

**RESTORATION AND FLOOD MITIGATION AT GULF BROOK PROJECT  
ESSEX COUNTY, NY**

Environmental Review Record



Prepared by LiRo Engineering, Inc.  
3 Aerial Way  
Syosset, NY 11791

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

February 5, 2019

**RESTORATION AND FLOOD MITIGATION AT GULF BROOK  
ESSEX COUNTY, NY**

Environmental Assessment  
February 5, 2019

**Project Name:** Restoration and Flood Mitigation at Gulf Brook  
**Project Location:** Mitigation measures within and adjacent to Gulf Brook at 44°15'25.36" North and -73°47'35.72" West, southeast reach and 44°15'27.43" North and -73°46'40.43" West, northwest reach. The project is located near the Town of Keene, near the intersection of NYS Routes 73 and 9N, Essex County, New York  
**Federal Agency:** U.S. Department of Housing and Urban Development  
**Responsible Entity:** New York State Homes and Community Renewal  
**Responsible Agency's Certifying Officer:** Lori A. Shirley, Certifying Officer  
**Project Sponsor:** Essex County  
**Primary Contact:** Michael Mascarenas, P.O. Box 217, Elizabethtown, NY 12932  
[mmascarenas@co.essex.ny.us](mailto:mmascarenas@co.essex.ny.us) (518) 873-3426  
**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, Director, Bureau of Environmental Review and Assessment, GOSR

**Environmental Review Prepared By:** LiRo Engineers Inc. 3 Aerial Way, Syosset, NY

### CERTIFICATION OF NEPA CLASSIFICATION

It is the finding of the New York State Housing Trust Fund Corporation that the activity(ies) proposed in its 2019 NYS CDBG-DR project, Restoration and Flood Mitigation at Gulf Brook 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**

Lori A. Shirley

\_\_\_\_\_  
**Print Name**

February 5, 2019

\_\_\_\_\_  
**Date**

Certifying Officer,  
Governor's Office of Storm Water  
Recovery

\_\_\_\_\_  
**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 2019 NYS CDBG-DR project, Restoration and Flood Mitigation at Gulf Brook 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



\_\_\_\_\_  
**Signature of Certifying Officer**

Lori A. Shirley

\_\_\_\_\_  
**Print Name**

February 5, 2019

\_\_\_\_\_  
**Date**

Certifying Officer,  
Governor's Office of Storm Water  
Recovery

\_\_\_\_\_  
**Title**

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

The project is the implementation of various stream restoration and flood mitigation measures within Gulf Brook (also known as Jones Brook). The proposed project area is within the bed, banks and adjacent upland areas of Gulf Brook. The proposed project actions are located upstream approximately 1,000 feet east of the intersection of Jackson Road and Hurricane Road to the downstream confluence of Gulf Brook and the East Branch of the Ausable River. The project starts at the northwest (upstream) coordinate of 44°15'25.46" North and - 73°46'40.41" to the southeast (downstream) coordinate of 44°15'22.95" North and - 73°47'31.87" (See **Appendix A, Figures 1 and 2**). The project has been designed in two phases as described below.

**Gulf Brook Phase 2**

The project will include the excavation and re-shaping of approximately 1,100 linear feet of channels and bank stabilization to address constrictions caused by the two bridges. Two bridges span Gulf Brook - a New York Department of Transportation Bridge on Route 9N and a smaller Essex County Bridge (also referred to as Bucks Lane Bridge) that provides access to several private residences. The Bucks Lane Bridge will be dismantled, removed and replaced with a new 45' span concrete bridge. The bridge at Route 9N will not be modified, but sediment will be removed from underneath the bridge to accommodate a new river vertical alignment. These improvements will increase water and sediment transport capacity of Gulf Brook and restore its natural function. This project will protect private and municipal properties in the Town of Keene from future flooding at Gulf Brook. The project may require and realignment of the outfall into East Branch of the Ausable River.

The proposed project includes the construction of cross channel boulder vanes and boulder clusters within Gulf Brook (see **Attachment 1**, Sheet C.201). Both banks of Gulf Brook will be stabilized by using vegetated Type VI rock slope projection (see **Attachment 1**, Sheet C.401).

Tree and brush removal will be required. The project area will be restored and vegetated.

Land acquisition will be required. Acquisition for this project will involve the relocation of one existing structure. In addition, certain permanent and/or temporary parcels may be acquired to allow the project to succeed. The extent of property acquisition will be determined during the design phase of the project.

These improvements will increase water and sediment transport capacity of Gulf Brook and restore its natural function. This project will protect private and municipal properties in the Town of Keene from future flooding at Gulf Brook. The project may require replacement of the County Bridge and realignment of the outfall into East Branch of the Ausable River.

### **Gulf Brook Phase 3**

The Gulf Brook Phase 3 project will include five distinct projects areas. These areas begin on the Auer property and continue upstream of the Hurricane Road bridge at Jackson Road. During Tropical Storm Irene, damage to these five areas included: destruction of an undersized bridge; undermining of the road embankment and stream banks; severe deposition of woody debris and coarse sediment; severe erosion and down cutting in the river channel (i.e., incision); and large slope failure, which contributed significant amounts of sediment and debris to the stream channel. The following flood mitigation and restoration measures will be implemented along this segment of Gulf Brook to protect downstream infrastructure, homes and businesses from future storm events:

- Removal of spoils, debris, and sediment;
- Floodplain / flood chute reconnection by re-grading and “roughening” the floodplain;
- Installation of grade control structures (i.e. weirs) to slow flood flow velocity and encourage the capture of debris and sediment;
- Stabilizing road banks (armoring and bioengineered stabilization techniques);
- Slope and toe protection at the base of the steep banks that failed; and
- Bioengineering to stabilize the upper slope.

A conceptual design and resilience Improvement Recommendation have been completed. (See **Attachment 2**, Phase 3 Recommendation)

During Hurricane Irene, rainfall caused Gulf Brook to overflow its banks and flow down the center of Route 9N. Floodwater inundated roadways, homes and businesses and caused severe damage. Completion of the proposed project fosters the recovery of the community by reducing the risk of localized flooding for the residences and businesses in the Town of Keene and by providing a flood-safe area for redevelopment of residential and commercial facilities in the Town.

The severe slopes and instability of the stream bank contributed to slope failure, deposition of tons of debris and degradation of aquatic habitat. The impacts to the project area from Hurricane Irene caused unprecedented destruction of the natural features of the riparian environment. Since the storm, some efforts have succeeded in the reconstruction of much of the damaged infrastructure as well as the protection of some properties from damage in future storms, but while these measures have stabilized the channel banks and provided flood mitigation in specific areas, properties adjacent to other parts of the stream, particularly downstream of the Bucks Lane Bridge still remain vulnerable.

The proposed project (both phases) will provide flood mitigation for approximately 1,100 linear feet and address constrictions caused by the two bridges. Additionally, the proposed project will also provide flood mitigation to 2,500 linear feet of flood mitigation measures starting immediately upstream of the Ticknor property and continue upstream of the Hurricane Road

bridge. These improvements will increase water and sediment transport capacity of Gulf Brook and restore its natural function.

The proposed project will mitigate intermittent flood related damage due to excessive rainfall events by expanding the capacity of Gulf Brook to transport water and sediment through required changes in the channel and the two bridges, creating a flood resistant area for residents and businesses. The mitigation activity will reduce the risk of localized flooding for residences and businesses in the target area.

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

The Town of Keene is built on an alluvial fan formed where Gulf Brook exits a steep mountain canyon and meets the valley bottom. In its current state, Gulf Brook is straightened and confined between the bluff and NYS Routes 9N and 73. There are two bridges that span Gulf Brook: a New York State Department of Transportation Bridge on Route 9N and a smaller Essex County Bridge (referred to as Bucks Lane Bridge) that provides access to several private residences. During Hurricane Irene, Gulf Brook overflowed its banks and flowed down the center of Main Street and severely damaged more than a dozen properties, including the Keene Firehouse, the public library, a medical center, several small businesses and a number of private residential properties. The proposed project will provide flood mitigation for approximately 3,600 linear feet of Gulf Brook, stream bed, slopes, and upland areas. The project consists of two phases, Phase II is approximately 1,100 linear feet and address constrictions caused by the bridges and sediment/debris channel deposits in Gulf Brook from the confluence with the Ausable River to upstream of Bucks Lane Bridge. Phase III consists of 2,500 linear feet of flood mitigation measures starting immediately upstream of the Ticknor property and continue upstream past the intersection of Jackson Road and Hurricane Road. These improvements will increase the water and sediment transport capacity of Gulf Brook and restore its natural function.

The proposed project will mitigate intermittent flood-related damage due to excessive rainfall events by expanding the capacity of Gulf Brook to transport water and sediment through required changes in the channel and the two bridges, creating a flood resistant area for residents and businesses. The mitigation activity will reduce the risk of localized flooding for residences and businesses in the target area.

**Existing Conditions and Trends** [24 CFR 58.40(a)]:

During Hurricane Irene, rainfall caused Gulf Brook to overflow its banks and flow down the center of Route 9N. Floodwater inundated roadways, homes and businesses and caused severe damage. Completion of the proposed project fosters the recovery of the community by reducing the risk of localized flooding for the residences and businesses in the Town of Keene and by providing a flood-safe area for redevelopment of residential and commercial facilities in the Town.

The severe slopes and instability of the stream bank contributed to slope failure, deposition of tons of debris and degradation of aquatic habitat. The impacts to the project area from

Hurricane Irene caused unprecedented destruction of the natural features of the riparian environment. Since the storm, some efforts have succeeded in the reconstruction of much of the damaged infrastructure and to protect some properties from damage in future storms, but while these measures have stabilized the channel banks and provided flood mitigation in specific areas, properties adjacent to other parts of the stream, particularly downstream of the Bucks Lane Bridge remain vulnerable.

**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**

<b>Estimated Total HUD Funded Amount</b>	<b>\$2,520,414 (Phase 2)</b>
	<b>\$1,188,782.30 (Phase 3)</b>
<b>Estimated Total Project Cost</b> (HUD and non-HUD funds) [24 CFR 58.32(d)]:	<b>3,709,196.30 Total Phase 2 and Phase 3</b>

**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.

<p><b>Compliance Factors:</b> Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6</p>	<p>Are formal compliance steps or mitigation required?</p>	<p>Compliance determinations</p>
<p><b>STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 and 58.6</b></p>		
<p><b>Airport Hazards</b> 24 CFR Part 51 Subpart D</p>	<p>Yes    No <input type="checkbox"/>   <input checked="" type="checkbox"/></p>	<p>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 sites, as projects within 2,500 feet of a civil airport require consultation with the appropriate civil airport operator.</p> <p>No civilian airports are within 2,500 feet of the Project site, and no military airports are within 15,000 feet of the Project site (see <b>Appendix A, Figure 3</b>). No further analysis required. (Source: Reference 1)</p>
<p><b>Coastal Barrier Resources</b> Coastal Barrier Resources Act, as amended by the Coastal Barrier Improvement Act of 1990 [16 USC 3501]</p>	<p>Yes    No <input type="checkbox"/>   <input checked="" type="checkbox"/></p>	<p>According to the Coastal Barrier Resources System map (see <b>Appendix A, Figure 4</b>), the Project site is not located within a coastal barrier resources area. No further analysis required. (Source: Reference 14).</p>
<p><b>Flood Insurance</b> Flood Disaster Protection Act of 1973 and National Flood Insurance Reform Act of 1994 [42 USC 4001-4128 and 42 USC 5154a]</p>	<p>Yes    No <input type="checkbox"/>   <input checked="" type="checkbox"/></p>	<p>Based on Flood Insurance Map 361151 0025C, Phase 2 of the Project area is within mapped Special Flood Hazard Area (SFHA) Zone A (areas of 100 year flood), as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate (see <b>Appendix A, Figure 5</b>). Phase 3 of the project is located in Zone C, area of minimal flood hazard.</p> <p>The project will increase the ability of the flood plain to resist damage due to storm events and decrease the amount of damage caused by storm events to adjacent properties. The project will not increase the size of the flood plain and temporary disturbance of the flood plain will be mitigated by design and Federal and State permits.</p> <p>A five-step analysis for compliance with executive order 11988 has been completed (see Flood Plain Management section). (Source: Reference 4). Proof of National Flood Insurance Program (NFIP) insurance is not required as the proposed project does not involve insurable structures. No further analysis is required</p>

STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 & 58.5		
<p><b>Clean Air</b> Clean Air Act, as amended, particularly section 176(c) &amp; (d); 40 CFR Parts 6, 51, 93</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>The Project site is not included in the most recent listing of nonattainment as defined by the US Environmental Protection Agency (EPA) Green Book Nonattainment Areas for Criteria Pollutants.(see <b>Appendix A, Figure 6</b>)</p> <p>The Project will not require an NYS Air Registration, Air Facility Permit, or Federal Clean Air Act Title IV or Title V Permit. The Project activities will not substantively affect air quality.</p> <p>The Project is consistent with the New York State Implementation Plan (SIP) as it will not involve new sources.</p> <p>Air quality impacts will be short term and localized during construction, so no significant adverse impacts to air quality are anticipated.</p> <p>The implementation of standard best management practices (BMPs) will control dust and other emissions during construction. Air quality impacts will be short term and localized during construction, so no significant adverse impacts to air quality are anticipated. No further analysis is required. (Source: References 1 and 2 )</p>
<p><b>Coastal Zone Management</b> Coastal Zone Management Act, sections 307(c) &amp; (d)</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>The project site is not located within the boundaries of a New York State Coastal Zone (see <b>Appendix A, Figure 7</b>). No further analysis is required. (Source: Reference 11)</p>
<p><b>Contamination and Toxic Substances</b> 24 CFR Part 50.3(i) &amp; 58.5(i)(2)</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>There are no known hazardous materials, contaminants, toxic chemicals, gases, or radioactive substances that could affect health and safety within the project area. The proposed project is not anticipated to result in any significant adverse impacts related to toxic, hazardous, or radioactive materials. (<b>see Appendix A, Figure 8</b>). A review of USEPA NEPA assist data base reported one RCRA generator (Lawrence Service station south of the project area. This site will not affect the project. No spills or cleanups for this site have been reported. A review of NYS Environmental Facility Navigator reported no Air Emissions, Solid Waste Facilities, or Remedial Site near the project area. No report of contamination or toxic substances have been reported from the data bases searched. No further analysis required. (Source: References 1,9 and 10)</p>
<p><b>Endangered Species</b> Endangered Species Act of 1973, particularly section 7; 50 CFR Part 402</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>GOSR submitted a consultation on August 28, 2017 to the USFWS for mitigation in the lower portion of Gulf Brook, known as Gulf Brook Phase II. Twelve trees will be removed from the lower portion of Gulf Brook. According to the USFWS Information, Planning and Conservation (IPaC) online planning tool and Trust Resource List generated for the proposed project the Federally endangered Indiana Bat (<i>Myotis sodalis</i>) and the threatened Northern Long-eared</p>

		<p>bat (NLEB) (<i>Myotis septentrionalis</i>) can be found within the vicinity of the project area.</p> <p>GOSR submitted a second consultation to the USFWS on November 5, 2018 for the upper portion of Gulf Brook known as Gulf Brook Phase III. The upper portion of Gulf Brook includes 5 work areas. The USFWS IPaC online tool Trust Resource List generated for the for the five areas lists the following Federally-listed species as having the potential to occur within the vicinity of the proposed project: Indiana Bat (<i>Myotis sodalist</i>) endangered and Northern Long-eared Bat (<i>Myotis septentrionalis</i>) (NLEB) – threatened (see <b>Appendix B</b>). Trees are the essential habitat used by these bat species. Approximately 0.25 acres of trees will be removed from the five project areas (see <b>Appendix B</b>, Gulf Brook Phase III Project Areas for review).</p> <p>NYSDEC conducted a Phase I Summer Habitat Assessment conducted on October 26, 2018 for the five project areas and found: <b>Project Areas 2–5</b>: these areas are at a high enough location (elevation) that Indiana bats would not be a concern (IPaC only lists NLEB). The project areas are about 11.5 – 12.5 miles from the nearest known NLEB hibernation site and is nearly 17 miles from the nearest Indiana bat occurrence. <b>Project Area 1</b>: this project area is low enough that IPaC lists both NLEB and Indiana bats. There are a few snags and trees that are large enough to be potential roosts. To minimize potential impacts to the IB and NLEB, tree clearing will take place from November 1 to March 31, which is outside of the active season of the IB and NLEB.</p> <p>If winter tree is determined at latter to be infeasible, an acoustic survey will be completed after May 15, 2019 or emergence surveys will be completed as determined by consultation with USFWS.</p> <p>A consultation letter was submitted to NYNHP on 10/10/2018. A response indicating that NYNHP had no records of rare or state-listed animals or plants, or significant natural communities directly at the project site was received on 10/29/2018. (see <b>Appendix B</b> for correspondence)</p> <p>(Source Reference 8 and 15)</p>
<p><b>Explosive and Flammable Hazards</b> 24 CFR Part 51 Subpart C</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>There are no known hazardous operations handling conventional fuels or chemicals of an explosive or flammable nature in the vicinity of the project area.</p> <p>As this project involves the mitigation measures to the stream bed, banks and adjacent areas and does not increase the existing foot print of the exiting stream protection measures and bridges, the project does not change the existing land use or add residential population and there are</p>

		no anticipated adverse impacts expected to occur. No further analysis is required.
<p><b>Farmlands Protection</b> Farmland Protection Policy Act of 1981, particularly sections 1504(b) and 1541; 7 CFR Part 658</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>The proposed project is not located within any Agricultural District. It would not cause disturbance of Prime, Unique, or Statewide Important Farmland and would not involve the conversion of farmland to non-agriculture use. Therefore, the proposed project would not violate the Farmland Protection Policy Act. No further analysis is required. (Source: Reference 6)</p>
<p><b>Floodplain Management</b> Executive Order 11988, particularly section 2(a); 24 CFR Part 55</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>Map 361151 0025C, Phase 2 of the Project area is within mapped Special Flood Hazard Area (SFHA) Zone A (areas of 100 year flood), as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate (see <b>Appendix A, Figure 5</b>). (Source Reference 4)</p> <p>Although the Project is located within a floodplain and wetland, the Project is a functionally dependent use. In accordance with 24 CFR Part 55, Floodplain Management and Protection of Wetlands, a 5-step wetland analysis was done for the Project to identify potential impacts to Gulf Brook and methods to minimize the potential adverse impacts in the floodplain and wetland. The analysis concluded that the Project would will not alter the survival and or quality of the floodplain and wetlands. (see <b>Appendix C</b>). As this project involves the mitigation measures to the stream bed, banks and adjacent areas. No further analysis is required.</p>
<p><b>Historic Preservation</b> National Historic Preservation Act of 1966, particularly sections 106 and 110; 36 CFR Part 800; Tribal notification for new ground disturbance.</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>A consultation to the New York State Historic Preservation Officer (SHPO) was performed under CRIS project number 16PR08582. The response from the SHPO stated that the proposed project has no potential impact on archaeological and/or historic resources. (see <b>Appendix D</b>). (Source Reference 12 and 13).</p> <p>A Consultation letter was submitted to St Regis Mohawk Tribe on 12/15/2016 requesting if the proposed project encompasses historic properties of religious or cultural significance. No response has been received as of the date of this review. No further analysis is required.</p>
<p><b>Noise Abatement and Control</b> Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978; 24 CFR Part 51 Subpart B</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>The proposed project would not generate noise within the project area, nor would it introduce any new or rehabilitate any existing noise sensitive uses. Therefore, no significant noise impacts would occur as a result of the proposed project. No further analysis is required.</p>
<p><b>Sole Source Aquifers</b> Safe Drinking Water Act of 1974, as amended, particularly section 1424(e); 40 CFR Part 149</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>The project site is not located on a Sole Source Aquifer. (see <b>Appendix A, Figure 9</b>) No further Analysis required. (Source Reference 3)</p>
<p><b>Wetlands Protection</b> Executive Order 11990, particularly sections 2 and 5</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>Gulf Brook (Jones Brooke) is classified on the National Wetlands Inventory (Federal) as Riverine (R3UBH) and the confluence with the Ausable River as a Freshwater</p>

		<p>Forested/Shrub Wetland (PFOE1). NYSDEC classifies Gulf/Jones Brook as a class AA stream.</p> <p>A Protection of Waters permit is required to physically disturb the bed or banks of a stream over 1,500 linear feet for Phase 2 and 2,500 linear feet for Phase 3, to mitigate the erosion and stabilization mitigation of the creek. An individual Water Quality Certification is required because the proposed project will disturb over 3,000 linear feet. In addition, an Adirondack Park Agency (APA) has jurisdiction over the project area and an APA permit will be required. (see <b>Appendix A Figures 10 and 11</b>). (Source Reference 1,8 and 16)</p> <p>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.</p>
<p><b>Wild and Scenic Rivers</b> Wild and Scenic Rivers Act of 1968, particularly section 7(b) and (c)</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>The project area is not located within the vicinity of any designated wild, scenic, or recreational rivers. The Delaware River is the only river in New York that is included in the National Wild and Scenic Rivers System. The proposed project is not located near this river and no adverse impacts are anticipated. (Source Reference 5) No further analysis is required.</p>
<p><b>ENVIRONMENTAL JUSTICE</b></p>		
<p><b>Environmental Justice</b> Executive Order 12898</p>	<p>Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>	<p>The project site is not located in or adjacent to potential justice areas identified by the New York State Department of Environmental Conservation. The proposed project would have no significant adverse environmental impact on the surrounding community and will provide a benefit to the residents. (see <b>Figure 12</b>) (Source Reference 7)</p>

**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
<b>LAND DEVELOPMENT</b>		
Conformance with Plans / Compatible Land Use and Zoning / Scale and Urban Design	2	The proposed project involves the multiple restoration and mitigation measures to Gulf Brook 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.
<b>SOCIOECONOMIC</b>		
Employment and Income Patterns	2	The construction tasks comprising the proposed project are limited to Gulf Brook 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 Gulf Brook 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.
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Environmental Assessment Factor	Impact Code	Impact Evaluation
<b>COMMUNITY FACILITIES AND SERVICES</b>		
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 Gulf Brook 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 Gulf Brook 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 Gulf Brook 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 Gulf Brook 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 Gulf Brook 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	1	The construction tasks comprising the proposed project are limited to Gulf Brook 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 and bridge resiliency would allow emergency response to areas serviced by the bridges there by increasing public safety.
Parks, Open Space and Recreation	2	The construction tasks comprising the proposed project are limited to Gulf Brook stream bed, channel, banks and adjacent upland area improvements and would not introduce any new development that would generate demand for open space resources.
Transportation and Accessibility	1	The construction tasks comprising the proposed project are limited to Gulf Brook stream bed, channel, banks and adjacent upland area and would not introduce any new development that would increase transportation requirements or impede accessibility. Steam stabilization and bridge resiliency would allow emergency response to areas serviced by the bridges there by increasing transportation and accessibility to effected areas.

<b>NATURAL FEATURES</b>		
Unique Natural Features, Water Resources	2	The construction tasks comprising the proposed project are limited to Gulf Brook bed, channel, banks and adjacent upland area improvements. The project improves Gulf Brook's 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	2	The construction tasks comprising the proposed project are limited to Gulf Brook bed, channel, banks and adjacent upland area improvements and would not result in any adverse impacts to vegetation or wildlife
Other Factors	2	N/A

**Additional Studies Performed:**

SEQRA Review (Unlisted, Coordinated review) per Section 617.5

**Field Inspection** (Date and completed by):

Essex County. Bridge Inspections. July 2, 2010.

Fitzgerald Environmental Associates, LLC. Fluvial Geomorphic Survey and Assessment of the Gulf Brook. August 22, 2014.

NYSDEC. Phase I Summer Habitat Assessment. Gulf Brook Phase III. October 26, 2018.

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

**References to be Updated after GOSR review of DRAFT.**

1. Environmental Protection Agency NEPAssist Data Base.  
Hppsts://nepassisttool.epa.gov/neapassist/nepamap.aspx
2. Environmental Protection Agency – Greenbook  
<http://epa.gov/airquality/greenbook>
3. Environmental Protection Agency – Region 2 Sole Source Aquifers  
<http://www.epa.gov/region2/water/aquifer/index.html>
4. Federal Emergency Management Agency – Flood Map Center  
<https://msc.fema.gov/portal>
5. National Wild and Scenic Rivers Systems  
<http://www.rivers.gov/maps/new-york.php>
6. New York State Department of Agriculture and Markets  
<http://www.agriculture.ny.gov/ap/agsservices/maps>

7. 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](http://www.dec.ny.gov/docs/permits_ej_operations_pdf/essexej.pdf)
8. New York State Department of Environmental Conservation – EAF Mapper  
<http://www.dec.ny.gov/eafmapper/>
9. New York State Department of Environmental Conservation Spill Incidence Data Base,  
<https://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=2>
10. New York State Department of Environmental Conservation – Environmental Site Remediation Database  
<https://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=3>
11. 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](http://appext20.dos.ny.gov/coastal_map_public/map.aspx)
12. New York State Office of Parks, Recreation and Historic Preservation - Cultural Resource Information System  
<https://cris.parks.ny.gov>
13. New York State Office of Parks, Recreation and Historic Preservation – Heritage Areas  
<http://www.nysparks.com/historic-preservation>
14. United States Fish and Wildlife Service – Coastal Barrier Resources System Mapper  
<http://www.fws.gov/cbra/maps/mapper.html>
15. United States Fish and Wildlife Service – IPaC – Information, Planning, and Conservation System  
<http://ecos.fws.gov/ipac>
16. United States Fish and Wildlife Service – National Wetlands Inventory – Wetland Mapper  
<http://www.fws.gov/wetlands/Data/Mapper.html>

#### **List of Attachments**

Attachment 1 Gulf Brook Channel Restoration Phase , 2 Dated March 2017

Attachment 2 Gulf Brook Phase III Project Areas for Review, Dated October 1, 2018

Attachment 3 Gulf Brook Geomorphology, Hydrology and Hydraulics, and Environmental Permitting, Memorandum dated August 22, 2014

Attachment 4 Gulf Brook Stabilization Project Phase II Alternatives Presentation Meeting Summary, dated December 8, 2015.

