYOR TO RESTORE ALL DISTURBED MONUMENTS TO THEIR ORIGINAL LOCATION AT THE CONTRACTOR'S EXPENSE.
21. THE CONTRACTOR WILL BE REQUIRED TO REMOVE ALL SNOW AND ICE AS NEEDED AT NO ADDITIONAL COST. CONTRACTORS OPERATIONS ALONG THE HIGHWAY SHOULDERS, MUST NOT INTERFERE WITH THE OWNER'S ABILITY TO REMOVE SNOW AND PROVIDE ICE CONTROL.
22. IF ANY HAZARDOUS CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL FOLLOW THE PREVAILING FEDERAL, STATE, AND LOCAL REQUIREMENTS FOR NOTIFICATIONS, ISOLATION, REMOVAL, STORAGE AND ALL PERTINENT REGULATIONS.
23. PRIOR TO COMMENCING WORK, CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES, BUILDINGS, PAVEMENTS, AND OTHER SITE FEATURES TO REMAIN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UTILIZE A LOCATING SERVICE TO VERIFY UTILITY LOCATIONS. NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES. CONTRACTOR SHALL CONTACT DIG SAFELY NEW YORK FOR LOCATION OF EXISTING UNDERGROUND UTILITIES PRIOR TO THE COMMENCING OF CONSTRUCTION. IF ANY UTILITIES ARE DAMAGED DURING CONSTRUCTION, IT SHALL BE REPAIRED TO STANDARD OF AUTHORITIES HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
24. PRIOR TO START OF WORK, COORDINATE CONSTRUCTION VEHICLE ACCESS/EGRESS ROUTES, STOCKPILE AREA, AND FIELD OFFICE AREA IF REQUIRED.

ENVIRONMENTAL RESOURCES NOTES:

1. CONTRACTOR SHALL IDENTIFY AND PROVIDE FENCING TO PROTECT SENSITIVE AREAS IDENTIFIED ON THE PLANS IN COORDINATION WITH THE ENGINEER AND OWNER BEFORE COMMENCING ANY WORK.
2. WORK IN WETLANDS, WATERCOURSES, AND OTHER ECOLOGICALLY SENSITIVE AREAS SHALL USE THE SPECIFIC CONSTRUCTION TECHNIQUES DESCRIBED IN THE CONTRACT DOCUMENTS. PRIOR TO COMMENCING WORK, CONFIRM LIMITS OF CONSTRUCTION FENCE TO BE PLACED AROUND WETLAND PERIMETERS WITH OWNER, ENGINEER, AND TOWN.
3. ALL PROPOSED WORK WITHIN LOCAL, STATE, AND FEDERALLY REGULATED AQUATIC RESOURCES (WETLANDS, BUFFER AREAS, AND WATER COURSES) WILL REQUIRE APPROPRIATE AGENCY AUTHORIZATION AS WELL AS ACCEPTANCE IN ACCORDANCE WITH SPDES GP-0-15-002.
4. THE OWNER SHALL PROVIDE TRAINED PERSONNEL TO SURVEY ALL AREAS TO BE DISTURBED IMMEDIATELY PRIOR TO CONSTRUCTION ACTIVITY IN ORDER TO ASSURE THAT NO PROTECTED SPECIES WILL BE IMPACTED, AND THAT APPROPRIATE MEASURES WILL BE TAKEN, IF POSSIBLE, TO RELOCATE ANY ANIMAL, PROTECTED OR NOT, FOUND IN THAT AREA OUT OF HARM'S WAY.
5. ALL TREE CLEARING ACTIVITIES ON THE SITE SHALL BE RESTRICTED TO THE PERIOD BETWEEN NOVEMBER 1 AND APRIL 1.
6. TREE REMOVAL SHALL BE CONFINED TO THE DESIGNATED WORK LIMITS OR OTHER PROPERTY AS INDICATED ON THE PLANS. THE CONTRACTOR SHALL MAKE EVERY ATTEMPT TO PRESERVE ALL TREES. NO CLEARING SHALL BE COMMENCED UNLESS FIRST APPROVED BY THE ENGINEER AND OWNER. TREE REMOVALS AND CLEARING SHALL BE REVIEWED IN THE FIELD WITH THE ENGINEER AND OWNER, ANY UNAUTHORIZED DAMAGE TO LANDSCAPING OR TREES SHALL REQUIRE THEM TO BE REPLACED IN KIND AT NO ADDITIONAL COST TO THE OWNER.
7. CLEARING OF TREES SOLELY FOR STAGING OF EQUIPMENT IS NOT ACCEPTABLE. DISTURBANCE SHOULD BE LIMITED TO ONLY WHAT IS NECESSARY FOR EQUIPMENT PASSAGE AND THE CONSTRUCTION (INCLUDING MATERIALS STAGING) OF PERMANENT STRUCTURES. EXCESSIVE STAGING AREAS SHOULD BE AVOIDED.

GRADING NOTES:

1. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE FOR FIELD ADJUSTMENTS OF NEW WORK TO BLEND WITH EXISTING WORK THAT IS TO REMAIN.
2. THE CONTRACTOR SHALL STAKE OUT ALL GRADES IN THE FIELD PRIOR TO CONSTRUCTION AND NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY DISCREPANCIES WITH THE CONSTRUCTION DOCUMENTS.
3. THE CONTRACTOR SHALL CONTINUALLY MONITOR EXISTING STORM WATER AND EROSION CONTROL SYSTEMS AND PERIODICALLY CLEAN, REPAIR, AND UPGRADE AS REQUIRED.
4. GRADES WITHIN DRIP-LINE OF VEGETATION TO REMAIN SHALL NOT BE COMPACTED OR ALTERED UNLESS SO DIRECTED IN EITHER THE DRAWINGS OR SPECIFICATIONS. IN THE EVENT THIS IS UNAVOIDABLE, CONSULT THE OWNER'S REPRESENTATIVE BEFORE PROCEEDING.

UTILITY NOTES:

1. PLANS ILLUSTRATE KNOWN SUBSURFACE STRUCTURES, ABOVE GROUND STRUCTURES, AND/OR UTILITIES BELIEVED TO EXIST IN THE WORKING AREA. THE EXACT OR EVEN APPROXIMATE LOCATION OF SUCH MAY BE DIFFERENT FROM THAT SHOWN OR MAY NOT BE SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROCEED WITH GREAT CARE IN EXECUTING ANY WORK AND TO LOCATE AND PROTECT ALL UTILITIES. CONTRACTOR SHALL COMPLY WITH THE STATE OF NEW YORK DEPARTMENT OF PUBLIC SERVICE, 16 NYCRR PART 753. OBTAIN A DIG SAFELY NEW YORK STAKE OUT PRIOR TO COMMENCING CONSTRUCTION.
2. DAMAGE TO UTILITIES RESULTING FROM NEGLIGENCE OR FAILURE ON THE PART OF THE CONTRACTOR TO MAKE ACCURATE LOCATION IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING OR REPAIRING ANY DAMAGED UTILITY TO THE SATISFACTION OF THE OWNER AND ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING UTILITY POLES AS REQUIRED, INCLUDING TEMPORARILY SUPPORTING POLES DURING IMPROVEMENTS AT NO ADDITIONAL COST TO THE OWNER. COORDINATE UTILITY POLE WORK WITH LOCAL UTILITY COMPANY.
4. NO WORK SHALL BE PROGRESSED ON PRIVATE PROPERTY, OR OUTSIDE OF EASEMENTS SHOWN ON PLANS WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER.

SURVEY NOTES:

1. SURVEY PREPARED BY BROOKS AND BROOKS SURVEYORS, P.C.
2. SUBJECT TO ALL RIGHTS OF WAYS, COVENANTS, EASEMENTS, RESTRICTIONS, CONDITIONS AND AGREEMENTS OF RECORD.
3. SUBJECT TO WHATEVER STATE OF FACTS A COMPLETE SEARCH OF TITLE MAY REVEAL.
4. SUBSURFACE STRUCTURES NOT VISIBLE OR READILY APPARENT ARE NOT SHOWN AND THEIR LOCATION AND EXTENT ARE NOT CERTIFIED.
5. AREA SHOWN CONTAINS FEDERAL WETLAND NOT DELINEATED OR SHOWN HEREON. AREA LIES WITHIN A FEMA FLOOD ZONE AS DEPICTED ON FEMA FIRM NO. 36111C0685F EFFECTIVE DATE 18 NOVEMBER, 2016.
6. APPROXIMATE BOUNDARIES SHOWN HEREON AS PER ULSTER COUNTY GIS TAX MAPPING, AND ARE SUBJECT TO COMPLETE SURVEYS.
7. CONTOURS BASED ON FIELD SURVEY. ELEVATIONS ARE APPROXIMATE NAVD88 AS DERIVED BY RTK GPS OBSERVATIONS.

LIDAR TOPOGRAPHY NOTES:

1. NOTE THAT PLANS FOR ALL SITES WITH THE EXCEPTION OF SITES 1, 10, AND 13 WERE PREPARED USING LIDAR TOPOGRAPHY AND ORTHOIMAGERY SOURCED FROM THE NYS GIS CLEARINGHOUSE.
2. THE NYS HIGH RESOLUTION DIGITAL ORTHOIMAGERY IS ACCURATE TO ±8-FT HORIZONTALLY AT THE 95% CONFIDENCE LEVEL FOR 2-FT RESOLUTION.

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

GENERAL NOTES

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: FEBRUARY 2019

Scale: AS SHOWN

Sheet Number: C001

Project Number: 924.068.002

Plotted: Feb 27, 2019 - 4:19PM By: rpc
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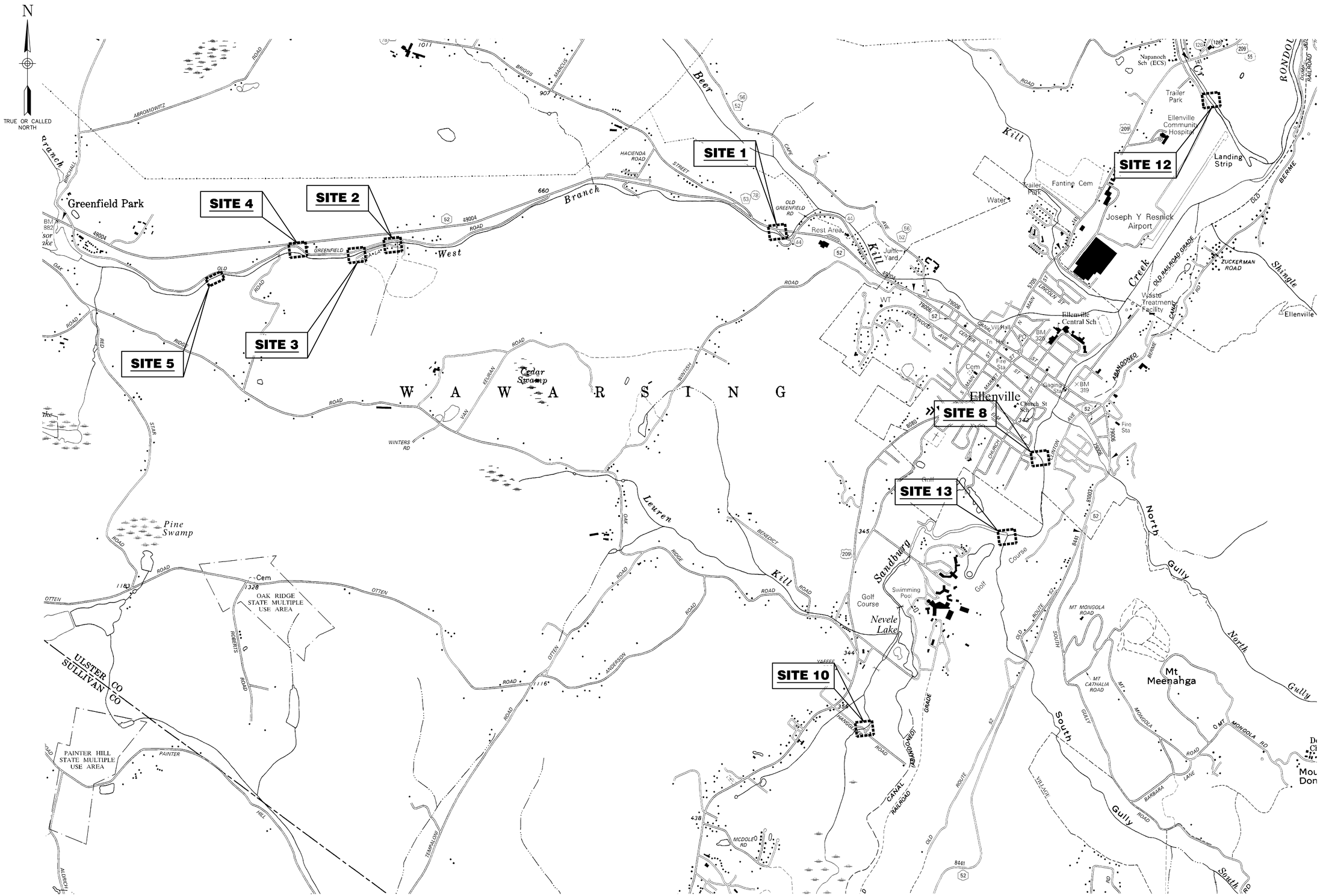
Project Name: Ellenville Stream Restoration Phase 2&3
Project No.: 924.068.002
In Charge of: RAM Last Saved: 2/27/2019
Designed by: EBG
Drawn by: RPC
Checked by: DME



NOTE: THERE ARE NO SITES 6, 7, 9, AND 11

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

KEY MAP

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: FEBRUARY 2019

Scale: AS SHOWN

Sheet Number: C101

Project Number: 924.068.002

Plotted: Feb 27, 2019 – 3:41PM SYR By: rpc
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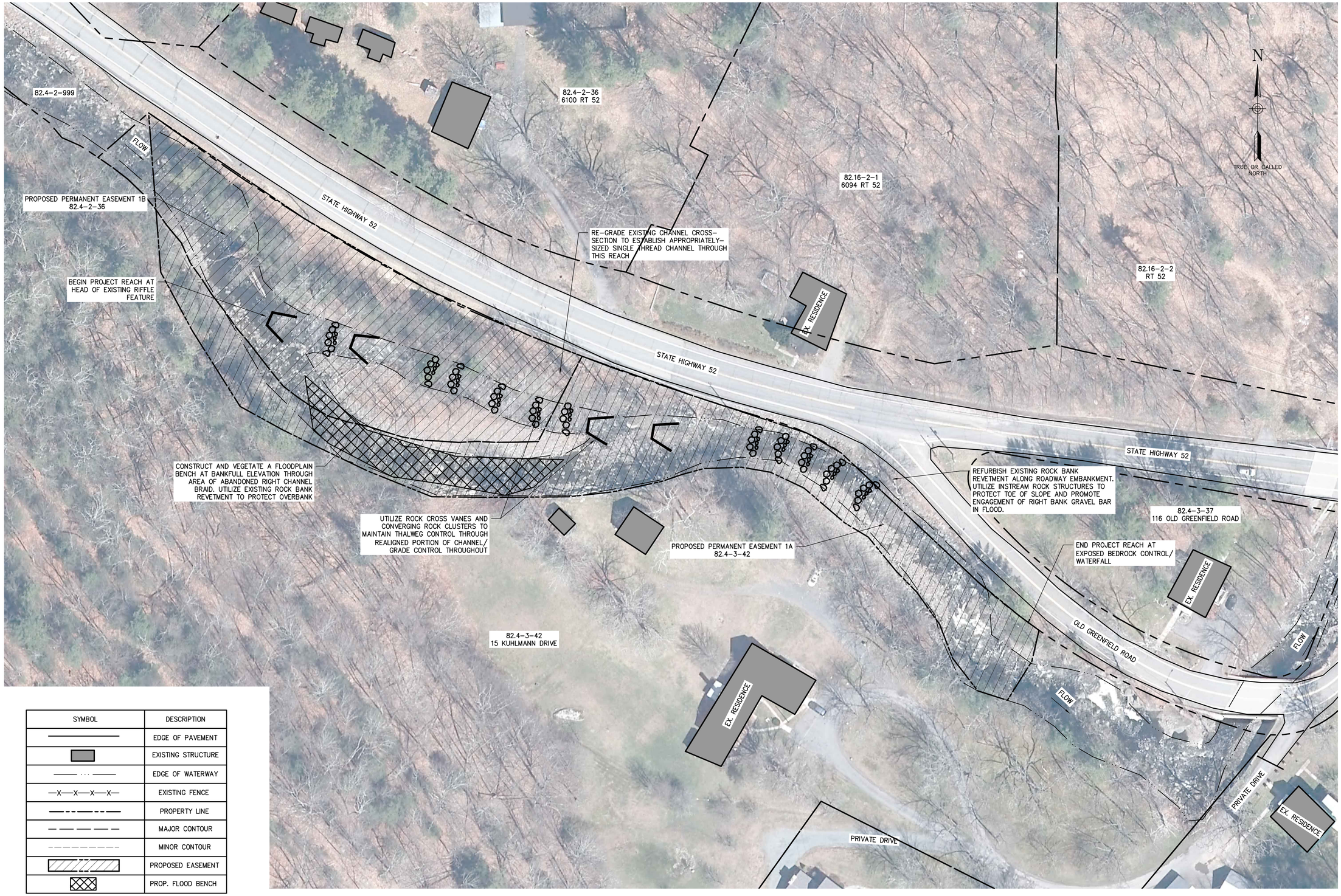
Layout Name: 924068_1-Title.dwg Project Number: 924.068.002
Checked by: DMF Drawn by: RPC Designed by: BDG In Charge of: BAM Last Saved: 2/27/2019



SYMBOL	DESCRIPTION
	EDGE OF PAVEMENT
	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT
	PROP. FLOOD BENCH

Plotted: Feb 27, 2019 - 3:41PM By: rpc
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File Name: 924068_2-Site1.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DHF Drawn by: RPC Designed by: ANE In Charge of: RAM Last Saved: 2/27/2019

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 1 30% DESIGN
STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C111

Project Number
924.068.002

SYMBOL	DESCRIPTION
	EDGE OF PAVEMENT
	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT
	PROP. REVETMENT

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 2 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

STREAM

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C121

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:42PM By: rpc
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Checked by: DHF Drawn by: RPC Designed by: BDG In Charge of: RAM Last Saved: 2/27/2019
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SYMBOL	DESCRIPTION
	EDGE OF PAVEMENT
	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT

40' 0 40' 80'

Plotted: Feb 27, 2019 - 3:43PM SYR By: rpc
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File Name: 924068_4-Site3.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DHF Drawn by: RPC Designed by: BDG In Charge of: RAM Last Saved: 2/27/2019

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 3 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

STREAM RESTORATION

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C131

Project Number
924.068.002

SYMBOL	DESCRIPTION
	EDGE OF PAVEMENT
	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT

30' 0 30' 60'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 4 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C141

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:44PM By: rpc
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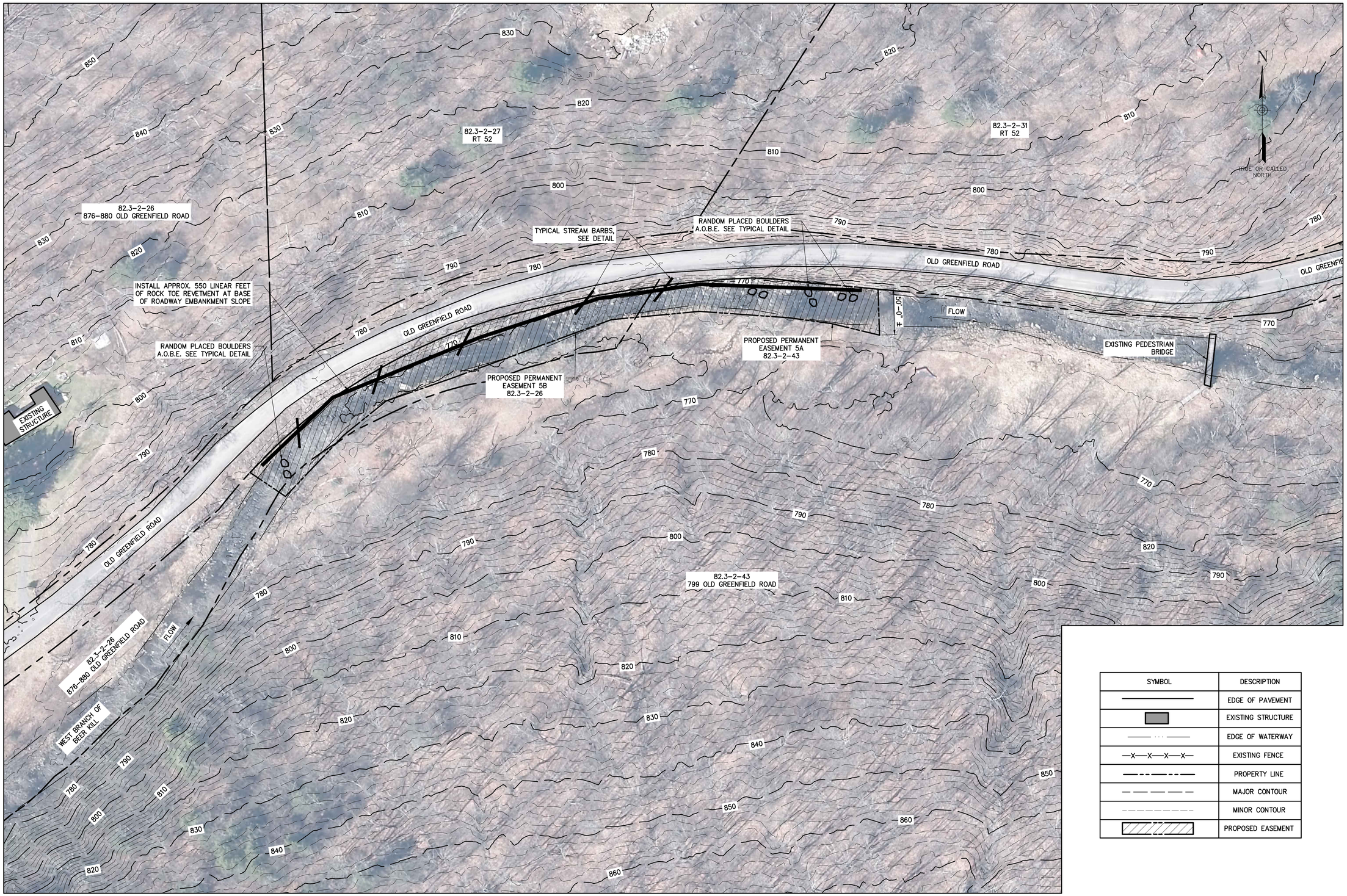
File Name: 924068_5-Site4.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DHF Drawn by: RPC Designed by: BDG In Charge of: RAM Last Saved: 2/27/2019



SYMBOL	DESCRIPTION
	EDGE OF PAVEMENT
	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT

10' 0 40' 80'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 5 STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C151

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:45PM By: rpc
File Name: 924068_6-Site5.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DHF Drawn by: RPC Designed by: BDG In Charge of: RAM Last Saved: 2/27/2019
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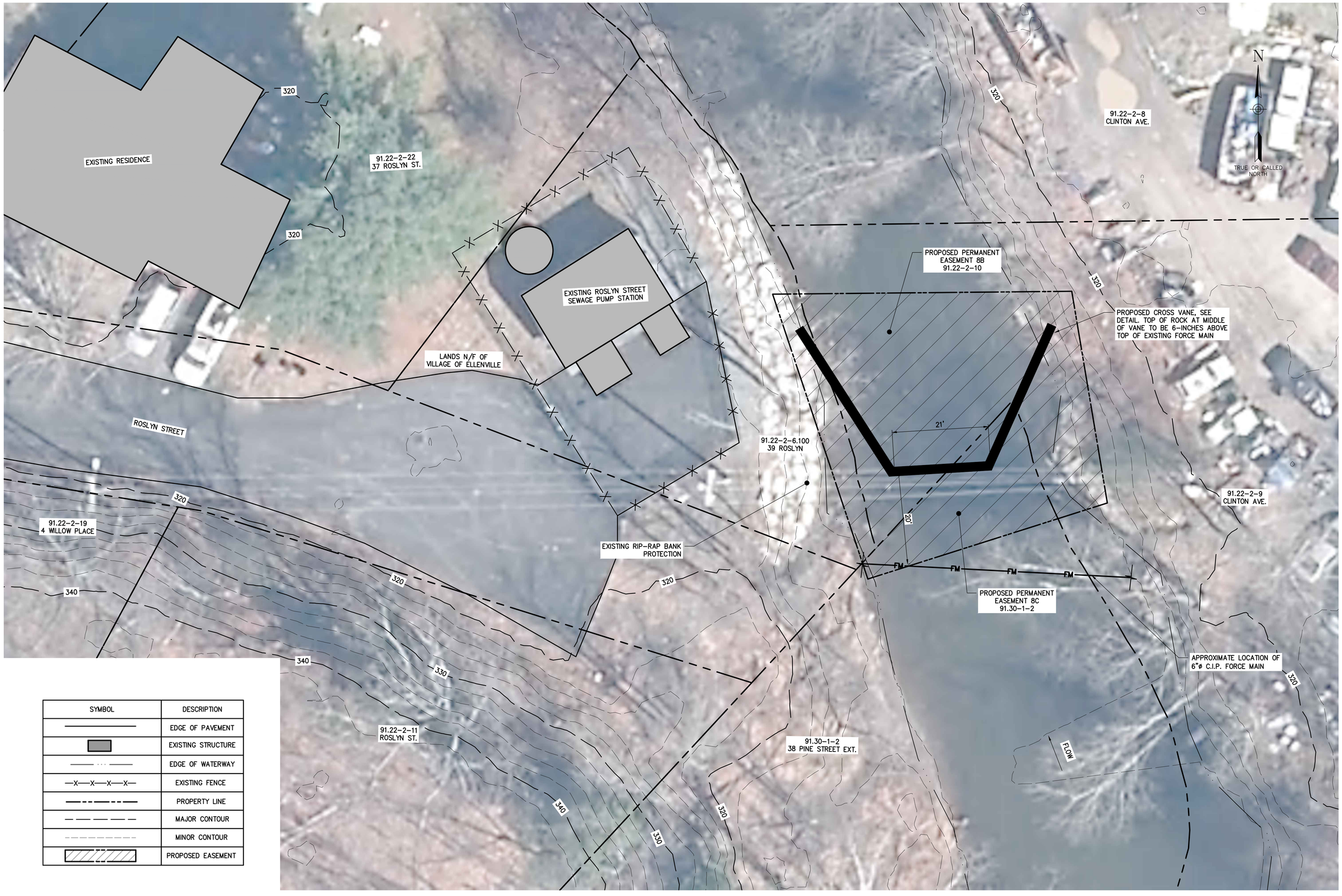

SYMBOL	DESCRIPTION
	EDGE OF PAVEMENT
	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 8
STREAM RESTORATION PLAN

TOWN OF WAWARSING ULSTER COUNTY, NEW YORK

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C161

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:46PM SYR By: rpc
File Name: 924068_7-Site8.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DHF Drawn by: RPC Designed by: BDG In Charge of: RAM Last Saved: 2/27/2019
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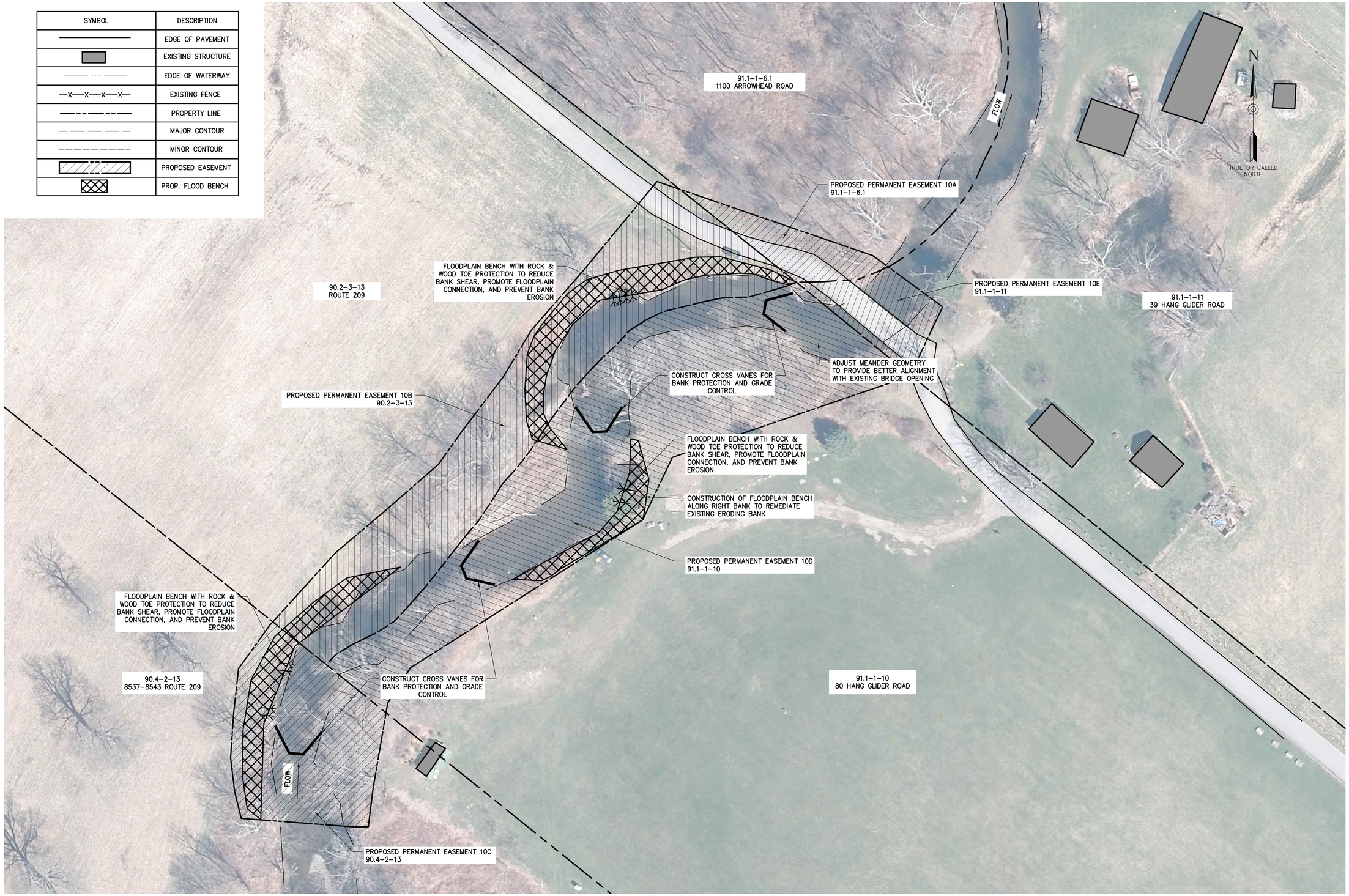
SYMBOL	DESCRIPTION
	EDGE OF PAVEMENT
	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED EASEMENT
	PROP. FLOOD BENCH



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 10 30% DESIGN STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C171

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:46PM By: rpc
File Name: 924068_8-Site10.dwg Project No.: 924.068.002
Checked by: DHF Drawn by: REC Designed by: ANE In Charge of: RAM Last Saved: 2/27/2019
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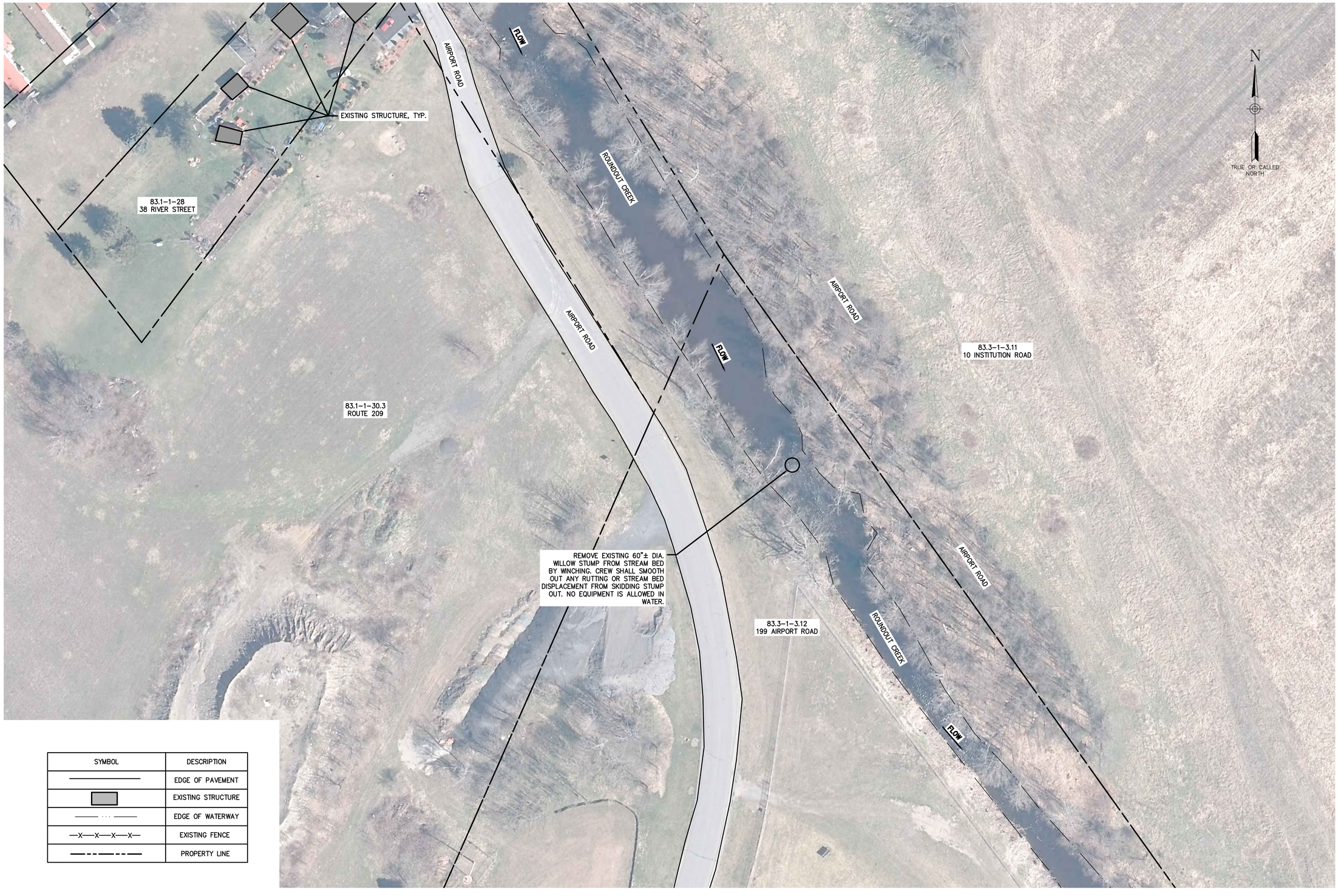

SYMBOL	DESCRIPTION
	EDGE OF PAVEMENT
	EXISTING STRUCTURE
	EDGE OF WATERWAY
—X—X—X—X—	EXISTING FENCE
	PROPERTY LINE

Plotted: Feb 27, 2019 - 3:47PM By: rpc
File Name: 924068_9-Site12.dwg Project No.: 924.068.002
Checked by: DHF Drawn by: RPC Designed by: BDG In Charge of: RAM Last Saved: 2/22/2019

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Project Name: Ellenville Stream Restoration Phase 2&3

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 12
STREAM RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C181

Project Number
924.068.002

N

TRUE OR CALLED NORTH

APPROXIMATE LOCATION OF TRANSECT #2

APPROXIMATE LOCATION OF TRANSECT #1

APPROXIMATE RIFFLE PEBBLE COUNT LOCATION

EXISTING STREAM CENTERLINE

APPROXIMATE BAR SAMPLE LOCATION

APPROXIMATE LOCATION OF TRANSECT #3

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 8+50

SANDBURG CREEK

SANDBURG CREEK

FLOW

NOTE:

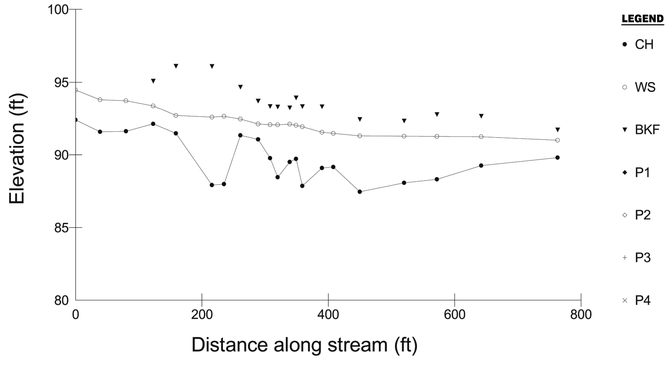
THE ENTIRE CREEK BED WAS NOT RECORDED DUE TO RUSHING HIGH WATER LEVELS. NO TOPOGRAPHY DATA COLLECTED

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- FALLEN TREE
- OVERHEAD UTILITIES
- STREAM CENTERLINE

EXISTING CONDITIONS PLAN

SCALE: 1" = 30'-0"



EXISTING CONDITIONS PROFILE

HORIZONTAL SCALE: 1" = 120'-0"
VERTICAL SCALE: 1" = 5'-0"

15' 0 15' 30'
1"=15'

30' 0 30' 60'
1"=30'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13
EXISTING CONDITIONS

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C191

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:47PM SYR By: rrc
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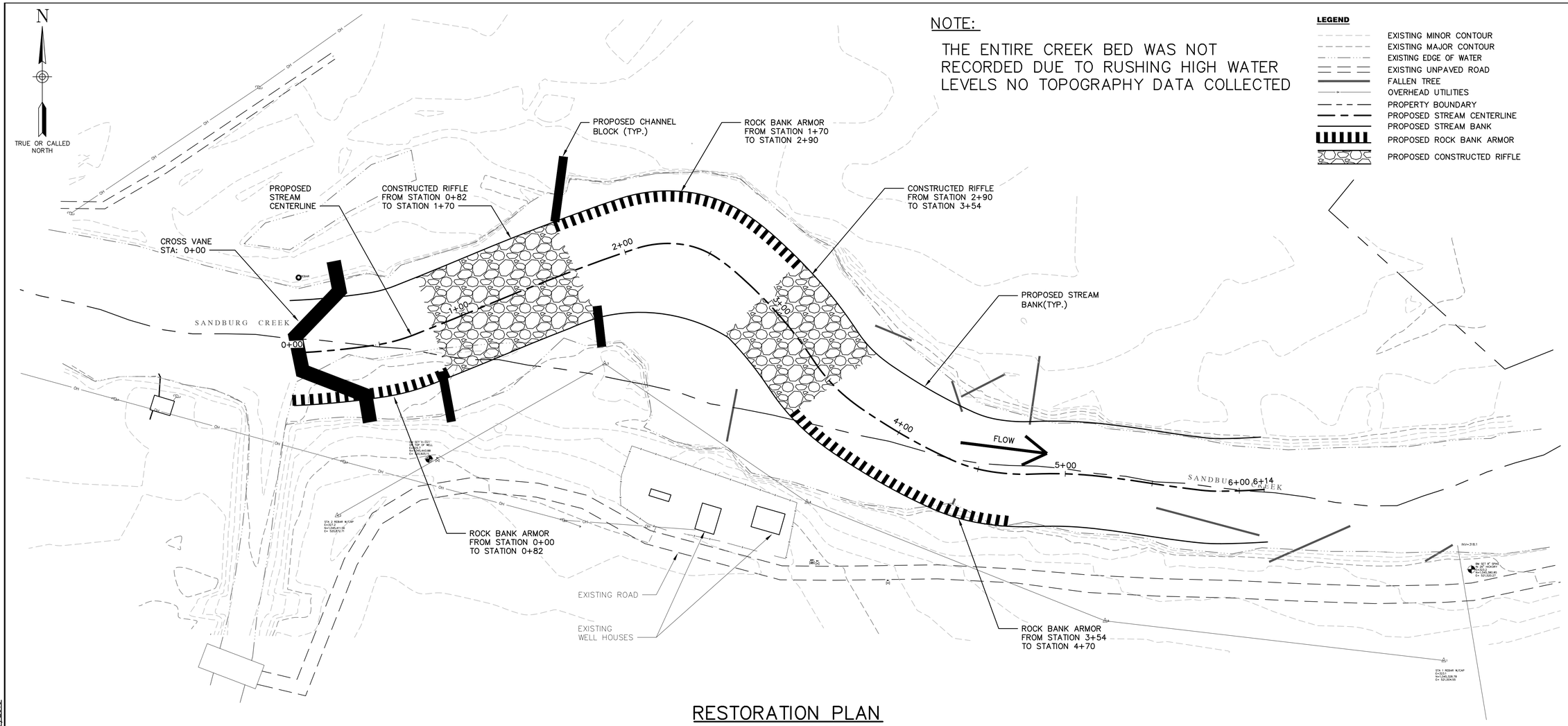
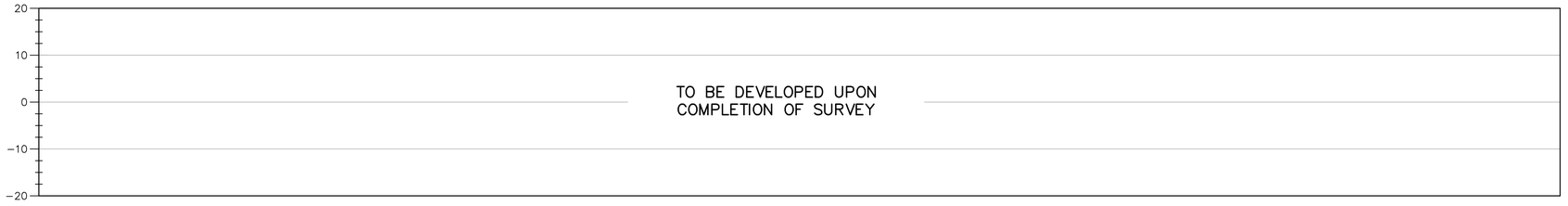
Checked by: DHF Drawn by: RPC Designed by: ANE In Charge of: RAM Last Saved: 2/27/2019



RESTORATION PLAN

SCALE: 1" = 30'-0"



RESTORATION PROFILE

HORIZONTAL SCALE: 1" = 30'-0"
VERTICAL SCALE: 1" = 15'-0"

15' 0 15' 30'
1"=15'

30' 0 30' 60'
1"=30'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 RESTORATION PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C192

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:47PM By: rrc
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File Name: 924068_9-Site13-C-902-Restoration Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DHF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 2/27/2019

N

TRUE OR CALLED NORTH

NOTE:

THE ENTIRE CREEK BED WAS NOT RECORDED DUE TO RUSHING HIGH WATER LEVELS NO TOPOGRAPHY DATA COLLECTED

CHANNEL AND FLOODPLAIN GRADING TO BE DESIGNED UPON COMPLETION OF SURVEY. SEE NOTE THIS SHEET.

SANDBURG CREEK

SANDBURG CREEK

ON SET X-CUT ON TOP OF WELL N=1,045,443.88 E= 320,820.12

STA. 2 REBAR W/CAP N=1,045,417.16 E= 320,872.71

INV=318.1

IN SET 8" SPIN ON 24" HUGHEY N=1,045,380.80 E= 321,320.27

STA. 1 REBAR W/CAP E=323.1 N=1,045,328.78 E= 321,504.55

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- FALLEN TREE
- OVERHEAD UTILITIES

30' 0 30' 60'

1"=30'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 GRADING PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C193

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:48PM By: rpc
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File Name: 924068_9-Site13-C-903-Grading Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DHE Drawn by: RPC Designed by: ANE In Charge of: RAM Last Saved: 2/27/2019

N

TRUE OR CALLED NORTH

NOTE:

THE ENTIRE CREEK BED WAS NOT RECORDED DUE TO RUSHING HIGH WATER LEVELS NO TOPOGRAPHY DATA COLLECTED

BYPASS PIPING. SIZE TO BE SPECIFIED OR CONFIRMED BY CONTRACTOR.

CHANNEL BLOCK (TYP.). SEE DETAIL SHEET C-1001.

BYPASS PUMP INTAKE SUMP

SANDBURG CREEK

PROPOSED STREAM BANK(TYP.)

SANDBURG CREEK

STAGING AREA

EROSION CONTROL FENCING (TYP.)

PROPOSED TEMPORARY ACCESS ROAD

TEMPORARY ENERGY DISSIPATION AT PIPE DISCHARGE. SEE DETAIL SHEET.

LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- FALLEN TREE
- OVERHEAD UTILITIES
- PROPOSED BYPASS PIPING
- EROSION CONTROL FENCE
- PROPOSED STAGING AREA
- PROPOSED TEMPORARY ACCESS ROAD
- CHANNEL BLOCK

30' 0 30' 60'
1"=30'

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 BYPASS PUMPING AND EROSION AND SEDIMENT CONTROL PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C194

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:48PM By: rpc
File Name: 924068_9-Site13-C-904-Bypass Pumping and E&SC Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DHF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 2/27/2019
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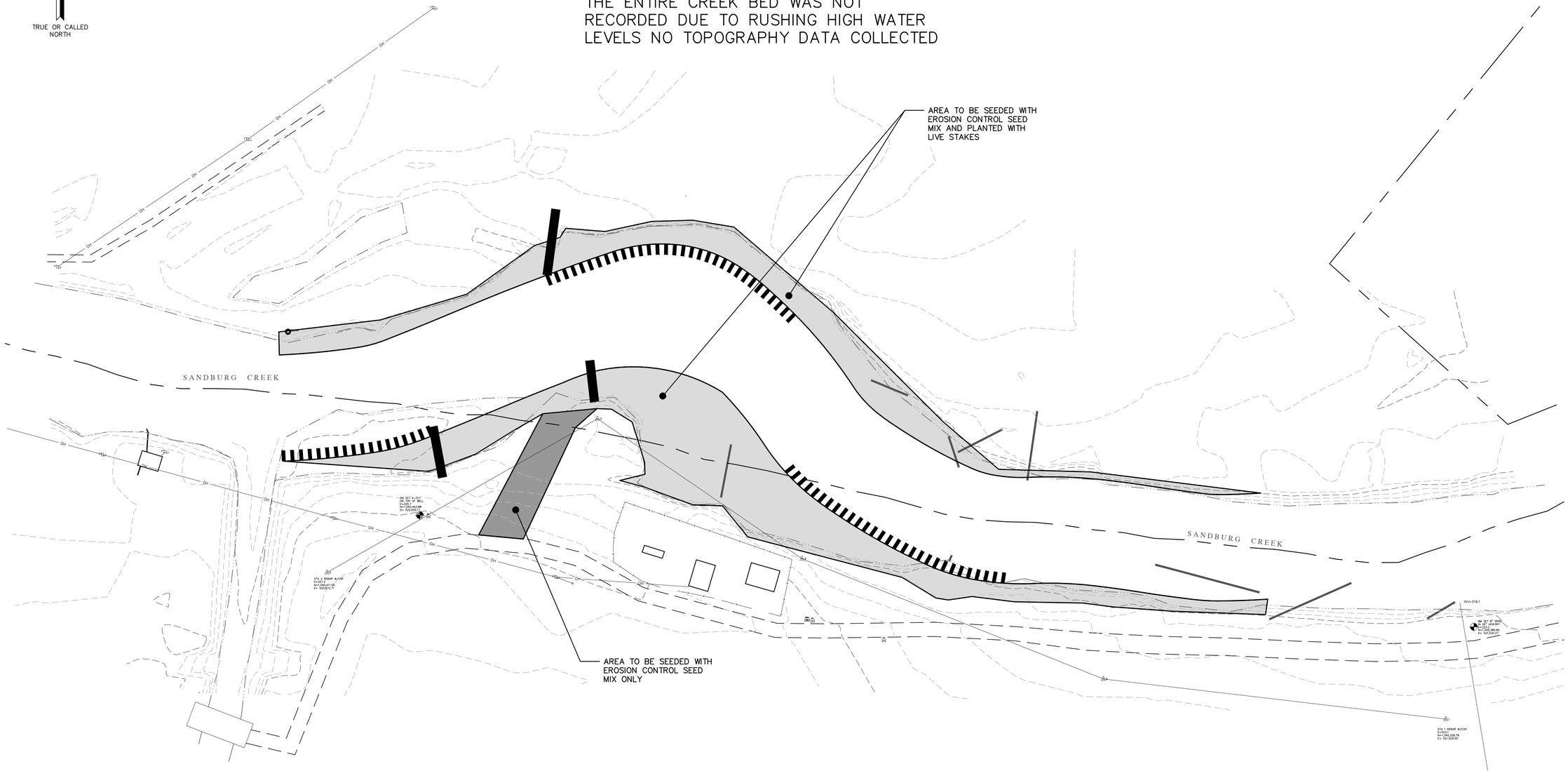
N

TRUE OR CALLED NORTH

NOTE:

THE ENTIRE CREEK BED WAS NOT RECORDED DUE TO RUSHING HIGH WATER LEVELS NO TOPOGRAPHY DATA COLLECTED



LEGEND

- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING EDGE OF WATER
- EXISTING UNPAVED ROAD
- FALLEN TREE
- OVERHEAD UTILITIES
- AREA TO BE SEEDED WITH EROSION CONTROL SEED MIX AND PLANTED WITH LIVE STAKES
- AREA SEEDED WITH EROSION CONTROL SEED MIX ONLY

30' 0 30' 60'
1"=30'

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13
PLANTING PLAN

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C195

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:48PM SYR By: rnc
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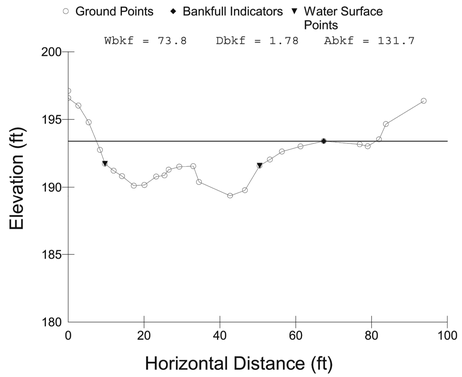
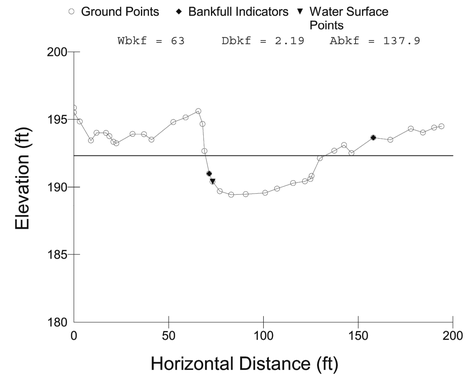
Checked by: DHF Drawn by: WBG Designed by: ANE



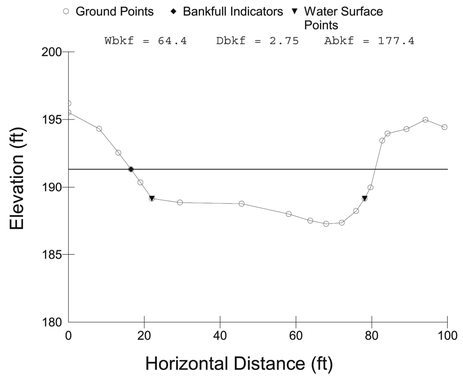
CROSS SECTION 1

HORIZONTAL SCALE: 1" = 25'-0"
VERTICAL SCALE: 1" = 5'-0"



CROSS SECTION 2

HORIZONTAL SCALE: 1" = 50'-0"
VERTICAL SCALE: 1" = 5'-0"

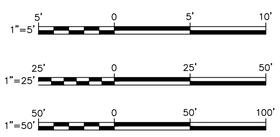


CROSS SECTION 3

HORIZONTAL SCALE: 1" = 25'-0"
VERTICAL SCALE: 1" = 5'-0"

NOTE:

CROSS SECTIONS DO NOT REFLECT ACTUAL ELEVATIONS.
ELEVATIONS WILL BE ADDED UPON COMPLETION OF SURVEY.



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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13
EXISTING CONDITIONS CROSS SECTIONS

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

Scale
AS SHOWN

Sheet Number
C196

Project Number
924.068.002

Plotted: Feb 27, 2019 - 3:48PM SYR By: rnc
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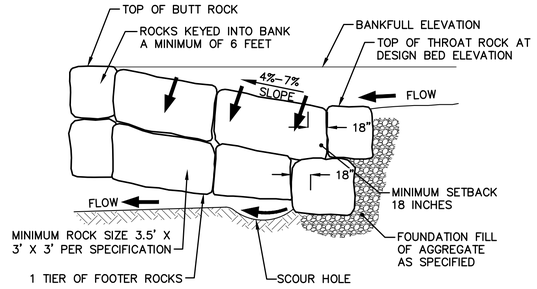
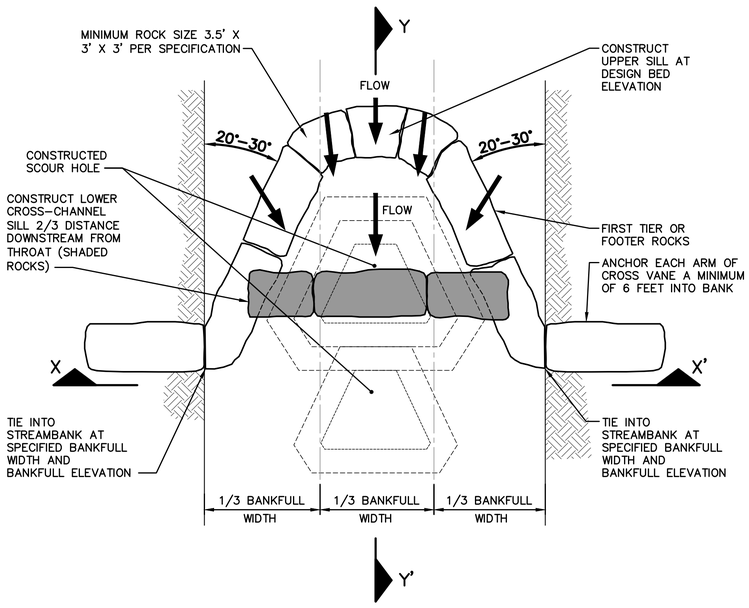
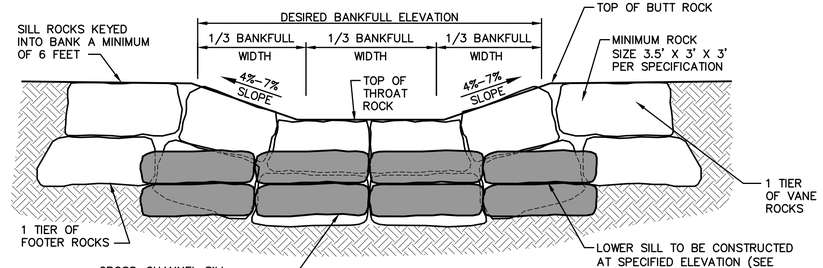
File Name: 924068_9-Site13-C-906-Cross Sections.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DHF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 2/27/2019



SECTION Y-Y'



PLAN VIEW



SECTION X-X'

CROSS VANE DETAIL

NOT TO SCALE

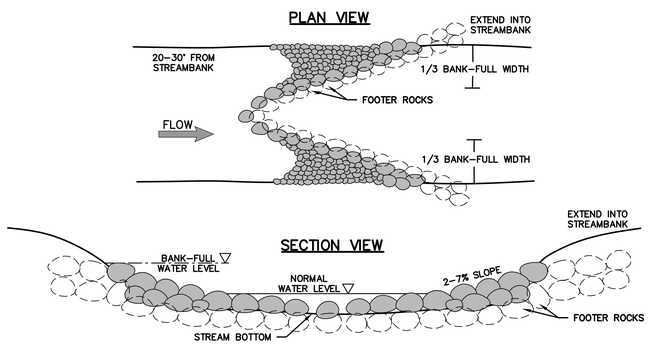
NOTES:

REFER TO TECHNICAL SPECIFICATION 02694 FOR MATERIAL INSTALLATION DETAILS.

FOOTER ROCKS WILL BE KEYED INTO BED AT THE PROPER DEPTH SUCH THAT THE UPPER TIER OF ROCK (VANE ROCKS) MAINTAINS THE FOLLOWING SPECIFICATIONS:

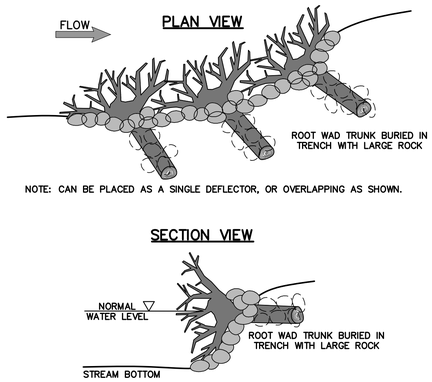
- TOP OF BUTT ROCK IS SET AT DESIRED BANKFULL ELEVATION.
- UPSTREAM END OF ARM ROCKS MEET THE DESIRED BED ELEVATION AT ONE-THIRD THE DESIGN BANKFULL CHANNEL WIDTH.
- ARMS EXTEND DOWNSTREAM FROM UPPER SILL TO BUTT ROCK AT A CONTINUOUS SLOPE OF 4% - 7%.
- ARMS ARE SET AT A 20° TO 30° ANGLE IN RESPECT TO THE NEAR BANK (SEE CROSS VANE DETAIL, PLAN VIEW, ON THIS SHEET).

STREAM BARB LAYOUT			
POINT	NORTHING	EASTING	ELEV. (FT)



ROCK CROSS VANE

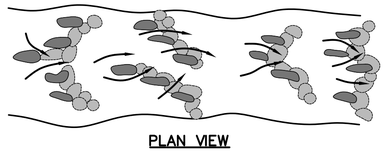
NOT TO SCALE



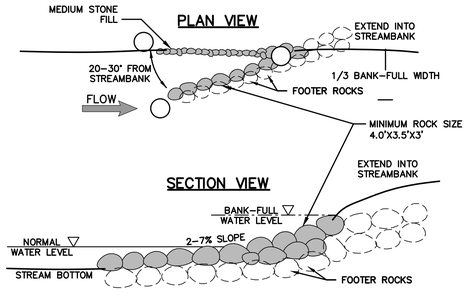
NOTE: CAN BE PLACED AS A SINGLE DEFLECTOR, OR OVERLAPPING AS SHOWN.

ROOT WAD DEFLECTOR

NOT TO SCALE

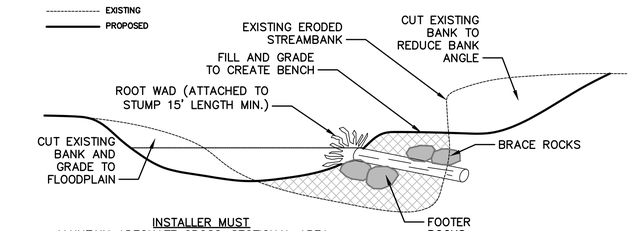


PLAN VIEW



STREAM BARB DETAIL

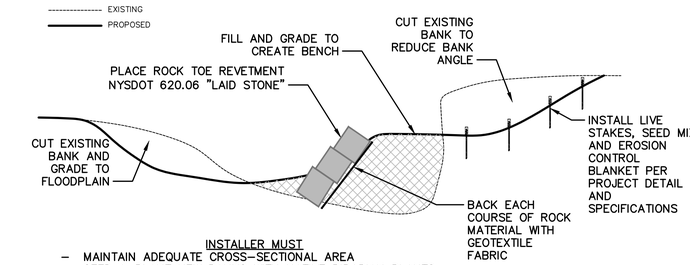
NOT TO SCALE



INSTALLER MUST
- MAINTAIN ADEQUATE CROSS-SECTIONAL AREA
- SEED & PLANT NEW BANKS WITH NATIVE RIPARIAN PLANTS
- CONSTRUCT STABLE CROSS SECTION GEOMETRY PER DESIGN (SPECIFIC CHANNEL WIDTH AND DEPTH)

FLOODPLAIN BENCH WITH ROOT WADS DETAIL

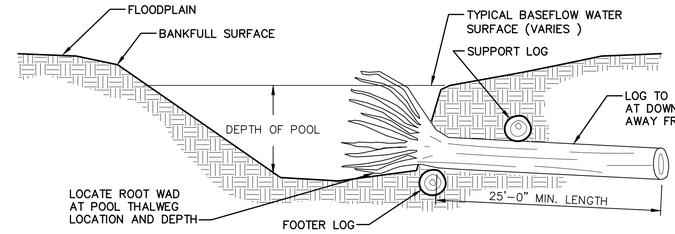
NOT TO SCALE



INSTALLER MUST
- MAINTAIN ADEQUATE CROSS-SECTIONAL AREA
- SEED & PLANT NEW BANKS WITH NATIVE RIPARIAN PLANTS
- CONSTRUCT STABLE CROSS SECTION GEOMETRY PER DESIGN (SPECIFIC CHANNEL WIDTH AND DEPTH)

FLOODPLAIN BENCH WITH ROCK REVETMENT DETAIL

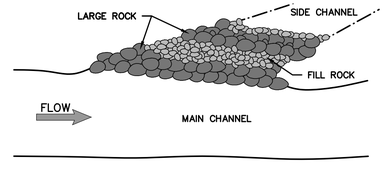
NOT TO SCALE



ROOT WAD DETAIL SECTION VIEW

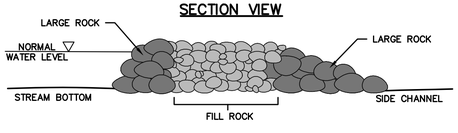
NOT TO SCALE

PLAN VIEW



NOTE: SILL LOGS SHOULD BE PLACED EVERY 15 FT.

SECTION VIEW



STONE CHANNEL BLOCK

NOT TO SCALE

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT
ULSTER COUNTY, NEW YORK

TYPICAL SECTIONS & DETAILS - 1

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: FEBRUARY 2019

Scale: AS SHOWN

Sheet Number: C301

Project Number: 924.068.002

Plotted: Feb 27, 2019 - 3:58PM By: rpc
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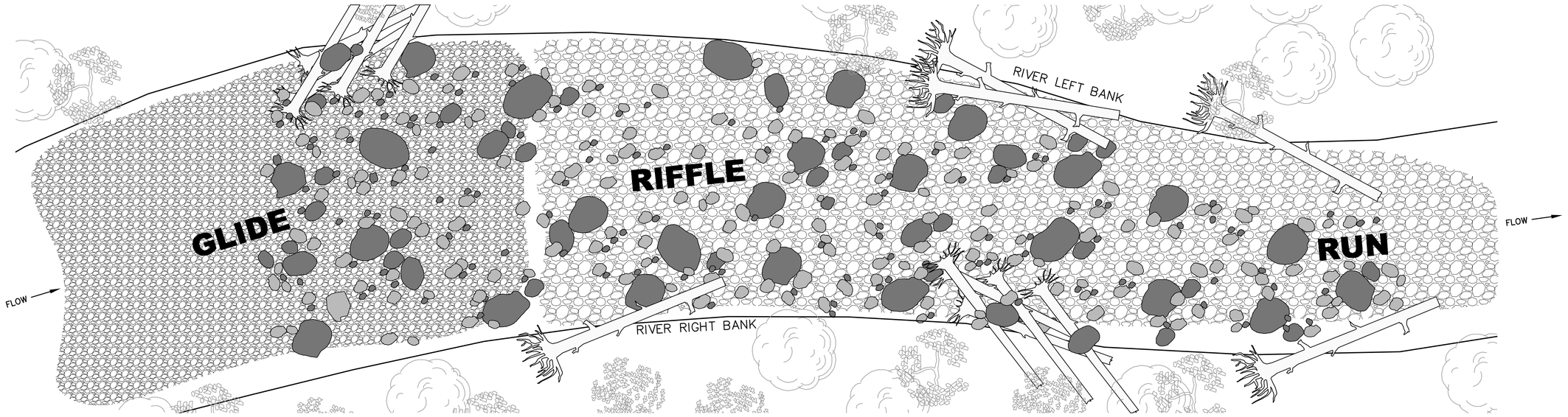
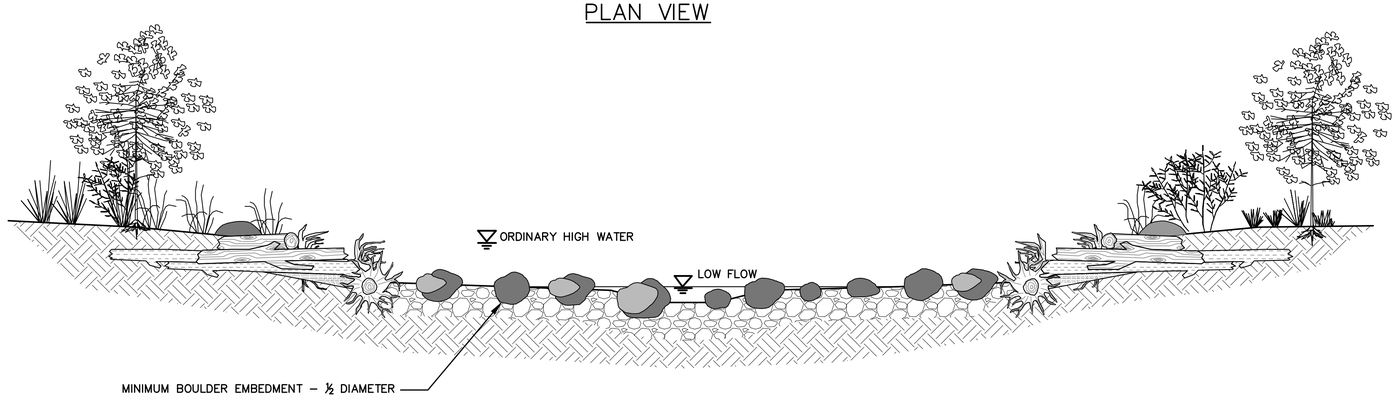
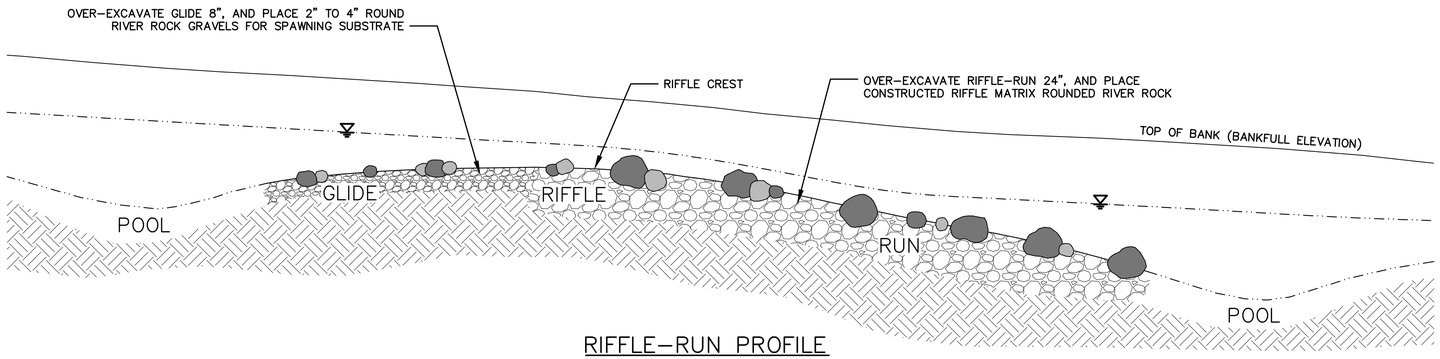


PLAN VIEW



RIFFLE SECTION



RIFFLE–RUN PROFILE

CONSTRUCTED RIFFLE

NOT TO SCALE

CONSTRUCTION NOTES:

BOULDER PLACEMENT BEGINS NEAR THE DOWNSTREAM END OF THE GLIDE TO PROVIDE LARGE SCALE ROUGHNESS DURING HIGH FLOW AND HYDRAULIC VARIABILITY UNDER LOW FLOW CONDITIONS. HYDRAULIC EFFECTS INCLUDE SPAWNING MATERIAL RETENTION AND DEPOSITION ALONG GLIDE FACE. BOULDERS PLACED ALONG THE RIFFLE AND RUN PROVIDE DISRUPTION OF AVERAGE VELOCITY PARTICULAR CARE SHOULD BE EMPLOYED WITH ELEMENT PLACEMENT TO REINFORCE THE RUN POOL TRANSITIONAL SLIP FACE.

BOULDERS SHOULD BE PLACED IN RANDOM PATTERNS THAT REPLICATE NATURAL STREAM CONDITIONS AS DIRECTED BY THE PROJECT FISHERIES BIOLOGIST AND HYDRAULIC ENGINEER.

SEE GRADUATION SCHEDULES ON THIS SHEET FOR CONSTRUCTED RIFFLE MATRIX GRADUATION AND HABITAT BOULDER REQUIREMENTS. SUFFICIENT FINES (SAND FRACTION OR FINER) SHALL BE DEVELOPED FROM ON–SITE EXCAVATIONS AND PRESSURE WASHED INTO THE PLACED RIFFLE MATRIX BOULDER FEATURE.

ENGINEERED RIFFLE TO BE CONSTRUCTED IN ONE HALF FOOT VERTICAL LIFTS WITH FINES ADDED AND PRESSURE WASHED. SUCCESSFUL WASHING WILL BE DETERMINED BY MINIMIZATION OF VOIDS WITHIN PLACED MATRIX SUCH THAT PONDING OCCURS ON TOP OF LIFT WITH LITTLE TO NO PERCOLATION LOSSES OCCURRING THROUGH THE ENGINEERED RIFFLE.

CONSTRUCTED RIFFLE HABITAT BOULDER SCHEDULE

BOULDER ELEMENT SIZE (FT.)	RGCS #1 L=230'	RGCS #2 L=201'	RGCS #3 L=230'	RGCS #4 L=270'	RGCS #5 L=170'	RGCS #6 L=120'
1.5'	127	110	127	121	94	66
2.0'	46	40	46	66	34	24
2.75'	69	60	69	66	51	36
3.5'	69	60	69	60	51	36

CONSTRUCTED RIFFLE MATRIX GRADATION

PERCENT PASSING	LOWER LIMIT (INCHES)	UPPER LIMIT (INCHES)
100	17.0	100
85	14.5	20.0
50	11.0	17.0
30	6.5	10.5
15	3.5	5.5

MATRIX THICKNESS (T) = 24 INCHES

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

TYPICAL SECTIONS & DETAILS – 2

ULSTER COUNTY, NEW YORK

TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date
FEBRUARY 2019

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Sheet Number
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Project Number
924.068.002

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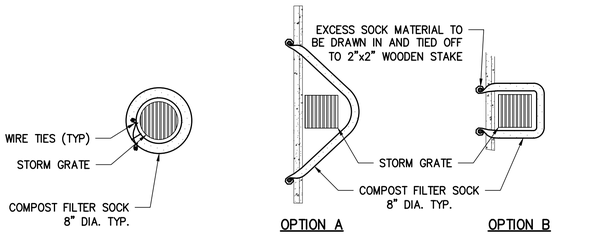

INLET PROTECTION

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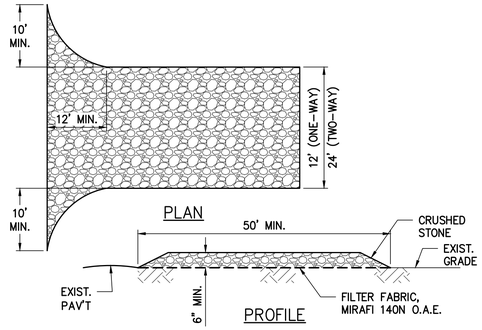
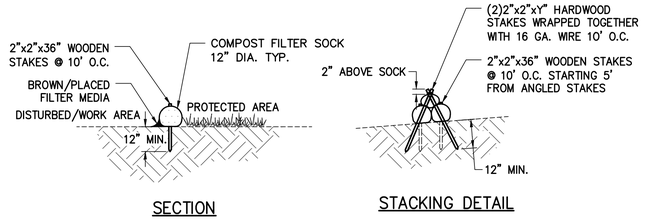
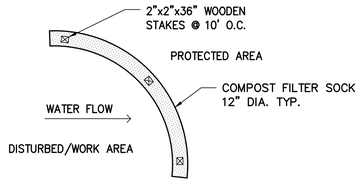


STABILIZED CONSTRUCTION ACCESS

NOT TO SCALE





PLAN

COMPOST FILTER SOCK

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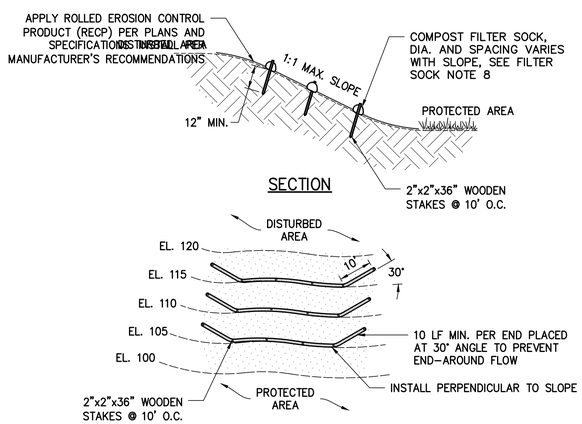

TEMPORARY & PERMANENT SLOPE STABILIZATION

NOT TO SCALE

STABILIZED CONSTRUCTION ACCESS NOTES:

1. MODIFICATIONS MAY BE REQUIRED TO MEET FIELD CONDITIONS.
2. PROPOSED DRAINAGE PIPES SHALL BE SIZED WITH SUFFICIENT CAPACITY TO CARRY DITCH FLOWS.
3. ALTERNATIVE WAYS OF TRANSPORTING DITCH DRAINAGE ACROSS CONSTRUCTION ENTRANCES MAY BE PROPOSED BY THE CONTRACTOR FOR APPROVAL BY THE ENGINEER.
4. ALL WORK TO CONSTRUCT THE STABILIZED ENTRANCE, INCLUDING GRADING, DRAINAGE PIPE, EXCAVATION, FILL, GEOTEXTILE, CRUSHED STONE, GRAVEL, CORRUGATED STEEL PANELS SHALL BE INCLUDED IN THE LUMP SUM BID.
5. GEOTEXTILE SHALL BE PLACED OVER THE ENTIRE AREA OF STABILIZED CONSTRUCTION ENTRANCE PRIOR TO PLACING STONE. STONE SHALL MEET THE REQUIREMENTS OF NYSDOT ITEM 623.12, CRUSHED STONE #3.
6. ALL SURFACE WATER SHALL BE DIVERTED AWAY FROM CONSTRUCTION ENTRANCE. A MOUNTABLE BERM WITH 5:1 SLOPE IS PERMITTED.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT OF WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT OF WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA WITH STONE AND WHICH DRAINS ONTO AN APPROVED SEDIMENT TRAPPING DEVICE (OR CORRUGATED STEEL PANELS).
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE DONE REGULARLY AND FOLLOWING EACH RAINFALL.

COMPOST FILTER SOCK NOTES:

1. COMPOST FILTER SOCKS ARE A TEMPORARY SEDIMENT CONTROL PRACTICE COMPOSED OF A DEGRADABLE GEOTEXTILE MESH TUBE FILLED WITH COMPOST FILTER MEDIA TO REDUCE RUNOFF VELOCITY, FILTER SEDIMENT AND OTHER POLLUTANTS ASSOCIATED WITH CONSTRUCTION ACTIVITY, AND TO PREVENT THEIR MIGRATION OFFSITE.
2. FILTER SOCKS CAN BE USED IN SENSITIVE AREAS WHERE CONTROL OF WEEDS AND INVASIVE PLANT SPECIES IS DESIRED.
3. FILTER SOCKS SHALL BE INSTALLED ON A LINE OF EQUAL ELEVATION (CONTOUR). THEY MAY BE INSTALLED AT INTERMEDIATE POINTS UP SLOPES AS WELL AS AT THE BOTTOM. ALL TERMINAL ENDS SHALL EXTEND 10 FEET UPSLOPE AT A 30° ANGLE TO PREVENT BYPASS FLOW.
4. FILTER SOCKS SHALL NOT BE USED IN OR ACROSS A FLOWING NATURAL CHANNEL. REFER TO CHECK DAM DETAIL AND SPECIFICATION.
5. FILTER SOCKS ARE NOT TO BE INSTALLED SO THAT RUNOFF WILL FLOW ALONG THE FILTER SOCK IN A CONCENTRATED MANNER.
6. FILTER SOCKS SHALL BE PLACED A MINIMUM OF 2 FEET FROM TOE OF SLOPE, (5 FEET PREFERRED), TO PROVIDE ADEQUATE AREA FOR SEDIMENT STORAGE AND TO FACILITATE MAINTENANCE OF THE SEDIMENT CONTAINMENT AREA.
7. POSTS MAY BE 2" x 2" MIN. WOOD OR 2 kg/m MIN. STEEL. SPACING SHALL BE AS RECOMMENDED BY THE MANUFACTURER. FOR USE ON IMPERVIOUS SURFACES SUCH AS ROAD PAVEMENT OR PARKING AREAS, PROPER ANCHORAGE MUST BE PROVIDED TO PREVENT SHIFTING OF THE SOCK OR SEPARATION OF THE CONTACT BETWEEN THE SOCK AND THE PAVEMENT.
8. FILTER SOCKS SHALL BE BETWEEN 12" AND 32". THE MAXIMUM SLOPE LENGTH ABOVE A FILTER SOCK SHALL NOT EXCEED THE FOLLOWING

	SLOPE (%)						
DIA.	2	5	10	20	25	33	50
8"	225'	200'	100'	50'	20'	–	–
12"	250'	225'	125'	65'	50'	40'	25'
18"	275'	250'	150'	70'	55'	45'	30'
24"	350'	275'	200'	130'	100'	60'	35'
32"	450'	325'	275'	150'	120'	75'	50'

9. MEASURES SHALL BE INSPECTED EVERY 7 CALENDAR DAYS, AFTER EACH RAINFALL OF 0.5" OR MORE WITHIN A 12 HOUR PERIOD, OR DAILY DURING PROLONGED RAINFALL. MEASURES SHALL BE CLEANED AND REPAIRED AS REQUIRED.
10. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES ONE-HALF OF THE ABOVE GROUND HEIGHT. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.
11. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE FILTER SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR THE MESH CAN BE CUT AND THE COMPOST SPREAD AS AN ADDITIONAL MULCH TO ACT AS A SOIL SUPPLEMENT.
12. MAXIMUM DRAINAGE AREA TRIBUTARY TO 100' OF FILTER SOCK SHALL BE 0.5 ACRE

TEMPORARY & PERMANENT SLOPE STABILIZATION NOTES:

1. ITEMS IN THIS DETAIL MAY APPEAR EXAGGERATED TO SHOW DETAIL.
2. ROLLED EROSION CONTROL PRODUCT (RECP) SHALL REFER TO EROSION CONTROL BLANKET AND TURF REINFORCEMENT MAT (TRM). REFER TO DETAIL AND SPECIFICATIONS FOR APPROPRIATE USE OF EACH PRODUCT.
3. IF SLOPE IS BROUGHT TO FINISHED GRADE, PERMANENT TOP SOIL AND SEEDING SHALL BE INSTALLED PRIOR TO INSTALLING ROLLED EROSION CONTROL PRODUCT (RECP).
4. ROLLED EROSION CONTROL PRODUCT (RECP) SHALL BE SELECTED AND INSTALLED IN ALIGNMENT WITH THE SPECIFICATIONS. PAYMENT WILL NOT BE MADE FOR MATERIALS THAT ARE NOT ON THE APPROVED LIST, IMPROPERLY INSTALLED, NOT MAINTAINED, DAMAGED BY THE CONTRACTOR AND/OR SUB-CONTRACTORS.
5. RECP MUST BE FLUSH AND IN CONTACT WITH THE SOIL AND NOT RAISED BY CLUMPS, WEEDS, STICKS, ETC. AND MUST BE STAPLED SECURELY.
6. ALL RECP DAMAGED BY CONTRACTOR AND/OR SUBCONTRACTORS SHALL BE REPAIRED WITHIN THREE (3) CALENDAR DAYS OF THE DAMAGE OCCURRENCE AT NO ADDITIONAL COST TO THE OWNER.

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REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT
ULSTER COUNTY, NEW YORK

EROSION & SEDIMENT CONTROL NOTES & DETAILS

TOWN OF WAWARSING

Barton & Loguidice

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Date
FEBRUARY 2019

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Sheet Number
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APPENDIX B

SPECIFICATIONS

SECTION 02690

MOBILIZATION & DEMOBILIZATION

PART 1 – GENERAL

1.1 DESCRIPTION: The work shall consist of the mobilization and demobilization of the Contractor's labor and the equipment necessary for performing the work required under the Contract. Mobilization will not be considered as work in fulfilling the contract requirement for commencement of work.

PART 2 – PRODUCTS

2.1 EQUIPMENT & MATERIALS:

2.1.1 Mobilization shall include all activities and costs for transportation of personnel, equipment, and supplies/materials to the site, establishment of offices, buildings and other necessary facilities for the Contractor's operations at the site.

2.1.2 Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies/materials not used in the Contract, including the disassembly, removal, and site cleanup of any offices, buildings or other facilities assembled on the site for the Contract.

2.1.3 This work includes mobilization and demobilization required by the Contract at the time of award. If additional mobilization/demobilization is required during the performance of the Contract due to changed, deleted or added items of work, for which the Contractor is entitled to an adjustment in the Contract price, compensation for such costs will be included in the price adjustment for the item or items of work changed or added.

2.1.4 The Contractor is responsible for security of the Contractor's equipment while on site.

PART 3 – EXECUTION

3.1 EQUIPMENT TRANSPORT:

3.1.1 The Contractor shall be responsible for all required permits for transportation of the Contractor's equipment. All equipment and materials shall be mobilized and demobilized in accordance with all local, State, and Federal laws related to transportation and safety.

3.2 PROJECT COMPLETION:

3.2.1 Upon completion of the work, the Contractor shall restore all access areas to the same condition as prior to the start of the work, or as otherwise required in conformance with the construction plans, details, and specifications.

PART 4 – MEASUREMENT & PAYMENT

4.1 MEASUREMENT – MOBILIZATION & DEMOBILIZATION:

4.1.1 Measurement for Mobilization & Demobilization shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

4.2 PAYMENT – MOBILIZATION & DEMOBILIZATION:

4.1.1 For Mobilization & Demobilization, not included in other unit or lump sum price items, payment for Mobilization & Demobilization will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02693

ROCK MATERIAL FOR STREAM RESTORATION

PART 1 – GENERAL

1.1 DESCRIPTION: This specification defines the type and quality of rock to be used in the construction of instream rock structures for stream restoration as well as rock for construction of a channel block. The use of rock in stream projects requires a dense, low porosity material that can withstand stream flows as well as freeze-thaw cycles.

PART 2 - PRODUCTS

2.1 QUALITY: Individual rocks shall be dense, sound and free from cracks, seams and other defects conducive to accelerated weathering. Except as provided below, the rock shall meet the following parameters:

2.1.1 Bulk specific gravity (saturated dry surface basis) not less than 2.5. Bulk specific gravity to be determined by ASTM Method C127.

2.1.2 Absorption not more than two percent (2%).

2.1.3 Soundness - weight loss in five (5) cycles not more than ten percent (10%) when sodium sulfate is used or more than fifteen percent (15%) when magnesium sulfate is used.

2.1.4 Soundness shall be determined in accordance with ASTM C88 for coarse aggregate modified as follows:

2.1.4.1 The test sample shall not be separated into fractions. It shall consist of 500 grams (+ 300 grams), reasonably uniform in size and shape and weighing approximately 100 grams each, obtained by breaking the rock and selecting fragments of the required size.

2.1.4.2 After the sample has dried, following completion of the final test cycle and washing to remove the reactants, the loss of weight shall be determined by subtracting from the original weight of the sample, the final weight of all fragments that have not broken into three or more pieces. The report shall show the percentage loss of weight and the results of the qualitative examination.

2.1.4.3 Rock that fails to meet the requirements in sub-sections 2.1.1 thru 2.1.4 above may be accepted if the rock has been pre-approved by NYSDOT or if similar rock from the same source has been demonstrated to be sound after five (5) years or more of service under conditions or weather, wetting, drying and erosive forces similar to those conditions anticipated at the site.

2.2 ROCK SHAPE & SIZE:

2.2.1 Rock for In-stream Structures: Rocks shall be angular, flat or cubed in shape. Uniform, cubed rocks are best for top (vane) rocks while those rocks with more roundness can be used as footer rocks.

2.2.2 Rock Size: Rock shall be consistent with the sizes set forth in the construction specification for each in-stream structure and/or for sediment gradation for streambed fill (if applicable).

2.3 SPECIAL CONDITIONS: Rock material must be inspected and approved by the Construction Supervisor prior to its use.

2.3.1 All disturbed areas that expose clay or any other highly-mobile sediment must be protected by sufficient placement of stone or gravel aggregate. This aggregate material must have a median size of 7 inches, in order to adequately withstand high water conditions.

2.4 CERTIFICATION: At the request of the Construction Supervisor or authorized Construction Supervisor, the Contractor shall provide acceptable documentation that the rock proposed for the project meets the specifications as set forth above. The Construction Supervisor may waive the need for certification of the rock if the quarry source is known to produce acceptable rock, or upon inspection of the proposed rock source by the Construction Supervisor and Project Engineer or authorized Construction Supervisor.

PART 3 – EXECUTION

3.1 ROCK MATERIAL INSTALLATION:

3.1.1 The Contractor shall furnish all labor, material, and equipment necessary to properly construct all items in this section in an acceptable manner.

3.1.2 Rock material shall be installed as indicated on the Contract Drawings.

PART 4 – MEASUREMENT & PAYMENT

4.1 MEASUREMENT – ROCK MATERIAL FOR STREAM RESTORATION:

4.1.1 Measurement for Rock Material for Stream Restoration shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

4.2 PAYMENT – ROCK MATERIAL FOR STREAM RESTORATION:

4.1.1 For Rock Material for Stream Restoration, not included in other unit or lump sum price items, payment for Rock Material for Stream Restoration will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02694

CROSS VANES

PART 1 – GENERAL

1.1 DESCRIPTION:

1.1.1 Cross Vanes are in-stream structures constructed for the purpose of reducing shear stress on streambanks as well as grade control for the streambed. Cross Vanes are constructed as shown in the Construction Drawings and this specification. Cross Vanes shall consist of both Footer Rocks, placed below the invert of the proposed channel, as well as Vane Rocks.

PART 2 – PRODUCTS

2.1 MATERIALS: Cross Vanes shall be constructed of angular, flat, or cubed rock. When possible, consideration should be given to obtaining rock that is similar in color and texture to the native stone in the project area. Rock should be of sufficient hardness to resist weathering and shall be free of cracks and other blemishes. Porous rock, such as some limestone, and soft rock, such as shale, is not allowed. In some cases, native rock present on-site may be authorized for use by the Construction Supervisor. In no instance will concrete or other "debris" rock be allowed. All rock under this specification shall meet the conditions of material Specification Section 02693: "Rock Material for Stream Restoration."

2.2 ROCK SIZE:

2.2.1 Rock used for the construction of Cross Vanes is determined by the predicted maximum shear stress available at the location of each installation. For this project, all cross vanes will be constructed of rock sized according to the table below. Rock size and shape is critical to the construction of proper cross vanes and as such, specifications will be strictly enforced.

	A-axis	**B-axis**	**C-axis**
Minimum Size	3 ft	2 ft	2 ft
Maximum Size	4 ft	3 ft	2 ft

2.2.2 Rock Weight - The dry unit weight of each rock shall be 150-lbs/cu. ft. or greater.

2.2.3 Any rock material that fails to meet the Construction Supervisor's approval for size, shape, or other criteria will be disqualified for use by the Contractor.

2.3 SOURCE OF MATERIALS:

2.3.1 Prior to the execution of the contract, the Contractor will locate potential sources of rock. The Contractor and Construction Supervisor will jointly visit the site(s) to determine whether the rock meets the requirements as set forth in these specifications. A site visit may be waived by the Construction Supervisor when rock will come from a source that has been approved in the past, or if it is obtained from the current approved supplier used by NYSDOT.

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS:

3.1.1 Cross Vanes shall be installed according to the Sequence of Construction, the Plans and Details, this specification and as directed by the Construction Supervisor.

3.1.2 Cross Vanes shall be constructed as two (2) Rock Vanes on opposite sides of the stream, with a connecting cross channel sill set at the proposed invert of the streambed. Cross Vanes shall consist of Vane Rock, Throat Rock, and Footer Rock.

3.1.3 Cross Vanes shall be constructed so that adjoining rocks taper in an upstream direction, from the bankfull elevation to the stream invert. The upstream (lower) end of the Cross Vane is set at an angle of 20°-30° tangent to the curve of the adjacent stream bank.

3.1.4 The downstream end of the Cross Vane shall be keyed into the streambank at the bankfull elevation. The Cross Vane shall be keyed a minimum of fifteen (15) feet into the streambank. The upstream end of Cross Vane shall be keyed into the streambed at the invert (desired bed) elevation. The Cross Vane shall be installed such that the throat invert is at the desired bed elevation and the arms of the vane slope upward to the bankfull elevation on a slope of 4% to 7%.

3.1.5 The Cross Vanes shall be completed by the placement of a cross channel throat at the design invert of the streambed. Cross channel rocks shall be set back a minimum of 18 inches upon the Footer Rocks (see Sections 3.1.6 and 3.1.7 below), and shall be placed so that the throat rocks are level across the channel. Throat rocks shall be placed in close rock-to-rock contact with no space between adjoining rocks. The elevation of the throat shall be as determined on the plan drawings, specifications, and construction notes or as determined on-site by the Construction Supervisor.

3.1.6 Footer Rocks shall be installed as shown in the Plans and Details and shall be firmly keyed into the streambed. A minimum of 2 tiers of footer rocks shall be utilized, with the upper tier of Footer rocks set back a minimum of 18 inches upon the tier below, but not to exceed ½

rock length (i.e. setback upon a rock 40 inches in length should not exceed 20 inches). Overall structure depth (base of footer to top of throat) must be a minimum of 6 feet.

3.1.7 Subsequent tiers of rocks will be set partly upon the tier beneath (see Section 3.1.6 and Construction Detail Drawings). Any portion of each tier of rocks not set upon the rocks below shall be set upon a base of imported aggregate material, established as specified by the Construction Supervisor or Project Engineer in a fashion that allows for adequate placement, leveling, and support of Footer and Vane Rocks without the risk of scour of parent streambed material around the Rocks.

3.1.8 Vane Rocks shall be placed in a linear fashion so as to produce the sloping Cross Vane, and shall be placed with tight, continuous surface contact between adjoining rocks. Rock shall be placed so as to have no significant gap between adjoining rocks. All gaps must be filled with smaller rock material to eliminate any gaps to the greatest extent possible.

3.1.9 Vane Rock shall be placed so as to have a final smooth surface along the top plane of the Cross Vane. No Vane Rock shall protrude higher than the other rock in the Rock Vane. A completed Cross Vane has a smooth, continuous finish grade sloping from the bankfull elevation to the streambed.

3.1.10 As the cross vane is constructed, the Contractor shall chink all voids between the footer rocks, and between the footer rocks and vane rocks. Voids shall be chinked with small boulders, cobble or rock fragments. Chinking will be conducted such that all void spaces between the footer and vane rocks are eliminated to the greatest extent possible.

3.1.11 Upon completion of the Cross Vane, the Contractor shall redress disturbed soils in the vicinity of the Cross Vane, and place bank treatments and plantings as indicated in the Construction Details and Specifications.

3.1.12 The Contractors shall upon completion of the work reshape the slopes and stream bottom to the specified elevations. All unsuitable and surplus rocks will be removed from the site. Any areas where stream-edge or streambed excavation has exposed clay must be treated with aggregate material as specified. For this project, such material will consist of an aggregate with a median size of 7 inches.

3.2 SPECIAL CONDITIONS:

3.2.1 The Contractor shall construct all Cross Vanes in the presence of an authorized Construction Supervisor.

3.2.2 Placement of Footer Rocks is critical to the success of Cross Vanes. To insure proper placement, the Contractor shall provide a portable pump to divert or de-water stream water and

excessive ground water from the excavation to the greatest extent possible. All footer rock placements shall be conducted in the driest conditions possible.

3.2.3.3 The construction of Cross Vanes requires equipment that can place rock in precise locations. An excavator of a suitable size and containing a thumb is suggested.

3.2.4 The presence of clays in the work area will require over excavation of the areas associated with the Cross Vanes. Contractor shall over-excavate the footer for each structure and will place an aggregate sub-base in the footer foundation before placing the footer rocks, as directed by the Construction Supervisor.

PART 4 – MEASUREMENT & PAYMENT

4.1 MEASUREMENT – CROSS VANES:

4.1.1 Measurement for Cross Vanes shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

4.2 PAYMENT – CROSS VANES:

4.1.1 For Cross Vanes, not included in other unit or lump sum price items, payment for Cross Vanes will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02695

J-HOOK

PART 1 – GENERAL

1.1 DESCRIPTION:

1.1.1 J-Hooks are in-stream structures constructed for the purpose of reducing shear stress on streambanks as well as grade control for the streambed, primarily in the vicinity of stream meanders. J-Hooks are constructed as shown in the Construction Details, and as set forth in the Project Drawings and in this specification. J-Hooks shall consist of both Footer Rocks, placed below the invert of the proposed channel, as well as Vane Rocks as shown in the Construction Details.

PART 2 – PRODUCTS

2.1 MATERIALS:

2.1.1 J-Hooks shall be constructed of angular, flat, or cubed rock. When possible, consideration should be given to obtaining rock that is similar in color and texture to the native stone in the project area. Rock should be of sufficient hardness to resist weathering and shall be free of cracks and other blemishes. Porous rock, such as some limestone, and soft rock, such as shale, is not allowed. In some cases, native rock present on-site may be authorized for use by the Construction Supervisor. Under no circumstances will concrete or other "debris" rock be allowed. All rock under this specification shall meet the conditions of material Specification Section 02693: "Rock Material for Stream Restoration."

2.1.2 Rock Size: Rock used for the construction of J-hooks is determined by the predicted maximum shear stress available at the location of each installation. For this project, all J-hooks will be constructed of rock sized according to the table below. Rock size and shape is critical to the construction of proper J-hooks and as such, specifications will be strictly enforced.

	A-axis	**B-axis**	**C-axis**
Minimum Size	3 ft	2 ft	2 ft
Maximum Size	4 ft	3 ft	2 ft

2.1.3 Rock Weight: The dry unit weight of each rock shall be 150-lbs/cu. Ft. or greater.

2.1.4 Any rock material that fails to meet the Construction Supervisor's approval for size, shape, or other criteria will be disqualified for use by the Contractor.

2.2 SOURCE OF MATERIALS: Prior to the execution of the contract, the Contractor will locate potential sources of rock. The Contractor and Construction Supervisor will jointly visit the site(s) to determine whether the rock meets the requirements as set forth in these specifications. A site visit may be waived by the Construction Supervisor when rock will come from a source that has been approved in the past, or if it is obtained from the current approved supplier used by NYSDOT.

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS:

3.1.1 J-Hooks shall be installed according to the Sequence of Construction, the Plans and Details, this specification and as directed by the Construction Supervisor.

3.1.2 J-Hooks shall be constructed as one (1) Rock Vane, with a connecting cross channel throat set at the proposed invert of the streambed. J-hooks shall consist of Vane Rock, Throat Rock, and Footer Rock(s).

3.1.3 J-Hooks shall be constructed so that adjoining rocks taper in an upstream direction, from the bankfull elevation to the stream invert. The vane (arm) of the J-Hook is set at an angle of 20°-30° tangent to the curve of the adjacent stream bank.

3.1.4 The downstream end of the J-hook shall be keyed into the streambank at the bankfull elevation. The J-Hook shall be keyed a minimum of fifteen feet (15') into the streambank. This distance may be extended to provide sufficient coverage upon the discretion of the Construction Supervisor. The upstream end of J-hook shall be keyed into the streambed at the invert (desired bed) elevation. The J-hook shall be installed such that the throat invert is at the desired bed elevation and the arm of the vane slopes upward to the bankfull elevation on a slope of 4% to 7%.

3.1.5 The J-hooks shall be completed by the placement of a hook-shaped cross channel throat at the design invert of the streambed. Cross channel rocks shall be set back a minimum of 18 inches upon the Footer Rocks (see Sections 3.1.7 and 3.1.8 below), and shall be placed so that the throat rocks are level across the channel. Throat rocks shall be placed in close rock-to-rock contact with no space between adjoining rocks. The elevation of the throat shall be as determined on the plan drawings, specifications, and construction notes or as determined on-site by the Construction Supervisor.

3.1.6 The elevation of the throat shall be as determined on the plan drawings, specifications, and construction notes or as determined on-site by the Construction Supervisor or Project Engineer.

3.17 Footer Rocks shall be installed as shown in the Plans and Details and shall be firmly keyed into the streambed. A minimum of 2 tiers of footer rocks shall be utilized, with the upper tier of Footer rocks set back a minimum of 18 inches upon the tier below, but not to exceed ½ rock length (i.e., setback upon a rock 40 inches in length should not exceed 20 inches). Overall structure depth (base of footer to top of throat) must be a minimum of 6 feet.

3.1.8 Subsequent tiers of rocks will be set partly upon the tier beneath (see Section 3.1.7 and Construction Detail Drawings). Any portion of each tier of rocks not set upon the rocks below shall be set upon a base of imported aggregate material, established as specified by the Construction Supervisor or Project Engineer in a fashion that allows for adequate placement, leveling, and support of Footer and Vane Rocks without the risk of scour of parent streambed material around the Rocks.

3.1.9 Vane Rocks shall be placed in a linear fashion so as to produce the sloping J-Hook, and shall be placed with tight, continuous surface contact between adjoining rocks. Rocks shall be placed so as to have no significant gap between adjoining rocks. Gaps must be 'chinked' or filled with smaller rock material to eliminate any gaps between vane rocks to the greatest possible extent.

3.1.10 Vane Rock shall be placed so as to have a final smooth surface along the top plane of the J-Hook. No Vane Rock shall protrude higher than the other rocks in the vane (arm). A properly completed J-hook has a smooth, continuous finish grade sloping from the bankfull elevation to the streambed.

3.1.11 As the J-Hook is constructed, the Contractor shall chink all voids between the footer rocks, and between the footer rocks and vane rocks. Voids shall be chinked with small boulders, cobble or rock fragments. Chinking will be conducted such that all void spaces between the footer and vane rocks are eliminated to the greatest degree possible.

3.1.12 Upon completion of the J-Hook, the Contractor shall redress disturbed soils in the vicinity of the J-Hook, and place bank treatments and plantings consistent with the construction plans, details, and specifications.

3.1.13 The Contractors shall upon completion of the work reshape the slopes and stream bottom to the specified elevations reflective of the typical cross-section, or as directed by the Construction Supervisor. All unsuitable and surplus rocks will be removed from the site. Any areas where stream-edge or streambed excavation has exposed clay must be treated with

aggregate material as specified. For this project, such material will consist of an aggregate with a median size of 7 inches.

3.2 SPECIAL CONDITIONS:

3.2.1 The Contractor shall construct all J-Hooks in the presence of the Construction Supervisor.

3.2.2 Placement of Footer Rocks is critical to the success of the J-Hook. To insure proper placement, the Contractor shall provide adequate diversions and pumping to de-water stream water and excessive ground water from the excavation site to the greatest extent possible. All footer rock placements shall be conducted in driest condition achievable.

3.2.3 The construction of J-Hooks requires equipment that can place rock in precise locations. An excavator of a suitable size and containing a thumb is suggested.

3.2.4 The presence of clays in the work area will require over excavation of the areas associated with the J-Hooks. Footers will be over-excavated and partially filled with a suitable aggregate sub-base as directed by the Construction Supervisor.

PART 4 – MEASUREMENT & PAYMENT

4.1 MEASUREMENT – J-HOOK:

4.1.1 Measurement for J-Hook shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

4.2 PAYMENT – J-HOOK:

4.1.1 For J-Hook, not included in other unit or lump sum price items, payment for J-Hook will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02697

STREAMBANK TREATMENTS

PART 1 – GENERAL

1.1 DESCRIPTION:

1.1.1 Streambank treatments are designed and intended to provide interim streambank stabilization during the time period following construction needed for streamside vegetation to become well established. The streambank treatments outlined in this document are comprised mostly of biodegradable materials. In the long term, areas stabilized with such streambank treatments will revert entirely to native vegetation.

1.1.2 Streambank treatments will be applied to all disturbed areas following construction/ restoration. The entire area disturbed or exposed as a result of this construction activity will be treated with streambank treatments, on both banks, from the very upper to the very lower limits of the project area.

PART 2 – PRODUCTS

2.1 MATERIALS: The prescribed streambank treatments are constructed primarily of biodegradable components. Although a wide variety of materials and treatments exist, the treatments employed in the construction of this project include the following components:

2.1.1 Biodegradable Erosion Control Mat:

2.1.1.1 Biodegradable Erosion Control (EC) mats to be used will be a minimum of seven feet (7’) in width.

2.1.1.2 EC Mats will be comprised of uniformly distributed 100% coconut fiber matrix, bound between biodegradable jute fiber or netting with biodegradable thread.

2.1.1.3 Erosion control blanket will be secured using six-inch (6”) erosion control blanket pins (staples).

PART 3 – EXECUTION

3.1 INSTALLATION:

3.1.1 Biodegradable Erosion Control Mat:

3.1.1.1 Erosion control blanket will be installed upslope of the water's edge on each streambank. The blanket will completely cover all disturbed soil areas within the construction area.

3.1.1.2 The erosion control blanket will be placed so that the lower portion of the blanket is anchored by imbedding the end into the soil by at least one foot (1'). This will help prevent under-washing of the coir mat by slope runoff. Consecutive blankets will be installed in a downstream fashion so that each blanket overlaps the next downstream blanket by at least one foot (1'). This will eliminate the risk of the blanket being under-washed during flood flows.

3.1.1.3 Erosion control blanket will be secured using erosion control blanket pins (staples). The staples will be installed according to manufacturer's specification.

3.1.1.4 The top edge of the erosion control blanket will be secured in a six-inch (6") deep trench, with a six-inch (6") wood stake, and buried. Wood stakes along the top edge of the erosion control blanket will be placed at ten foot (10') centers.

PART 4 – MEASUREMENT & PAYMENT

4.1 MEASUREMENT – STREAMBANK TREATMENTS:

4.1.1 Measurement for Streambank Treatments shall include the cost of all materials, equipment, labor, submittals and testing for the work indicated in this Section.

4.2 PAYMENT – STREAMBANK TREATMENTS:

4.1.1 For Streambank Treatments, not included in other unit or lump sum price items, payment for Streambank Treatments will be made at the applicable price stated in the Bid.

END OF SECTION

SECTION 02900

LANDSCAPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY:

This Section includes the following:

1. Trees.
2. Shrubs.
3. Ground covers.
4. Plants.
5. Lawns.
6. Topsoil and soil amendments.
7. Fertilizers and mulches.
8. Stakes and guys.
9. Landscape edgings.

A. Related Sections: The following Sections contain requirements that relate to this Section:

1. Section 02110 " Clearing"
2. Section 02484 “Topsoil”
3. Section 02220 “Excavation” for excavation, filling, rough grading, and subsurface aggregate drainage and drainage backfill.

1.3 SUBMITTALS:

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product certificates signed by manufacturers certifying that their products comply with specified requirements.

1. Manufacturer's certified analysis for standard products.

2. Analysis for other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

3. Label data substantiating that plants, trees, shrubs, and planting materials comply with specified requirements.

C. Certification of grass seed from seed vendor for each grass-seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

D. Mulch sample: six (6 oz.) ounce for each color and texture of mulch required in labeled plastic bags.

E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of architects and owners, and other information specified.

F. Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated.

1. Analysis of existing topsoil.
2. Analysis of imported topsoil.

G. Planting schedule indicating anticipated dates and locations for each type of planting.

H. Maintenance instructions recommending procedures to be established by Owner for maintenance of landscaping during an entire year. Submit before expiration of required maintenance periods.

1.4 QUALITY ASSURANCE:

A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful landscape establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that landscaping is in progress.

B. Testing Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Landscape Architect's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.

C. Provide quality, size, genus, species, and variety of trees and shrubs indicated, complying with applicable requirements of ANSI Z60.1 "American Standard for Nursery Stock."

D. Topsoil Analysis: Furnish a soil analysis made by a qualified independent soil-testing agency stating percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, pH, and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for growth of applicable planting material. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil.

E. Measurements: Measure trees and shrubs according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches (150 mm) above ground for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

1.5 DELIVERY, STORAGE, AND HANDLING:

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.

B. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

C. Sod: Harvest, deliver, store, and handle sod according to the requirements of the American Sod Producers Association's (ASPA) "Specifications for Turfgrass Sod Materials and Transplanting/Installing."

D. Trees and Shrubs: Deliver freshly dug trees and shrubs. Do not prune before delivery, except as approved by Landscape Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy natural shape. Provide protective covering during delivery. Do not drop trees and shrubs during delivery.

E. Handle balled and burlapped stock by the root ball.

F. Deliver trees, shrubs, ground covers, and plants after preparations for planting have been completed and install immediately. If planting is delayed more than 6 hours after delivery, set planting materials in shade, protect from weather and mechanical damage, and keep roots moist.

1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
2. Do not remove container-grown stock from containers before time of planting.
3. Water root systems of trees and shrubs stored on site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

SECTION 02900

LANDSCAPING

1.6 JOB CONDITIONS: Job conditions in Section 01010 apply.

Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Landscape Architect before planting.

1.7 COORDINATION AND SCHEDULING:

Coordinate installation of planting materials during normal planting seasons for each type of plant material required.

1.8 WARRANTY:

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Warrant the following living planting materials for a period of one year after date of Substantial Completion, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, abnormal weather conditions unusual for warranty period, or incidents that are beyond Contractor's control.

1. Trees.
2. Shrubs.
3. Ground covers.
4. Plants.

C. Remove and replace dead planting materials immediately unless required to plant in the succeeding planting season.

D. Replace planting materials that are more than 25 percent dead or in an unhealthy condition at end of warranty period.

E. A limit of one replacement of each plant material will be required, except for losses or replacements due to failure to comply with requirements.

1.9 TREE AND SHRUB MAINTENANCE:

Maintain trees and shrubs by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings. Maintain trees and shrubs for 3 months following Substantial Completion.

1.10 GROUND COVER AND PLANT MAINTENANCE:

Maintain ground cover and plants by watering, weeding, fertilizing, and other operations as required to establish healthy, viable plantings. Maintain for 3 months following Substantial Completion.

1.11 LAWN MAINTENANCE:

A. Begin maintenance of seeded lawns immediately after each area is planted and continue until acceptable lawn is established, but for not less than 3 months following Substantial Completion after date of Substantial Completion. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.

B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly healthy smooth lawn.

C. Watering: Water lawn at the minimum rate of 1 inch (25 mm) per week. Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawns uniformly moist to a depth of 4 inches (100 mm).

D. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height without cutting more than 40 percent of the grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.

E. Post Fertilization: Apply fertilizer to lawn after first mowing and when grass is dry. Use fertilizer that will provide actual nitrogen of at least 1 lb. per 1000 sq. ft. (0.5 kg per 100 sq. m) of lawn area.

PART 2 - PRODUCTS

2.1 SMALL TREE AND SHRUB MATERIAL:

A. General: Furnish nursery-grown trees and shrubs conforming to ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully-branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

B. Grade: Provide small, uptight, multi-system trees and shrubs of sizes and grades conforming to ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.

C. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name.

D. Label at least 1 tree and 1 shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.

2.2 FLOWERING TREES:

A. General: Small upright or spreading type, branched or pruned naturally according to species and type, and with relationship of caliper, height, and branching recommended by ANSI Z60.1, and multi-stem form.

B. Provide balled and burlapped trees.

2.3 DECIDUOUS SHRUBS:

A. Form and Size: Deciduous shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub.

B. Provide balled and burlapped deciduous shrubs.

C. Provide bare-root deciduous shrubs.

D. Provide balled and burlapped deciduous shrubs. Container-grown deciduous shrubs will be acceptable in lieu of balled and burlapped deciduous shrubs subject to meeting ANSI Z60.1 limitations for container stock.

2.4 CONIFEROUS EVERGREENS:

A. Form and Size: Normal-quality, well-balanced, coniferous evergreens, of type, height, spread, and shape required, conforming to ANSI Z60.1.

B. Form and Size: Specimen-quality, exceptionally heavy, tightly knit, symmetrically shaped coniferous evergreens of the following grade:

4. Heavy Grade: "X."
5. Heavy Grade: "XX."
6. Heavy Grade: "XXX."

C. Provide balled and burlapped coniferous evergreens.

1. Container-grown coniferous evergreens will be acceptable in lieu of balled and burlapped coniferous evergreens subject to meeting ANSI Z60.1 limitations for container stock.

2.5 GROUND COVERS AND PLANTS:

Provide ground covers and plants established and well rooted in removable containers or integral peat pots and with not less than the minimum number and length of runners required by ANSI Z60.1 for the pot size indicated.

2.6 SOIL AMENDMENTS:

A. Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent, with a minimum 99 percent passing a No. 8 (2.36 mm) sieve and a minimum 75 percent passing a No. 60 (250 micrometer) sieve. Provide lime in the form of dolomitic limestone.

B. Aluminum Sulfate: Commercial grade, unadulterated.

C. Sand: Clean, washed, natural or manufactured sand, free of toxic materials.

D. Perlite: Horticultural perlite, soil amendment grade.

E. Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.5, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.

F. Peat Humus: For acid-tolerant trees and shrubs, provide moss peat, with a pH range of 3.2 to 4.5, coarse fibrous texture, medium-divided sphagnum moss peat or reed-sedge peat.

G. Sawdust or Ground-Bark Humus: Decomposed, nitrogen-treated, of uniform texture, free of chips, stones, sticks, soil, or toxic materials. When site treated, mix with at least 0.15 lb. (2.4 kg) of ammonium nitrate or 0.25 lb. (4 kg) of ammonium sulfate per cu. ft. (cu. m) of loose sawdust or ground bark.

H. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

I. Herbicides: EPA registered and approved, of type recommended by manufacturer.

J. Water: Potable.

2.7 FERTILIZER:

A. Bonemeal: Commercial, raw, finely ground; minimum of 4 percent nitrogen and 20 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; minimum of 20 percent available phosphoric acid.

C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:

1. Composition: 1 lb. per 1000 sq. ft. (0.5 kg per 100 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

D. Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 5 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight.
2. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
3. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.8 MULCH:

Hard, durable, rounded, riverbed stone, washed free of loam, sand, clay, and other foreign substances, sized 1½" (max) – ¾" (min), in readily available natural color. Range to complement or match color range in the stone wall and veneer as acceptable to the Landscape Architect.

2.9 MULCH FOR SEEDED LAWNS:

A. When not hydroseeding, shall be straw consisting of clean stalks of oats, wheat, rye, or other Landscape Architect approved crops well seasoned before bailing which are free of noxious weed seeds, roots, toxic materials, and growth or germination inhibitors.

B. When hydroseeding, shall be hydromulch containing pure wood fibers from clean wood chips. Chips shall be processed in such a manner to contain no lead paint, varnish, printing ink, petroleum based compounds, or seed germination inhibitors. The mulch shall contain a Colloidal Polysaccharide tackifier, adhered to the fiber during manufacturing to prevent separation during shipment and to avoid chemical agglomeration during mixing in the hydromulching equipment. The tackifier shall be homogeneous within the unit container. It shall have no growth or germination inhibitor and be non-toxic. Standard of quality shall be Hydromulch 2000 as manufactured by Conwed Fibers, 219 Simpson Street, Conover, NC 28613 (Telephone 800-366-1180) or Landscape Architect approved equal.

2.10 PLANTING ACCESSORIES:

A. Planting soil mixture for trees, shrubs, perennials, and plant beds shall be premixed in bulk and contain the following by volume:

20.0 parts clean on site soil
10.0 parts topsoil
7.5 parts organic compost (25% of the volume of the above soils)

B. Topsoil: 5-20% organic, 20-65% passing 200 mesh sieve. Fertile, friable, natural topsoil of leafy character, without admixture of subsoil material, obtained from a well-drained arable site, reasonably free from clay, lumps, coarse sand, stones, plants, roots, sticks, and other foreign materials, with acidity range of between pH6.5 and 7.5, free of substances harmful to plants which will be grown in the soil.

C. Starter fertilizer: Water soluble fertilizer and plant food 10-52-17 containing no sulfate or chloride salts. Standard of quality shall be as manufactured by Fairlawn Chemical Co., Inc., 485 Holt Road, Webster, NY (Telephone 716-787-2711) or Landscape Architect approved equal.

D. Organic compost: Shall be an all natural by-product of the brewing industry, locally available and free of weeds and substances harmful to plants which will be grown in the soil. It shall have a 7.2% pH, improve water absorption and retention capacity, contain microorganisms to improve biological activity in the soil and supply time released nitrogen and minerals. Standard of quality shall be NutriBrew as supplied by Commodity Specialists Company, P.O. Box 610, Baldwinsville, NY 13027 (Telephone 315-638-1113).

2.11 NEW ENGLAND ASTER (SYMPHYOTRICHUM NOVAE-ANGLIAE):

Native perennial forb which grows from 2-1/2 to 6 feet tall from 1 gallon (minimum) container.

2.12 LEMON DAYLILY (HEMEROCALLIS LILIOASPHODELUS L.):

Clumping form gives rise to clustered, lily-like flowers atop bare stems. 30” height. Hardy to Zone 4.

PART 3 - EXECUTION

3.1 EXAMINATION:

Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION:

Lay out areas for multiple plantings. Stake locations, outline areas, and secure Landscape Architect's acceptance before the start of planting work. Make minor adjustments as may be required.

3.3 PLANTING SOIL PREPARATION:

A. Before bulk mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

B. Bulk mix soil amendments and fertilizers with topsoil at rates noted in the Planting Accessories (2.11 above). Delay mixing fertilizer if planting does not follow placing of planting soil within a few days.

C. For tree pit or trench backfill, mix planting soil before backfilling and stockpile at site.

D. For planting beds and lawns, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.

1. Mix lime with dry soil prior to mixing fertilizer. Prevent lime from contacting roots of acid-tolerant plants.
2. Apply phosphoric acid fertilizer, other than that constituting a portion of complete fertilizers, directly to subgrade before applying planting soil and tilling.

3.4 LAWN PLANTING PREPARATION:

A. Limit subgrade preparation to areas that will be planted in the immediate future.

B. Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous materials.

C. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen.

1. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
2. Allow for sod thickness in areas to be sodded.

D. Preparation of Unchanged Grades: Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:

1. Remove and dispose of existing grass, vegetation, and turf. Do not turn over into soil being prepared for lawns.
2. Till surface soil to a depth of at least 6 inches (150 mm). Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches (100 mm) of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
3. Clean surface soil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
4. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property.

E. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1-1/2 inches (38 mm) in any dimension, and other objects that may interfere with planting or maintenance operations.

F. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

G. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

3.5 GROUND COVER AND PLANT BED PREPARATION:

A. Loosen subgrade of planting bed areas to a minimum depth of 6 inches (150 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous materials.

B. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.

C. Till soil in beds to a minimum depth of 8 inches (200 mm) and mix with specified soil amendments and fertilizers.

D. Remove soil to a minimum depth of 8 inches (200 mm) and replace with prepared planting soil mixture.

3.6 EXCAVATION FOR TREES AND SHRUBS:

A. Pits and Trenches: Excavate with vertical sides and with bottom of excavation slightly raised at center to assist drainage. Loosen hard subsoil in bottom of excavation.

1. Balled and Burlapped Trees and Shrubs: Excavate approximately 1-1/2 times as wide as ball diameter and equal to ball depth, plus the following setting layer depth: Setting Layer: Allow 6 inches (75 mm) of planting soil.
2. Container-Grown Trees and Shrubs: Excavate to container width and depth, plus the following setting-layer depth: Setting Layer: Allow 6 inches (75 mm) of planting soil.

B. Dispose of subsoil removed from landscape excavations. Do not mix with planting soil or use as backfill.

C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

D. Hardpan Layer: Drill 6-inch- (150-mm-) diameter holes into free-draining strata or to a depth of 10 feet (3 m), whichever is less, and backfill with free-draining material.

E. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

F. Fill excavations with water and allow to percolate out, before placing setting layer and positioning trees and shrubs.

3.7 PLANTING TREES AND SHRUBS:

A. Set balled and burlapped stock plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.

1. Place stock on setting layer of compacted planting soil.
2. Remove burlap and wire baskets from tops of balls and partially from sides, but do not remove from under balls. Remove pallets, if any, before setting. Do not use planting stock if ball is cracked or broken before or during planting operation.
3. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.

B. Set container-grown stock plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.

1. Carefully remove containers so as not to damage root balls.
2. Place stock on setting layer of compacted planting soil.
3. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.

C. Dish and tamp top of backfill to form a 3-inch- (75-mm-) high mound around the rim of the pit. Do not cover top of root ball with backfill.

3.8 TREE AND SHRUB PRUNING:

A. Prune, thin, and shape trees and shrubs as directed by Landscape Architect.

B. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Landscape Architect, do not cut tree leaders; remove only injured or

dead branches from flowering trees. Prune shrubs to retain natural character. Shrub sizes indicated are size after pruning.

3.9 TREE AND SHRUB GUYING AND STAKING:

A. Upright Staking and Tying: Stake trees of 2- through 5-inch (50- through 125-mm) caliper. Stake trees of less than 2-inch (50-mm) caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 18 inches (450 mm) below bottom of backfilled excavation and to extend at least 72 inches (1800 mm) above grade. Set vertical stakes and space to avoid penetrating balls or root masses. Support trees with 2 strands of tie wire encased in hose sections at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

B. Guying and Staking: Guy and stake trees exceeding 14 feet (4.2 m) and more than 3-inch (75-mm) caliper unless otherwise indicated. Securely attach no fewer than 3 guys to stakes 30 inches (760 mm) long, driven to grade. Attach flags to each guy wire, 30 inches (760 mm) above finish grade.

3.10 PLANTING GROUND COVER AND PLANTS:

A. Space ground cover and plants as indicated.

B. Dig holes large enough to allow spreading of roots, and backfill with planting soil. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

3.11 MULCHING:

A. Mulch backfilled surfaces of tree pits, hedge trenches, plant beds, and other areas indicated.

B. Apply three (3”) inches continuous thickness of mulch and finish level with adjacent finish grades. Do not place mulch against trunks or stems.

3.12 HYDROSEEDING NEW LAWNS:

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.

1. Mix slurry with nonasphaltic tackifier.
2. Apply slurry uniformly to all areas to be seeded in a 1-step process. Apply mulch at the minimum rate of 1500 lb. per acre (16.5 kg per 100 sq. m) dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.13 RECONDITIONING LAWNS:

A. Recondition existing lawn areas damaged by Contractor's operations, including storage of materials or equipment and movement of vehicles. Also recondition lawn areas where settlement or washouts occur or where minor regrading is required.

B. Remove sod and vegetation from diseased , contaminated, or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.

C. Where substantial lawn remains, mow, dethatch, core aerate, and rake. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

D. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of it off the Owner's property.

E. Till stripped, bare, and compacted areas thoroughly to a depth of 6 inches (150 mm).

F. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches (100 mm) of soil. Provide new planting soil as required to fill low spots and meet new finish grades.

G. Apply seed and protect with mulch and tackifier as required for new lawns.

H. Water newly planted areas and keep moist until new grass is established.

3.14 CLEANUP AND PROTECTION:

A. During landscaping, keep pavements clean and work area in an orderly condition.

B. Protect landscaping from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.15 DISPOSAL OF SURPLUS AND WASTE MATERIALS:

Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION

APPENDIX C

SITE 1 EXHIBITS

EXHIBIT C-1

SITE 1 CROSS SECTIONS

RIVERMORPH CROSS SECTION SUMMARY

River Name: WB of Beer Kill
Reach Name: Reach 1
Cross Section Name: Site 1 XS #1
Survey Date: 03/08/2016

Cross Section Data Entry

BM Elevation: 100 ft
Backsight Rod Reading: 100 ft

TAPE	FS	ELEV	NOTE
0	4.99	195.01	TOLP
0	5.78	194.22	BOLP
2	6.25	193.75	
4	6.36	193.64	
6.8	6.61	193.39	Top of Left Bank
8.4	10.13	189.87	
10.3	11.19	188.81	BKF
12.9	11.94	188.06	
13.2	12.47	187.53	LEW
15.6	13.24	186.76	
19.3	14	186	
22.4	13.59	186.41	
27.1	13.27	186.73	
30.6	13.37	186.63	
33.6	13.52	186.48	
36.2	13.58	186.42	
39.7	13.25	186.75	
42.2	13.3	186.7	
44.7	13.27	186.73	
47.2	13.12	186.88	
49.6	13.08	186.92	
51.3	13.04	186.96	
53.1	12.72	187.28	
54.9	12.3	187.7	REW
56.2	12.02	187.98	
59.3	11.22	188.78	
62.7	9.15	190.85	
66.2	7.96	192.04	
73.4	7.38	192.62	
85.6	9.36	190.64	
94.2	10.38	189.62	
106.7	6.4	193.6	

Cross Sectional Geometry

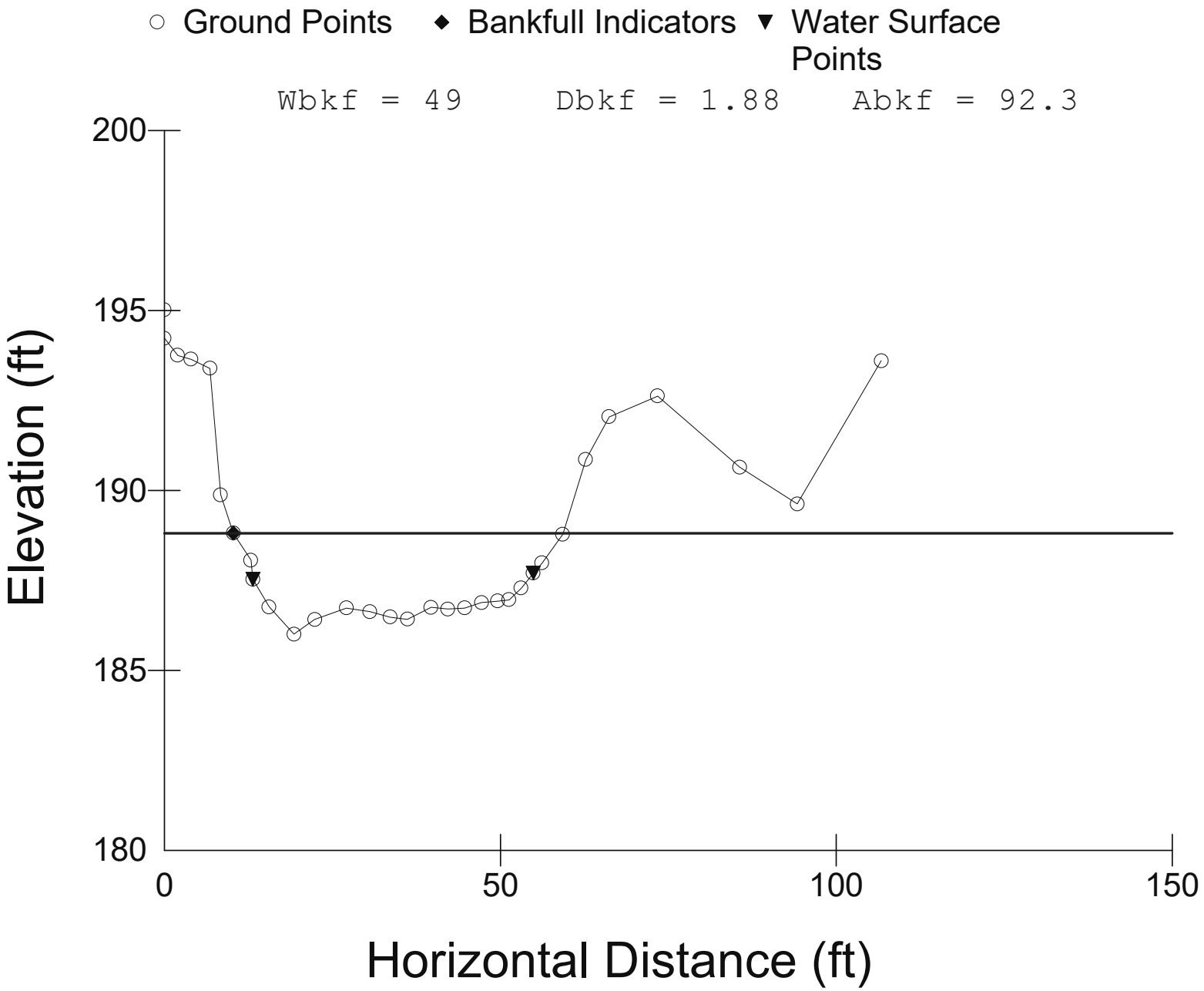
	Channel	Left	Right
Floodprone Elevation (ft)	191.62	191.62	191.62
Bankfull Elevation (ft)	188.81	188.81	188.81
Floodprone Width (ft)	78.28	-----	-----
Bankfull Width (ft)	49.05	31.43	17.62
Entrenchment Ratio	1.6	-----	-----
Mean Depth (ft)	1.88	2.08	1.53
Maximum Depth (ft)	2.81	2.81	2.11
Width/Depth Ratio	26.09	15.14	11.52
Bankfull Area (sq ft)	92.25	65.24	27.02
Wetted Perimeter (ft)	49.94	34.2	19.94
Hydraulic Radius (ft)	1.85	1.91	1.35
Begin BKF Station	10.3	10.3	41.73
End BKF Station	59.35	41.73	59.35

Entrainment Calculations

Entrainment Formula: Rosgen Modified Shields Curve

	Channel	Left Side	Right Side
Slope	0	0	0
Shear Stress (lb/sq ft)			
Movable Particle (mm)			

Site 1 XS #1 - Riffle



RIVERMORPH CROSS SECTION SUMMARY

River Name: WB of Beer Kill
Reach Name: Reach 1
Cross Section Name: Site 1 XS #2
Survey Date: 03/08/2016

Cross Section Data Entry

BM Elevation: 100 ft
Backsight Rod Reading: 100 ft

TAPE	FS	ELEV	NOTE
0	3.48	196.52	TOLP
0	4.21	195.79	BOLP
2.1	4.57	195.43	
5	5.33	194.67	
7.5	5.45	194.55	
10.3	5.08	194.92	
13.8	5.36	194.64	
16.1	5.38	194.62	
21.7	6.11	193.89	
26.1	6.98	193.02	
28.8	9.61	190.39	BKF
30.9	12.4	187.6	
34.8	13.38	186.62	LEW
38.1	13.88	186.12	
43	13.94	186.06	
47.7	14.55	185.45	
51.3	14.41	185.59	
54.9	14.01	185.99	
57.8	14.3	185.7	
61	13.91	186.09	
63.1	13.32	186.68	REW
67.1	12.68	187.32	Center Bar
70.9	12.35	187.65	
73.6	10.91	189.09	
80.1	10.49	189.51	
89.3	9.58	190.42	
98.5	10.77	189.23	
105.4	12.13	187.87	
111.9	14.03	185.97	
115.2	14.95	185.05	LEW 2
118.1	15.18	184.82	
122.4	15.41	184.59	
124	15.97	184.03	
128.4	15.75	184.25	

131.9	15.25	184.75	
135.6	14.86	185.14	REW 2
139.3	14.23	185.77	
144.4	12.75	187.25	
149.3	11.58	188.42	
152	10.66	189.34	

Cross Sectional Geometry

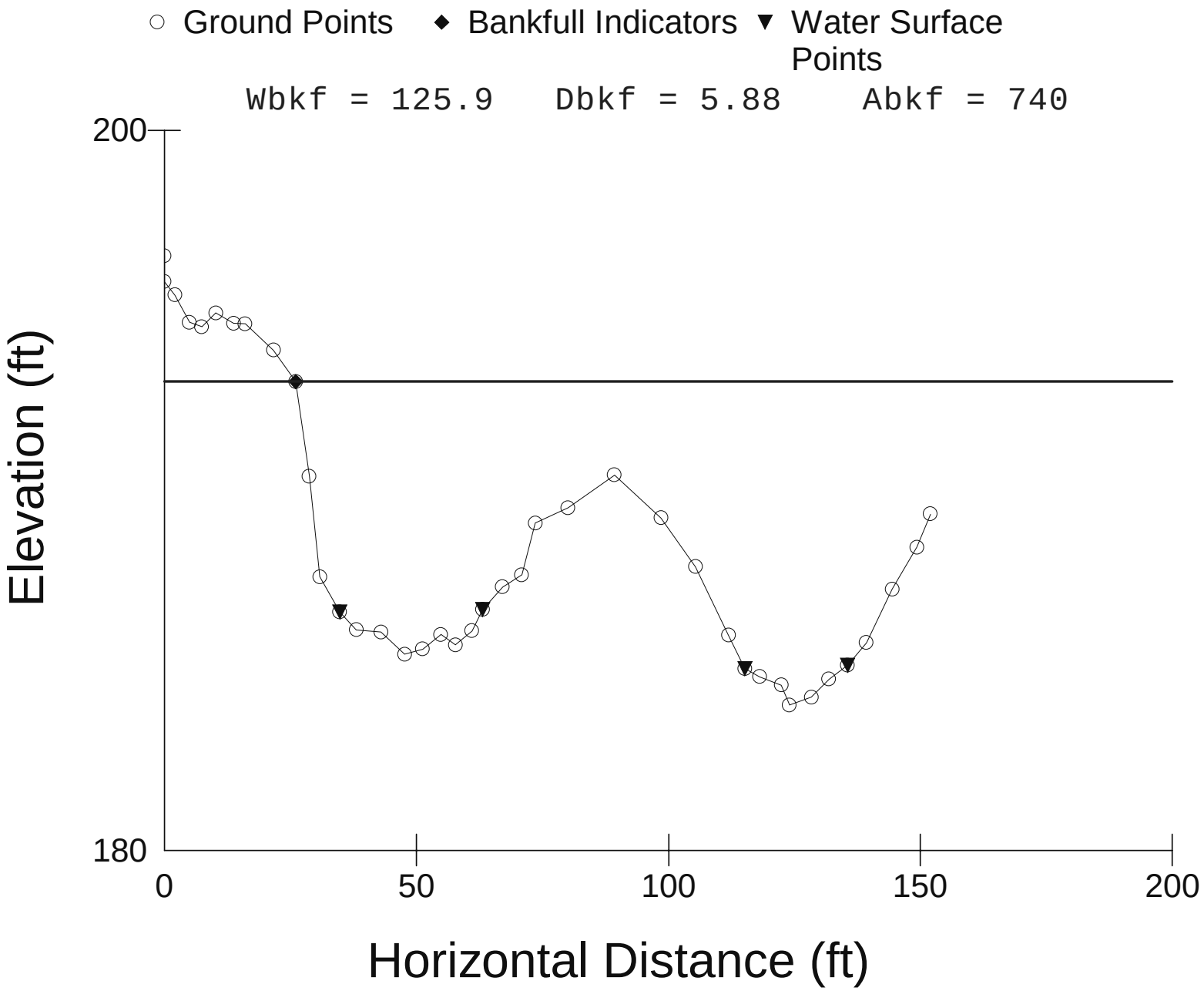
	Channel	Left	Right
Floodprone Elevation (ft)	191.47	191.47	191.47
Bankfull Elevation (ft)	187.75	187.75	187.75
Floodprone Width (ft)	124.31	-----	-----
Bankfull Width (ft)	80.98	40.49	75.21
Entrenchment Ratio	1.53	-----	-----
Mean Depth (ft)	1.86	1.44	2.28
Maximum Depth (ft)	3.72	2.3	3.72
Width/Depth Ratio	43.54	28.14	32.99
Bankfull Area (sq ft)	150.55	58	92.55
Wetted Perimeter (ft)	82.37	40.81	41.56
Hydraulic Radius (ft)	1.83	1.42	2.23
Begin BKF Station	30.79	30.79	105.81
End BKF Station	146.49	71.09	146.49

Entrainment Calculations

Entrainment Formula: Rosgen Modified Shields Curve

	Channel	Left Side	Right Side
Slope	0	0	0
Shear Stress (lb/sq ft)			
Movable Particle (mm)			

Site 1 XS #2 - Riffle



RIVERMORPH CROSS SECTION SUMMARY

River Name: WB of Beer Kill
Reach Name: Reach 1
Cross Section Name: Site 1 XS #3
Survey Date: 03/08/2016

Cross Section Data Entry

BM Elevation: 100 ft
Backsight Rod Reading: 100 ft

TAPE	FS	ELEV	NOTE
0	1.56	198.44	Top of Guiderail Post
0	4.1	195.9	Bottom of Guiderail Post
5.8	5.23	194.77	BKF
10.8	9.54	190.46	Rip Rap
16.3	13.9	186.1	LEW
20.8	15.39	184.61	
25	15.36	184.64	
30.1	15.08	184.92	
35.2	14.41	185.59	
43.4	13.95	186.05	REW
53.6	13.18	186.82	BAR
64.5	12.78	187.22	
74.3	12.73	187.27	
81.2	11.83	188.17	
88.8	11.72	188.28	
90.8	9.63	190.37	Berm
97.3	5.45	194.55	Top of Berm
100	6.19	193.81	

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	193.35	193.35	193.35
Bankfull Elevation (ft)	188.98	188.98	188.98
Floodprone Width (ft)	87.99	-----	-----
Bankfull Width (ft)	76.8	38.4	38.4
Entrenchment Ratio	1.15	-----	-----
Mean Depth (ft)	2.41	3.29	1.53
Maximum Depth (ft)	4.37	4.37	2.35
Width/Depth Ratio	31.87	11.67	25.1
Bankfull Area (sq ft)	185.16	126.42	58.74

Wetted Perimeter (ft)	78.51	42.08	41.12
Hydraulic Radius (ft)	2.36	3	1.43
Begin BKF Station	12.67	12.67	51.07
End BKF Station	89.47	51.07	89.47

Entrainment Calculations

Entrainment Formula: Rosgen Modified Shields Curve

	Channel	Left Side	Right Side
Slope	0	0	0
Shear Stress (lb/sq ft)			
Movable Particle (mm)			

Site 1 XS #3 - Riffle

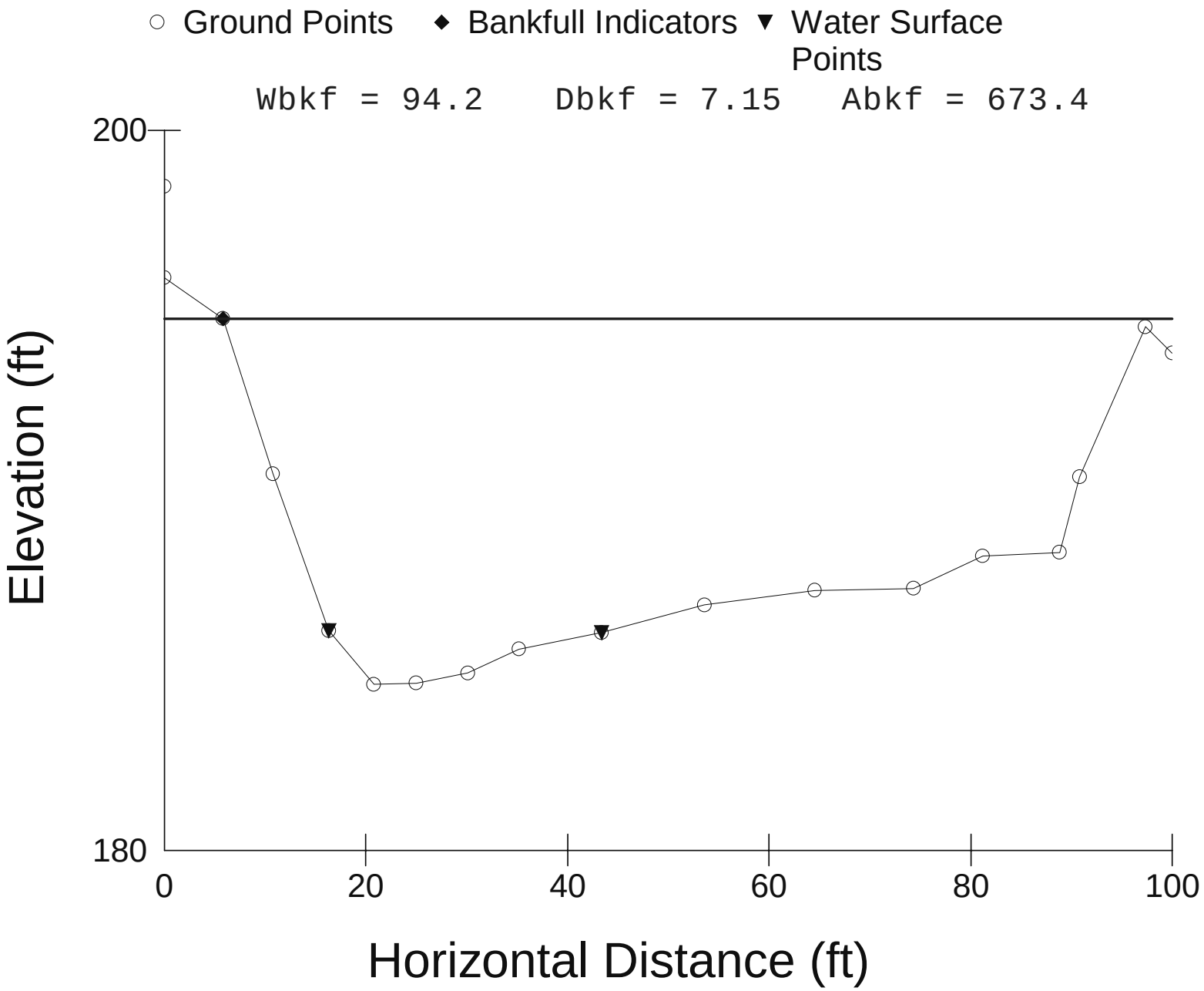


EXHIBIT C-2

SITE 1 LONGITUDINAL PROFILE

RIVERMORPH PROFILE SUMMARY

River Name: WB of Beer Kill
Reach Name: Reach 1
Profile Name: Site #1
Survey Date: 03/08/2016

Survey Data

DIST	CH	WS	BKF	P1	P2	P3	P4
0	7.56	6.35					
24	7.54	6.68	5.13				
26.5	8.83	6.81	5.16				
44	7.73	6.82					
48	8.72	7.14					
63	8.14	7.15	5.5				
70	8.83	7.56	5.54				
86	8.66	7.73					
97	9.28	7.83	5.8				
122	9.06	7.84	6.09				
144	9.74	8.32	6.57				
167	9.98	8.5	6.41				
182	12.1	8.58					
205	11	8.59	6.97				
250	7.02	5.66					
278	6.59	5.94	4.47				
303	7.44	6.29					
340	9.06	8.07	5.91				
346	10.29	8.51	6.44				
356	11.21	9.66	7.06				
365	13.63	10.55	7.66				
389	12.57	10.55	7.66				
415	11.84	10.55	8.53				
429	12.79	11.39	8.95				
437	12.23	11.39	8.8				
449	13.28	12.2	8.89				
472	13.84						
518	9.1	8.09	6.9				
547	9.47	8.7					
568	10.74	9.3					
583	12.01	10.22	9.36				
600	12.17	11.15	9.47				
618	13.01	12.16	9.63				
643	14.91	13.61					
670	16.22	14.19	10.4				

698	16.13	14.19	10.87
743	16.18	14.37	11.82
767	16.9	14.45	12.25
795	16.2	14.86	
816	17.44	14.95	
830	11.98	9.06	7.66
862	10.74	9.34	8.49
883	11.4	9.66	8.81
907	11.45	10.07	9.84

Cross Section / Bank Profile Locations

Name	Type	Profile Station
Site 1 XS #1	Riffle XS	0
Site 1 XS #2	Other XS	0
Site 1 XS #3	Riffle XS	0

Measurements from Graph

Bankfull Slope: 0

Variable	Min	Avg	Max
S riffle	0	0	0
S pool	0	0	0
S run	0	0	0
S glide	0	0	0
S step	0	0	0
P - P	0	0	0
Pool length	0	0	0
Riffle length	0	0	0
Dmax riffle	0	0	0
Dmax pool	0	0	0
Dmax run	0	0	0
Dmax glide	0	0	0
Dmax step	0	0	0
Low bank ht	0	0	0

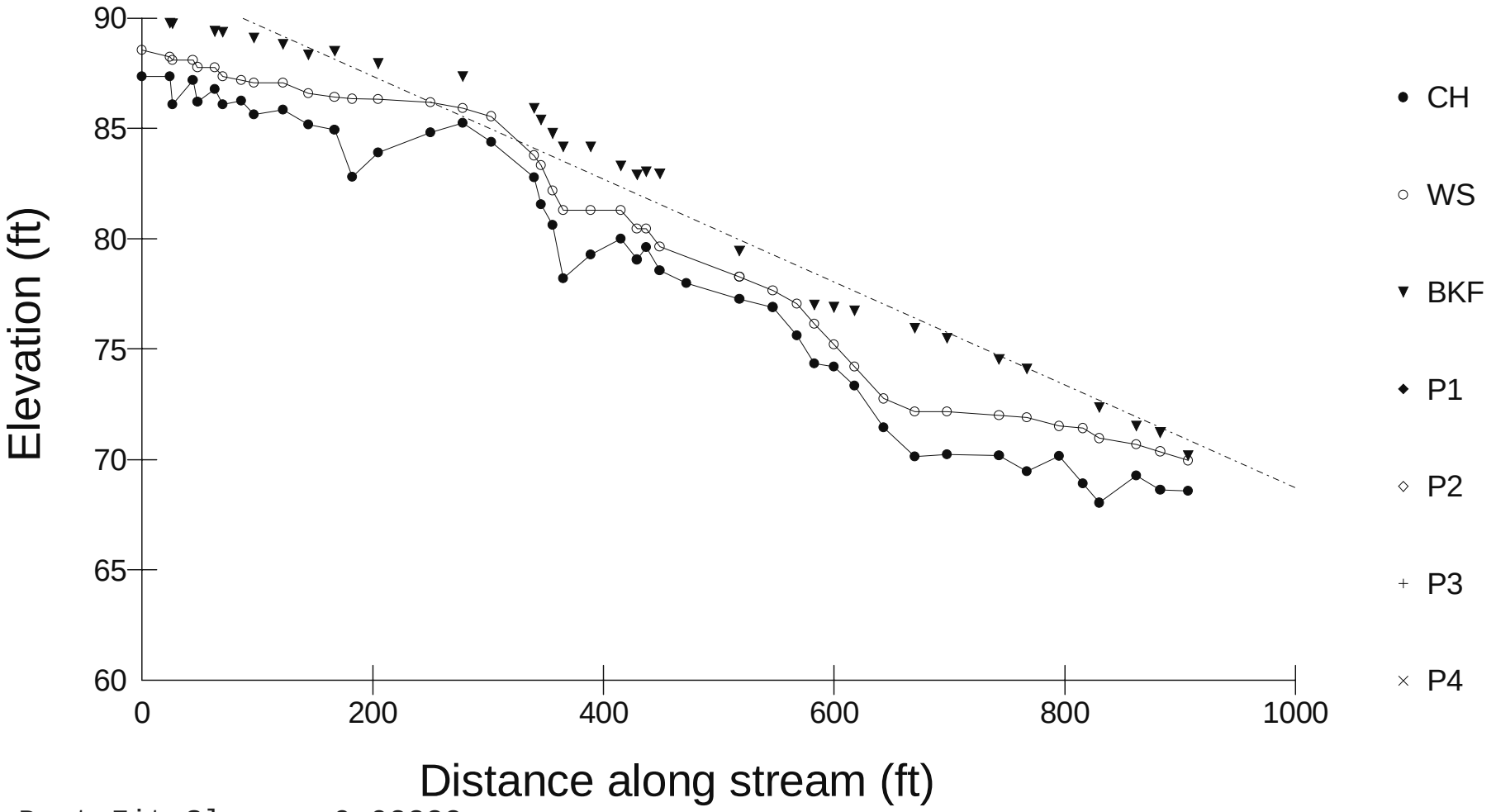
Length and depth measurements in feet, slopes in ft/ft.