**List of Appendices**

Appendix A - Figures

Appendix B - U.S. Fish and Wildlife Service Trust Resources List and NYSDEC Natural Heritage Program Correspondence

Appendix C – Five Step Floodplain Management and Wetland Protection Analysis

Appendix D– New York State Historic Preservation Office and Tribal Historic Preservation Office

**List of Permits Obtained or Required:**

Adirondack Park Agency Permit (APA Project No. 2018-0002) application submitted 1/2/2018

USACE Nationwide Permit 3

NYSDEC Article 15, Stream Disturbance

Clean Water Act Section 401, Water Quality Certification

NYS DOT Highway Work Permit

Essex County DPW- Digging/right-of-way Permit

Keene Town Board- Site Plan Approval

**Public Outreach** [24 CFR 50.23 & 58.43]:

In developing the New York Rising Community Reconstruction (NYRCR) Plan, the Towns of Jay and Keene came together to drive an ambitious agenda that would yield regional-scale change for resiliency in future flood events and that provides a model for sustainable, resilient reconstruction and economic development for rural communities in the Adirondack Park. In Jay and Keene, a volunteer NYRCR Planning Committee was created to lead the planning process. The Committee included local business owners, the Supervisors of both Jay and Keene the head of the Ausable River Association, representatives from Essex County Planning and Essex County Soil and Water Conservation District, and other regional stakeholders. The Planning Committee held monthly meetings starting, as well as a series of five public meetings. Members of the Planning Committee conducted informal interviews with more than two dozen stakeholders, and they worked hard to capture community members' stories. Boxes were placed in local libraries to allow community members to provide comments and other input, and community members were encouraged to contact committee members to share their thoughts.

A Publication of a Combined Notice of Finding of No Significant Impact (FONSI) and Notice of Intent to Request Release of Funds (NOI-RROF) was published on February 7, 2019.

**Cumulative Impact Analysis** [24 CFR 58.32]:

In the Towns of Jay and Keene Community Reconstruction Program Plan, 5 projects were proposed in the Town of Keene that it would like to implement to help recover and become more resilient. Aside from the proposed Gulf Brook restoration and flood mitigation project, the Town is proposing repairs to Hull's Road and the installation of a pedestrian bridge to connect to Grist Mill Road, new water rescue equipment, necessary emergency support equipment, and a generator upgrade at Keene Central School. Although these projects were proposed by the Town, only the Gulf Brook project is moving forward as of the date of this review. Other projects are expected to move forward in the future.

During Hurricane Irene, Gulf Brook overflowed its banks and flowed down the center of Main Street, damaging more than a dozen properties. To mitigate flooding, several different solutions have been proposed, all of which seek to expand the capacity of Gulf Brook to transport water and sediment. The restoration will increase water and sediment transport capacity for approximately 1,500 feet of Gulf Brook. Due to the degraded condition of Gulf Brook, channel profile and channel form will need adjustments. This will require earthwork to expand the conveyance prism as well as grade control and energy dissipation structures.

The cumulative environmental impacts of the project and others proposed by the Community Reconstruction Program Planning Committee are not expected.

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

There was a study performed that consisted of a hydraulic investigation of the Gulf Brook stream (Attachment 3). The study analyzed the hydraulic capacity and identified deficiencies of the existing drainage system and the existing stream channel and culvert bridge crossings along Gulf Brook. The study also investigated conceptual improvement options and recommendations regarding possible future projects.

The hydraulic analysis of existing conditions identified that the hydraulic capacity of Gulf Brook is constrained at several cross-culvert crossing locations. It was also noted that the hydraulic capacity of several of the culvert crossings were significantly reduced as a result of bedload deposits and debris accumulating at the culvert. When examining project alternatives, it was known that major upgrades to culvert crossings and channel improvements would be very expensive and would significantly impact private property. Due to the relatively low cost, the preferred alternative was sediment management controls including Gulf Brook grade adjustments, construction of cross vane structures, sediment traps and stabilization of stream banks. The sites selected are the result of public meetings and locations that experience high levels of flooding, erosion and drainage problems (Attachment 4).

The existing bridges were evaluated and modification designed. (Attachment 1).

**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. Currently, there is chronic and problematic flooding along Gulf Brook. Sediment and debris will also continue to compromise the hydraulic capacity of the creek 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	<ul style="list-style-type: none"> <li>• Adirondack Park Agency Permit</li> <li>• USACE Nationwide Permit 3</li> <li>• 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,”</li> <li>• CWA Section 401 Water Quality Certification</li> <li>• NYSDOT Highway Work Permit</li> <li>• Essex County DPW- Digging/right-of-way Permit</li> <li>• Keene Town Board- Site Plan Approval.</li> </ul>
Mitigation	<ul style="list-style-type: none"> <li>• Erosion and Sediment Control Plan</li> <li>• Stream Protection Plan</li> <li>• Winter tree clearing, between November 1 and March 31. If winter tree clearing is not feasible, an acoustic survey must be conducted after May 15; further consultation with USFWS based on results of acoustic survey will determine whether an emergent survey must be conducted.</li> </ul>

**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.



\_\_\_\_\_  
**Preparer Signature**

2/5/2019

\_\_\_\_\_  
**Date**

Thomas A. Fralick P.G.  
LiRo Engineers Inc.

\_\_\_\_\_  
**Name/Title/Organization**



\_\_\_\_\_  
**Signature of Certifying Officer**

Lori A. Shirley

\_\_\_\_\_  
**Print Name**

2/5/2019

\_\_\_\_\_  
**Date**

Certifying Environmental Officer  
Governor's Office of Storm Recovery

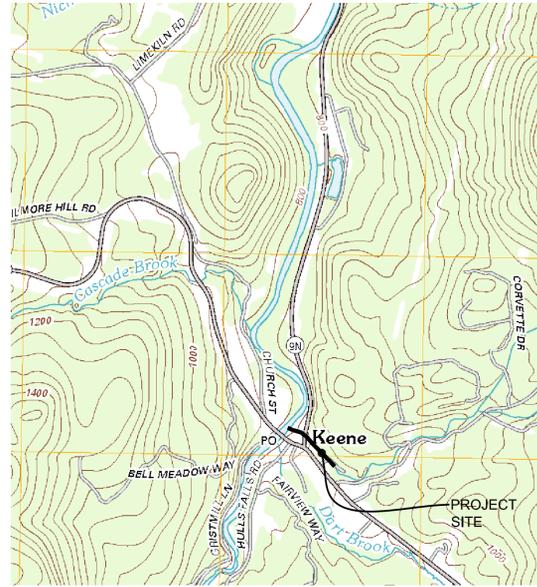
\_\_\_\_\_  
**Title**

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).

**GULF BROOK RESTORATION AND FLOOD MITIGATION PROJECT  
ESSEX COUNTY, NY**

**ATTACHMENT 1  
PHASE 2 DESIGN**

SITE LOCATION BASE MAP OBTAINED FROM THE USGS



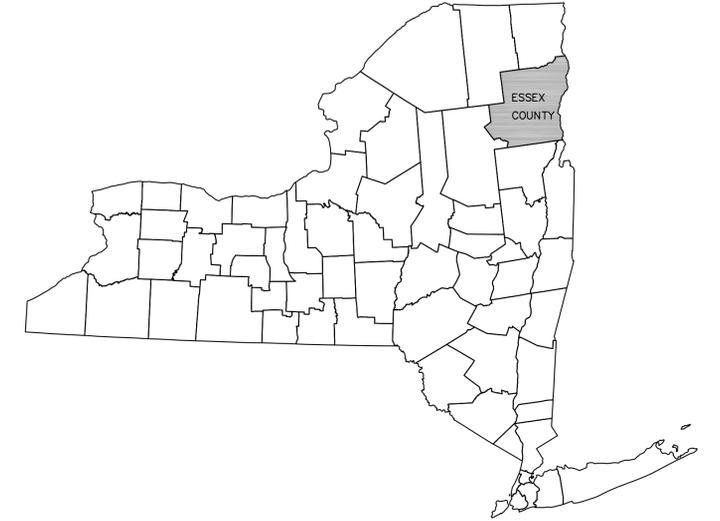
SITE LOCATION MAP  
SCALE: NTS

# GULF BROOK CHANNEL RESTORATION PROJECT PHASE 2

## FUNDED BY: NEW YORK STATE COMMUNITY DEVELOPMENT BLOCK GRANT (DISASTER RECOVERY FUNDS)

### KEENE, NY MARCH, 2017

THIS PROJECT INVOLVES THE RESTORATION OF APPROXIMATELY 1,100 LINEAR FEET OF THE GULF BROOK INCLUDING THE CONSTRUCTION OF AN ENHANCED CHANNEL SECTION WITH A MINIMUM BANK FULL WIDTH OF 40- FEET, INSTALLATION OF CHANNEL BANK ROCK ARMOR PROTECTION, CONSTRUCTION OF BOULDER VANES, CONSTRUCTION OF IN-STREAM BOULDERS FOR HABITAT ENHANCEMENT, REMOVAL OF THE EXISTING BUCKS LANE BRIDGE AND REPLACEMENT WITH A PROPOSED 45' SPAN BRIDGE, INSTALLATION OF APPROXIMATELY 460 LF OF CONCRETE BLOCK RETAINING WALL, TEMPORARY AND PERMANENT MEASURES TO STABILIZE UPPER CHANNEL BANKS, AND ADDITIONAL MISCELLANEOUS WORK PER THESE DESIGN PLANS.



NEW YORK STATE MAP  
SCALE: NTS

LIST OF ABBREVIATIONS

BW	BOTTOM OF WALL
C#	ALIGNMENT CURVE
CONT.	CONTAINER
E	EASTING
EG	EXISTING GRADE
ELEV.	ELEVATION
EX	EXISTING
FG	FINISHED GRADE
GAL	GALLON
H	HORIZONTAL
I.E.	INVERT ELEVATION
L#	ALIGNMENT LINE
LxWxH	LENGTH, WIDTH, HEIGHT
LT	LEFT
MAX	MAXIMUM
MIN	MINIMUM
N	NORTHING
N.T.S.	NOT TO SCALE
OHW	ORDINARY HIGH WATERMARK
PC	POINT OF CURVATURE
PRO	PROPOSED
PT	POINT OF TANGENCY
RCP	REINFORCED CONCRETE PIPE
RT	RIGHT
S	SLOPE
SB	SOIL BORING
STA	STATION
TBD	TO BE DECIDED
TYP	TYPICAL
TW	TOP OF WALL
V	VERTICAL
VSEL	WATER SURFACE ELEVATION



PROJECT AREA MAP  
SCALE: 1"=50'

PRELIMINARY DESIGN PLAN  
NOT FOR CONSTRUCTION

SHEET INDEX:

- CV.001: COVER SHEET
- C.101: EXISTING CONDITIONS PLAN
- C.201: CIVIL PLAN AND PROFILE (STATION 15+50 TO 21+25)
- C.202: CIVIL PLAN AND PROFILE (STATION 21+25 TO 26+40)
- C.203: CONCRETE BLOCK WALL PLAN AND PROFILE VIEWS
- C.204: BUCKS LANE BRIDGE - DEMOLITION AND SITE PLAN
- C.205: BUCKS LANE BRIDGE - PROFILE, ELEVATION, SECTIONS AND DETAILS
- C.301: CROSS SECTIONS FROM STATIONS 15+50 TO 22+00
- C.302: CROSS SECTIONS FROM STATIONS 22+50 TO 25+50
- C.401: TYPICAL CROSS SECTION DETAILS
- C.402: TYPICAL CROSS SECTION DETAIL

DESIGN TEAM:



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WWW.ESPC-CONSULTING.COM  
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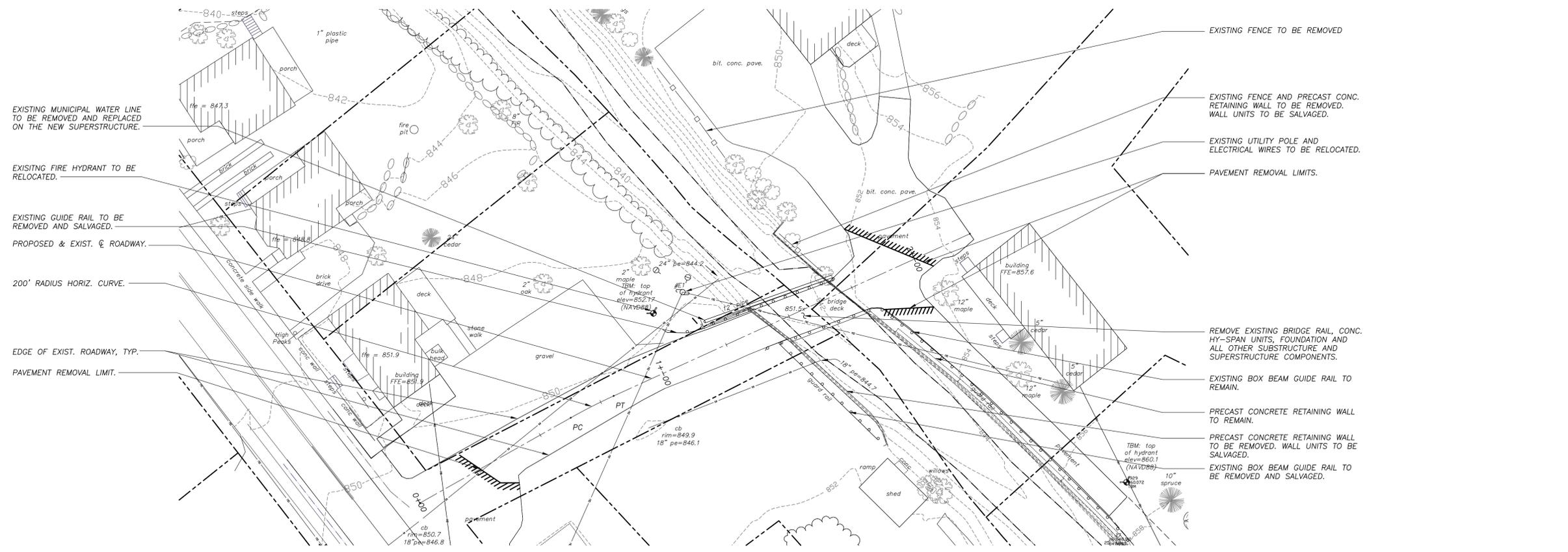
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TEL: 802-876-7778



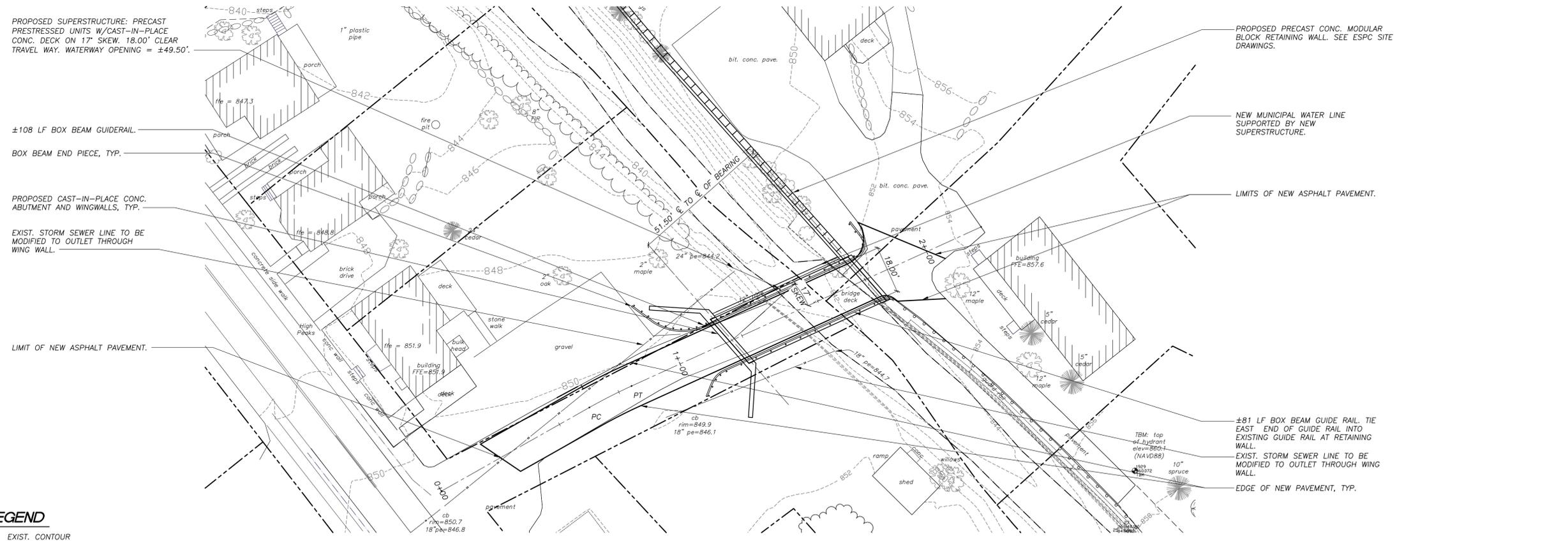








**PRELIMINARY BRIDGE REMOVALS PLAN**  
1"=20'-0"



**PRELIMINARY BRIDGE SITE PLAN**  
1"=20'-0"

**LEGEND**  
---620--- EXIST. CONTOUR  
- - - - - PROPERTY LINE  
- - - - - EXISTING STREAM CHANNEL

NOTE: SEE ESPC DWG. C.201 FOR SITE PLAN INFORMATION NOT SHOWN.

REVISIONS		
REV.	DATE	DESCRIPTION

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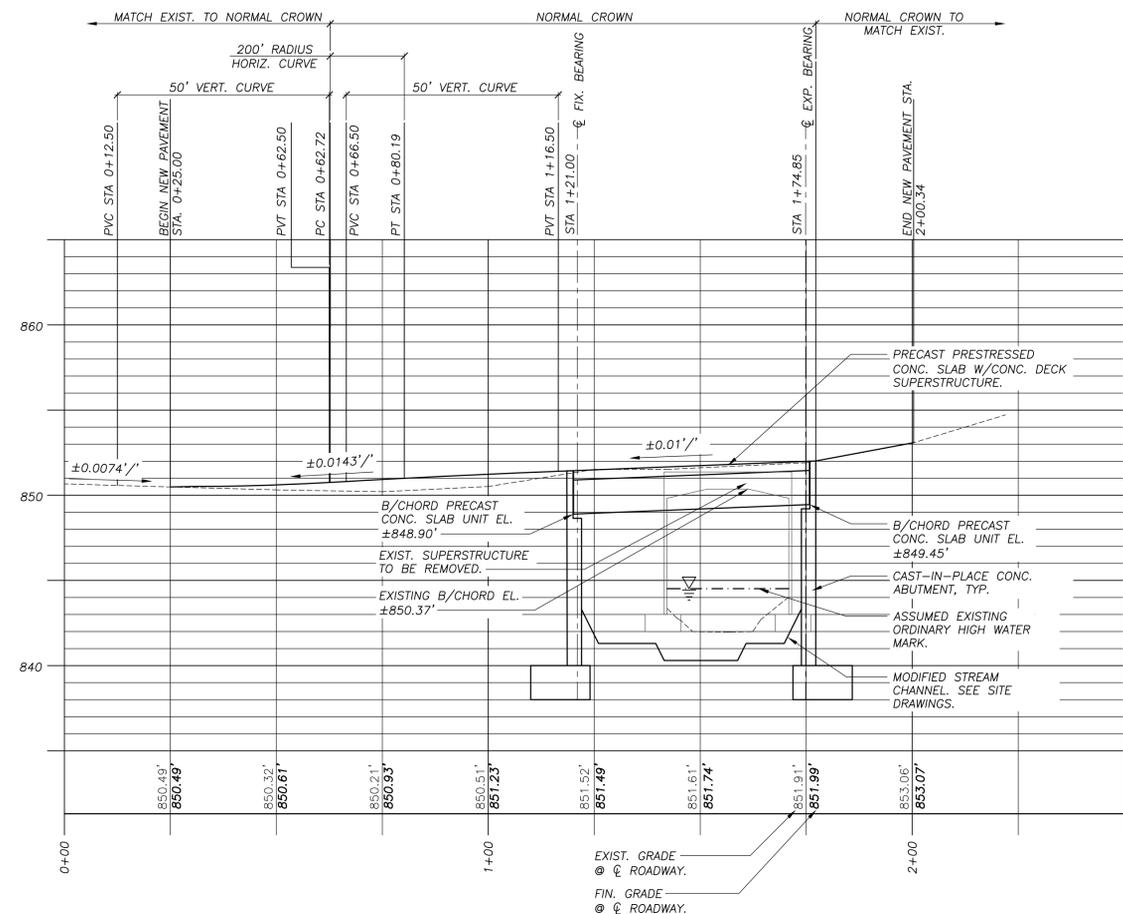
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KEENE, NY**

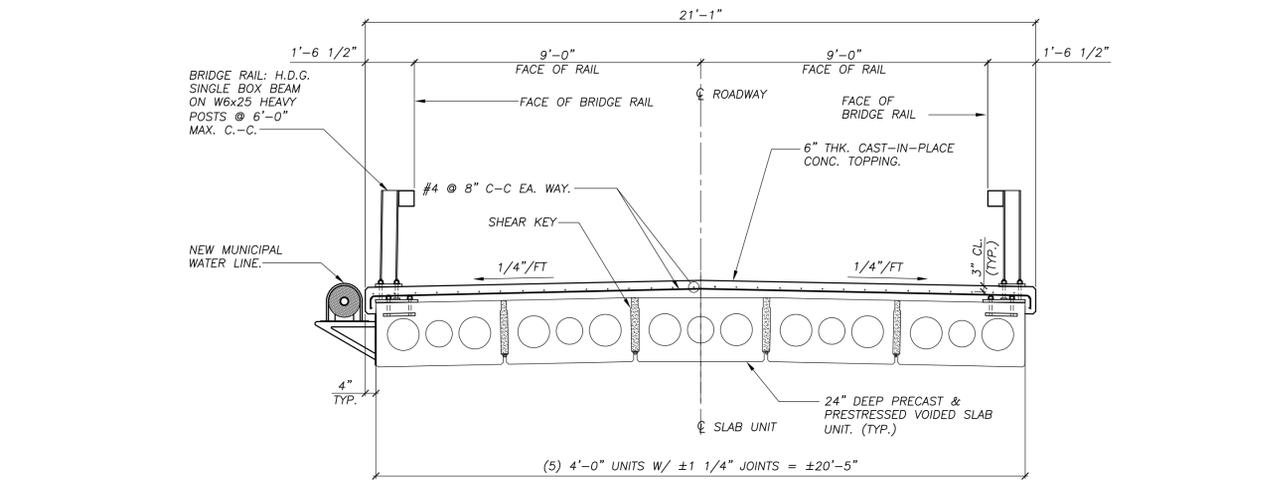
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REPLACEMENT OVER GULF BROOK**

**PRELIMINARY BRIDGE PLANS**

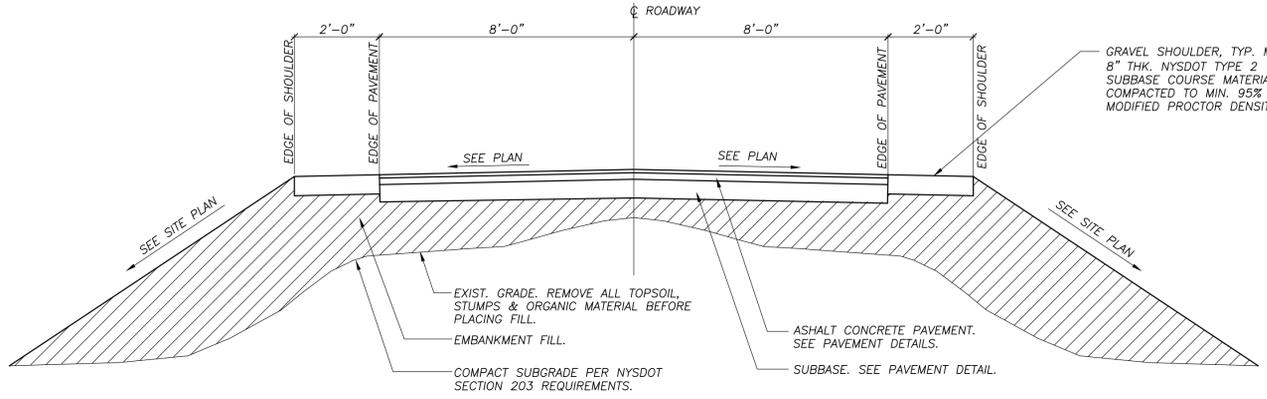
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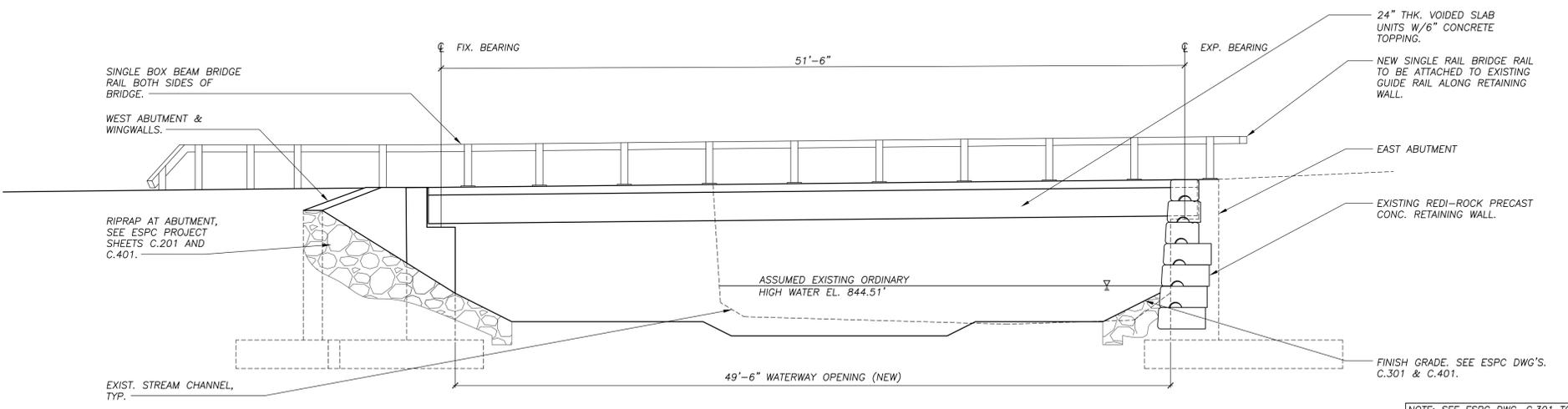
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 1"=20' HORIZ.  
 1"=5' VERT.