RIVERMORPH PROFILE SUMMARY

Notes

River Name: WB of Beer Kill
Reach Name: Reach 1
Profile Name: Site #1
Survey Date: 03/08/2016

Site #1 Longitudinal Profile



BKF Best Fit Slope = 0.02332

EXHIBIT C-3

SITE 1 SEDIMENT COMPETENCE CALCULATIONS

Worksheet 3-14. Sediment competence calculation form to assess bed stability.

Stream:	**West Branch Beer Creek**		Stream Type:		
Location:	**Site #1**		Valley Type:		
Observers:	**ANE. RML**		Date:		
Enter Required Information for Existing Condition					
200.0	D_{50}	Median particle size of riffle bed material (mm)			
50.0	$D_{50}^{\wedge}$	Median particle size of bar or sub-pavement sample (mm)			
1.640	D_{max}	Largest particle from bar sample (ft)	**500**	**(mm)**	304.8 mm/ft
0.02000	**S**	Existing bankfull water surface slope (ft/ft)			
5.00	**d**	Existing bankfull mean depth (ft)			
1.65	$\gamma_s - \gamma/\gamma$	Immersed specific gravity of sediment			
Select the Appropriate Equation and Calculate Critical Dimensionless Shear Stress					
4.00	$D_{50}/D_{50}^{\wedge}$	Range: 3 – 7	Use EQUATION 1: $\tau^* = 0.0834 \left(D_{50}/D_{50}^{\wedge} \right)^{-0.872}$		
2.50	D_{max}/D_{50}	Range: 1.3 – 3.0	Use EQUATION 2: $\tau^* = 0.0384 \left(D_{max}/D_{50}\right)^{-0.887}$		
0.025	τ^*	Bankfull Dimensionless Shear Stress	EQUATION USED:		**1**
Calculate Bankfull Mean Depth Required for Entrainment of Largest Particle in Bar Sample					
3.37	**d**	Required bankfull mean depth (ft) $d = \frac{\tau^*(\gamma_s - 1)D_{max}}{S}$	(use D_{max} in ft)		
Calculate Bankfull Water Surface Slope Required for Entrainment of Largest Particle in Bar Sample					
0.01348	**S**	Required bankfull water surface slope (ft/ft) $S = \frac{\tau^*(\gamma_s - 1)D_{max}}{d}$	(use D_{max} in ft)		
Check: ☑ Stable ☐ Aggrading ☐ Degrading					
Sediment Competence Using Dimensional Shear Stress					
6.240		Bankfull shear stress $\tau = \gamma dS$ (lbs/ft^2) (substitute hydraulic radius, R, with mean depth, d) γ = 62.4, d = existing depth, S = existing slope			
Shields **525.4**	CO **584.5**	Predicted largest moveable particle size (mm) at bankfull shear stress τ **(Figure 3-11)**			
Shields **5.95**	CO **5.047**	Predicted shear stress required to initiate movement of measured D_{max} (mm) **(Figure 3-11)**			
Shields **4.77**	CO **4.04**	Predicted mean depth required to initiate movement of measured D_{max} (mm) τ = predicted shear stress, γ = 62.4, S = existing slope $d = \frac{\tau}{\gamma S}$			
Shields **0.0191**	CO **0.0162**	Predicted slope required to initiate movement of measured D_{max} (mm) τ = predicted shear stress, γ = 62.4, d = existing depth $S = \frac{\tau}{\gamma d}$			
Check: ☑ Stable ☐ Aggrading ☐ Degrading					

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EXHIBIT C-4

SITE 1 BANKFULL DISCHARGE CALCULATION SUMMARY

Worksheet 2-2. Computations of velocity and bankfull discharge using various methods (Rosgen, 2006b; Rosgen and Silvey, 2007).

Bankfull VELOCITY & DISCHARGE Estimates

Stream:	**West Branch Beer Creek**	Location:	**Reach - Site #1**
Date:		Stream Type:	
Valley Type:			
Observers:	**ANE, RML**	HUC:	

INPUT VARIABLES			OUTPUT VARIABLES		
Bankfull Riffle Cross-Sectional AREA	**201.40**	**A_{bkf}** (ft^2)	Bankfull Riffle Mean DEPTH	**2.98**	**d_{bkf}** (ft)
Bankfull Riffle WIDTH	**67.48**	**W_{bkf}** (ft)	Wetted PERMIMETER ~ $(2 * d_{bkf}) + W_{bkf}$	**70.01**	**W_p** (ft)
D_{84} at Riffle	**500.00**	**Dia.** (mm)	D_{84} (mm) / 304.8	**1.64**	**D_{84}** (ft)
Bankfull SLOPE	**0.0200**	**S_{bkf}** (ft / ft)	Hydraulic RADIUS A_{bkf} / W_p	**2.88**	**R** (ft)
Gravitational Acceleration	**32.2**	g (ft / sec^2)	Relative Roughness R(ft) / D_{84} (ft)	**4.07**	**R / D_{84}**
Drainage Area	**0.0**	**DA** (mi^2)	Shear Velocity $u^* = (gRS)^{½}$	**1.362**	**u*** (ft/sec)

ESTIMATION METHODS		Bankfull VELOCITY		Bankfull DISCHARGE	
1. Friction Factor / Relative Roughness	$u = [2.83 + 5.66 * Log \{ R / D_{84} \}] u^*$	**5.73**	ft / sec	**1154.24**	cfs
2. Roughness Coefficient: a) Manning's *n* from Friction Factor / Relative Roughness (Figs. 2-18, 2-19)	$u = 1.49*R^{2/3}*S^{1/2} / n$ $n =$ **0**	**0.00**	ft / sec	**0.00**	cfs
2. Roughness Coefficient: b) Manning's *n* from Stream Type (Fig. 2-20)	$u = 1.49*R^{2/3}*S^{1/2} / n$ $n =$ **0**	**0.00**	ft / sec	**0.00**	cfs
2. Roughness Coefficient: c) Manning's *n* from Jarrett (USGS): **Note:** This equation is applicable to **steep, step/pool, high boundary roughness, cobble- and boulder-dominated stream systems**; i.e., for Stream Types A1, A2, A3, B1, B2, B3, C2 & E3	$u = 1.49*R^{2/3}*S^{1/2} / n$ $n = 0.39*S^{0.38}*R^{-0.16}$ $n =$ **0.075**	**5.71**	ft / sec	**1149.59**	cfs
3. Other Methods (Hey, Darcy-Weisbach, Chezy C, etc.) **Manning's Limerinos n=0.0662**		**6.42**	ft / sec	**1293.59**	cfs
3. Other Methods (Hey, Darcy-Weisbach, Chezy C, etc.) **Darcy-Weisbach (Leopold, Wolman and Miller)**		**5.98**	ft / sec	**1204.70**	cfs
4. Continuity Equations: a) Regional Curves **Return Period for Bankfull Discharge**	$u = Q / A$ $Q =$ **0.0** **year**	**0.00**	ft / sec	**0.00**	cfs
4. Continuity Equations: b) USGS Gage Data	$u = Q / A$	**0.00**	ft / sec	**0.00**	cfs

Protrusion Height Options for the D_{84} Term in the Relative Roughness Relation (R/D_{84}) – Estimation Method 1

Option 1.	For **sand-bed** channels: Measure 100 **"protrusion heights"** of sand dunes from the downstream side of feature to the top of feature. Substitute the D_{84} sand dune protrusion height in ft for the D_{84} term in method 1.
Option 2.	For **boulder-dominated** channels: Measure 100 **"protrusion heights"** of boulders on the sides from the bed elevation to the top of the rock on that side. Substitute the D_{84} boulder protrusion height in ft for the D_{84} term in method 1.
Option 3.	For **bedrock-dominated** channels: Measure 100 **"protrusion heights"** of rock separations, steps, joints or uplifted surfaces above channel bed elevation. Substitute the D_{84} bedrock protrusion height in ft for the D_{84} term in method 1.
Option 4.	For **log-influenced** channels: Measure "**protrustion heights**" proportionate to channel width of log diameters or the height of the log on upstream side if embedded. Substitute the D_{84} protrusion height in ft for the D_{84} term in method 1.

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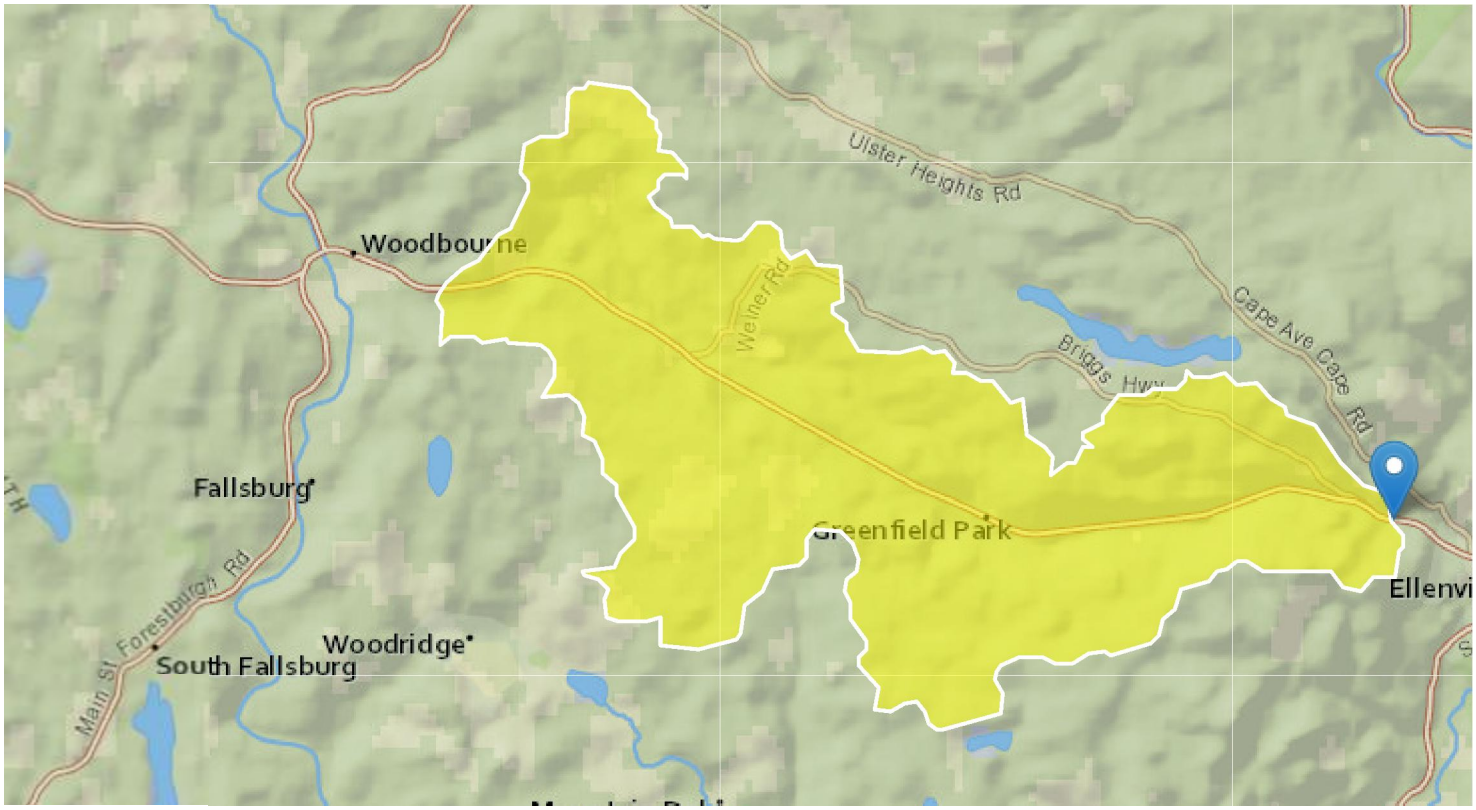
EXHIBIT C-5

SITE 1 STREAMSTATS OUTPUT SUMMARY

StreamStats Report

Region ID: NY
Workspace ID: NY20181227145517797000
Clicked Point (Latitude, Longitude): 41.72534, -74.41602
Time: 2018-12-27 09:55:31 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	19.7	square miles
LAGFACTOR	Lag Factor as defined in SIR 2006-5112	0.2	dimensionless
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	3.88	percent
MAR	Mean annual runoff for the period of record in inches	25.4	inches
BSLOPCM	Mean basin slope determined by summing lengths of all contours in basin mulitplying by contour interval and dividing product by drainage area	519	feet per mi
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	541172.2	feet

Parameter Code	Parameter Description	Value	Unit
CENTROIDY	Basin centroid vertical (y) location in state plane units	4620479.5	feet
CONTOUR	Total length of all elevation contours in drainage area in miles	102.14	miles
CSL1085LO	10-85 slope of lower half of main channel in feet per mile.	76.2	feet per mi
CSL1085UP	10-85 slope of upper half of main channel in feet per mile.	45.6	feet per mi
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	56.4	feet per mi
EL1200	Percentage of basin at or above 1200 ft elevation	27.8	percent
FOREST	Percentage of area covered by forest	88.7	percent
JULAVPRE	Mean July Precipitation	4.31	inches
JUNAVPRE	Mean June Precipitation	4.59	inches
JUNMAXTMP	Maximum June Temperature, in degrees F	76.2	degrees F
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	5.2	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.53	percent
LENGTH	Length along the main channel from the measuring location extended to the basin divide	12.2	miles
MAYAVPRE	Mean May Precipitation	4.77	inches
MXSNO	50th percentile of seasonal maximum snow depth from Northeast Regional Climate Center atlas by Cember and Wilks, 1993	16.2	inches
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	548575	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	4619445	feet
PRECIP	Mean Annual Precipitation	45.2	inches
PRJUNAUG00	Basin average mean precip for June to August from PRISM 1971-2000	13.1	inches
SLOPERATIO	Ratio of main channel slope to basin slope as defined in SIR 2006-5112	0.11	dimensionless
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	0.8	percent

Parameter Code	Parameter Description	Value	Unit
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	2.89	percent

Bankfull Statistics Parameters [Bankfull Region 4 SIR2009 5144]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	19.7	square miles	3.72	237

Bankfull Statistics Flow Report [Bankfull Region 4 SIR2009 5144]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu
Bankfull Area	181	ft^2	62.4	527
Bankfull Depth	2.73	ft	1.06	7.03
Bankfull Streamflow	1200	ft^3/s	208	6920
Bankfull Width	67.4	ft	25.1	181

Bankfull Statistics Citations

Mulvihill, C.I., Baldigo, B.P., Miller, S.J. , and DeKoskie, Douglas,2009, Bankfull Discharge and Channel Characteristics of Streams in New York State: U.S. Geological Survey Scientific Investigations Report 2009-5144, 51 p. (http://pubs.usgs.gov/sir/2009/5144/)

Peak-Flow Statistics Parameters [100 Percent (19.7 square miles) 2006 Full Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	19.7	square miles	1.93	996
LAGFACTOR	Lag Factor	0.2	dimensionless	0.014	6.997
STORAGE	Percent Storage	3.88	percent	0	11.88
MAR	Mean Annual Runoff in inches	25.4	inches	16.03	33.95

Peak-Flow Statistics Flow Report [100 Percent (19.7 square miles) 2006 Full Region 2]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp	Equiv. Yrs.
1.25 Year Peak Flood	433	ft^3/s	25.5	25.5	4.8
1.5 Year Peak Flood	538	ft^3/s	25.6	25.6	4.3
2 Year Peak Flood	690	ft^3/s	25.8	25.8	4.4
5 Year Peak Flood	1170	ft^3/s	27	27	7.3
10 Year Peak Flood	1580	ft^3/s	28.2	28.2	10.1
25 Year Peak Flood	2200	ft^3/s	29.9	29.9	13.6
50 Year Peak Flood	2750	ft^3/s	31.5	31.5	15.8
100 Year Peak Flood	3370	ft^3/s	33.3	33.3	17.6
200 Year Peak Flood	4070	ft^3/s	35.3	35.3	18.9
500 Year Peak Flood	5160	ft^3/s	38.4	38.4	20.1

Peak-Flow Statistics Citations

Lumia, Richard, Freehafer, D.A., and Smith, M.J.,2006, Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006–5112, 152 p. (http://pubs.usgs.gov/sir/2006/5112/)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.3.0

APPENDIX D

SITE 2 EXHIBITS

Soil Map—Ulster County, New York
(Site 2)

Map Scale: 1:1,720 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 25 50 100 150

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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

Soil Survey Area: Ulster County, New York
Survey Area Data: Version 17, Sep 3, 2018

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

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CgB	Castile gravelly silt loam, 3 to 8 percent slopes	0.7	39.8%
LCD	Lackawanna and Swartswood soils, moderately steep, very bouldery	1.0	60.2%
Totals for Area of Interest		**1.7**	**100.0%**

APPENDIX E

SITE 3 EXHIBITS

Soil Map—Ulster County, New York
(Site 3)

Map Scale: 1:1,440 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

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

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

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Soil Survey Area: Ulster County, New York
Survey Area Data: Version 17, Sep 3, 2018

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Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 2017

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CgB	Castile gravelly silt loam, 3 to 8 percent slopes	1.3	81.3%
LCD	Lackawanna and Swartswood soils, moderately steep, very bouldery	0.3	18.7%
Totals for Area of Interest		**1.6**	**100.0%**

APPENDIX F

SITE 4 EXHIBITS

Soil Map—Ulster County, New York
(Site 4)

Map Scale: 1:778 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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Soil Survey Area: Ulster County, New York
Survey Area Data: Version 17, Sep 3, 2018

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

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 2017

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

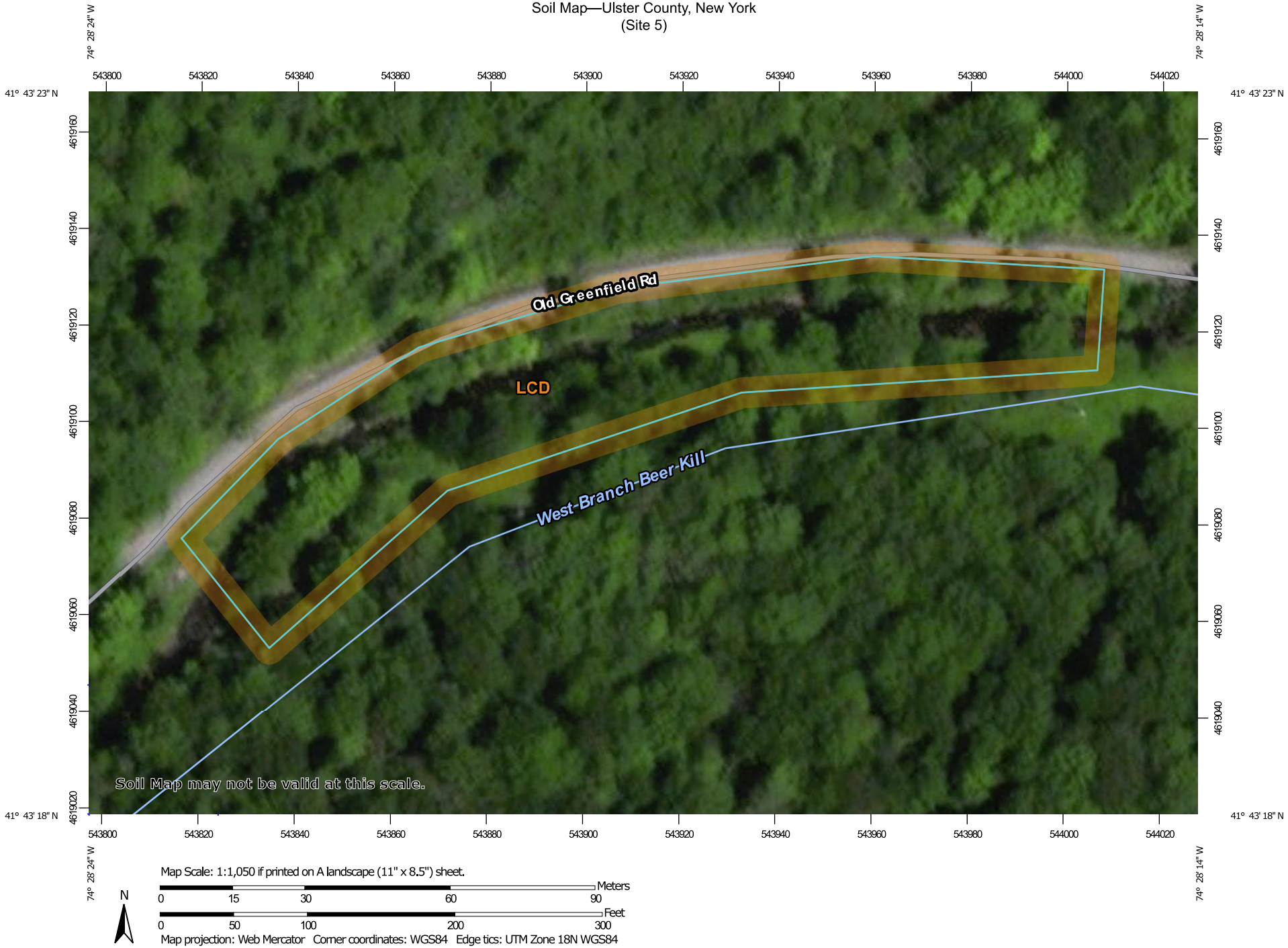
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Mr	Middlebury silt loam	1.3	95.8%
VAB	Valois very bouldery soils, gently sloping	0.1	4.2%
Totals for Area of Interest		**1.4**	**100.0%**

APPENDIX G

SITE 5 EXHIBITS

Soil Map—Ulster County, New York
(Site 5)



Map Scale: 1:1,050 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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

Soil Survey Area: Ulster County, New York
Survey Area Data: Version 17, Sep 3, 2018

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

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 2017

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

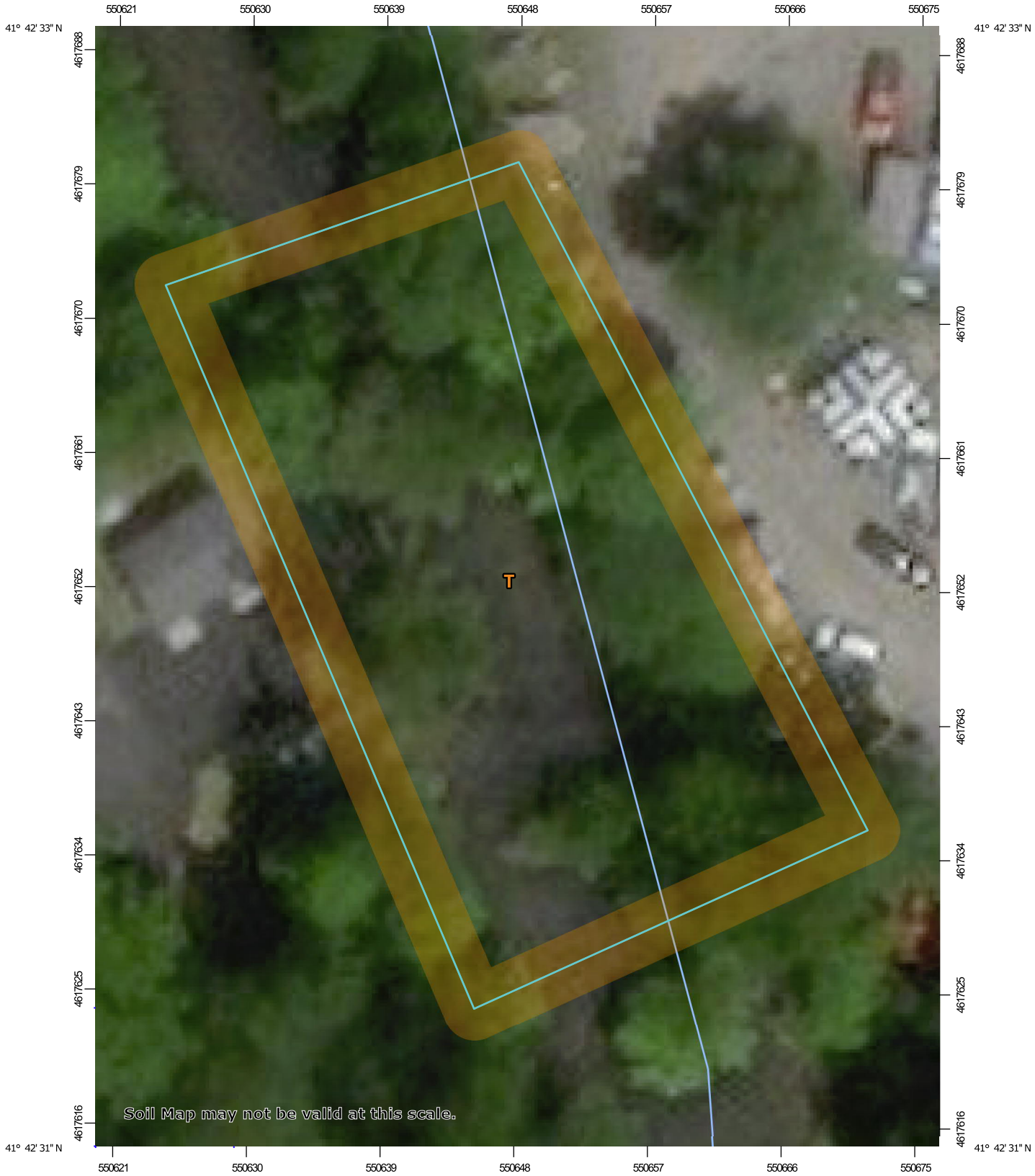
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LCD	Lackawanna and Swartswood soils, moderately steep, very bouldery	1.3	100.0%
Totals for Area of Interest		**1.3**	**100.0%**

APPENDIX H

SITE 8 EXHIBITS

Soil Map—Ulster County, New York
(Site 8)



Map Scale: 1:366 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 15 30 60 90

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
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- Closed Depression
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- Gravelly Spot
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Background
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MAP INFORMATION

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Warning: Soil Map may not be valid at this scale.

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

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

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Survey Area Data: Version 17, Sep 3, 2018

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Tg	Tioga fine sandy loam	0.3	100.0%
Totals for Area of Interest		**0.3**	**100.0%**

APPENDIX I

SITE 10 EXHIBITS

EXHIBIT I-1

SITE 10 CROSS SECTIONS

xs1 rpt

RIVERMORPH CROSS SECTION SUMMARY

River Name: Sandburg Creek
Reach Name: Site #10
Cross Section Name: XS #1
Survey Date: 12/11/2018

Cross Section Data Entry

BM Elevation: 100 ft
Backsight Rod Reading: 100 ft

TAPE	FS	ELEV	NOTE
0	2.94	197.06	TOLP
0	3.31	196.69	BOLP
10.3	3.53	196.47	Top of Left Bank
13.3	9.72	190.28	LEW (Side Channel
19.3	11.61	188.39	Bed
25.7	9.48	190.52	REW (Side Channel)
28.7	8.27	191.73	Top of Right Bank (Side Channel)
37.3	6.93	193.07	Bar
45.3	6.65	193.35	Bar
53.3	7.31	192.69	Bar
56.3	6.81	193.19	Bar
64.3	6.91	193.09	Bar
68.7	7.35	192.65	Top of Left Bank (Active Channel)
69.9	7.75	192.25	BKF
72.4	9.75	190.25	LEW
75.3	10.4	189.6	Bed
86.3	10.32	189.68	Bed
93	10.67	189.33	Bed
98.3	10.83	189.17	Bed
103.7	11.17	188.83	Bed
106	11.3	188.7	Bed
111.1	10.73	189.27	Bed
114.7	10.35	189.65	Bed
117.3	9.71	190.29	REW
121.9	4.56	195.44	Top of Bank Right Bank
123.5	5.17	194.83	
127.3	5.13	194.87	
130.6	5.12	194.88	BORP
130.6	4.85	195.15	

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	198.81	198.81	198.81
Bankfull Elevation (ft)	193.6	193.6	193.6
Floodprone Width (ft)	130.6	-----	-----
Bankfull Width (ft)	108.57	29.82	78.75
Entrenchment Ratio	1.2	-----	-----
Mean Depth (ft)	2.67	2.5	2.74
Maximum Depth (ft)	5.21	5.21	4.9
Width/Depth Ratio	40.66	11.94	28.74
Bankfull Area (sq ft)	289.86	74.46	215.41
Wetted Perimeter (ft)	114.19	33.26	81.7

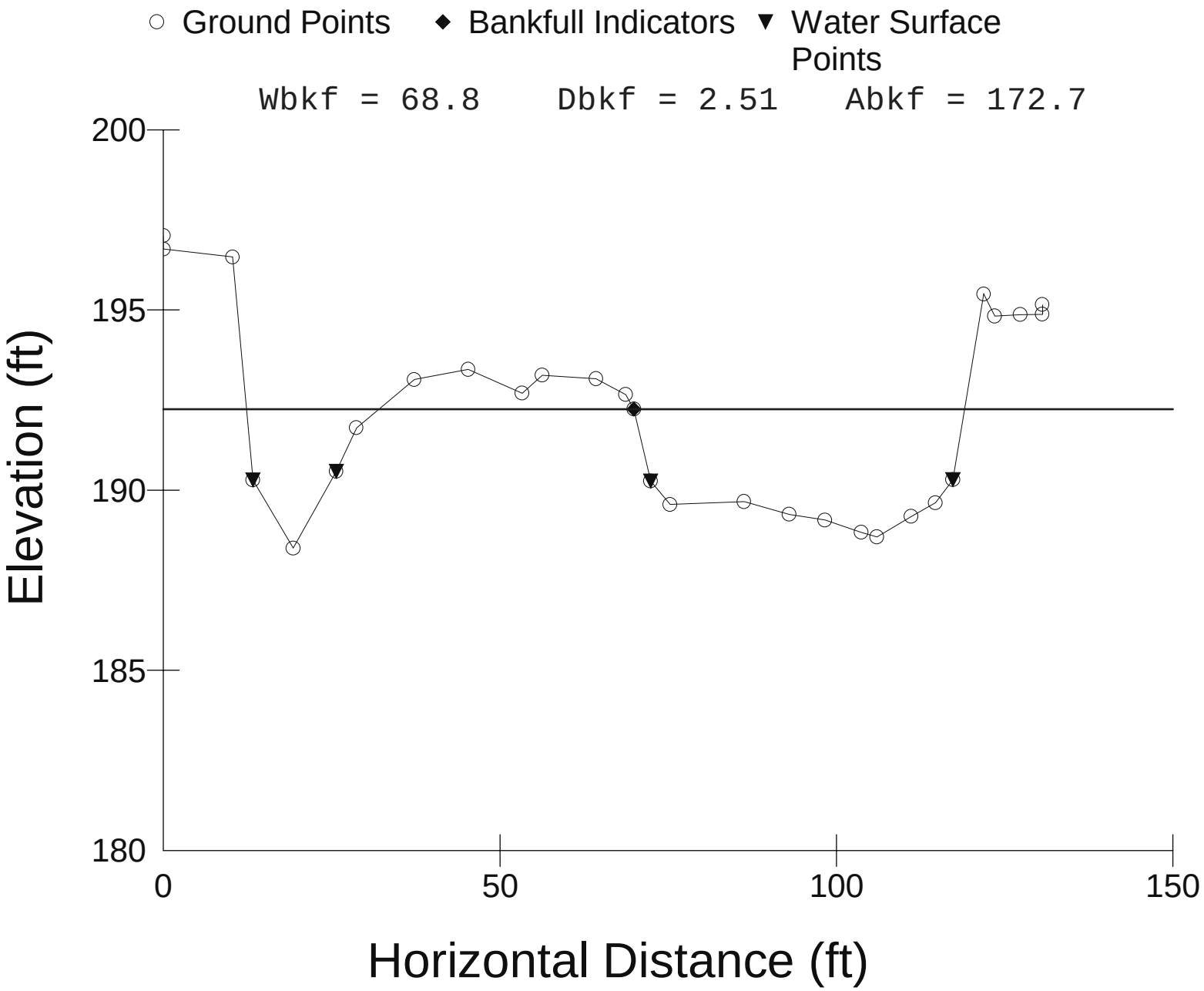
Hydraulic Radius (ft)	2.54	2.24	2.64
Begin BKF Station	11.69	11.69	41.51
End BKF Station	120.26	41.51	120.26

Entrainment Calculations

Entrainment Formula: Rosgen Modified Shields Curve

	Channel	Left Side	Right Side
Slope	0	0	0
Shear Stress (lb/sq ft)			
Movable Particle (mm)			

Site 10 - XS #1 (Riffle)



xs2 r

RIVERMORPH CROSS SECTION SUMMARY

River Name: Sandburg Creek
Reach Name: Site #10
Cross Section Name: XS #2
Survey Date: 12/11/2018

Cross Section Data Entry

BM Elevation: 100 ft
Backsight Rod Reading: 100 ft

TAPE	FS	ELEV	NOTE
0	2.09	197.91	TOLP
0	2.35	197.65	BOLP
3	2.99	197.01	Bank
5.4	3.56	196.44	Top of LB
10.3	8.07	191.93	Toe of LB
15	8.12	191.88	Bed
24	7.73	192.27	
30.6	7.08	192.92	Bank/Bar
39	7.18	192.82	Bar
46	7.02	192.98	Bar
59	7.4	192.6	Bar
63	7.18	192.82	BKF
66	7.72	192.28	Top of LB
67	8.97	191.03	LEW
68	9.47	190.53	Toe of LB
71.5	10.14	189.86	Bed
75	10.04	189.96	Bed
80	12.55	187.45	Deep pool to deep to accurately measure
123	13.55	186.45	
125	12.1	187.9	Toe of RB
127.6	5.77	194.23	Top of RB
132	4.34	195.66	Bank
142	4.3	195.7	Bank
154.4	3.59	196.41	BORP
154.4	3.25	196.75	

Cross Sectional Geometry

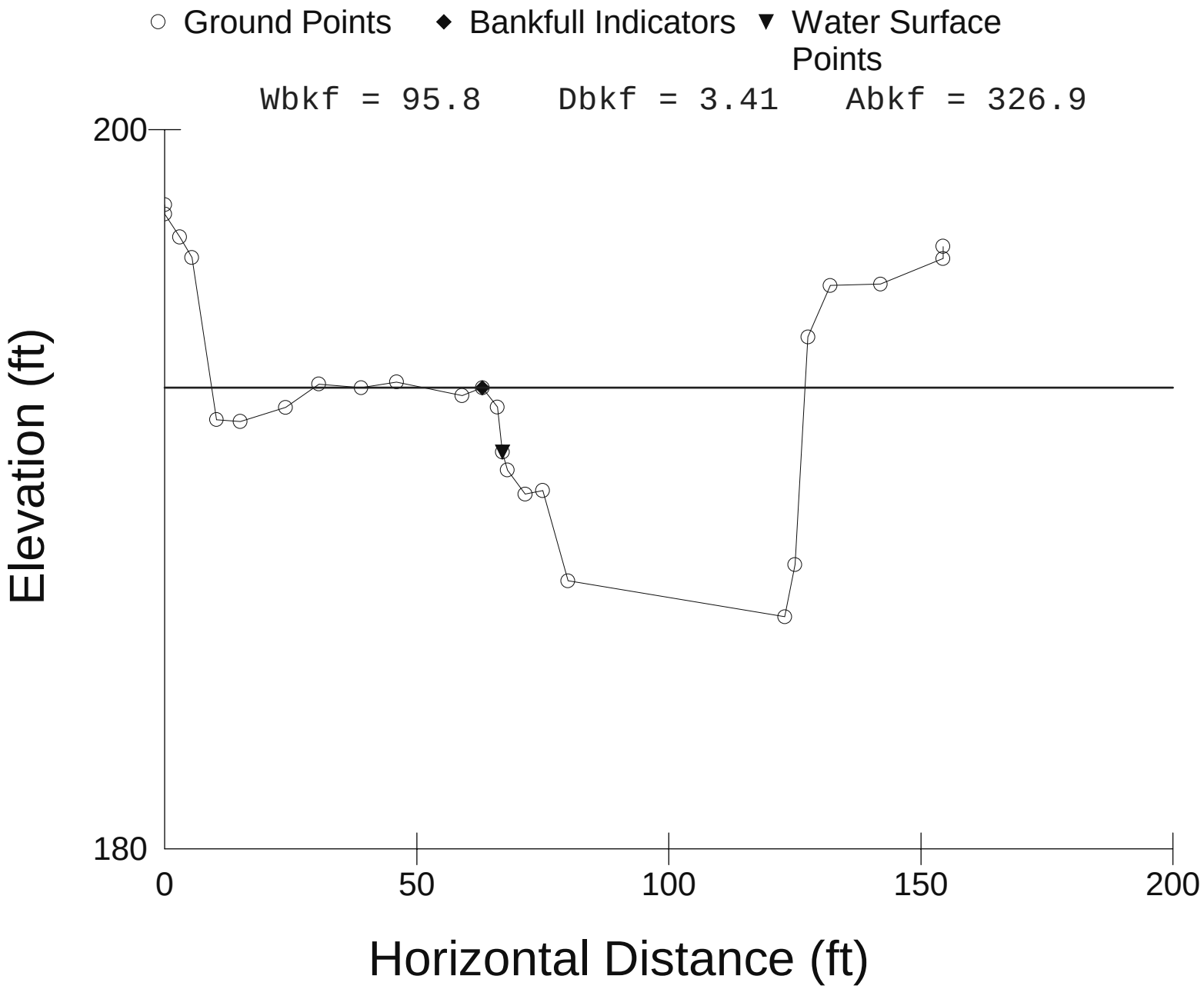
	Channel	Left	Right
Floodprone Elevation (ft)	199.19	199.19	199.19
Bankfull Elevation (ft)	192.82	192.82	192.82
Floodprone Width (ft)	154.4	-----	-----
Bankfull Width (ft)	95.8	47.9	69.79
Entrenchment Ratio	1.61	-----	-----
Mean Depth (ft)	3.41	0.52	4.49
Maximum Depth (ft)	6.37	0.94	6.37
Width/Depth Ratio	28.09	92.58	15.54
Bankfull Area (sq ft)	326.87	13.46	313.42
Wetted Perimeter (ft)	101.4	26.56	75.17
Hydraulic Radius (ft)	3.22	0.51	4.17
Begin BKF Station	9.33	9.33	57.23
End BKF Station	127.02	57.23	127.02

Entrainment Calculations

Entrainment Formula: Rosgen Modified Shields Curve

	Channel	Left Side	Right Side
Slope	0	0	0
Shear Stress (lb/sq ft)			
Movable Particle (mm)			

Site 10 XS #2 (Pool)



xs3r

RIVERMORPH CROSS SECTION SUMMARY

River Name: Sandburg Creek
Reach Name: Site #10
Cross Section Name: XS #3
Survey Date: 12/11/2018

Cross Section Data Entry

BM Elevation: 100 ft
Backsight Rod Reading: 100 ft

TAPE	FS	ELEV	NOTE
0	3.09	196.91	TOLP
0	3.45	196.55	BOLP
8	3.33	196.67	Top of LB
16	9.82	190.18	LEW
22	11.57	188.43	TW
30.5	10.61	189.39	Bed
42	10.36	189.64	Bed
52	10.63	189.37	Bed
60	10.54	189.46	Toe of RB
62	9.76	190.24	REW
64	7.42	192.58	BKF
79.5	6.58	193.42	Top of RB
85	6.57	193.43	
88	5.53	194.47	
103	4.78	195.22	
126.3	3.92	196.08	BORP
126.3	3.5	196.5	

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	196.73	196.73	196.73
Bankfull Elevation (ft)	192.58	192.58	192.58
Floodprone Width (ft)	126.3	-----	-----
Bankfull Width (ft)	50.96	25.48	25.48
Entrenchment Ratio	2.48	-----	-----
Mean Depth (ft)	3.01	3.11	2.91
Maximum Depth (ft)	4.15	4.15	3.21
Width/Depth Ratio	16.93	8.19	8.76
Bankfull Area (sq ft)	153.51	79.28	74.23
Wetted Perimeter (ft)	53.35	29.65	29.73
Hydraulic Radius (ft)	2.88	2.67	2.5
Begin BKF Station	13.04	13.04	38.52
End BKF Station	64	38.52	64

Entrainment Calculations

Entrainment Formula: Rosgen Modified Shields Curve

	Channel	Left Side	Right Side
Slope	0	0	0

Shear Stress (lb/sq ft)
Movable Particle (mm)

Site 10 XS #3 (Riffle)

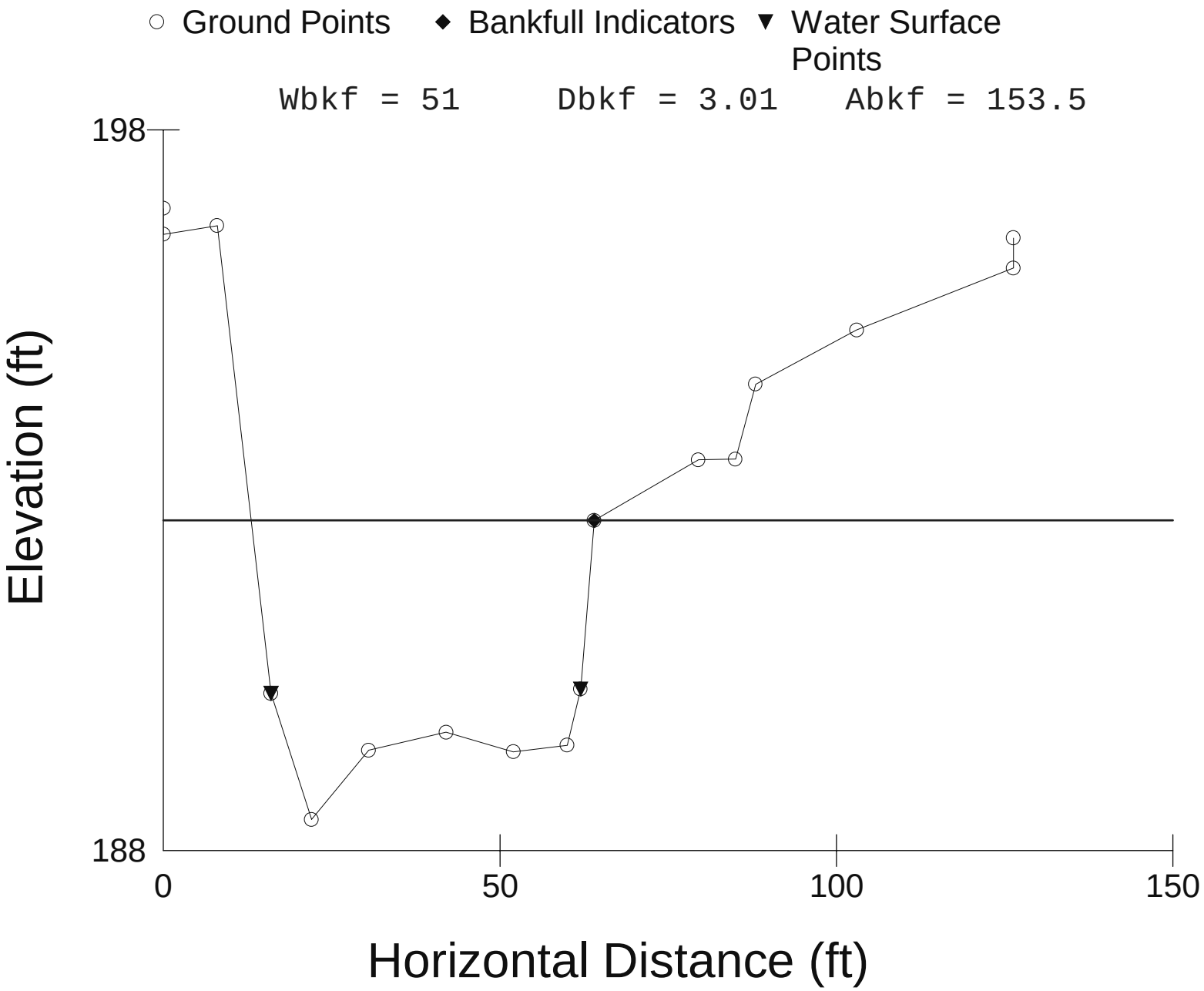


EXHIBIT I-2

SITE 10 LONGITUDINAL PROFILE

LPR
RIVERMORPH PROFILE SUMMARY

River Name: Sandburg Creek
Reach Name: Site #10
Profile Name: Site #11 Hang Glider Road
Survey Date: 12/21/2018

Survey Data

DIST	CH	WS	BKF	P1	P2	P3	P4
2	3.89	3.74					
12	4.69	4.22					
15	7.34	4.3	3.12				
56	5.73	4.59	3.24				
98	6.31	4.87	3.94				
114	8.08	4.86					
137	8.32	4.97					
175	6.95	4.95	3.2				
200	8.9	5.06					
222	9.09	5.12	3.68				
262	8.8	5.02					
305	7.49	5.04					
312	6.49	5.04					
335	6.17	5.36	3.97				
397	11.34	9.71	7.93				
426	11.16	9.87	8.43				
455	11.84	9.91					
473	13.55	9.93					
504	13.55	9.94	8.37				
554	13.06	9.87					
578	11.08	9.84					
614	11.25	10.36					
635	13.48	10.32					
683	13.13	10.36					
715	11.52	10.78					
762	11.32	9.85					
799	13.23	9.92	7.85				
845	13.41	9.91					
891	11.46						
896	11.04	10.02					

Cross Section / Bank Profile Locations

Name	Type	Profile Station
XS #1	Riffle XS	400
XS #2	Pool XS	522
XS #3	Riffle XS	719

Measurements from Graph

Bankfull Slope: 0

Variable	Min	Avg	Max
S riffle	0	0	0

			LPR
S pool	0	0	0
S run	0	0	0
S glide	0	0	0
S step	0	0	0
P - P	0	0	0
Pool length	0	0	0
Riffle length	0	0	0
Dmax riffle	0	0	0
Dmax pool	0	0	0
Dmax run	0	0	0
Dmax glide	0	0	0
Dmax step	0	0	0
Low bank ht	0	0	0

Length and depth measurements in feet, slopes in ft/ft.

♀

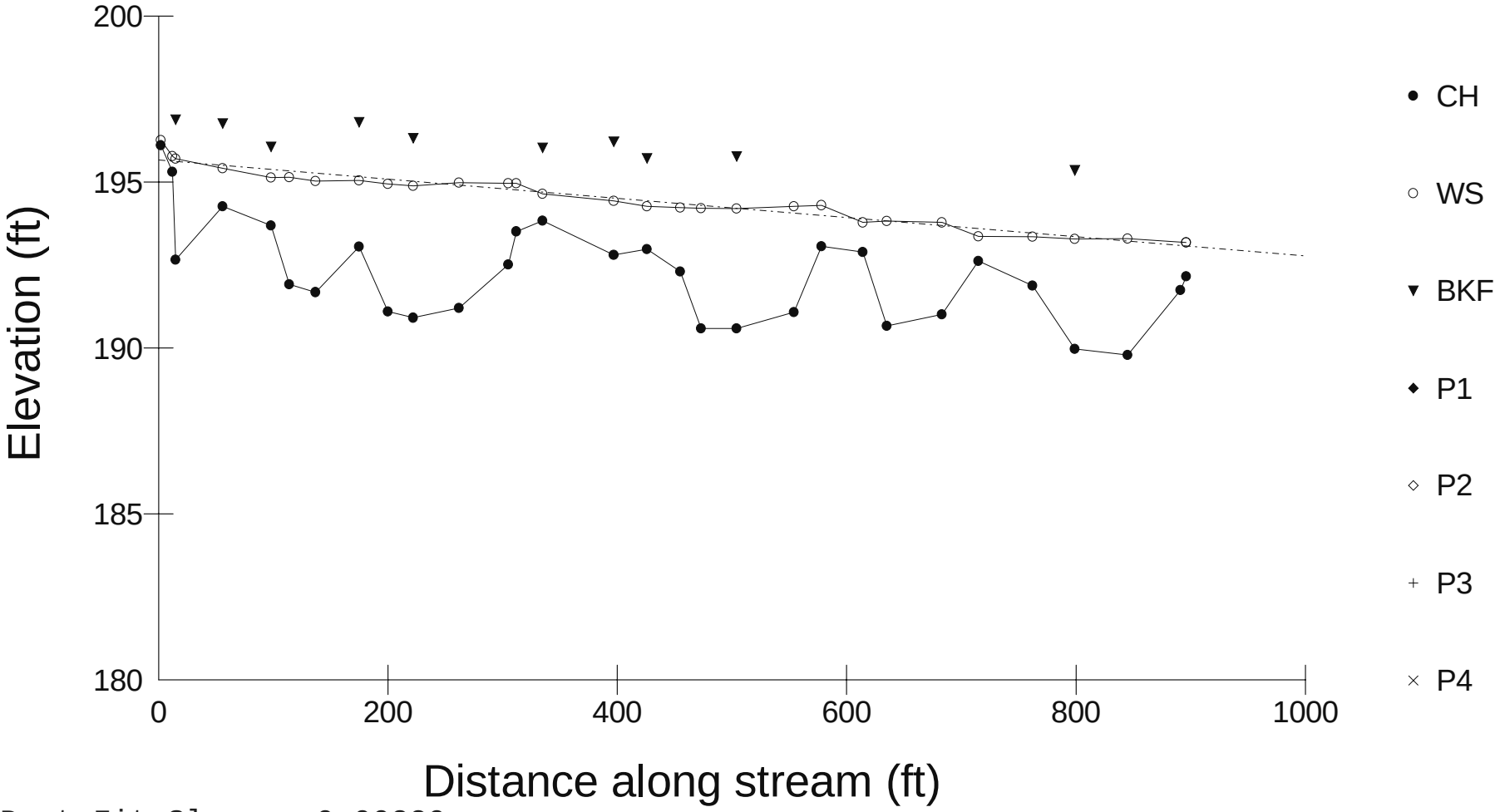
RIVERMORPH PROFILE SUMMARY

Notes

River Name: Sandburg Creek
Reach Name: Site #10
Profile Name: Site #11 Hang Glider Road
Survey Date: 12/21/2018

DIST	Note
2	Head of Riffle
12	Bottom of Riffle
15	Max Pool
56	Head of Riffle
98	Bottom of Riffle
114	Pool
137	Pool
175	Pool/Run
200	Pool to deep to accurately measure
222	Pool to deep to accurately measure
262	Pool to deep to accurately measure
305	Pool/Glide
312	Top of Glide
335	Top Riffle
397	Riffle
426	Riffle
455	End Riffle
473	Pool to deep to accurately measure
504	Pool to deep to accurately measure
554	Pool
578	Head of Riffle
614	Bottom of Riffle
635	Pool to deep to accurately measure
683	Glide
715	Riffle
762	Bottom of Riffle
799	Pool

Site #10 Hang Glider Road



WS Best Fit Slope = 0.00289

EXHIBIT I-3

SITE 10 RIFFLE AND BAR SAMPLE PARTICLE SIZE DISTRIBUTIONS

rifrpt

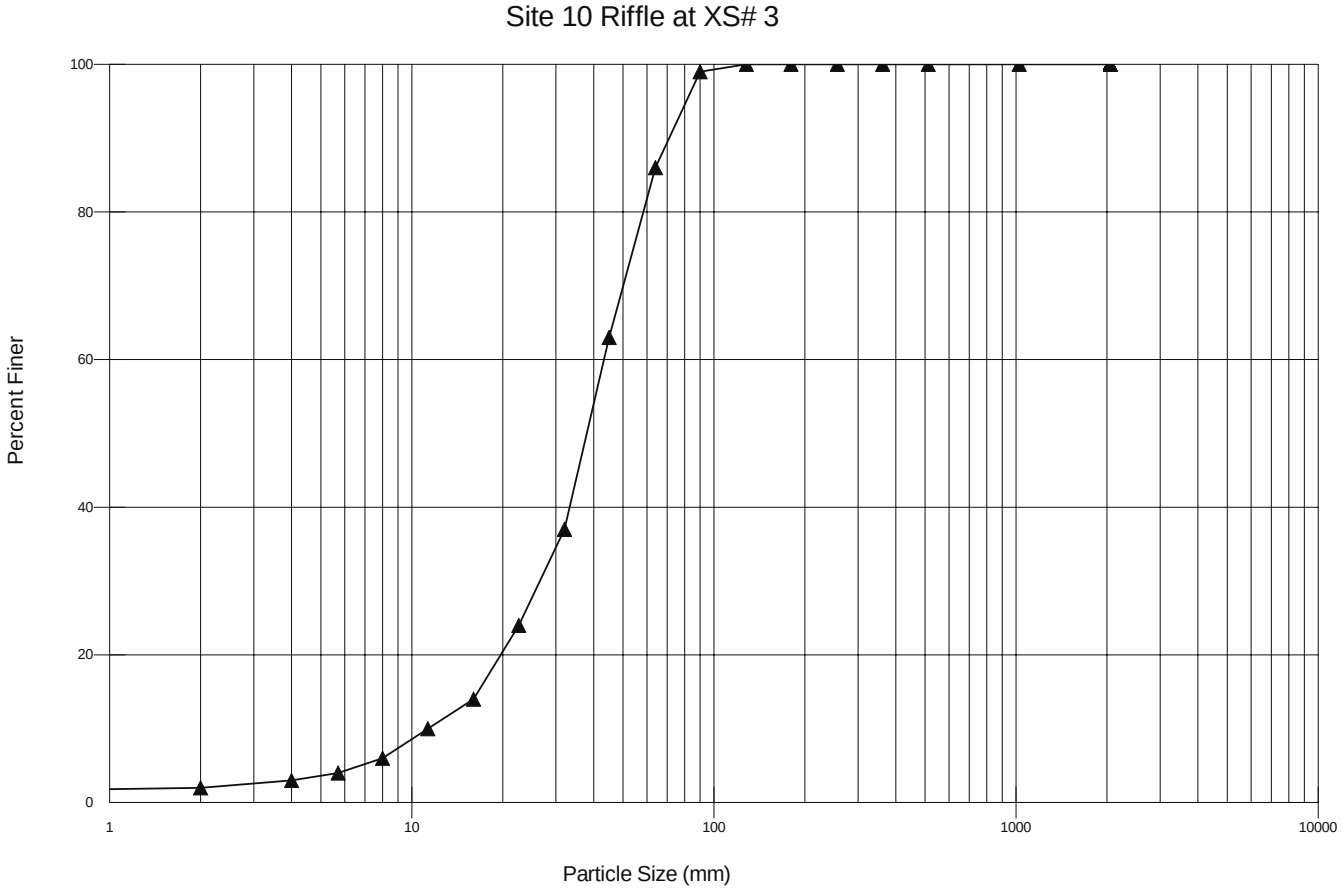
RIVERMORPH PARTICLE SUMMARY

River Name: Sandburg Creek
Reach Name: Site #10
Sample Name: Riffle at XS#3
Survey Date: 12/12/2018

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	0	0.00	0.00
0.062 - 0.125	0	0.00	0.00
0.125 - 0.25	0	0.00	0.00
0.25 - 0.50	0	0.00	0.00
0.50 - 1.0	0	0.00	0.00
1.0 - 2.0	2	2.00	2.00
2.0 - 4.0	1	1.00	3.00
4.0 - 5.7	1	1.00	4.00
5.7 - 8.0	2	2.00	6.00
8.0 - 11.3	4	4.00	10.00
11.3 - 16.0	4	4.00	14.00
16.0 - 22.6	10	10.00	24.00
22.6 - 32.0	13	13.00	37.00
32 - 45	26	26.00	63.00
45 - 64	23	23.00	86.00
64 - 90	13	13.00	99.00
90 - 128	1	1.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	17.32
D35 (mm)	30.55
D50 (mm)	38.5
D84 (mm)	62.35
D95 (mm)	82
D100 (mm)	128
Silt/Clay (%)	0
Sand (%)	2
Gravel (%)	84
Cobble (%)	14
Boulder (%)	0
Bedrock (%)	0

Total Particles = 100.


Site 10 Riffle at XS# 3
Percent Finer
100
80
60
40
20
0
1
10
100
1000
10000
Particle Size (mm)

bar rpt

RIVERMORPH PARTICLE SUMMARY

River Name: Sandburg Creek
Reach Name: Site #10
Sample Name: Bar Sample #1
Survey Date: 12/12/2018

SIEVE (mm)	NET WT
63	1.76
31.5	13.56
16	19.07
8	7.17
4	3.42
2	16.76
PAN	6.06

D16 (mm)	2.62
D35 (mm)	6.05
D50 (mm)	17.38
D84 (mm)	46.61
D95 (mm)	67.32
D100 (mm)	90
Silt/Clay (%)	0
Sand (%)	8.63
Gravel (%)	85.68
Cobble (%)	5.69
Boulder (%)	0
Bedrock (%)	0

Total Weight = 70.2200.

Largest Surface Particles:

	Size(mm)	Weight
Particle 1:	90	1.76
Particle 2:	55	0.66

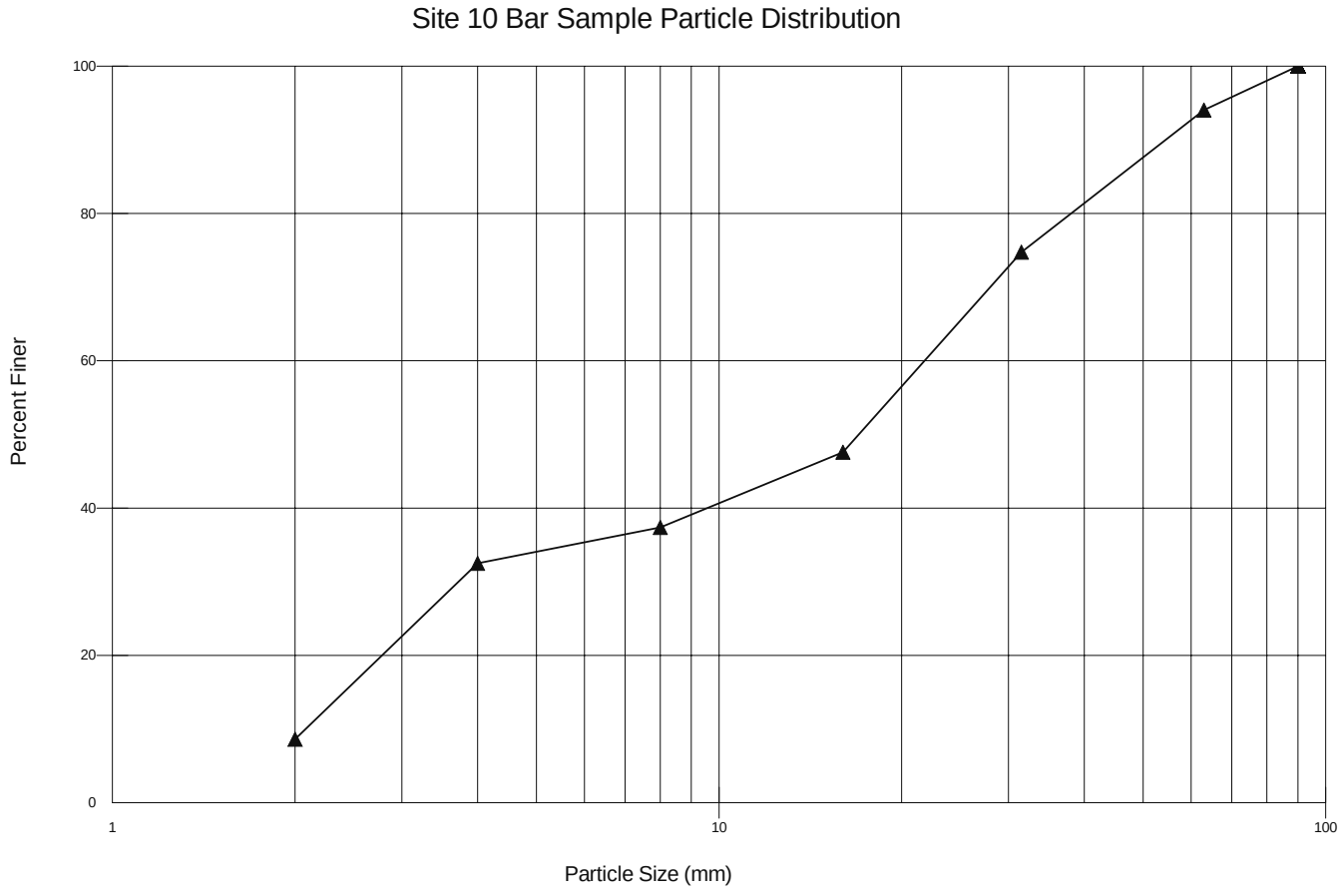

Site 10 Bar Sample Particle Distribution
Percent Finer
100
80
60
40
20
0
1
10
100
Particle Size (mm)

EXHIBIT I-4

SITE 10 STREAM CLASSIFICATION WORKSHEET

Worksheet 2-3. Field form for Level II stream classification (Rosgen, 1996; Rosgen and Silvey, 2005).

Stream:	**Sandburg Creek, Reach - Site #10**				
Basin:		Drainage Area:	**0**	acres	mi^2
Location:					
Twp.&Rge:	**;**	Sec.&Qtr.:	**;**		
Cross-Section Monuments (Lat./Long.):	**0 Lat / 0 Long**			Date:	**01/30/19**
Observers:				Valley Type:	C-AL-IG

Bankfull WIDTH (W_{bkf}) WIDTH of the stream channel at bankfull stage elevation, in a riffle section.	**51.35**	ft
Bankfull DEPTH (d_{bkf}) Mean DEPTH of the stream channel cross-section, at bankfull stage elevation, in a riffle section (d_{bkf} = A / W_{bkf}).	**3.01**	ft
Bankfull X-Section AREA (A_{bkf}) AREA of the stream channel cross-section, at bankfull stage elevation, in a riffle section.	**154.54**	ft^2
Width/Depth Ratio (W_{bkf} / d_{bkf}) Bankfull WIDTH divided by bankfull mean DEPTH, in a riffle section.	**17.06**	ft/ft
Maximum DEPTH (d_{mbkf}) Maximum depth of the bankfull channel cross-section, or distance between the bankfull stage and Thalweg elevations, in a riffle section.	**4.17**	ft
WIDTH of Flood-Prone Area (W_{fpa}) Twice maximum DEPTH, or (2 x d_{mbkf}) = the stage/elevation at which flood-prone area WIDTH is determined in a riffle section.	**126.3**	ft
Entrenchment Ratio (ER) The ratio of flood-prone area WIDTH divided by bankfull channel WIDTH (W_{fpa} / W_{bkf}) (riffle section).	**2.46**	ft/ft
Channel Materials (Particle Size Index) D_{50} The D_{50} particle size index represents the mean diameter of channel materials, as sampled from the channel surface, between the bankfull stage and Thalweg elevations.	**39**	mm
Water Surface SLOPE (S) Channel slope = "rise over run" for a reach approximately 20–30 bankfull channel widths in length, with the "riffle-to-riffle" water surface slope representing the gradient at bankfull stage.	**0.003**	ft/ft
Channel SINUOSITY (k) Sinuosity is an index of channel pattern, determined from a ratio of stream length divided by valley length (SL / VL); or estimated from a ratio of valley slope divided by channel slope (VS / S).	**1.1**	

Stream Type **C 4** (See **Figure 2-14**)

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EXHIBIT I-5

SITE 10 SEDIMENT COMPETENCE CALCULATIONS

Worksheet 3-14. Sediment competence calculation form to assess bed stability.

Stream:	**Sandburg Creek**		Stream Type: **C 4**		
Location:	**Site #10**		Valley Type: **C-AL-IG**		
Observers:			Date: **01/30/2019**		
Enter Required Information for Existing Condition					
38.5	D_{50}	Median particle size of riffle bed material (mm)			
17.4	D_{50}	Median particle size of bar or sub-pavement sample (mm)			
0.295	D_{max}	Largest particle from bar sample (ft)	**90**	**(mm)**	304.8 mm/ft
0.00300	S	Existing bankfull water surface slope (ft/ft)			
2.21	d	Existing bankfull mean depth (ft)			
1.65	$\gamma_s-\gamma/\gamma$	Immersed specific gravity of sediment			

Select the Appropriate Equation and Calculate Critical Dimensionless Shear Stress					
2.21	D_{50}/D_{50}	Range: 3 – 7	Use EQUATION 1: $t^* = 0.0834 (D_{50}/D_{50})^{-0.872}$		
2.34	D_{max}/D_{50}	Range: 1.3 – 3.0	Use EQUATION 2: $t^* = 0.0384 (D_{max}/D_{50})^{-0.887}$		
0.018	t^*	Bankfull Dimensionless Shear Stress		EQUATION USED:	**2**

Calculate Bankfull Mean Depth Required for Entrainment of Largest Particle in Bar Sample			
2.94	**d**	Required bankfull mean depth (ft) $d = \frac{t^*(\gamma_s - 1)D_{max}}{S}$	(use D_{max} in ft)
Calculate Bankfull Water Surface Slope Required for Entrainment of Largest Particle in Bar Sample			
0.00399	**S**	Required bankfull water surface slope (ft/ft) $S = \frac{t^*(\gamma_s - 1)D_{max}}{d}$	(use D_{max} in ft)
Check: ☑ Stable ☐ Aggrading ☐ Degrading			

Sediment Competence Using Dimensional Shear Stress		
0.414		Bankfull shear stress $t = gdS$ (lbs/ft^2) (substitute hydraulic radius, R, with mean depth, d) g= 62.4, d = existing depth, S = existing slope
Shields **31.082**	CO **79.43**	Predicted largest moveable particle size (mm) at bankfull shear stress t **(Figure 3-11)**
Shields **1.1477**	CO **0.4903**	Predicted shear stress required to initiate movement of measured D_{max} (mm) **(Figure 3-11)**
Shields **6.13**	CO **2.62**	Predicted mean depth required to initiate movement of measured D_{max} (mm) $d = \frac{t}{\gamma S}$ t = predicted shear stress, g= 62.4, S = existing slope
Shields **0.0083**	CO **0.0036**	Predicted slope required to initiate movement of measured D_{max} (mm) $S = \frac{t}{\gamma d}$ t = predicted shear stress, g= 62.4, d = existing depth
Check: ☑ Stable ☐ Aggrading ☐ Degrading		

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EXHIBIT I-6

SITE 10 BANKFULL DISCHARGE CALCULATION SUMMARY

Worksheet 2-2. Computations of velocity and bankfull discharge using various methods (Rosgen, 2006b; Rosgen and Silvey, 2007).

Bankfull VELOCITY & DISCHARGE Estimates

Stream:	**Sandburg Creek**		Location:	**Reach - Site #10**	
Date:	**1/30/2019**	Stream Type: **C4**	Valley Type:	**C-AL-IG**	
Observers:	**ANE/RML**		HUC:		

INPUT VARIABLES			OUTPUT VARIABLES		
Bankfull Riffle Cross-Sectional AREA	**154.54**	**A_{bkf}** (ft^2)	Bankfull Riffle Mean DEPTH	**3.01**	**d_{bkf}** (ft)
Bankfull Riffle WIDTH	**51.35**	**W_{bkf}** (ft)	Wetted PERMIMETER ~ $(2 * d_{bkf}) + W_{bkf}$	**53.75**	**W_p** (ft)
D_{84} at Riffle	**62.35**	**Dia.** (mm)	D_{84} (mm) / 304.8	**0.20**	**D_{84}** (ft)
Bankfull SLOPE	**0.0030**	**S_{bkf}** (ft / ft)	Hydraulic RADIUS A_{bkf} / W_p	**2.88**	**R** (ft)
Gravitational Acceleration	**32.2**	g (ft / sec^2)	Relative Roughness R(ft) / D_{84} (ft)	**14.05**	**R / D_{84}**
Drainage Area	**40.5**	**DA** (mi^2)	Shear Velocity u* = $(gRS)^{½}$	**0.527**	**u*** (ft/sec)

ESTIMATION METHODS	Bankfull VELOCITY		Bankfull DISCHARGE	
1. Friction Factor / Relative Roughness $u = [2.83 + 5.66 * Log \{ R / D_{84} \}] u^*$	**4.92**	ft / sec	**759.60**	cfs
2. Roughness Coefficient: a) Manning's *n* from Friction Factor / Relative Roughness (Figs. 2-18, 2-19) $u = 1.49 R^{2/3} S^{1/2} / n$ $n =$	**0.00**	ft / sec	**0.00**	cfs
2. Roughness Coefficient: b) Manning's *n* from Stream Type (Fig. 2-20) $u = 1.49 R^{2/3} S^{1/2} / n$ $n =$	**0.00**	ft / sec	**0.00**	cfs
2. Roughness Coefficient: c) Manning's *n* from Jarrett (USGS): $u = 1.49 R^{2/3} S^{1/2} / n$ $n = 0.39 S^{0.38} R^{-0.16}$ **Note:** This equation is applicable to **steep, step/pool, high boundary roughness, cobble- and boulder-dominated stream systems**; i.e., for Stream Types A1, A2, A3, B1, B2, B3, C2 & E3 $n =$ **0.036**	**4.55**	ft / sec	**702.85**	cfs
3. Other Methods (Hey, Darcy-Weisbach, Chezy C, etc.) **Manning's Limerinos n=0.0318**	**5.18**	ft / sec	**800.05**	cfs
3. Other Methods (Hey, Darcy-Weisbach, Chezy C, etc.) **Darcy-Weisbach (Leopold, Wolman and Miller)**	**5.14**	ft / sec	**794.49**	cfs
4. Continuity Equations: a) Regional Curves $u = Q / A$ **Return Period for Bankfull Discharge** $Q =$ **0.0** **year**	**0.00**	ft / sec	**0.00**	cfs
4. Continuity Equations: b) USGS Gage Data $u = Q / A$	**0.00**	ft / sec	**0.00**	cfs

Protrusion Height Options for the D_{84} Term in the Relative Roughness Relation (R/D_{84}) – Estimation Method 1

Option 1.	For **sand-bed** channels: Measure 100 **"protrusion heights"** of sand dunes from the downstream side of feature to the top of feature. Substitute the D_{84} sand dune protrusion height in ft for the D_{84} term in method 1.
Option 2.	For **boulder-dominated** channels: Measure 100 **"protrusion heights"** of boulders on the sides from the bed elevation to the top of the rock on that side. Substitute the D_{84} boulder protrusion height in ft for the D_{84} term in method 1.
Option 3.	For **bedrock-dominated** channels: Measure 100 **"protrusion heights"** of rock separations, steps, joints or uplifted surfaces above channel bed elevation. Substitute the D_{84} bedrock protrusion height in ft for the D_{84} term in method 1.
Option 4.	For **log-influenced** channels: Measure "**protrustion heights**" proportionate to channel width of log diameters or the height of the log on upstream side if embedded. Substitute the D_{84} protrusion height in ft for the D_{84} term in method 1.

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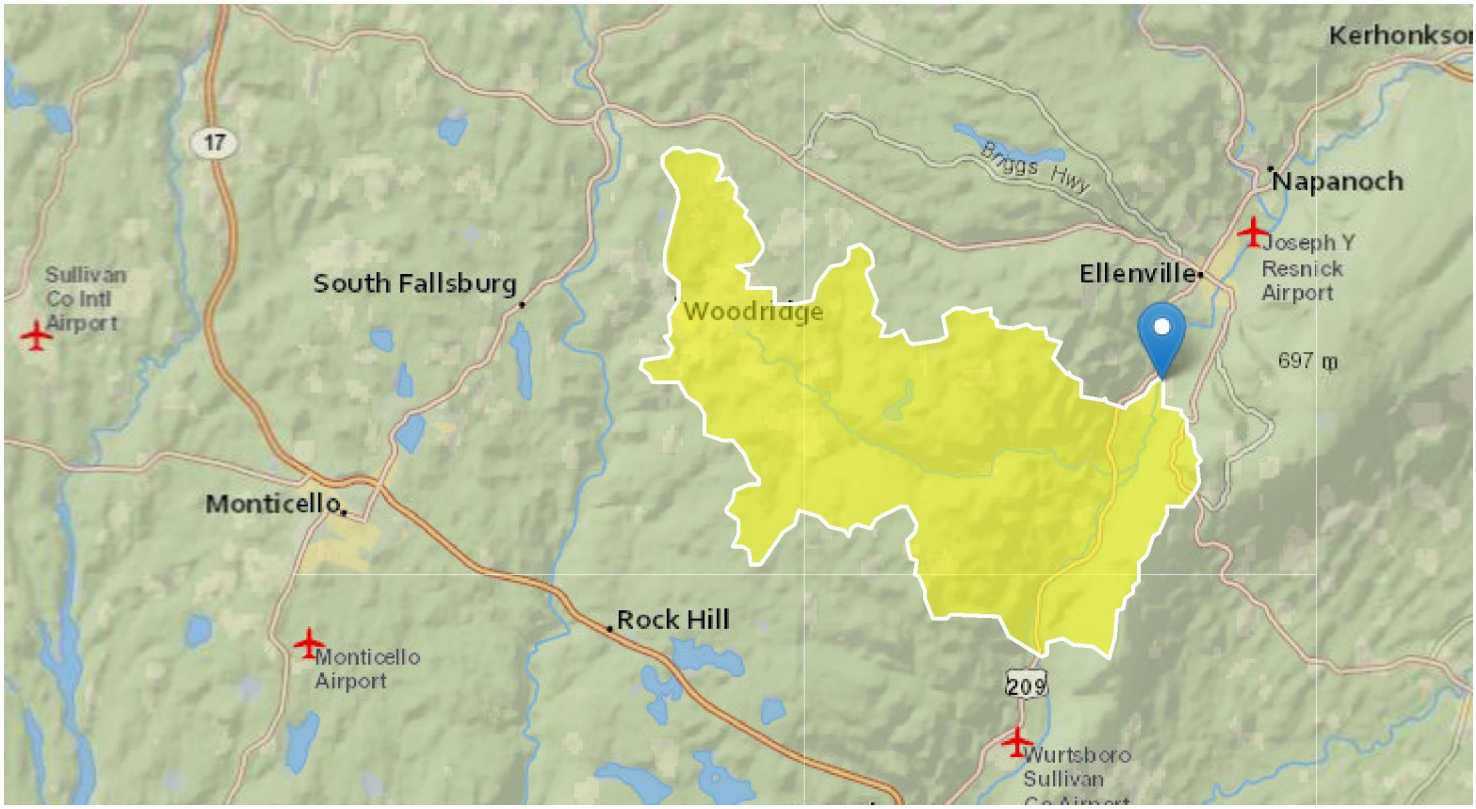
EXHIBIT I-7

SITE 10 STREAMSTATS OUTPUT SUMMARY

StreamStats Report

Region ID: NY
Workspace ID: NY20181227141646359000
Clicked Point (Latitude, Longitude): 41.68934, -74.40871
Time: 2018-12-27 09:17:00 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	40.5	square miles
LAGFACTOR	Lag Factor as defined in SIR 2006-5112	0.28	dimensionless
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	2.37	percent
MAR	Mean annual runoff for the period of record in inches	24.6	inches
BSLOPCM	Mean basin slope determined by summing lengths of all contours in basin mulitplying by contour interval and dividing product by drainage area	707	feet per mi
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	542281.3	feet

Parameter Code	Parameter Description	Value	Unit
CENTROIDY	Basin centroid vertical (y) location in state plane units	4613989.6	feet
CONTOUR	Total length of all elevation contours in drainage area in miles	286.25	miles
CSL1085LO	10-85 slope of lower half of main channel in feet per mile.	68.2	feet per mi
CSL1085UP	10-85 slope of upper half of main channel in feet per mile.	50.6	feet per mi
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	65.7	feet per mi
EL1200	Percentage of basin at or above 1200 ft elevation	47.5	percent
FOREST	Percentage of area covered by forest	92.4	percent
JULAVPRE	Mean July Precipitation	4.24	inches
JUNAVPRE	Mean June Precipitation	4.59	inches
JUNMAXTMP	Maximum June Temperature, in degrees F	76.3	degrees F
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	5.46	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.59	percent
LENGTH	Length along the main channel from the measuring location extended to the basin divide	16.6	miles
MAYAVPRE	Mean May Precipitation	4.82	inches
MXSNO	50th percentile of seasonal maximum snow depth from Northeast Regional Climate Center atlas by Cember and Wilks, 1993	15.4	inches
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	549205	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	4615455	feet
PRECIP	Mean Annual Precipitation	44.7	inches
PRJUNAUG00	Basin average mean precip for June to August from PRISM 1971-2000	13	inches
SLOPERATIO	Ratio of main channel slope to basin slope as defined in SIR 2006-5112	0.0929	dimensionless
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	9.18	percent

Parameter Code	Parameter Description	Value	Unit
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	4.53	percent

Bankfull Statistics Parameters [Bankfull Region 4 SIR2009 5144]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	40.5	square miles	3.72	237

Bankfull Statistics Flow Report [Bankfull Region 4 SIR2009 5144]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PII	PIu
Bankfull Area	318	ft^2	107	947
Bankfull Depth	3.42	ft	1.29	9.07
Bankfull Streamflow	2100	ft^3/s	375	11800
Bankfull Width	93.8	ft	34	259

Bankfull Statistics Citations

Mulvihill, C.I., Baldigo, B.P., Miller, S.J. , and DeKoskie, Douglas,2009, Bankfull Discharge and Channel Characteristics of Streams in New York State: U.S. Geological Survey Scientific Investigations Report 2009-5144, 51 p. (http://pubs.usgs.gov/sir/2009/5144/)

Peak-Flow Statistics Parameters [100 Percent (40.5 square miles) 2006 Full Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	40.5	square miles	1.93	996
LAGFACTOR	Lag Factor	0.28	dimensionless	0.014	6.997
STORAGE	Percent Storage	2.37	percent	0	11.88
MAR	Mean Annual Runoff in inches	24.6	inches	16.03	33.95

Peak-Flow Statistics Flow Report [100 Percent (40.5 square miles) 2006 Full Region 2]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp	Equiv. Yrs.
1.25 Year Peak Flood	982	ft^3/s	25.5	25.5	4.8
1.5 Year Peak Flood	1210	ft^3/s	25.6	25.6	4.3
2 Year Peak Flood	1550	ft^3/s	25.8	25.8	4.4
5 Year Peak Flood	2570	ft^3/s	27	27	7.3
10 Year Peak Flood	3450	ft^3/s	28.2	28.2	10.1
25 Year Peak Flood	4760	ft^3/s	29.9	29.9	13.6
50 Year Peak Flood	5890	ft^3/s	31.5	31.5	15.8
100 Year Peak Flood	7160	ft^3/s	33.3	33.3	17.6
200 Year Peak Flood	8600	ft^3/s	35.3	35.3	18.9
500 Year Peak Flood	10800	ft^3/s	38.4	38.4	20.1

Peak-Flow Statistics Citations

Lumia, Richard, Freehafer, D.A., and Smith, M.J.,2006, Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006–5112, 152 p. (http://pubs.usgs.gov/sir/2006/5112/)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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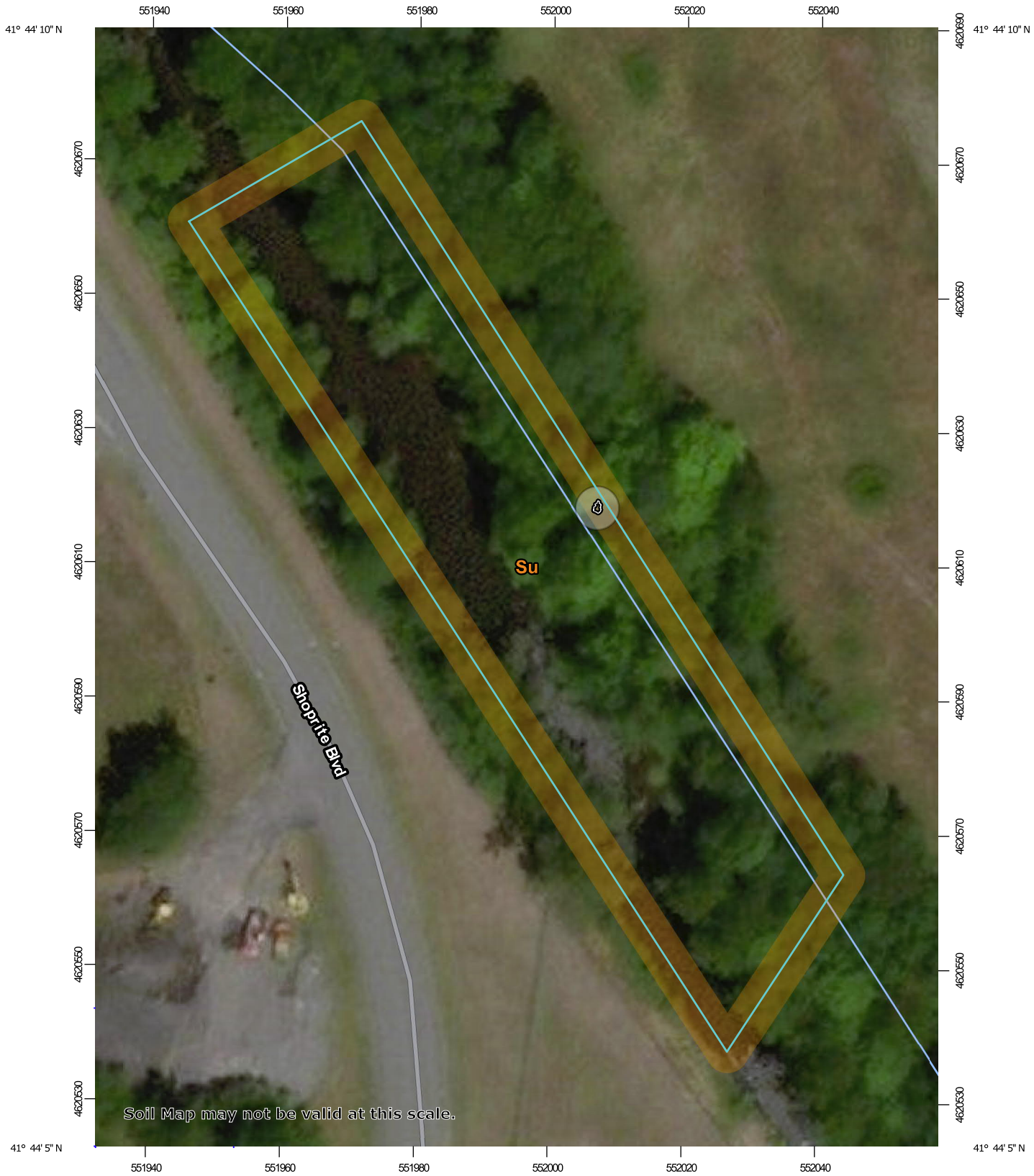
Application Version: 4.3.0

APPENDIX J

SITE 12 EXHIBITS

Soil Map—Ulster County, New York
(Site 12)



Map Scale: 1:812 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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

Soil Survey Area: Ulster County, New York
Survey Area Data: Version 17, Sep 3, 2018

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

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Su	Suncook loamy fine sand	1.0	100.0%
Totals for Area of Interest		**1.0**	**100.0%**

APPENDIX K

SITE 13 EXHIBITS

EXHIBIT K-1

SITE 13 CROSS SECTIONS

XS1
RIVERMORPH CROSS SECTION SUMMARY

River Name: Sandburg Creek
Reach Name: Site #13
Cross Section Name: Site13 XS #1
Survey Date: 12/21/2018

Cross Section Data Entry

BM Elevation: 100 ft
Backsight Rod Reading: 100 ft

TAPE	FS	ELEV	NOTE
0	2.89	197.11	TOLP
0	3.42	196.58	BOLP
2.7	3.98	196.02	Top of Left Bank
5.4	5.21	194.79	
8.4	7.25	192.75	
9.7	8.27	191.73	LEW
12	8.79	191.21	
14.2	9.19	190.81	
17.3	9.89	190.11	
20.1	9.84	190.16	
23.2	9.22	190.78	
25.4	9.13	190.87	
26.5	8.71	191.29	
29.3	8.49	191.51	
33	8.45	191.55	Edge of check dam
34.5	9.62	190.38	Left Dege of Trib
42.7	10.64	189.36	
46.6	10.23	189.77	
50.5	8.41	191.59	REW
53.2	7.96	192.04	
56.4	7.37	192.63	
61.3	6.99	193.01	
67.4	6.6	193.4	BKF
76.9	6.84	193.16	
79	6.98	193.02	
82	6.47	193.53	Top of Right Bank
83.8	5.34	194.66	
93.8	3.63	196.37	

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	197.44	197.44	197.44
Bankfull Elevation (ft)	193.4	193.4	193.4
Floodprone Width (ft)	93.8	-----	-----
Bankfull Width (ft)	73.79	37.2	36.6
Entrenchment Ratio	1.27	-----	-----
Mean Depth (ft)	1.78	2.68	0.87
Maximum Depth (ft)	4.04	4.04	3.84
Width/Depth Ratio	41.46	13.86	42.07
Bankfull Area (sq ft)	131.69	99.83	31.86
Wetted Perimeter (ft)	75.71	42.38	41
Hydraulic Radius (ft)	1.74	2.36	0.78

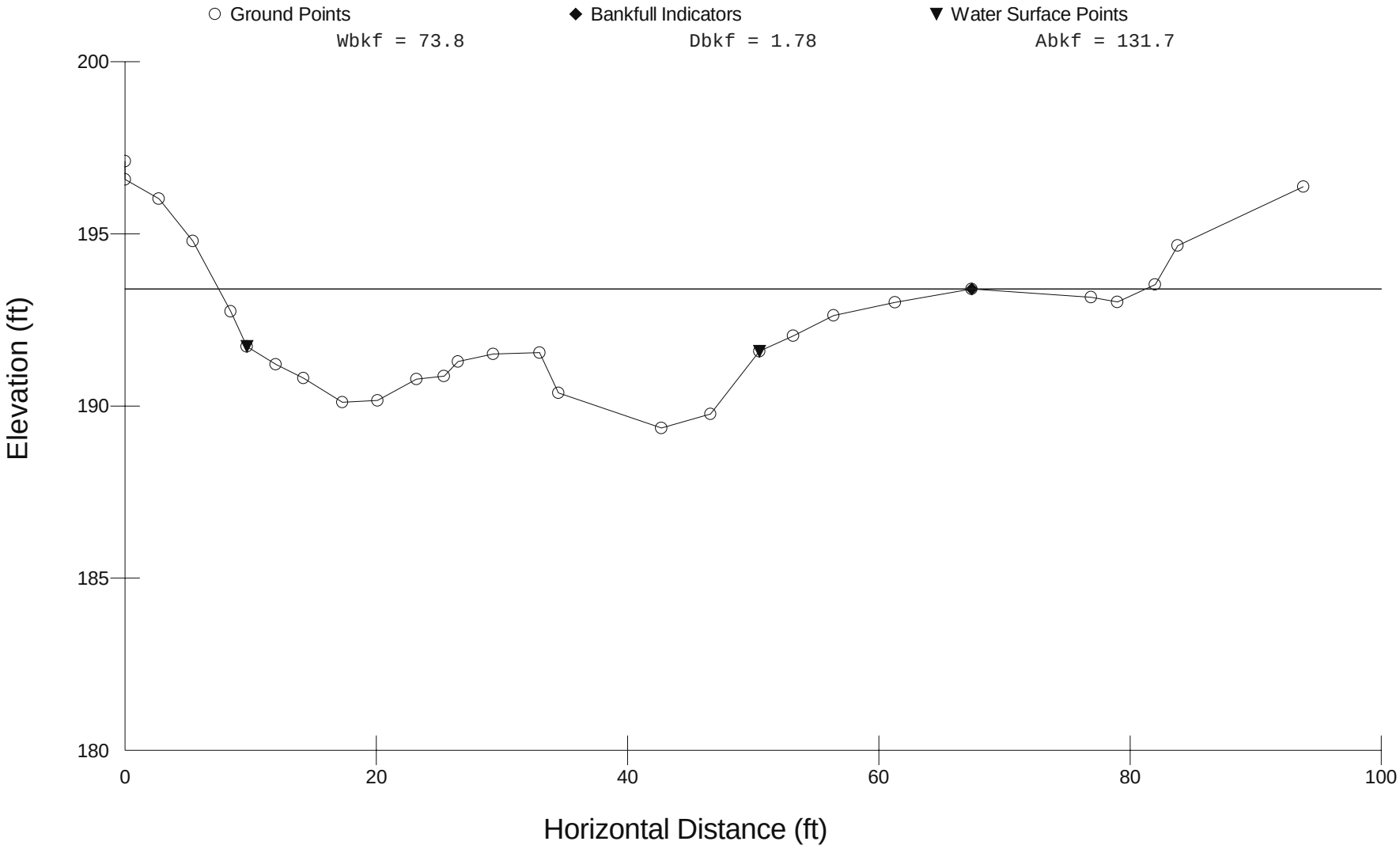
	XS1		
Begin BKF Station	7.44	7.44	44.64
End BKF Station	81.24	44.64	81.24

Entrainment Calculations

Entrainment Formula: Rosgen Modified Shields Curve

	Channel	Left Side	Right Side
Slope	0	0	0
Shear Stress (lb/sq ft)			
Movable Particle (mm)			

Site 13 - Cross Section #1



xs2 report
RIVERMORPH CROSS SECTION SUMMARY

River Name: Sandburg Creek
Reach Name: Site #13
Cross Section Name: Site 13 XS #2
Survey Date: 03/08/2016

Cross Section Data Entry

BM Elevation: 100 ft
Backsight Rod Reading: 100 ft

TAPE	FS	ELEV	NOTE
0	4.14	195.86	TOLP
0	4.49	195.51	BOLP
3.1	5.16	194.84	Flood Channel
9	6.56	193.44	Flood Channel
12	5.99	194.01	Flood Channel
17	6	194	Flood Channel
18.8	6.24	193.76	Flood Channel
20.9	6.66	193.34	Flood Channel
22.4	6.77	193.23	Flood Channel
31	6.08	193.92	Flood Channel
37	6.1	193.9	Flood Channel
41	6.5	193.5	Flood Channel
52.5	5.2	194.8	Flood Channel
59	4.86	195.14	End of Flood Channel
65.7	4.39	195.61	
67.9	5.34	194.66	TOLB
68.9	7.34	192.66	
71.4	9.01	190.99	
73.2	9.6	190.4	LEW
77	10.31	189.69	
83	10.57	189.43	
90.7	10.53	189.47	
101	10.43	189.57	
107.2	10.12	189.88	
115.7	9.71	190.29	
121.9	9.58	190.42	
124.8	9.41	190.59	
125.5	9.18	190.82	
129.8	7.87	192.13	BKF
137.4	7.32	192.68	
142.6	6.9	193.1	
146.5	7.49	192.51	
158	6.35	193.65	
167	6.51	193.49	
177.8	5.69	194.31	Toe of Right Bank
184.2	5.97	194.03	
190.1	5.61	194.39	
194	5.51	194.49	End at Large Red Maple

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	194.83	194.83	194.83

xs2 report

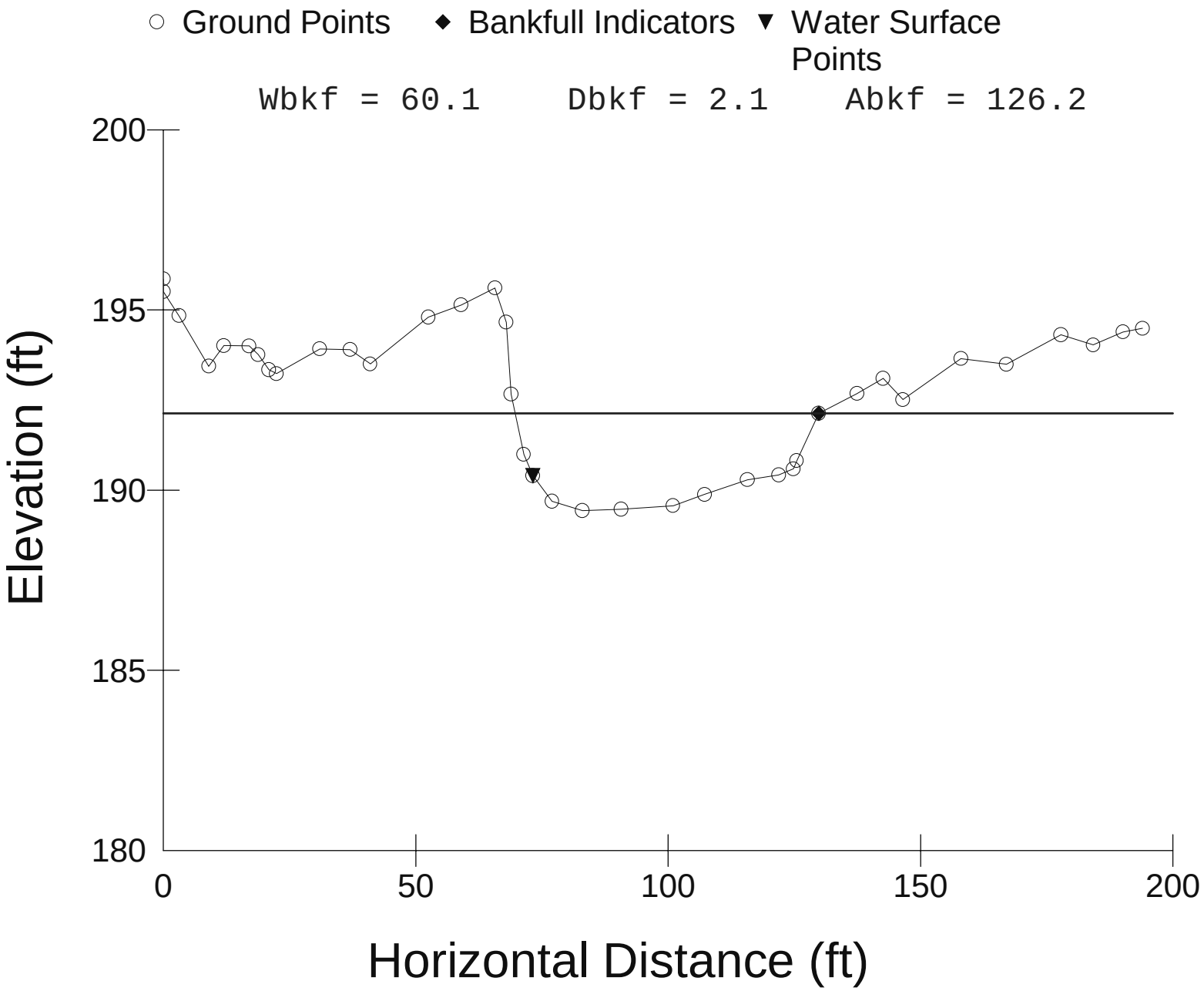
Bankfull Elevation (ft)	192.13	192.13	192.13
Floodprone Width (ft)	176.43	-----	-----
Bankfull Width (ft)	60.11	41.5	18.61
Entrenchment Ratio	2.94	-----	-----
Mean Depth (ft)	2.1	2.36	1.52
Maximum Depth (ft)	2.7	2.7	2.06
Width/Depth Ratio	28.62	17.59	12.24
Bankfull Area (sq ft)	126.24	97.92	28.32
Wetted Perimeter (ft)	60.87	44.08	20.91
Hydraulic Radius (ft)	2.07	2.22	1.35
Begin BKF Station	69.69	69.69	111.19
End BKF Station	129.8	111.19	129.8

Entrainment Calculations

Entrainment Formula: Rosgen Modified Shields Curve

	Channel	Left Side	Right Side
Slope	0	0	0
Shear Stress (lb/sq ft)			
Movable Particle (mm)			

Site 13 - Cross Section #2



xs3 report
RIVERMORPH CROSS SECTION SUMMARY

River Name: Sandburg Creek
Reach Name: Site #13
Cross Section Name: Site 13 XS #3
Survey Date: 03/08/2016

Cross Section Data Entry

BM Elevation: 100 ft
Backsight Rod Reading: 100 ft

TAPE	FS	ELEV	NOTE
0	3.81	196.19	TOLP
0	4.48	195.52	BOLP
8.1	5.69	194.31	
13.2	7.46	192.54	
16.5	8.68	191.32	
19	9.65	190.35	BKF
22	10.87	189.13	LEW
29.4	11.16	188.84	
45.7	11.25	188.75	
58.1	12.01	187.99	
63.8	12.5	187.5	
68	12.74	187.26	
72.1	12.66	187.34	
75.9	11.79	188.21	
78.14	10.87	189.13	REW
79.7	10.03	189.97	
82.8	6.56	193.44	
84.2	6.04	193.96	Base of Sycamore
89.2	5.71	194.29	
94.2	5.02	194.98	
99.2	5.57	194.43	

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	193.44	193.44	193.44
Bankfull Elevation (ft)	190.35	190.35	190.35
Floodprone Width (ft)	72.19	-----	-----
Bankfull Width (ft)	61.04	29.7	31.34
Entrenchment Ratio	1.18	-----	-----
Mean Depth (ft)	1.91	1.43	2.37
Maximum Depth (ft)	3.09	1.78	3.09
Width/Depth Ratio	31.96	20.83	13.22
Bankfull Area (sq ft)	116.52	42.35	74.16
Wetted Perimeter (ft)	62	31.73	33.83
Hydraulic Radius (ft)	1.88	1.33	2.19
Begin BKF Station	19	19	48.7
End BKF Station	80.04	48.7	80.04

Entrainment Calculations

---

xs3 report

Entrainment Formula: Rosgen Modified Shields Curve

	Channel	Left Side	Right Side
Slope	0	0	0
Shear Stress (lb/sq ft)			
Movable Particle (mm)			

Site 13 - Cross Section #3

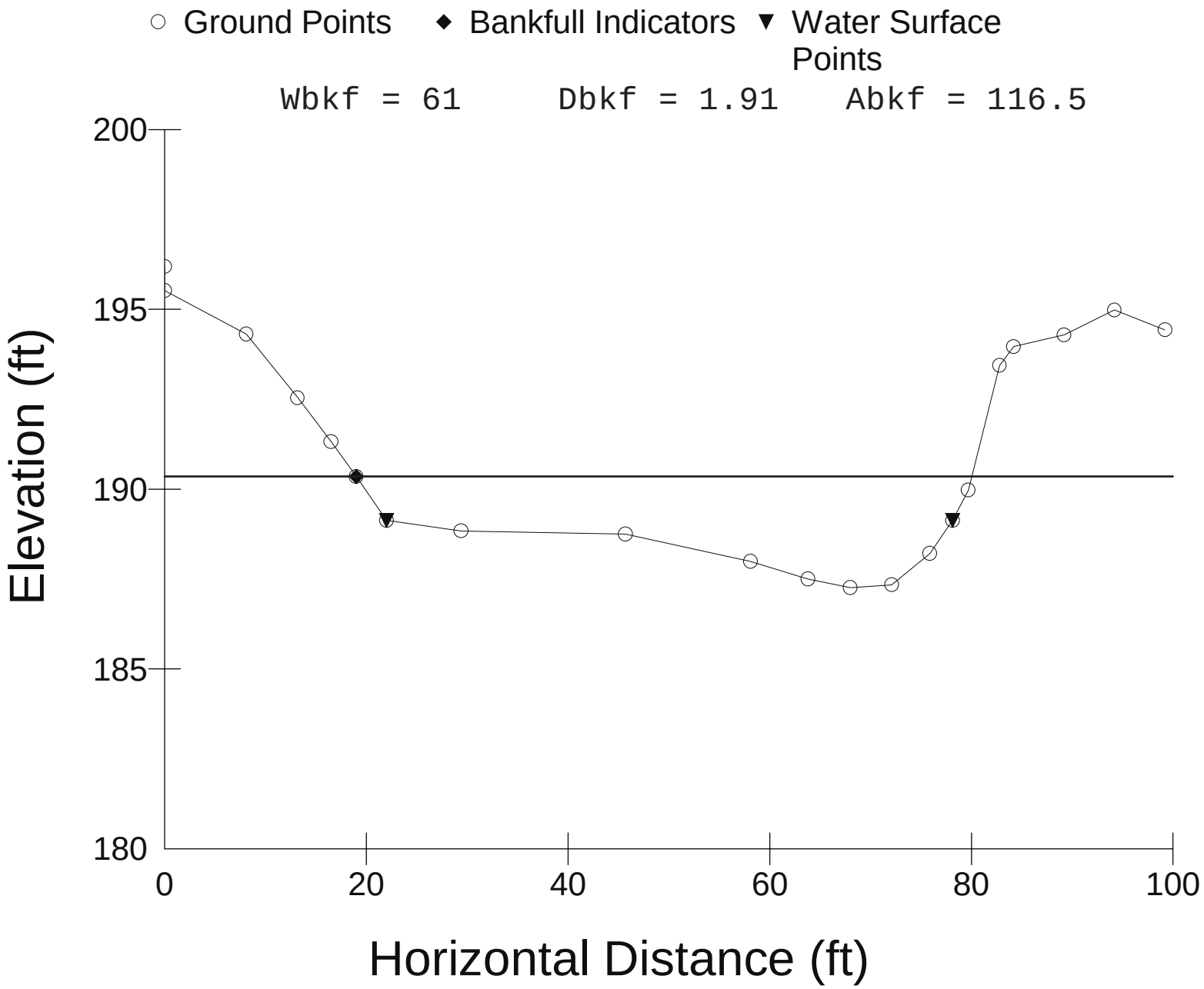


EXHIBIT K-2

SITE 13 LONGITUDINAL PROFILE

RIVERMORPH PROFILE SUMMARY

River Name: Sandburg Creek
Reach Name: Site #13
Profile Name: Site #13
Survey Date: 03/08/2016

Survey Data

DIST	CH	WS	BKF	P1	P2	P3	P4
0	7.6	5.53					
39	8.42	6.2					
80	8.38	6.26					
123	7.87	6.62	4.92				
159	9.2	7.96	4.56				
216	12.75	8.08	4.58				
235	12.68	8.02					
261	9.33	8.21	6				
289	9.61	8.55	6.95				
308	10.9	8.6	7.32				
320	12.21	8.61	7.36				
339	11.16	8.56	7.42				
349	10.95	8.64	6.73				
359	12.81	8.74	7.33				
390	11.58	9.12	7.34				
408	11.51	9.2					
450	13.21	9.37	8.23				
520	12.6	9.39	8.34				
572	9.06	6.11	4.6				
642	8.11	6.13	4.71				
763	7.56	6.37	5.66				

Cross Section / Bank Profile Locations

Name	Type	Profile Station
Site13 XS #1	Riffle XS	0
Site 13 XS #2	Riffle XS	0
Site 13 XS #3	Riffle XS	0

Measurements from Graph

Bankfull Slope: 0

Variable	Min	Avg	Max
S riffle	0	0	0
S pool	0	0	0
S run	0	0	0
S glide	0	0	0
S step	0	0	0
P - P	0	0	0
Pool length	0	0	0
Riffle length	0	0	0
Dmax riffle	0	0	0
Dmax pool	0	0	0
Dmax run	0	0	0
Dmax glide	0	0	0
Dmax step	0	0	0

Low bank ht 0 0 0
Length and depth measurements in feet, slopes in ft/ft.
♀

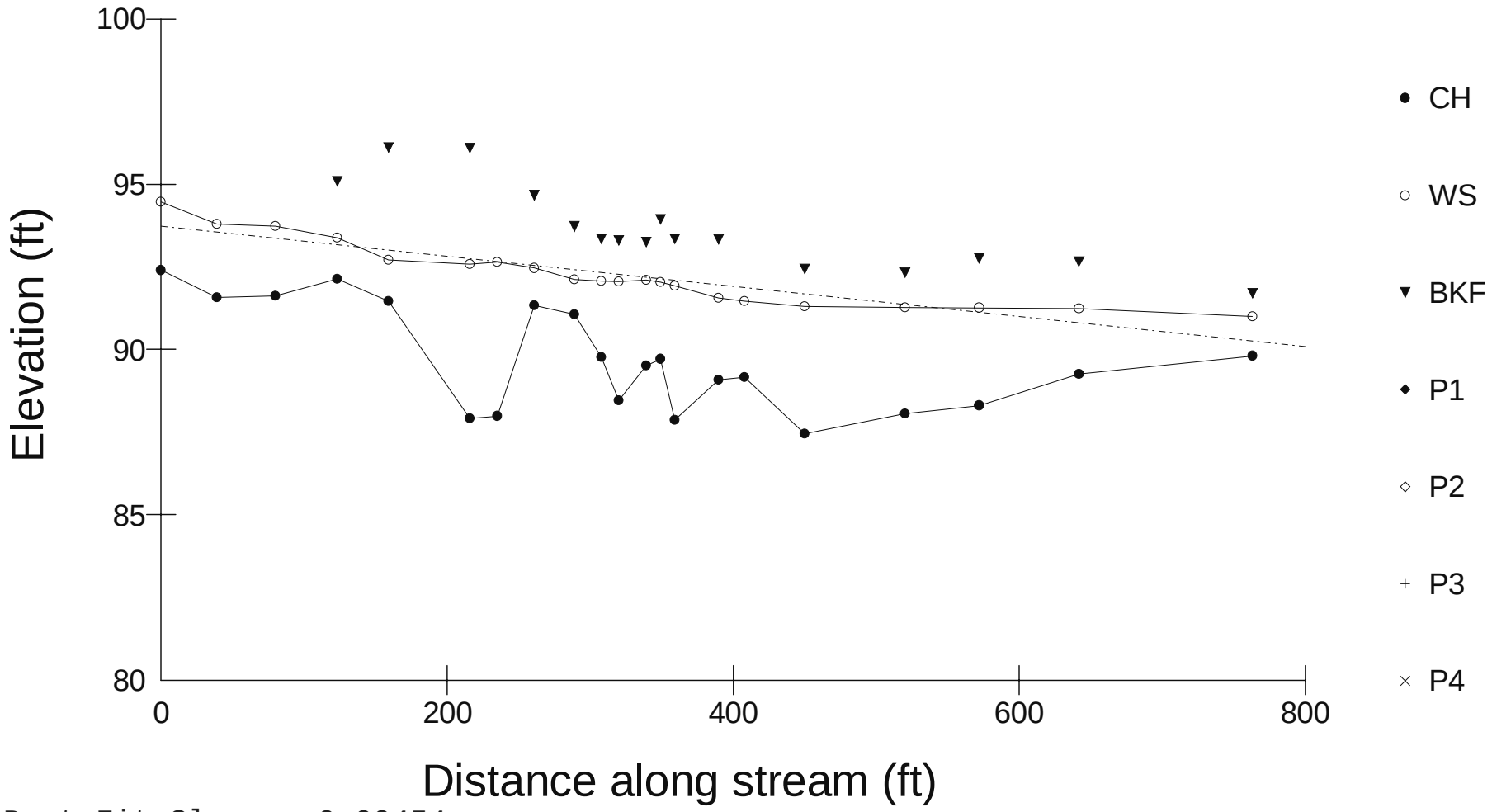
RIVERMORPH PROFILE SUMMARY

Notes

River Name: Sandburg Creek
Reach Name: Site #13
Profile Name: Site #13
Survey Date: 03/08/2016

DIST	Note
0	Head of Riffle
39	Run
80	Run Pool
123	Top Riffle
159	Run
216	Max Pool too deep to measure
235	Glide
261	Max Glide
289	Riffle
308	Run at Wellhouse
320	Pool
339	Compound Pool
349	Compound Pool
359	Compound Pool
390	Riffle Crest
408	Run
450	Pool
520	Pool
572	Pool
642	Glide
763	Max Glide Top of Riffle

Site #13 Longitudinal Profile



WS Best Fit Slope = 0.00454

EXHIBIT K-3

SITE 13 PEBBLE COUNT AND BAR SAMPLE RESULTS

PEB REP
RIVERMORPH PARTICLE SUMMARY

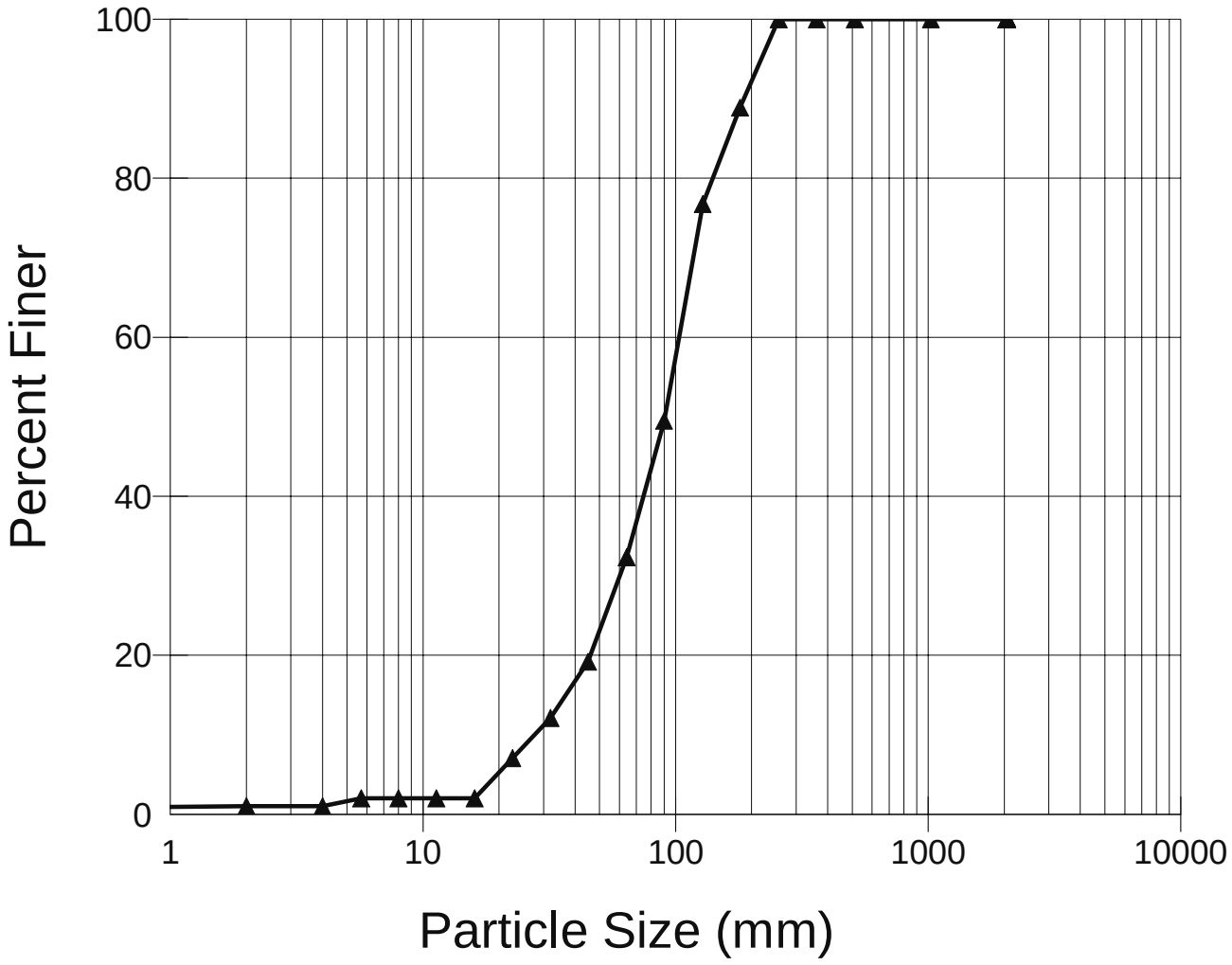
River Name: Sandburg Creek
Reach Name: Site #13
Sample Name: Riffle @ XS #2
Survey Date: 12/12/2018

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	0	0.00	0.00
0.062 - 0.125	0	0.00	0.00
0.125 - 0.25	0	0.00	0.00
0.25 - 0.50	0	0.00	0.00
0.50 - 1.0	0	0.00	0.00
1.0 - 2.0	1	1.01	1.01
2.0 - 4.0	0	0.00	1.01
4.0 - 5.7	1	1.01	2.02
5.7 - 8.0	0	0.00	2.02
8.0 - 11.3	0	0.00	2.02
11.3 - 16.0	0	0.00	2.02
16.0 - 22.6	5	5.05	7.07
22.6 - 32.0	5	5.05	12.12
32 - 45	7	7.07	19.19
45 - 64	13	13.13	32.32
64 - 90	17	17.17	49.49
90 - 128	27	27.27	76.77
128 - 180	12	12.12	88.89
180 - 256	11	11.11	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	39.13
D35 (mm)	68.06
D50 (mm)	90.71
D84 (mm)	159.02
D95 (mm)	221.8
D100 (mm)	256
Silt/Clay (%)	0
Sand (%)	1.01
Gravel (%)	31.31
Cobble (%)	67.68
Boulder (%)	0
Bedrock (%)	0

Total Particles = 99.

RIFFLE PEBBLE COUNT AT XS #2



BARPT
RIVERMORPH PARTICLE SUMMARY

River Name: Sandburg Creek
Reach Name: Site #13
Sample Name: Bar Sample #1
Survey Date: 12/12/2018

SIEVE (mm)	NET WT
63	2.31
31.5	10.03
16	6.72
8	7.39
4	6.83
2	5.51
PAN	4.74
D16 (mm)	2.97
D35 (mm)	7.51
D50 (mm)	14.62
D84 (mm)	55.93
D95 (mm)	72.37
D100 (mm)	80
Silt/Clay (%)	0
Sand (%)	10.22
Gravel (%)	79.37
Cobble (%)	10.41
Boulder (%)	0
Bedrock (%)	0

Total Weight = 46.3900.

Largest Surface Particles:

	Size(mm)	Weight
Particle 1:	80	2.2
Particle 2:	60	0.66

SITE 13 BAR SAMPLE RESULTS

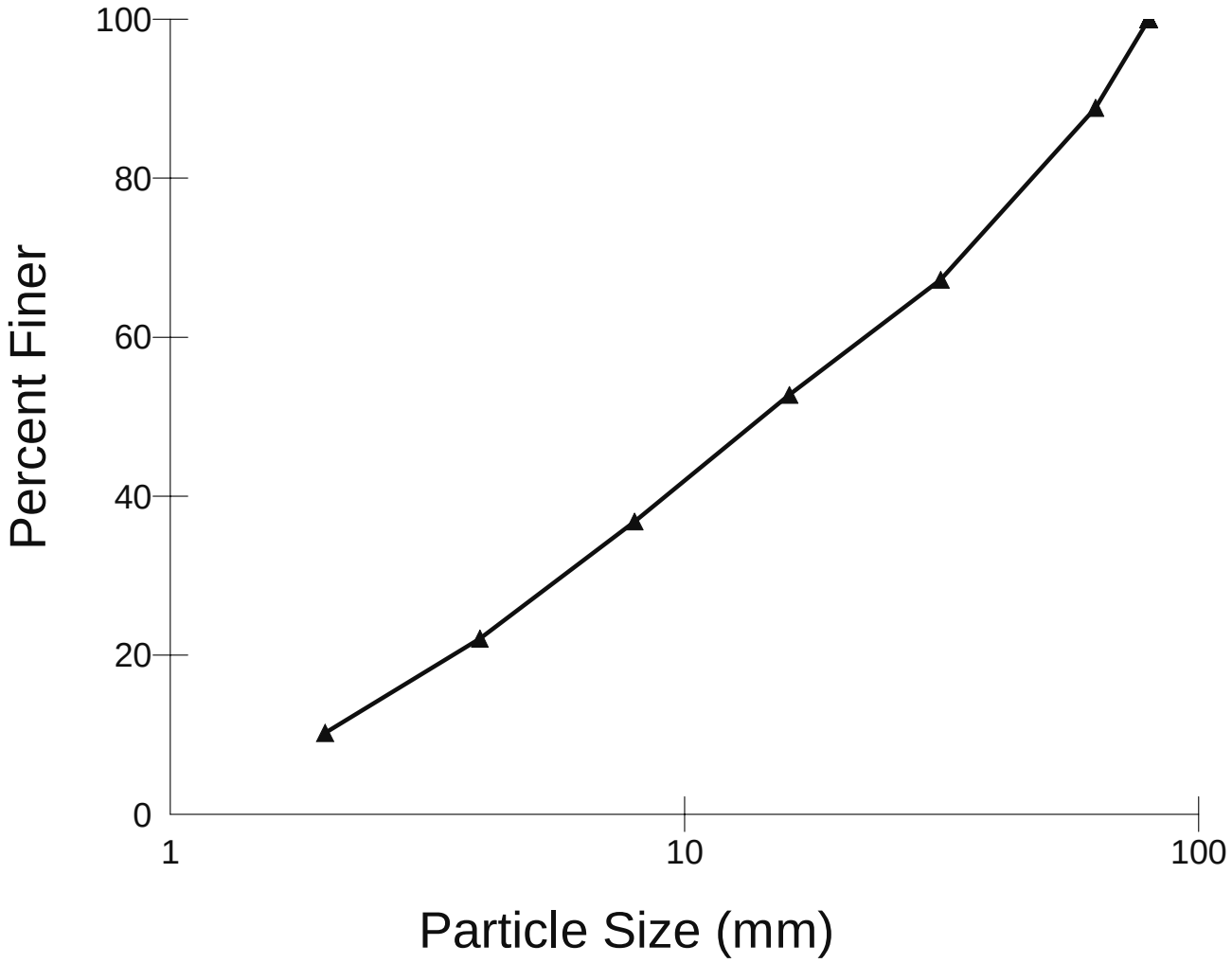


EXHIBIT K-4

SITE 13 STREAM CLASSIFICATION SUMMARY

Worksheet 2-3. Field form for Level II stream classification (Rosgen, 1996; Rosgen and Silvey, 2005).

Stream:	**Sandburg Creek, Reach - Site #13**			
Basin:	Drainage Area:	**31808** acres	**49.7**	mi^2
Location:				
Twp.&Rge: **;**	Sec.&Qtr.: **;**			
Cross-Section Monuments (Lat./Long.):	**0 Lat / 0 Long**		Date:	**12/21/18**
Observers:			Valley Type:	C-AL-IG

Bankfull WIDTH (W_{bkf}) WIDTH of the stream channel at bankfull stage elevation, in a riffle section.	**75.54**	ft
Bankfull DEPTH (d_{bkf}) Mean DEPTH of the stream channel cross-section, at bankfull stage elevation, in a riffle section ($d_{bkf} = A / W_{bkf}$).	**2.13**	ft
Bankfull X-Section AREA (A_{bkf}) AREA of the stream channel cross-section, at bankfull stage elevation, in a riffle section.	**160.88**	ft^2
Width/Depth Ratio (W_{bkf} / d_{bkf}) Bankfull WIDTH divided by bankfull mean DEPTH, in a riffle section.	**35.46**	ft/ft
Maximum DEPTH (d_{mbkf}) Maximum depth of the bankfull channel cross-section, or distance between the bankfull stage and Thalweg elevations, in a riffle section.	**4.43**	ft
WIDTH of Flood-Prone Area (W_{fpa}) Twice maximum DEPTH, or ($2 \times d_{mbkf}$) = the stage/elevation at which flood-prone area WIDTH is determined in a riffle section.	**93.8**	ft
Entrenchment Ratio (ER) The ratio of flood-prone area WIDTH divided by bankfull channel WIDTH (W_{fpa} / W_{bkf}) (riffle section).	**1.24**	ft/ft
Channel Materials (Particle Size Index) D_{50} The D_{50} particle size index represents the mean diameter of channel materials, as sampled from the channel surface, between the bankfull stage and Thalweg elevations.	**90.7**	mm
Water Surface SLOPE (S) Channel slope = "rise over run" for a reach approximately 20–30 bankfull channel widths in length, with the "riffle-to-riffle" water surface slope representing the gradient at bankfull stage.	**0.005**	ft/ft
Channel SINUOSITY (k) Sinuosity is an index of channel pattern, determined from a ratio of stream length divided by valley length (SL / VL); or estimated from a ratio of valley slope divided by channel slope (VS / S).	**1.1**	

Stream Type **F 3** (See **Figure 2-14**)

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EXHIBIT K-5

SITE 13 SEDIMENT COMPETENCE CALCULATIONS

Worksheet 3-14. Sediment competence calculation form to assess bed stability.

Stream:	**Sandburg Creek**		Stream Type:	**F 3**	
Location:	**Site #13**		Valley Type:	**C-AL-IG**	
Observers:			Date:	**12/21/2018**	

Enter Required Information for Existing Condition

91.0	D_{50}	Median particle size of riffle bed material (mm)			
15.0	$D_{50}^{\wedge}$	Median particle size of bar or sub-pavement sample (mm)			
0.263	D_{max}	Largest particle from bar sample (ft)	**80**	**(mm)**	304.8 mm/ft
0.00500	S	Existing bankfull water surface slope (ft/ft)			
1.91	d	Existing bankfull mean depth (ft)			
1.65	$\gamma_s - \gamma/\gamma$	Immersed specific gravity of sediment			

Select the Appropriate Equation and Calculate Critical Dimensionless Shear Stress

6.07	$D_{50}/D_{50}^{\wedge}$	Range: 3 – 7	Use EQUATION 1: $\tau^* = 0.0834 (D_{50}/D_{50}^{\wedge})^{-0.872}$	
0.88	D_{max}/D_{50}	Range: 1.3 – 3.0	Use EQUATION 2: $\tau^* = 0.0384 (D_{max}/D_{50})^{-0.887}$	
0.017	τ^*	Bankfull Dimensionless Shear Stress	EQUATION USED:	**1**

Calculate Bankfull Mean Depth Required for Entrainment of Largest Particle in Bar Sample

1.50	**d**	Required bankfull mean depth (ft) $d = \frac{\tau^*(\gamma_s - 1)D_{max}}{S}$	(use D_{max} in ft)

Calculate Bankfull Water Surface Slope Required for Entrainment of Largest Particle in Bar Sample

0.00393	**S**	Required bankfull water surface slope (ft/ft) $S = \frac{\tau^*(\gamma_s - 1)D_{max}}{d}$	(use D_{max} in ft)

Check: ☑ Stable ☐ Aggrading ☐ Degrading

Sediment Competence Using Dimensional Shear Stress

0.596		Bankfull shear stress $\tau = \gamma dS$ (lbs/ft^2) (substitute hydraulic radius, R, with mean depth, d) γ = 62.4, d = existing depth, S = existing slope
Shields **45.46**	CO **103.9**	Predicted largest moveable particle size (mm) at bankfull shear stress τ **(Figure 3-11)**
Shields **1.025**	CO **0.418**	Predicted shear stress required to initiate movement of measured D_{max} (mm) **(Figure 3-11)**
Shields **3.29**	CO **1.34**	Predicted mean depth required to initiate movement of measured D_{max} (mm) $d = \frac{\tau}{\gamma S}$ τ = predicted shear stress, γ = 62.4, S = existing slope
Shields **0.0086**	CO **0.0035**	Predicted slope required to initiate movement of measured D_{max} (mm) $S = \frac{\tau}{\gamma d}$ τ = predicted shear stress, γ = 62.4, d = existing depth

Check: ☑ Stable ☐ Aggrading ☐ Degrading

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EXHIBIT K-6

SITE 13 BANKFULL DISCHARGE CALCULATION SUMMARY

Worksheet 2-2. Computations of velocity and bankfull discharge using various methods (Rosgen, 2006b; Rosgen and Silvey, 2007).

Bankfull VELOCITY & DISCHARGE Estimates

Stream:	**Sandburg Creek**	Location:	**Reach - Site #13**
Date:		Stream Type: **F3**	Valley Type: **C-AL-IG**
Observers:	**ANE/RML**	HUC:	

INPUT VARIABLES			OUTPUT VARIABLES		
Bankfull Riffle Cross-Sectional AREA	**177.36**	**A_{bkf}** (ft^2)	Bankfull Riffle Mean DEPTH	**2.75**	**d_{bkf}** (ft)
Bankfull Riffle WIDTH	**64.41**	**W_{bkf}** (ft)	Wetted PERMIMETER ~ (2 * d_{bkf}) + W_{bkf}	**65.98**	**W_p** (ft)
D_{84} at Riffle	**159.02**	**Dia.** (mm)	D_{84} (mm) / 304.8	**0.52**	**D_{84}** (ft)
Bankfull SLOPE	**0.0050**	**S_{bkf}** (ft / ft)	Hydraulic RADIUS A_{bkf} / W_p	**2.69**	**R** (ft)
Gravitational Acceleration	**32.2**	g (ft / sec^2)	Relative Roughness R(ft) / D_{84} (ft)	**5.15**	**R / D_{84}**
Drainage Area	**49.7**	**DA** (mi^2)	Shear Velocity $u^* = (gRS)^{½}$	**0.658**	**u*** (ft/sec)

ESTIMATION METHODS	Bankfull VELOCITY		Bankfull DISCHARGE	
1. Friction Factor / Relative Roughness $u = [\ 2.83 + 5.66 * Log\ \{ R / D_{84} \}\ ]\ u^*$	**4.51**	ft / sec	**800.39**	cfs
2. Roughness Coefficient: a) Manning's *n* from Friction Factor / Relative Roughness (Figs. 2-18, 2-19) $u = 1.49*R^{2/3}*S^{1/2} / n$ $n =$ **0**	**0.00**	ft / sec	**0.00**	cfs
2. Roughness Coefficient: b) Manning's *n* from Stream Type (Fig. 2-20) $u = 1.49*R^{2/3}*S^{1/2} / n$ $n =$ **0.056**	**3.63**	ft / sec	**643.64**	cfs
2. Roughness Coefficient: c) Manning's *n* from Jarrett (USGS): $u = 1.49*R^{2/3}*S^{1/2} / n$ $n = 0.39*S^{0.38}*R^{-0.16}$ **Note:** This equation is applicable to **steep, step/pool, high boundary roughness, cobble- and boulder-dominated stream systems**; i.e., for Stream Types A1, A2, A3, B1, B2, B3, C2 & E3 $n =$ **0.045**	**4.57**	ft / sec	**810.00**	cfs
3. Other Methods (Hey, Darcy-Weisbach, Chezy C, etc.) **Manning's Limerinos n=0.0421**	**4.83**	ft / sec	**856.12**	cfs
3. Other Methods (Hey, Darcy-Weisbach, Chezy C, etc.) **Darcy-Weisbach (Leopold, Wolman and Miller)**	**4.64**	ft / sec	**823.05**	cfs
4. Continuity Equations: a) Regional Curves $u = Q / A$ **Return Period for Bankfull Discharge** $Q =$ **0.0** **year**	**0.00**	ft / sec	**0.00**	cfs
4. Continuity Equations: b) USGS Gage Data $u = Q / A$	**0.00**	ft / sec	**0.00**	cfs

Protrusion Height Options for the D_{84} Term in the Relative Roughness Relation (R/D_{84}) – Estimation Method 1

Option 1.	For **sand-bed** channels: Measure 100 **"protrusion heights"** of sand dunes from the downstream side of feature to the top of feature. Substitute the D_{84} sand dune protrusion height in ft for the D_{84} term in method 1.
Option 2.	For **boulder-dominated** channels: Measure 100 **"protrusion heights"** of boulders on the sides from the bed elevation to the top of the rock on that side. Substitute the D_{84} boulder protrusion height in ft for the D_{84} term in method 1.
Option 3.	For **bedrock-dominated** channels: Measure 100 **"protrusion heights"** of rock separations, steps, joints or uplifted surfaces above channel bed elevation. Substitute the D_{84} bedrock protrusion height in ft for the D_{84} term in method 1.
Option 4.	For **log-influenced** channels: Measure "**protrustion heights**" proportionate to channel width of log diameters or the height of the log on upstream side if embedded. Substitute the D_{84} protrusion height in ft for the D_{84} term in method 1.

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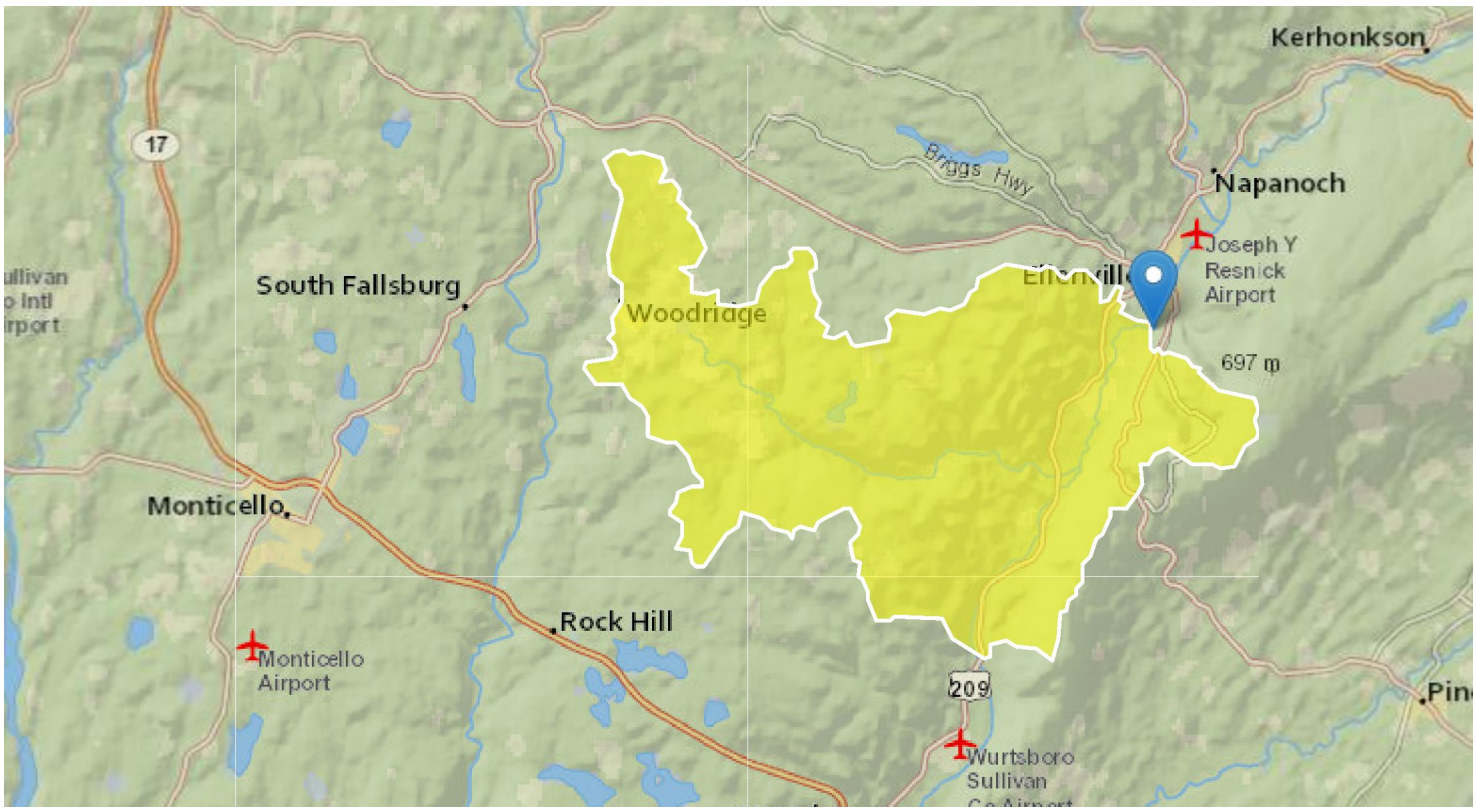
EXHIBIT K-7

SITE 13 STREAMSTATS OUTPUT SUMMARY

StreamStats Report

Region ID: NY
Workspace ID: NY20181227143001447000
Clicked Point (Latitude, Longitude): 41.70342, -74.39263
Time: 2018-12-27 09:30:15 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	49.7	square miles
LAGFACTOR	Lag Factor as defined in SIR 2006-5112	0.33	dimensionless
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	2.06	percent
MAR	Mean annual runoff for the period of record in inches	24.6	inches
BSLOPCM	Mean basin slope determined by summing lengths of all contours in basin mulitplying by contour interval and dividing product by drainage area	758	feet per mi
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	543559	feet

Parameter Code	Parameter Description	Value	Unit
CENTROIDY	Basin centroid vertical (y) location in state plane units	4614376.3	feet
CONTOUR	Total length of all elevation contours in drainage area in miles	376.68	miles
CSL1085LO	10-85 slope of lower half of main channel in feet per mile.	56.9	feet per mi
CSL1085UP	10-85 slope of upper half of main channel in feet per mile.	53.1	feet per mi
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	60.9	feet per mi
EL1200	Percentage of basin at or above 1200 ft elevation	45.2	percent
FOREST	Percentage of area covered by forest	91.5	percent
JULAVPRE	Mean July Precipitation	4.23	inches
JUNAVPRE	Mean June Precipitation	4.6	inches
JUNMAXTMP	Maximum June Temperature, in degrees F	76.3	degrees F
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	6.58	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.66	percent
LENGTH	Length along the main channel from the measuring location extended to the basin divide	18.4	miles
MAYAVPRE	Mean May Precipitation	4.82	inches
MXSNO	50th percentile of seasonal maximum snow depth from Northeast Regional Climate Center atlas by Cember and Wilks, 1993	15.5	inches
OUTLETX	Basin outlet horizontal (x) location in state plane coordinates	550535	feet
OUTLETY	Basin outlet vertical (y) location in state plane coordinates	4617025	feet
PRECIP	Mean Annual Precipitation	44.7	inches
PRJUNAUG00	Basin average mean precip for June to August from PRISM 1971-2000	13	inches
SLOPERATIO	Ratio of main channel slope to basin slope as defined in SIR 2006-5112	0.0804	dimensionless
SSURGOA	Percentage of area of Hydrologic Soil Type A from SSURGO	8.43	percent

Parameter Code	Parameter Description	Value	Unit
SSURGOB	Percentage of area of Hydrologic Soil Type B from SSURGO	4.74	percent

Bankfull Statistics Parameters [Bankfull Region 4 SIR2009 5144]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	49.7	square miles	3.72	237

Bankfull Statistics Flow Report [Bankfull Region 4 SIR2009 5144]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	PIl	PIu
Bankfull Area	372	ft^2	120	1160
Bankfull Depth	3.65	ft	1.31	10.1
Bankfull Streamflow	2470	ft^3/s	418	14500
Bankfull Width	103	ft	35.7	298

Bankfull Statistics Citations

Mulvihill, C.I., Baldigo, B.P., Miller, S.J. , and DeKoskie, Douglas,2009, Bankfull Discharge and Channel Characteristics of Streams in New York State: U.S. Geological Survey Scientific Investigations Report 2009-5144, 51 p. (http://pubs.usgs.gov/sir/2009/5144/)

Peak-Flow Statistics Parameters [100 Percent (49.8 square miles) 2006 Full Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	49.7	square miles	1.93	996
LAGFACTOR	Lag Factor	0.33	dimensionless	0.014	6.997
STORAGE	Percent Storage	2.06	percent	0	11.88
MAR	Mean Annual Runoff in inches	24.6	inches	16.03	33.95

Peak-Flow Statistics Flow Report [100 Percent (49.8 square miles) 2006 Full Region 2]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp	Equiv. Yrs.
1.25 Year Peak Flood	1230	ft^3/s	25.5	25.5	4.8
1.5 Year Peak Flood	1510	ft^3/s	25.6	25.6	4.3
2 Year Peak Flood	1930	ft^3/s	25.8	25.8	4.4
5 Year Peak Flood	3190	ft^3/s	27	27	7.3
10 Year Peak Flood	4270	ft^3/s	28.2	28.2	10.1
25 Year Peak Flood	5870	ft^3/s	29.9	29.9	13.6
50 Year Peak Flood	7250	ft^3/s	31.5	31.5	15.8
100 Year Peak Flood	8800	ft^3/s	33.3	33.3	17.6
200 Year Peak Flood	10500	ft^3/s	35.3	35.3	18.9
500 Year Peak Flood	13200	ft^3/s	38.4	38.4	20.1

Peak-Flow Statistics Citations

Lumia, Richard, Freehafer, D.A., and Smith, M.J.,2006, Magnitude and Frequency of Floods in New York: U.S. Geological Survey Scientific Investigations Report 2006–5112, 152 p. (http://pubs.usgs.gov/sir/2006/5112/)

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Application Version: 4.3.0

ATTACHMENT 3

November 14, 2019

John Petronella
Regional Permit Administrator
NYSDEC Region 3
21 South Putt Corners Road
New Paltz, New York 12561-1620

Re: Ellenville-Wawarsing Stream Bank Stabilization
Village of Ellenville and Town of Wawarsing, Ulster County

Subj: Joint Application for Permit

File: 924.068.002

Dear Mr. Petronella:

Barton & Loguidice, D.P.C. (B&L) has been retained by the Village of Ellenville and Town of Wawarsing in Ulster County for design and permitting assistance in regards to the Governor's Office of Storm Recovery (GOSR) funded Ellenville-Wawarsing Stream Bank Stabilization Project. The intent of the project is to address stream bank failure and floodplain improvements at various sites identified within the respective Village and Town in critical areas after substantial damage due to Super-storm Sandy, Hurricane Irene, and Tropical Storm Lee.

The work will require disturbances to stream resources preliminarily determined to be Waters of the U.S. (WOUS). This permit application will cover the Site identified as Site #1 along the West Branch Beer Kill. This disturbances will require a Nationwide Permit #13 for Bank Stabilization under Section 404 of the Clean Water Act from the United States Army Corps of Engineers (USACE), and 401 Water Quality Certification and an Article 15, Stream Disturbance permit, from the New York State Department of Environmental Conservation (NYSDEC). The Village of Ellenville is the Applicant/Sponsor for this project.

We are transmitting one copy of the Joint Application for Permit for your review comprised of the following Exhibits:

Exhibit 1: Joint Application Form
Exhibit 2: Project Description
Exhibit 3: Project Location Maps
Exhibit 4: Engineering Drawings
Exhibit 5: Threatened and Endangered Species Documentation
Exhibit 6: Historic and Cultural Resources Documentation

Please note that the GOSR is currently assembling an Environmental Compliance Package that will include all support documentation for State Environmental Quality Review (SEQR), threatened and

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endangered species coordination with state and federal agencies, and historic/cultural resources review. This package will be forwarded when complete. It is anticipated that the projects will comply with all federal and state regulations in regards to these resources.

One copy of this permit application has also been sent to the USACE New York Office for concurrent review.

Thank you for your review of this application. Please do not hesitate to contact Rebecca Minas, Project Manager, or Corinne Steinmuller, Environmental Scientist, should you have any further questions at 518-218-1801 or rminas@bartonandloguidice.com and csteinmuller@bartonandloguidice.com, respectively.

Sincerely,

BARTON & LOGUIDICE, D.P.C.