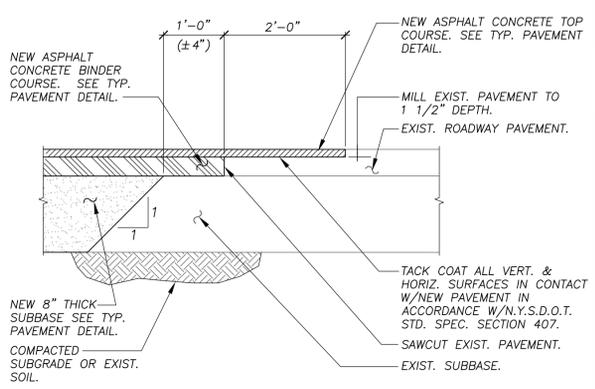
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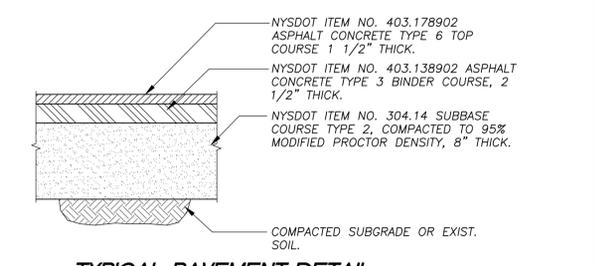
**TYPICAL ROADWAY SECTION**  
 N.T.S.



**BRIDGE ELEVATION (LOOKING NORTHWEST)**  
 1"=5'-0"



**PAVEMENT TRANSITION DETAIL**  
 N.T.S.



**TYPICAL PAVEMENT DETAIL**  
 N.T.S.

REVISIONS		
REV.	DATE	DESCRIPTION

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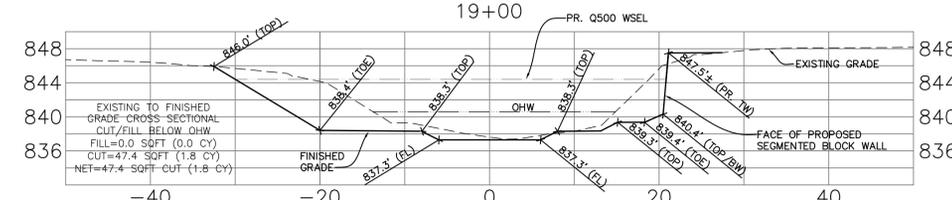
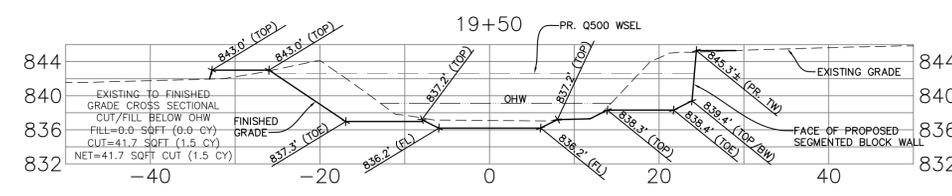
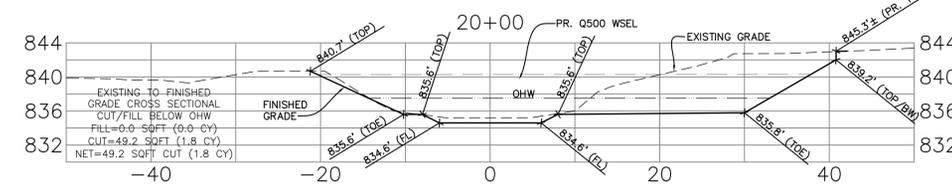
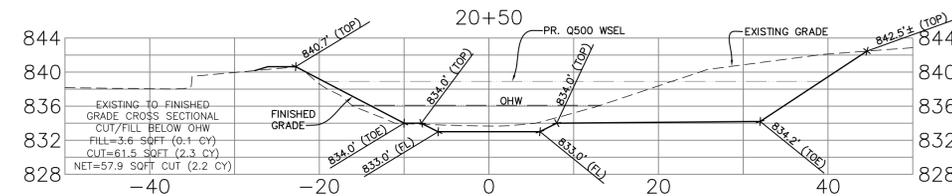
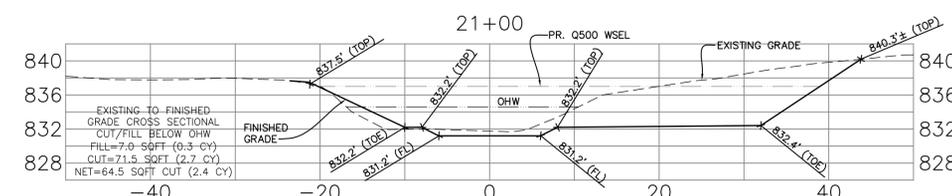
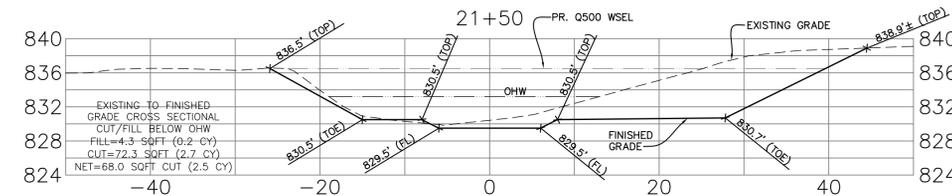
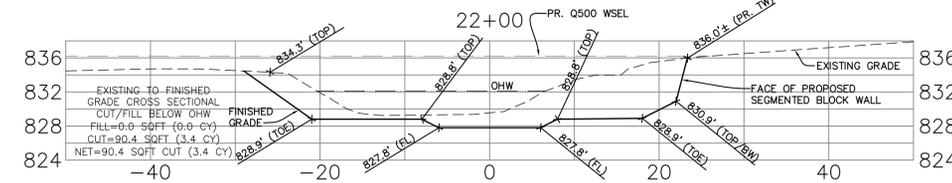
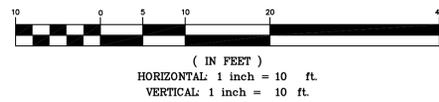
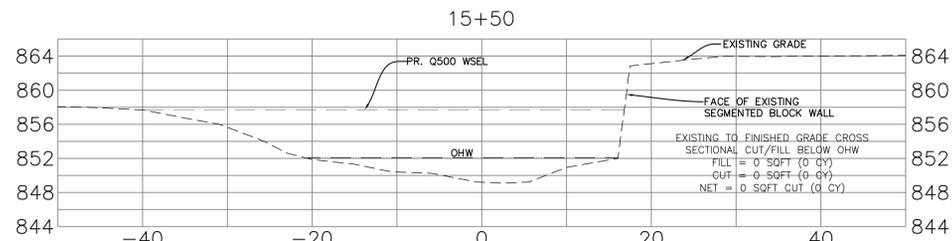
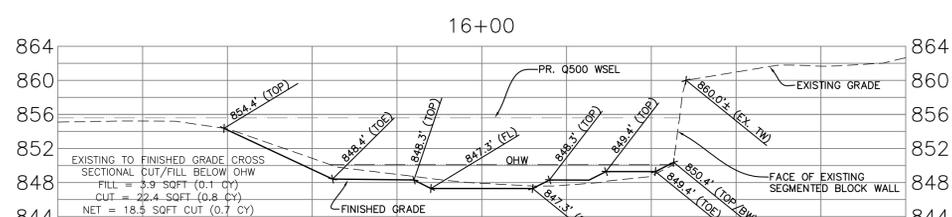
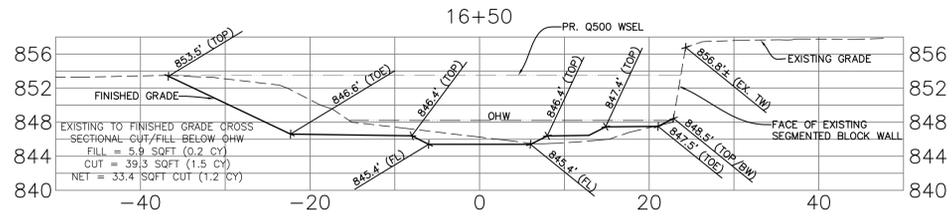
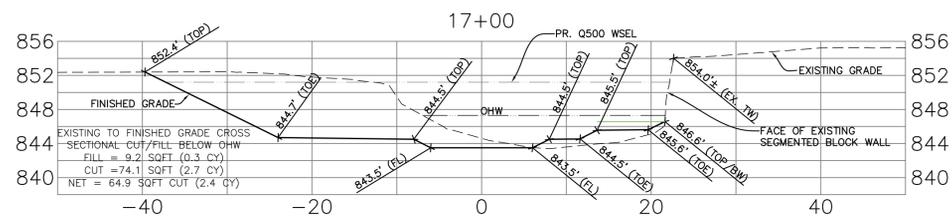
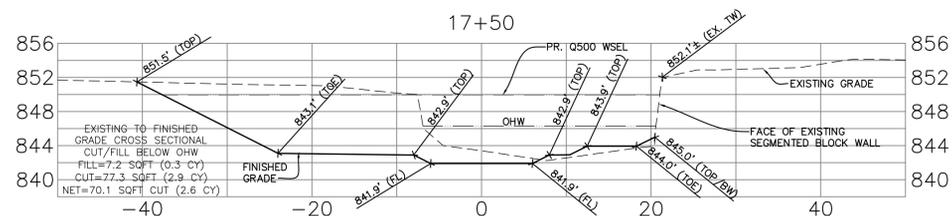
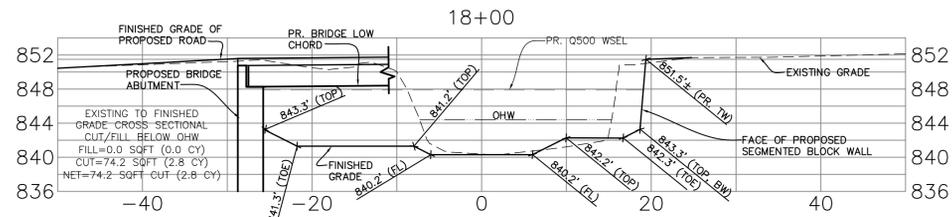
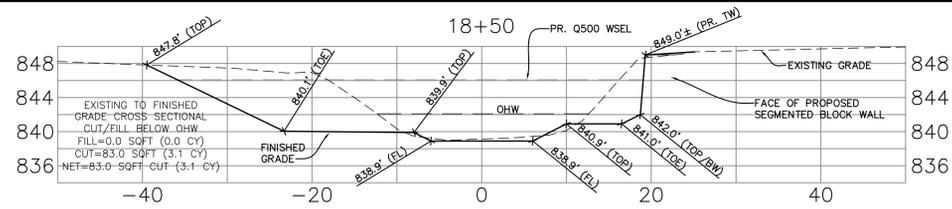
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 PROJ. NO: 15-881 CHK'D BY: MEH

CLIENT NAME  
**TOWN OF KEENE  
 KEENE, NY**

DRAWING TITLE  
**BUCKS LANE BRIDGE  
 REPLACEMENT OVER GULF BROOK  
 PRELIMINARY CENTERLINE  
 PROFILE, ELEVATION,  
 SECTIONS AND DETAILS**

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NOTE: SEE ESPC DWG. C.301 TO C.401 FOR DETAILED CHANNEL CROSS SECTION AT BRIDGE.



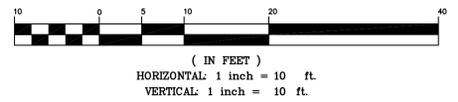
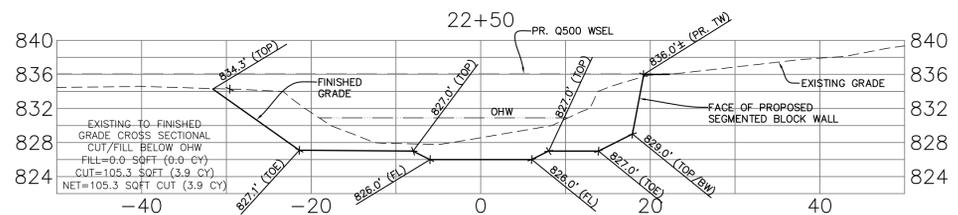
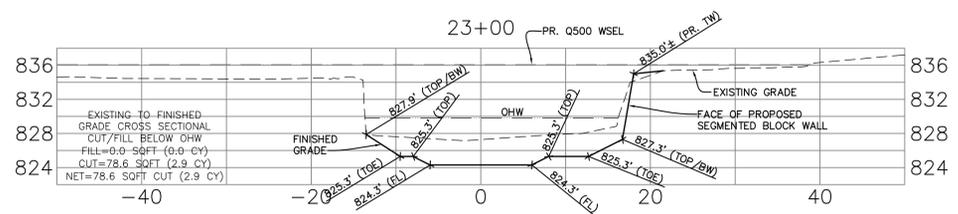
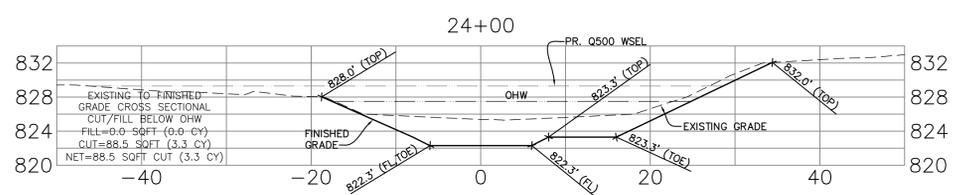
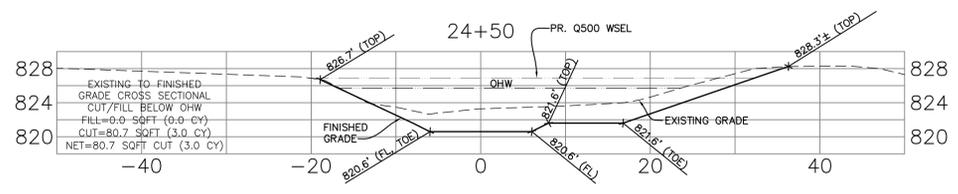
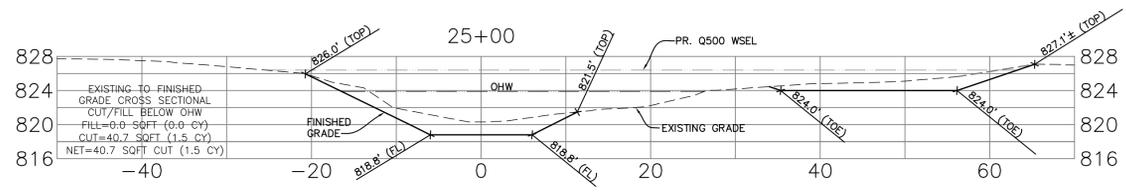
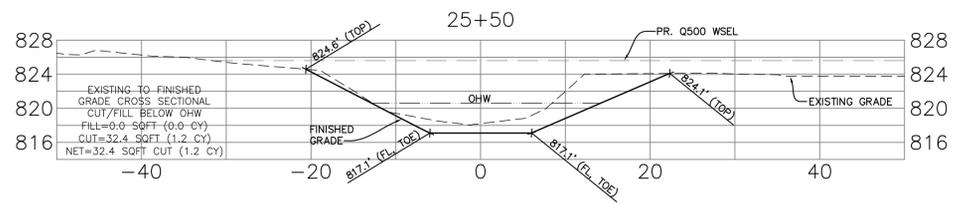
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 CIVIL AND ENVIRONMENTAL ENGINEERING  
 P.O. BOX 2787, PLATTSBURGH, NY 12901  
 WWW.ESPCCONSULTING.COM  
 TEL: 518-563-9445 FAX: 518-562-5189

KEENE, NY  
 GULF BROOK CHANNEL RESTORATION PROJECT  
 CROSS SECTION STATIONS 15+50 TO 22+00  
 KEENE, NY

DRAWN	SJD
CHECKED	SJD
DATE	3/9/17
SCALE	AS SHOWN
JOB NO.	ESPC # 20141253

**C.301**



REVISIONS	BY

**ESPC**  
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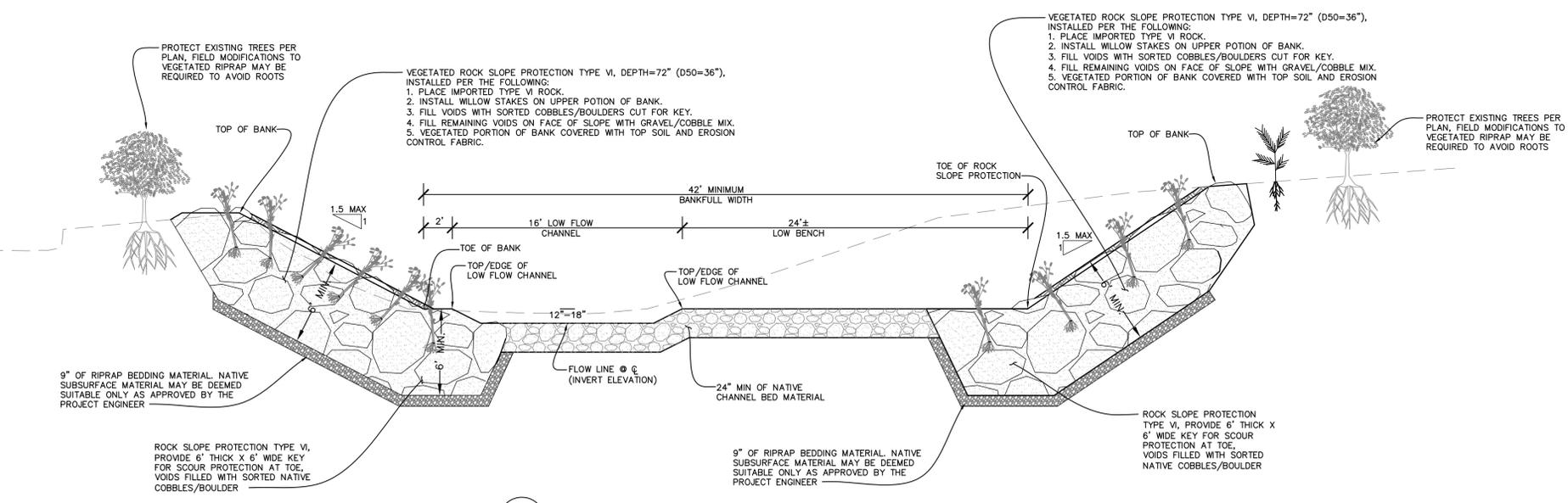
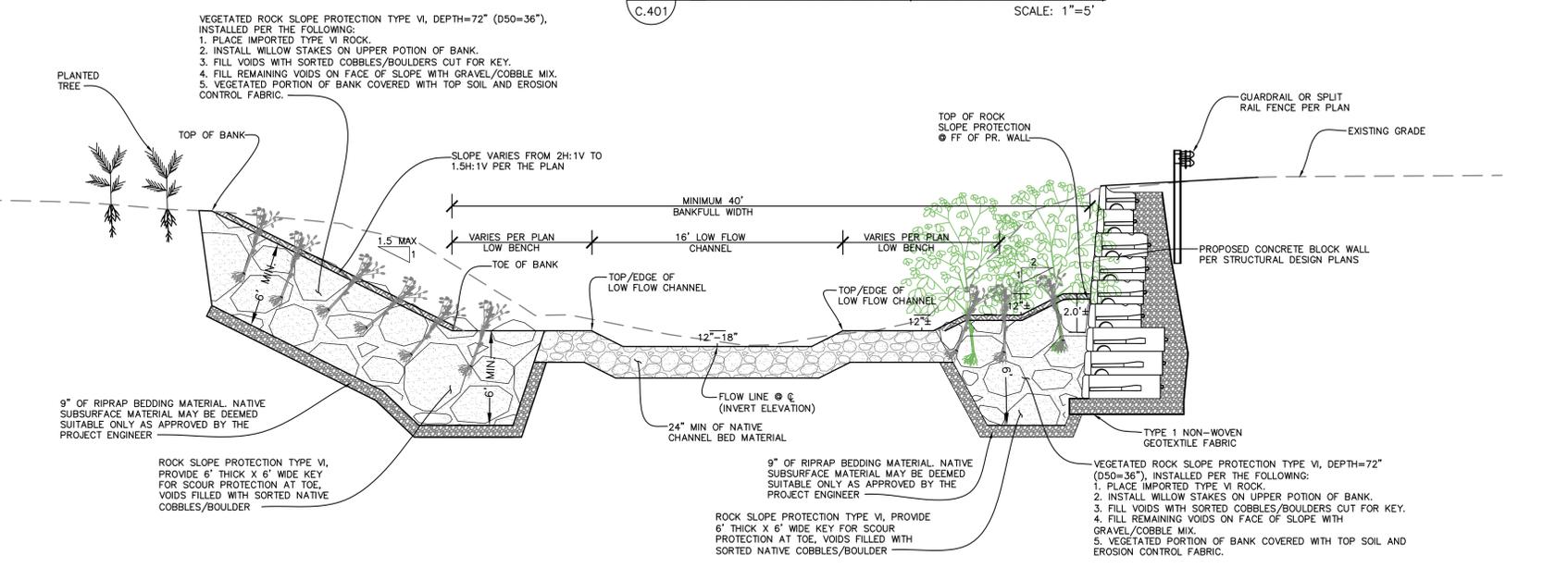
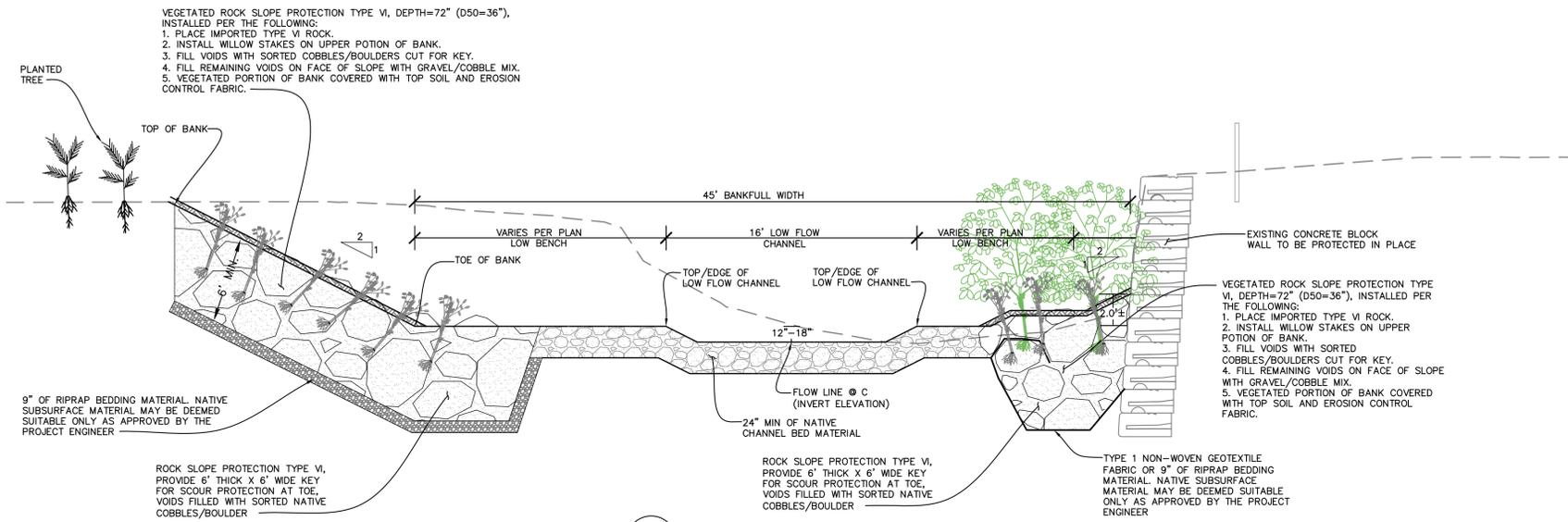
KEENE, NY

GULF BROOK CHANNEL RESTORATION PROJECT

CROSS SECTION STATIONS 22+50 TO 25+50  
 KEENE, NY

DRAWN	SJD
CHECKED	SJD
DATE	3/9/17
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JOB NO.	ESPC # 20141253

C.302



ROCK SLOPE PROTECTION SPECIFICATIONS:

- ROCK SELECTION:**
- ROCKS MUST BE APPROVED, HARD, ANGULAR, BLASTED, STRONG, RESISTANT TO WEATHERING, AND RING WHEN STRUCK WITH A GEOLOGY HAMMER.
  - ROCKS MUST BE FREE OF MAJOR WEAK ZONES SUCH AS CRACKS, SEAMS, AND FOLIATION.
  - THE SPECIFIED ROCK SLOPE PROTECTION SHALL BE PLACED IN ONE COURSE THICKNESS AS SHOWN ON THE PLANS IN A MANNER THAT WILL RESULT IN A REASONABLY WELL GRADED SURFACE. CARE SHALL BE TAKEN IN THE PLACING TO AVOID DISPLACING THE UNDERLYING MATERIAL.
  - THE ROCK SLOPE PROTECTION SHALL BE PLACED AND DISTRIBUTED SO THAT THERE WILL BE NO ACCUMULATIONS OF EITHER THE LARGER OR SMALLER SIZES OF STONE. REARRANGEMENT OF THE STONE FILL BY HAND LABOR OR MECHANICAL EQUIPMENT MAY BE REQUIRED TO OBTAIN THE SPECIFIED RESULTS.
  - WHEN ROCK SLOPE PROTECTION AND FILTER BLANKET ARE TO BE PLACED AS PART OF AN EMBANKMENT, THE PROTECTIVE MATERIALS SHALL BE PLACED CONCURRENTLY WITH THE CONSTRUCTION OF THE EMBANKMENT, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. WHERE ROCK FILL ARE TO BE PLACED UNDER WATER, METHODS SHALL BE USED THAT WILL MINIMIZE SEGREGATION AND ENSURE THAT THE REQUIRED THICKNESS OF PROTECTIVE MATERIAL WILL BE OBTAINED.
  - THE ROCK SLOPE PROTECTION SHALL BE PLACED ON THE PREPARED SLOPE SO THAT THERE WILL BE A MINIMUM OF SPACE BETWEEN THE STONES. THE DEPTH OF EACH STONE SHALL BE EQUAL TO THE THICKNESS OF THE COURSE SHOWN ON THE PLANS. THE VOIDS BETWEEN THE STONES SHALL BE CHINKED WITH SMALLER STONES TO PRODUCE A RELATIVELY SMOOTH AND UNIFORM SURFACE.
  - THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING THE ROCK SLOPE PROTECTION AS A WELL COMPACTED MASS, WITH STONES INTERLOCKED WITH EACH OTHER AND WITH NO LARGE VOIDS TO REDUCE THE POTENTIAL FOR UPLIFT AND MOVEMENT.
  - TO ACHIEVE A WELL COMPACTED MASS, CONTRACTOR MAY BE REQUIRED TO FOLLOW THE INITIAL PLACEMENT OF ROCK SLOPE PROTECTION WITH ADDITIONAL PASSES OF SMALLER MATERIAL. SELECTIVE HAND PLACEMENT OF ROCK OR STONE FOLLOWED BY COMPACTED MAY ALSO BE REQUIRED.
  - DUMPING OF ROCK SLOPE PROTECTION AT THE TOP OF SLOPES AND ROLLING OR PUSHING INTO PLACE SHALL NOT BE PERMITTED.
  - ROCK SLOPE PROTECTION SHALL MEET THE GRADATION BELOW AS BEST AVAILABLE FROM LOCAL SOURCES.