Corinne I. Steinmuller
Environmental Scientist II

CIS/akg
Enclosures

Barton & Loguidice

November 14, 2019

Brian Orzel
U.S. Army Corps of Engineers
New York District
26 Federal Plaza, Room 1937
New York, New York 10278-0090

Re: Ellenville-Wawarsing Stream Bank Stabilization
Village of Ellenville and Town of Wawarsing, Ulster County

Subj: Joint Application for Permit

File: 924.068.002

Dear Mr. Orzel:

Barton & Loguidice, D.P.C. (B&L) has been retained by the Village of Ellenville and Town of Wawarsing in Ulster County for design and permitting assistance in regards to the Governor's Office of Storm Recovery (GOSR) funded Ellenville-Wawarsing Stream Bank Stabilization Project. The intent of the project is to address stream bank failure and construct floodplain improvements at various sites identified within the respective Village and Town in critical areas after substantial damage due to Super-storm Sandy, Hurricane Irene, and Tropical Storm Lee.

The work will require disturbance to stream resources preliminarily determined to be Waters of the U.S. (WOUS). This permit application will cover the Site identified as #1 along the West Branch Beer Kill. These disturbances will require a Nationwide Permit #13 for Bank Stabilization under Section 404 of the Clean Water Act from the United States Army Corps of Engineers (USACE), and 401 Water Quality Certification and an Article 15 Stream Disturbance permit from the New York State Department of Environmental Conservation (NYSDEC). In addition, a preliminary jurisdictional determination is requested from the USACE. The Village of Ellenville is the Applicant/Sponsor for this project.

We are transmitting one copy of the Joint Application for Permit for your review comprised of the following Exhibits:

Exhibit 1: Joint Application Form
Exhibit 2: Project Description
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10 Airline Drive, Suite 200, Albany, NY 12205 ▪ Office: 518-218-1801 ▪ Fax: 518-218-1805 ▪ BartonandLoguidice.com

The experience to listen
The power to solve

Please note that the GOSR is currently assembling an Environmental Compliance Package that will include all support documentation for State Environmental Quality Review (SEQR), threatened and endangered species coordination with state and federal agencies, and historic/cultural resources review. This package will be forwarded when complete. It is anticipated that the projects will comply with all federal and state regulations in regards to these resources.

Two copies of this permit application have also been sent to the Region 3 Permits Administrator with the NYSDEC for concurrent review.

Thank you for your review of this application. Please do not hesitate to contact Rebecca Minas, Project Manager, or Corinne Steinmuller, Environmental Scientist, should you have any further questions at 518-218-1801 or rminas@bartonandloguidice.com and csteinmuller@bartonandloguidice.com, respectively.

Sincerely,

BARTON & LOGUIDICE, D.P.C.

Corinne I. Steinmuller
Environmental Scientist II

CIS/akg
Enclosures

NY Rising Streambank Stabilization Project

Site #1

West Beer Kill

Town of Wawarsing, Ulster County, New York

Joint Application for Permit

November 2019

Barton&Loguidice

NY Rising Streambank Stabilization Project

Town of Wawarsing
Ulster County, New York

Joint Application for Permit – November 2019

Exhibit 1—Joint Application Form

Exhibit 2—Project Description

Exhibit 3—Project Location Maps

Exhibit 4—Design Plans

Exhibit 5 – Threatened and Endangered Species Documentation

Exhibit 6 – Historic and Cultural Resources Documentation

Barton & Loguidice

Exhibit 1

Joint Application for Permit Form

NEW YORK STATE | Department of Environmental Conservation | Office of General Services | Department of State

US Army Corps of Engineers

JOINT APPLICATION FORM

For Permits for activities activities affecting streams, waterways, waterbodies, wetlands, coastal areas, sources of water, and endangered and threatened species.

You must separately apply for and obtain Permits from each involved agency before starting work. Please read all instructions.

1. **Applications To:**

>NYS Department of Environmental Conservation ☑ Check here to confirm you sent this form to NYSDEC.

Check all permits that apply:

- ☑ Stream Disturbance
- ☐ Excavation and Fill in Navigable Waters
- ☐ Docks, Moorings or Platforms
- ☐ Dams and Impoundment Structures
- ☑ 401 Water Quality Certification
- ☐ Freshwater Wetlands
- ☐ Tidal Wetlands
- ☐ Wild, Scenic and Recreational Rivers
- ☐ Coastal Erosion Management
- ☐ Water Withdrawal
- ☐ Long Island Well
- ☐ Incidental Take of Endangered / Threatened Species

>US Army Corps of Engineers ☑ Check here to confirm you sent this form to USACE.

Check all permits that apply: ☑ Section 404 Clean Water Act ☐ Section 10 Rivers and Harbors Act

Is the project Federally funded? ☐ Yes ☐ No

If yes, name of Federal Agency:

General Permit Type(s), if known: #13, #27

Preconstruction Notification: ☐ Yes ☐ No

>NYS Office of General Services ☐ Check here to confirm you sent this form to NYSOGS.

Check all permits that apply:

- ☐ State Owned Lands Under Water
- ☐ Utility Easement (pipelines, conduits, cables, etc.)
- ☐ Docks, Moorings or Platforms

>NYS Department of State ☐ Check here to confirm you sent this form to NYSDOS.

Check if this applies: ☐ Coastal Consistency Concurrence

2. **Name of Applicant**

Town of Wawarsing c/o Terry Houck

Taxpayer ID (if applicant is NOT an individual)

Mailing Address	Post Office / City	State	Zip
PO Box 671	Ellenville	NY	12428

Telephone Email

Applicant Must be (check all that apply): ☐ Owner ☑ Operator ☐ Lessee

3. **Name of Property Owner (if different than Applicant)**

Mailing Address	Post Office / City	State	Zip

Telephone Email

For Agency Use Only	Agency Application Number:

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

4. **Name of Contact / Agent**

Corinne Steinmuller/ Barton and Loguidice, D.P.C.

Mailing Address	Post Office / City	State	Zip
10 Airline Drive	Albany	NY	12205

Telephone: 518-218-1801 x 2033 Email: csteinmuller@bartonandloguidice.com

5. **Project / Facility Name**

NY Rising Streambank Stabilization Project

Property Tax Map Section / Block / Lot Number:

Project Street Address, if applicable	Post Office / City	State	Zip
	Ellenville/Wawarsing	NY	Multiple

Provide directions and distances to roads, intersections, bridges and bodies of water

The project will cover 13 different sites within the Village and Town. See Exhibit 3 for attached location maps.

☐ Town ☐ Village ☐ City

Wawarsing	County: Ulster	Stream/Waterbody Name: Multiple

Project Location Coordinates: Enter Latitude and Longitude in degrees, minutes, seconds:

Latitude: 41 43 ' 5.05 " Longitude: 74 23 ' 52.28 "

6. **Project Description:** Provide the following information about your project. Continue each response and provide any additional information on other pages. **Attach plans on separate pages.**

a. Purpose of the proposed project:

The Village of Ellenville and Town of Wawarsing have been awarded a New York Rising grant to address flood resiliency post Hurrican Irene and Tropical Storm Lee. Degredation and erosion of stream banks have effected water quality through sediment deposition and remain a threat to infrastructure for future flood events.

b. Description of current site conditions:

Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing. This application is for the identified Site #1 on the West Branch Beer Kill.

c. Proposed site changes:

The goal is to restore severely eroded/damaged sites to be capable of withstanding large flood events. See Exhibit 2 for further details.

d. Type of structures and fill materials to be installed, and quantity of materials to be used (e.g., square feet of coverage, cubic yards of fill material, structures below ordinary/mean high water, etc.):

Rock cross vanes and grade control structures will be utilized. An existing rock retaining wall will be reconstructed to address deficiencies. See Exhibit 2 for details and quantities.

e. Area of excavation or dredging, volume of material to be removed, location of dredged material placement:

Excavation will be required for the creation of a new floodplain as well as installation of cross vanes and grade control structures. The stream will be restored to a single thread. See Exhibit 2 for details and quantities.

f. Is tree cutting or clearing proposed? ☐ Yes If Yes, explain below. ☐ No

Timing of the proposed cutting or clearing (month/year): TBD - will conduct emergence surveys

Number of trees to be cut: Acreage of trees to be cleared: <3 acres total

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

g. Work methods and type of equipment to be used:

Various equiment will be utilized depending on the action. At minimum, heavy equipment such as excavators and bulldozers are expected.

h. Describe the planned sequence of activities:

i. Pollution control methods and other actions proposed to mitigate environmental impacts:

For the duration of the project pollution control measures will be utilized by the contractor to minimize the potential pollution releases.

j. Erosion and silt control methods that will be used to prevent water quality impacts:

For the duration of the project stormwater site controls will be in place to minimize water quality impacts. At each site requiring in-stream entry, temporary cofferdams will be utilized to work in the dry, a turbidity curtain will be installed, and fiber rolls will be placed.

k. Alternatives considered to avoid regulated areas. If no feasible alternatives exist, explain how the project will minimize impacts:

No alternatives exist. Overall, this project will be beneficial to the resource. All appropriate erosion and sediment controls will be utilized during construction and post construction a more stable channels should be established, reducing overall sediment load into the basin and enhancing overal ecological function.

l. Proposed use: ☐ Private ☑ Public ☐ Commercial

m. Proposed Start Date: Summer 2019 Estimated Completion Date: Fall 2019

n. Has work begun on project? ☐ Yes If Yes, explain below. ☐ No

o. Will project occupy Federal, State, or Municipal Land? ☐ Yes If Yes, explain below. ☐ No

Portions of the project will occur on municipally owned land in the Town of Wawarsing.

p. List any previous NYSDEC or USACE Permit / Application numbers for activities at this location:

q. Will this project require additional Federal, State, or Local permits, including zoning changes?

☐ Yes If Yes, list below. ☐ No

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

7. **Signatures.**

Applicant and Owner (If different) must sign the application.
Append additional pages of this Signature section if there are multiple Applicants, Owners or Contact/Agents.

I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief.

Permission to Inspect - I hereby consent to Agency inspection of the project site and adjacent property areas. Agency staff may enter the property without notice between 7:00 am and 7:00 pm, Monday - Friday. Inspection may occur without the owner, applicant or agent present. If the property is posted with "keep out" signs or fenced with an unlocked gate, Agency staff may still enter the property. Agency staff may take measurements, analyze site physical characteristics, take soil and vegetation samples, sketch and photograph the site. I understand that failure to give this consent may result in denial of the permit(s) sought by this application.

False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the NYS Penal Law. Further, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project. In addition, Federal Law, 18 U.S.C., Section 1001 provides for a fine of not more than $10,000 or imprisonment for not more than 5 years, or both where an applicant knowingly and willingly falsifies, conceals, or covers up a material fact; or knowingly makes or uses a false, fictitious or fraudulent statement.

Signature of Applicant | Date

Applicant Must be (check all that apply): ☐ Owner ☑ Operator ☐ Lessee

Printed Name: Terry Houck | Title: Town Supervisor

Signature of Owner (if different than Applicant) | Date

Printed Name | Title

Signature of Contact / Agent | Date

Printed Name: Corinne Steinmuller/ Barton and Loguidice, D.P.C. | Title: Environmental Scientist

For Agency Use Only **DETERMINATION OF NO PERMIT REQUIRED**

Agency Application Number

(Agency Name) has determined that No Permit is required from this Agency for the project described in this application.

Agency Representative:

Printed Name | Title

Signature | Date

Exhibit 2

Project and Site Details

Exhibit 2
Project Description

Project Introduction

Governor Andrew M. Cuomo established the New York Rising Community Reconstruction (NYRCR) program to provide additional rebuilding and revitalization assistance to communities damaged by Super-storm Sandy, Hurricane Irene, and Tropical Storm Lee. The Governor's Office of Storm Recovery (GOSR) is managing the NYRCR program in partnership with the NYS Department of State (DOS). Additional support has been provided through the Regional Economic Development Council's (REDC) State Agency Review Teams. Nine project sites are proposed on various waterbodies located within the Village of Ellenville and in the Town of Wawarsing, Ulster County, New York. This Joint Application for Permit is specific to Site #1, located on the West Branch Beer Kill in the Town of Wawarsing. See Exhibit 3, Project Location Maps, for further details.

Objectives

As a result of major storms in 2011 (Hurricane Irene and Tropical Storm Lee), the Village of Ellenville and Town of Wawarsing noted many of the stream resources surrounding the communities were significantly damaged. Bank failure and sedimentation were noted in numerous sites. As a result of post-storm analysis, 13 locations were initially selected to require the most urgent attention. This JAP is for proposed work at Site #1. Work at this site is being progressed to:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, schools emergency services, and the Ellenville Regional Hospital;
- Provide long-term protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

Wetland Assessment

The project site was assessed for potential presence of wetlands. Prior to a field visit, the National Wetlands Inventory (NWI) and New York State Department of Environmental Conservation's (NYSDEC) Environmental Resource Mapper (ERM) were reviewed. No wetlands were mapped at or within the vicinity of the site. A preliminary field visit was performed on December 12, 2018 when no snow cover was present to determine whether formal delineation should occur during the growing season. No potential wetlands were identified as the site was defined by steep slopes and the absence of floodplains. In addition, no remnants of hydrophytic vegetation were observed within the project's limit of disturbance.

Stream Resources

The project will occur along the West Branch Beer Kill (Waters Index Number H-139-14-38-3-1) mapped within the Lower Hudson River Drainage Basin. This site is located off of Route 52 and Old Greenfield Road. The West Branch Beer Kill is classified as a Class B stream with a (TS) Standard, which indicates it supports trout spawning. The West Branch Beer Kill does not meet Federal or State standards for navigability within the project reach.

Permitting

NYSDEC: Article 15 Stream Disturbance Permit, Section 401 Water Quality Certification

United States Army Corps of Engineers (USACE): #13 for Streambank Stabilization, #27 for Aquatic Restoration, Establishment, and Enhancement Activities

Existing and Proposed Conditions

Site #1:

The West Branch Beer Kill flows west through Site 1 south of Route 52 and its intersection with Old Greenfield Road. Aggrading conditions induced by deposition of sediment from upstream bed and bank erosion have contributed to channel avulsion and repetitive flooding of the residential property located along the right bank (south side of channel). Channel avulsion has resulted in a high channel width/depth ratio in the upper segment, which will likely contribute to future channel widening and continued erosion along the right streambank. Through the lower portion of this site, the channel slope and velocity appear to increase as primary flow runs along the base of the existing roadway embankment. A sizeable gravel berm was constructed along the right bank opposite the embankment to protect the residential property to the south from storm flows. The channel confinement along the base of the road embankment contributes to a high erosion hazard and threat to the road.

To alleviate these issues it is proposed to regrade the existing channel cross section in this area to establish an appropriately sized single thread channel. Rock cross vanes and grade control structures will be utilized throughout the regraded portion of the channel to maintain appropriate thalweg and grade control. A vegetated floodplain bench will be constructed at bankfull elevation along the restored channel to provide overbank flood protection for the previously flooded property to the south side of the channel. The existing rock retaining wall along the left bank in the lower half of the project area will be reconstructed to address existing deficiencies and to protect the adjacent roadway from failure. The restoration design is illustrated on Sheet C-112, and design channel cross sections are shown on Sheets C-113 through C-115 in Exhibit 4. The erosion and sediment control plan and water management plan are presented on Sheet C-116, and the proposed planting plan is provided on Sheet C-117 in Exhibit 4.

Table 1, below, quantifies the proposed stream impacts.

Table 1. Impacts to the West Branch Beer Kill

Site	Length (ft)	Width (ft)	Area of Disturbance (sq ft)	Excavation Quantity (CY)	Backfill Quantity (CY)	Rock Structures (CY)	Total Fill (CY)	Net Fill (CY)
1	650	90	58500	2,900	2,800	385	3185	285

Means and Methods

De-watering and Erosion and Sediment Control:

The contractor shall submit a proposed dewatering/sediment control plan to the Engineer for review and approval prior to work start. The plan will be required to achieve dewatering and sediment controls per the elements noted on the Typical Section and Details (Sheet C-1001 in Exhibit 4) to ensure protection of the water quality of the West Branch Beer Kill. A construction sequence plan will also be a required submission for review that demonstrates a logical order of the work and minimizes impacts to the local environment and traffic.

The following specifications will be included in the contract documents: The project shall be staged such that the dewatered "work area" shall be limited to an amount of work to be completed within one to two days. At the discretion of the contractor, the work area will be delineated by a stone wall barrier, or alternative practice acceptable to the Engineer. Where feasible, excavated spoil material and stones will be used to create the barrier. Prior to construction of the barrier, a turbidity curtain shall be placed on the downstream side of the barrier to capture sediment during barrier construction and excavation, and on the upstream side to deflect stream flow around the work area. Once the barrier is in place, a pump(s) and hose(s) shall be used to dewater the work area to the extent necessary to perform the work. It is proposed that the hose will run up the streambank and across Old Greenfield Road (pending permit for road closure during construction) where it will filter through dewatering bag(s) into the existing roadside ditch. The existing vegetated ditch will offer additional filtration of any remaining sediment before the water returns to the stream through existing culvert(s). This system shall be repeated as many times as necessary for Site #1. All disturbed areas will be restored to pre-construction conditions.

Re-vegetation:

A native riparian seed mix will be applied to the stream banks, benches, and overbank areas in the immediate riparian corridor or within any disturbed areas. Native trees and shrubs will be vital to encourage stabilization of the banks and evaluation of the establishment of the plantings will be included in the post-construction monitoring plan.

Sheets C301 – C302 in Exhibit 4 present General Details for the project, and Sheet C501 illustrates the proposed Erosion and Sediment Controls.

Property Ownership

The project area of Site #1 is owned by two different property owners. Arrangements are currently being made with the property owners for permanent easements on their properties for restoration work in the project area. A summary of the easement types and property owners is provided in Table 2,

Table 2. Current Property Owner Easement Information

Easement Type	Size (ac)	Owner	Property Address and Tax I.D.	Mailing Address
Permanent	1.29	Pamela Kuhlmann	15 Kulhmann Drive: 82.4-3-42	PO Box 652, Ellenville NY 12428
Permanent	0.71	D. Barron Bolton	6100 Rt 52: 82.4-2-36	6100 Rt. 52, Ellenville NY 12428

Threatened and Endangered Species

The following databases were queried to determine the potential for threatened and endangered species to be impacted by this effort.

United States Fish and Wildlife Service:

The United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation site (IPaC) reported two threatened and one endangered species for the project area of Site 1: the threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*), the endangered Indiana bat (IBat) (*Myotis sodalis*), and the threatened bog turtle (*Clemmys muhlenbergii*). In accordance with the 2016 USFWS' Range-wide Indiana Bat Summer Survey Guidelines (this document also applies to NLEBs), suitable roosting and foraging habitat for the IBat and NLEB includes mixed age stands of trees greater than 3 inches diameter at breast height (DBH), with foraging habitat frequently containing areas of open water or open travel corridors. Man-made structures such as bridges also provide suitable habitat. These habitat requirements were observed within and adjacent to the proposed project area.

A Phase I habitat assessment was conducted through sub-contracted services by the GOSR on April 2, 2019. The site was found to have suitable bat roosting habitat.

The bog turtle prefers spring-fed wetlands with deep, soft "mucky" organic soils, into which they can burrow. Suitable habitat often also contains tussock-forming herbaceous vegetation dominated by various sedge species. No wetlands were identified within or immediately adjacent to the limits of the proposed project area. In accordance with the FHWA Species – Specific Key for Bog Turtle, the assumption is being made that bog turtle habitat does not exist within or adjacent to the project area.

New York State:

The NYSDEC ERM reported no rare species or significant natural communities in the project area. The GOSR coordinated with the New York Natural Heritage Program (NHP) and a response received on November 7, 2018 from NHP indicated no records of state protected species at Site 1.

The New York State Breeding Bird Atlas (BBA) reported eight NYS species of special concern observed in the survey blocks that included the project area, listed in the table below.

Table 3. BBA Identified Species

Common Name	Scientific Name	NY Status
Red-shouldered hawk	*Buteo lineatus*	Protected-Special Concern
Grasshopper sparrow	*Ammodramus savannarum*	Protected-Special Concern
Whip-poor-will	*Caprimulgus vociferus*	Protected-Special Concern
Osprey	*Pandion haliaetus*	Protected-Special Concern
Sharp-shinned hawk	*Accipiter striatus*	Protected-Special Concern
Cooper's hawk	*Accipiter cooperii*	Protected-Special Concern
Northern goshawk	*Accipiter gentilis*	Protected-Special Concern
Golden-winged warbler	*Vermivora chrysoptera*	Protected-Special Concern

It is possible that these species could utilize the project sites and adjacent areas. However, beyond temporary construction disturbance, no impacts will occur to their habitat or the species themselves.

Post construction, the streams will function better ecologically and may benefit certain of the species listed above due to improved habitat.

The GOSR coordinated with USFWS and NYSDEC to determine the projects potential impact on Threatened and Endangered Species. For the bat species, it is recommended that emergence surveys be conducted the night prior to tree removals if they are to be removed between April 1 and October 31, when bats are active. A letter was received from USFWS on April 17, 2019, indicating concurrence and that no further coordination or consultation was required under the ESA at this time. This letter is included in Exhibit 5, Threatened and Endangered Species Documentation.

Cultural Resources

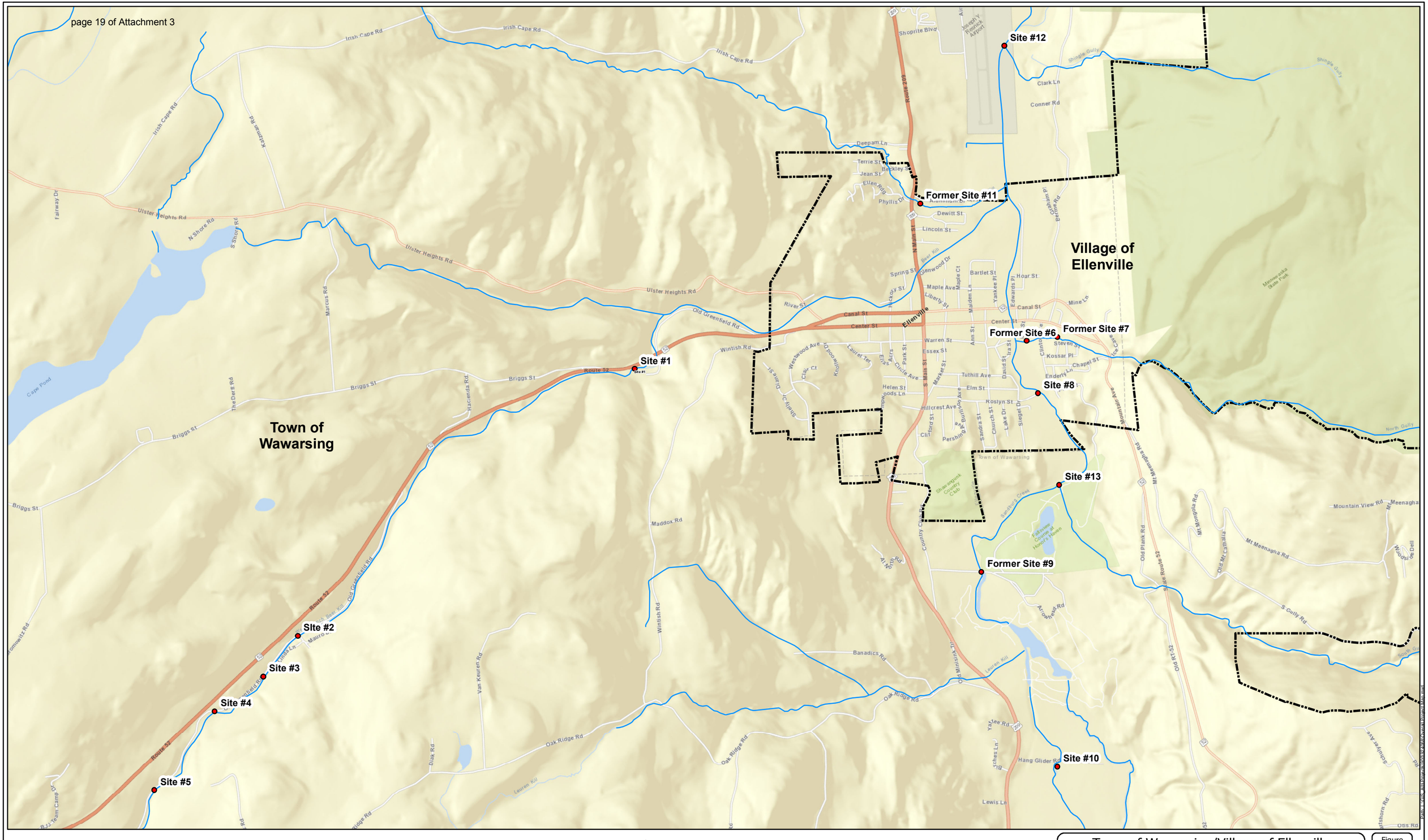
The GOSR coordinated with New York State Office of Parks, Recreation, and Historic Preservation's (NYSOPRHP) State Historic Preservation Office (SHPO) and Tribal Historic Preservation Offices (THPOs) to determine the projects potential impact on cultural resources. On June 19th, 2017, the SHPO requested a Phase 1A Archaeological Survey for the site. Subsequently, an archaeological firm (Landmark Archaeology, Inc.) was subcontracted to perform the survey and the report was submitted to SHPO in May 2019. A Phase IB was not recommended for Site #1. SHPO issued a letter on August 13, 2019 that based on these surveys and previously submitted information, no historic properties, including archaeological and/or historic resources, will be affected by this project. Letters received from SHPO are included in Exhibit 6.

State Environmental Quality Review

The GOSR has determined the Wawarsing/Ellenville Stream Restoration Project is classified as an Unlisted Action under the State Environmental Quality Review Act (SEQRA), 6 NYCRR Part 617. The GOSR declared intent to be Lead Agency on February 20, 2019 and subsequently circulated Part 1 of the Full Environmental Assessment Form (FEAF) to interested and involved agencies. Coordination is ongoing and the determination will be forwarded once it is received.

Exhibit 3

Site Figures



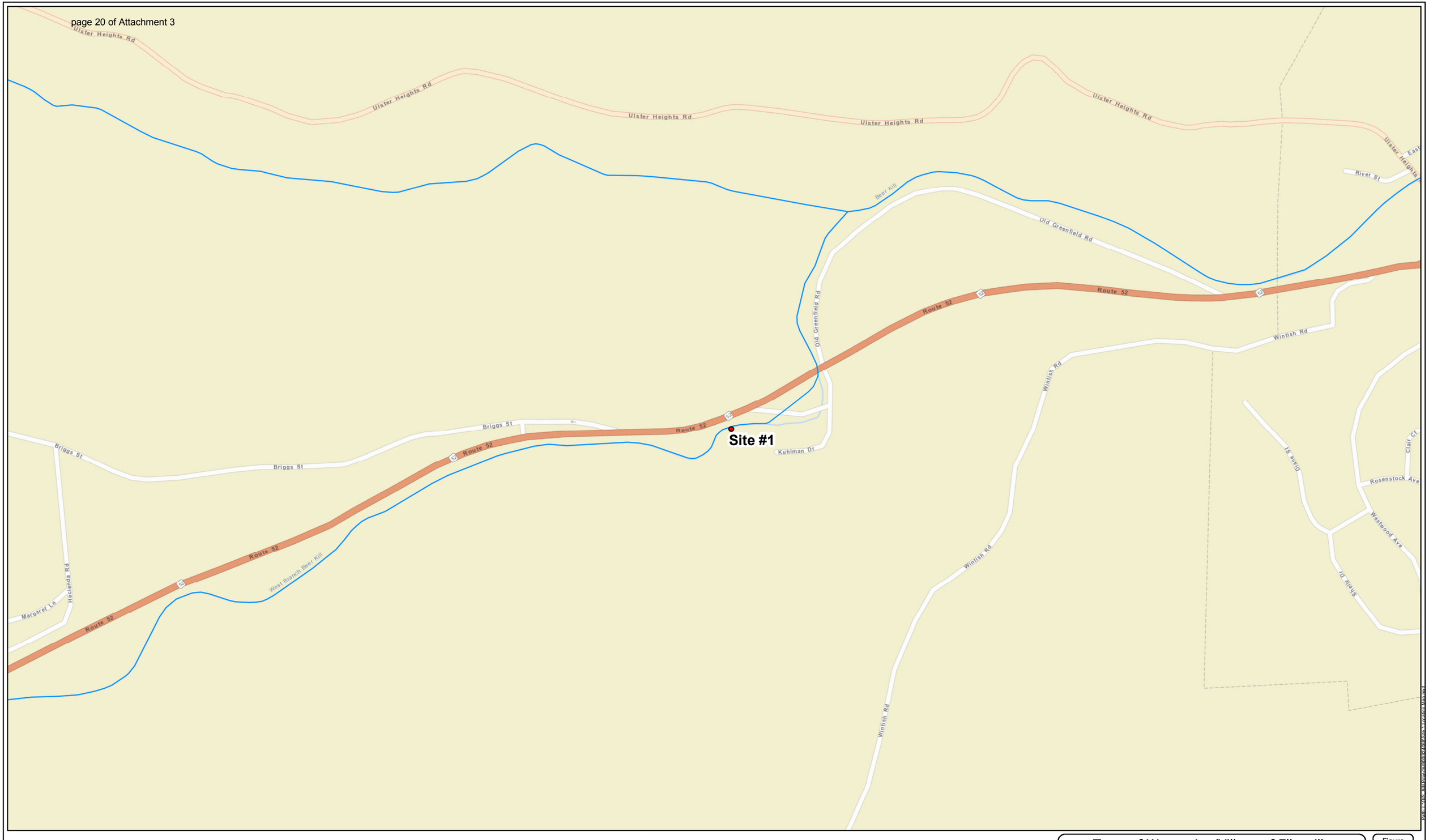
Barton & Loguidice

1 inch = 2,000 feet

Town of Wawarsing/Village of Ellenville
GOSR Stream Restoration
Overall Project Location Map
Ulster County 1/14/2019 New York

Figure 1

Project No. 924.068



Barton & Loguidice

1 inch = 500 feet

Town of Wawarsing/Village of Ellenville
GOSR Stream Restoration
Site 1
Ulster County 1/14/2019 New York

Figure 2

Project No. 924.068

NY Rising Streambank Stabilization Project

West Branch Beer Kill, Sites 2-5
Town of Wawarsing, Ulster County, New York

Joint Application for Permit

April 2019

Barton&Loguidice

NY Rising Streambank Stabilization Project

Town of Wawarsing
Ulster County, New York

Joint Application for Permit – April 2019

Exhibit 1—Joint Application Form

Exhibit 2—Project Description

Exhibit 3—Project Location Maps

Exhibit 4—Design Plans

Barton & Loguidice

Exhibit 1

Joint Application for Permit Form

NEW YORK STATE | Department of Environmental Conservation | Office of General Services | Department of State

US Army Corps of Engineers

JOINT APPLICATION FORM

For Permits for activities activities affecting streams, waterways, waterbodies, wetlands, coastal areas, sources of water, and endangered and threatened species.

You must separately apply for and obtain Permits from each involved agency before starting work. Please read all instructions.

1. **Applications To:**

>NYS Department of Environmental Conservation ☑ Check here to confirm you sent this form to NYSDEC.

Check all permits that apply:

- ☑ Stream Disturbance
- ☐ Excavation and Fill in Navigable Waters
- ☐ Docks, Moorings or Platforms
- ☐ Dams and Impoundment Structures
- ☑ 401 Water Quality Certification
- ☐ Freshwater Wetlands
- ☐ Tidal Wetlands
- ☐ Wild, Scenic and Recreational Rivers
- ☐ Coastal Erosion Management
- ☐ Water Withdrawal
- ☐ Long Island Well
- ☐ Incidental Take of Endangered / Threatened Species

>US Army Corps of Engineers ☑ Check here to confirm you sent this form to USACE.

Check all permits that apply: ☑ Section 404 Clean Water Act ☐ Section 10 Rivers and Harbors Act

Is the project Federally funded? ☐ Yes ☐ No

If yes, name of Federal Agency:

General Permit Type(s), if known: #13, #27

Preconstruction Notification: ☐ Yes ☐ No

>NYS Office of General Services ☐ Check here to confirm you sent this form to NYSOGS.

Check all permits that apply:

☐ State Owned Lands Under Water

☐ Utility Easement (pipelines, conduits, cables, etc.) ☐ Docks, Moorings or Platforms

>NYS Department of State ☐ Check here to confirm you sent this form to NYSDOS.

Check if this applies: ☐ Coastal Consistency Concurrence

2. **Name of Applicant**

Town of Wawarsing c/o Terry Houck

Taxpayer ID (if applicant is NOT an individual)

Mailing Address	Post Office / City	State	Zip
PO Box 671	Ellenville	NY	12428

Telephone Email

Applicant Must be (check all that apply): ☐ Owner ☑ Operator ☐ Lessee

3. **Name of Property Owner (if different than Applicant)**

Mailing Address	Post Office / City	State	Zip

Telephone Email

For Agency Use Only	Agency Application Number:

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

4. **Name of Contact / Agent**

Corinne Steinmuller/ Barton and Loguidice, D.P.C.

Mailing Address	Post Office / City	State	Zip
10 Airline Drive	Albany	NY	12205

Telephone 518-218-1801 x 2033 Email csteinmuller@bartonandloguidice.com

5. **Project / Facility Name**

NY Rising Streambank Stabilization Project

Property Tax Map Section / Block / Lot Number:

Project Street Address, if applicable	Post Office / City	State	Zip
	Ellenville/Wawarsing	NY	Multiple

Provide directions and distances to roads, intersections, bridges and bodies of water

The project will cover 13 different sites within the Village and Town. See Exhibit 3 for attached location maps.

☐ Town ☐ Village ☐ City

Wawarsing	County: Ulster	Stream/Waterbody Name: Multiple

Project Location Coordinates: Enter Latitude and Longitude in degrees, minutes, seconds:

Latitude: 41 43 ' 5.05 " Longitude: 74 23 ' 52.28 "

6. **Project Description:** Provide the following information about your project. Continue each response and provide any additional information on other pages. **Attach plans on separate pages.**

a. Purpose of the proposed project:

The Village of Ellenville and Town of Wawarsing have been awarded a New York Rising grant to address flood resiliency post Hurrican Irene and Tropical Storm Lee. Degredation and erosion of stream banks have effected water quality through sediment deposition and remain a threat to infrastructure for future flood events.

b. Description of current site conditions:

Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing. This application is for the identified Site #1 on the West Branch Beer Kill.

c. Proposed site changes:

The goal is to restore severely eroded/damaged sites to be capable of withstanding large flood events. See Exhibit 2 for further details.

d. Type of structures and fill materials to be installed, and quantity of materials to be used (e.g., square feet of coverage, cubic yards of fill material, structures below ordinary/mean high water, etc.):

Rock cross vanes and grade control structures will be utilized. An existing rock retaining wall will be reconstructed to address deficiencies. See Exhibit 2 for details and quantities.

e. Area of excavation or dredging, volume of material to be removed, location of dredged material placement:

Excavation will be required for the creation of a new floodplain as well as installation of cross vanes and grade control structures. The stream will be restored to a single thread. See Exhibit 2 for details and quantities.

f. Is tree cutting or clearing proposed? ☐ Yes If Yes, explain below. ☐ No

Timing of the proposed cutting or clearing (month/year): TBD - will conduct emergence surveys

Number of trees to be cut: Acreage of trees to be cleared: <3 acres total

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

g. Work methods and type of equipment to be used:

Various equiment will be utilized depending on the action. At minimum, heavy equipment such as excavators and bulldozers are expected.

h. Describe the planned sequence of activities:

i. Pollution control methods and other actions proposed to mitigate environmental impacts:

For the duration of the project pollution control measures will be utilized by the contractor to minimize the potential pollution releases.

j. Erosion and silt control methods that will be used to prevent water quality impacts:

For the duration of the project stormwater site controls will be in place to minimize water quality impacts. At each site requiring in-stream entry, temporary cofferdams will be utilized to work in the dry, a turbidity curtain will be installed, and fiber rolls will be placed.

k. Alternatives considered to avoid regulated areas. If no feasible alternatives exist, explain how the project will minimize impacts:

No alternatives exist. Overall, this project will be beneficial to the resource. All appropriate erosion and sediment controls will be utilized during construction and post construction a more stable channels should be established, reducing overall sediment load into the basin and enhancing overal ecological function.

l. Proposed use: ☐ Private ☑ Public ☐ Commercial

m. Proposed Start Date: Summer 2019 Estimated Completion Date: Fall 2019

n. Has work begun on project? ☐ Yes If Yes, explain below. ☐ No

o. Will project occupy Federal, State, or Municipal Land? ☐ Yes If Yes, explain below. ☐ No

Portions of the project will occur on municipally owned land in the Town of Wawarsing.

p. List any previous NYSDEC or USACE Permit / Application numbers for activities at this location:

q. Will this project require additional Federal, State, or Local permits, including zoning changes?

☐ Yes If Yes, list below. ☐ No

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

7. **Signatures.**

Applicant and Owner (If different) must sign the application.
Append additional pages of this Signature section if there are multiple Applicants, Owners or Contact/Agents.

I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief.

Permission to Inspect - I hereby consent to Agency inspection of the project site and adjacent property areas. Agency staff may enter the property without notice between 7:00 am and 7:00 pm, Monday - Friday. Inspection may occur without the owner, applicant or agent present. If the property is posted with "keep out" signs or fenced with an unlocked gate, Agency staff may still enter the property. Agency staff may take measurements, analyze site physical characteristics, take soil and vegetation samples, sketch and photograph the site. I understand that failure to give this consent may result in denial of the permit(s) sought by this application.

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Signature of Applicant | Date

Applicant Must be (check all that apply): ☐ Owner ☑ Operator ☐ Lessee

Printed Name: Terry Houck | Title: Town Supervisor

Signature of Owner (if different than Applicant) | Date

Printed Name | Title

Signature of Contact / Agent | Date

Printed Name: Corinne Steinmuller/ Barton and Loguidice, D.P.C. | Title: Environmental Scientist

For Agency Use Only **DETERMINATION OF NO PERMIT REQUIRED**

Agency Application Number

(Agency Name) has determined that No Permit is required from this Agency for the project described in this application.

Agency Representative:

Printed Name | Title

Signature | Date

Exhibit 2

Project and Site Details

Exhibit 2
Project Description

Project Introduction

Governor Andrew M. Cuomo established the New York Rising Community Reconstruction (NYRCR) program to provide additional rebuilding and revitalization assistance to communities damaged by Super-storm Sandy, Hurricane Irene, and Tropical Storm Lee. The Governor's Office of Storm Recovery (GOSR) is managing the NYRCR program in partnership with the NYS Department of State (DOS). Additional support has been provided through the Regional Economic Development Council's (REDC) State Agency Review Teams. Nine project sites are proposed on various waterbodies located within the Village of Ellenville and in the Town of Wawarsing, Ulster County, New York. This Joint Application for Permit is specific to Sites #2 - #5, located on the West Branch Beer Kill off of Old Greenfield Road in the Town of Wawarsing. See Exhibit 3, Project Location Maps, for further details.

Objectives

As a result of major storms in 2011 (Hurricane Irene and Tropical Storm Lee), the Village of Ellenville and Town of Wawarsing noted many of the stream resources surrounding the communities were significantly damaged. Bank failure and sedimentation were noted in numerous sites. As a result of post-storm analysis, 13 locations were initially selected to require the most urgent attention. This JAP is for proposed work at Sites #2, 3, 4, and 5. Work at these sites is being progressed to:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, schools emergency services, and the Ellenville Regional Hospital;
- Provide long-term protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

Wetland Assessment

The project sites were assessed for potential presence of wetlands. Prior to a field visit, the National Wetlands Inventory (NWI) and New York State Department of Environmental Conservation's (NYSDEC) Environmental Resource Mapper were reviewed. No wetlands were mapped at or within the vicinity of the sites. A preliminary field visit was performed on December 12, 2018 when no snow cover was present to determine whether formal delineation should occur during the growing season. No potential wetlands were identified as the site was defined by steep slopes and the absence of floodplains. In

addition, no remnants of hydrophytic vegetation were observed within the project's limit of disturbance.

Stream Resources

The project will occur at 4 sites along the West Branch Beer Kill (Waters Index Number H-139-14-38-3-1) mapped within the Lower Hudson River Drainage Basin. These sites are all off of Old Greenfield Road in the Town of Wawarsing. The West Branch Beer Kill is classified as a Class B stream with a (TS) Standard, which indicates it supports trout spawning. The West Branch Beer Kill does not meet Federal or State standards for navigability within the project reach.

Permitting

NYSDEC: Article 15 Stream Disturbance Permit, Section 401 Water Quality Certification

United States Army Corps of Engineers (USACE): Individual Permit

Existing and Proposed Conditions

Site #2: The channel of the West Branch Beer Kill at Site #2 is confined by the proximity of the adjacent roadway (Old Greenfield) along the left bank, causing elevated flood velocity and excessive erosion and scour. There is a history of scour issues with the existing rock revetment along the left bank in this area. The proposed project consists of the installation of in-stream structures to create grade controls that will reduce erosive force of storm flows. The existing rock revetment along the left bank will be extended and fortified. Cross vanes are proposed to be constructed immediately downstream of the Barbara Road bridge to create grade controls and prevent further erosion of the embankment along Old Greenfield Road.

Site #3: The channel of the West Branch Beer Kill at Site #3 is laterally cutting against the toe of the roadway embankment along the left bank and vertically incising, which has lowered the bed elevation and increased flood velocities. The project for Site #3 proposes the installation of in-stream structures to create grade controls that will reduce the erosive force of storm flows.

Site #4: Channel braiding and lateral migration of the West Branch Beer Kill is occurring toward the left bank and adjacent to Old Greenfield Road. This migration will lead to undermining and eventual failure of the road embankment. Rock cross vanes are proposed to be installed at this site to support and maintain a single thread channel through this site and direct flood flows away from the embankment. Sediment removal will restore the site to a single-thread channel.

Site #5: The channel of the West Branch Beer Kill is laterally cutting against the toe of the Old Greenfield Road embankment in this location, lowering the bed elevation and increasing flood velocities. The project at this site proposes the installation of in-stream structures to create grade controls to reduce the erosive force of storm flows. Rock toe revetment will also be placed at the base of the roadway embankment slope.

See Exhibit 4 Plans for design drawings (Site 2 - Sheet C121, Site 3 - C131, Site 4 - C141, and Site 5 - C151).

Table 1. Stream Disturbance Totals				
Site I.D.	Site 2	Site 3	Site 4	Site 5
Total Area of Disturbance (square feet)	1500	850	350	1821
Total Length of Disturbance (linear feet)	580	490	265	667

Table 2. Permanent and Temporary Impacts to Water Resources												
Site #	**2**			**3**			**4**			**5**		
Practice	**Quantity**	**Cut**	**Fill**	**Quantity**	**Cut**	**Fill**	**Quantity**	**Cut**	**Fill**	**Quantity**	**Cut**	**Fill**
Stream Barb	6 barbs	59	88	7	69	103	3 barbs	30	44	5 barbs	49	74
Cross Vane	50 LF	25	33	-	-	-	-	-	-	-	-	-
Revetment Wall	235 LF	168	191	-		-	-	-	-	550 LF	392	448
Boulder Placement	-	-	-	3 LF	4	5	2 LF	3	4	4 LF	5	7
Total	-	252	312	-	73	108	-	33	48	-	446	529

Means and Methods

De-watering and Erosion and Sediment Control:

The contractor shall submit a proposed dewatering/sediment control plan to the Engineer for review and approval prior to work start. The plan will be required to achieve dewatering and sediment controls per the elements noted on the Typical Section and Details, Sheet C-1001 to ensure protection of the water quality of the West Branch Beer Kill. A construction sequence plan will also be a required submission for review that demonstrates a logical order of the work and minimizes impacts to the local environment and traffic.

The following specifications will be included in the contract documents: The project shall be staged such that the dewatered "work area" shall be limited to an amount of work to be completed within one to two days. At the discretion of the contractor, the work area will be delineated by a stone wall barrier, or alternative practice acceptable to the Engineer. Where feasible, excavated spoil material and stones will be used to create the barrier. Prior to construction of the barrier, a turbidity curtain shall be placed on the downstream side of the barrier to capture sediment during barrier construction and excavation, and on the upstream side to deflect stream flow around the work area. Once the barrier is in place, a pump(s) and hose(s) shall be used to dewater the work area to the extent necessary to perform the work. It is proposed that the hose will run up the streambank and across Old Greenfield Road (pending permit for road closure during construction) where it will filter through dewatering bag(s) into the existing roadside ditch. The existing vegetated ditch will offer additional filtration of any remaining sediment before the water returns to the stream through existing culvert(s). This system shall be repeated as many times as necessary for sites 2-5 along Old Greenfield Road. All disturbed areas will be restored to pre-construction conditions.

Re-vegetation:

A native riparian seed mix will be applied to the stream banks, benches, and overbank areas in the immediate riparian corridor or within any disturbed areas. Native trees and shrubs will be vital to encourage stabilization of the banks and evaluation of the establishment of the plantings will be included in the post-construction monitoring plan.

Sheets C301 – C302 in Exhibit 4 present General Details for the project, and Sheet C501 illustrates the proposed Erosion and Sediment Controls.

Property Ownership

The project area of Sites #2 - #5 is owned by five different property owners. Arrangements are currently being made with the property owners for permanent easements on their properties for restoration work in the project area. A summary of the easement types and property owners is provided in Table 3, below. Ownership of properties identified as null will be verified during metes and bounds survey.

Table 3. Current Property Owner Easement Information

Site and Easement Type	Size (ac)	Owner	Property Address and Tax I.D.	Mailing Address
2 – Permanent	0.59	Null	Null	
2 – Permanent Access	0.03	Umberto Gallo & Connie Gallo	Linda Lane	24 Crown Place, Staten Island NY 10312
3 – Permanent	0.72	Lorraine Hamouz	734 Old Greenfield Rd	2 Homespun Ct., Mahwah, NJ 07430
4 – Permanent	0.33	Lorraine Hamouz	734 Old Greenfield Rd	2 Homespun Ct., Mahwah, NJ 07430
5 – Permanent	0.54	Town of Wawarsing	799 Old Greenfield Rd	108 Canal St., Ellenville NY 12428
5 - Permanent	0.33	Frank Fusco & Louis Fusco	876-880 Old Greenfield Rd	1148 76th S. St. Brooklyn, NY 11228

Threatened and Endangered Species

The following databases were queried to determine the potential for threatened and endangered species to be impacted by this effort.

United States Fish and Wildlife Service:

The United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation site (IPaC) reported two threatened and one endangered species for the project area of Sites #2-#5: the threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*), the endangered Indiana bat (IBat) (*Myotis sodalis*), and the threatened bog turtle (*Clemmys muhlenbergii*). In accordance with the 2016 USFWS' Range-wide Indiana Bat Summer Survey Guidelines (this document also applies to NLEBs), suitable roosting and foraging habitat for the IBat and NLEB includes mixed age stands of trees greater than 3 inches diameter at breast height (DBH), with foraging habitat frequently containing areas of open water or open travel corridors. Man-made structures such as bridges also provide suitable habitat. These habitat requirements were observed within and adjacent to the proposed project area.

A Phase I habitat assessment was conducted through sub-contracted services by the GOSR on April 2, 2019. All sites were found to have suitable roosting habitat for both bat species due to five suitable snags at Site 3 and one suitable snag at Site 5.

The bog turtle prefers spring-fed wetlands with deep, soft "mucky" organic soils, into which they can burrow. Suitable habitat often also contains tussock-forming herbaceous vegetation dominated by various sedge species. No wetlands were identified within or immediately adjacent to the limits of the proposed project area. In accordance with the FHWA Species – Specific Key for Bog Turtle, the assumption is being made that bog turtle habitat does not exist within or adjacent to the project area.

New York State:

The NYSDEC Environmental Resource Mapper (ERM) reported no rare species or significant natural communities in the project area. The GOSR coordinated with the New York Natural Heritage Program (NHP) and a response received on November 7, 2018 indicated no records of state protected species at Sites #2-#5.

The New York State Breeding Bird Atlas (BBA) reported eight NYS species of special concern observed in the survey blocks that included the project area, listed in the table below.

Table 3. BBA Identified Species

Common Name	Scientific Name	NY Status
Red-shouldered hawk	*Buteo lineatus*	Protected-Special Concern
Grasshopper sparrow	*Ammodramus savannarum*	Protected-Special Concern
Whip-poor-will	*Caprimulgus vociferus*	Protected-Special Concern
Osprey	*Pandion haliaetus*	Protected-Special Concern
Sharp-shinned hawk	*Accipiter striatus*	Protected-Special Concern

Cooper's hawk	*Accipiter cooperii*	Protected-Special Concern
Northern goshawk	*Accipiter gentilis*	Protected-Special Concern
Golden-winged warbler	*Vermivora chrysoptera*	Protected-Special Concern

It is possible that these species could utilize the project sites and adjacent areas. However, beyond temporary construction disturbance, no impacts will occur to the habitat quality or species itself. Post construction, the streams will function better ecologically and may benefit certain of the species listed above due to improved habitat.

The GOSR is currently coordinating with USFWS and NYSDEC to determine the projects potential impact on Threatened and Endangered Species. For the bat species, it is recommended that emergence surveys be conducted the night prior to tree removals if they are to be removed between April 1 and October 31, when bats are active. Concurrence will be forwarded as it is received.

Cultural Resources

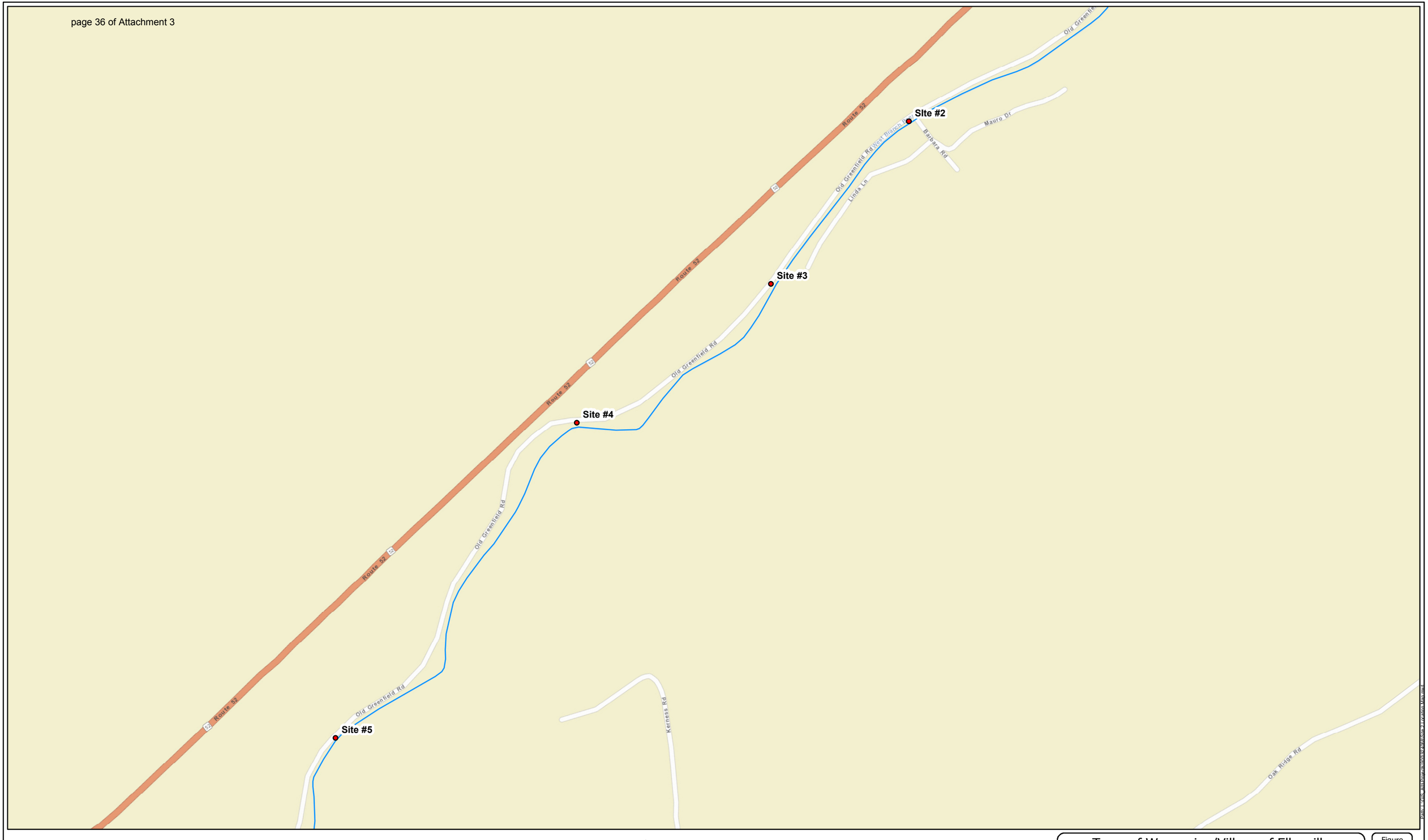
The GOSR coordinated with New York State Office of Parks, Recreation, and Historic Preservation's (NYSOPRHP) State Historic Preservation Office (SHPO) and Tribal Historic Preservation Offices (THPOs) to determine the projects potential impact on cultural resources. Coordination is ongoing and concurrence will be forwarded as it is received.

State Environmental Quality Review

The GOSR has determined the Wawarsing/Ellenville Stream Restoration Project is classified as an Unlisted Action under the State Environmental Quality Review Act (SEQRA), 6 NYCRR Part 617. The GOSR declared intent to be Lead Agency on February 20, 2019 and subsequently circulated Part 1 of the Full Environmental Assessment Form (FEAF) to interested and involved agencies. Coordination is ongoing and concurrence will be forwarded as it is received.

Exhibit 3

Site Figures



Barton & Loguidice

1 inch = 500 feet

Town of Wawarsing/Village of Ellenville

GOSR Stream Restoration Sites 2-5

Ulster County 1/14/2019 New York

Figure 2

Project No. 924.068

Barton & Loguidice

1 inch = 500 feet

Town of Wawarsing/Village of Ellenville
GOSR Stream Restoration Sites 2-5
Ulster County 3/26/2019 New York

Figure 2

Project No. 924.068

NY Rising Streambank Stabilization Project

Sandburg Creek - Site 8
Village of Ellenville, Ulster County, New York

Joint Application for Permit

April 2019

Barton&Loguidice

NY Rising Streambank Stabilization Project

Village of Ellenville
Ulster County, New York

Joint Application for Permit – April 2019

Exhibit 1—Joint Application Form

Exhibit 2—Project Description

Exhibit 3—Project Location Maps

Exhibit 4—Design Plans

Barton & Loguidice

Exhibit 1

Joint Application for Permit Form

NEW YORK STATE | Department of Environmental Conservation | Office of General Services | Department of State

US Army Corps of Engineers

JOINT APPLICATION FORM

For Permits for activities activities affecting streams, waterways, waterbodies, wetlands, coastal areas, sources of water, and endangered and threatened species.

You must separately apply for and obtain Permits from each involved agency before starting work. Please read all instructions.

1. **Applications To:**

>NYS Department of Environmental Conservation ☑ Check here to confirm you sent this form to NYSDEC.

Check all permits that apply:

- ☑ Stream Disturbance
- ☐ Excavation and Fill in Navigable Waters
- ☐ Docks, Moorings or Platforms
- ☐ Dams and Impoundment Structures
- ☑ 401 Water Quality Certification
- ☐ Freshwater Wetlands
- ☐ Tidal Wetlands
- ☐ Wild, Scenic and Recreational Rivers
- ☐ Coastal Erosion Management
- ☐ Water Withdrawal
- ☐ Long Island Well
- ☐ Incidental Take of Endangered / Threatened Species

>US Army Corps of Engineers ☑ Check here to confirm you sent this form to USACE.

Check all permits that apply: ☑ Section 404 Clean Water Act ☐ Section 10 Rivers and Harbors Act

Is the project Federally funded? ☐ Yes ☐ No

If yes, name of Federal Agency:

General Permit Type(s), if known: #13, #27

Preconstruction Notification: ☐ Yes ☐ No

>NYS Office of General Services ☐ Check here to confirm you sent this form to NYSOGS.

Check all permits that apply:

- ☐ State Owned Lands Under Water
- ☐ Utility Easement (pipelines, conduits, cables, etc.)
- ☐ Docks, Moorings or Platforms

>NYS Department of State ☐ Check here to confirm you sent this form to NYSDOS.

Check if this applies: ☐ Coastal Consistency Concurrence

2. **Name of Applicant**

Town of Wawarsing c/o Terry Houck

Taxpayer ID (if applicant is NOT an individual)

Mailing Address	Post Office / City	State	Zip
PO Box 671	Ellenville	NY	12428

Telephone Email

Applicant Must be (check all that apply): ☐ Owner ☑ Operator ☐ Lessee

3. **Name of Property Owner (if different than Applicant)**

Mailing Address	Post Office / City	State	Zip

Telephone Email

For Agency Use Only	Agency Application Number:

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

4. **Name of Contact / Agent**

Corinne Steinmuller/ Barton and Loguidice, D.P.C.

Mailing Address	Post Office / City	State	Zip
10 Airline Drive	Albany	NY	12205

Telephone: 518-218-1801 x 2033 Email: csteinmuller@bartonandloguidice.com

5. **Project / Facility Name**

NY Rising Streambank Stabilization Project

Property Tax Map Section / Block / Lot Number:

Project Street Address, if applicable	Post Office / City	State	Zip
	Ellenville/Wawarsing	NY	Multiple

Provide directions and distances to roads, intersections, bridges and bodies of water

The project will cover 13 different sites within the Village and Town. See Exhibit 3 for attached location maps.

☐ Town ☐ Village ☐ City

Wawarsing	County: Ulster	Stream/Waterbody Name: Multiple

Project Location Coordinates: Enter Latitude and Longitude in degrees, minutes, seconds:

Latitude: 41 43 ' 5.05 " Longitude: 74 23 ' 52.28 "

6. **Project Description:** Provide the following information about your project. Continue each response and provide any additional information on other pages. **Attach plans on separate pages.**

a. Purpose of the proposed project:

The Village of Ellenville and Town of Wawarsing have been awarded a New York Rising grant to address flood resiliency post Hurrican Irene and Tropical Storm Lee. Degredation and erosion of stream banks have effected water quality through sediment deposition and remain a threat to infrastructure for future flood events.

b. Description of current site conditions:

Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing. This application is for the identified Site #1 on the West Branch Beer Kill.

c. Proposed site changes:

The goal is to restore severely eroded/damaged sites to be capable of withstanding large flood events. See Exhibit 2 for further details.

d. Type of structures and fill materials to be installed, and quantity of materials to be used (e.g., square feet of coverage, cubic yards of fill material, structures below ordinary/mean high water, etc.):

Rock cross vanes and grade control structures will be utilized. An existing rock retaining wall will be reconstructed to address deficiencies. See Exhibit 2 for details and quantities.

e. Area of excavation or dredging, volume of material to be removed, location of dredged material placement:

Excavation will be required for the creation of a new floodplain as well as installation of cross vanes and grade control structures. The stream will be restored to a single thread. See Exhibit 2 for details and quantities.

f. Is tree cutting or clearing proposed? ☐ Yes If Yes, explain below. ☐ No

Timing of the proposed cutting or clearing (month/year): TBD - will conduct emergence surveys

Number of trees to be cut: Acreage of trees to be cleared: <3 acres total

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

g. Work methods and type of equipment to be used:

Various equiment will be utilized depending on the action. At minimum, heavy equipment such as excavators and bulldozers are expected.

h. Describe the planned sequence of activities:

i. Pollution control methods and other actions proposed to mitigate environmental impacts:

For the duration of the project pollution control measures will be utilized by the contractor to minimize the potential pollution releases.

j. Erosion and silt control methods that will be used to prevent water quality impacts:

For the duration of the project stormwater site controls will be in place to minimize water quality impacts. At each site requiring in-stream entry, temporary cofferdams will be utilized to work in the dry, a turbidity curtain will be installed, and fiber rolls will be placed.

k. Alternatives considered to avoid regulated areas. If no feasible alternatives exist, explain how the project will minimize impacts:

No alternatives exist. Overall, this project will be beneficial to the resource. All appropriate erosion and sediment controls will be utilized during construction and post construction a more stable channels should be established, reducing overall sediment load into the basin and enhancing overal ecological function.

l. Proposed use: ☐ Private ☑ Public ☐ Commercial

m. Proposed Start Date: Summer 2019 Estimated Completion Date: Fall 2019

n. Has work begun on project? ☐ Yes If Yes, explain below. ☐ No

o. Will project occupy Federal, State, or Municipal Land? ☐ Yes If Yes, explain below. ☐ No

Portions of the project will occur on municipally owned land in the Town of Wawarsing.

p. List any previous NYSDEC or USACE Permit / Application numbers for activities at this location:

q. Will this project require additional Federal, State, or Local permits, including zoning changes?

☐ Yes If Yes, list below. ☐ No

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

7. **Signatures.**

Applicant and Owner (If different) must sign the application.
Append additional pages of this Signature section if there are multiple Applicants, Owners or Contact/Agents.

I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief.

Permission to Inspect - I hereby consent to Agency inspection of the project site and adjacent property areas. Agency staff may enter the property without notice between 7:00 am and 7:00 pm, Monday - Friday. Inspection may occur without the owner, applicant or agent present. If the property is posted with "keep out" signs or fenced with an unlocked gate, Agency staff may still enter the property. Agency staff may take measurements, analyze site physical characteristics, take soil and vegetation samples, sketch and photograph the site. I understand that failure to give this consent may result in denial of the permit(s) sought by this application.

False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the NYS Penal Law. Further, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project. In addition, Federal Law, 18 U.S.C., Section 1001 provides for a fine of not more than $10,000 or imprisonment for not more than 5 years, or both where an applicant knowingly and willingly falsifies, conceals, or covers up a material fact; or knowingly makes or uses a false, fictitious or fraudulent statement.

Signature of Applicant | Date

Applicant Must be (check all that apply): ☐ Owner ☑ Operator ☐ Lessee

Printed Name: Terry Houck | Title: Town Supervisor

Signature of Owner (if different than Applicant) | Date

Printed Name | Title

Signature of Contact / Agent | Date

Printed Name: Corinne Steinmuller/ Barton and Loguidice, D.P.C. | Title: Environmental Scientist

For Agency Use Only **DETERMINATION OF NO PERMIT REQUIRED**

Agency Application Number

(Agency Name) has determined that No Permit is required from this Agency for the project described in this application.

Agency Representative:

Printed Name | Title

Signature | Date

Exhibit 2

Project and Site Details

Exhibit 2
Project Description

Project Introduction

Governor Andrew M. Cuomo established the New York Rising Community Reconstruction (NYRCR) program to provide additional rebuilding and revitalization assistance to communities damaged by Super-storm Sandy, Hurricane Irene, and Tropical Storm Lee. The Governor's Office of Storm Recovery (GOSR) is managing the NYRCR program in partnership with the NYS Department of State (DOS). Additional support has been provided through the Regional Economic Development Council's (REDC) State Agency Review Teams. Nine project sites are proposed on various waterbodies located within the Village of Ellenville and in the Town of Wawarsing, Ulster County, New York.

Location

This Joint Application for Permit is specific to Site #8, located on Sandburg Creek off of Roslyn Street in the Village of Ellenville. See Exhibit 3, Project Location Maps, for further details.

Objectives

Many of the stream resources surrounding the Village of Ellenville and Town of Wawarsing were significantly damaged by major storms in 2011 (Hurricane Irene and Tropical Storm Lee). Bank failure and sedimentation were noted in numerous sites. As a result of post-storm analysis, work at Site #8 is being progressed to:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, schools emergency services, and the Ellenville Regional Hospital;
- Provide long-term protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

Wetland Assessment

The project sites were assessed for potential presence of wetlands. Prior to a field visit, the National Wetlands Inventory (NWI) and New York State Department of Environmental Conservation's (NYSDEC) Environmental Resource Mapper were reviewed. No wetlands were mapped at or within the vicinity of the sites. A preliminary field visit was performed on December 12, 2018 when no snow cover was present to determine whether formal delineation should occur during the growing season. No potential wetlands were identified as the site was defined by steep slopes and the absence of floodplains. In addition, no remnants of hydrophytic vegetation were observed within the project's limit of disturbance.

Stream Resources

This project will occur in Sandburg Creek (Waters Index Number H-139-14-38), mapped within the Lower Hudson River Drainage Basin in the Village of Ellenville. Sandburg Creek is classified by the New York State Department of Environmental Conservation (NYSDEC) as a Class B stream with TS Standards, which reflect its ability to support trout spawning. Sandburg Creek does not meet Federal or State standards for navigability within the project reach.

Permitting

NYSDEC: Article 15 Stream Disturbance Permit, Section 401 Water Quality Certification

United States Army Corps of Engineers (USACE): Nationwide Permit (NWP) #13 – Bank Stabilization

Existing and Proposed Conditions

At Site #8, bed scour has partially exposed a sewer line adjacent to the right bank. Should scour continue, this line may become entirely exposed and at great risk for failure and sewage release to the waterbody. A cross vane is proposed to be installed downstream of the sewer line as grade control to reduce erosion along the right bank and maintain the bed elevation over the line. Work below the Ordinary High Water Mark (OHWM) is quantified in Table 3, below. See Exhibit 4 Plans for design drawings (Sheets C161 – Site 8).

Table 1. Stream Disturbance Totals	
Total Area of Disturbance (square feet)	2000 SF-temporary
Total Length of Disturbance (linear feet)	45

Table 2. Permanent and Temporary Impacts to Water Resources			
Site #	8		
Practice	Linear Feet	Cut	Fill
Cross Vane	105	53	70

Means and Methods

De-watering and Erosion and Sediment Control

The contractor shall submit a proposed dewatering/sediment control plan to the Engineer for review and approval prior to work start. The plan will be required to achieve dewatering and sediment controls per the elements noted on the Typical Section and Details, Sheet C-1001 to ensure protection of the water quality of Sandburg Creek. A construction sequencing Plan will also be a required submission for review that demonstrates a logical order of the work that minimizes impacts to the local environment and traffic.

In order to facilitate this plan, the following specifications will be included: The project shall be staged such that the dewatered "work area" shall be limited to an amount of work to be completed within one to two days. At the discretion of the contractor, the work area will be delineated by a stone wall barrier, or alternative practice acceptable to the Engineer. Where feasible, excavated spoil material and stones be used to create the barrier. Prior to construction of the barrier, a turbidity curtain shall be placed on the downstream side of the barrier to capture sediment during excavation and the upstream side to deflect stream flow. Once the barrier is in place, a pump(s) and hose(s) shall be used to dewater the work area to the extent necessary to perform the work.

It is proposed that the hose(s) from the dewatered area will discharge downstream of the stone barrier and upstream of the turbidity curtain via a sediment bag located along the stream bank. Intake from the area upstream of the first barrier will discharge directly to the waterway, downstream of the stone barrier and upstream of the turbidity curtain. Refer Typical Sections and Details Sheet C-1001. All disturbed areas will be restored.

Re-vegetation

A native riparian seed mix will be applied to the stream banks, benches, and overbank areas in the immediate riparian corridor or within any disturbed areas. Native trees and shrubs will be vital to encourage stabilization of the banks. Evaluation of the establishment of the plantings will be included in the post-construction monitoring plan.

Exhibit 4, Plans, Sheets C301 – C302 for General Details and Sheet C501 for Erosion and Sediment Controls.

Property Ownership

The project area of Site #8 is owned by three different property owners. Arrangements are currently being made with the property owners for permanent easements on their properties for restoration work in the project area. A summary of the easement types and property owners is provided in Table 3, below. Ownership for 'Null' properties will be determined by the surveyor during metes and bounds mapping.

Table 3. Current Property Owner Easement Information

Easement Type	Size (ac)	Owner	Property Address and Tax I.D.	Mailing Address
Permanent	0.48 ± ac.	Michael Mansfield	47 Clinton Avenue: 91.22-2-7	PO Box 357 Napanoch, NY 12458
Permanent	0.04 ± ac.	Null	Null: 91.22-2-10	Null
Permanent	0.1 ± ac.	Ellenville Real Estate Holding, LLC	38 Pine St. Extension: 91.30-1-2	1195 Arrowhead Rd. Ellenville, NY 12428

Threatened and Endangered Species

The following databases were queried to determine the potential for threatened and endangered species to be affected by this project.

United States Fish and Wildlife Service

The United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation site (IPaC) reported three threatened or endangered species for the project area:

the threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*), the endangered Indiana bat (IBat) (*Myotis sodalis*), and the threatened bog turtle (*Clemmys muhlenbergii*). In accordance with the 2016 USFWS' Range-wide Indiana Bat Summer Survey Guidelines (this document also applies to the NLEB), suitable roosting and foraging habitat for the IBat and NLEB includes mixed age stands of trees greater than 3 inches diameter at breast height (DBH), with foraging habitat frequently containing areas of open water or open travel corridors. Man-made structures such as bridges also provide suitable roosting habitat. These habitat requirements were observed within and adjacent to the proposed project area.

A Phase I habitat assessment was conducted through sub-contracted services by the GOSR on April 2, 2019. All sites were found to have suitable roosting habitat for both bat species due to two suitable snags at Site 8.

The bog turtle prefers spring-fed wetlands with deep, soft "mucky" organic soils, into which they can burrow. Suitable habitat often also contains tussock-forming herbaceous vegetation dominated by various sedge species. No wetlands were identified within or immediately adjacent to the proposed project area. In accordance with the FHWA Species – Specific Key for Bog Turtle, the assumption is being made that bog turtle habitat does not exist within or adjacent to the project area.

New York State

The NYSDEC Environmental Resource Mapper reported no rare species, but did make note of a significant natural community around certain sites, including Site #8: chestnut oak forest. This community was also reported by the New York Nature Explorer. Site #8 is not located within a forested areas and therefore no impact will occur to this resource.

The GOSR coordinated with the New York Natural Heritage Program (NHP) for state-listed species in the project area. A response received from NHP on November 7, 2018 indicated that Site #8 is located within 1.5 miles of documented timber rattlesnake (*Crotalus horridus* – NYS Threatened) habitat.

The GOSR is currently coordinating with USFWS and NYSDEC to determine the projects potential impact on Threatened and Endangered Species. For the bat species, it is recommended that emergence surveys be conducted the night prior to tree removals if they are to be removed between April 1 and October 31, when bats are active. Concurrence will be forwarded as it is received.