TYPE VI ROCK SLOPE PROTECTION GRADATION

% PASSING	SIZE
100	60"-72"
85	54"-66"
50	36"-48"
15	30"-42"
0	24"

NATIVE CHANNEL BED MATERIAL NOTES:

- NATIVE CHANNEL BED MATERIAL SHALL BE EXISTING BED MATERIAL EXCAVATED DURING THE WORK UNDER THIS PROJECT. THE MATERIAL SHALL BE STOCKPILED AND REUSED AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.

LOW FLOW CHANNEL NOTES:

- THE LOW FLOW CHANNEL AND LOW CHANNEL BENCHES SHALL BE EXISTING CHANNEL MATERIAL AND SHALL BE PLACED TO MIMIC THE NATURAL COBBLE / ROCK RIVER BOTTOM AND ROUGHNESS THROUGHOUT THE PROJECT TO THE SATISFACTION OF THE ENGINEER.

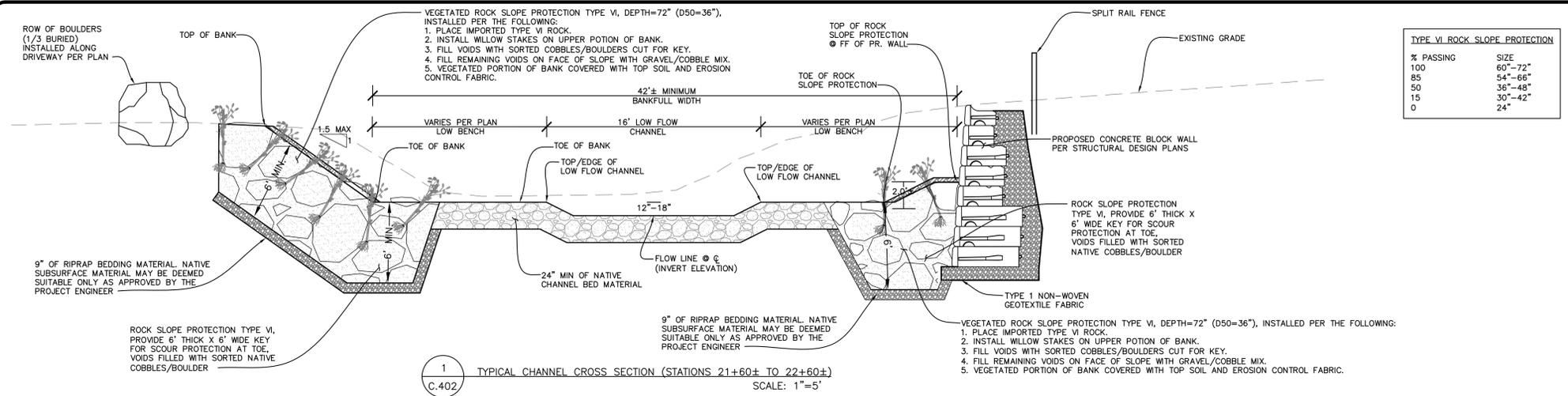
REVISIONS	BY

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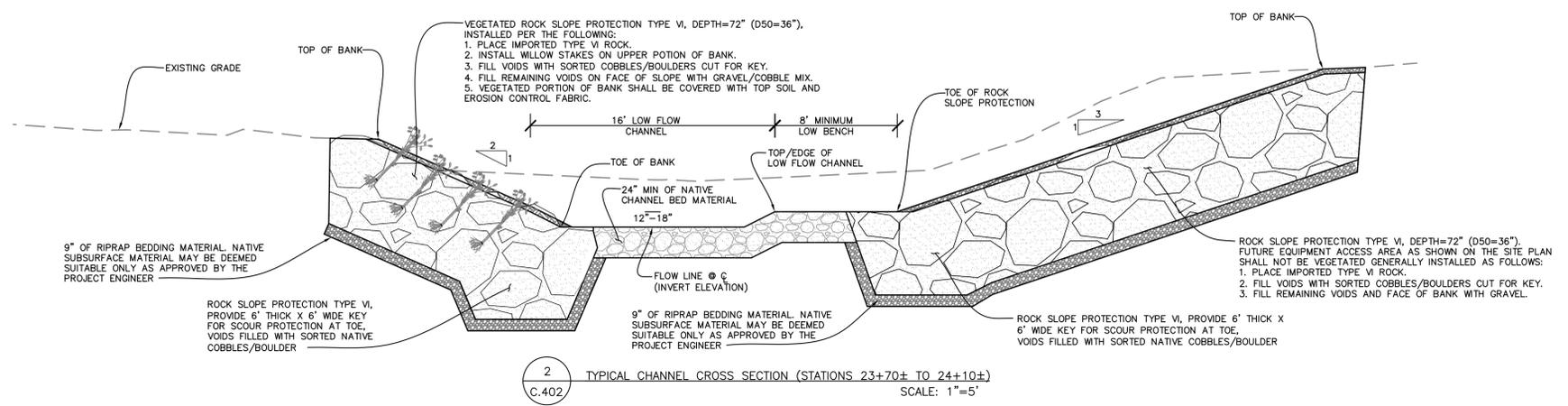
KEENE, NY  
 GULF BROOK CHANNEL RESTORATION PROJECT  
 TYPICAL CHANNEL CROSS-SECTION DETAILS  
 KEENE, NY

DRAWN	SJD
CHECKED	SJD
DATE	3/9/17
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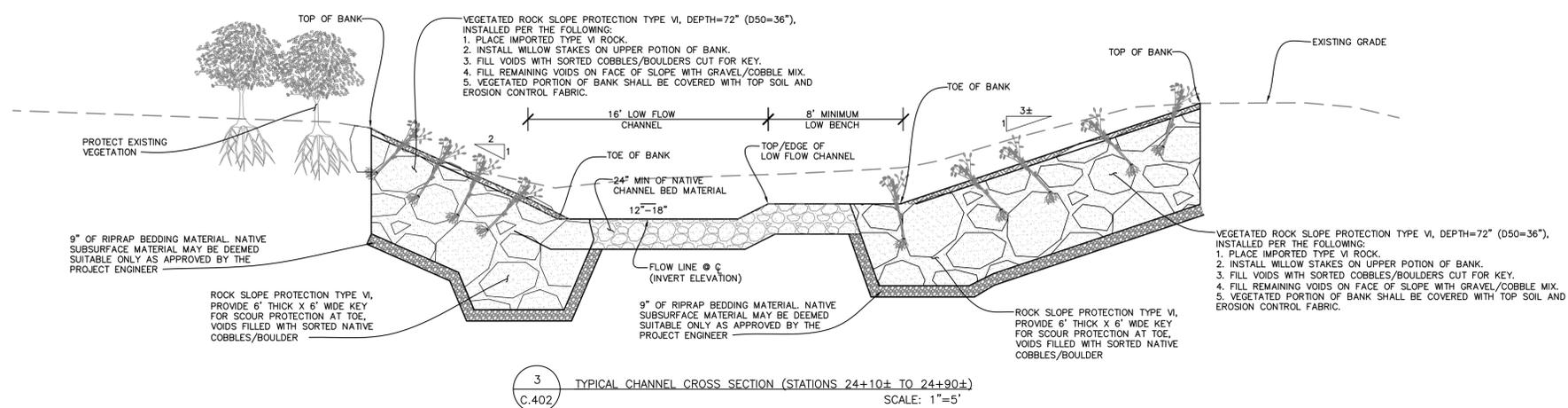
C.401



1 TYPICAL CHANNEL CROSS SECTION (STATIONS 21+60± TO 22+60±)  
C.402 SCALE: 1"=5'



2 TYPICAL CHANNEL CROSS SECTION (STATIONS 23+70± TO 24+10±)  
C.402 SCALE: 1"=5'



3 TYPICAL CHANNEL CROSS SECTION (STATIONS 24+10± TO 24+90±)  
C.402 SCALE: 1"=5'

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KEENE, NY  
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 KEENE, NY

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C.402

**GULF BROOK RESTORATION AND FLOOD MITIGATION PROJECT  
ESSEX COUNTY, NY**

**ATTACHMENT 2  
PHASE 3 - RECOMMENDATION**



**Notes**  
 - No mapped wetlands in Phase III project area per Adirondack Park Agency.  
 - NYSODP Imagery from 2017.  
**Map By:** EHB and JHB  
**Date:** October 1, 2018

**Depth of Disturbance\***  
 Greater than 2ft  
 \*Tree removal required in depth of disturbance areas.

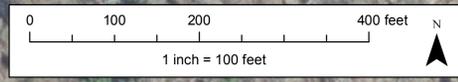
**Stream Centerline**  
**Parcel Boundary**  
**Potential Tree Clearing Area of Potential Extent (APE)**

**Gulf Brook Phase III  
 Keene, NY**

**Project Areas for Review**

**Fitzgerald Environmental Associates, LLC.**  
 18 Severance Green, Suite 203  
 Colchester, VT 05446  
 Tel: 802.256.7276  
 www.fitzgeraldenvironmental.com

**ESPC**  
 civil and environmental engineering





engineering and environmental consulting

May 12, 2016

Mr. William Ferebee, Supervisor  
Town of Keene  
P.O. Box 89  
Keene, NY 12942

RE: **Gulf Brook Restoration** – Up Stream Flood Resilience Improvement  
Recommendations

Dear Mr. Ferebee:

As you know, the ESPC Project Team is working for Essex County to develop design plans and complete permitting for the Gulf Brook Restoration Project. This project focuses on implementing measures that are located within Keene Hamlet to provide improved flood protection and resiliency. It has been strongly recommended to also focus efforts on implementing stabilization measures upstream of the hamlet to help reduce the loading of coarse sediment into the hamlet during large storm events. As such, part of our scope has included assessing conditions and developing conceptual improvements for implementation in Gulf Brook upstream of Keene Hamlet.

Five project areas have been identified in Gulf Brook that are located upstream of the hamlet. Attached to this letter includes a map identifying the location of each project area and a brief narrative description characterizing each area and the presentation of restoration concepts.

In order to provide improved flood protection to the hamlet, provide better protection to the existing and new infrastructure that is currently in design and soon to be constructed, and to aid the Town and the County in channel and structure maintenance in the future, it is recommended that designs be developed for each of these project areas upstream of the hamlet and that those designs be constructed either at the same time as construction of the improvements in the hamlet or as soon as possible thereafter.

ESPC and its Project Team are pleased to be completing this project for the Town of Keene and Essex County. Please feel free to contact me if you have any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Erik C.F. Sandblom', is written over a horizontal line.

Erik C.F. Sandblom, P.E.  
Principal Engineer

Enclosure

Cc: Michael Mascarenas, Essex County Community Planning  
Jim Dougan, Essex County Public Works

ERIK SANDBLOM, PC

VERMONT OFFICE:

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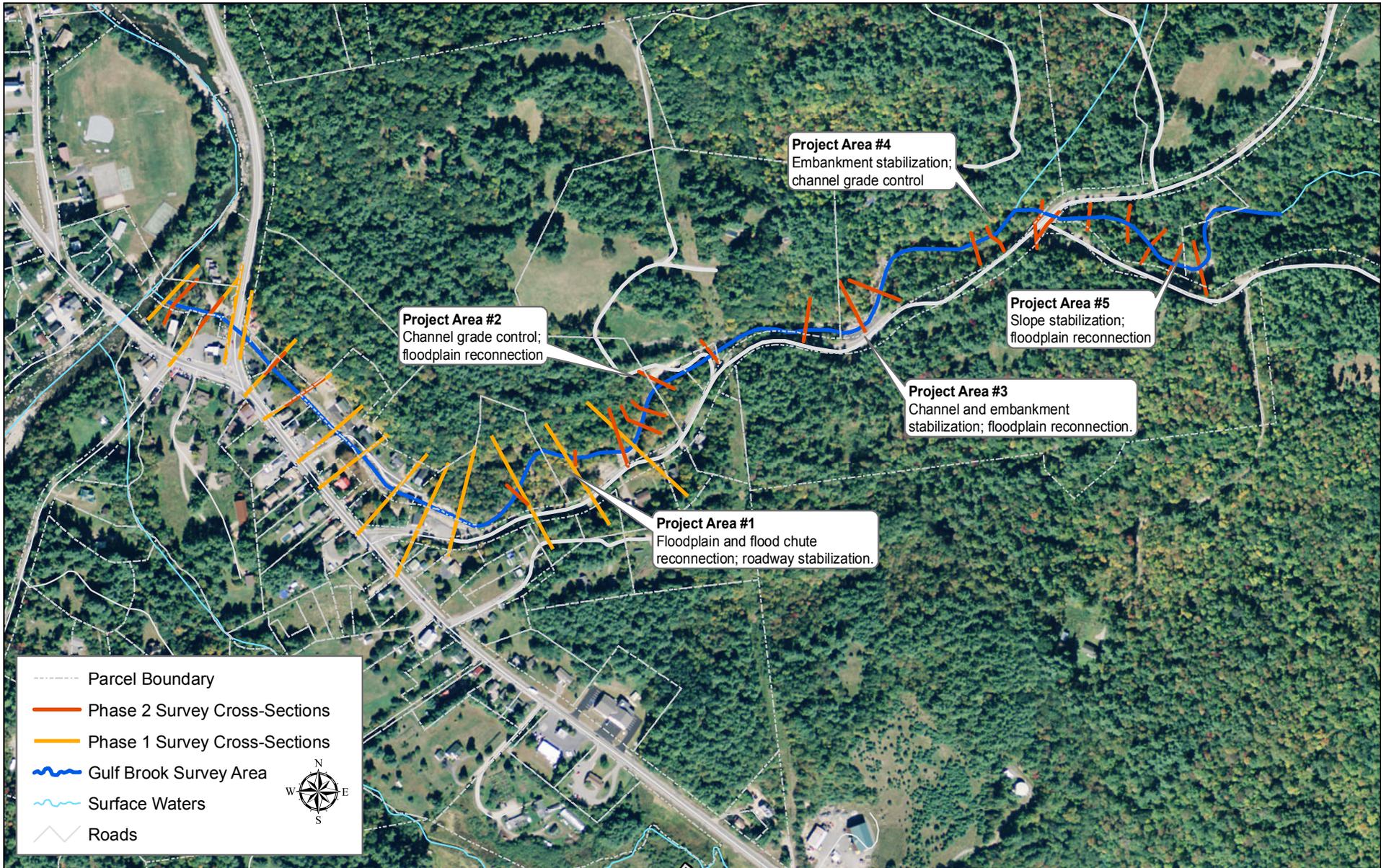
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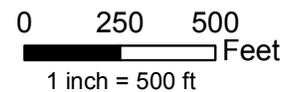


Fitzgerald  
Environmental  
Associates, LLC



## Town of Keene, NY

### Gulf Brook Restoration Project Phase 2 - Geomorphic Recommendations



Date: Apr 20, 2016  
Drawn: JHB; EPF

Notes:  
- Background imagery is post-Irene  
- Geomorphic surveys were conducted  
by FEA staff August-October 2015

## Keene Gulf Brook Restoration – Phase 2 Upstream Project Areas

April 20, 2016

### Project Area #1

This site is located immediately upstream of the Gulf Brook Phase 1 project limits on the Auer property and along Hurricane Road. At this location the channel has good access to a floodplain located between the channel and Hurricane Road. During Tropical Storm Irene, this area experienced severe deposition of woody debris and coarse sediment. This is likely exacerbated by an undersized bridge on the driveway serving the Auer residence across the brook. A portion of Hurricane Road was flooded and eroded in 2011, and flood recovery work left piles of dredging spoils and berms along the banks of the brook (see photo below).

Restoration concepts for this site include floodplain reconnection, re-grading and “roughening” of the floodplain to encourage the capture of debris and sediment in the next large flood, design of a flood chute to safely pass overbank flow through the Auer property, and embankment stabilization along Hurricane Road. The flood resiliency work at this site would cover approximately 600 linear feet of Gulf Brook.



Spoils from post-Irene dredging along the Hurricane Road.

## Project Area #2

This site is located immediately upstream of a 90-degree bend in Gulf Brook along Hurricane Road, which is the upstream limit of Project Area #1. During the 2011 flood an undersized bridge on High Meadows Way was destroyed and the road embankment immediately downstream was undermined. As part of the flood recovery work the bridge was rebuilt with a span of 60 feet and includes an approximate bankfull channel. However, the in-stream restoration work left the channel with a sharp change in slope and an over-widened channel in the downstream area (see photo below). This resulted in a floodplain disconnection on the right bank downstream of the repaired embankment.

Restoration concepts for this site include floodplain reconnection, installation of grade control structures (e.g., weirs), “roughening” of the channel to slow flood flow velocity and encourage the capture of debris and sediment in the next large flood, and road embankment stabilization. The flood resiliency work at this site would cover approximately 300 linear feet of Gulf Brook.



Stabilized embankment along High Meadows Way with abrupt change in channel slope downstream.

### Project Area #3

This site is located between the High Meadows Way bridge and the intersection of Hurricane and Jackson Roads. During Tropical Storm Irene, this area experienced severe erosion of the road embankment and downcutting in the river channel (i.e., incision). The tall road embankment was washed out for approximately 200 feet. It was rebuilt but appears to be unstable due to the steep slope and the potential for the river bed to continue incising, thereby undermining the road embankment. On the upstream side of the embankment there are several areas of exposed fabric underlayment where the riprap has slipped down the slope (see photo below).

Restoration concepts for this site include natural channel raising, floodplain reconnection, installation of grade control structures (e.g., weirs), and road embankment stabilization. The flood resiliency work at this site would cover approximately 300 linear feet of Gulf Brook.



Unstable embankment armor along Hurricane Road.

#### Project Area #4

This site is located immediately downstream of the Hurricane Road bridge. During Tropical Storm Irene, this area experienced moderate to severe erosion of the road embankment and downcutting in the river channel (i.e., incision) in the downstream reach. The road embankment is unstable due to the steep slope and the potential for the river bed to continue incising, thereby undermining the road embankment. There are several areas where the bank erosion is within 3 feet of the edge of pavement (see photo below).

Restoration concepts for this site include road embankment armoring while minimizing encroachment on the channel, and installation of grade control structures (e.g., weirs) in the downstream reach. The flood resiliency work at this site would cover approximately 300 linear feet of Gulf Brook.



Unstable embankment along Hurricane Road southwest of the intersection with Jackson Road.

### Project Area #5

This site is located upstream of the Hurricane Road bridge. During Tropical Storm Irene, this area experienced severe deposition of woody debris and coarse sediment. In addition, a large slope failure along Jackson Road became more unstable and contributes significant amounts of sediment to the channel. Downstream of the slope failure, the inlet to a flood chute in between the brook and Jackson Road was blocked off by a large pile of logs left by the floodwaters. The loss of access to this flood chute increases floodwater velocity resulting in greater potential for bank erosion in this area.

Restoration concepts for this site include debris removal and floodplain/flood chute reconnection, “roughening” of the channel along the eroded slope and toe protection, and bioengineering stabilization of the upper slope. The flood resiliency work at this site would cover approximately 600 linear feet of Gulf Brook.



Tall slope failure along Jackson Road.

**GULF BROOK RESTORATION AND FLOOD MITIGATION PROJECT  
ESSEX COUNTY, NY**

**ATTACHMENT 3**



## Fitzgerald Environmental Associates, LLC.

---

Applied Watershed Science & Ecology

### MEMORANDUM

**To:** ESPC and Town of Keene  
**From:** Evan P. Fitzgerald, CPESC  
**Re:** Gulf Brook Geomorphology, Hydrology and Hydraulics, and Environmental Permitting  
**Date:** August 22, 2014

Fitzgerald Environmental Associates, LLC. ("FEA") is a member of the ESPC Project Team retained by the Town of Keene ("Town") to design stabilization and restoration measures for a section of Gulf Brook in Keene, New York. FEA's role in the project was to perform a fluvial geomorphic survey and assessment of the Gulf Brook reach through the project site, conduct hydrologic-hydraulic modeling of the watershed and brook, assist in the alternatives analysis and restoration design approach, and summarize environmental permitting information for state and federal agencies. This memorandum serves to summarize the following: 1) methods and results of our geomorphic survey; 2) methods and results of hydrologic and hydraulic modeling; and 3) permitting information to support the design plans submitted by ESPC on behalf of the Town.

#### River Survey Methods

##### Cross-section Surveys

Fitzgerald Environmental Associates (FEA) collected longitudinal and cross-section survey data including multiple survey benchmark points that were tied in to the ground survey performed for ESPC (see Figure 1 on page 1 of Attachment). Cross-section survey data were collected using a CST-Berger® 32x SAL Automatic Level ( $\pm 1.0\text{mm}$  accuracy @ 1km run) and standard survey rods. Horizontal data such as cross-section start and ends points were collected using a handheld Ashtech MobileMapper™ M100 Series GPS device (sub half-meter accuracy). The cross-section data served to: 1) inform the fluvial geomorphic assessment of river stability and aquatic habitat in the reach; and 2) provide data required to develop a detailed hydraulic model of the river reach for design purposes.

##### Channel Geomorphic Surveys

The purpose of the geomorphic assessments was to gather sufficient data to characterize the geomorphic setting and processes, hydraulic geometry, bed and bank substrates of the reach, and to assess existing vertical and lateral stability of the river. Given this information, in conjunction with hydrologic and hydraulic modeling data, we evaluated long-term river channel stability in support of our proposed design alternatives.

FEA followed all major components of the "Phase 3 survey" approach outlined in the Vermont Agency of Natural Resources (VTANR) Stream Geomorphic Assessment Protocols (VTANR, 2009a). We assessed the quality of aquatic habitat using the Reach Habitat Assessment Protocols developed by VTANR (VTANR, 2008). A description of our field methods and results follows.

River assessments were completed during low flow conditions on May 13<sup>th</sup>, 2014 by staff from FEA trained in the VTANR Phase 3 Protocols. The assessments were conducted within the study area shown in Figure 1 on page 1 of the Attachment. The following data were collected:

*1) Longitudinal Profile & Planform Geometry*

A longitudinal profile of the channel was completed following Step 2.1 of the VTANR Phase 3 Protocol. Channel bed elevation data were collected at all significant bed features including riffle heads and tails, pools, glides, runs and grade controls. A GPS point of the thalweg (deepest point of flow) was recorded at each bed feature to provide the basis for analyzing planform geometry and longitudinal distance and profile.

*2) Channel Cross-Sections*

Channel and floodplain cross-section data were collected at four (4) stations along the segment following Step 2.2 of the Phase 3 Protocol to augment survey data collected by E&E and ESPC. Cross-sections were located at riffles or step features or where flow was predominantly laminar in nature. Elevation data within and proximate the bankfull channel were surveyed in the greatest detail (i.e., minimum elevation change of 0.5 ft). Bank profiles were taken from the E&E and ESPC surveys on the river left and right banks, respectively, and were integrated into the cross-section plots for modeling purposes and the calculation of flood prone metrics.