Cultural Resources

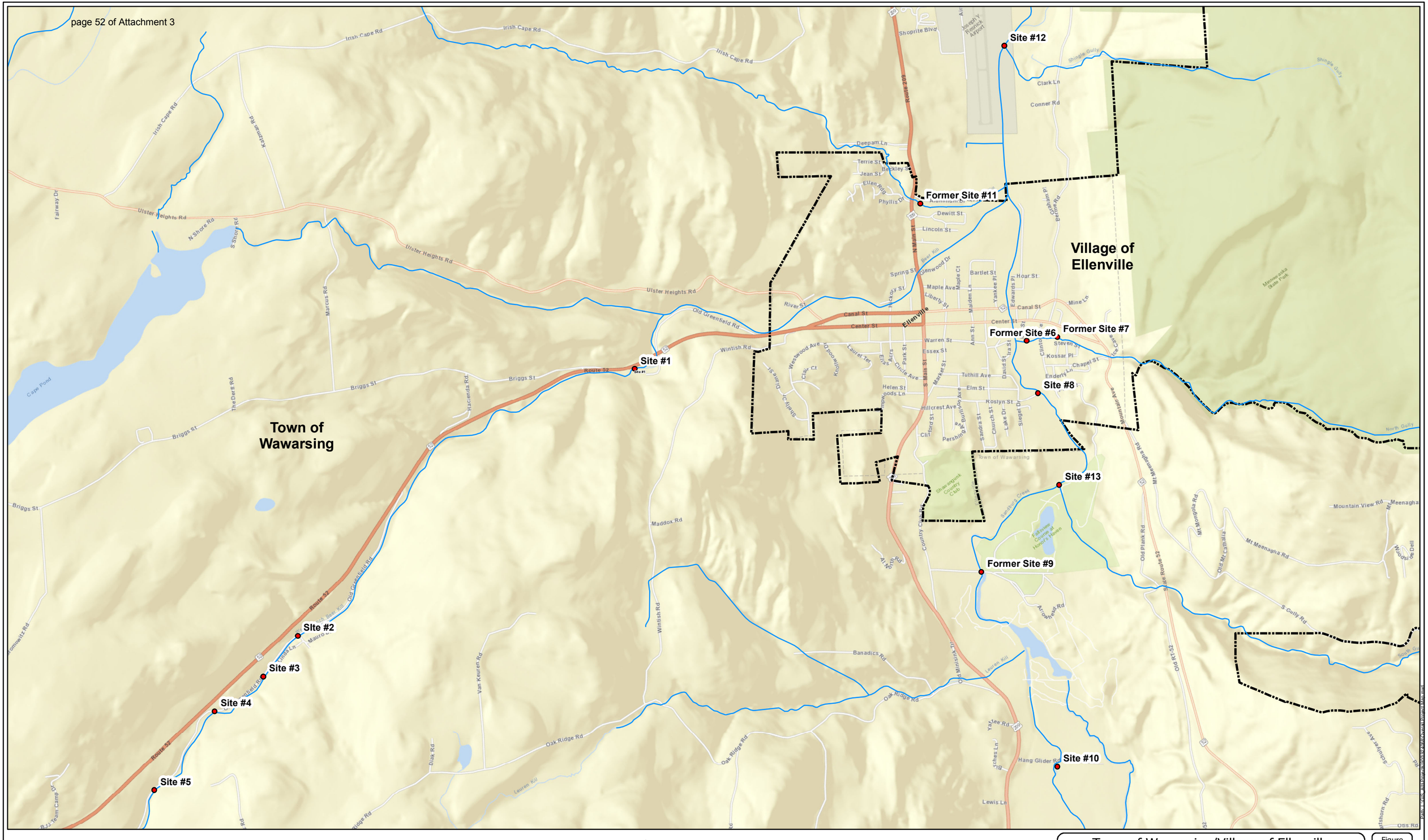
The GOSR coordinated with New York State Office of Parks, Recreation, and Historic Preservation's (NYSOPRHP) State Historic Preservation Office (SHPO) and Tribal Historic Preservation Offices (THPOs) to determine the projects potential impact on cultural resources. Coordination is ongoing and concurrence will be forwarded as it is received.

State Environmental Quality Review

The GOSR has determined the Wawarsing/Ellenville Stream Restoration Project is classified as an Unlisted Action under the State Environmental Quality Review Act (SEQRA), 6 NYCRR Part 617. The GOSR declared intent to be Lead Agency on February 20, 2019 and subsequently circulated Part 1 of the Full Environmental Assessment Form (FEAF) to interested and involved agencies. Coordination is ongoing and concurrence will be forwarded as it is received.

Exhibit 3

Site Figures



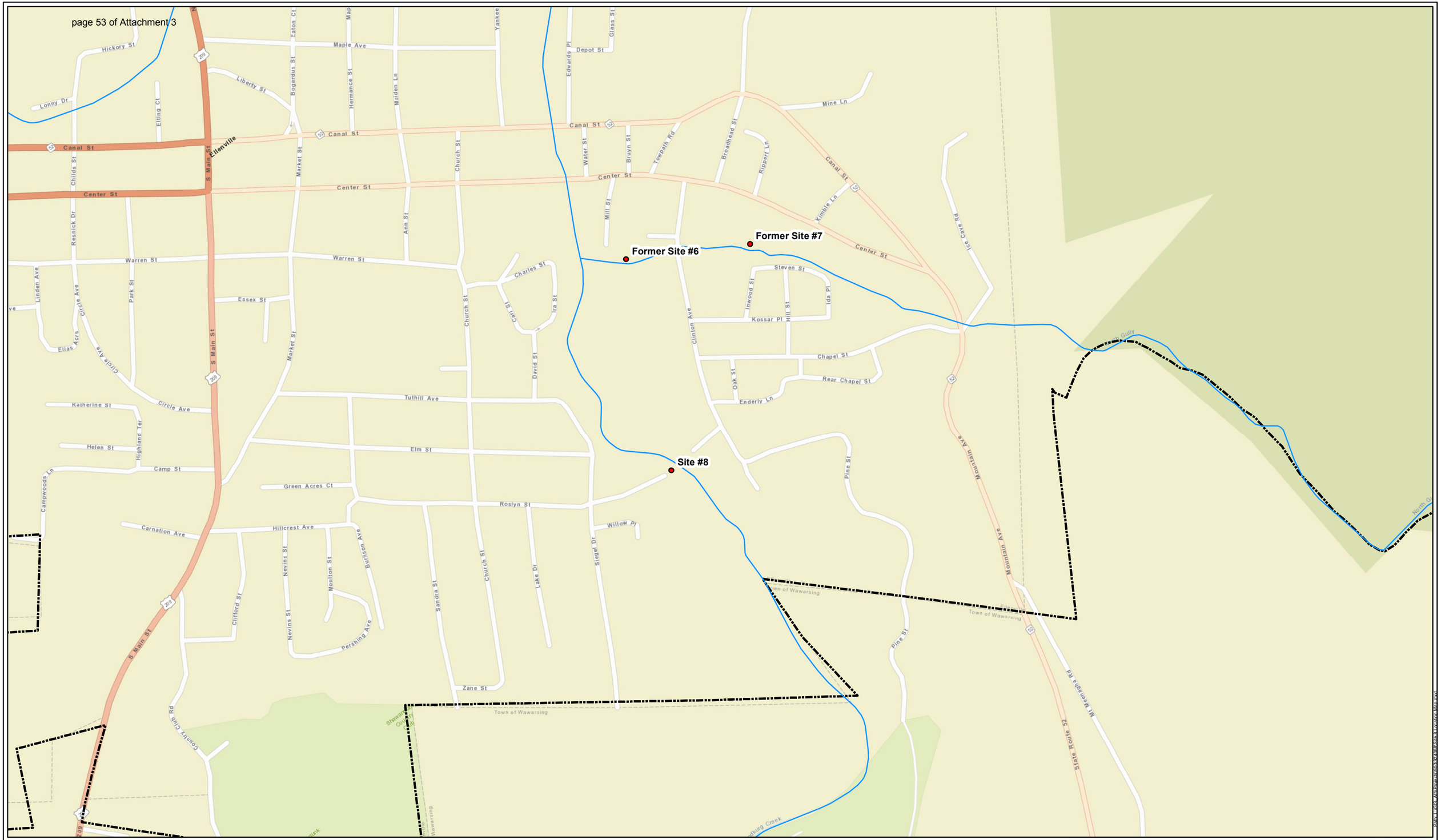
Barton & Loguidice

1 inch = 2,000 feet

Town of Wawarsing/Village of Ellenville
GOSR Stream Restoration
Overall Project Location Map
Ulster County 1/14/2019 New York

Figure 1

Project No. 924.068



Barton & Loguidice

1 inch = 500 feet

Town of Wawarsing/Village of Ellenville

GOSR Stream Restoration

Site 8

Ulster County 1/14/2019 New York

Figure 2

Project No. 924.068

Barton & Loguidice

1 inch = 125 feet

Town of Wawarsing/Village of Ellenville
GOSR Stream Restoration
Site 8
Ulster County 3/26/2019 New York

Figure 2

Project No. 924.068

Barton & Loguidice

November 14, 2019

John Petronella
Regional Permit Administrator
NYSDEC Region 3
21 South Putt Corners Road
New Paltz, New York 12561-1620

Re: Ellenville-Wawarsing Stream Bank Stabilization
Village of Ellenville and Town of Wawarsing, Ulster County

Subj: Joint Application for Permit

File: 924.068.002

Dear Mr. Petronella:

Barton & Loguidice, D.P.C. (B&L) has been retained by the Village of Ellenville and Town of Wawarsing in Ulster County for design and permitting assistance in regards to the Governor's Office of Storm Recovery (GOSR) funded Ellenville-Wawarsing Stream Bank Stabilization Project. The intent of the project is to address stream bank failure and floodplain improvements at various sites identified within the respective Village and Town in critical areas after substantial damage due to Super-storm Sandy, Hurricane Irene, and Tropical Storm Lee.

The work will require disturbances to stream resources preliminarily determined to be Waters of the U.S. (WOUS). This permit application will cover the Site identified as Site #13 along the Sandburg Creek. This disturbance will require a Nationwide Permit #13 for Bank Stabilization under Section 404 of the Clean Water Act from the United States Army Corps of Engineers (USACE), and 401 Water Quality Certification and an Article 15, Stream Disturbance permit, from the New York State Department of Environmental Conservation (NYSDEC). The Village of Ellenville is the Applicant/Sponsor for this project.

We are transmitting one copy of the Joint Application for Permit for your review comprised of the following Exhibits:

Exhibit 1: Joint Application Form
Exhibit 2: Project Description
Exhibit 3: Project Location Maps
Exhibit 4: Engineering Drawings
Exhibit 5: Threatened and Endangered Species Documentation
Exhibit 6: Historic and Cultural Resources Documentation

10 Airline Drive, Suite 200, Albany, NY 12205 ▪ Office: 518-218-1801 ▪ Fax: 518-218-1805 ▪ BartonandLoguidice.com

The experience to listen
The power to solve

Please note that the GOSR is currently assembling an Environmental Compliance Package that will include all support documentation for State Environmental Quality Review (SEQR), threatened and endangered species coordination with state and federal agencies, and historic/cultural resources review. This package will be forwarded when complete. It is anticipated that the projects will comply with all federal and state regulations in regards to these resources.

One copy of this permit application has also been sent to the USACE New York Office for concurrent review.

Thank you for your review of this application. Please do not hesitate to contact Rebecca Minas, Project Manager, or Corinne Steinmuller, Environmental Scientist, should you have any further questions at 518-218-1801 or rminas@bartonandloguidice.com and csteinmuller@bartonandloguidice.com, respectively.

Sincerely,

BARTON & LOGUIDICE, D.P.C.

Corinne I. Steinmuller
Environmental Scientist II

CIS/akg
Enclosures

Barton & Loguidice

November 14, 2019

Brian Orzel
U.S. Army Corps of Engineers
New York District
26 Federal Plaza, Room 1937
New York, New York 10278-0090

Re: Ellenville-Wawarsing Stream Bank Stabilization
Village of Ellenville and Town of Wawarsing, Ulster County

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Sincerely,

BARTON & LOGUIDICE, D.P.C.

Corinne I. Steinmuller
Environmental Scientist II

CIS/akg
Enclosures

NY Rising Streambank Stabilization Project

Site #10

Sandburg Creek

Town of Wawarsing, Ulster County, New York

Joint Application for Permit

November 2019

Barton&Loguidice

NY Rising Streambank Stabilization Project

Town of Wawarsing
Ulster County, New York

Joint Application for Permit – November 2019

Exhibit 1—Joint Application Form

Exhibit 2—Project Description

Exhibit 3—Project Location Maps

Exhibit 4—Design Plans

Exhibit 5 – Threatened and Endangered Species Documentation

Exhibit 6 – Historic and Cultural Resources Documentation

Barton & Loguidice

Exhibit 1

Joint Application for Permit Form

NEW YORK STATE | Department of Environmental Conservation | Office of General Services | Department of State

US Army Corps of Engineers

JOINT APPLICATION FORM

For Permits for activities activities affecting streams, waterways, waterbodies, wetlands, coastal areas, sources of water, and endangered and threatened species.

You must separately apply for and obtain Permits from each involved agency before starting work. Please read all instructions.

1. **Applications To:**

>NYS Department of Environmental Conservation ☑ Check here to confirm you sent this form to NYSDEC.

Check all permits that apply:

- ☑ Stream Disturbance
- ☐ Excavation and Fill in Navigable Waters
- ☐ Docks, Moorings or Platforms
- ☐ Dams and Impoundment Structures
- ☑ 401 Water Quality Certification
- ☐ Freshwater Wetlands
- ☐ Tidal Wetlands
- ☐ Wild, Scenic and Recreational Rivers
- ☐ Coastal Erosion Management
- ☐ Water Withdrawal
- ☐ Long Island Well
- ☐ Incidental Take of Endangered / Threatened Species

>US Army Corps of Engineers ☑ Check here to confirm you sent this form to USACE.

Check all permits that apply: ☑ Section 404 Clean Water Act ☐ Section 10 Rivers and Harbors Act

Is the project Federally funded? ☐ Yes ☐ No

If yes, name of Federal Agency:

General Permit Type(s), if known: #13, #27

Preconstruction Notification: ☐ Yes ☐ No

>NYS Office of General Services ☐ Check here to confirm you sent this form to NYSOGS.

Check all permits that apply:

☐ State Owned Lands Under Water

☐ Utility Easement (pipelines, conduits, cables, etc.) ☐ Docks, Moorings or Platforms

>NYS Department of State ☐ Check here to confirm you sent this form to NYSDOS.

Check if this applies: ☐ Coastal Consistency Concurrence

2. **Name of Applicant**

Town of Wawarsing c/o Terry Houck

Taxpayer ID (if applicant is NOT an individual)

Mailing Address	Post Office / City	State	Zip
PO Box 671	Ellenville	NY	12428

Telephone Email

Applicant Must be (check all that apply): ☐ Owner ☑ Operator ☐ Lessee

3. **Name of Property Owner (if different than Applicant)**

Mailing Address	Post Office / City	State	Zip

Telephone Email

For Agency Use Only	Agency Application Number:

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

4. **Name of Contact / Agent**

Corinne Steinmuller/ Barton and Loguidice, D.P.C.

Mailing Address	Post Office / City	State	Zip
10 Airline Drive	Albany	NY	12205

Telephone: 518-218-1801 x 2033 Email: csteinmuller@bartonandloguidice.com

5. **Project / Facility Name**

NY Rising Streambank Stabilization Project

Property Tax Map Section / Block / Lot Number:

Project Street Address, if applicable	Post Office / City	State	Zip
	Ellenville/Wawarsing	NY	Multiple

Provide directions and distances to roads, intersections, bridges and bodies of water

The project will cover 13 different sites within the Village and Town. See Exhibit 3 for attached location maps.

☐ Town ☐ Village ☐ City

Wawarsing	County: Ulster	Stream/Waterbody Name: Multiple

Project Location Coordinates: Enter Latitude and Longitude in degrees, minutes, seconds:

Latitude: 41 43 ' 5.05 " Longitude: 74 23 ' 52.28 "

6. **Project Description:** Provide the following information about your project. Continue each response and provide any additional information on other pages. **Attach plans on separate pages.**

a. Purpose of the proposed project:

The Village of Ellenville and Town of Wawarsing have been awarded a New York Rising grant to address flood resiliency post Hurrican Irene and Tropical Storm Lee. Degredation and erosion of stream banks have effected water quality through sediment deposition and remain a threat to infrastructure for future flood events.

b. Description of current site conditions:

Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing. This application is for the identified Site #1 on the West Branch Beer Kill.

c. Proposed site changes:

The goal is to restore severely eroded/damaged sites to be capable of withstanding large flood events. See Exhibit 2 for further details.

d. Type of structures and fill materials to be installed, and quantity of materials to be used (e.g., square feet of coverage, cubic yards of fill material, structures below ordinary/mean high water, etc.):

Rock cross vanes and grade control structures will be utilized. An existing rock retaining wall will be reconstructed to address deficiencies. See Exhibit 2 for details and quantities.

e. Area of excavation or dredging, volume of material to be removed, location of dredged material placement:

Excavation will be required for the creation of a new floodplain as well as installation of cross vanes and grade control structures. The stream will be restored to a single thread. See Exhibit 2 for details and quantities.

f. Is tree cutting or clearing proposed? ☐ Yes If Yes, explain below. ☐ No

Timing of the proposed cutting or clearing (month/year): TBD - will conduct emergence surveys

Number of trees to be cut: Acreage of trees to be cleared: <3 acres total

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

g. Work methods and type of equipment to be used:

Various equiment will be utilized depending on the action. At minimum, heavy equipment such as excavators and bulldozers are expected.

h. Describe the planned sequence of activities:

i. Pollution control methods and other actions proposed to mitigate environmental impacts:

For the duration of the project pollution control measures will be utilized by the contractor to minimize the potential pollution releases.

j. Erosion and silt control methods that will be used to prevent water quality impacts:

For the duration of the project stormwater site controls will be in place to minimize water quality impacts. At each site requiring in-stream entry, temporary cofferdams will be utilized to work in the dry, a turbidity curtain will be installed, and fiber rolls will be placed.

k. Alternatives considered to avoid regulated areas. If no feasible alternatives exist, explain how the project will minimize impacts:

No alternatives exist. Overall, this project will be beneficial to the resource. All appropriate erosion and sediment controls will be utilized during construction and post construction a more stable channels should be established, reducing overall sediment load into the basin and enhancing overal ecological function.

l. Proposed use: ☐ Private ☑ Public ☐ Commercial

m. Proposed Start Date: Summer 2019 Estimated Completion Date: Fall 2019

n. Has work begun on project? ☐ Yes If Yes, explain below. ☐ No

o. Will project occupy Federal, State, or Municipal Land? ☐ Yes If Yes, explain below. ☐ No

Portions of the project will occur on municipally owned land in the Town of Wawarsing.

p. List any previous NYSDEC or USACE Permit / Application numbers for activities at this location:

q. Will this project require additional Federal, State, or Local permits, including zoning changes?

☐ Yes If Yes, list below. ☐ No

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

7. **Signatures.**

Applicant and Owner (If different) must sign the application.
Append additional pages of this Signature section if there are multiple Applicants, Owners or Contact/Agents.

I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief.

Permission to Inspect - I hereby consent to Agency inspection of the project site and adjacent property areas. Agency staff may enter the property without notice between 7:00 am and 7:00 pm, Monday - Friday. Inspection may occur without the owner, applicant or agent present. If the property is posted with "keep out" signs or fenced with an unlocked gate, Agency staff may still enter the property. Agency staff may take measurements, analyze site physical characteristics, take soil and vegetation samples, sketch and photograph the site. I understand that failure to give this consent may result in denial of the permit(s) sought by this application.

False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the NYS Penal Law. Further, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project. In addition, Federal Law, 18 U.S.C., Section 1001 provides for a fine of not more than $10,000 or imprisonment for not more than 5 years, or both where an applicant knowingly and willingly falsifies, conceals, or covers up a material fact; or knowingly makes or uses a false, fictitious or fraudulent statement.

Signature of Applicant | Date

Applicant Must be (check all that apply): ☐ Owner ☑ Operator ☐ Lessee

Printed Name: Terry Houck | Title: Town Supervisor

Signature of Owner (if different than Applicant) | Date

Printed Name | Title

Signature of Contact / Agent | Date

Printed Name: Corinne Steinmuller/ Barton and Loguidice, D.P.C. | Title: Environmental Scientist

For Agency Use Only **DETERMINATION OF NO PERMIT REQUIRED**

Agency Application Number

(Agency Name) has determined that No Permit is required from this Agency for the project described in this application.

Agency Representative:

Printed Name | Title

Signature | Date

Exhibit 2

Project and Site Details

Exhibit 2
Project Description

Project Introduction

Governor Andrew M. Cuomo established the New York Rising Community Reconstruction (NYRCR) program to provide additional rebuilding and revitalization assistance to communities damaged by Super-storm Sandy, Hurricane Irene, and Tropical Storm Lee. The Governor's Office of Storm Recovery (GOSR) is managing the NYRCR program in partnership with the NYS Department of State (DOS). Additional support has been provided through the Regional Economic Development Council's (REDC) State Agency Review Teams. Nine project sites are proposed on various waterbodies located within the Village of Ellenville and in the Town of Wawarsing, Ulster County, New York. This Joint Application for Permit is specific to Site #10, on the Sandburg Creek in the Town of Wawarsing. See Exhibit 3, Project Location Maps, for further details.

Objectives

As a result of major storms in 2011 (Hurricane Irene and Tropical Storm Lee), the Village of Ellenville and Town of Wawarsing noted many of the stream resources surrounding the communities were significantly damaged. Bank failure and sedimentation were noted in numerous sites. As a result of post-storm analysis, 13 locations were initially selected to require the most urgent attention. This JAP is for proposed work at Site #10. Work at these sites is being progressed to:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, schools emergency services, and the Ellenville Regional Hospital;
- Provide long-term protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

Wetland Assessment

The project site was assessed for potential presence of wetlands. Prior to a field visit, the National Wetlands Inventory (NWI) and New York State Department of Environmental Conservation's (NYSDEC) Environmental Resource Mapper (ERM) were reviewed. No wetlands were mapped at or within the vicinity of the site. A preliminary field visit was performed on December 12, 2018 when no snow cover was present to determine whether formal delineation should occur on the site during the growing season. No potential wetlands were identified as the site was defined by steep slopes and the absence of floodplains. In addition, no remnants of hydrophytic vegetation were observed within the project's limit of disturbance.

Stream Resources

The project will occur along Sandburg Creek (Waters Index Number H-139-14-38) mapped within the Lower Hudson River Drainage Basin. The Sandburg Creek is a Class B with B(T) Standards, which indicates it supports trout habitat. The site is off of Hanglider Road in the Town of Wawarsing. The Sandburg Creek does not meet Federal or State standards for navigability within the project reach.

Permitting

NYSDEC: Article 15 Stream Disturbance Permit, Section 401 Water Quality Certification

United States Army Corps of Engineers (USACE): #13 for Streambank Stabilization, #27 for Aquatic Habitat Restoration, Establishment, and Enhancement Activities

Existing and Proposed Conditions

Site #10:

As Sandburg Creek approaches Hang Glider Road in Site 10, it flows through two very sharp meanders that have severely skewed the alignment of the existing channel in relation to the bridge crossing. These sharp bends create an exacerbated backwater condition during flooding, which results in overtopping the road, as well as accelerated erosion of the left bank upstream of the bridge. The lateral erosion of this bank continues to increase the angle and misalign the channel and the bridge approach. Two deep pools have formed at the sharp bends and the right bank at the further upstream bend was previously armored with rock to prevent the channel from cutting a direct channel to the bridge.

Design for the restoration/stabilization of Sandburg Creek at Site 10 involves some channel relocation to soften bend angles, grading the areas adjacent to the channel to create an interactive floodplain, installing cross vanes to anchor the bed elevation and to direct flow into the center of the channel away from currently eroding banks, and installing rock armor at critical locations to stabilize actively eroding banks. The restoration design is illustrated on Sheet C-172, and design channel cross sections are shown on Sheet C-173 in Exhibit 4. The erosion and sediment control plan and water management plan are presented on Sheet C-174, and the proposed planting plan is provided on Sheet C-175 in Exhibit 4. Table 1, below, quantifies the proposed stream impacts.

Table 1. Impacts to the West Branch Beer Kill

Site	Length (ft)	Width (ft)	Area of Disturbance (sq ft)	Excavation Quantity (CY)	Backfill Quantity (CY)	Rock Structures (CY)	Total Fill (CY)	Net Fill (CY)
10	750	110	82,500	3,200	1,200	347	1547	-1653

Means and Methods

De-watering and Erosion and Sediment Control:

The contractor shall submit a proposed dewatering/sediment control plan to the Engineer for review and approval prior to work start. The plan will be required to achieve dewatering and sediment controls per the elements noted on the Typical Section and Details(Sheet C-1001 in Exhibit 4) to ensure protection of the water quality of Sandburg Creek. A construction sequence plan will also be a required

submission for review that demonstrates a logical order of the work and minimizes impacts to the local environment and traffic.

While the contractor will ultimately submit a specific dewatering/sediment control plan, the plans specify that sandbags/stone barriers are to be used as cofferdams/channel blockers to allow for work to be completed in the dry. A turbidity curtain and compost filter socks are recommended for use. This system shall be repeated as many times as necessary for Site #10. All disturbed areas will be restored to pre-construction conditions.

Re-vegetation:

A native riparian seed mix will be applied to the stream banks, benches, and overbank areas in the immediate riparian corridor or within any disturbed areas. Native trees and shrubs will be vital to encourage stabilization of the banks and evaluation of the establishment of the plantings will be included in the post-construction monitoring plan.

Sheets C301 – C302 in Exhibit 4 present General Details for the project, and Sheet C501 illustrates the proposed Erosion and Sediment Controls.

Property Ownership

The project area of Site #10 is owned by five different property owners. Arrangements are currently being made with the property owners for permanent easements on their properties for restoration work in the project area. A summary of the easement types and property owners is provided in Table 2.

Table 2. Current Property Owner Easement Information

Easement Type	Size (ac)	Owner	Property Address and Tax I.D.	Mailing Address
Permanent	0.14	Nevele-R, LLC (ownership changed to STAR Nevele Owner, LLC	1100 Arrowhead Rd., 91.1-1-6.110	PO Box 388
Permanent	1.25	Grace Kennedy & Patricia Sherry	Rt 209, 90.2-3-13	8552 Route 209
Permanent	0.25	Kelly Sand & Gravel, Inc.	8537-8543 Rt 209, 90.4-2-13	8552 Rt 209
Permanent	1.21	Antonio Covelli	80 Hang Glider Rd, 91.1-1-10	80 Hang Glider Rd
Permanent	0.12	Joseph Noval & Stanley Noval	39 Hang Glider Rd., 91.1-1-11	PO Box 643

Threatened and Endangered Species

The following databases were queried to determine the potential for threatened and endangered species to be impacted by this effort.

United States Fish and Wildlife Service:

The United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation site (IPaC) reported two threatened and one endangered species for the project area of Site 10: the threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*), the endangered Indiana bat (IBat) (*Myotis sodalis*), and the threatened bog turtle (*Clemmys muhlenbergii*). In accordance with the 2016 USFWS' Range-wide Indiana Bat Summer Survey Guidelines (this document also applies to NLEBs), suitable roosting and foraging habitat for the IBat and NLEB includes mixed age stands of trees greater than 3 inches diameter at breast height (DBH), with foraging habitat frequently containing areas of open

water or open travel corridors. Man-made structures such as bridges also provide suitable habitat. These habitat requirements were observed within and adjacent to the proposed project area.

A Phase I habitat assessment was conducted through sub-contracted services by the GOSR on April 2, 2019. The site was found to have suitable bat roosting habitat.

The bog turtle prefers spring-fed wetlands with deep, soft "mucky" organic soils, into which they can burrow. Suitable habitat often also contains tussock-forming herbaceous vegetation dominated by various sedge species. No wetlands were identified within or immediately adjacent to the limits of the proposed project area. The assumption is being made that bog turtle habitat does not exist within or adjacent to the project area.

New York State:

The NYSDEC ERM reported no rare species or significant natural communities in the project area. The GOSR coordinated with the New York Natural Heritage Program (NHP) and a response received on November 7, 2018 indicated no records of state protected species at Site #10.

The New York State Breeding Bird Atlas (BBA) reported eight NYS species of special concern, listed in the table below, observed in the survey blocks that included the project area.

Table 3. BBA Identified Species

Common Name	Scientific Name	NY Status
Red-shouldered hawk	*Buteo lineatus*	Protected-Special Concern
Grasshopper sparrow	*Ammodramus savannarum*	Protected-Special Concern
Whip-poor-will	*Caprimulgus vociferus*	Protected-Special Concern
Osprey	*Pandion haliaetus*	Protected-Special Concern
Sharp-shinned hawk	*Accipiter striatus*	Protected-Special Concern
Cooper's hawk	*Accipiter cooperii*	Protected-Special Concern
Northern goshawk	*Accipiter gentilis*	Protected-Special Concern
Golden-winged warbler	*Vermivora chrysoptera*	Protected-Special Concern

It is possible that these species could utilize the project sites and adjacent areas. However, beyond temporary construction disturbance, no impacts will occur to their habitat or the species themselves. Post construction, the streams will function better ecologically and may benefit certain of the species listed above due to improved habitat.

The GOSR coordinated with USFWS and NYSDEC to determine the projects potential impact on Threatened and Endangered Species. For the protection of the bat species, it is recommended that emergence surveys be conducted the night prior to tree removals if they are to be removed between April 1 and October 31, when bats are active. A letter was received from USFWS on April 17, 2019, indicating concurrence and that no further coordination or consultation was required under the ESA at this time. This letter is included in Exhibit 5, Threatened and Endangered Species Documentation.

Cultural Resources

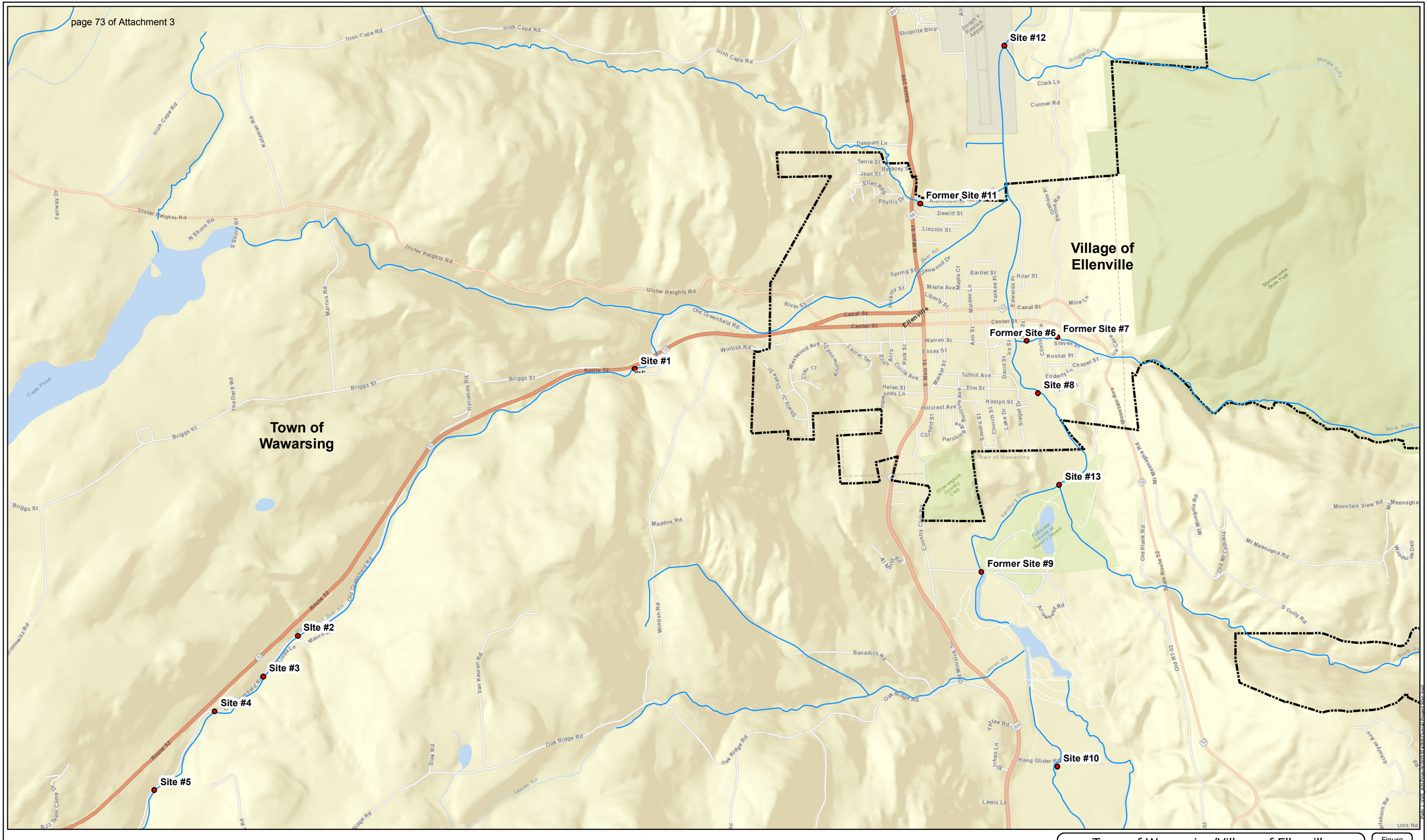
The GOSR coordinated with New York State Office of Parks, Recreation, and Historic Preservation's (NYSOPRHP) State Historic Preservation Office (SHPO) and Tribal Historic Preservation Offices (THPOs) to determine the project's potential impact on cultural resources. On June 19, 2017 the SHPO requested a Phase 1A Archaeological Survey on the site. Subsequently, an archaeological firm (Landmark Archaeology, Inc.) was subcontracted to perform the survey and the summary report was submitted to SHPO in May 2019. On June 5, 2019, SHPO requested a Phase 1B Archaeological Survey at site #13. This survey was performed by Christine Davis Consultants in July 2019, and the SHPO issued a letter on August 13, 2019 that, based on the results of these surveys and previously submitted information, no historic properties, including archaeological and/or historic resources, will be affected by this project. Letters received from SHPO are included in Exhibit 6.

State Environmental Quality Review

The GOSR has determined the Wawarsing/Ellenville Stream Restoration Project is classified as an Unlisted Action under the State Environmental Quality Review Act (SEQRA), 6 NYCRR Part 617. The GOSR declared intent to be Lead Agency on February 20, 2019 and subsequently circulated Part 1 of the Full Environmental Assessment Form (FEAF) to interested and involved agencies. Coordination is ongoing and a determination will be forwarded once it is received.

Exhibit 3

Site Figures



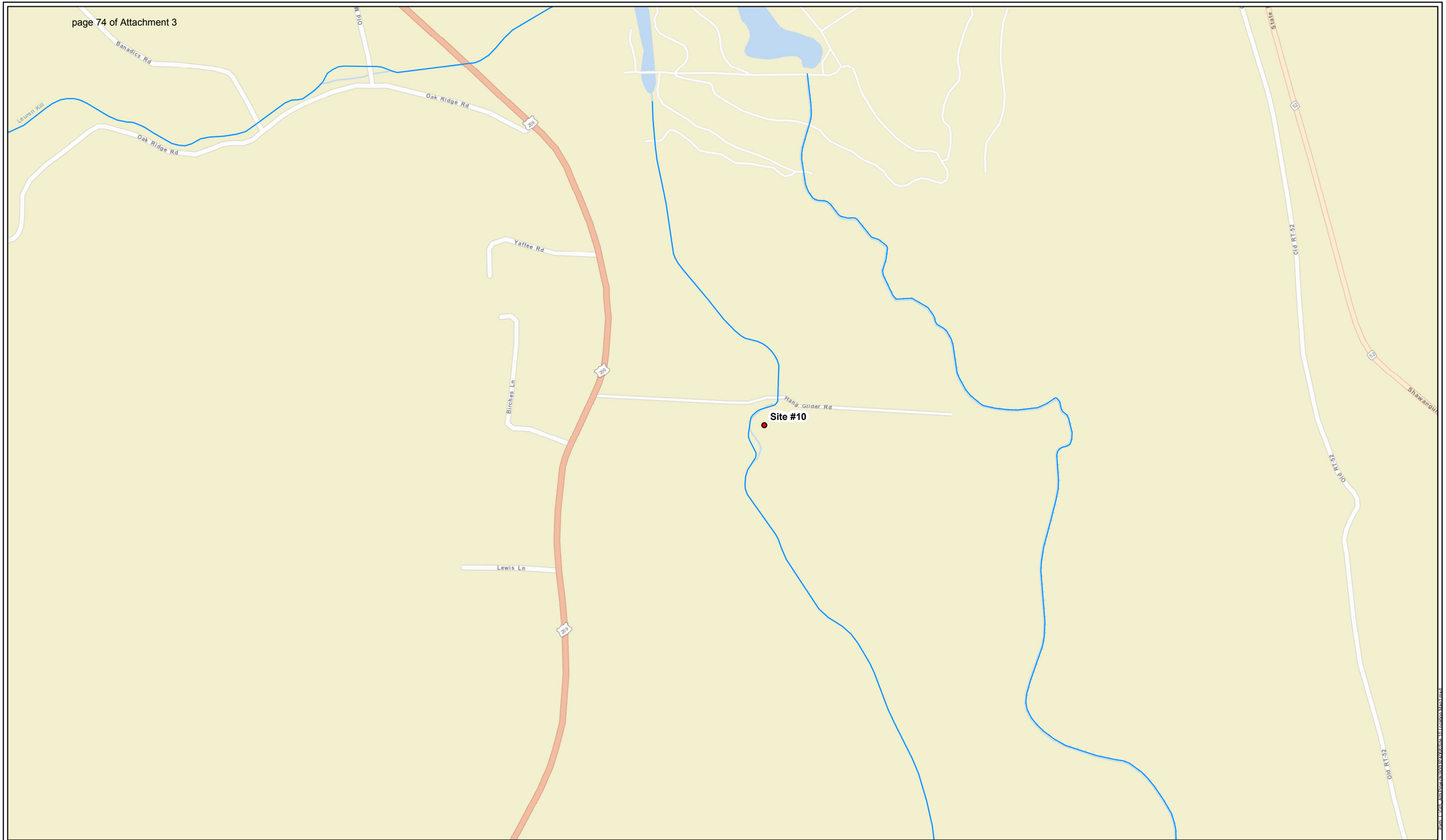
Barton & Loguidice

1 inch = 2,000 feet

Town of Wawarsing/Village of Ellenville
GOSR Stream Restoration
Overall Project Location Map
Ulster County 1/14/2019 New York

Figure 1

Project No. 924.068



Barton & Loguidice

1 inch = 500 feet

Town of Wawarsing/Village of Ellenville

GOSR Stream Restoration Site 10

Ulster County 1/14/2019 New York

Figure 2

Project No. 924.068

Barton & Loguidice

November 14, 2019

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Regional Permit Administrator
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The experience to listen
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Sincerely,

BARTON & LOGUIDICE, D.P.C.

Corinne I. Steinmuller
Environmental Scientist II

CIS/akg
Enclosures

Barton & Loguidice

November 14, 2019

Brian Orzel
U.S. Army Corps of Engineers
New York District
26 Federal Plaza, Room 1937
New York, New York 10278-0090

Re: Ellenville-Wawarsing Stream Bank Stabilization
Village of Ellenville and Town of Wawarsing, Ulster County

Subj: Joint Application for Permit

File: 924.068.002

Dear Mr. Orzel:

Barton & Loguidice, D.P.C. (B&L) has been retained by the Village of Ellenville and Town of Wawarsing in Ulster County for design and permitting assistance in regards to the Governor's Office of Storm Recovery (GOSR) funded Ellenville-Wawarsing Stream Bank Stabilization Project. The intent of the project is to address stream bank failure and construct floodplain improvements at various sites identified within the respective Village and Town in critical areas after substantial damage due to Super-storm Sandy, Hurricane Irene, and Tropical Storm Lee.

The work will require disturbance to stream resources preliminarily determined to be Waters of the U.S. (WOUS). This permit application will cover the Site identified as #1 along the West Branch Beer Kill. These disturbances will require an Individual Permit under Section 404 of the Clean Water Act from the United States Army Corps of Engineers (USACE), and 401 Water Quality Certification and an Article 15 Stream Disturbance permit from the New York State Department of Environmental Conservation (NYSDEC). In addition, a preliminary jurisdictional determination is requested from the USACE. The Village of Ellenville is the Applicant/Sponsor for this project.

We are transmitting one copy of the Joint Application for Permit for your review comprised of the following Exhibits:

Exhibit 1: Joint Application Form
Exhibit 2: Project Description
Exhibit 3: Project Location Maps
Exhibit 4: Engineering Drawings
Exhibit 5: Threatened and Endangered Species Documentation
Exhibit 6: Historic and Cultural Resources Documentation

10 Airline Drive, Suite 200, Albany, NY 12205 ▪ Office: 518-218-1801 ▪ Fax: 518-218-1805 ▪ BartonandLoguidice.com

The experience to listen
The power to solve

Please note that the GOSR is currently assembling an Environmental Compliance Package that will include all support documentation for State Environmental Quality Review (SEQR), threatened and endangered species coordination with state and federal agencies, and historic/cultural resources review. This package will be forwarded when complete. It is anticipated that the projects will comply with all federal and state regulations in regards to these resources.

Two copies of this permit application have also been sent to the Region 3 Permits Administrator with the NYSDEC for concurrent review.

Thank you for your review of this application. Please do not hesitate to contact Rebecca Minas, Project Manager, or Corinne Steinmuller, Environmental Scientist, should you have any further questions at 518-218-1801 or rminas@bartonandloguidice.com and csteinmuller@bartonandloguidice.com, respectively.

Sincerely,

BARTON & LOGUIDICE, D.P.C.

Corinne I. Steinmuller
Environmental Scientist II

CIS/akg
Enclosures

NY Rising Streambank Stabilization Project

Site #13

Sandburg Creek

Town of Wawarsing, Ulster County, New York

Joint Application for Permit

November 2019

Barton&Loguidice

NY Rising Streambank Stabilization Project

Town of Wawarsing
Ulster County, New York

Joint Application for Permit – November 2019

Exhibit 1—Joint Application Form

Exhibit 2—Project Description

Exhibit 3—Project Location Maps

Exhibit 4—Design Plans

Exhibit 5 – Threatened and Endangered Species Documentation

Exhibit 6 – Historic and Cultural Resources Documentation

Barton & Loguidice

Exhibit 1

Joint Application for Permit Form

NEW YORK STATE | Department of Environmental Conservation | Office of General Services | Department of State

US Army Corps of Engineers

JOINT APPLICATION FORM

For Permits for activities activities affecting streams, waterways, waterbodies, wetlands, coastal areas, sources of water, and endangered and threatened species.

You must separately apply for and obtain Permits from each involved agency before starting work. Please read all instructions.

1. **Applications To:**

>NYS Department of Environmental Conservation ☑ Check here to confirm you sent this form to NYSDEC.

Check all permits that apply:

- ☑ Stream Disturbance
- ☐ Excavation and Fill in Navigable Waters
- ☐ Docks, Moorings or Platforms
- ☐ Dams and Impoundment Structures
- ☑ 401 Water Quality Certification
- ☐ Freshwater Wetlands
- ☐ Tidal Wetlands
- ☐ Wild, Scenic and Recreational Rivers
- ☐ Coastal Erosion Management
- ☐ Water Withdrawal
- ☐ Long Island Well
- ☐ Incidental Take of Endangered / Threatened Species

>US Army Corps of Engineers ☑ Check here to confirm you sent this form to USACE.

Check all permits that apply: ☑ Section 404 Clean Water Act ☐ Section 10 Rivers and Harbors Act

Is the project Federally funded? ☐ Yes ☐ No

If yes, name of Federal Agency:

General Permit Type(s), if known: #13, #27

Preconstruction Notification: ☐ Yes ☐ No

>NYS Office of General Services ☐ Check here to confirm you sent this form to NYSOGS.

Check all permits that apply:

☐ State Owned Lands Under Water

☐ Utility Easement (pipelines, conduits, cables, etc.) ☐ Docks, Moorings or Platforms

>NYS Department of State ☐ Check here to confirm you sent this form to NYSDOS.

Check if this applies: ☐ Coastal Consistency Concurrence

2. **Name of Applicant**

Town of Wawarsing c/o Terry Houck

Taxpayer ID (if applicant is NOT an individual)

Mailing Address	Post Office / City	State	Zip
PO Box 671	Ellenville	NY	12428

Telephone Email

Applicant Must be (check all that apply): ☐ Owner ☑ Operator ☐ Lessee

3. **Name of Property Owner (if different than Applicant)**

Mailing Address	Post Office / City	State	Zip

Telephone Email

For Agency Use Only	Agency Application Number:

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

4. **Name of Contact / Agent**

Corinne Steinmuller/ Barton and Loguidice, D.P.C.

Mailing Address	Post Office / City	State	Zip
10 Airline Drive	Albany	NY	12205

Telephone: 518-218-1801 x 2033 Email: csteinmuller@bartonandloguidice.com

5. **Project / Facility Name**

NY Rising Streambank Stabilization Project

Property Tax Map Section / Block / Lot Number:

Project Street Address, if applicable	Post Office / City	State	Zip
	Ellenville/Wawarsing	NY	Multiple

Provide directions and distances to roads, intersections, bridges and bodies of water

The project will cover 13 different sites within the Village and Town. See Exhibit 3 for attached location maps.

☐ Town ☐ Village ☐ City

Wawarsing	County: Ulster	Stream/Waterbody Name: Multiple

Project Location Coordinates: Enter Latitude and Longitude in degrees, minutes, seconds:

Latitude: 41 43 ' 5.05 " Longitude: 74 23 ' 52.28 "

6. **Project Description:** Provide the following information about your project. Continue each response and provide any additional information on other pages. **Attach plans on separate pages.**

a. Purpose of the proposed project:

The Village of Ellenville and Town of Wawarsing have been awarded a New York Rising grant to address flood resiliency post Hurrican Irene and Tropical Storm Lee. Degredation and erosion of stream banks have effected water quality through sediment deposition and remain a threat to infrastructure for future flood events.

b. Description of current site conditions:

Hurricane Irene and Tropical Storm Lee caused widespread flooding, resulting in stream bank and streambed erosion and some areas of sediment deposition along major streams in the Village of Ellenville, and surrounding Town of Wawarsing. This application is for the identified Site #1 on the West Branch Beer Kill.

c. Proposed site changes:

The goal is to restore severely eroded/damaged sites to be capable of withstanding large flood events. See Exhibit 2 for further details.

d. Type of structures and fill materials to be installed, and quantity of materials to be used (e.g., square feet of coverage, cubic yards of fill material, structures below ordinary/mean high water, etc.):

Rock cross vanes and grade control structures will be utilized. An existing rock retaining wall will be reconstructed to address deficiencies. See Exhibit 2 for details and quantities.

e. Area of excavation or dredging, volume of material to be removed, location of dredged material placement:

Excavation will be required for the creation of a new floodplain as well as installation of cross vanes and grade control structures. The stream will be restored to a single thread. See Exhibit 2 for details and quantities.

f. Is tree cutting or clearing proposed? ☐ Yes If Yes, explain below. ☐ No

Timing of the proposed cutting or clearing (month/year): TBD - will conduct emergence surveys

Number of trees to be cut: Acreage of trees to be cleared: <3 acres total

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

g. Work methods and type of equipment to be used:

Various equiment will be utilized depending on the action. At minimum, heavy equipment such as excavators and bulldozers are expected.

h. Describe the planned sequence of activities:

i. Pollution control methods and other actions proposed to mitigate environmental impacts:

For the duration of the project pollution control measures will be utilized by the contractor to minimize the potential pollution releases.

j. Erosion and silt control methods that will be used to prevent water quality impacts:

For the duration of the project stormwater site controls will be in place to minimize water quality impacts. At each site requiring in-stream entry, temporary cofferdams will be utilized to work in the dry, a turbidity curtain will be installed, and fiber rolls will be placed.

k. Alternatives considered to avoid regulated areas. If no feasible alternatives exist, explain how the project will minimize impacts:

No alternatives exist. Overall, this project will be beneficial to the resource. All appropriate erosion and sediment controls will be utilized during construction and post construction a more stable channels should be established, reducing overall sediment load into the basin and enhancing overal ecological function.

l. Proposed use: ☐ Private ☑ Public ☐ Commercial

m. Proposed Start Date: Summer 2019 Estimated Completion Date: Fall 2019

n. Has work begun on project? ☐ Yes If Yes, explain below. ☐ No

o. Will project occupy Federal, State, or Municipal Land? ☐ Yes If Yes, explain below. ☐ No

Portions of the project will occur on municipally owned land in the Town of Wawarsing.

p. List any previous NYSDEC or USACE Permit / Application numbers for activities at this location:

q. Will this project require additional Federal, State, or Local permits, including zoning changes?

☐ Yes If Yes, list below. ☐ No

JOINT APPLICATION FORM – Continued. Submit this completed page as part of your Application.

7. **Signatures.**

Applicant and Owner (If different) must sign the application.
Append additional pages of this Signature section if there are multiple Applicants, Owners or Contact/Agents.

I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief.

Permission to Inspect - I hereby consent to Agency inspection of the project site and adjacent property areas. Agency staff may enter the property without notice between 7:00 am and 7:00 pm, Monday - Friday. Inspection may occur without the owner, applicant or agent present. If the property is posted with "keep out" signs or fenced with an unlocked gate, Agency staff may still enter the property. Agency staff may take measurements, analyze site physical characteristics, take soil and vegetation samples, sketch and photograph the site. I understand that failure to give this consent may result in denial of the permit(s) sought by this application.

False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the NYS Penal Law. Further, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project. In addition, Federal Law, 18 U.S.C., Section 1001 provides for a fine of not more than $10,000 or imprisonment for not more than 5 years, or both where an applicant knowingly and willingly falsifies, conceals, or covers up a material fact; or knowingly makes or uses a false, fictitious or fraudulent statement.

Signature of Applicant | Date

Applicant Must be (check all that apply): ☐ Owner ☑ Operator ☐ Lessee

Printed Name: Terry Houck | Title: Town Supervisor

Signature of Owner (if different than Applicant) | Date

Printed Name | Title

Signature of Contact / Agent | Date

Printed Name: Corinne Steinmuller/ Barton and Loguidice, D.P.C. | Title: Environmental Scientist

For Agency Use Only **DETERMINATION OF NO PERMIT REQUIRED**

Agency Application Number

(Agency Name) has determined that No Permit is required from this Agency for the project described in this application.

Agency Representative:

Printed Name | Title

Signature | Date

Exhibit 2

Project and Site Details

Exhibit 2
Project Description

Project Introduction

Governor Andrew M. Cuomo established the New York Rising Community Reconstruction (NYRCR) program to provide additional rebuilding and revitalization assistance to communities damaged by Super-storm Sandy, Hurricane Irene, and Tropical Storm Lee. The Governor's Office of Storm Recovery (GOSR) is managing the NYRCR program in partnership with the NYS Department of State (DOS). Additional support has been provided through the Regional Economic Development Council's (REDC) State Agency Review Teams. Nine project sites are proposed on various waterbodies located within the Village of Ellenville and in the Town of Wawarsing, Ulster County, New York. This Joint Application for Permit is specific to Site #13, located on the West Branch Beer Kill in the Town of Wawarsing. See Exhibit 3, Project Location Maps, for further details.

Objectives

As a result of major storms in 2011 (Hurricane Irene and Tropical Storm Lee), the Village of Ellenville and Town of Wawarsing noted many of the stream resources surrounding the communities were significantly damaged. Bank failure and sedimentation were noted in numerous sites. As a result of post-storm analysis, 13 locations were initially selected to require the most urgent attention. This JAP is for proposed work at Site #13. Work at this site is being progressed to:

- Increase the channels' ability to handle water flow, therefore reducing hazard exposure to nearby assets including wastewater treatment plants, schools emergency services, and the Ellenville Regional Hospital;
- Provide long-term protection of homes and businesses thereby encouraging economic health by ensuring retention of residents and commercial tax base;
- Restore the health, resiliency, and capacity of the subject waterways to better support biological diversity and resulting increases to water quality; and
- Reduce roadway inundation that can limit local and regional access to/from emergency, health, and social service providers and facilities.

Wetland Assessment

The project site was assessed for potential presence of wetlands. Prior to a field visit, the National Wetlands Inventory (NWI) and New York State Department of Environmental Conservation's (NYSDEC) Environmental Resource Mapper (ERM) were reviewed. No wetlands were mapped at or within the vicinity of the site. A preliminary field visit was performed on December 12, 2018 when no snow cover was present to determine whether formal delineation should occur during the growing season. No potential wetlands were identified as the site was defined by steep slopes and the absence of floodplains. In addition, no remnants of hydrophytic vegetation were observed within the project's limit of disturbance.

Stream Resources

The project will occur on Sandburg Creek (Waters Index Number H-139-14-38), mapped within the Lower Hudson River Drainage Basin. This site is located at the golf course in the Town of Wawarsing. The Sandburg Creek is classified as a Class B stream with a (T) Standard, which indicates it supports trout habitat. The Sandburg Creek does not meet Federal or State standards for navigability within the project reach.

Permitting

NYSDEC: Article 15 Stream Disturbance Permit, Section 401 Water Quality Certification

United States Army Corps of Engineers (USACE): #13 for Streambank Stabilization, #27 for Aquatic Habitat Restoration, Establishment, and Enhancement Activities

Existing and Proposed Conditions

Site #13:

This stream segment is impacted by the delivery of large quantities of sediment from the adjoining South Gully, which meets Sandburg Creek at the upper limit of the project reach. Existing conditions exhibit evidence of significant channel braiding and avulsion attributable to the deposition of large volumes of bedload, most likely derived from bed and bank erosion from South Gully. Over-widening of the channel has occurred immediately adjacent to the location of the existing pump houses, reducing sediment transport capability and promoting continued deposition of sediment as a result of the increased width/depth ratio. Furthermore, lateral migration of the right channel braid has vastly accelerated erosion of the right bank and threatens the longevity of the recently retrofitted pump houses that are perched atop this actively-eroding streambank.

Site 13 will be restored and stabilized using natural channel design applications to appropriately size a single thread channel through the over-widened portion of this reach. Adjacent former channel areas will be graded to create and vegetate interactive floodplains along the left and right banks through the restored reach. Instream structures, consisting of constructed riffles will be utilized to maintain the dimensions of the single-thread channel, reduce the risk of streambank erosion and/or avulsion across the newly reconstructed floodplain, and maintain suitable grade control through the project reach. In addition, erosion-prone bank areas will be armored with rock to protect the pumphouse from erosion.

The most critical aspect of the project is the design of an appropriate channel cross-section, profile and planform to allow for transport of significant sediment loads, delivered from South Gully to this segment of the Sandburg Creek during high-water events, without attributing to channel aggrading or degrading. Secondly, the development of an extensive, vegetated floodplain between the restored channel and the pump houses will provide an additional element of protection from damages associated with lateral meander migration, streambank erosion, and bank failure. Existing conditions are illustrated on Sheets C-181 and C-182 in Exhibit 4.

Table 1, below, quantifies the proposed stream impacts.

Table 1. Impacts to the West Branch Beer Kill								
Site	Length (ft)	Width (ft)	Area of Disturbance (sq ft)	Excavation Quantity (CY)	Backfill Quantity (CY)	Rock Structures (CY)	Total Fill (CY)	Net Fill (CY)
13	600	75	45000	370	750	330	1080	710

Means and Methods

De-watering and Erosion and Sediment Control:

The contractor shall submit a proposed dewatering/sediment control plan to the Engineer for review and approval prior to work start. The plan will be required to achieve dewatering and sediment controls using the elements noted on the Typical Section and Details (Sheet C-1001 in Exhibit 4) to ensure protection of the water quality of Sandburg Creek. A construction sequence plan will also be a required submission for review that demonstrates a logical order of the work and minimizes impacts to the local environment and traffic.

The following specifications will be included in the contract documents: The project shall be staged such that the dewatered “work area” shall be limited to an amount of work to be completed within one to two days. At the discretion of the contractor, the work area will be delineated by a stone wall barrier, or alternative practice acceptable to the Engineer. Where feasible, excavated spoil material and stones will be used to create the barrier. Prior to construction of the barrier, a turbidity curtain shall be placed on the downstream side of the barrier to capture sediment during barrier construction and excavation, and on the upstream side to deflect stream flow around the work area. Once the barrier is in place, a pump(s) and hose(s) shall be used to dewater the work area to the extent necessary to perform the work. This system shall be repeated as many times as necessary for Site #13. All disturbed areas will be restored to pre-construction conditions.

Re-vegetation:

A native riparian seed mix will be applied to the stream banks, benches, and overbank areas in the immediate riparian corridor or within any disturbed areas. Native trees and shrubs will be vital to encourage stabilization of the banks and evaluation of the establishment of the plantings will be included in the post-construction monitoring plan.

Sheets C301 – C302 in Exhibit 4 present General Details for the project, and Sheet C501 illustrates the proposed Erosion and Sediment Controls.

Property Ownership

The project area of Site #13 is owned by two different property owners. Arrangements are currently being made with the property owners for permanent easements on their properties for restoration work in the project area. A summary of the easement types and property owners is provided in Table 2.

Table 2. Current Property Owner Easement Information

Easement Type	Size (ac)	Owner	Property Address and Tax I.D.	Mailing Address
Permanent	1.8	Nikolaos Panagiotopoulos	Sandra St.: 91.1-1-2.210	35 Sandra St., Ellenville NY 12428
Permanent	1.07	Ellenville Real Estate Holding, LLC	1195 Arrowhead Rd.: 91.1-1-3.100	1195 Arrowhead Rd., Ellenville NY 12428

Threatened and Endangered Species

The following databases were queried to determine the potential for threatened and endangered species to be impacted by this effort.

United States Fish and Wildlife Service:

The United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation site (IPaC) reported two threatened and one endangered species for the project area of Site #13 the threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*), the endangered Indiana bat (IBat) (*Myotis sodalis*), and the threatened bog turtle (*Clemmys muhlenbergii*). In accordance with the 2016 USFWS' Range-wide Indiana Bat Summer Survey Guidelines (this document also applies to NLEBs), suitable roosting and foraging habitat for the IBat and NLEB includes mixed age stands of trees greater than 3 inches diameter at breast height (DBH), with foraging habitat frequently containing areas of open water or open travel corridors. Man-made structures such as bridges also provide suitable habitat. These habitat requirements were observed within and adjacent to the proposed project area.

A Phase I habitat assessment was conducted through sub-contracted services by the GOSR on April 2, 2019. The site was found to have suitable roosting habitat for bats.

The bog turtle prefers spring-fed wetlands with deep, soft "mucky" organic soils, into which they can burrow. Suitable habitat often also contains tussock-forming herbaceous vegetation dominated by various sedge species. No wetlands were identified within or immediately adjacent to the limits of the proposed project area. Therefore, the assumption is being made that bog turtle habitat does not exist within or adjacent to the project area.

New York State:

The NYSDEC ERM reported no rare species or significant natural communities in the project area. The GOSR coordinated with the New York Natural Heritage Program (NHP) and a response received on November 7, 2018 indicated no records of state protected species at Site 13.

The New York State Breeding Bird Atlas (BBA) reported eight NYS species of special concern, listed in the table below, observed in the survey blocks that included the project area.

Table 3. BBA Identified Species		
Common Name	**Scientific Name**	**NY Status**
Red-shouldered hawk	*Buteo lineatus*	Protected-Special Concern
Grasshopper sparrow	*Ammodramus savannarum*	Protected-Special Concern
Whip-poor-will	*Caprimulgus vociferus*	Protected-Special Concern
Osprey	*Pandion haliaetus*	Protected-Special Concern
Sharp-shinned hawk	*Accipiter striatus*	Protected-Special Concern
Cooper's hawk	*Accipiter cooperii*	Protected-Special Concern
Northern goshawk	*Accipiter gentilis*	Protected-Special Concern
Golden-winged warbler	*Vermivora chrysoptera*	Protected-Special Concern

It is possible that these species could utilize the project sites and adjacent areas. However, beyond temporary construction disturbance, no impacts will occur to the habitat or the species themselves. Post construction, the streams will function better ecologically and may benefit certain of the species listed above due to improved habitat.

The GOSR coordinated with USFWS and NYSDEC to determine the projects potential impact on Threatened and Endangered Species. For the bat species, it is recommended that emergence surveys be conducted the night prior to tree removals if they are to be removed between April 1 and October 31, when bats are active. A letter was received from USFWS on April 17, 2019, indicating concurrence and that no further coordination or consultation was required under the ESA at this time. This letter is included in Exhibit 5, Threatened and Endangered Species Documentation.

Cultural Resources

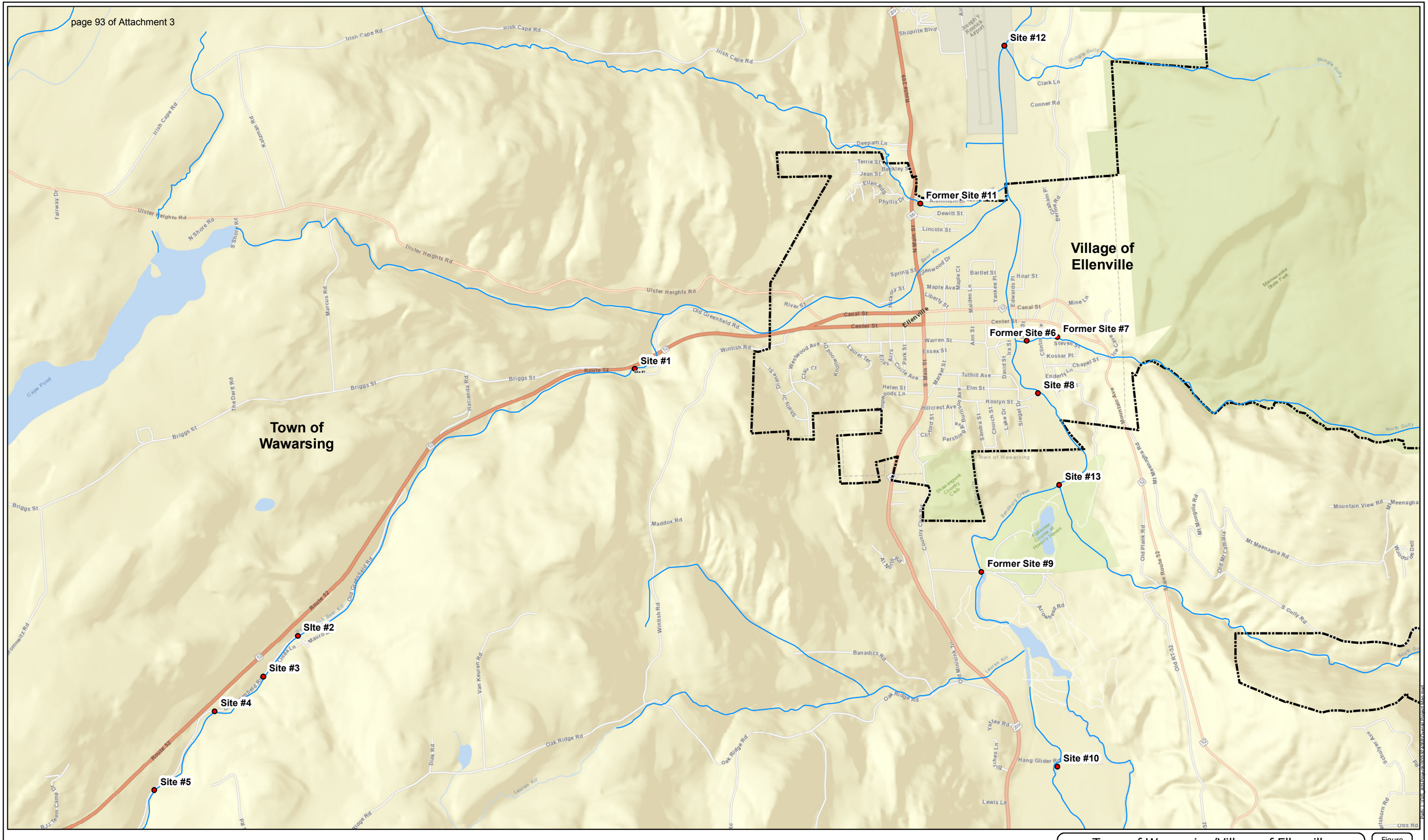
The GOSR coordinated with New York State Office of Parks, Recreation, and Historic Preservation's (NYSOPRHP) State Historic Preservation Office (SHPO) and Tribal Historic Preservation Offices (THPOs) to determine the projects potential impact on cultural resources. On June 19th, 2017, the SHPO requested a Phase 1A Archaeological Survey for the site. Subsequently, an archaeological firm (Landmark Archaeology, Inc.) was subcontracted to perform the survey and the report was submitted to SHPO in May 2019. On June 5, 2019, SHPO requested a Phase 1B Archaeological Survey at sites #13. This survey was performed by Christine Davis Consultants in July 2019, and the SHPO issued a letter on August 13, 2019 that, based on these surveys and previously submitted information, no historic properties, including archaeological and/or historic resources, will be affected by this project. Letters received from SHPO are included in Exhibit 6.

State Environmental Quality Review

The GOSR has determined the Wawarsing/Ellenville Stream Restoration Project is classified as an Unlisted Action under the State Environmental Quality Review Act (SEQRA), 6 NYCRR Part 617. The GOSR declared intent to be Lead Agency on February 20, 2019 and subsequently circulated Part 1 of the Full Environmental Assessment Form (FEAF) to interested and involved agencies. Coordination is ongoing and the final determination will be forwarded once it is received.