*3) Substrate Data*

Substrate sampling was completed at four locations following Step 2.6 of the Phase 3 Protocol. Substrate was sampled on well-formed sediment bars following Step 2.13 of the Phase 2 Protocols (VTANR, 2009b). Substrate data were plotted and analyzed in spreadsheets to evaluate parameters important for hydraulic modeling and aquatic habitat.

Aquatic Habitat Assessments

The purpose of the aquatic habitat assessments was to characterize existing habitat features in the reach. This data informed our proposed design alternatives by highlighting the presence and absence of key habitat features that would typically be found in this geomorphic setting. The following data were collected:

*1) Large Woody Debris (LWD)*

All LWD (and debris jams) with a minimum diameter of 6 inches were tallied in the reach, with five (5) size classes tallied separately per the VTANR protocols. Understanding the distribution of different size classes of woody debris is critical to evaluating habitat quality, and informed our proposed in-stream structures to improve habitat.

*2) Pools*

All pools with a minimum depth of 1 foot within the study reach were measured and tallied. As with LWD, different size classes were measured per the VTANR protocols. Pools are very important habitat features for the native salmonid fishery.

*3) Undercut Banks*

All stable, undercut banks with overhanging vegetation and a minimum length of 2 feet were tallied per the size classes outlined in the protocols. Undercut banks provide important refuge for fish, and their presence/absence informed the design of in-stream or near-bank stabilization structures.

## Geomorphic and Habitat Conditions Summary

### Channel Geomorphology

Gulf Brook is a tributary to the East Branch of the Ausable River. It is drained by a small, steep watershed with a drainage area of 8.1 square miles (see Figure 2 on page 2 of Attachment). Gulf Brook is a high-gradient, 3<sup>rd</sup> order stream. The channel has a sharp decrease in slope (from approximately 6% to 3%) and a widening river valley as it approaches the Village area near the intersection of Route 9N/73 and Hurricane Road. As witnessed during Tropical Storm Irene, these stream characteristics create a very dynamic environment - typically characterized as an “alluvial fan” - due to large volume of sediment and debris that tends to deposit in these settings during large floods.

There are two distinct slope transitions along Gulf Brook in the Village that make the channel prone to sediment and debris deposition during large floods (see Figure 3 on page 3 of Attachment). Immediately upstream of the old Firehouse, the slope decreases around the sharp channel bend from 5.5% to 4.2%. This is the first area in the Village where severe sediment deposition occurred during Tropical Storm Irene (TSI). A second slope transition occurs approximately 100 feet upstream of the Bucks Lane bridge, where the slope decreases from 4.2% to 2.9% for the remainder of the reach down to the East Branch Ausable River. Based on our cross-sectional surveys in May 2014, we observed aggradation (i.e., higher channel bed) on the order of 1-2 feet at this location (model section 7) in comparison to the E&E survey conducted in early spring prior to the April 15<sup>th</sup>, 2014 bankfull flow event. Aggradation was most severe at the channel bend just upstream of the old Firehouse (see Figure 4 on page 4 of Attachment).

Channel cross-section data from (9) stations are summarized below in Table 1. Cross-sectional plots and substrate distribution plots are provided for select sections in Figures 5 through 8 on pages 5 through 8 of the Attachment.

**Table 1: Geomorphology Data Summary**

Cross-section	Wbkf (ft)	Dbkf (ft)	W:D	ER	Stream Type	Bedform	CEM Stage (dominant adjustment processes)
XS-1	30.4	1.4	21.5	6.5	C <sub>b</sub>	Pool-Riffle	IV (aggradation & planform)
XS-2	25.6	1.6	15.6	5.2	C <sub>b</sub>	Pool-Riffle	IV (aggradation & planform)
XS-3	24.8	1.4	17.9	2.0	B	Step-Pool	II (incision & entrenchment)
XS-4	25.1	1.9	13.3	1.3	F	Step-Pool	II (incision & entrenchment)
XS-5	19.7	1.8	11.0	1.4	F	Step-Pool	II (incision & entrenchment)
XS-6	19.2	1.9	10.0	1.3	F	Plane Bed	II (incision & entrenchment)
XS-7	25.4	1.8	13.9	1.1	F	Plane Bed	II (incision & entrenchment)
XS-8	21.4	2.2	9.6	1.3	F	Plane Bed	II (incision & entrenchment)
XS-9	25.2	1.7	14.6	1.4	F	Plane Bed	II (incision & entrenchment)

Notes:

Wbkf = bankfull width; Dbkf = mean bankfull depth; W:D = width to depth ration; ER = entrenchment ration; Stream typing and bedform per Rosgen (1994) and Montgomery and Buffington (1997); CEM (channel evolution model) assessed per Schumm (1977) and VTANR (2009b).

Our geomorphic survey indicates that the channel morphology of Gulf Brook transitions from a high energy, moderately confined stream type (i.e., Rosgen B and C<sub>b</sub> types) to a channelized alluvial fan

setting in the Village. There was some floodplain access noted in the upper reach above the Village, as noted in the entrenchment ratios and stream typing for sections 1 and 2. As Gulf Brook approaches the Village and alluvial fan landscape, it becomes confined by Hurricane Road and a taller abandoned floodplain to the north. At this critical transition point on the longitudinal profile on the channel bend upstream of the old Firehouse, the channel is incised and entrenched. In other words, floodwaters are contained primarily within the channel boundaries and the floodflow velocity is very high, allowing for significant sediment and debris entrainment downstream.

Based on the USGS regional hydraulic geometry regressions (Mulvihill et al., 2007), the predicted bankfull channel width for this reach of Gulf Brook is 46 feet, with a mean depth of 2.1 feet. The brook was channelized through TSI deposits during the flood recovery work, resulting in an average bankfull width of less than 25 feet. Upstream of the Village, the bankfull channel varied between 25 and 30 feet. It should be noted that similar hydraulic geometry regressions for Vermont (VTDEC, 2006) at the statewide scale would predict a bankfull width of 33 feet and a bankfull depth of 1.8 feet for this reach. Although the Vermont regressions may appear to better fit the Gulf Brook system, we used the New York regional regressions for comparison with current conditions. Given the alluvial fan setting where channel widths would typically exceed those of single thread systems, the New York regressions were also deemed more appropriate.

#### Aquatic Habitat

The channel bed substrate is dominated by cobble and gravel near Bucks Lane. Generally, fine sedimentation in the bed was limited, with sand representing less than 5% of the substrate at each section. At the old Firehouse and upstream, the bed begins to coarsen with boulders representing 25% of the substrate. The transition in gradation is indicative of greater energy and sediment/debris transport in the areas upstream of the Village. While some step-pool features have reformed naturally in the reach since TSI recovery, bed features are mostly absent on the approach to the Bucks Lane bridge. Step-pool sequences have become better established in the reach above the Village.

Large woody debris (LWD) was absent in the channel from the old Firehouse to Bucks Lane bridge. Small pieces of LWD were noted in the reach above the Village (between sections 1 and 2), but generally most LWD appeared to have been removed from the channel during flood recovery work. Three (3) pools were observed in the lower reach from the old Firehouse down to the Bucks Lane bridge. Each pool had a depth between 1 and 2 feet. No undercut banks providing fish refuge were noted in the project area, and were generally limited in the reach above the Village due to heavy bank scour during TSI. Fish refuge areas and habitat were very limited throughout the study reach due to reduced LWD, pools, and undercut banks.

### **Hydrologic and Hydraulic Modeling**

#### Hydrologic Analysis

FEA estimated the 2-year (Q2) and 100-year (Q100) discharge for Gulf Brook using a wide range of available methods (Table 2). The USGS Stream Stats interface automatically delineated the Gulf Brook watershed from the study area and estimated discharge based on watershed size, elevation, and wetland/pond area ([http://water.usgs.gov/osw/streamstats/new\\_york.html](http://water.usgs.gov/osw/streamstats/new_york.html)). We also estimated discharge based on drainage area normalized discharge from active USGS stream gaging stations with

similar basin area and elevation in NY hydrologic region 1 (Lumia et al., 2006). Discharge values for the Sand Lake outlet (Piseco, NY) and Dry Brook (Adams, MA) were area-normalized to estimate flows for Gulf Brook. The same method was used to estimate flows from the USGS gage on the East Branch of the Ausable River, which is hydrologically connected to Gulf Brook, but is a much larger drainage basin (198 square miles) located Ausable Forks NY. Q100 was estimated by NYDOT during the hydraulic design process when the Rt 9N bridge was replaced in 1999.

A TR-20 runoff model (NRCS methods; SCS, 1983) was created using HydroCAD software to estimate discharge from 2-year (2.23") and 100-year (5.27") 24 hour rainfall events based on watershed soil and land cover characteristics and flow concentration estimates. Rainfall depths were sourced from nearby climate stations maintained by the Northeast Regional Climate Center (<http://precip.eas.cornell.edu/>). Several of the soil types in the basin were listed as having two different hydrologic soil groups depending on the degree of saturation (unsaturated and saturated). The first model iteration assumed unsaturated conditions. The "Mod Hydrogroup" iteration assumed saturated conditions. We also re-ran both iterations using antecedent moisture conditions (AMC) of 3 to represent rainfall on saturated soils for the entire watershed. The area weighted curve number from the TR-20 model and rainfall intensity estimates from the Northeast Regional Climate Center were used to estimate runoff using the Rational Method for both unsaturated and saturated soil hydrogroup iterations.

**Table 2: Summary of Hydrologic Analysis for Gulf Brook Watershed**

Method	Q2 (cfs)	Q100 (cfs)	Source/Notes
USGS Stream Stats	263	863	Based on regional gages and regressions
USGS Region 1 High Elevation Watersheds	408	991	Sand Lake and Dry Brook USGS gages
East Branch Ausable River	--	1,301	TS Irene peak discharge scaled to Gulf Brook
NYDOT Route 9N Bridge	--	1,535	Basis for hydraulic design in 1999 plans
HydroCad TR-20 AMC2	--	1,319	NRCS Methods; Normal soil conditions; CN = 57
HydroCad TR-20 AMC2 Mod Hydrogroup	--	1,812	Modified all soils with dual hydrogroup B/D from B to D
HydroCad TR-20 AMC3	515	3,317	Saturated soil conditions
Rational Method	445	1,084	Average rainfall intensity for 3 hours (ToC)
Rational Method Mod Hydrogroup	475	1,188	Modified all soils with dual hydrogroup B/D from B to D

### Hydraulic Modeling

Using data from the geomorphic cross-section surveys in combination with the survey data from ESPC and E&E, we developed a hydraulic model of Gulf Brook. The model was built using one-dimensional HEC-RAS software from the U.S. Army Corps of Engineers (USACE, 2010). The model was developed to estimate and understand surface water elevations, and channel and overbank water velocities through the project site. These data were used to 1) validate assumptions for ordinary high water for permitting purposes, 2) estimate the magnitude of discharge in Gulf Brook during TSI, and 3) inform the design of stabilization measures and habitat improvement features by ensuring that the proposed treatments will meet the project objectives for flood mitigation and adequately resist hydraulic forces during high flow events.

Predicted surface water elevations using our selected 2-year recurrence discharge of 408 cfs showed good alignment with observed bankfull characteristics in the reach upstream of the Village. In addition, we observed and photographed a minor flood event on April 15<sup>th</sup>, 2014, which was a bankfull flood for many rivers in the region. This flood event aligned well with our surface water predictions at many stations through the reach (see Figure 9 on page 9 of the Attachment). This discharge was used to determine the extents of ordinary high water (OHW) throughout the reach for permitting purposes.

To recreate the flood dynamics during TSI, we evaluated hydraulics in the reach using various assumptions for the elevation of the sediment and debris deposits in the Village. Based on a review of photographs taken immediately after the recession of floodwaters, and those taken after flood recovery work in the channel, we estimated that the channel invert of Gulf Brook was 2 to 3 feet higher during and after the flood. Sediment fill was simulated HEC-RAS model for cross-sections 3 through 7 in the Village (see Figure 10 on page 10 of the Attachment). Using this sediment fill assumption and our largest magnitude flood estimate from the hydrologic analysis (3,317 cfs), surface water elevations aligned well with those observed during the flood. Based on elevations of overbank sediment and debris deposits at the upstream and downstream ends of the Village, and a known flood elevation over the first floor of the building immediately west of the Bucks Lane bridge (see calibration points shown in Figure 1 in the Attachment), our model predicted surface water elevations within 0.5 feet at each location. Although overbank flow around the Bucks Lane bridge would be more accurately predicted with a two-dimensional hydraulic model, the one-dimensional HEC-RAS model gave reasonably good predictions of surface water elevations, even in this area of complex hydraulics. Our modeling exercise gave us confidence that the TSI discharge was at least twice as large as the NYDOT Q100 estimate for the Route 9N bridge design, and this became our basis for designing the flood mitigation components of the project.

Key results of the hydraulic modeling, and how these data were utilized in the proposed design, are summarized below.

- The low flow channel design was scaled to one-third bankfull width with hydraulic capacity of approximately 2 cfs per square mile drainage area based on guidance from the Vermont Standard River Management Principles and Practices (Schiff and Fitzgerald, 2014).
- A bankfull or OHW discharge of approximately 400 cfs used as the design flow for sizing the in-stream treatments and widths.
- OHW velocity for existing conditions ranged from 7 to 11 feet per second (fps) through the project site, with an average velocity of 9 fps.
- TSI flood magnitude likely exceeded 3,000 cfs in Gulf Brook. This was used as the design flow for flood resiliency measures in the Village.
- Predicted velocities during TSI elevation ranged from 7 to 19 feet fps through the project site, with an average velocity of 16 fps.
- The modeling indicates that floodflows under existing conditions are typically supercritical (i.e., very turbulent) throughout the reach, making the channel bed and banks unstable and vulnerable to sudden changes due to sediment transport and debris snagging.

- We used the HEC-RAS model to simulate the proposed plans with and without the old Firehouse in place. Leaving the Firehouse restricts the channel and floodway width to about 30 feet, resulting in flood levels approximately 1.5 to 2.5 feet higher at the bend in the brook. Projected flood velocities just downstream (at the eastern end of the new wall on the north bank) would be approximately 35% higher with the Firehouse left in place.

### **Rationale for Geomorphic Restoration Approach**

As described above, the project area is situated in a highly dynamic zone of the watershed known as an alluvial fan. Severe bank erosion and mass wasting of valley walls caused by TSI was noted by FEA in the upper watershed. Although these areas are currently beyond the scope of the current project, this reach receives the brunt of the sediment and debris deposits during floods due to the landscape setting and channel constrictions at Bucks Lane and Route 9N. Given the site setting, the primary objectives of the channel restoration and flood resiliency design from a geomorphic standpoint are summarized below.

#### Channel and Floodplain Dimensions

- Low flow channel to enhance habitat and ensure aquatic organism passage during low to moderate flows.
- Minimum bankfull width of 45 feet wherever possible.
- Maximum floodway width and area possible to accommodate extreme floodflows and sediment and debris transport and deposition.

#### Rock Vanes

- Vane/step spacing and profile based on observations of natural steps in upper watershed and guidance from Rosgen (2001). Steps are spaced at approximately 2 times the bankfull channel width.
- Vanes are designed to divert floodflows away from the bank and back into the center of the channel to protect adjacent infrastructure.
- Vanes are designed to accommodate sediment and debris deposition during large floods so that this material can be removed from the channel as needed without significant disturbance to the low flow channel (see Figure on page 11 of the Attachment).

#### Flood Benches

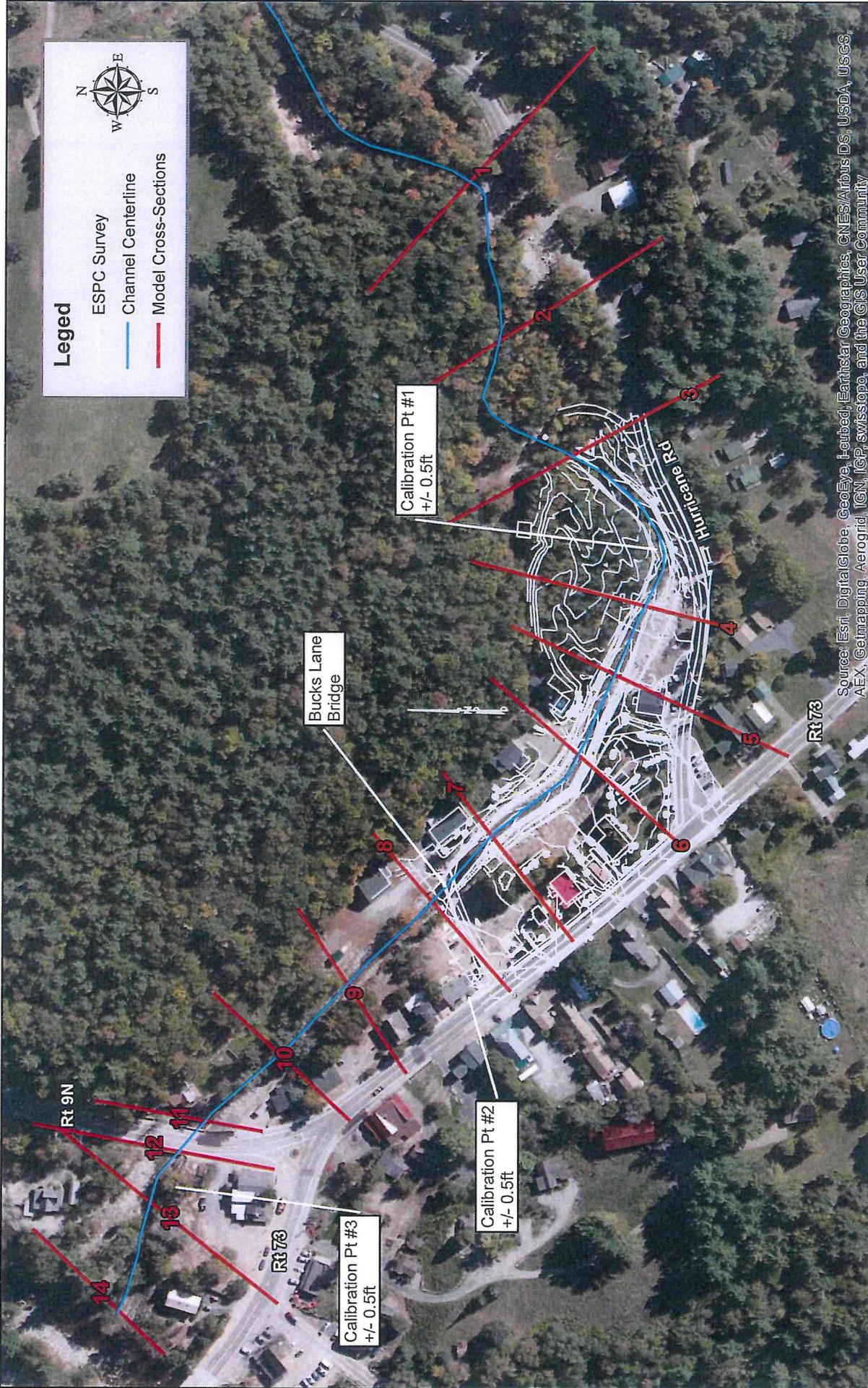
- Large flood benches are designed on both sides of the channel at the bend in the brook where the channel slope decreases significantly. These are situated where we expect the greatest sediment and debris deposition during future floods, and are designed to be maintainable given the ease of access.

Enc.

## References

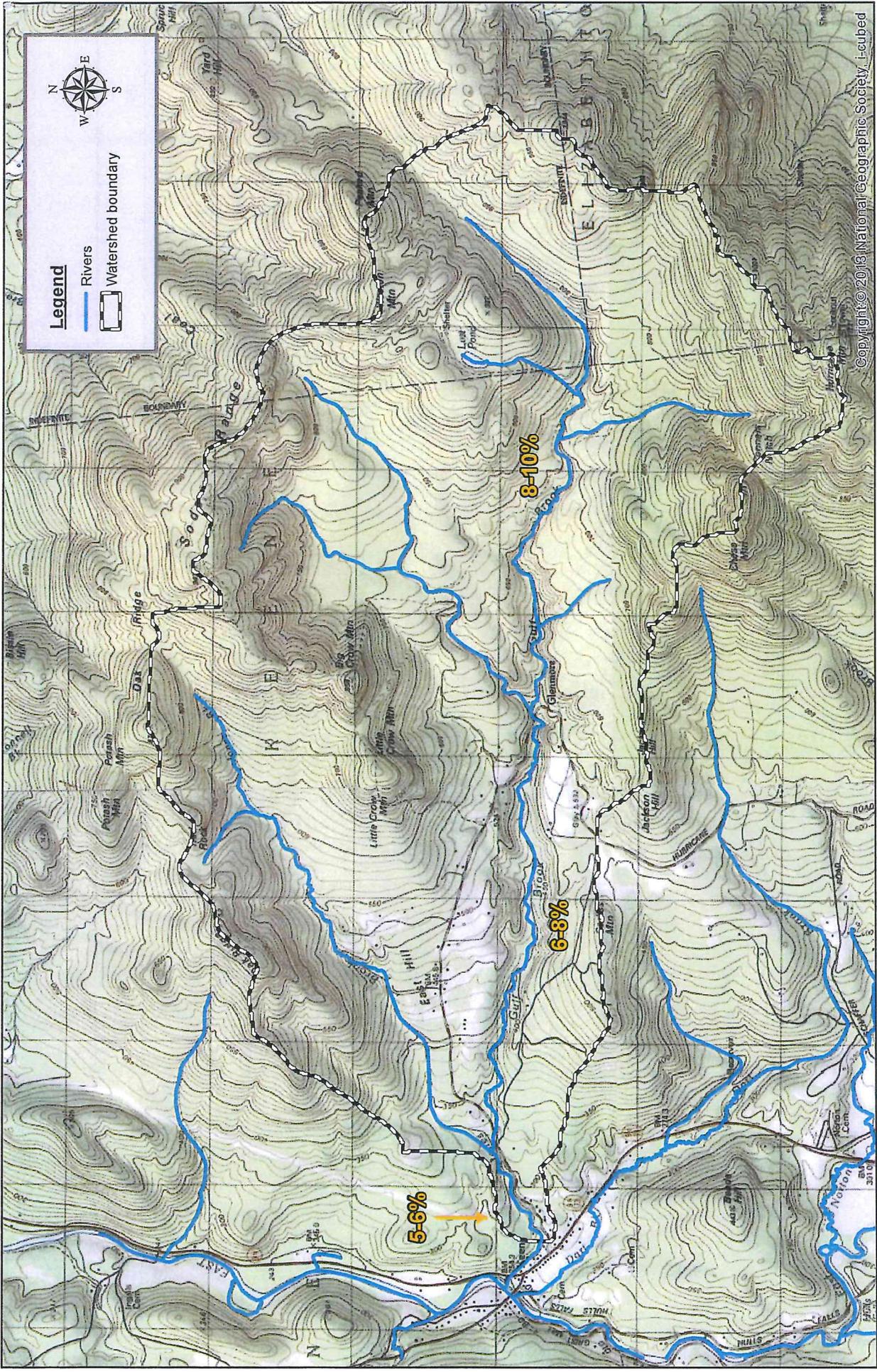
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**ATTACHMENT**



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

<p><b>Fitzgerald Environmental Associates, LLC</b>          18 Severance Green, Suite 203          Colchester, VT 05446          Telephone: 802.876.7778  <a href="http://www.fitzgeraldenvironmental.com">www.fitzgeraldenvironmental.com</a></p>	<p><b>Town of Keene, NY</b>  <b>Gulf Brook Channel Restoration</b>  <b>Gulf Brook Hydraulic Modeling Section and Survey Location Map</b></p>	<p><b>Figure 1</b></p> <p>0 100 200 Feet          1 inch = 200 ft          Date: August 21, 2014          Drawn: EPF</p>	<p><b>Notes:</b>          - FEA geomorphic survey completed from Sections 1 through 14 with greatest detail within ESPC survey limits.          - Model section locations from E&amp;E survey.</p>
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<p><b>Fitzgerald Environmental Associates, LLC</b>          18 Severe Green, Suite 203          Colchester, VT 05446          Telephone: 802.87.6.7778  <a href="http://www.fitzgeraldenvironmental.com">www.fitzgeraldenvironmental.com</a></p>	<p><b>Town of Keene, NY</b>  <b>Gulf Brook Channel Restoration</b>  <b>Topographic Map and Watershed Boundary for Gulf Brook</b></p>	<p>0 1,500 3,000 Feet          1 inch = 3,000 ft          Date: August 21, 2014          Drawn: EPF</p>	<p>Notes:          - Watershed drainage area = 8.1 sqmi          - Channel slopes range from 4 to 10%;          Reach slopes shown in orange.</p>
<p>Figure 2</p>		<p>Keene/Gulf Brook Attachment Page 2 of 11</p>	

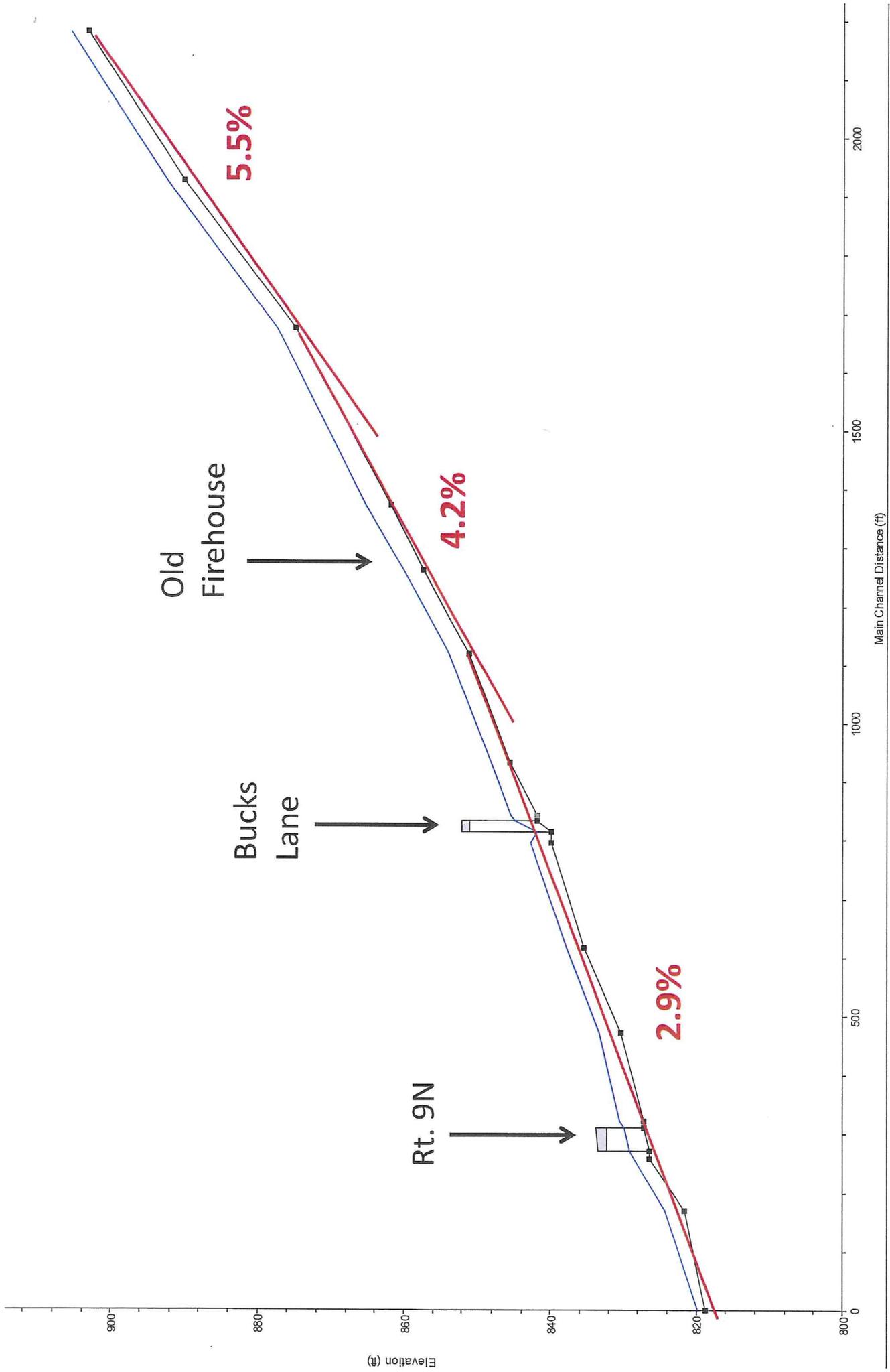


Figure 3: Longitudinal Profile of Gulf Brook

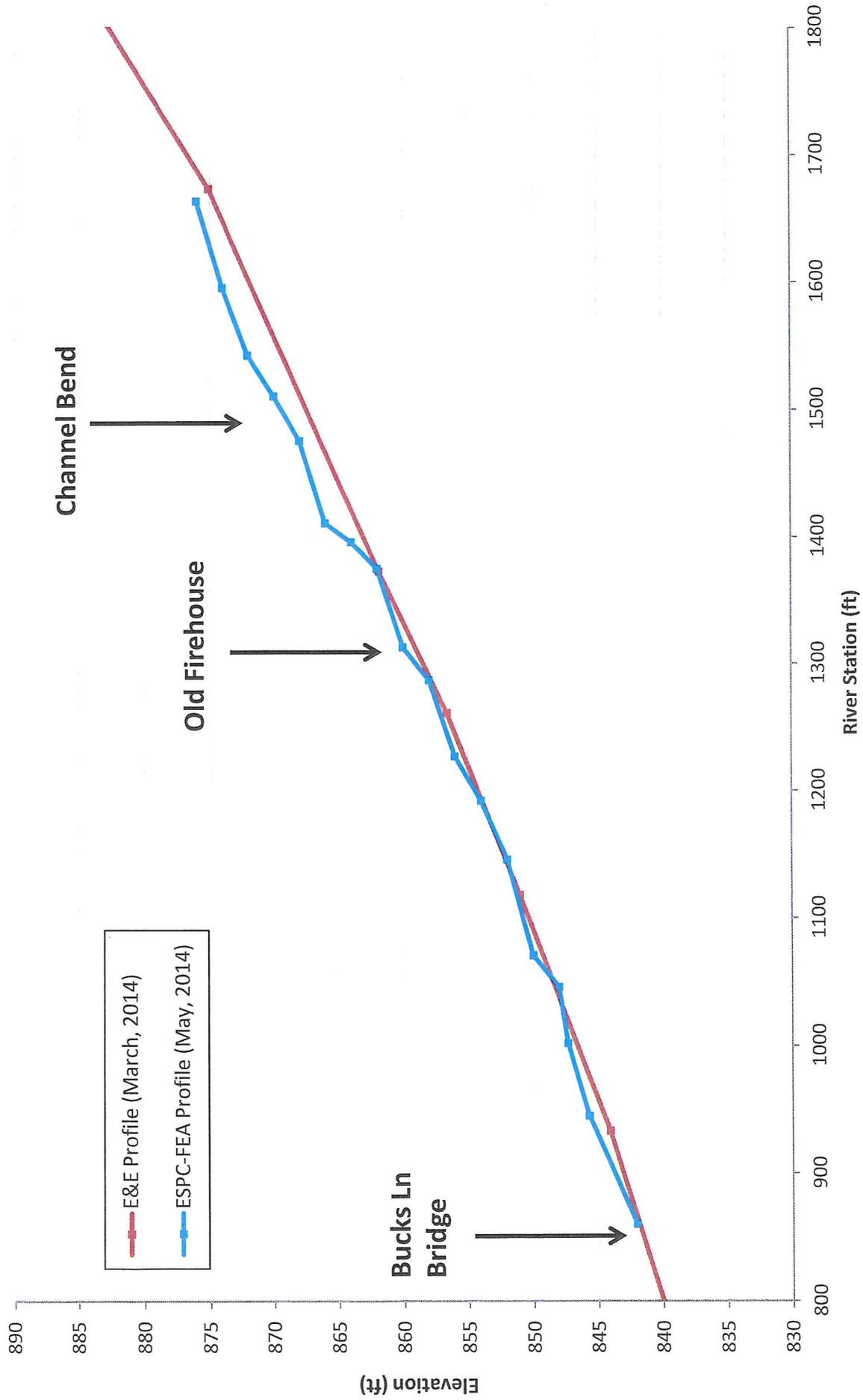
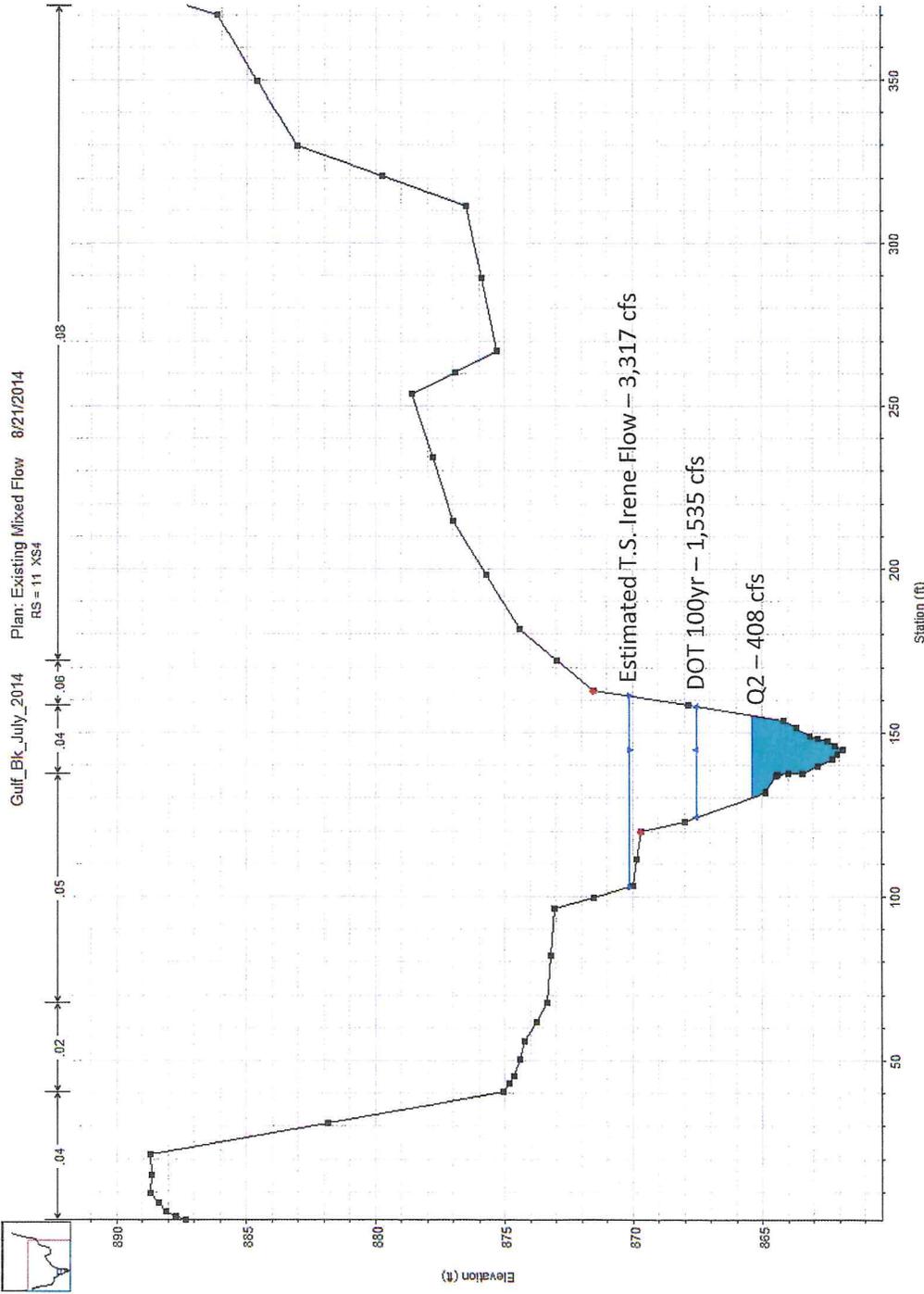


Figure 4: Longitudinal Profile of Gulf Brook



# Figure 6

XS 4

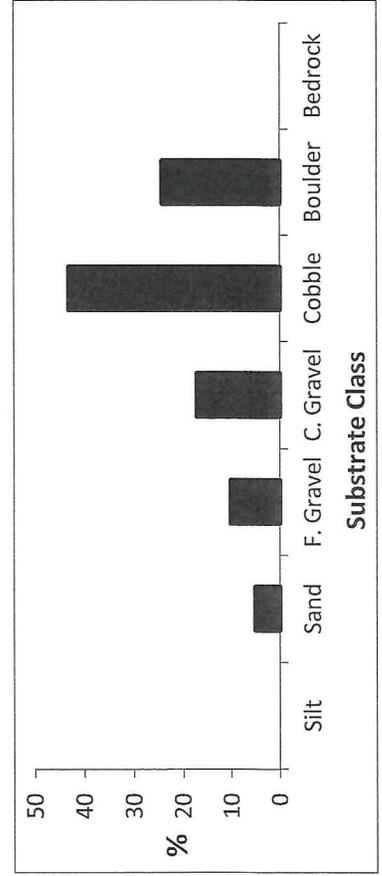
## Just Upstream of Old Firehouse

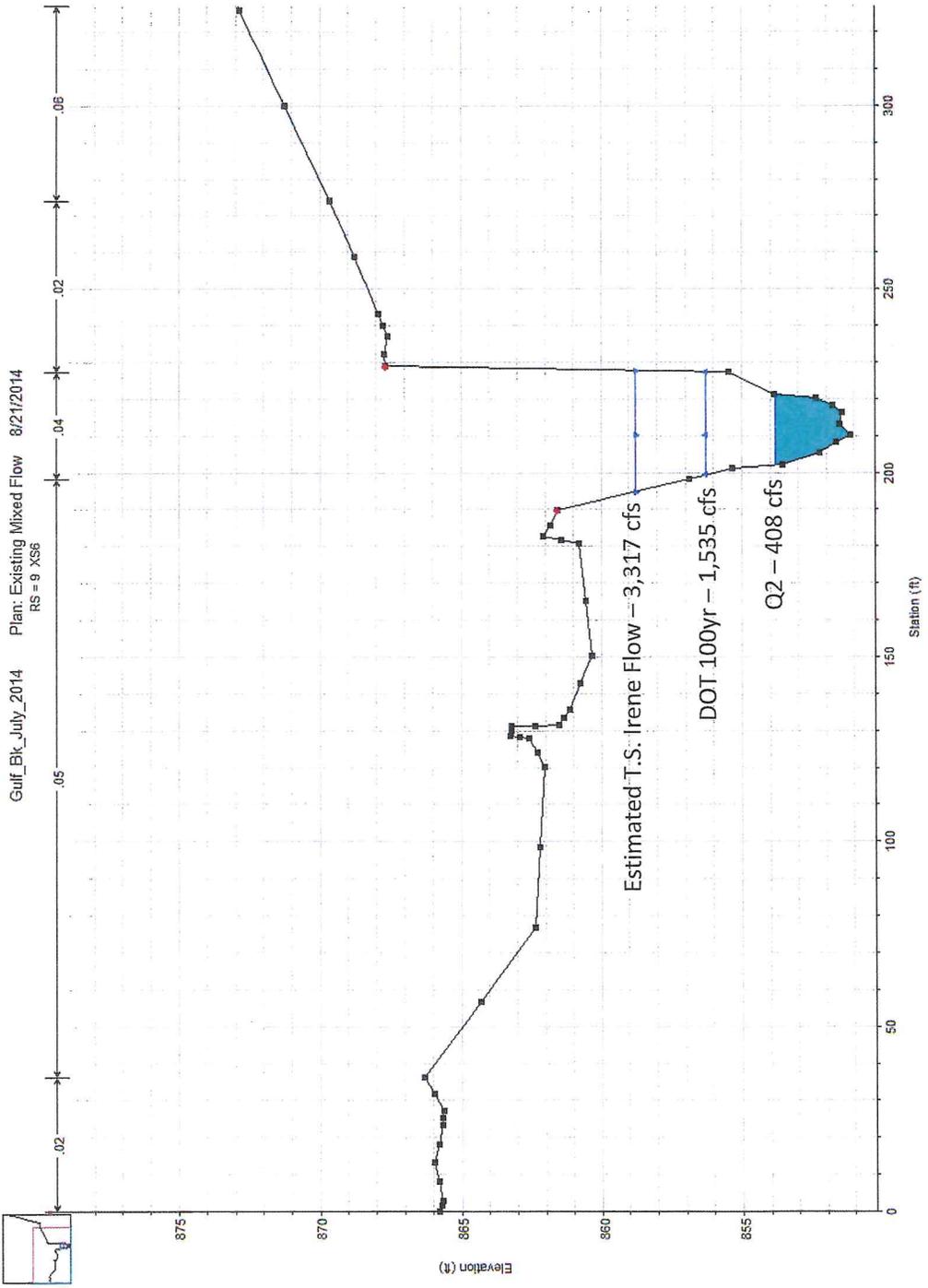
### Channel Characteristics:

- HGC Wbkf: 46 ft
- Measured Wbkf : 25.1 ft
- Mean Dbkf: 1.9 ft
- Width-to-Depth Ratio: 13.3
- Entrenchment Ratio: 1.3
- Stream Type: F, Step-Pool
- CEM Stage: II (incised)

### Notes:

- HGC = Hydraulic Geometry Curves from USGS NY Regions 1 and 2 (Mulvihill *et al.*, 2007)
- Wbkf = bankfull width
- Dbkf = bankfull depth
- Stream typing per Rosgen (1994) and Montgomery and Buffington (1997)
- CEM (channel evolution stage) assessed per Schumm (1977) and VTANR (2009b)





**Figure 7**

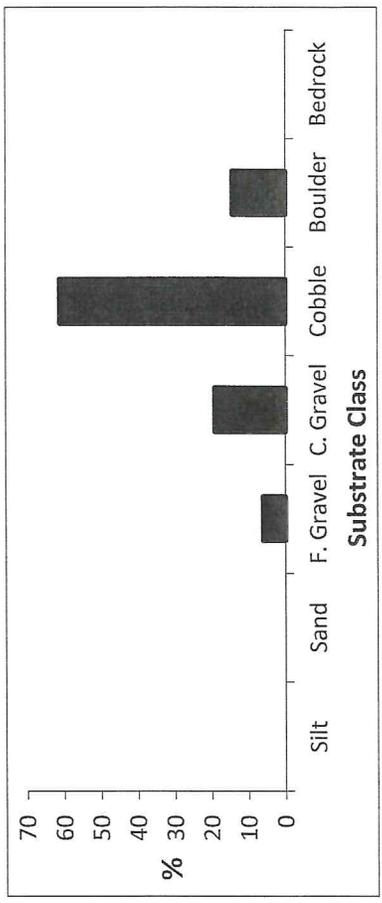
**XS 6**  
**100ft above Bucks Lane**

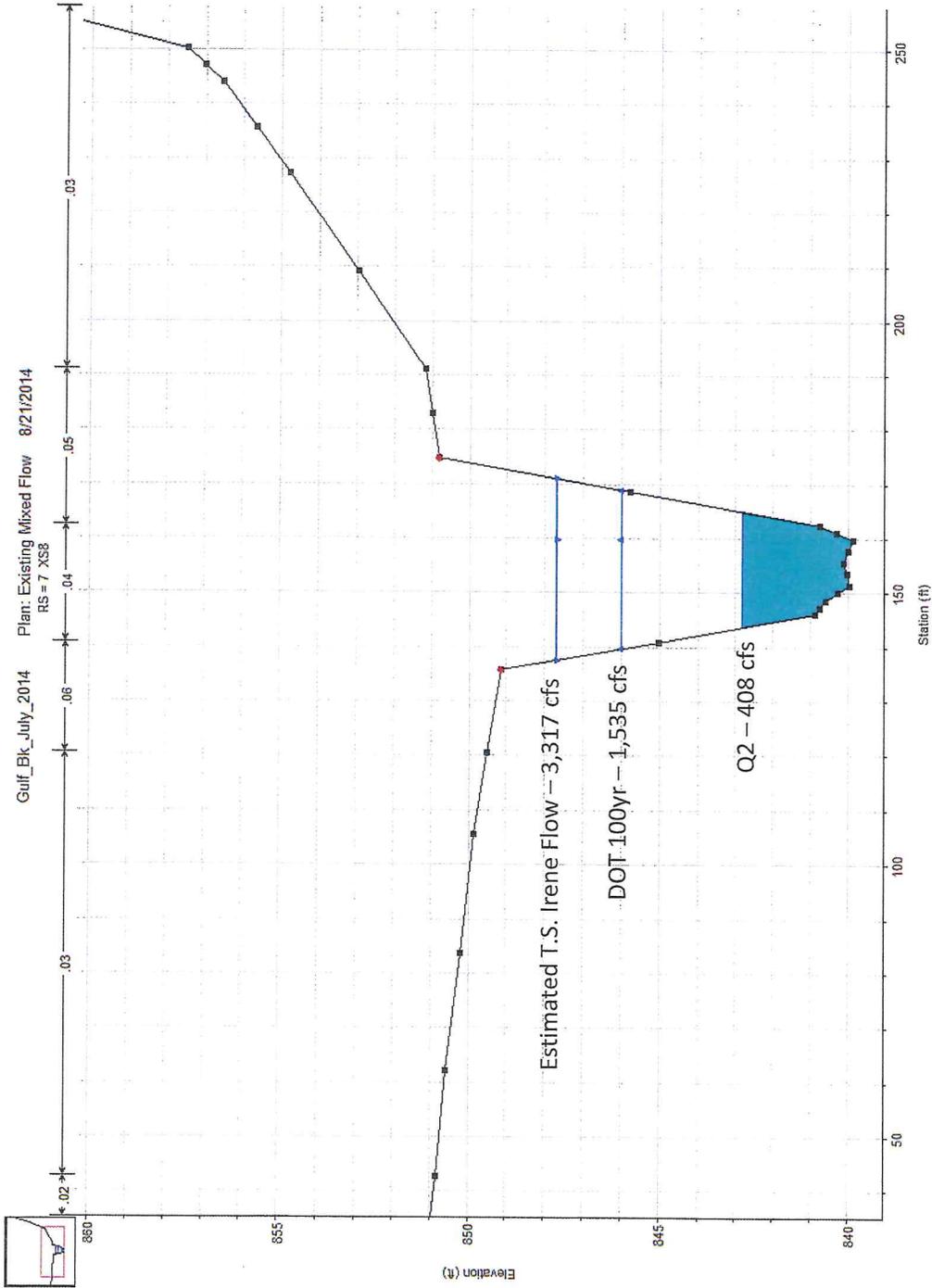
Channel Characteristics:

- HGC Wbkf: 46 ft
- Measured Wbkf : 19.2 ft
- Mean Dbkf: 1.9 ft
- Width-to-Depth Ratio: 10.0
- Entrenchment Ratio: 1.3
- Stream Type: F, Plane Bed
- CEM Stage: II (incised)

Notes:

- HGC = Hydraulic Geometry Curves from USGS NY Regions 1 and 2 (Mulvihill *et al.*, 2007)
- Wbkf = bankfull width
- Dbkf = bankfull depth
- Stream typing per Rosgen (1994) and Montgomery and Buffington (1997)
- CEM (channel evolution stage) assessed per Schumm (1977) and VTANR (2009b)





**Figure 8**

**XS 8**

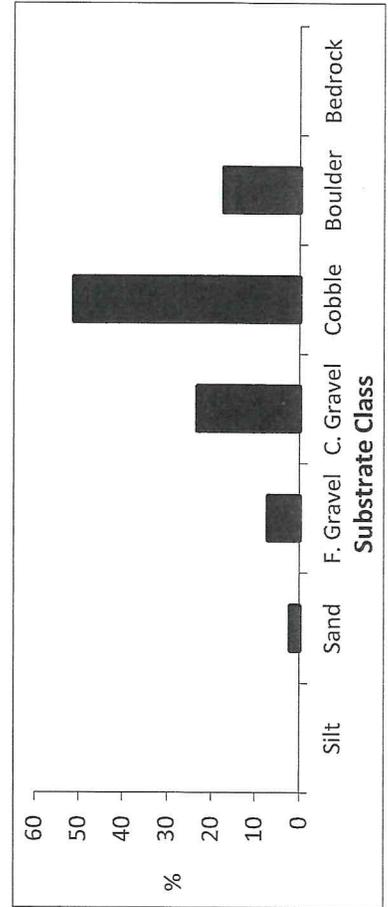
**100ft below Bucks Lane**

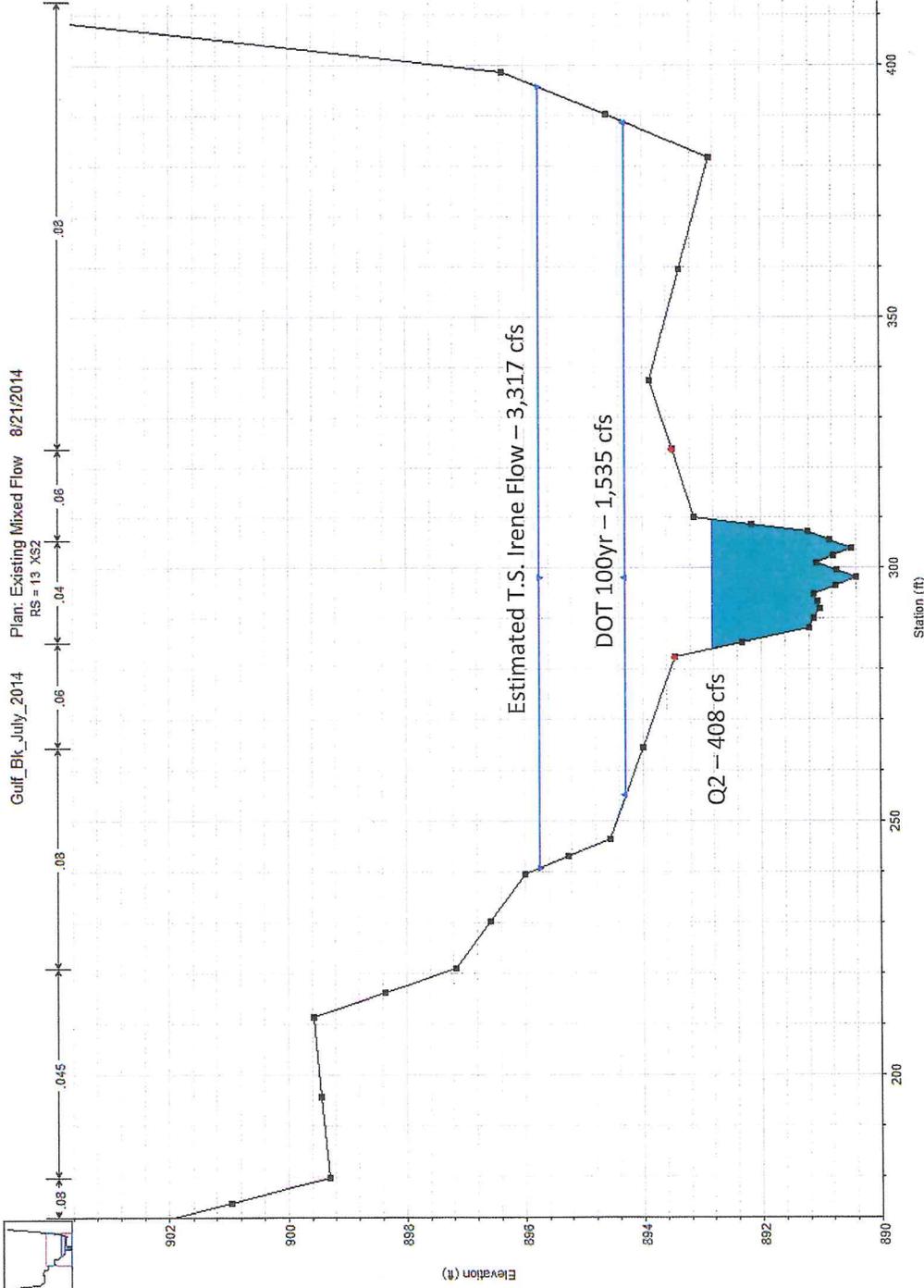
Channel Characteristics:

- HGC Wbkf: 46 ft
- Measured Wbkf : 21.4 ft
- Mean Dbkf: 2.2 ft
- Width-to-Depth Ratio: 9.6
- Entrenchment Ratio: 1.3
- Stream Type: F, Plane Bed
- CEM Stage: II (incised)

Notes:

- HGC = Hydraulic Geometry Curves from USGS NY Regions 1 and 2 (Mulvihill *et al.*, 2007)
- Wbkf = bankfull width
- Dbkf = bankfull depth
- Stream typing per Rosgen (1994) and Montgomery and Buffington (1997)
- CEM (channel evolution stage) assessed per Schumm (1977) and VTANR (2009b)





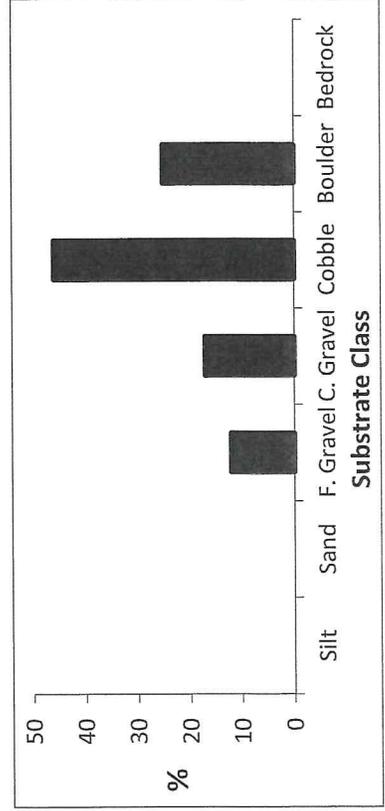
# Figure 5

## XS 2

### Above Project Area

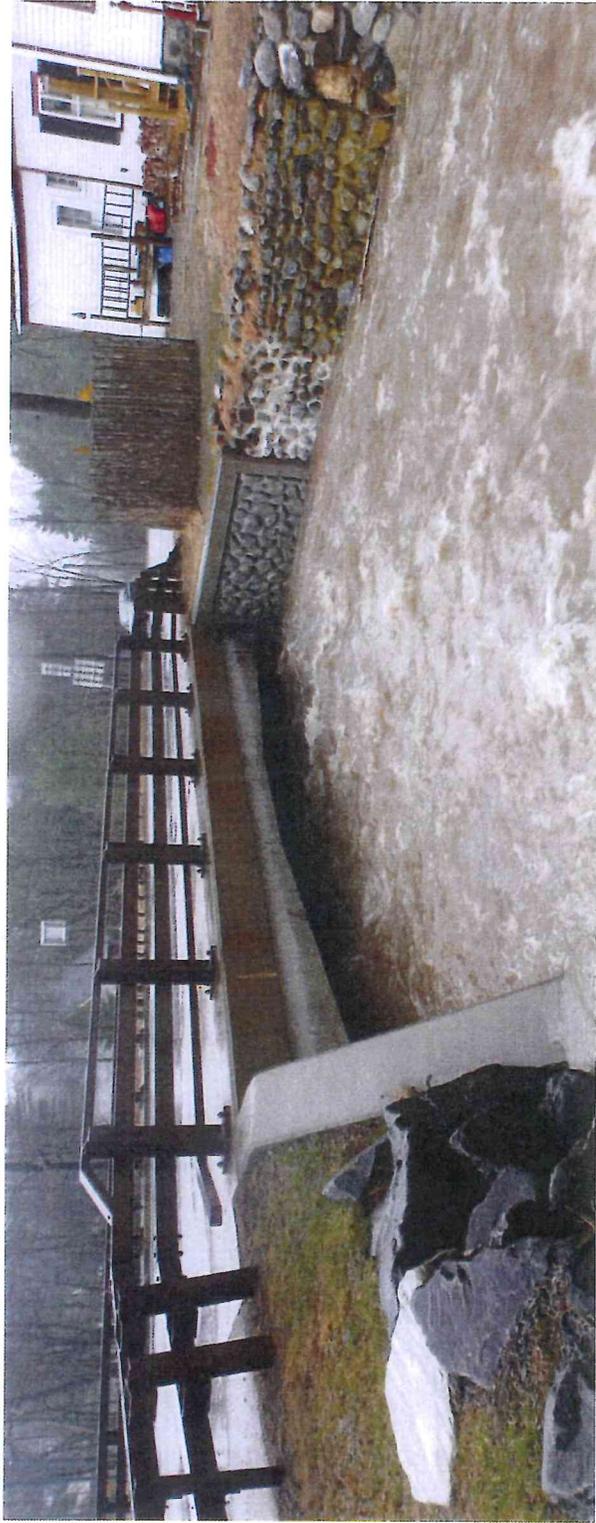
Channel Characteristics:

- HGC Wbkf: 46 ft
- Measured Wbkf : 25.6 ft
- Mean Dbkf: 1.6 ft
- Width-to-Depth Ratio: 15.6
- Entrenchment Ratio: 5.2
- Stream Type: C<sub>p</sub>, Pool-Riffle
- CEM Stage: IV (aggradation and planform adjustment)



Notes:

- HGC = Hydraulic Geometry Curves from USGS NY Regions 1 and 2 (Mulvihill *et al.*, 2007)
- Wbkf = bankfull width
- Dbkf = bankfull depth
- Stream typing per Rosgen (1994) and Montgomery and Buffington (1997)
- CEM (channel evolution stage) assessed per Schumm (1977) and VTANR (2009b)



April 15, 2014, Q2 (Bankfull Flow)

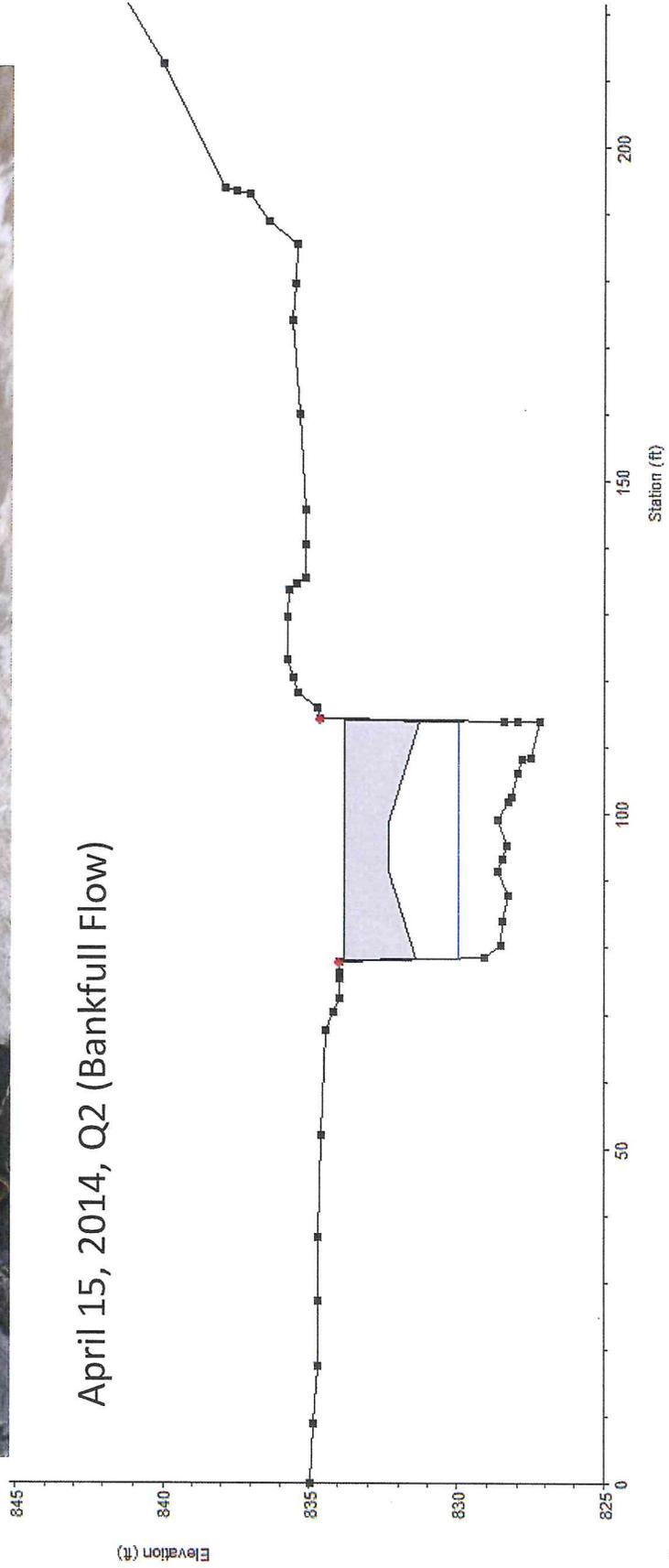
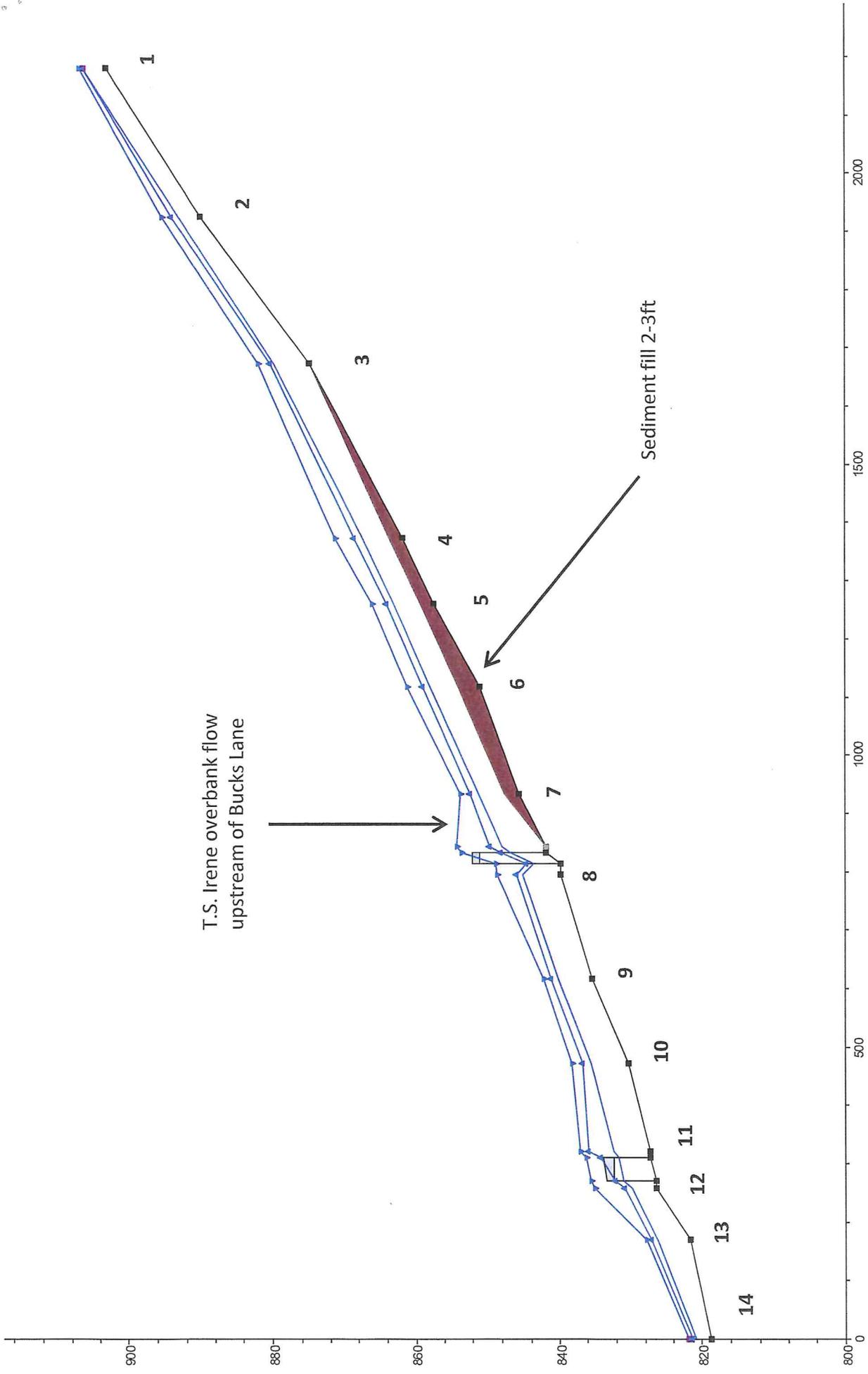


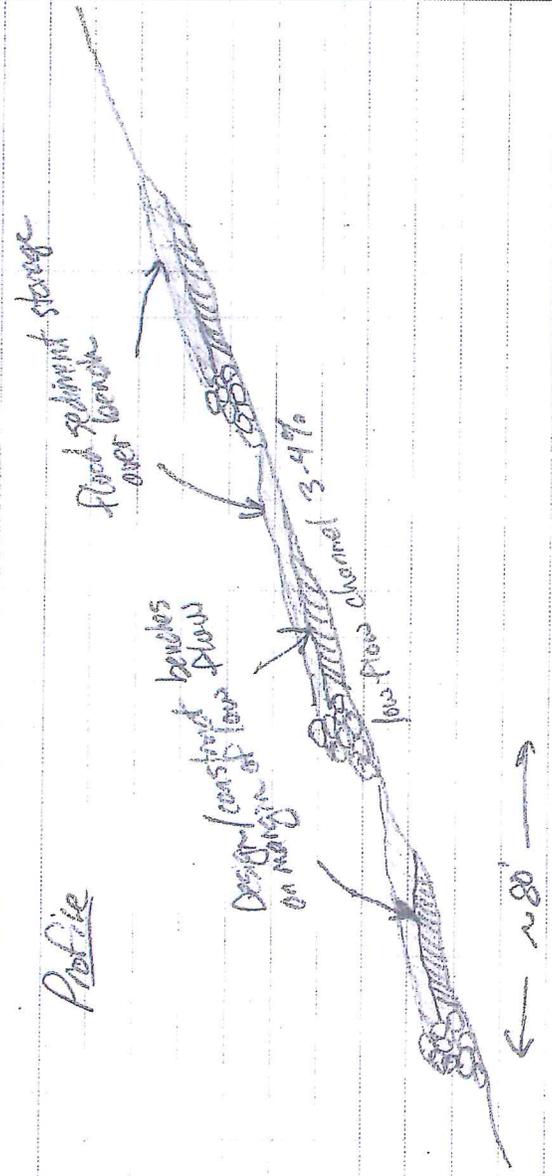
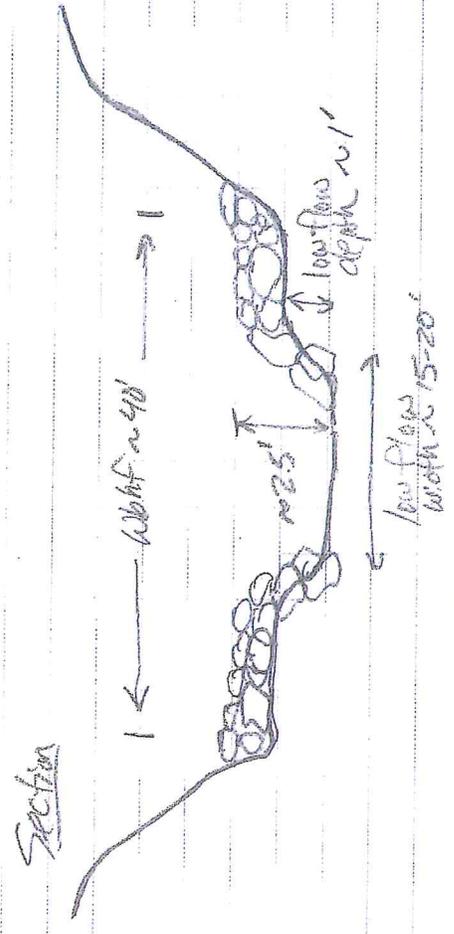
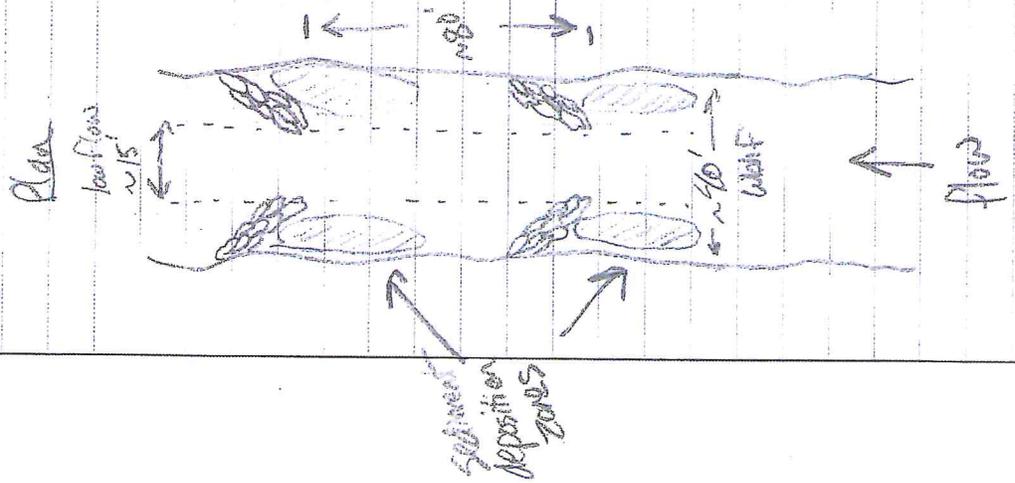
Figure 9: Observed and Modeled Bankfull Event at the Route 9N bridge



**Figure 10: Sediment fill assumptions and water surface profile for T.S. Irene flood**

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Job: Keene - Gulf Brook  
 Sheet No. of  
 Date: 7/2/14 Drawn by: EPF  
 Vertical Scale: NA Horizontal Scale: NA



**GULF BROOK RESTORATION AND FLOOD MITIGATION PROJECT  
ESSEX COUNTY, NY**

**ATTACHMENT 4**



engineering and environmental consulting

## ALTERNATIVES PRESENTATION MEETING SUMMARY

Gulf Brook Stabilization Project – Phase II  
December 8, 2015 – 6:30 PM Keene Town Hall

Project Team Members Presenting: Erik Sandblom, PE, ESPC  
Stephen Diglio, PE, KAS/ESPC  
Evan Fitzgerald, FEA  
Matt Huntington, PE, SRA

### Meeting Attendees:

Board Members: Bill Ferebee, Supervisor  
Paul Martin  
Bob Biesemeyer  
Michael Buysse  
Jerry Smith

Town Residents: Richard & Angela Durant  
Kent & Melissa Wells  
Katie Purdy  
Martha Gallager  
Rocco Giampaolo  
Bob Tupper  
Gary Manley  
Deb Witson

### The Project Team presented the following:

1. A background of the project area;
2. A summary of the hydrologic and hydraulic analysis for the project area;
3. Various alternatives for improving the Buck Lane Bridge and immediate surrounding;
4. Various alternatives for improving the Route 9N bridge and immediate area;
5. A recommended strategy and general recommended channel improvements for the brook between Buck Lane Bridge and the Route 9N bridge;
6. A recommended strategy and general recommended channel improvements for the brook between the Route 9N bridge and the East Branch of the Ausable River;
7. A recommended Preferred Alternative for the project; and,
8. A brief descriptions of upstream recommended improvements to reduce future sediment loading on the reach of the brook through Keene Hamlet.

The attached slide show, Gulf Brook Channel Improvement Project Evaluation Matrix, and sketch plans were presented and made available to the attendees of the meeting.

ERIK SANDBLOM, PC

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The Project Team recommended the following preferred alternative:

**Buck Lane Bridge** – Option 3 involving a replacement of the existing bridge with an approximately 49-foot span at a slight skew that would result in a channel width of 45 feet.

**Route 9N Bridge** – Option 2 involving restoring the original hydraulic opening of the bridge by removing deposited sediment below the bridge and conducting other channel improvements to reduce continued deposition of sediments in the future. In addition, the eventual implementation of Option 4, complete bridge replacement, should be pursued by advocating for and encouraging NYSDOT to include the Route 9N bridge on its replacement program.

**Channel Improvements between Buck Lane and Route 9N and downstream of Route 9N** – The recommendation is to develop a design that generally meets the conceptual layout presented on the sketch plans. This involves obtaining as close to a 45-foot wide bank-full width as possible with structures protecting existing property and infrastructure where indicated and maintaining existing berms at river left downstream of Buck Lane Bridge and river right downstream of the Route 9N bridge.

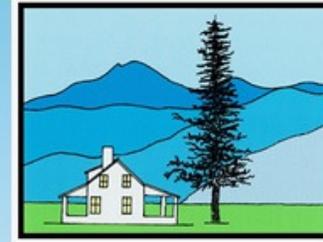
Comments from the audience included the following:

- 1) Some attendees expressed the desire to have a pedestrian friendly railing along the Buck Lane Bridge. The Walton Pedestrian Bridge was provided as an example.
- 2) Landowners adjacent to the Gulf Brook were concerned about potential impacts to existing septic systems and encroachment into existing yards. This concern was alleviated after seeing the proposed channel improvements on the sketch plans that showed little to no impact in these areas.