Exhibit 3

Site Figures



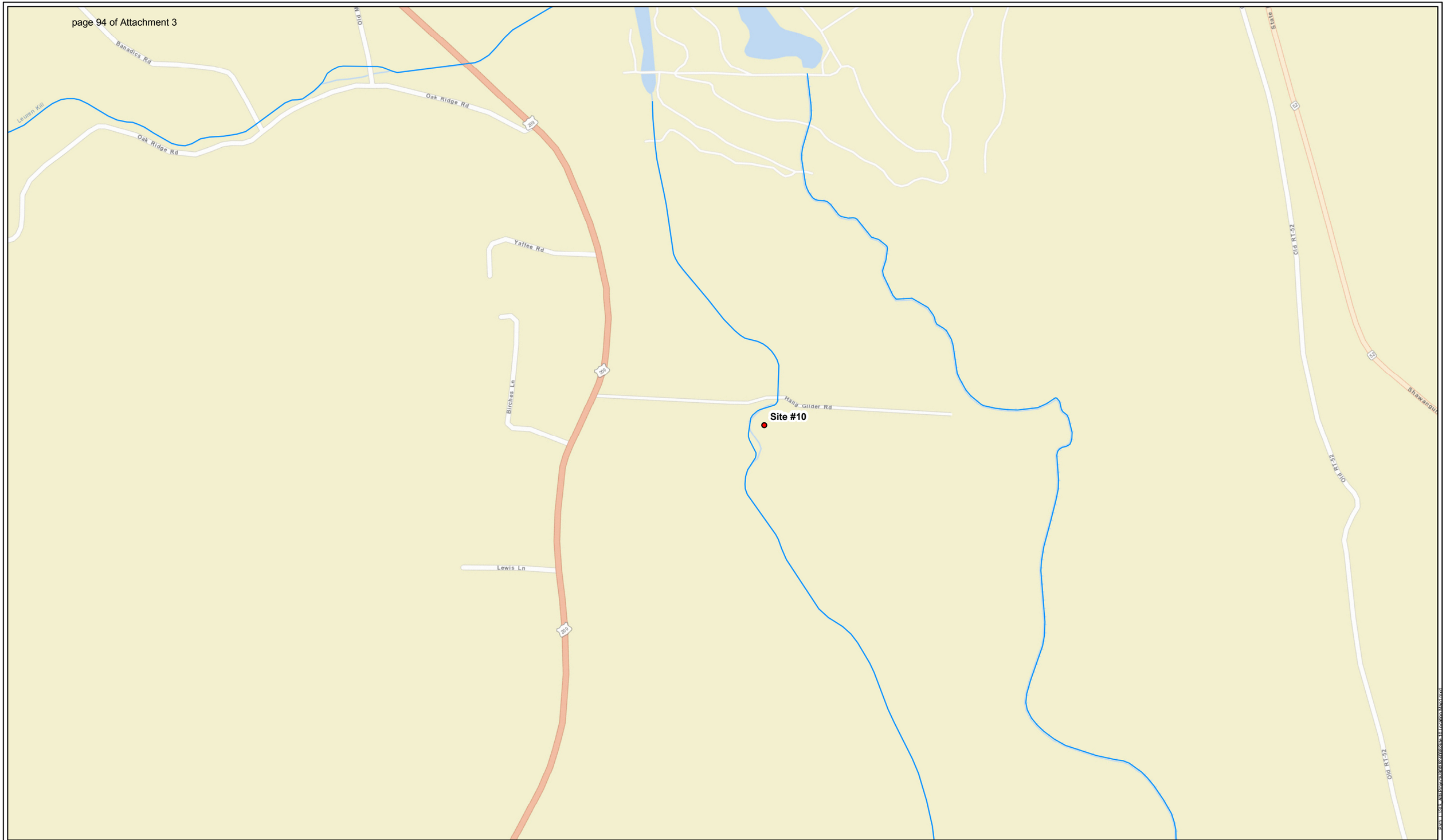
Barton & Loguidice

1 inch = 2,000 feet

Town of Wawarsing/Village of Ellenville
GOSR Stream Restoration
Overall Project Location Map
Ulster County 1/14/2019 New York

Figure 1

Project No. 924.068



Barton & Loguidice

1 inch = 500 feet

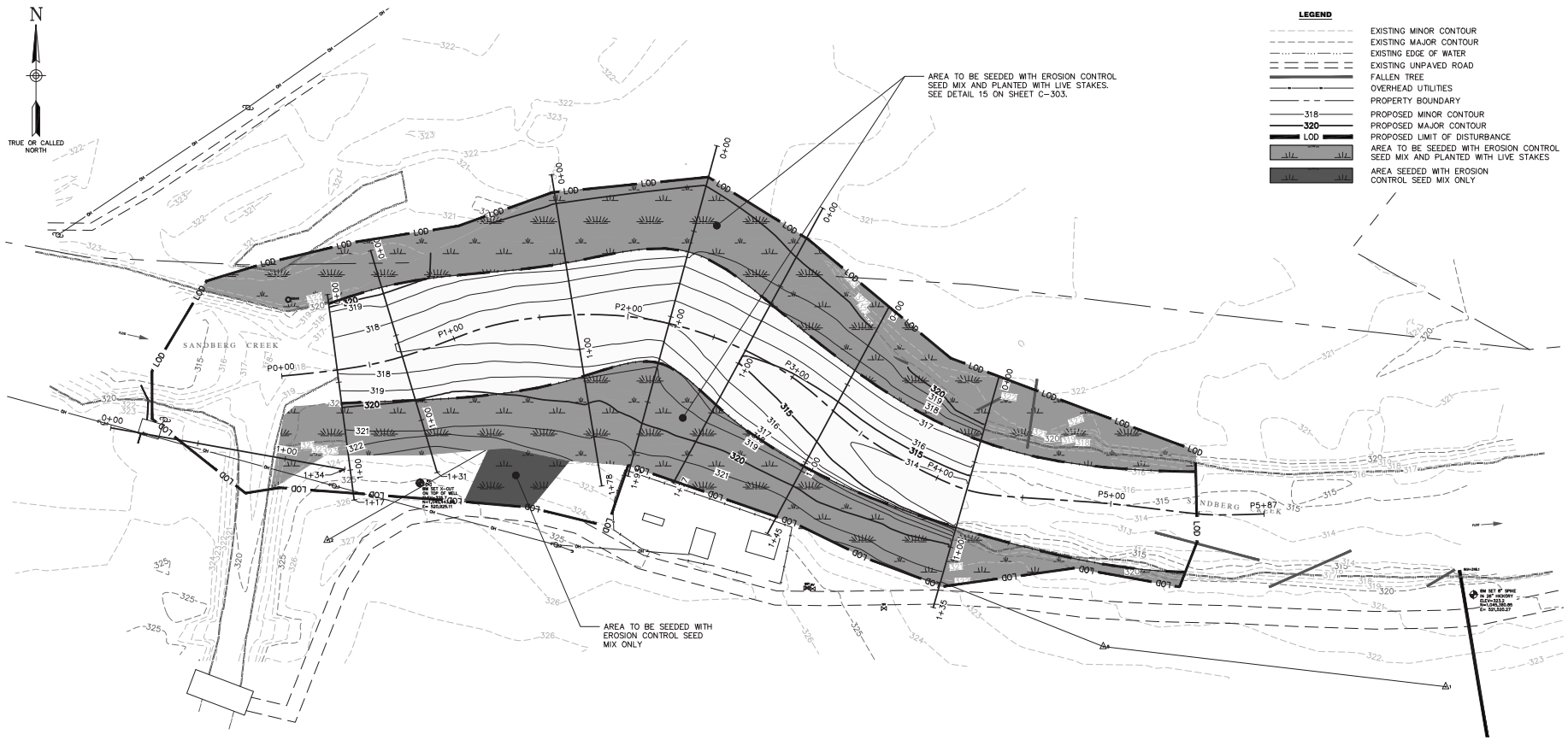
Town of Wawarsing/Village of Ellenville

GOSR Stream Restoration Site 10

Ulster County 1/14/2019 New York

Figure 2

Project No. 924.068



SPECIFIED RIPARIAN RESTORATION SEED MIX

15%	VIRGINIA WILD RYE, PA ECOTYPE (ELYMUS VIRGINICUS, PA ECOTYPE)	2%	NEW YORK IRONWEED, PA ECOTYPE (VERNONIA NOVEBORACENSIS, PA ECOTYPE)
15%	RIVERBANK WILD RYE, PA ECOTYPE (ELYMUS RIPARIUS, PA ECOTYPE)	2%	COMMON MILKWEED, PA ECOTYPE (ASCLEPIAS SYRIACA, PA ECOTYPE)
15%	LITTLE BLUESTEM, 'CAMPER' (SCHIZACHYRIUM SCOPARIUM)	2%	SOFT RUSH (JUNCUS EFFUSUS)
15%	FOX SEDGE, PA ECOTYPE (CAREX VULPINOIDEA, PA ECOTYPE)	1%	CANADA GOLDENROD, PA ECOTYPE (SOLIDAGO CANADENSIS), PA ECOTYPE)
10%	DEER TONGUE, 'TIOGA' (PANICUM CLANDESTINUM (DICHANTHELIUM C.), 'TIOGA')	1%	WRINKLELEAF GOLDENROD, PA ECOTYPE (SOLIDAGO RUGOSA), PA ECOTYPE)
10%	BIG BLUESTEM, 'NIAGARA' (ANDROPOGON GERARDII, 'NIAGARA')	1%	SPOTTED JOE PYE WEED, PA ECOTYPE (EUPATORIUM MACULATUM, PA ECOTYPE)
3%	BLUE VERVAIN (VERBENA HASTATA)	1%	BONESET, PA ECOTYPE (EUPATORIUM PERFOLIATUM, PA ECOTYPE)
3%	BLACK-EYED SUSAN, PA ECOTYPE (RUDBECKIA HIRTA)	1%	WHITE SNAKEROOT, PA ECOTYPE (AGERATINA ALTISSIMA, PA ECOTYPE)
2%	NEW ENGLAND ASTER, PA ECOTYPE (SYMPHYOTRICHUM NOVAE-ANGLIAE)	1%	INDIANHEMP, PA ECOTYPE (APOCYNUM CANNABINUM, PA ECOTYPE)

SPECIFIED COVER CROP/TEMPORARY SEED MIX

50%	CEREAL RYE (SECALE CEREAL)
50%	OATS (AVENA SATIVA)

SPECIFIED LIVE STAKES

60%	SILKY WILLOW (SALIX SERICIA)
10%	PUSSY WILLOW (SALIX DISCOLOR)
10%	SILKY DOGWOOD (CORNUS AMOMUM)
10%	RED ELDERBERRY (SAMBUCUS RACEMOSA)
10%	BLACK ELDERBERRY (SAMBUCUS CANADENSIS)

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION".

REVISIONS

VILLAGE OF ELLENVILLE & TOWN OF WAWARSING
STREAM RESTORATION PROJECT

SITE 13 PLANTING PLAN

ULSTER COUNTY, NEW YORK
TOWN OF WAWARSING

Barton & Loguidice

DRAFT

Date: DECEMBER 2019
Scale: AS SHOWN
Sheet Number: C-188
Project Number: 924.068.002

Plotted: Dec 18, 2019 - 2:15PM By: WBG
Path: Vault\924\924.068\002\4623-8927-HRUP\CAD\167200-167299\167282\924.068.002_Site13_C188-Planting Plan (ID 167282).dwg
File Name: 924.068.002_Site13_C188-Planting Plan.dwg Project No.: 924.068.002 Project Name: Ellenville Stream Restoration Phase 2&3
Checked by: DMF Drawn by: WBG Designed by: ANE In Charge of: RAM Last Saved: 10/1/2019

ATTACHMENT 4

Search Results

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Search Parameters: 1 Site EPA ID: Equal To: NYSFN0204190

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SITE EPA ID:	NYSFN0204190	**SITE NAME:**	ELLENVILLE SCRAP IRON AND METAL
STREET ADDRESS:	34 CAPE ROAD	**FACILITY INFORMATION**	View facility information
CITY NAME:	ELLENVILLE		
STATE ABBR:	NY	**FEDERAL FACILITY:**	N
ZIP CODE:	12428	**NPL STATUS:**	Deleted from the Final NPL
COUNTY NAME:	ULSTER	**NPL STATUS:**	
LATITUDE:	41.724028	**LONGITUDE:**	-74.4055

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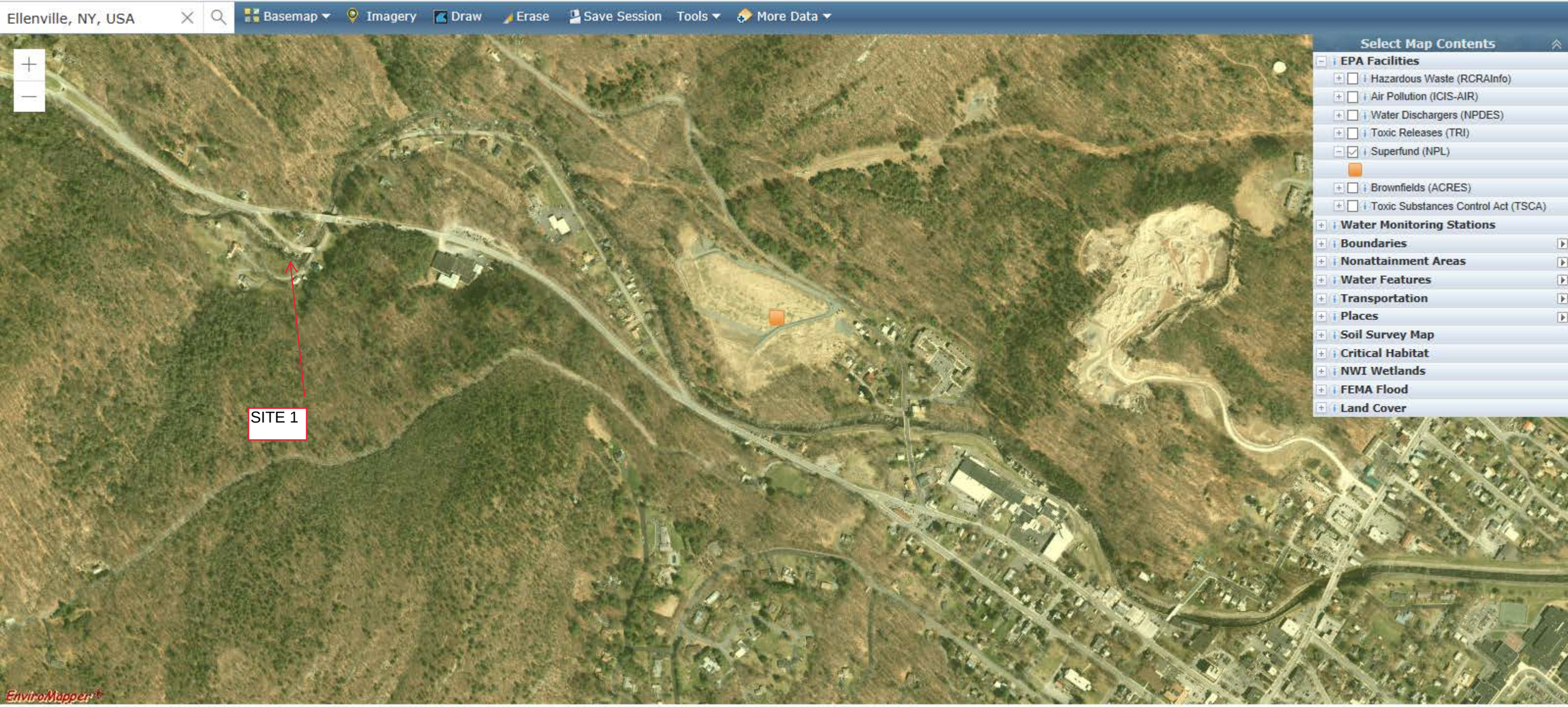
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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Environmental Site Remediation Database Search Details

Site Record

Administrative Information

Site Name: Ellenville Scrap Iron and Metal
Site Code: 356022
Program: State Superfund Program
Classification: 04
EPA ID Number:

Location

DEC Region: 3
Address: 34 Cape Road
City: Ellenville (V) Zip: 12428-
County: Ulster
Latitude: 41.72433253
Longitude: -74.40490014
Site Type: DUMP LANDFILL
Estimated Size: 28.1 Acres

Institutional And Engineering Controls

Control Type:
Deed Restriction

Control Elements:
Ground Water Use Restriction
Cover System
Deed Notice
Landuse Restriction
Monitoring Plan
Site Management Plan
IC/EC Plan
Monitoring Wells

Site Owner(s) and Operator(s)

Current Owner Name: John C. Bruno
Current Owner(s) Address: 46 Chambers Street
Newburgh,NY, 12550

Current Owner Name: Catello Viviani
Current Owner(s) Address: PO Box 1973
Kingston,NY, 12402
Owner(s) during disposal: ALBERT & PRISCILLA KOPLIC
Current On-Site Operator: Catello Viviani
Stated Operator(s) Address: PO Box 1973
Kingston,NY 12402
Current On-Site Operator: C. Bruno Demolition, Inc.
Stated Operator(s) Address: P.O. Box 7037
Newburgh,NY 12552

Site Description

Location: The Ellenville Scrap Iron and Metal Site is located at 34 Cape Road in the Village of Ellenville, Town of Warwarsing, Ulster County, New York. The site is located about 0.5 miles northwest of the intersection of State Routes 209 and 52. The site is bounded to the north by Cape Road; to the south by Beer Kill Creek; to the west by undeveloped land; and to the east by residential properties. Site Features: The site is an approximately 28-acre property, of which 5 acres is a capped waste consolidation cell in the upper terrace. The consolidation area is fenced. The lower terrace is a partially fenced area that was restored with trees and grass. The lower terrace also contains a surface water detention basin for the consolidation cell and a wetland area. Current Zoning /Uses: The site is classified as Other Rural Vacant Lands and Vacant Land Located in Commercial Areas. The site is currently vacant with no buildings or structures. Past Uses of the Site: Prior to remediation, the site was used for a variety of scrap metal operations and battery reclamation and a part of the Site was used for the storage and disposal of heavy equipment and automobile batteries. At one time the Site contained a truck scale, a hydraulic baling machine used for metal cans and other small parts, abandoned automobiles and trucks, scrap metal piles, a landfill embankment composed of construction and demolition debris, railroad ties, storage of automobile battery casings and assorted brush piles. Site Geology and Hydrogeology: The Site overlies the Hamilton shale and sandstones, which are underlain by the Onondaga, Helderberg and Rondout limestone, outcropping in the valley just to the east of the Site. Overlying the bedrock are glacial deposits consisting of ground moraine and stratified drift. Post glacial alluvium deposits are present on the flat terrain adjacent to the Beer Kill River. The depth to water at the Site ranges from approximately 8 to 13.5 feet below ground surface (bgs) near the Beer Kill River on the lower plateau of the Site to approximately 21 feet bgs on the upper plateau of the Site. There is a limited overburden aquifer present in the upper plateau area. Groundwater flows to the south in the upper plateau area and to the southeast in the lower plateau area.

Contaminants of Concern (Including Materials Disposed)

Contaminant Name/Type

barium
benzo(b)fluoranthene
benzo(k)fluoranthene
cadmium
chrysene
dibenz[a,h]anthracene
zinc
indeno(1,2,3-CD)pyrene
arsenic
lead
nickel
tetrachloroethene (PCE)
mercury
chromium
benzo(a)anthracene
benzo(a)pyrene

Site Environmental Assessment

Remediation at the site is complete. Prior to remediation, the primary contaminants of concern were polychlorinated biphenyls (PCBs), tetrachloroethene (PCE), polyaromatic hydrocarbons (PAHs), and metals in soil. Remedial actions have successfully achieved soil cleanup objectives for commercial use within the capped landfill area, and restricted residential use in the lower terrain area. Remaining contamination in the soil and groundwater is being managed under a Site Management Plan.

Site Health Assessment

The landfill was properly capped when it was closed; therefore, people are not likely to contact contaminated soils. Measures are in place to control the potential for coming in contact with subsurface soil and groundwater contamination remaining on the site.

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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Public Health Assessment for

ELLENVILLE SCRAP IRON AND METAL
ELLENVILLE, ULSTER COUNTY, NEW YORK
EPA FACILITY ID: NYSFN0204190
FEBRUARY 1, 2006

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Agency for Toxic Substances and Disease Registry

THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This Public Health Assessment was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6)), and in accordance with our implementing regulations (42 C.F.R. Part 90). In preparing this document, ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate.

In addition, this document has previously been provided to EPA and the affected states in an initial release, as required by CERCLA section 104 (i)(6)(H) for their information and review. The revised document was released for a 30-day public comment period. Subsequent to the public comment period, ATSDR addressed all public comments and revised or appended the document as appropriate. The public health assessment has now been reissued. This concludes the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the agency's opinion, indicates a need to revise or append the conclusions previously issued.

Agency for Toxic Substances & Disease Registry ..... Julie L. Gerberding, M.D., M.P.H., Administrator
Howard Frumkin, M.D., Dr.P.H., Director

Division of Health Assessment and Consultation…. ..... William Cibulas, Jr., Ph.D., Director
Sharon Williams-Fleetwood, Ph.D., Deputy Director

Health Promotion and Community Involvement Branch ..... Lisa Calhoun Hayes, P.E., DEE, Acting Chief

Exposure Investigations and Consultation Branch ..... Susan M. Moore, Ph.D., Chief

Federal Facilities Assessment Branch ..... Sandra G. Isaacs, B.S., Chief

Superfund and Program Assessment Branch ..... Richard E. Gillig, M.C.P., Chief

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PUBLIC HEALTH ASSESSMENT

ELLENVILLE SCRAP IRON AND METAL

ELLENVILLE, ULSTER COUNTY, NEW YORK

EPA FACILITY ID: NYSFN0204190

Prepared by:

New York State Department of Health
Center for Environmental Health
Under a Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Superfund and Program Assessment Branch

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SUMMARY

The Ellenville Scrap Iron and Metal (Ellenville Scrap) site is an inactive recycling and solid waste disposal facility in the Village of Ellenville, Town of Wawarsing, Ulster County. The Ellenville Scrap operators recycled metals and automobile batteries and disposed of solid waste such as tires, scrap metal, and construction and demolition (C&D) debris on ten acres of the 24-acre property. The site operated from the 1950s until 1998. The site was proposed for listing on the National Priorities List (NPL) on September 13, 2001 and was added on September 4, 2002. This public health assessment (PHA) fulfills a congressional mandate that requires public health activities for all sites nominated to the NPL. Ellenville Scrap is also listed in the New York State Department of Environmental Conservation (NYS DEC) Registry of Inactive Hazardous Waste sites. This public health assessment was distributed for public comment on November 21, 2005. The public comment period ended on December 31, 2005. NYS DOH received no comments from the residents.

Lead, polychlorinated biphenyls (PCBs), antimony, cadmium, and hydrogen sulfide are the contaminants of potential health concern associated with this site. On-site soils and groundwater are contaminated with lead. Off-site soils are contaminated with lead at levels that exceed the United States Environmental Protection Agency (US EPA) definition of a lead hazard in soil. Off-site soil samples showed detections above both background and noncancer health comparison values for antimony and cadmium; and above background but below noncancer health comparison values for arsenic, barium, chromium, cobalt, copper, manganese, mercury, nickel, selenium, silver, and zinc. Off-site groundwater is contaminated with lead below the drinking water standards. On- and off-site soils are contaminated with PCB mixtures (Aroclors) above cancer and noncancer health comparison values.

Area residents had complained about odors from the site. The odors were hydrogen sulfide and other compounds released from the decomposition of the C&D materials at the site. The odors were not detected during the most recent site visits. Four off-site sediment samples from the Beer Kill Creek did not contain site-related contaminants at a level of concern. Groundwater from the seven on-site monitoring wells is contaminated with lead, cadmium, manganese, nickel, iron and tetrachloroethene at or above drinking water standards. However, adjacent residents are connected to public water, and the private wells down-gradient and across the Beer Kill Creek do not show any site-related contaminants at concentrations of concern. The off-site, up-gradient monitoring well does not contain any site-related contamination.

Completed off-site exposure pathways include contact with contaminated soil and breathing contaminated ambient air. The completed soil pathway is dermal contact and incidental ingestion of metals (i.e., lead, antimony and cadmium) or PCB-contaminated soil from five nearby residential yards. The completed air pathway is the inhalation of odor-producing gases from the site in the past (e.g., hydrogen sulfide).

Potential exposure pathways for this site include exposure to contaminated soil, leachate, air, and waste materials on-site. These potential pathways may become completed exposure pathways if people trespass on the site and come in contact with contaminants of concern. The facility is not

in operation; consequently there are currently no on-site worker exposures. The property was recently purchased. The site is a potential concern for future exposures should the use of the site change without remediation. Also, an immediate removal response occurred on the residential property believed to formerly be a part of the site. US EPA removed one foot of soil, installed a geofabric membrane and covered it with one foot of topsoil and then sod. The US EPA on-scene coordinator set up air monitors during the removal to detect lead dust stirred up by the removal process and to trigger actions to minimize exposures to the public if action levels were exceeded. The fact sheet, that was mailed out at NYS DEC's request, was prepared for the community addressing the removal process and outlining the contact information for the project managers of the site (US EPA, 2004). In addition, NYS DEC indicated a need for at least a temporary measure to reduce exposures to contaminants on the escarpment where there are hundreds of discarded battery casings and high levels of lead. US EPA has since removed these casings and disposed of them off-site.

No exposures to groundwater contamination above NYS DOH drinking water standards are expected. To date, the five sampled private wells, across the Beer Kill Creek, do not contain any contaminants above the maximum contaminant levels (MCLs) promulgated for public water supplies by NYS DOH. About 15 households adjacent to the site receive drinking water from a public water supplier. Public water is monitored regularly, and immediate corrective action is taken if any contamination is found above drinking water standards.

People living near Ellenville Scrap want to know if there is an elevated incidence of chronic disease, especially cancer and respiratory disease, among area residents. While residents may have been exposed to site-related contamination, there is inadequate information about levels of possible exposure to evaluate potential adverse health effects (e.g. respiratory disease).

Area residents are concerned about the possible health effects from direct contact with lead or PCB contaminated soils in their yards. In 1992, New York State legislation was enacted requiring screening for lead in children under the age of six. The legislation also requires that all blood lead results be reported to NYS DOH. Because possible lead exposure is a concern at this site, NYS DOH staff reviewed the blood lead test results for all children under six years old who were screened between January 1994 and July 2002. No children living in homes on the streets near the site had blood lead levels that exceeded the CDC recommended follow-up level of 10 micrograms per deciliter (mcg/dL). NYS DOH estimates the increased risk from exposure to PCBs in off-site soil to be low for both cancer and noncancer health effects.

People complained about odors from the site in the past and are concerned about health effects from the gases causing the odors. Odors were not detected on site visits and no complaints about odors have been received since 2001. No odors or leachate were observed on a site visit in November of 2004. Available data are insufficient to evaluate potential health effects from this past exposure.

The residents are also concerned about wading in, and eating fish from, Beer Kill Creek. To date, analysis of surface water and Creek sediment have not indicated the presence of site-related contaminants. There is no specific advisory for consumption of fish from the Creek.

The community is concerned about trespassers being exposed to contaminants and physical hazards on-site. NYS DEC installed fencing along the side next to residential areas on River Street. The rest of the site is fenced with the exception of the portion that borders Beer Kill Creek, or the southwestern boundary of the property. The fence is in disrepair in some spots, particularly in two areas. A tree fell on the fence in one spot and the fence was intentionally cut in another area. Fresh garbage bags were found dumped in this spot. This PHA recommends improvements to the perimeter fence.

Finally, the residents expressed concerns that the tires on-site may provide a breeding area for mosquitoes that may carry the West Nile Virus. Local and county officials removed most of the tires from the site in 2001. The remaining tires were removed in June of 2005.

Nearby residents were exposed in the past and may continue to be exposed to site-related contaminants, especially lead and PCBs, in their yards. The soil in the yards of three homes near the Ellenville Scrap Iron and Metal site contains levels of lead that exceed the US EPA's definition of a lead hazard in soil. Additionally, the residence that was possibly a part of the site in the past had levels of lead up to 230,000 mg/kg in the surface soil prior to the removal action. Based on these data and ATSDR's public health hazard categories (Appendix D), the Ellenville Scrap Iron and Metal site represents a public health hazard. In addition, the residential yard that was potentially part of the site in the past contained PCBs at levels above background and health comparison values. Exposure to the highest level of Aroclor 1260 detected is estimated to have posed a low increased risk of cancer and a moderate to high increased risk of noncancer health effects in the past. While the removal of the top foot of soil in this yard has eliminated the immediate exposure concern, potential future exposure to lead and Aroclor 1260 under the foot of clean soil on this property needs to be given consideration during final remedy selection. In addition, further sampling is needed to better characterize the extent of PCB-contaminated soil in residential yards near the site.

US EPA should better characterize PCB contamination in residential areas to identify the extent of contamination in off-site soil. This action will help to reduce the potential for area residents to be exposed to site-related contaminants. US EPA should also limit access to the site by improving the perimeter fence.

PURPOSE AND HEALTH ISSUES

Congressman Maurice Hinchey requested that the Agency for Toxic Substance and Disease Registry (ATSDR) investigate the Ellenville Scrap Iron and Metal site to determine if people living near the site are being exposed to site-related contaminants. Area residents expressed concern about cancer incidence in the community and the prevalence of other chronic and acute health problems such as respiratory disease. This public health assessment (PHA) will summarize the environmental data, evaluate potential past, current and future human exposures to site-related contaminants and make recommendations for appropriate site-specific health interventions. This PHA also fulfills the congressional mandate for a public health activity for each site proposed to the National Priorities List (NPL).

BACKGROUND

A. Site Description and History

The Ellenville Scrap Iron and Metal site began operation in the 1950s as a battery recycling facility. Scrap metal, tires, and other waste materials, including construction and demolition (C&D) debris were also accepted and stored on about 10 acres of the 24 acre site (Figure 1). The owners accepted waste material from area manufacturers such as Nepera Chemical, IBM, Amour Textiles and C&R Freon Removal. In 1997, a new owner began accepting significantly greater amounts of ground C&D debris and other wastes. A significantly larger waste mass was created by the disposal of the C&D debris on an embankment at the edge of the upper portion of the site. US EPA estimated the volume of this material at approximately 4550 cubic yards. During periods of rainfall, leachate accumulates in a low area beneath the waste debris embankment. An area resident reported that leachate from the site discharged to Beer Kill Creek in February and March of 1998. This observation has not been independently confirmed.

An office building, a drum crusher, metal drums, a hydraulic bailing machine, an aluminum smelter/sweating furnace, a metal shearer, a tub grinder, wrecked trucks, petroleum storage tanks and metal dumpsters were located above the embankment on the upper portion of the site. Additional waste material such as waste tires (now removed), metal and automobile debris, wooden pallets and railroad ties are on the lower portion of the site below the embankment. US EPA is in the process of removing all of this miscellaneous waste.

In March 1987, the site owner acknowledged that he was operating a solid waste facility without a NYS DEC permit. He paid a fine and agreed to close and cover the area where solid waste was disposed. Inspections of the site by NYS DEC, beginning in 1995, indicated that additional solid waste had been deposited at the site and that the operator was in violation of NYS DEC solid waste regulations. The operator agreed, by consent order, to conduct a site assessment. In May 1997, the new owner significantly increased the volume of solid waste at the site, including creation of a large C&D disposal area along an embankment that divided the upper and lower portions of the site. This operator was also cited for operating a solid waste facility without a permit and also agreed, by consent order, to pay a fine, cease operating a solid waste

management facility, and remove illegally dumped solid waste. Because the operator failed to comply with provisions of the consent order and failed to pay the fine, NYS DEC obtained a temporary restraining order from a NYS Supreme Court Justice in August 1998. The restraining order prohibited further activities at the site until the operator complied with NYS DEC regulatory directives. The facility is not currently operating and there are no workers on the site.

In 1998, US EPA contractors collected on- and off-site surface soil samples, sediment samples from Beer Kill Creek and leachate samples from the ponded area at the base of the embankment. These samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs) and trace metals. Analysis of these samples indicated the presence of SVOCs and trace metals in surface soil and leachate that may be due to waste material at the site. The site was proposed for NPL listing on September 9, 2001 and was added on September 4, 2002.

US EPA collected residential soil samples from four residential yards in June of 2004 and tested them for metals. These samples contained lead at levels above New York State background (levels typically found in soils in New York State) and health comparison values (levels at which health effects may potentially be seen). In addition, antimony, and cadmium were found above health comparison values in one residential yard and arsenic above health comparison values in two residential yards.

The Ellenville Scrap site was recently purchased. In addition, an immediate removal response was completed on the residential property believed to formerly be a part of the site. US EPA removed one foot of soil, installed a geofabric membrane and covered it with one foot of topsoil and then sod. The US EPA on-scene coordinator set up air monitors to prevent potential exposures of the community to lead dust stirred up by the removal process. In addition, three buildings were demolished as part of the removal process and roughly twenty drums containing various VOCs and petroleum by-products will be disposed of off-site. NYS DEC requested that a fact sheet be prepared for the community addressing the removal process and outlining the contact information for the project managers of the site. In addition, NYS DEC felt that at least a cover was needed for the escarpment where there are hundreds of discarded battery casings and high levels of lead. US EPA removed the casings and disposed of them off-site. The site is a potential concern for future exposures should the use of the site change without remediation.

B. Site Visit

NYS DEC, NYS DOH, and Ulster County Department of Health (UC DOH) staff visited the site numerous times to collect environmental samples, observe operations at the site and to respond to area resident's complaints. Complaints were chiefly about odors from the site. Agency staff noted hydrogen sulfide (H_2S) and other odors that might be associated with off-gassing of site waste, both on-site and near the perimeter of the site. Slight odors were present on several occasions in residential areas. On September 2, 1998, NYS DOH staff conducted air testing for H_2S with a direct field reading instrument. H_2S levels ranged from less than the instrument minimum detection limit, 0.001 parts per million (ppm), on the perimeter of the site and in

residential areas, to 0.003 ppm on the site. US EPA staff visited the site several times for reconnaissance and sample collection. Representatives of ATSDR, NYS DEC, and NYS DOH visited the site on September 5, 2001 prior to a public availability session with area residents, elected officials and local media. NYS DOH staff visited the site in July 2002 and detected no odors on- or off-site.

Scarlett Messier, the NYS DOH project manager, accompanied by the EPA project manager, and NYS DOH district staff, visited the site in September of 2004. Ms. Messier saw pallet piles, construction and demolition debris landfills, metal waste, battery piles, trucks, a crane, tires and approximately 20 drums. US EPA had previously tested the drums in June of 2004 and determined that some contained various volatile organic compounds while others were assumed to contain waste oil. The residence that is believed to formerly be part of the site appeared to be built on a large car battery pile. The highest lead level (230,000 milligrams per kilogram (mg/kg)) in residential soil was detected in this yard. During a site visit on November 3, 2004, preparations were made for an immediate soil removal response in the yard at this residence. US EPA has since removed one foot of soil on this property, installed a geofabric membrane and covered it with one foot of topsoil and then sod. US EPA has also removed the casings and disposed of them off-site.

C. Demographics

NYS DOH estimated, from the 2000 Census (US Bureau of the Census. 2001) that 2,466 people live within one mile of the Ellenville Scrap Site in Ulster County, NY. The age distribution of the area is similar to that of New York State. There were 553 females of reproductive age (ages 15-44) in the area. The area has a slightly higher proportion of minorities compared to the rest of the state due in part to the sizable Hispanic population in the area. Based on the 2000 Census (US Bureau of the Census. 2002) a higher percentage of the population in this area is living below the poverty level and the median household income is lower than the rest of the state. These comparisons are provided in the following table. In addition, there are three schools and no nursing homes in the area.

	New York State	Ellenville Scrap Area
Age Distribution		
<6	8%	9%
6-19	20%	21%
20-64	60%	58%
>64	13%	12%
Race Distribution		
White	68%	68%
Black	16%	11%
Native American	<1%	<1%
Asian	6%	2%
Pacific Islander	<1%	0%
Other	7%	13%
Multi-Racial	3%	6%
Percent Minority*	38%	43%
Ethnicity Distribution		
Percent Hispanic	15%	28%
1999 Median Income	$43,393	$32,748
% Below Poverty Level[2]	15%	23%

* Minority includes Hispanic, African-Americans, Asian Americans, Pacific Islanders, and American Indians.

DISCUSSION

A. Environmental Contamination and Pathway Analysis

On-site Contamination

US EPA consultants, NYS DEC and a consultant hired by the original site owner sampled on-site surface soil. Sampling occurred between 1998 and 2004. Organic chemicals that were detected at the site included benzene, xylene (total), tetrachloroethene (PCE), trichloroethene, 1,1-dichloroethene, chlorobenzene, toluene, polycyclic aromatic hydrocarbons (PAHs) and PCB Aroclors (commercial mixtures of PCBs). Arsenic, barium, cadmium, chromium (total), copper, iron, lead, and mercury were detected above typical NYS soil background levels. Detection of these compounds in soil is consistent with reports of liquid and solid waste dumping at the site, including lead acid batteries, asphalt, petroleum hydrocarbons, scrap metal and electrical equipment.

US EPA and NYS DEC collected samples from the leachate ponding area beneath the embankment. Analytical results of these samples detected PCBs, arsenic, chromium, lead, mercury, ethylbenzene, and SVOCs indicating possible migration of waste from disposal areas.

Agency staff noted hydrogen sulfide (H_2S) and other odors that might be associated with off gassing of site waste, on-site and near the perimeter of the site. On September 2, 1998, NYS DOH staff conducted air testing for H_2S with a direct reading instrument. H_2S levels ranged from less than the instrument minimum detection limit (0.001 parts per million (ppm)) on the perimeter of the site to 0.003 ppm on the site. The nearest home is approximately 50 feet from the site. Odors appeared to be greater when leachate collected into ponds below the landfill. Odors were not detected during more recent site visits including the one in November 2004.

NYS DEC collected samples from on-site groundwater monitoring wells. Analytical results were compared to results from an off-site, up-gradient monitoring well. Compounds detected at comparatively elevated levels included arsenic, cadmium, chromium, lead, mercury, and tetrachloroethene, indicating that liquid and solid waste on the site have affected on-site groundwater.

People who trespassed onto the site may have been exposed to contaminants by direct contact with contaminated surface soil and/or leachate and may have inhaled hydrogen sulfide or other compounds produced from C&D debris decomposition. Although the site is fenced on three sides, access may be gained along the Beer Kill Creek side (southwestern) and in areas where the fencing is in disrepair. This is a potential exposure pathway. There are no pathways for exposure to contamination from on-site groundwater because there are no drinking water wells or groundwater seeps on-site.

Off-site Contamination

Surface Soil in Residential Yards

US EPA, NYS DEC, NYS DOH, UC DOH and a private consultant for the site owner collected samples from surface soils in five residential yards near the site and at the perimeter of the site. The levels of contaminants in one yard were higher than in the others sampled, so this property will be discussed separately.

In one residential yard, several metals (antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, silver, selenium, and zinc) were detected in off-site surface soil at levels that exceed typical background ranges, or levels usually expected in soil (Table 1). Aroclor 1260 was detected at levels (up to 30 mg/kg) above levels we would typically expect to find in surface soil, and the levels exceeded public health assessment comparison values (Table 2). Lead in this yard was also detected in 37 samples at levels (31 mg/kg to 230,000 mg/kg) above typical background levels for soil in New York State and at levels that exceed the US EPA's definition of a lead hazard in soil (US EPA, 2001). This residential yard is believed to formerly be part of the site. Piles of battery cases on this property were removed in the summer of 2005. For this yard, exposures to lead were likely in the past and may be a future hazard if measures are not taken to minimize the potential for exposure to contaminated soil one foot below the surface.

Levels of contaminants in the other residential yards sampled are lower. In these yards, lead was found in all 22 samples at levels ranging from 36 mg/kg to 11,100 mg/kg. The detected levels of antimony, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc were above typical background levels for soil in New York State (Table 1). Aroclor 1260 was detected in these yards at levels below health comparison values, however, further sampling of these yards is needed to better characterize PCB contamination.

Nearby residents were possibly exposed in the past and may continue to be exposed to site-related contaminants, especially lead, in their yards. This is likely a completed exposure pathway, although further sampling of these yards is needed to better characterize the extent of PCB-contaminated soil in the yards. See the Off-Site Surface Soils discussion in the Public Health Implications section of this document for more detailed analyses.

Off-site indoor air

There is a potential for soil vapor contamination related to contaminated soil or groundwater. VOC soil vapor contamination, if present, could intrude into basements and impact indoor air. This PHA recommends that US EPA and NYS DOH work together to evaluate this potential exposure pathway.

NYS DOH and NYS DEC will evaluate the need to conduct additional investigations to determine the potential for soil vapor intrusion into structures on or near the site.

Off-site ambient air

Area residents reported being exposed to airborne contaminants from the off-gassing of site contaminants and the decomposition and consequent gas production of organic waste. Although hydrogen sulfide can be the dominant compound released from the decomposition of C&D debris, other compounds may have also been present. On September 2, 1998, NYS DOH staff conducted air testing for H_2S with a direct reading instrument. H_2S was not detected at levels above the instrument minimum detection limit (0.001 ppm) in residential areas.

Because residents reported odors near their homes, this is a completed exposure pathway and residents were exposed to some level of site-related contaminants. However, since only H_2S measurements were collected, and only once using field instrumentation, this pathway cannot be completely evaluated. Agency staff observations indicate that the gas phase products of decomposition appear to have diminished significantly since initial reports of odors in 1997. During site visits in 2001 and 2002, and the most recent in November 2004, State agency staff detected no odors on- or off-site. No complaints have been received about odors from the site since 2001.

Off-site drinking water

No drinking water wells are immediately down-gradient of the site. About 15 homes on the opposite side of Beer Kill Creek have individual drinking water wells (Figure 1). The wells appear to be down gradient of the site, however the groundwater direction has not been fully

characterized. UC DOH and NYS DOH collected water samples from five of these wells in March 1998 and December 1999. Samples were analyzed for VOCs, SVOCs, PCBs, pesticides and metals. Low levels of acetone, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, chloroform, diethylphthalate, and di-N-butyl phthalate were found below the NYS DOH drinking water standards promulgated for public water supplies. No other organic contaminants were detected and levels of metals were similar to area background.

Residents down-gradient of the site obtain drinking water from the Ellenville municipal water supply. This supply obtains water from three wells and a reservoir. One well is within two miles of the site and is recharged by the Sandburg Creek Valley Aquifer that flows under the Ellenville Scrap site. Due to the distance between the site and the wells we do not anticipate that the site will affect the public water supply wells. Additional groundwater monitoring is needed to track contaminants as well as to ensure that the private drinking water wells down-gradient and across the stream continue to meet current New York State drinking water standards.

Surface Water, Sediment and Fish in Beer Kill Creek

US EPA consultants collected four samples from the streambed of Beer Kill Creek, one upstream and three downstream of the site, and analyzed them for site-related contaminants. Analytical results of samples collected downstream of the site were similar to the upstream sample and did not indicate that the site had affected stream sediment. Although surface water was not sampled at that time, the sediment indicates that the site has not had a significant effect on Beer Kill Creek. Residents reported that leachate from the site sometimes reaches the Creek. However, leachate discharges to the creek have not been observed by site investigators and may occur only intermittently between rains. There are no specific advisories for fish consumption in the creek. The creek does not appear to be significantly affected by the site to date; therefore exposure pathways associated with the creek will not be discussed further in the public health assessment.

B. Public Health Implications: Toxicological and Epidemiological Evaluation

An analysis of the toxicological and epidemiological implications of the human exposure pathways of concern is presented below. To evaluate the potential health risks from contaminants of concern associated with the Ellenville Scrap Iron and Metal site, NYS DOH assessed the risks for cancer and noncancer health effects. The risks of health effects depend primarily on contaminant concentration, exposure route, exposure frequency and duration. Additional information on the NYS DOH procedure for evaluation of health risks is presented in Appendix C.

On-Site Surface Soil

On-site surface soil at the Ellenville Scrap Iron and Metal site contains metals above NYS background soil levels (arsenic, barium, cadmium, chromium (total), copper, iron, lead and mercury), organic chemicals (benzene, 1,1-dichloroethene, chlorobenzene, tetrachloroethene, toluene, trichloroethene, trichlorofluoromethane) and commercial mixtures of PCBs (Aroclors). Samples collected from the leachate ponding area also contained PCBs and metals (lead and

chromium) at levels above those we typically expect to find in the environment. If people gain access to the site, they could be exposed to site contaminants by direct contact with the contaminated surface soil and leachate, and the risk for adverse health effects could increase. However, the site is mostly inaccessible because of topography and fencing. Thus, while access to the site is a possibility, the existing barriers as well as the awareness of hazards by nearby residents suggest that this is currently not a significant exposure concern.

Off-Site Surface Soils

Several metals (antimony, arsenic, barium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, silver, selenium, and zinc) were detected in off-site surface soil at levels that exceed typical background ranges, or levels usually expected in soil (ATSDR, 1990; Clarke, et al., 1985; Connor et al., 1957; Dragun, 1988; McGovern, 1988; Seiler, 1988; Shacklette and Boerngen, 1984). Aroclor 1260 was detected above levels we would typically expect to find in surface soil, and the levels exceeded noncancer and cancer public health assessment comparison values based on residential exposure (Table 2). Lead was detected in residential areas above typical background levels and at levels that exceed the US EPA's definition of a lead hazard in soil (US EPA, 2001). Antimony and cadmium were also detected at levels that exceed typical background and noncancer comparison values for residential exposure (Table 2). Aroclor 1260, lead, antimony and cadmium are selected for further evaluation. No other contaminants exceeded both typical soil background levels and their public health comparison values for residential soil with the exception of arsenic in one residential sample.

Lead

Lead was detected in all off-site surface soil samples from five properties. On one property, lead levels in surface soil ranged from 31 mg/kg to 230,000 mg/kg. The sample that contained 230,000 mg/kg of lead was in an area that was described as containing battery parts. For the other properties, lead levels in surface soil ranged from 36 mg/kg to 11,100 mg/kg. All of the properties sampled had lead levels higher than typical background levels and three were higher than the levels US EPA considers to be lead hazards in bare soil (400 mg/kg in bare soils of play areas or averaging over 1200 mg/kg in bare soil for the rest of the yard) (US EPA, 2001).

Chronic exposure to lead is predominantly associated with effects on the nervous system and blood (e.g., anemia and increased blood pressure). The developing fetus and young children are particularly sensitive to lead-induced effects. For example, lead exposure is associated with premature birth and low birth weights, and may affect mental and physical development in children (ATSDR, 1999a). The health risks associated with exposure to lead in surface soil are not quantitatively evaluated as they are for other contaminants because lead does not have a reference dose or comparison value. The higher levels of lead detected in surface soil in the residential areas could increase exposure of people (particularly young children) to this contaminant especially if the contamination is located in bare soil. Exposure to the highest levels of lead detected in soil on the residential properties (11,100 mg/kg and 230,000 mg/kg) would pose a high risk for increasing blood lead levels and causing lead-related adverse health effects.

Other Metals

On the same residential property containing the highest levels of lead, several other metals (antimony, arsenic, barium, cadmium, chromium, cobalt, copper, manganese, mercury, nickel, silver and zinc) were detected in surface soil at levels that exceed typical background ranges (i.e., levels that we would usually expect to find in soil (ATSDR, 1990; Clarke, et al., 1985; Connor et al., 1957; Dragun, 1988; McGovern, 1988; Seiler, 1988; Shacklette and Boerngen, 1984)). The highest levels of antimony and cadmium on this property also exceed public health assessment comparison values based on residential exposure (Table 2). Antimony and cadmium were selected for further evaluation. The maximum detection of arsenic (28 mg/kg) at this property was the only off-site detection above the typical background range of 2 mg/kg to 20 mg/kg (Clarke, et al., 1985; McGovern, 1988; Shacklette and Boerngen, 1984). The average arsenic level for all the surface soil samples from this property (8.0 mg/kg) is within the typical background range, and therefore the health risk for past exposure to arsenic on this property is estimated to be similar to the health risk associated with arsenic exposure in typical soils. The surface soil from the other off-site residential properties that were sampled contained some metals above typical background levels (cadmium, chromium, copper, manganese, mercury, selenium and zinc), but none of the detected levels exceeded health based soil comparison values for residential exposure. The levels of the remaining metals detected were consistent with typical background levels.

Antimony causes liver damage and blood changes in animals exposed to high levels for long periods of time (ATSDR, 1992). The primary and most sensitive human health effect associated with long-term exposure to cadmium is kidney damage (ATSDR, 1999b). Toxicological data are inadequate to assess the carcinogenicity of antimony and cadmium by the oral route of exposure (ATSDR, 1992, 1999b). Based on the available sampling data, past exposure via incidental ingestion to the highest levels of antimony (660 mg/kg) in off-site residential surface soil is estimated to have resulted in a moderate risk for noncancer health effects. Exposure to the highest level of cadmium in off-site surface soil (92 mg/kg) is estimated to have posed a low risk for noncancer health effects. If the average level of antimony (44 mg/kg) and cadmium (7.3 mg/kg) on the one property having elevated levels of these metals is considered to be more representative of people's potential exposure than the maximum value, the estimated noncancer risk would be minimal for both contaminants (please refer to Appendix C for an explanation of the meaning of the qualitative descriptors of risk).

Aroclors

Surface soil samples from five residential properties were analyzed for Aroclors. Surface soil samples from only one of these five properties contained elevated levels of Aroclors. Samples from the one property, which also had the highest soil lead levels and was possibly once part of the site, contained Aroclor 1260 ranging from nondetect to 30 mg/kg. Other sampling results from this property showed levels that exceed cancer and/or noncancer public health assessment

comparison values based on residential exposure. Therefore, Aroclor 1260 was selected for further evaluation.

Aroclor 1260 is a commercial mixture of polychlorinated biphenyls (PCBs). Studies of workers exposed to PCBs in air (and perhaps through the skin) raise concerns about the human carcinogenicity of PCBs, but the results of these studies are not consistent. The data from these studies are inadequate to prove that exposure to PCBs causes cancer in humans. Some types of PCBs cause cancer in laboratory animals exposed to high levels over their lifetimes (ATSDR, 2000). Chemicals that cause cancer in laboratory animals may also increase the risk of cancer developing in humans who are exposed to lower levels over long periods of time. Based on the results of animal and human studies, long term exposure via incidental ingestion to the average (22.2 mg/kg) or maximum level of Aroclor 1260 (30 mg/kg) detected in surface soil on the residential property that once may have been part of the site is estimated to pose a low increased risk for cancer (i.e., the estimated increased risk is between one-in-one million and one-in-ten thousand).

PCBs are also known to cause adverse noncancer health effects. Industrial workers who were exposed to large amounts of PCBs and other chemicals in air (and perhaps through their skin) experienced skin, eye and respiratory tract irritation and mild changes in the functioning of their livers. Some studies of pregnant women suggest a link between a mother's increased exposure to PCBs and other chemicals (from eating contaminated fish or from other environmental sources) and slight effects on her child's birth weight, short-term memory, and learning. Recent studies also suggest that women who ate fish containing PCBs (and other contaminants) have slightly shorter menstrual cycles and take a longer time to become pregnant than women who did not eat contaminated fish. A study of older adults who ate fish containing PCBs (and other contaminants) suggests that PCB exposure is associated with lower scores on several measures of memory and learning. Although some of these studies did control for the possible effects of other chemical contaminants, the role of these chemicals in causing the observed effects is not fully understood.

PCBs affect the skin, liver, and the nervous, immune and reproductive systems of laboratory animals exposed to high levels. PCBs also reduce the birth weight and change the behavior of offspring born to animals exposed before, during and after pregnancy. Some PCBs cause birth defects in offspring born to animals exposed during pregnancy. Although the risks of noncancer health effects from PCBs in surface soil are not completely understood, the available information suggests they would be moderate for exposure to the highest and average level of Aroclor 1260 (30 mg/kg and 22.2 mg/kg, respectively) detected on the residential property that once may have been part of the site. The estimated level of exposure to Aroclor 1260 in soil would be about 30 times lower than the exposure level known to cause PCB-related noncancer health effects in animals. This estimate assumes that a 13.2 kilogram child ingests 82 milligrams of soil five days per week for six months per year, and 40 milligrams of house dust (with an outdoor soil source) each day, and that the soil contains the highest detected level of Aroclor 1260 (30 mg/kg).

If residents consume produce grown in gardens in the areas of lead, antimony, cadmium and Aroclor contamination, exposure and the risk for adverse health effects could increase. We have no knowledge of any samples taken from garden areas off-site. Our estimates of health risks for

exposure to antimony, cadmium, and Aroclor 1260 in off-site surface soil are summarized in the following table.

Contaminant	Range of Levels in Off-site Surface Soil	Average Detected Level in Off-site Surface Soil*	Descriptor for Estimated Increased Cancer Risk**	Descriptor for Estimated Increased Noncancer Risk***
antimony	2.3 mg/kg to 660 mg/kg	44 mg/kg	---	minimal
Aroclor 1260	ND to 30 mg/kg	22.2 mg/kg	low	moderate
cadmium	0.4 mg/kg to 92 mg/kg	7.3 mg/kg	---	minimal
lead (one residence)	31 mg/kg to 230,000 mg/kg	9,085 mg/kg	---	high[a]
lead (other residences)	36 mg/kg to 11,100 mg/kg	728 mg/kg	---	[b]

ND = not detected.

* Averages for property that may have once been part of the site, except for lead results which are also shown for other residences.

** Based on average levels. The descriptor is also "low" if the maximum detected level of Aroclors is used to represent exposure.

*** Based on average levels. The descriptor for noncancer risk would be "low" for cadmium, "moderate" for antimony, and "moderate" for Aroclor 1260 if the maximum detected level is used to represent exposure.

[a] Average level exceeds the US EPA standard for defining a lead hazard in soil (400 mg/kg in bare soils of play areas or averaging over 1200 mg/kg in bare soil for the rest of the yard) (US EPA, 2001).

[b] Average level does not exceed the US EPA standard for defining a lead hazard in soil (400 mg/kg in bare soils of play areas or averaging over 1200 mg/kg in bare soil for the rest of the yard) (US EPA, 2001).

C. Child Health Considerations

ATSDR emphasizes the on-going examination of relevant child health issues in all of the Agency's activities, including evaluating child-focused concerns through its mandated public health assessment activities. ATSDR and NYS DOH consider children when evaluating exposure pathways and potential health effects from environmental contaminants. We recognize that children are of special concern because of their greater potential for exposure from play and other behavior patterns. Children sometimes differ from adults in their susceptibility to hazardous chemicals, but whether there is a difference depends on the chemical. Children may be more or less susceptible than adults to health effects, and the relationship may change with developmental age.

Lead and PCBs (Aroclors) are the primary contaminants of concern associated with the Ellenville Scrap Iron and Metal site. As stated previously, the developing fetus and young children are particularly sensitive to lead-induced health effects (ATSDR, 1999a), and lead exposure is associated with premature birth and low birth weights. Lead may also affect mental and physical development in children. Exposure to the levels of lead detected in soil in some of the off-site areas (as high as 230,000 mg/kg) could increase blood lead levels in children and pose a high risk of lead-related adverse health effects.

The possibility that children or the developing fetus may have increased sensitivity to Aroclor 1260 was taken into account when evaluating the potential health risks associated with

exposure to contaminated soil. As stated previously, human studies suggest that exposure to PCBs and other chemicals during pregnancy may cause slight effects on birth weight, short-term memory and learning in children. In studies of laboratory animals, some PCB mixtures cause birth defects in offspring born to animals exposed during pregnancy at exposure levels that also cause adverse effects in the parent animal (ATSDR, 2000). The estimated level of exposure to Aroclor 1260 in off-site surface soil at the highest detected levels near the Ellenville Scrap Iron and Metal site are at least 32 times lower than the levels of exposure to Aroclors in the animal studies in which adverse developmental effects were observed.

D. Health Outcome Data Evaluation

NYS DOH has not evaluated health outcome data specifically for this site. While residents may have been exposed to site-related contaminants, there is inadequate information about levels of possible exposure. NYS DOH maintains several health outcome databases, which could be used to generate site-specific data, if warranted. These databases include the cancer registry, the congenital malformations registry, vital records (birth and death certificates) and hospital discharge information.

In addition, since 1981, NYS DOH has maintained a registry of individuals found to have elevated blood levels of heavy metals. Any physician, clinical laboratory or health facility in attendance of a person with a blood or urine test with a value of arsenic, cadmium, lead or mercury at or above certain levels has been required to report such occurrence to NYS DOH within 10 days of the receipt of the test results. In 1992, New York State legislation was enacted which requires universal screening for lead in children under the age of six. In addition, the legislation required all blood lead results, regardless of concentration or age of patient, to be reported to the NYS DOH.

Because lead contamination is a concern at this site, we reviewed the blood lead results from all children under six years of age who were screened between January 1994 and July 2002. No children living in homes on the streets near the site had blood lead levels that exceeded 10 micrograms per deciliter (mcg/dL), the United States Centers for Disease Control and Prevention (CDC) recommended follow-up level.

COMMUNITY HEALTH CONCERNS

This public health assessment was distributed for public comment on November 21, 2005. The public comment period ended on December 31, 2005. NYS DOH received no comments from the residents. Community health concerns were expressed to agency staff through the public availability session on September 5, 2001 via personal contact and phone calls.

> **Concern:** A resident was concerned about lead exposures to small children who visit the residences.

Response: Young children are particularly sensitive to lead-induced health effects (ATSDR, 1999), and lead exposure is associated with premature birth and low birth weights. Lead may also affect mental and physical development in children. The levels of lead detected in soil in some of the off-site areas (as high as 230,000 mg/kg) could increase exposure of people (including children) to this contaminant and pose a concern for lead-related health effects, especially if the contamination is located in bare soil. No children living in homes on the streets near the site had blood lead levels that exceeded 10 micrograms per deciliter (mcg/dL), the United States Centers for Disease Control and Prevention (CDC) recommended follow-up level. See Child Health Considerations.

Concern: Area residents and elected officials expressed concerns about a potentially elevated incidence of chronic disease, especially cancer and respiratory diseases, among people who live near the site.

Response: NYS DOH has not evaluated health outcome data specifically for this site. While residents may have been exposed to site-related contaminants, there is inadequate information about levels of possible exposure to evaluate potential adverse health outcomes.

Concern: Residents are also concerned about health effects from inhalation of airborne site-related contaminants such as H_2S, particulates and VOCs and direct contact with soils contaminated with lead or PCBs.

Response: We do not have adequate sampling data to evaluate the potential health effects from past exposure to air-borne contaminants. However, off-site migration of airborne contaminants has significantly diminished since operation of the site ceased in 1998. Additional evaluation of on-going air emissions from the site is needed and recommended in this PHA. Because lead contamination is a concern at this site, we reviewed the blood lead results from all children under six years of age that were screened between January 1994 and July 2002. No children living in homes on the streets near the site had blood lead levels that exceeded 10 mcg/dL, the CDC recommended follow-up level. NYS DOH estimates the increased risk from exposure to PCB in off-site soil to be low for cancer effects and moderate for noncancer health effects.

Concern: During a public availability session in September 2001, residents expressed concerns about consumption of fish from Beer Kill Creek and contact with contaminated surface water while wading in the Creek.

Response: Analysis of Creek sediment did not indicate the presence of site-related contaminants. There are no specific fish consumption advisories for the Creek.

Concern: The community expressed concern about people trespassing onto the site and being exposed to contaminants and physical hazards.

Response: NYS DEC installed fencing along the side next to residential areas on River Street. The rest of the site is fenced with the exception of the portion that borders the Beer Kill Creek. We believe the fencing and resident's knowledge of the site limit trespassing at this time. However, we recommend in this public health assessment that the fencing be improved to further impede trespassing.

Concern: Residents and local officials expressed concerns about exposure to insects such as mosquitoes that could breed in standing water in waste tires on the site and may be vectors of the West Nile Virus.

Response: Local and county officials removed most of the tires from the site in 2001. Removal of the remaining tires from the site in 2005 addressed this concern.

CONCLUSIONS

Nearby residents were exposed in the past and may continue to be exposed to site-related contaminants, especially lead and PCBs, in their yards. The soil in the yards of three homes near the Ellenville Scrap Iron and Metal site contains levels of lead that exceed the US EPA's definition of a lead hazard in soil. Additionally, the residence that was possibly a part of the site in the past had levels of lead up to 230,000 mg/kg in the surface soil prior to the removal action. Based on these data and ATSDR's public health hazard categories (Appendix D), the Ellenville Scrap Iron and Metal site represents a public health hazard. In addition, the residential yard that was potentially part of the site in the past contained PCBs at levels above background and health comparison values. Exposure to the highest level of Aroclor 1260 detected is estimated to have posed a low increased risk of cancer and a moderate to high increased risk of noncancer health effects in the past. While the removal of the top foot of soil in this yard has eliminated the immediate exposure concern, potential future exposure to lead and Aroclor 1260 under the foot of clean soil on this property needs to be given consideration during final remedy selection. In addition, further sampling is needed to better characterize the extent of PCB-contaminated soil in residential yards near the site.

Some waste remains on the site, posing a potential threat of release of contaminants to Beer Kill Creek. Although measures have been taken to reduce public access to the site, wastes on the site are a chemical exposure and physical hazard concern for unauthorized trespassers. Although we do not anticipate that the down-gradient public water supply wells will be affected by the site because of the distance between the site and the wells, additional groundwater investigation is needed. Without remediation, the site is a potential concern for future exposures should the use of the site change.

Past exposure to airborne site-related contaminants cannot be evaluated because of inadequate data. Anecdotal reports of odors from the site have diminished since 1998. Because lead contamination is a concern at this site, NYS DOH staff reviewed the blood lead results from all children under six years of age who were screened between January 1994 and July 2002. No children living in homes on the streets near the site had blood lead levels that exceeded 10 mcg/dL, the CDC recommended follow-up level. NYS DOH has not evaluated other health outcome data specifically for this site.

RECOMMENDATIONS

1. Take actions to reduce the likely exposures to lead in the soil of three yards where clean-up has not been done.

2. Improve fencing around the site to further limit access.

3. Investigate the potential for C & D landfill gas emissions, and if necessary, a remedial action should be implemented to control these emissions to reduce the potential for landfill gas releases.

4. Evaluate the potential for soil vapor contamination related to contaminated soil or groundwater needs to be evaluated.

5. Conduct appropriate on-site clean-up to address current and future exposure concerns.

6. Consider, during final remedy selection, the need to reduce the potential for future exposures to lead and Aroclor 1260 in the soil under the one foot of clean soil in the yard that may have formerly been part of the site.

7. Conduct further sampling to better characterize the extent of PCB-contaminated soil in residential yards near the site.

8. Conduct additional groundwater investigation to determine the extent of groundwater contamination and whether additional actions are needed.

PUBLIC HEALTH ACTION PLAN

The Public Health Action Plan (PHAP) for the Ellenville Scrap Iron and Metal site contains a description of actions already taken or to be taken by the NYS DOH and/or ATSDR following completion of this public health assessment. The purpose of the PHAP is to ensure that this public health assessment identifies public health hazards and provides a plan of action designed to mitigate and prevent adverse human health effects resulting from the past, present and/or future exposures to hazardous substances in contaminated soil and groundwater in this area.

Included is a commitment on the part of the NYS DOH to follow up on this plan to ensure that it is implemented. The public health actions are as follows:

1. NYS DOH and ATSDR will work with US EPA to further reduce potential exposures to lead and PCB contaminated soil in residential yards, evaluate the potential for soil vapor contamination related to the site, and limit onsite exposures by improving the perimeter fence.

2. NYS DOH and ATSDR will review US EPA site investigation work plans to assure that onsite cleanup and sampling, including groundwater, is appropriate to evaluate current and future exposure concerns. US EPA should also investigate the potential for landfill gas emissions.

3. NYS DOH and ATSDR will review additional environmental data as they become available to determine whether additional public health actions are needed to reduce exposure to site-related contaminants. ATSDR and NYS DOH will reevaluate and expand the PHAP when needed.

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CERTIFICATION

The Public Health Assessment for the Ellenville Scrap Iron and Metal Site was prepared by the New York State Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the public health assessment was initiated. Editorial review was completed by the cooperative agreement partner.

Technical Project Officer, CAT, SPAB, DHAC

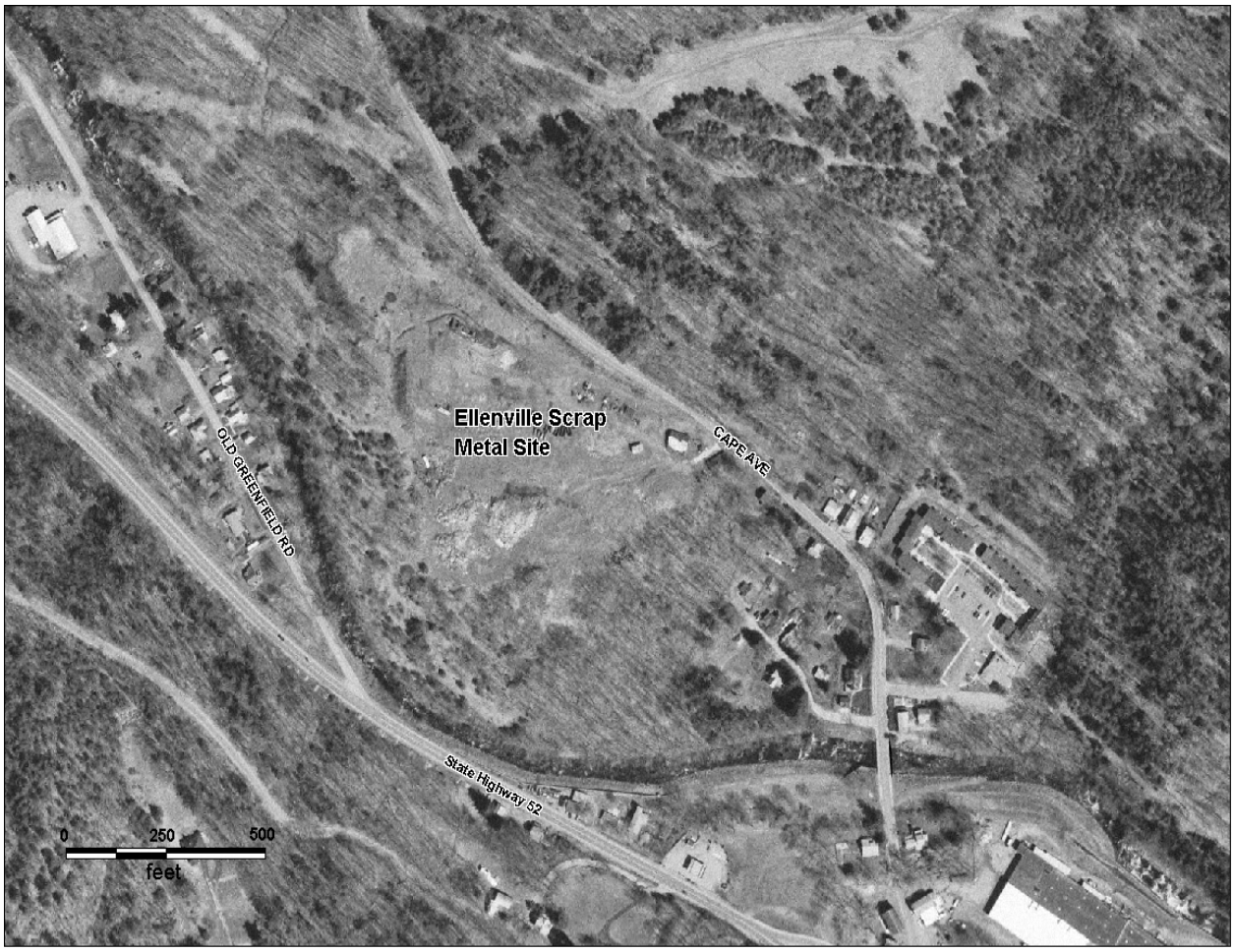
The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation, and concurs with its findings.

Team Leader, CAT, SPAB, DHAC, ATSDR

APPENDIX A

Figure

FIGURE 1
Ellenville Scrap Metal and Iron Site



APPENDIX B

Tables

Table 1
Range of Detection, Typical Background Levels and Health-Based Comparison Values for Contaminants in Off-site Surface Soil Near the Ellenville Scrap Iron and Metal Site
[All values in milligrams per kilogram (mg/kg)]

Chemicals	Range of Detection	Range of Detection	Typical	Comparison Values*			
	First Home	Other Homes	Background Level	Noncancer	Basis**	Cancer	Basis**
antimony	2.3 - 660	2.2 - 3.0	<1 - 2	77	EPA RfD		
Aroclor 1260	8.6 - 30	0.01 - 0.3		3.87	EPA RfD	1.24	EPA CPF
arsenic	1.9 - 28	4.0 - 20.3	2 - 20	58	EPA RfD	1.65	EPA CPF
barium	17.0 - 1,600	38.0 – 342	200 - 400	3,900	EPA RfD		
cadmium	0.5 - 92	0.4 - 14.4	<0.5 - 1.5	28	NYS DOH RfD		
calcium	350 - 22,000	970 – 3,600	400 - 10,000				
chromium	3.9 - 71	7.5 – 192	10 - 60	580	EPA RfD		
cobalt	2.5 - 17	4.9 – 11	3 - 15	3,900	EPA RfD		
copper	7.5 - 1,100	10 – 929	2 - 40	27,100	IOM RfD		
iron	7,100 - 200,000	10,000 - 23,700	15,000 - 30,000				
lead	31 - 230,000	36.0 - 11,100	10 - 300	400***	---		
manganese	91 - 1,700	230 – 1,250	150 - 1,000	9,700	CA EPA RfD		
mercury	0.03 - 1.5	0.1 - 5.1	0.01 - 1.0	31	EPA RfD		
nickel	6.7 - 72	11.0 – 32	<5 - 25	3,900	EPA RfD		
selenium	0.8 - 1.5	0.7 - 1.3	<0.1 - 1	970	EPA RfD		
silver	0.7 - 1.3	0.7 - 4.0	0.1 - 0.4	970	EPA RfD		
zinc	34 - 3,300	52 – 496	20 - 200	58,000	EPA RfD		

* Comparison Values: Noncancer comparison values assume a 13.2 kg child ingests 80 milligrams of soil per day, 5 days per week, 6 months per year and 40 milligrams of indoor dust with an outdoor soil source per day, 7 days per week, 12 months per year. Cancer comparison values assume an average body weight of 47.7 kg and an average soil ingestion rate of 19.3 milligrams per day for the first 30 years of a 70-year lifetime.

** IOM RfD: Institute of Medicine Reference Dose
CA EPA RfD: California Environmental Protection Agency Reference Dose
EPA RfD: United States Environmental Protection Agency Reference Dose
NYS DOH RfD: New York State Department of Health Reference Dose
EPA CPF: United States Environmental Protection Agency Cancer Potency Factor

*** A comparison value for lead is not available. Sampling results were compared to the US EPA standard for defining a lead hazard in soil (400 mg/kg in bare soils of play areas or averaging over 1200 mg/kg in bare soil for the rest of the yard) (US EPA, 2001).

Table 2
Sampling Results, Typical Background Levels and Public Health Assessment Comparison Values for Chemicals Selected for Evaluation in Off-Site Surface Soil at Ellenville Scrap Iron and Metal Site
[All values in milligrams per kilogram (mg/kg)]

Chemical	Range of Detection	Typical Background Level	Comparison Values*			
			Noncancer	Basis**	Cancer	Basis**
antimony	2.3 – 660	<1 – 2[a]	77	US EPA RfD	---	---
cadmium	0.5 - 92	<0.5 – 1.5[a]	28	NYS DOH RfD	---	---
Aroclor 1260	ND - 30	---	3.87	US EPA RfD [b]	1.24	US EPA CPF
lead	31 - 230,000	10 - 300[a]	400[c]	---	---	---

* Comparison Values: Noncancer comparison values assume a 13.2 kg child ingests 80 milligrams of soil per day, 5 days per week, 6 months per year and 40 milligrams of indoor dust with an outdoor soil source per day, 7 days per week, 12 months per year. Cancer comparison values assume an average body weight of 47.7 kg and an average soil ingestion rate of 19.3 milligrams per day for the first 30 years of a 70-year lifetime.

** EPA RfD: United States Environmental Protection Agency Reference Dose
NYS DOH RfD: New York State Department of Health Reference Dose
US EPA CPF: United States Environmental Protection Agency Cancer Potency Factor (Reference: United States Environmental Protection Agency. 1996. PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures. National Center for Environmental Assessment. Office of Research and Development. Washington, DC.)

Footnotes

[a] References: (1) Clarke, L., C. Hudson, G. Laccetti, W. Stone and B. Ungerman. 1985. Study of metal concentrations in soil and surface sand of seven New York counties. Albany: New York State Department of Health, Bureau of Toxic Substance Assessment. September, 1985. (2) Shacklette, H.T. and J.G. Boerngen. 1984. Element concentrations in soil and other surficial materials of the conterminous United States. U.S. Geological Survey Professional Paper 1270. Washington DC: U.S. Government Printing Office.

[b] Value is based on reference dose for Aroclor 1254.

[c] A comparison value for lead is not available. Sampling results were compared to the US EPA standard for defining a lead hazard in soil (400 mg/kg in bare soils of play areas or averaging over 1200 mg/kg in bare soil for the rest of the yard) (US EPA, 2001).

ND = not detected

APPENDIX C

NYS DOH Procedure for Evaluating Potential Health Risks for Contaminants of Concern

NYS DOH PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS FOR CONTAMINANTS OF CONCERN

To evaluate the potential health risks from contaminants of concern associated with the Ellenville Scrap Iron and Metal site, the New York State Department of Health assessed the risks for cancer and noncancer health effects.

Increased cancer risks were estimated by using site-specific information on exposure levels for the contaminant of concern and interpreting them using cancer potency estimates derived for that contaminant by the US EPA or, in some cases, by the NYS DOH. The following qualitative ranking of cancer risk estimates, developed by the NYS DOH, was then used to rank the risk from very low to very high. For example, if the qualitative descriptor was "low", then the excess lifetime cancer risk from that exposure is in the range of greater than one per million to less than one per ten thousand. Other qualitative descriptors are listed below:

Excess Lifetime Cancer Risk

Risk Ratio	Qualitative Descriptor
equal to or less than one per million	very low
greater than one per million to less than one per ten thousand	low
one per ten thousand to less than one per thousand	moderate
one per thousand to less than one per ten	high
equal to or greater than one per ten	very high

An estimated increased excess lifetime cancer risk is not a specific estimate of expected cancers. Rather, it is a plausible upper bound estimate of the probability that a person may develop cancer sometime in his or her lifetime following exposure to that contaminant.

There is insufficient knowledge of cancer mechanisms to decide if there exists a level of exposure to a cancer-causing agent below which there is no risk of getting cancer, namely, a threshold level. Therefore, every exposure, no matter how low, to a cancer-causing compound is assumed to be associated with some increased risk. As the dose of a carcinogen decreases, the chance of developing cancer decreases, but each exposure is accompanied by some increased risk.

There is general consensus among the scientific and regulatory communities on what level of estimated excess cancer risk is acceptable. An increased lifetime cancer risk of one in one million or less is generally not considered a significant public health concern.

For noncarcinogenic health risks, the contaminant intake was estimated using exposure assumptions for the site conditions. This dose was then compared to a risk reference dose (estimated daily intake of a chemical that is likely to be without an appreciable risk of health effects) developed by the US EPA, ATSDR and/or NYS DOH. The resulting ratio was then compared to the following qualitative scale of health risk:

Qualitative Descriptions for
Noncarcinogenic Health Risks

Ratio of Estimated Contaminant Intake to Risk Reference Dose	Qualitative Descriptor
equal to or less than the risk reference dose	minimal
greater than one to five times the risk reference dose	low
greater than five to ten times the risk reference dose	moderate
greater than ten times the risk reference dose	high

Noncarcinogenic effects unlike carcinogenic effects are believed to have a threshold, that is, a dose below which adverse effects will not occur. As a result, the current practice is to identify, usually from animal toxicology experiments, a no-observed-effect-level (NOEL). This is the experimental exposure level in animals at which no adverse toxic effect is observed. The NOEL is then divided by an uncertainty factor to yield the risk reference dose. The uncertainty factor is a number that reflects the degree of uncertainty that exists when experimental animal data are extrapolated to the general human population. The magnitude of the uncertainty factor takes into consideration various factors such as sensitive subpopulations (for example, children or the elderly), extrapolation from animals to humans, and the incompleteness of available data. Thus, the risk reference dose is not expected to cause health effects because it is selected to be much lower than dosages that do not cause adverse health effects in laboratory animals.

The measure used to describe the potential for noncancer health effects to occur in an individual is expressed as a ratio of estimated contaminant intake to the risk reference dose. A ratio equal to or less than one is generally not considered a significant public health concern. If exposure to the contaminant exceeds the risk reference dose, there may be concern for potential noncancer health effects because the margin of protection is less than that afforded by the reference dose. As a rule, the greater the ratio of the estimated contaminant intake to the risk reference dose, the greater the level of concern. This level of concern depends upon an evaluation of a number of factors such as the actual potential for exposure, background exposure, and the strength of the toxicologic data.

APPENDIX D

Public Health Hazard Categories

INTERIM PUBLIC HEALTH HAZARD CATEGORIES

CATEGORY / DEFINITION	DATA SUFFICIENCY	CRITERIA
A. Urgent Public Health Hazard This category is used for sites where short-term exposures (< 1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.	This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that site-specific conditions or likely exposures have had, are having, or are likely to have in the future, an adverse impact on human health that requires immediate action or intervention. Such site-specific conditions or exposures may include the presence of serious physical or safety hazards.
B. Public Health Hazard This category is used for sites that pose a public health hazard due to the existence of long-term exposures (> 1 yr) to hazardous substance or conditions that could result in adverse health effects.	This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants (including radionuclides) have had, are having, or are likely to have in the future, an adverse impact on human health that requires one or more public health interventions. Such site-specific exposures may include the presence of serious physical or safety hazards.
C. Indeterminate Public Health Hazard This category is used for sites in which "*critical*" data are *insufficient* with regard to extent of exposure and/or toxicologic properties at estimated exposure levels.	This determination represents a professional judgement that critical data are missing and ATSDR has judged the data are insufficient to support a decision. This does not necessarily imply all data are incomplete; but that some additional data are required to support a decision.	The health assessor must determine, using professional judgement, the "criticality" of such data and the likelihood that the data can be obtained and will be obtained in a timely manner. Where some data are available, even limited data, the health assessor is encouraged to the extent possible to select other hazard categories and to support their decision with clear narrative that explains the limits of the data and the rationale for the decision.
D. No Apparent Public Health Hazard This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.	This determination represents a professional judgement based on critical data which ATSDR considers sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that, under site-specific conditions of exposure, exposures to site-specific contaminants in the past, present, or future are not likely to result in any adverse impact on human health.
E: No Public Health Hazard This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.	Sufficient evidence indicates that no human exposures to contaminated media have occurred, none are now occurring, and none are likely to occur in the future	

**Such as environmental and demographic data; health outcome data; exposure data; community health concerns information; toxicologic, medical, and epidemiologic data; monitoring and management plans*

APPENDIX E

ATSDR Glossary of Terms

ATSDR Glossary of Terms

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency with headquarters in Atlanta, Georgia, and 10 regional offices in the United States. ATSDR's mission is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances. ATSDR is not a regulatory agency, unlike the U.S. Environmental Protection Agency (EPA), which is the federal agency that develops and enforces environmental laws to protect the environment and human health. This glossary defines words used by ATSDR in communications with the public. It is not a complete dictionary of environmental health terms. If you have questions or comments, call ATSDR's toll-free telephone number, 1-888-422-8737.

General Terms

Absorption - The process of taking in. For a person or an animal, absorption is the process of a substance getting into the body through the eyes, skin, stomach, intestines, or lungs.

Acute - Occurring over a short time [compare with chronic].

Acute exposure - Contact with a substance that occurs once or for only a short time (up to 14 days) [compare with intermediate duration exposure and chronic exposure].

Additive effect - A biologic response to exposure to multiple substances that equals the sum of responses of all the individual substances added together [compare with antagonistic effect and synergistic effect].

Adverse health effect - A change in body function or cell structure that might lead to disease or health problems

Aerobic - Requiring oxygen [compare with anaerobic].

Ambient - Surrounding (for example, *ambient* air).

Anaerobic - Requiring the absence of oxygen [compare with aerobic].

Analyte - A substance measured in the laboratory. A chemical for which a sample (such as water, air, or blood) is tested in a laboratory. For example, if the analyte is mercury, the laboratory test will determine the amount of mercury in the sample.

Analytic epidemiologic study - A study that evaluates the association between exposure to hazardous substances and disease by testing scientific hypotheses.

Antagonistic effect - A biologic response to exposure to multiple substances that is **less** than would be expected if the known effects of the individual substances were added together [compare with additive effect and synergistic effect].

Background level - An average or expected amount of a substance or radioactive material in a specific environment, or typical amounts of substances that occur naturally in an environment.

Biodegradation - Decomposition or breakdown of a substance through the action of microorganisms (such as bacteria or fungi) or other natural physical processes (such as sunlight).

Biologic indicators of exposure study - A study that uses (a) biomedical testing or (b) the measurement of a substance [an analyte], its metabolite, or another marker of exposure in human body fluids or tissues to confirm human exposure to a hazardous substance [also see exposure investigation].

Biologic monitoring - Measuring hazardous substances in biologic materials (such as blood, hair, urine, or breath) to determine whether exposure has occurred. A blood test for lead is an example of biologic monitoring.

Biologic uptake - The transfer of substances from the environment to plants, animals, and humans.

Biomedical testing - Testing of persons to find out whether a change in a body function might have occurred because of exposure to a hazardous substance.

Biota - Plants and animals in an environment. Some of these plants and animals might be sources of food, clothing, or medicines for people.

Body burden - The total amount of a substance in the body. Some substances build up in the body because they are stored in fat or bone or because they leave the body very slowly.

Cancer - Any one of a group of diseases that occur when cells in the body become abnormal and grow or multiply out of control.

Cancer risk - A theoretical risk for getting cancer if exposed to a substance every day for 70 years (a lifetime exposure). The true risk might be lower.

Carcinogen - A substance that causes cancer.

Case study - A medical or epidemiologic evaluation of one person or a small group of people to gather information about specific health conditions and past exposures.

Case-control study - A study that compares exposures of people who have a disease or condition (cases) with people who do not have the disease or condition (controls). Exposures that are more common among the cases may be considered as possible risk factors for the disease.

CAS registry number - A unique number assigned to a substance by the American Chemical Society Abstracts Service.

Central nervous system - The part of the nervous system that consists of the brain and the spinal cord.

CERCLA - [see Comprehensive Environmental Response, Compensation, and Liability Act of 1980]

Chronic - Occurring over a long time [compare with acute].

Chronic exposure - Contact with a substance that occurs over a long time (more than 1 year) [compare with acute exposure and intermediate duration exposure]

Cluster investigation - A review of an unusual number, real or perceived, of health events (for example, reports of cancer) grouped together in time and location. Cluster investigations are designed to confirm case reports; determine whether they represent an unusual disease occurrence; and, if possible, explore possible causes and contributing environmental factors.

Community Assistance Panel (CAP) - A group of people from a community and from health and environmental agencies who work with ATSDR to resolve issues and problems related to hazardous substances in the community. CAP members work with ATSDR to gather and review community health concerns, provide information on how people might have been or might now be exposed to hazardous substances, and inform ATSDR on ways to involve the community in its activities.

Comparison value (CV) - Calculated concentration of a substance in air, water, food, or soil that is unlikely to cause harmful (adverse) health effects in exposed people. The CV is used as a screening level during the public health assessment process. Substances found in amounts greater than their CVs might be selected for further evaluation in the public health assessment process.

Completed exposure pathway - [see exposure pathway].

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) - CERCLA, also known as Superfund, is the federal law that concerns the removal or cleanup of hazardous substances in the environment and at hazardous waste sites. ATSDR, which was created by CERCLA, is responsible for assessing health issues and supporting public health activities related to hazardous waste sites or other environmental releases of hazardous substances. This law was later amended by the Superfund Amendments and Reauthorization Act (SARA).

Concentration - The amount of a substance present in a certain amount of soil, water, air, food, blood, hair, urine, breath, or any other media.

Contaminant - A substance that is either present in an environment where it does not belong or is present at levels that might cause harmful (adverse) health effects.

Delayed health effect - A disease or an injury that happens as a result of exposures that might have occurred in the past.

Dermal - Referring to the skin. For example, dermal absorption means passing through the skin.

Dermal contact - Contact with (touching) the skin [see route of exposure].

Descriptive epidemiology - The study of the amount and distribution of a disease in a specified population by person, place, and time.

Detection limit - The lowest concentration of a chemical that can reliably be distinguished from a zero concentration.

Disease prevention - Measures used to prevent a disease or reduce its severity.

Disease registry - A system of ongoing registration of all cases of a particular disease or health condition in a defined population.

DOD - United States Department of Defense.

DOE - United States Department of Energy.

Dose (for chemicals that are not radioactive) - The amount of a substance to which a person is exposed over some time period. Dose is a measurement of exposure. Dose is often expressed as milligram (amount) per kilogram (a measure of body weight) per day (a measure of time) when people eat or drink contaminated water, food, or soil. In general, the greater the dose, the greater the likelihood of an effect. An "exposure dose" is how much of a substance is encountered in the environment. An "absorbed dose" is the amount of a substance that actually got into the body through the eyes, skin, stomach, intestines, or lungs.

Dose (for radioactive chemicals) - The radiation dose is the amount of energy from radiation that is actually absorbed by the body. This is not the same as measurements of the amount of radiation in the environment.

Dose-response relationship - The relationship between the amount of exposure [dose] to a substance and the resulting changes in body function or health (response).

Environmental media - Soil, water, air, biota (plants and animals), or any other parts of the environment that can contain contaminants.

Environmental media and transport mechanism - Environmental media include water, air, soil, and biota (plants and animals). Transport mechanisms move contaminants from the source to points where human exposure can occur. The environmental media and transport mechanism is the second part of an exposure pathway.

EPA - United States Environmental Protection Agency.

Epidemiologic surveillance - [see Public health surveillance].

Epidemiology - The study of the distribution and determinants of disease or health status in a population; the study of the occurrence and causes of health effects in humans.

Exposure - Contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term [acute exposure], of intermediate duration, or long-term [chronic exposure].

Exposure assessment - The process of finding out how people come into contact with a hazardous substance, how often and for how long they are in contact with the substance, and how much of the substance they are in contact with.

Exposure-dose reconstruction - A method of estimating the amount of people's past exposure to hazardous substances. Computer and approximation methods are used when past information is limited, not available, or missing.

Exposure investigation - The collection and analysis of site-specific information and biologic tests (when appropriate) to determine whether people have been exposed to hazardous substances.

Exposure pathway - The route a substance takes from its source (where it began) to its end point (where it ends), and how people can come into contact with (or get exposed to) it. An exposure pathway has five parts: a source of contamination (such as an abandoned business); an environmental media and transport mechanism (such as movement through groundwater); a point of exposure (such as a private well); a

route of exposure (eating, drinking, breathing, or touching), and a receptor population (people potentially or actually exposed). When all five parts are present, the exposure pathway is termed a completed exposure pathway.

Exposure registry - A system of ongoing followup of people who have had documented environmental exposures.

Feasibility study - A study by EPA to determine the best way to clean up environmental contamination. A number of factors are considered, including health risk, costs, and what methods will work well.

Geographic information system (GIS) - A mapping system that uses computers to collect, store, manipulate, analyze, and display data. For example, GIS can show the concentration of a contaminant within a community in relation to points of reference such as streets and homes.

Grand rounds - Training sessions for physicians and other health care providers about health topics.

Groundwater - Water beneath the earth's surface in the spaces between soil particles and between rock surfaces [compare with surface water].

Half-life ($t_{½}$) - The time it takes for half the original amount of a substance to disappear. In the environment, the half-life is the time it takes for half the original amount of a substance to disappear when it is changed to another chemical by bacteria, fungi, sunlight, or other chemical processes. In the human body, the half-life is the time it takes for half the original amount of the substance to disappear, either by being changed to another substance or by leaving the body. In the case of radioactive material, the half life is the amount of time necessary for one half the initial number of radioactive atoms to change or transform into another atom (that is normally not radioactive). After two half lives, 25% of the original number of radioactive atoms remain.

Hazard - A source of potential harm from past, current, or future exposures.

Hazardous Substance Release and Health Effects Database (HazDat) - The scientific and administrative database system developed by ATSDR to manage data collection, retrieval, and analysis of site-specific information on hazardous substances, community health concerns, and public health activities.

Hazardous waste - Potentially harmful substances that have been released or discarded into the environment.

Health consultation - A review of available information or collection of new data to respond to a specific health question or request for information about a potential environmental hazard. Health consultations are focused on a specific exposure issue. Health consultations are therefore more limited than a public health assessment, which reviews the exposure potential of each pathway and chemical [compare with public health assessment].

Health education - Programs designed with a community to help it know about health risks and how to reduce these risks.

Health investigation - The collection and evaluation of information about the health of community residents. This information is used to describe or count the occurrence of a disease, symptom, or clinical measure and to evaluate the possible association between the occurrence and exposure to hazardous substances.

Health promotion - The process of enabling people to increase control over, and to improve, their health.

Health statistics review - The analysis of existing health information (i.e., from death certificates, birth defects registries, and cancer registries) to determine if there is excess disease in a specific population, geographic area, and time period. A health statistics review is a descriptive epidemiologic study.

Indeterminate public health hazard - The category used in ATSDR's public health assessment documents when a professional judgment about the level of health hazard cannot be made because information critical to such a decision is lacking.

Incidence - The number of new cases of disease in a defined population over a specific time period.

Ingestion - The act of swallowing something through eating, drinking, or mouthing objects. A hazardous substance can enter the body this way [see route of exposure].

Inhalation - The act of breathing. A hazardous substance can enter the body this way [see route of exposure].

Intermediate duration exposure - Contact with a substance that occurs for more than 14 days and less than a year [compare with acute exposure and chronic exposure].

In vitro - In an artificial environment outside a living organism or body. For example, some toxicity testing is done on cell cultures or slices of tissue grown in the laboratory, rather than on a living animal [compare with in vivo].

In vivo - Within a living organism or body. For example, some toxicity testing is done on whole animals, such as rats or mice [compare with in vitro].

Lowest-observed-adverse-effect level (LOAEL) - The lowest tested dose of a substance that has been reported to cause harmful (adverse) health effects in people or animals.

Medical monitoring - A set of medical tests and physical exams specifically designed to evaluate whether an individual's exposure could negatively affect that person's health.

Metabolism - The conversion or breakdown of a substance from one form to another by a living organism.

Metabolite - Any product of metabolism.

mg/kg - Milligram per kilogram.

mg/cm^2 - Milligram per square centimeter (of a surface).

mg/m^3 - Milligram per cubic meter; a measure of the concentration of a chemical in a known volume (a cubic meter) of air, soil, or water.

Migration - Moving from one location to another.

Minimal risk level (MRL) - An ATSDR estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of harmful (adverse), noncancerous effects. MRLs are calculated for a route of exposure (inhalation or oral) over a specified time period (acute, intermediate, or chronic). MRLs should not be used as predictors of harmful (adverse) health effects [see reference dose].

Morbidity - State of being ill or diseased, the occurrence of a disease or condition that alters health and quality of life.

Mortality - Death. Usually the cause (a specific disease, a condition, or an injury) is stated.

Mutagen - A substance that causes mutations (genetic damage).

Mutation - A change (damage) to the DNA, genes, or chromosomes of living organisms.

National Priorities List for Uncontrolled Hazardous Waste Sites (National Priorities List or **NPL)** - EPA's list of the most serious uncontrolled or abandoned hazardous waste sites in the United States. The NPL is updated on a regular basis.

National Toxicology Program (NTP) - Part of the Department of Health and Human Services. NTP develops and carries out tests to predict whether a chemical will cause harm to humans.

No apparent public health hazard - A category used in ATSDR's public health assessments for sites where human exposure to contaminated media might be occurring, might have occurred in the past, or might occur in the future, but where the exposure is not expected to cause any harmful health effects.

No-observed-adverse-effect level (NOAEL) - The highest tested dose of a substance that has been reported to have no harmful (adverse) health effects on people or animals.

No public health hazard - A category used in ATSDR's public health assessment documents for sites where people have never and will never come into contact with harmful amounts of site-related substances.

NPL - [see National Priorities List for Uncontrolled Hazardous Waste Sites]

Physiologically based pharmacokinetic model (PBPK model) - A computer model that describes what happens to a chemical in the body. This model describes how the chemical gets into the body, where it goes in the body, how it is changed by the body, and how it leaves the body.

Pica - A craving to eat nonfood items, such as dirt, paint chips, and clay. Some children exhibit pica-related behavior.

Plume - A volume of a substance that moves from its source to places farther away from the source. Plumes can be described by the volume of air or water they occupy and the direction they move. For example, a plume can be a column of smoke from a chimney or a substance moving with groundwater.

Point of exposure - The place where someone can come into contact with a substance present in the environment [see exposure pathway].

Population - A group or number of people living within a specified area or sharing similar characteristics (such as occupation or age).

Potentially responsible party (PRP) - A company, government, or person legally responsible for cleaning up the pollution at a hazardous waste site under Superfund. There may be more than one PRP for a particular site.

ppb - Parts per billion.

ppm - Parts per million.

Prevalence - The number of existing disease cases in a defined population during a specific time period.

Prevalence survey - The measure of the current level of disease(s) or symptoms and exposures through a questionnaire that collects self-reported information from a defined population.

Prevention - Actions that reduce exposure or other risks, keep people from getting sick, or keep disease from getting worse.

Public availability session - An informal, drop-by meeting at which community members can meet one-on-one with ATSDR staff members to discuss health and site-related concerns.

Public comment period - An opportunity for the public to comment on agency findings or proposed activities contained in draft reports or documents. The public comment period is a limited time period during which comments will be accepted.

Public health action - A list of steps to protect public health.

Public health advisory - A statement made by ATSDR to EPA or a state regulatory agency that a release of hazardous substances poses an immediate threat to human health. The advisory includes recommended measures to reduce exposure and reduce the threat to human health.

Public health assessment (PHA) - An ATSDR document that examines hazardous substances, health outcomes, and community concerns at a hazardous waste site to determine whether people could be harmed from coming into contact with those substances. The PHA also lists actions that need to be taken to protect public health [compare with health consultation].

Public health hazard - A category used in ATSDR's public health assessments for sites that pose a public health hazard because of long-term exposures (greater than 1 year) to sufficiently high levels of hazardous substances or radionuclides that could result in harmful health effects.

Public health hazard categories - Public health hazard categories are statements about whether people could be harmed by conditions present at the site in the past, present, or future. One or more hazard categories might be appropriate for each site. The five public health hazard categories are no public health hazard, no apparent public health hazard, indeterminate public health hazard, public health hazard, and urgent public health hazard.

Public health statement - The first chapter of an ATSDR toxicological profile. The public health statement is a summary written in words that are easy to understand. The public health statement explains how people might be exposed to a specific substance and describes the known health effects of that substance.

Public health surveillance - The ongoing, systematic collection, analysis, and interpretation of health data. This activity also involves timely dissemination of the data and use for public health programs.

Public meeting - A public forum with community members for communication about a site.

Radioisotope - An unstable or radioactive isotope (form) of an element that can change into another element by giving off radiation.

Radionuclide - Any radioactive isotope (form) of any element.

RCRA - [see Resource Conservation and Recovery Act (1976, 1984)]

Receptor population - People who could come into contact with hazardous substances [see exposure pathway].

Reference dose (RfD) - An EPA estimate, with uncertainty or safety factors built in, of the daily lifetime dose of a substance that is unlikely to cause harm in humans.

Registry - A systematic collection of information on persons exposed to a specific substance or having specific diseases [see exposure registry and disease registry].

Remedial investigation - The CERCLA process of determining the type and extent of hazardous material contamination at a site.

Resource Conservation and Recovery Act (1976, 1984) (RCRA) - This Act regulates management and disposal of hazardous wastes currently generated, treated, stored, disposed of, or distributed.

RFA - RCRA Facility Assessment. An assessment required by RCRA to identify potential and actual releases of hazardous chemicals.

RfD - [see reference dose]

Risk - The probability that something will cause injury or harm.

Risk reduction - Actions that can decrease the likelihood that individuals, groups, or communities will experience disease or other health conditions.

Risk communication - The exchange of information to increase understanding of health risks.

Route of exposure - The way people come into contact with a hazardous substance. Three routes of exposure are breathing [inhalation], eating or drinking [ingestion], or contact with the skin [dermal contact].

Safety factor - [see uncertainty factor]

SARA - [see Superfund Amendments and Reauthorization Act]

Sample - A portion or piece of a whole. A selected subset of a population or subset of whatever is being studied. For example, in a study of people the sample is a number of people chosen from a larger population [see population]. An environmental sample (for example, a small amount of soil or water) might be collected to measure contamination in the environment at a specific location.

Sample size - The number of units chosen from a population or an environment.

Solvent - A liquid capable of dissolving or dispersing another substance (for example, acetone or mineral spirits).

Source of contamination - The place where a hazardous substance comes from, such as a landfill, waste pond, incinerator, storage tank, or drum. A source of contamination is the first part of an exposure pathway.

Special populations - People who might be more sensitive or susceptible to exposure to hazardous substances because of factors such as age, occupation, sex, or behaviors (for example, cigarette

smoking). Children, pregnant women, and older people are often considered special populations.

Stakeholder - A person, group, or community who has an interest in activities at a hazardous waste site.

Statistics - A branch of mathematics that deals with collecting, reviewing, summarizing, and interpreting data or information. Statistics are used to determine whether differences between study groups are meaningful.

Substance - A chemical.

Substance-specific applied research - A program of research designed to fill important data needs for specific hazardous substances identified in ATSDR's toxicological profiles. Filling these data needs would allow more accurate assessment of human risks from specific substances contaminating the environment. This research might include human studies or laboratory experiments to determine health effects resulting from exposure to a given hazardous substance.

Superfund - [see Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act (SARA)

Superfund Amendments and Reauthorization Act (SARA) - In 1986, SARA amended the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and expanded the health-related responsibilities of ATSDR. CERCLA and SARA direct ATSDR to look into the health effects from substance exposures at hazardous waste sites and to perform activities including health education, health studies, surveillance, health consultations, and toxicological profiles.

Surface water - Water on the surface of the earth, such as in lakes, rivers, streams, ponds, and springs [compare with groundwater].

Surveillance - [see public health surveillance]

Survey - A systematic collection of information or data. A survey can be conducted to collect information from a group of people or from the environment. Surveys of a group of people can be conducted by telephone, by mail, or in person. Some surveys are done by interviewing a group of people [see prevalence survey].

Synergistic effect - A biologic response to multiple substances where one substance worsens the effect of another substance. The combined effect of the substances acting together is greater than the sum of the effects of the substances acting by themselves [see additive effect and antagonistic effect].

Teratogen - A substance that causes defects in development between conception and birth. A teratogen is a substance that causes a structural or functional birth defect.

Toxic agent - Chemical or physical (for example, radiation, heat, cold, microwaves) agents that, under certain circumstances of exposure, can cause harmful effects to living organisms.

Toxicological profile - An ATSDR document that examines, summarizes, and interprets information about a hazardous substance to determine harmful levels of exposure and associated health effects. A toxicological profile also identifies significant gaps in knowledge on the substance and describes areas where further research is needed.

Toxicology -The study of the harmful effects of substances on humans or animals.

Tumor - An abnormal mass of tissue that results from excessive cell division that is uncontrolled and progressive. Tumors perform no useful body function. Tumors can be either benign (not cancer) or malignant (cancer).

Uncertainty factor - Mathematical adjustments for reasons of safety when knowledge is incomplete. For example, factors used in the calculation of doses that are not harmful (adverse) to people. These factors are applied to the lowest-observed-adverse-effect-level (LOAEL) or the no-observed-adverse-effect-level (NOAEL) to derive a minimal risk level (MRL). Uncertainty factors are used to account for variations in people's sensitivity, for differences between animals and humans, and for differences between a LOAEL and a NOAEL. Scientists use uncertainty factors when they have some, but not all, the information from animal or human studies to decide whether an exposure will cause harm to people [also sometimes called a safety factor].

Urgent public health hazard - A category used in ATSDR's public health assessments for sites where short-term exposures (less than 1 year) to hazardous substances or conditions could result in harmful health effects that require rapid intervention.

Volatile organic compounds (VOCs) - Organic compounds that evaporate readily into the air. VOCs include substances such as benzene, toluene, methylene chloride, and methyl chloroform.

Other glossaries and dictionaries:
Environmental Protection Agency - http://www.epa.gov/OCEPAterms/
National Library of Medicine (NIH) - http://www.nlm.nih.gov/medlineplus/mplusdictionary.html

For more information on the work of ATSDR, please contact
NCEH/ATSDR Office of Communication, Information Services Center
1600 Clifton Road, N.E. (MS E-29)
Atlanta, GA 30333
Telephone: 1-888-422-8737

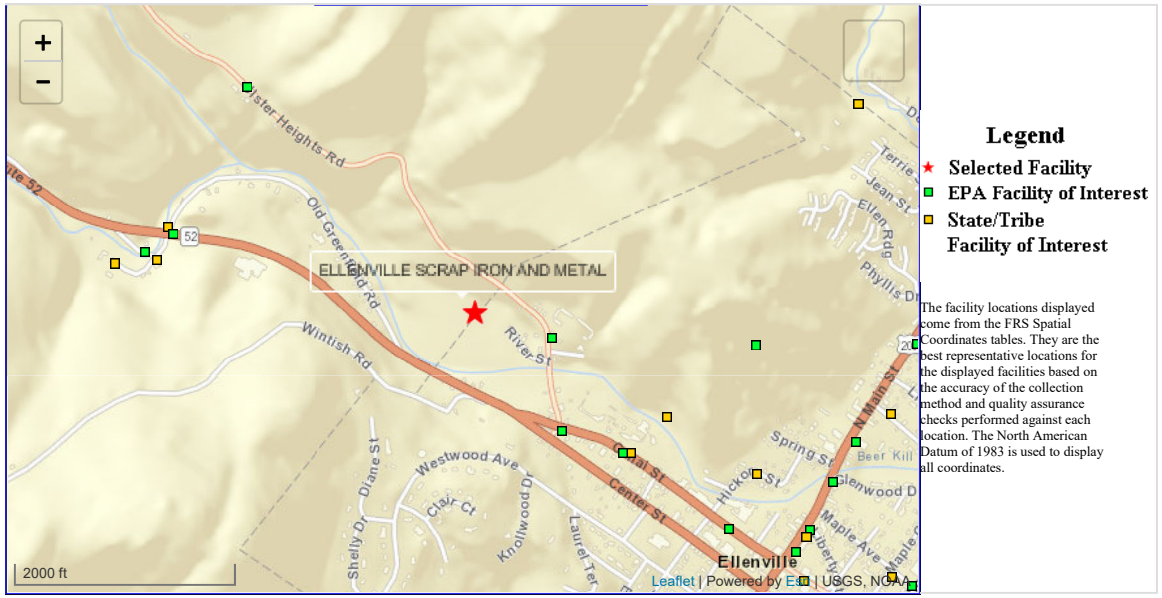
Related Topics: Envirofacts

FRS

FRS Facility Detail Report

ELLENVILLE SCRAP IRON AND METAL

EPA Registry Id: 110009303672
34 CAPE ROAD
ELLENVILLE, NY 12428



Legend
- Selected Facility
- EPA Facility of Interest
- State/Tribe Facility of Interest

The facility locations displayed come from the FRS Spatial Coordinates tables. They are the best representative locations for the displayed facilities based on the accuracy of the collection method and quality assurance checks performed against each location. The North American Datum of 1983 is used to display all coordinates.

Facilty Registry Service Links:

- Facility Registry Service (FRS) Overview
- FRS Facility Query
- FRS Organization Query
- EZ Query
- FRS Physical Data Model
- FRS Geospatial Model

Environmental Interests

Information System	System Facility Name	Information System Id/Report Link	Environmental Interest Type	Data Source	Last Updated Date	Supplemental Environmental Interests:
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	ELLENVILLE SCRAP IRON AND METAL	NYSFN0204190	SUPERFUND NPL	SEMS		
NEW YORK - FACILITY INFORMATION SYSTEM	ELLENVILLE SCRAP IRON AND METAL CO	3-5156-00133	STATE MASTER	FIS		**FIS**-3-5156-00133/00001 AIR PROGRAM **FIS**-3-5156-00133/00003 AIR PROGRAM

Additional EPA Reports: MyEnvironment Site Demographics Facility Coordinates Viewer Environmental Justice Map Viewer Watershed Report

Standard Industrial Classification Codes (SIC)

No SIC Codes returned.

Facility Codes and Flags

EPA Region:	02
Duns Number:	
Congressional District Number:	19
Legislative District Number:	
HUC Code/Watershed:	02020007 / RONDOUT
US Mexico Border Indicator:	
Federal Facility:	NO
Tribal Land:	NO

Alternative Names

No Alternative Names returned.

Organizations

No Organizations returned.

National Industry Classification System Codes (NAICS)

No NAICS Codes returned.

Facility Mailing Addresses

No Facility Mailing Addresses returned.

Contacts

Affiliation Type	Full Name	Office Phone	Information System	Mailing Address
REMEDIAL PROJECT MANAGER (RPM)	DAMIAN DUDA	2126374269	SEMS	

Query executed on: JAN-24-2020

Last updated on September 24, 2015

ATTACHMENT 5

NEPAssist

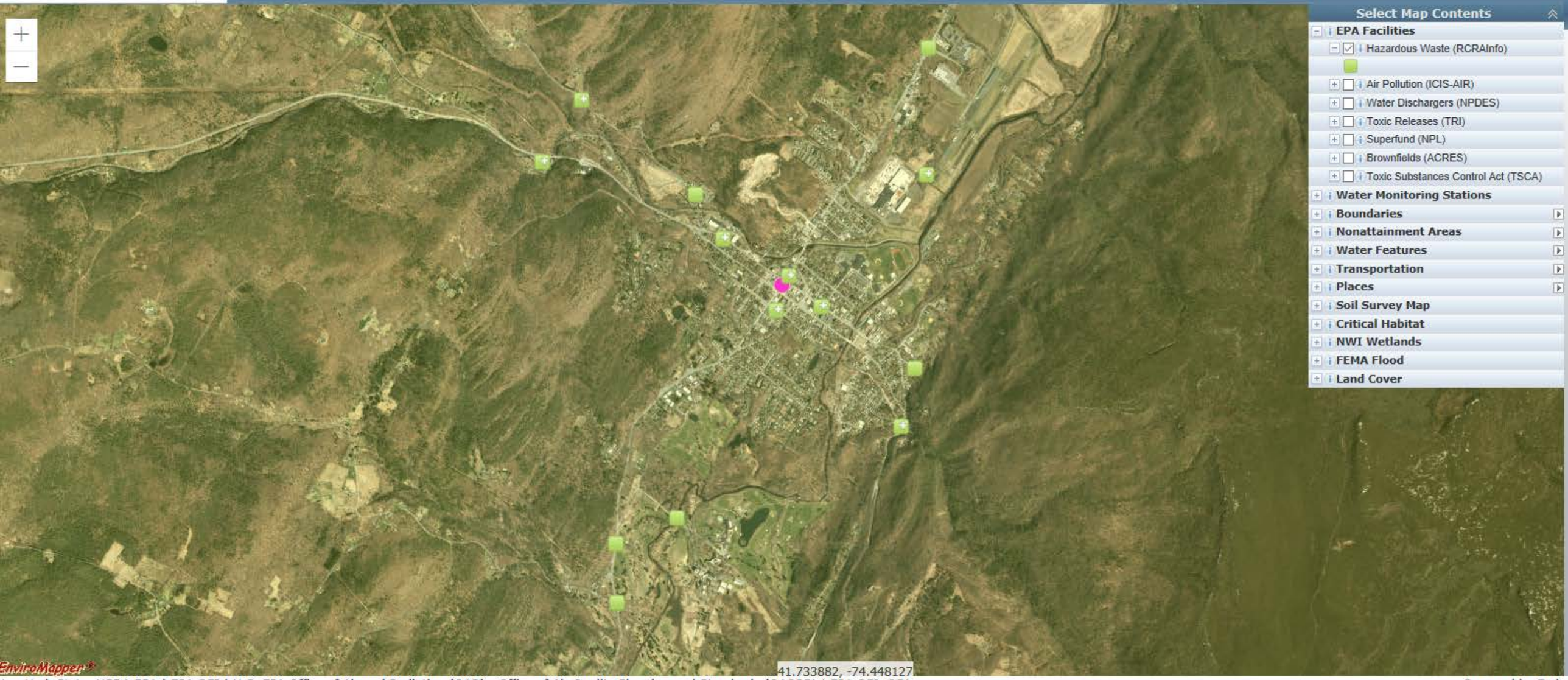
Ellenville Scrap Iron and Metal

Home | Help

United States Environmental Protection Agency

Ellenville, NY, USA

Basemap | Imagery | Draw | Erase | Save Session | Tools | More Data



New York State, USDA FSA | EPA OEI | U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS) | EPA OEI, OFA

Powered by Esri

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Environmental Site Remediation Database Search Details

Site Record

Administrative Information

Site Name: Ellenville Scrap Iron and Metal
Site Code: 356022
Program: State Superfund Program
Classification: 04
EPA ID Number:

Location

DEC Region: 3
Address: 34 Cape Road
City: Ellenville (V) Zip: 12428-
County: Ulster
Latitude: 41.72433253
Longitude: -74.40490014
Site Type: DUMP LANDFILL
Estimated Size: 28.1 Acres

Institutional And Engineering Controls

Control Type:
Deed Restriction

Control Elements:
Ground Water Use Restriction
Cover System
Deed Notice
Landuse Restriction
Monitoring Plan
Site Management Plan
IC/EC Plan
Monitoring Wells

Site Owner(s) and Operator(s)

Current Owner Name: John C. Bruno
Current Owner(s) Address: 46 Chambers Street
Newburgh,NY, 12550

Current Owner Name: Catello Viviani
Current Owner(s) Address: PO Box 1973
Kingston,NY, 12402
Owner(s) during disposal: ALBERT & PRISCILLA KOPLIC
Current On-Site Operator: Catello Viviani
Stated Operator(s) Address: PO Box 1973
Kingston,NY 12402
Current On-Site Operator: C. Bruno Demolition, Inc.
Stated Operator(s) Address: P.O. Box 7037
Newburgh,NY 12552

Site Description

Location: The Ellenville Scrap Iron and Metal Site is located at 34 Cape Road in the Village of Ellenville, Town of Warwarsing, Ulster County, New York. The site is located about 0.5 miles northwest of the intersection of State Routes 209 and 52. The site is bounded to the north by Cape Road; to the south by Beer Kill Creek; to the west by undeveloped land; and to the east by residential properties. Site Features: The site is an approximately 28-acre property, of which 5 acres is a capped waste consolidation cell in the upper terrace. The consolidation area is fenced. The lower terrace is a partially fenced area that was restored with trees and grass. The lower terrace also contains a surface water detention basin for the consolidation cell and a wetland area. Current Zoning /Uses: The site is classified as Other Rural Vacant Lands and Vacant Land Located in Commercial Areas. The site is currently vacant with no buildings or structures. Past Uses of the Site: Prior to remediation, the site was used for a variety of scrap metal operations and battery reclamation and a part of the Site was used for the storage and disposal of heavy equipment and automobile batteries. At one time the Site contained a truck scale, a hydraulic baling machine used for metal cans and other small parts, abandoned automobiles and trucks, scrap metal piles, a landfill embankment composed of construction and demolition debris, railroad ties, storage of automobile battery casings and assorted brush piles. Site Geology and Hydrogeology: The Site overlies the Hamilton shale and sandstones, which are underlain by the Onondaga, Helderberg and Rondout limestone, outcropping in the valley just to the east of the Site. Overlying the bedrock are glacial deposits consisting of ground moraine and stratified drift. Post glacial alluvium deposits are present on the flat terrain adjacent to the Beer Kill River. The depth to water at the Site ranges from approximately 8 to 13.5 feet below ground surface (bgs) near the Beer Kill River on the lower plateau of the Site to approximately 21 feet bgs on the upper plateau of the Site. There is a limited overburden aquifer present in the upper plateau area. Groundwater flows to the south in the upper plateau area and to the southeast in the lower plateau area.

Contaminants of Concern (Including Materials Disposed)

Contaminant Name/Type

barium
benzo(b)fluoranthene
benzo(k)fluoranthene
cadmium
chrysene
dibenz[a,h]anthracene
zinc
indeno(1,2,3-CD)pyrene
arsenic
lead
nickel
tetrachloroethene (PCE)
mercury
chromium
benzo(a)anthracene
benzo(a)pyrene

Site Environmental Assessment

Remediation at the site is complete. Prior to remediation, the primary contaminants of concern were polychlorinated biphenyls (PCBs), tetrachloroethene (PCE), polyaromatic hydrocarbons (PAHs), and metals in soil. Remedial actions have successfully achieved soil cleanup objectives for commercial use within the capped landfill area, and restricted residential use in the lower terrain area. Remaining contamination in the soil and groundwater is being managed under a Site Management Plan.

Site Health Assessment

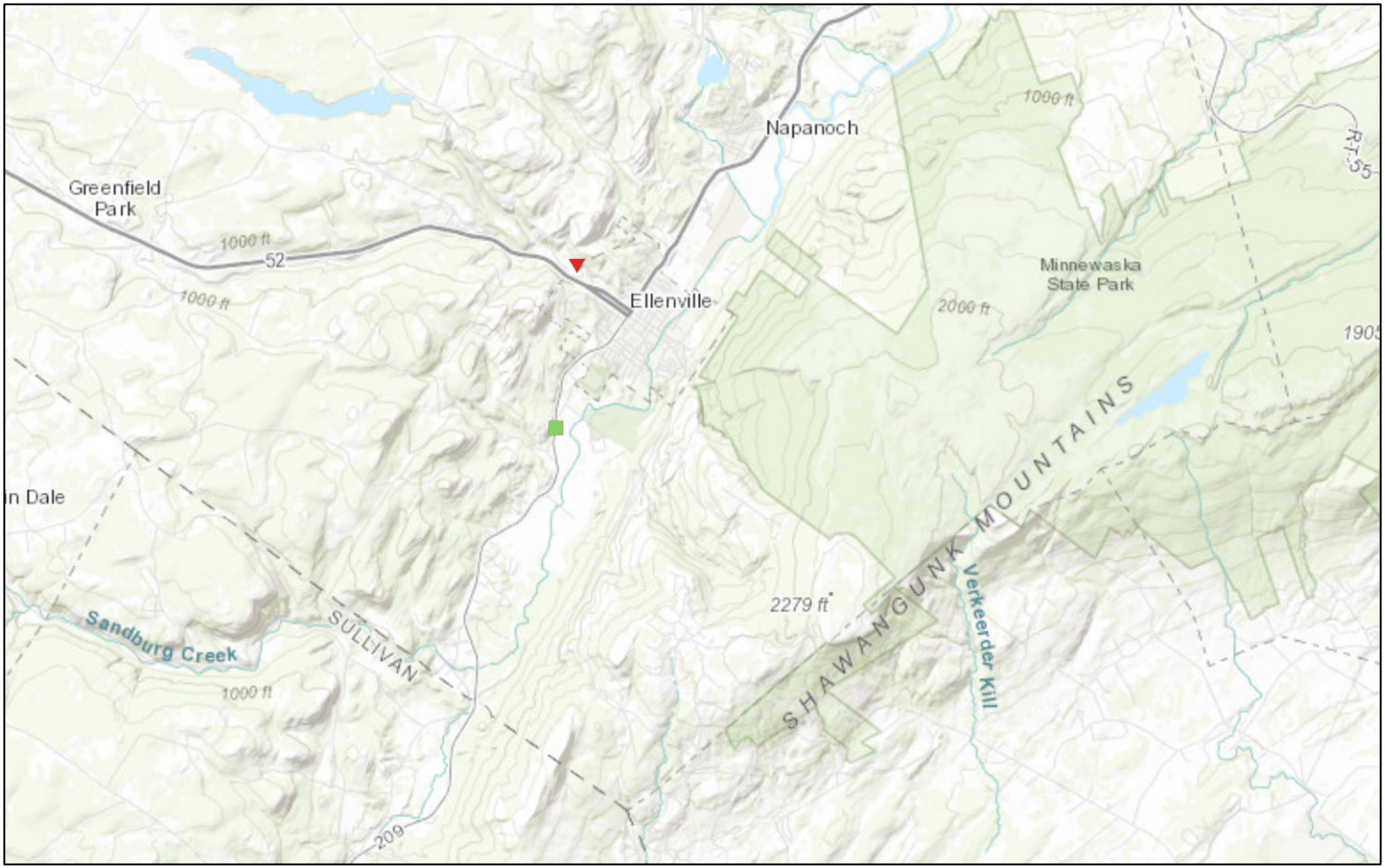
The landfill was properly capped when it was closed; therefore, people are not likely to contact contaminated soils. Measures are in place to control the potential for coming in contact with subsurface soil and groundwater contamination remaining on the site.

For more Information: E-mail Us

Return To Results

Refine This Search

Ellenville EPA Sites



January 24, 2020

State Outlines

Sites

Incidents of National Significance

Federal Facility Docket/Superfund NPL/RCRA CA

Federal Facility Docket/Brownfields/RCRA CA

RCRA Corrective Action/Superfund NPL

AVNET INCORPORATED

Ellenville Scrap Iron and Metal

1:117,289

0 0.75 1.5 3 mi

0 1 2 4 km

US EPA, Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL,

Generated from: Cleanups in My Community: Date above is the date map

ECHO
Enforcement and Compliance History Online

Detailed Facility Report

Facility Summary

AVNET INCORPORATED
ROUTE 209, ELLENVILLE, NY 12428

FRS (Facility Registry Service) ID: 110002152438
EPA Region: 02
Latitude: 41.70048
Longitude: -74.40974
Locational Data Source: FRS
Industry:
Indian Country: N

Enforcement and Compliance Summary

Statute	RCRA
Insp (5 Years)	3
Date of Last Inspection	08/30/2019
Current Compliance Status	No Violation Identified
Qtrs with NC (of 12)	0
Qtrs with Significant Violation	0
Informal Enforcement Actions (5 years)	1
Formal Enforcement Actions (5 years)	--
Penalties from Formal Enforcement Actions (5 years)	--
EPA Cases (5 years)	--
Penalties from EPA Cases (5 years)	--

Regulatory Information

Clean Air Act (CAA): No Information
Clean Water Act (CWA): No Information
Resource Conservation and Recovery Act (RCRA): Active (NYD042457788)
Safe Drinking Water Act (SDWA): No Information

Other Regulatory Reports

Air Emissions Inventory (EIS): No Information
Greenhouse Gas Emissions (eGGRT): No Information
Toxic Releases (TRI): No Information
Compliance and Emissions Data Reporting Interface (CEDRI): No Information

Known Data Problems

Facility/System Characteristics

Facility/System Characteristics

System	Statute	Identifier	Universe	Status	Areas	Permit Expiration Date	Indian Country	Latitude	Longitude
FRS		110002152438					N	41.70048	-74.40974
RCRAInfo	RCRA	NYD042457788	TSDF	Active (PA)			N	41.723333	-74.38

Facility Address

System	Statute	Identifier	Facility Name	Facility Address
FRS		110002152438	AVNET INCORPORATED	ROUTE 209, ELLENVILLE, NY 12428
RCRAInfo	RCRA	NYD042457788	AVNET INC	RTE 209, ELLENVILLE, NY 12428

Facility SIC (Standard Industrial Classification) Codes

System	Identifier	SIC Code	SIC Description
No data records returned			

Facility NAICS (North American Industry Classification System) Codes

System	Identifier	NAICS Code	NAICS Description
RCRAInfo	NYD042457788	334419	Other Electronic Component Manufacturing

Facility Tribe Information

Reservation Name	Tribe Name	EPA Tribal ID	Distance to Tribe (miles)
No data records returned			

Enforcement and Compliance

Compliance Monitoring History (5 years)

Statute	Source ID	System	Activity Type	Compliance Monitoring Type	Lead Agency	Date	Finding (if applicable)
RCRA	NYD042457788	RCRAInfo		GROUNDWATER MONITORING EVALUATION	State	08/30/2019	No Violations Or Compliance Issues Were Found
RCRA	NYD042457788	RCRAInfo		COMPLIANCE EVALUATION INSPECTION ON-SITE	State	11/05/2018	No Violations Or Compliance Issues Were Found
RCRA	NYD042457788	RCRAInfo		COMPLIANCE EVALUATION INSPECTION ON-SITE	State	08/09/2016	Violations Or Compliance Issues Were Found

Entries in italics are not counted in EPA compliance monitoring strategies or annual results.

Compliance Summary Data

Statute	Source ID	Current SNC (Significant Noncompliance)/HPV (High Priority Violation)	Current As Of	Qtrs with NC (Noncompliance) (of 12)	Data Last Refreshed
RCRA	NYD042457788	No	01/18/2020	0	01/17/2020

Three-Year Compliance History by Quarter

Statute	Program/Pollutant/Violation Type	QTR 1	QTR 2	QTR 3	QTR 4	QTR 5	QTR 6	QTR 7	QTR 8	QTR 9	QTR 10	QTR 11	QTR 12+
RCRA (Source ID: NYD042457788)		01/01-03/31/17	04/01-06/30/17	07/01-09/30/17	10/01-12/31/17	01/01-03/31/18	04/01-06/30/18	07/01-09/30/18	10/01-12/31/18	01/01-03/31/19	04/01-06/30/19	07/01-09/30/19	10/01-12/31/19
	Facility-Level Status	**No Violation Identified**	**No Violation Identified**	**No Violation Identified**	**No Violation Identified**	**No Violation Identified**	**No Violation Identified**	**No Violation Identified**	**No Violation Identified**	**No Violation Identified**	**No Violation Identified**	**No Violation Identified**	**No Violation Identified**

Informal Enforcement Actions (5 Years)

Statute	System	Source ID	Type of Action	Lead Agency	Date
RCRA	RCRAInfo	NYD042457788	WRITTEN INFORMAL	State	08/22/2016

Formal Enforcement Actions (5 Years)

Statute	System	Law/Section	Source ID	Action Type	Case No.	Lead Agency	Case Name	Issued/Filed Date	Settlements/Actions	Settlement/Action Date	Federal Penalty	State/Local Penalty	SEP Cost	Comp Action Cost
No data records returned														

Environmental Conditions

Water Quality

Permit ID	Combined Sewer System?	Number of CSO (Combined Sewer Overflow) Outfalls	12-Digit WBD (Watershed Boundary Dataset) HUC (RAD (Reach Address Database))	WBD (Watershed Boundary Dataset) Subwatershed Name (RAD (Reach Address Database))	State Water Body Name (ICIS (Integrated Compliance Information System))	Impaired Waters	Impaired Class	Causes of Impairment(s) by Group(s)	Watershed with ESA (Endangered Species Act)-listed Aquatic Species?
No data records returned									

Water Body Designated Uses

Reach Code	Water Body Name	Exceptional Use	Recreational Use	Aquatic Life Use	Shellfish Use	Beach Closure Within Last Year	Beach Closure Within Last Two Years
No data records returned							

Air Quality

Nonattainment Area?	Pollutant(s)	Applicable Nonattainment Standard(s)
No	Ozone	
No	Lead	
No	Particulate Matter	
No	Carbon Monoxide	
No	Nitrogen Dioxide	
No	Sulfur Dioxide	

Pollutants

Toxics Release Inventory History of Reported Chemicals Released in Pounds per Year at Site

TRI Facility ID	Year	Total Air Emissions	Surface Water Discharges	Off-Site Transfers to POTWs (Publicly Owned Treatment Works)	Underground Injections	Releases to Land	Total On-site Releases	Total Off-site Transfers
No data records returned								

Toxics Release Inventory Total Releases and Transfers in Pounds by Chemical and Year

Chemical Name
No data records returned

Demographic Profile

EJSCREEN EJ Indexes

Eleven primary environmental justice (EJ) indexes of EJSCREEN, EPA's screening tool for EJ concerns. EPA uses these indexes to identify geographic areas that may warrant further consideration or analysis for potential EJ concerns. Note that use of these indexes does not designate an area as an "EJ community" or "EJ facility." EJSCREEN provides screening level indicators, not a determination of the existence or absence of EJ concerns. For more information, see the EJSCREEN home page.

Census Block Group EJ Indexes (percentile)	
Particulate Matter (PM 2.5)	62
Ozone NATA Diesel PM	62.3
NATA Air Toxics Cancer Risk	60.9
NATA Respiratory Hazard Index (HI)	60.3
Traffic Proximity	67.2
Lead Paint Indicator	73.7
Superfund Proximity	88.2
Risk Management Plan (RMP) Proximity	59.7
Hazardous Waste Proximity	58.9
Wastewater Discharge Proximity	77.9

Number of EJ Indexes Above 80th Percentile
1

View EJSCREEN Report

Demographic Profile of Surrounding Area (3 Miles)

This section provides demographic information regarding the community surrounding the facility. ECHO compliance data alone are not sufficient to determine whether violations at a particular facility had negative impacts on public health or the environment. Statistics are based upon the 2010 US Census and American Community Survey data, and are accurate to the extent that the facility latitude and longitude listed below are correct. The latitude and longitude are obtained from the EPA Locational Reference Table (LRT) when available.

General Statistics	
Total Persons	6,126
Population Density	218/sq.mi.
Percent Minority	42%
Households in Area	2,412
Housing Units in Area	3,163
Households on Public Assistance	136
Persons Below Poverty Level	3,039

Geography	
Radius of Selected Area	3 mi.
Center Latitude	41.70048
Center Longitude	-74.40974
Land Area	100%
Water Area	0%

Income Breakdown - Households (%)	
Less than $15,000	405 (17.95%)
$15,000 - $25,000	362 (16.05%)
$25,000 - $50,000	608 (26.95%)
$50,000 - $75,000	298 (13.21%)
Greater than $75,000	583 (25.84%)

Age Breakdown - Persons (%)	
Children 5 years and younger	419 (7%)
Minors 17 years and younger	1,592 (26%)
Adults 18 years and older	4,535 (74%)
Seniors 65 years and older	847 (14%)

Race Breakdown - Persons (%)	
White	4,392 (72%)
African-American	744 (12%)
Hispanic-Origin	1,515 (25%)
Asian/Pacific Islander	136 (2%)
American Indian	65 (1%)
Other/Multiracial	789 (13%)

Education Level(Persons 25 & older) - Persons (%)	
Less than 9th Grade	266 (6.78%)
9th through 12th Grade	698 (17.78%)
High School Diploma	1,081 (27.53%)
Some College/2-year	1,036 (26.39%)
B.S./B.A. (Bachelor of Science/Bachelor of Arts) or More	845 (21.52%)

ATTACHMENT 6

Site Number	Site Type	Facility Name	County	Locality	Site Address	ZipCode	Facility Status	Expiration Date	Latitude	Longitude
3-011541	PBS	GREAT AMERICAN #418	ULSTER	ELLENVILLE	16 NORTH MAIN ST	12428	UNREGULATED/CLOSED	9/2/1991	41.722515	-74.389555
3-016810	PBS	B. PETROLEUM CORP	ULSTER	ELLENVILLE	8081 ROUTE 209	12428	UNREGULATED/CLOSED	11/12/2014	41.72990645	-74.38352631
3-025313	PBS	ELLENVILLE TERMINAL CORP	ULSTER	ELLENVILLE	210 CANAL ST	12428	UNREGULATED/CLOSED	10/29/1992	41.713848	-74.387761
3-028630	PBS	ELLENVILLE CENTRAL SCHOOL DISTRICT	ULSTER	ELLENVILLE	28 MAPLE AVENUE	12428	ACTIVE	9/19/2021	41.717965	-74.389949
3-053732	PBS	CANAL LOCK APARTMENTS	ULSTER	ELLENVILLE	110 CENTER STREET	12428	ACTIVE	12/2/2016	41.714744	-74.392103
3-068314	PBS	HERITAGENERGY	ULSTER	ELLENVILLE	4 EDWARDS PLACE	12428	UNREGULATED/CLOSED	12/18/1991	41.714644	-74.388542
3-075167	PBS	ULSTER COUNTY HIGHWAY DEPT	ULSTER	ELLENVILLE	229 ULSTER HEIGHTS ROA	12428	UNREGULATED/CLOSED	12/30/2016	41.729177	-74.412539
3-078077	PBS	TRUDY RESNICK FARBER CENTER	ULSTER	ELLENVILLE	50 CENTER STREET	12428	ACTIVE	12/30/2021	41.717877	-74.396779
3-104477	PBS	ROBERT GOLDSMITH FUEL OIL INC	ULSTER	ELLENVILLE	P O BOX 246 MOULTON S	12428	UNREGULATED/CLOSED	3/24/1992		
3-138231	PBS	MARVS SERVICE STATION	ULSTER	ELLENVILLE	2 N MAIN ST	12428	UNREGULATED/CLOSED	5/7/2002	41.716974	-74.39561
3-167126	PBS	CENTRAL HUDSON G&E-ELLENVILLE	ULSTER	ELLENVILLE	GREENVILLE ROAD	12428	UNREGULATED/CLOSED	6/5/1992	41.2630505	-73.6903535
3-167517	PBS	KROSS FARMS	ULSTER	ELLENVILLE	RD 1 BOX 117	12928	UNREGULATED/CLOSED	6/18/1997	40.95850673	-72.39857797
3-168785	PBS	ELLENVILLE FOOD MART; INC.	ULSTER	ELLENVILLE	8112 ROUTE 209	12428	ACTIVE	11/14/2020	41.726229	-74.388087
3-170224	PBS	HERBS DODGE	ULSTER	ELLENVILLE	55 NO MAIN ST	12428	INACTIVE	10/2/1992	41.720299	-74.393306
3-172391	PBS	BURNISHED METAL CORP	ULSTER	ELLENVILLE	18 PINE ST BOX 387	12428	UNREGULATED/CLOSED	8/24/1992	41.708091	-74.388843
3-173061	PBS	BALDASSARE TRUST	ULSTER	ELLENVILLE	55 NORTH MAIN ST	12428	INACTIVE	9/28/2014	41.720299	-74.393306
3-174602	PBS	SHAKELTON AUTO & TRUCK CENTERS LLC	ULSTER	ELLENVILLE	8093 ROUTE 209	12428	ACTIVE	5/3/2022	41.72887637	-74.38474876
3-174882	PBS	GULF ELLENVILLE	ULSTER	ELLENVILLE	102 SOUTH MAIN STREET	12428	ACTIVE	3/11/2021	41.71693282	-74.39509089
3-175188	PBS	GETTY #58712	ULSTER	ELLENVILLE	WEST CANAL STREET RTE	12428	UNREGULATED/CLOSED	6/30/2007	41.72157847	-74.4043192
3-177202	PBS	REED SYSTEMS; LTD	ULSTER	ELLENVILLE	EDWARDS PLACE	12428	UNREGULATED/CLOSED	8/17/1997	41.71431221	-74.3886971
3-184357	PBS	VERIZON NEW YORK INC-NY-99318	ULSTER	ELLENVILLE	31 WARREN STREET	12428	ACTIVE	8/26/2022	41.71545	-74.39545
3-185140	PBS	HYDRO ALUMINUM	ULSTER	ELLENVILLE	9 ALUMINUM DRIVE	12428	UNREGULATED/CLOSED	9/5/2012	41.722825	-74.387479
3-436631	PBS	SAMARITAN VILLAGE; INC	ULSTER	ELLENVILLE	751 BRIGGS HIGHWAY	12428	ACTIVE	5/19/2023	41.74448	-74.483764
3-441597	PBS	ELLENVILLE REGIONAL HOSPITAL	ULSTER	ELLENVILLE	ROUTE 209 & SHOPRITE R	12428	ACTIVE	4/16/2018	41.7746343	-74.30011423
3-459011	PBS	VALLEY GROCERS	ULSTER	ELLENVILLE	120 SOUTH MAIN ST.	12428	UNREGULATED/CLOSED	4/28/1998	41.716039	-74.396107
3-460907	PBS	ELLENVILLE; NY POST OFFICE	ULSTER	ELLENVILLE	1 LIBERTY SQ.	12428	UNREGULATED/CLOSED	10/14/1993	41.717094	-74.3931131
3-486027	PBS	KIDDICRAFT	ULSTER	ELLENVILLE	48 CANAL STREET	12428	UNREGULATED/CLOSED	6/14/2005	41.718667	-74.396374
3-494828	PBS	HONOR'S HAVEN RESORT & SPA	ULSTER	ELLENVILLE	1195 ARROWHEAD ROAD	12428	ACTIVE	9/17/2019	41.700679	-74.400283
3-502111	PBS	FRESKEETO FROZEN FOODS INC.	ULSTER	ELLENVILLE	8019 ROUTE 209	12428	ACTIVE	6/22/2020	41.73322371	-74.38137506
3-600017	PBS	JOSEPH Y. RESNICK AIRPORT N89	ULSTER	ELLENVILLE	EAST OF ELLENVILLE HOSF	12428	ACTIVE	4/24/2021	41.7285713	-74.3787123
3-600061	PBS	OPTIMUM WINDOW MFG.	ULSTER	ELLENVILLE	28 CANAL STREET	12428	UNREGULATED/CLOSED	5/21/2006	41.72053	-74.40072
3-600253	PBS	THE COLLIER MOTOR CAR CO;INC.	ULSTER	ELLENVILLE	188 SOUTH MAIN STREET	12428	UNREGULATED/CLOSED	11/20/2012	41.7112149	-74.40321082
3-600291	PBS	GIOVANNIELLO ICE CO.	ULSTER	ELLENVILLE	26 N. MAIN ST.	12428	UNREGULATED/CLOSED	9/10/1997	41.722219	-74.391088
3-600596	PBS	RENAISSANCE PROJECT;INC.	ULSTER	ELLENVILLE	767 CAPE RD.	12428	ACTIVE	12/2/2018	41.753125	-74.443876
3-601128	PBS	VILLAGE MOTEL	ULSTER	ELLENVILLE	70 MAIN STREET	12428	UNREGULATED/CLOSED	11/19/2014	41.71909636	-74.39352096
3-601486	PBS	MAHIMA CORP	ULSTER	ELLENVILLE	8404 ROUTE 209	12428	ACTIVE	8/3/2021	41.710306	-74.405973
3-601509	PBS	FORMER VILLAGE OF ELLENVILLE	ULSTER	ELLENVILLE	81 NORTH MAIN STREET	12428	UNREGULATED/CLOSED	7/16/2014	41.718419	-74.394602
3-601510	PBS	VILLAGE OF ELLENVILLE - STREET DEPARTMI	ULSTER	ELLENVILLE	BERME ROAD	12428	UNREGULATED/CLOSED	12/18/2016	41.72371	-74.38986
3-601678	PBS	ROLLING V BUS CORP.	ULSTER	ELLENVILLE	216 CANAL STREET	12428	ACTIVE	10/19/2024	41.713671	-74.387431
3-601698	PBS	PROVIDENT BANK	ULSTER	ELLENVILLE	85 NORTH MAIN STREET	12428	UNREGULATED/CLOSED	12/7/2009	41.718002	-74.394636
3-601700	PBS	PHYLJOHN DISTRIBUTORS; INC.	ULSTER	ELLENVILLE	DBA GILLETTE CREAMERY	12428	UNREGULATED/CLOSED	12/31/2014	41.720917	-74.389479
3-601708	PBS	DUSO II	ULSTER	ELLENVILLE	6055 ROUTE 52 WEST	12428	ACTIVE	2/22/2020	41.725339	-74.413092
3-601731	PBS	VILLAGE OF ELLENVILLE	ULSTER	ELLENVILLE	GOVERNMENT CENTER	12428	ACTIVE	4/8/2024	41.718044	-74.395923
3-601858	PBS	LONSTEINS MOTORS; INC.	ULSTER	ELLENVILLE	44 CANAL STREET	12428	UNREGULATED/CLOSED	10/20/2016	41.71903045	-74.39780628
3-601860	PBS	ULSTER-GREENE ARC	ULSTER	ELLENVILLE	46 CANAL STREET	12428	UNREGULATED/CLOSED	11/2/2011	41.71880204	-74.39740162
3-601937	PBS	SAMARITAN VILLAGE; INC.; ELLENVILLE	ULSTER	ELLENVILLE	751 BRIGGS HIGHWAY	12428	INACTIVE	9/10/2012	41.74448	-74.483764
3-601946	PBS	WAREHOUSE (VACANT)	ULSTER	ELLENVILLE	140 S. MAIN STREET	12428	UNREGULATED/CLOSED	1/16/2013	41.71487698	-74.39742375
3-601955	PBS	WATER/SEWER PLANT	ULSTER	ELLENVILLE	EDWARDS PLACE EXTENSI	12428	INACTIVE	2/6/2013		
3-602036	PBS	VILLAGE OF ELLENVILLE	ULSTER	ELLENVILLE	WATER/SEWER PLANT	12428	UNREGULATED/CLOSED	4/6/2014		
3-602119	PBS	WOODYS AUTO PARTS; INC.	ULSTER	ELLENVILLE	92 WOODY LANE	12428	UNREGULATED/CLOSED	6/28/2015		
3-602177	PBS	ELLENVILLE PUBLIC LIBRARY & MUSEUM	ULSTER	ELLENVILLE	40 CENTER STREET	12428	ACTIVE	3/23/2021	41.717916	-74.397488
3-602222	PBS	NEVELE GRAND RESORT	ULSTER	ELLENVILLE	1 NEVELE ROAD	12428	ACTIVE	9/20/2021	41.71209818	-74.40129642
3-602242	PBS	LAUNDRY	ULSTER	ELLENVILLE	44 NORTH MAIN STREET	12428	UNREGULATED/CLOSED	7/10/2017	41.72105	-74.392307

Site Number	Site Type	Facility Name	County	Locality	Site Address	ZipCode	Facility Status	Expiration Date	Latitude	Longitude
3-991036	PBS	RAYMOND J. SMITH	ULSTER	ELLENVILLE	11 MOUNTAIN RD. RT 52	12428	UNREGULATED/CLOSED	7/28/2022		

ATTACHMENT 7

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Environmental Site Remediation Database Search Details

Site Record

Administrative Information

Site Name: Channel Master
Site Code: 356025
Program: Resource Conservation and Recovery
Classification: A
EPA ID Number:

Location

DEC Region: 3
Address: 7 Schrade Court
City: Ellenville Zip: 12428
County: Ulster
Latitude: 41.724008957
Longitude: -74.386202924
Site Type:
Estimated Size: 0 Acres

Site Owner(s) and Operator(s)

Site Description

Location: The site is located at 7 Schrade Court in Ellenville, Ulster County. Site Features: The main site features include a large building (currently vacant) and a parking lot. About one half of the site is covered with grass or wooded. Current Zoning and Land Use: The on-site building is currently vacant. The surrounding parcels are used for a combination of commercial and residential. Past Use of the Site: Channel Master manufactured television antennas and related equipment at the site until 1984, when Channel Master sold the facility. Wastewater was treated in a chemical treatment system within the plant building and in an outdoor surface impoundment (lagoon). The plant and the surface impoundment were decommissioned under the Resource Conservation and Recovery Act (RCRA) in accordance with Channel Master's approved Closure Plan. Groundwater beneath the building was found to be contaminated with

several volatile compounds (VOCs), the primary of which was 1,1,1-trichloroethane (TCA), a solvent used in degreasing. A groundwater recovery and treatment system was installed and has been operating since January 1987. Site Geology and Hydrogeology: The geology of the Ellenville area consists of sedimentary rock units overlain by glacially deposited soils. The soils overlying the bedrock north and northwest of the lagoon are interbedded silt and clay with layers of increased sand and gravel content. The soils to the southeast of lagoon are chiefly sand and gravel with varying amounts of silt and clay. Groundwater, in the vicinity of the Channel Master plant, flows to the southeast.

Contaminants of Concern (Including Materials Disposed)

Contaminant Name/Type
tetrachloroethane

Site Environmental Assessment

Nature and Extent of Contamination: The site is comprised of two distinct areas, the main plant building and the former lagoon. Based upon investigations conducted to date, the primary contaminant of concern, under the main plant, is 1,1,1-trichloroethane (TCA). Initial concentrations of TCA in groundwater were found to be as high as 900,000 parts per billion (ppb). Groundwater samples in the former lagoon area were initially collected and analyzed for volatile organic compounds (VOCs), cyanide, and metals. In May 1997, groundwater sampling and analysis were eliminated for all monitoring wells in the lagoon area except MW-3, MW-8D, and MW-10S, which continue to be sampled semiannually and analyzed for arsenic. Post-Remediation: Impacted groundwater is being contained through operation of a pump and treat system. TCA concentrations in groundwater are typically detected between 100 and 500 ppb.

For more Information: E-mail Us

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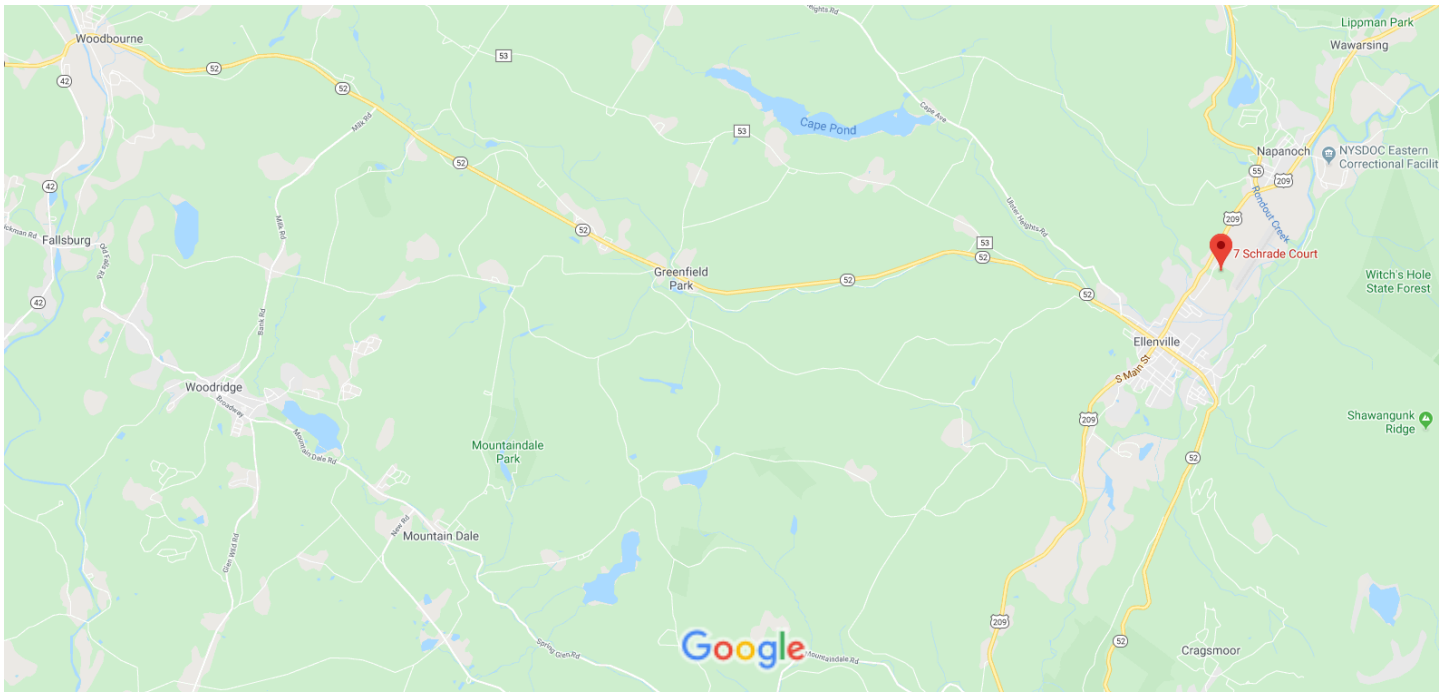
Refine This Search

Google Maps 7 Schrade Ct



Map data ©2020 Google 1 mi

7 Schrade Ct

Ellenville, NY 12428

Directions Save Nearby Send to your phone Share

PJG8+JH Ellenville, Wawarsing, NY

ATTACHMENT 8

	Spill Numb	Date Spill Reported	Spill Name	County	City/Town	Address
1	1810770	1/24/2019	GIOVANIELLO RES	Ulster	ELLENVILLE	1 OLD MINISINK TRAIL
2	1811806	2/26/2019	CRUZ MOBILE HOME	Ulster	ELLENVILLE	4 BECKLEY (LOT L12)
3	1901374	5/9/2019	AUTO REPAIR SHOP	Ulster	ELLENVILLE	188 SOUTH MAIN ST
4	1904941	8/9/2019	LUCKY PETROLEUM	Ulster	ELLENVILLE	109 SOUTH MAIN ST
5	1906098	9/12/2019	HEAD PROPERTY	Ulster	ELLENVILLE	3 CHARLES ST
6	1906306	9/19/2019	RESIDENTIAL	Ulster	ELLENVILLE	512 S GULLY RD
7	1907485	10/25/2019	175 SHALOM RD	Ulster	ELLENVILLE	175 SHALOM RD POLE #33
8	1909830	1/16/2020	STREET	Ulster	ELLENVILLE	CENTER ST @ BROADHEAD ST
9	1909831	1/16/2020	COUNTY WASTE	Ulster	ELLENVILLE	19 BROADHEAD ST

	Spill Number	Date Spill Reported	Spill Name	County	City/Town	Address
1	1801712	5/15/2018	STORM DRAIN	Ulster	ELLENVILLE	CANAL ST
2	1804269	7/20/2018	STEWARTS SHOP 248	Ulster	ELLENVILLE	99 SOUTH MAIN STREET
3	1805344	8/16/2018	EMPIRE WASTE SPILL	Ulster	ELLENVILLE	7 ROSLYN ST
4	1807590	10/16/2018	TALAVERA RES	Ulster	ELLENVILLE	5 IRA ST
5	1808314	11/5/2018	CONDEMNED HOUSE	Ulster	ELLENVILLE	2 PENNY PLACE
6	1808359	11/6/2018	ROADWAY	Ulster	ELLENVILLE	INTERSECTION RTE 52 /CHAPEL ST
7	1810530	1/16/2019	SOIL	Ulster	ELLENVILLE	110 CENTER ST