Attachments: 1) Slide Show: Gulf Brook Stream Channel Restoration Project: Phase II Evaluation / Alternatives Presentation.  
2) Gulf Brook Channel Improvement Project Evaluation Matrix  
3) Sketch Plans  
ALT.1 – Route 9N Option 2  
ALT.2 – Route 9N Option 3  
ALT.3 – Route 9N Option 3 with downstream improvements  
ALT.4 – Route 9N Option 4

*Town of Keene*

EST. 1808



# Gulf Brook Stream Channel Restoration Project: Phase II Evaluation / Alternatives Presentation

Presented By:



**Fitzgerald Environmental Associates, LLC.**

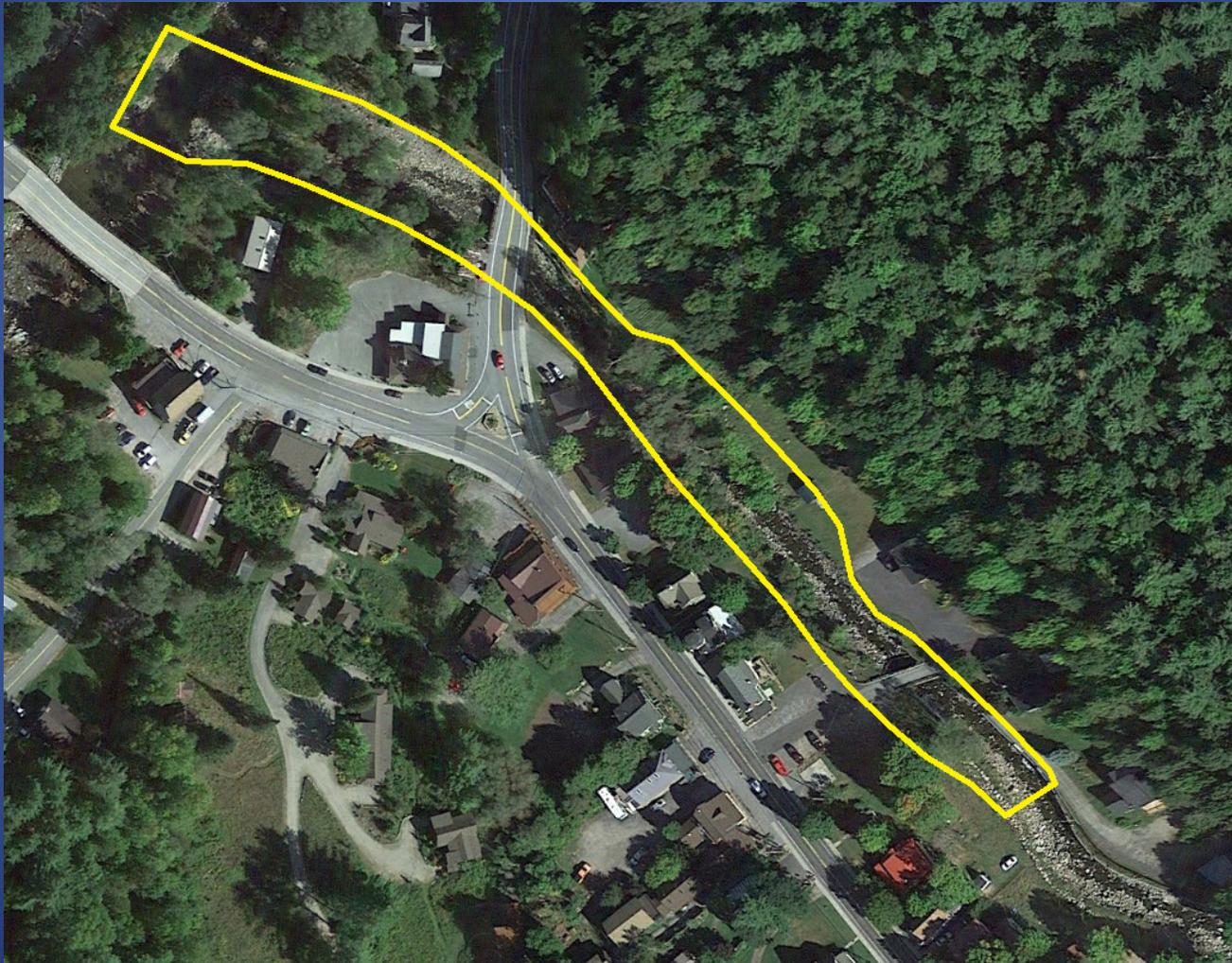
Applied Watershed Science & Ecology

**SR SCHODER RIVERS  
ASSOCIATES**  
Consulting Engineers, P.C.

# Project Area



# Project Area





12/16/2015



12/16/2015

5



12/16/2015



12/16/2015



12/16/2015



12/16/2015



12/16/2015

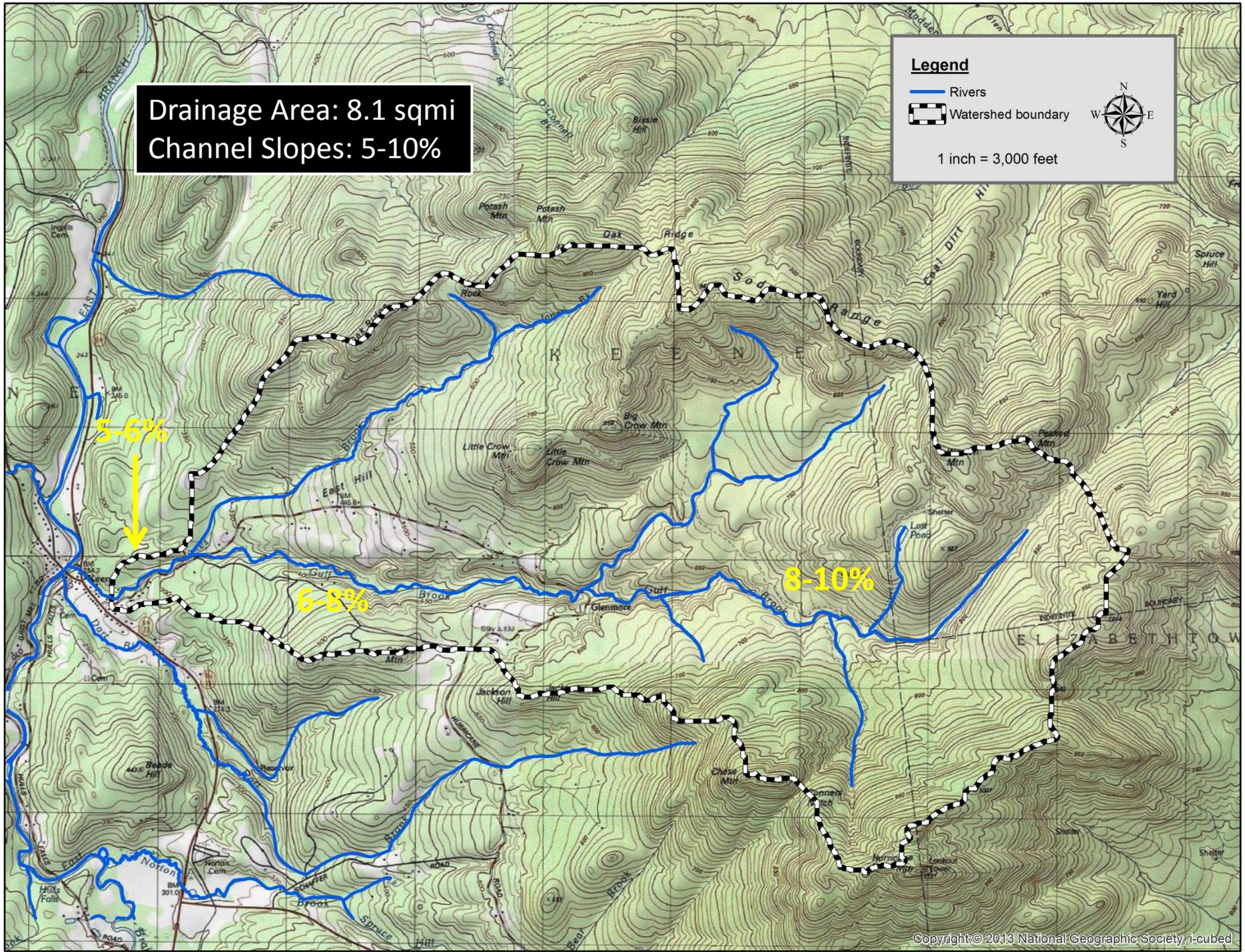
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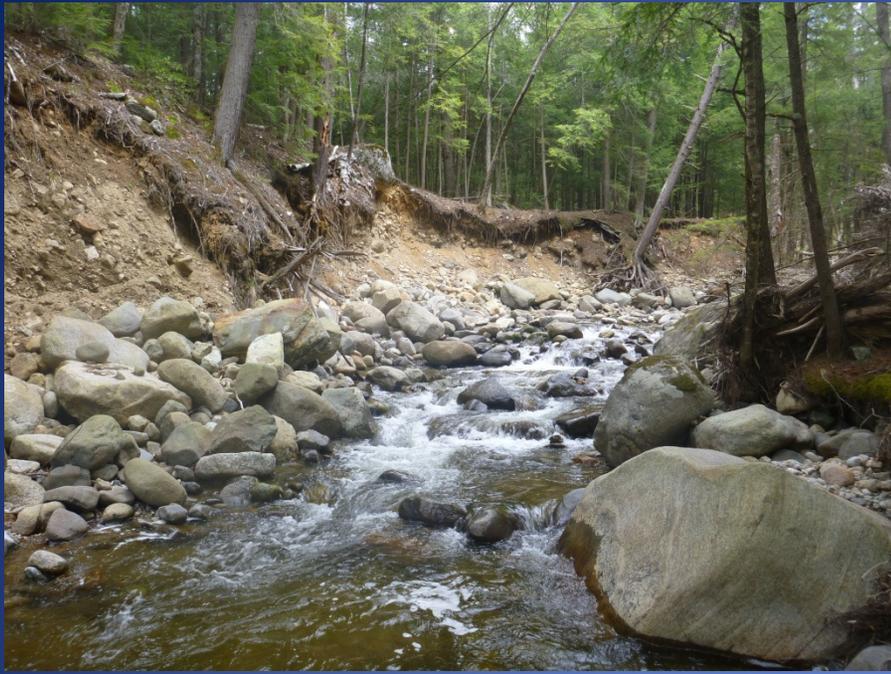
Drainage Area: 8.1 sqmi  
Channel Slopes: 5-10%

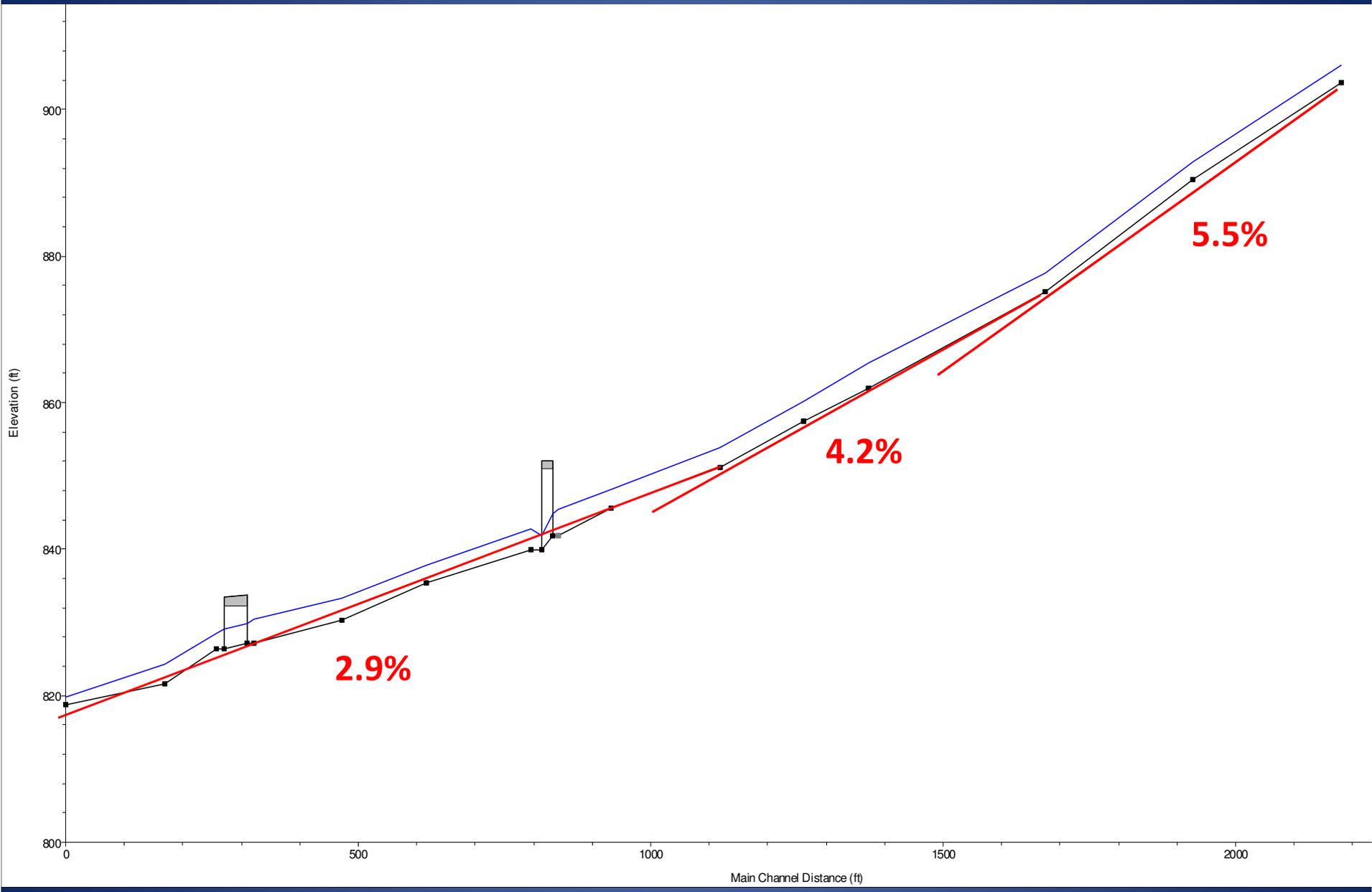
**Legend**

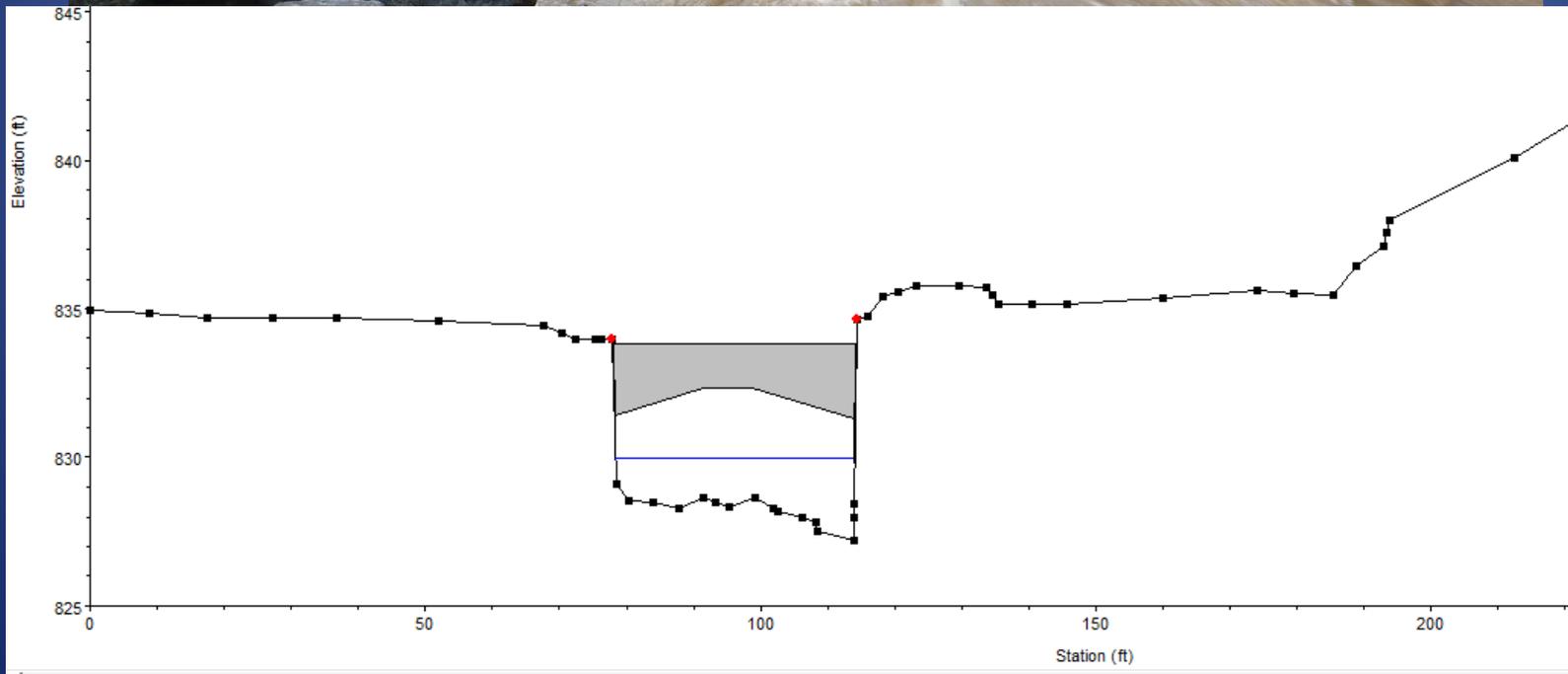
- Rivers
- Watershed boundary

1 inch = 3,000 feet







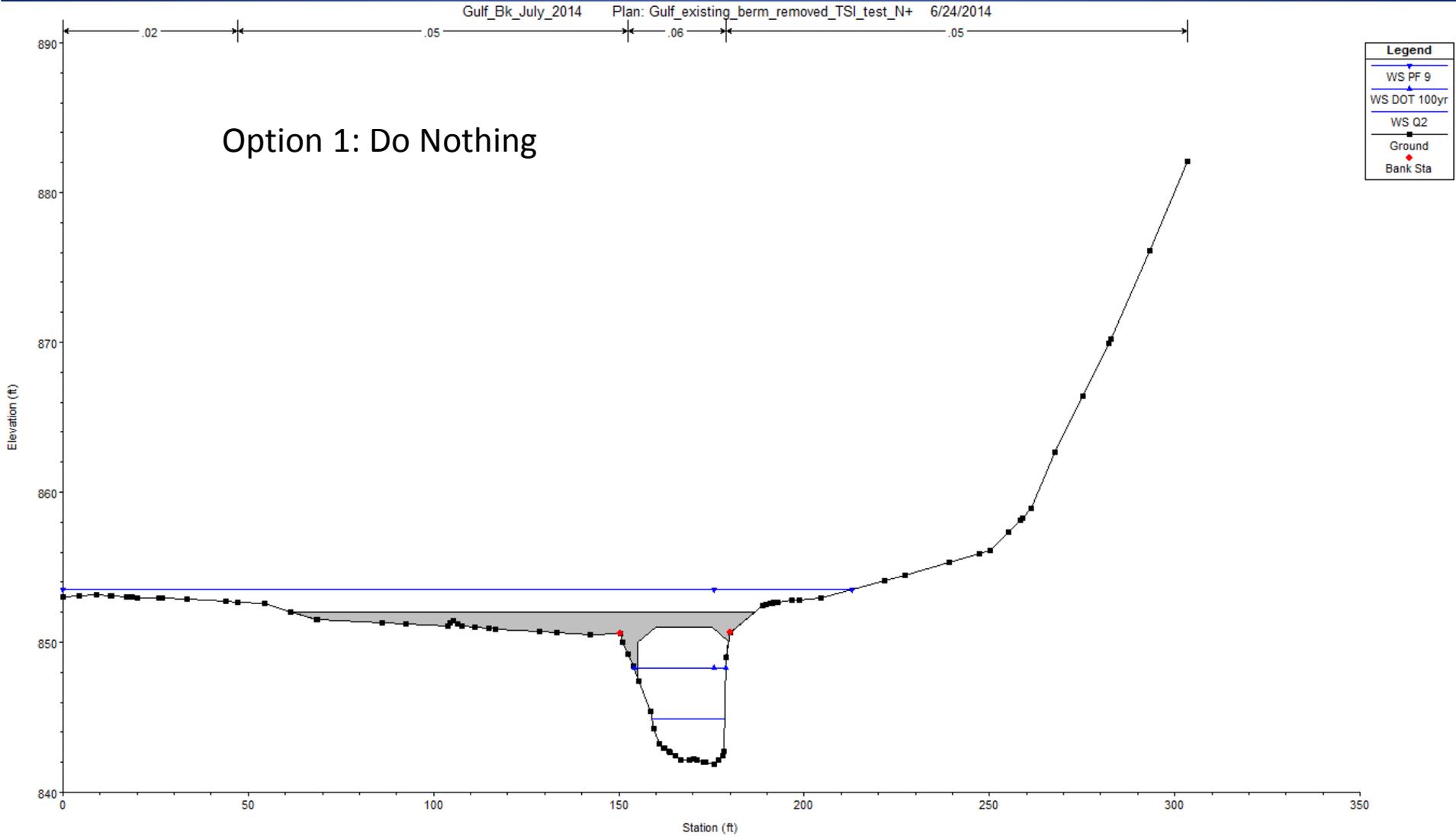


April 15, 2014, Q2 (Bankfull Flow)

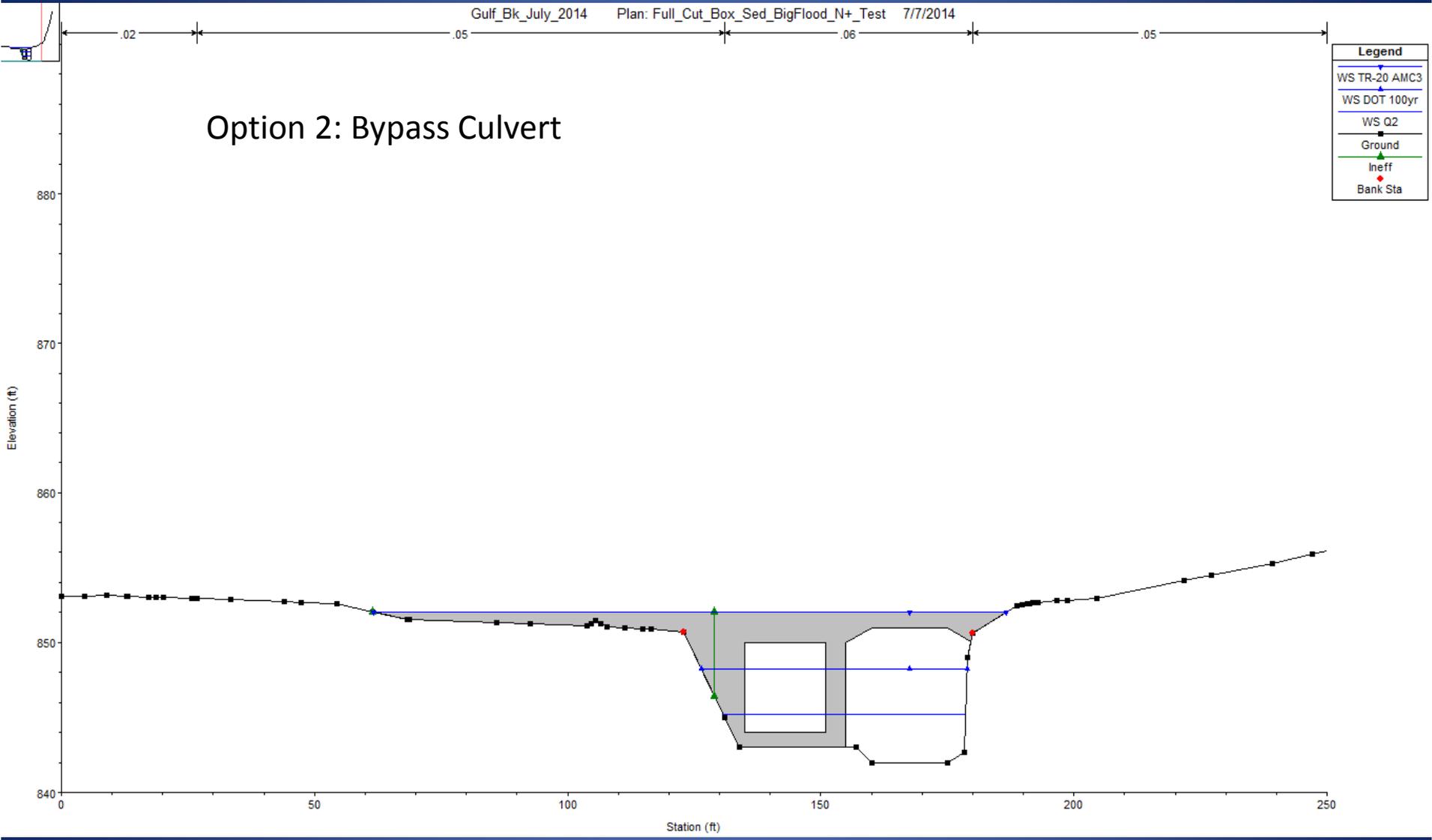


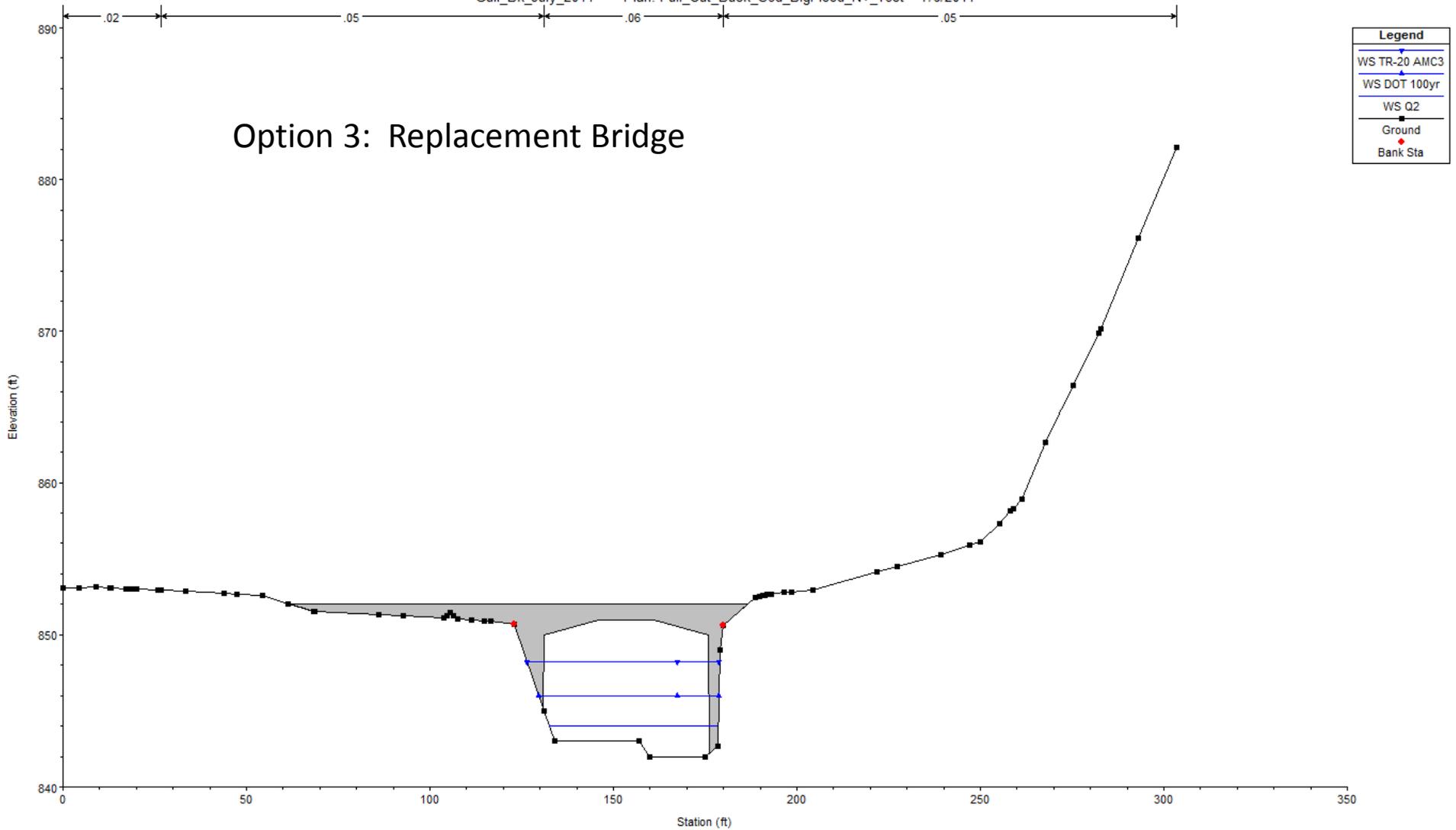


# Alternatives - Buck Lane Bridge



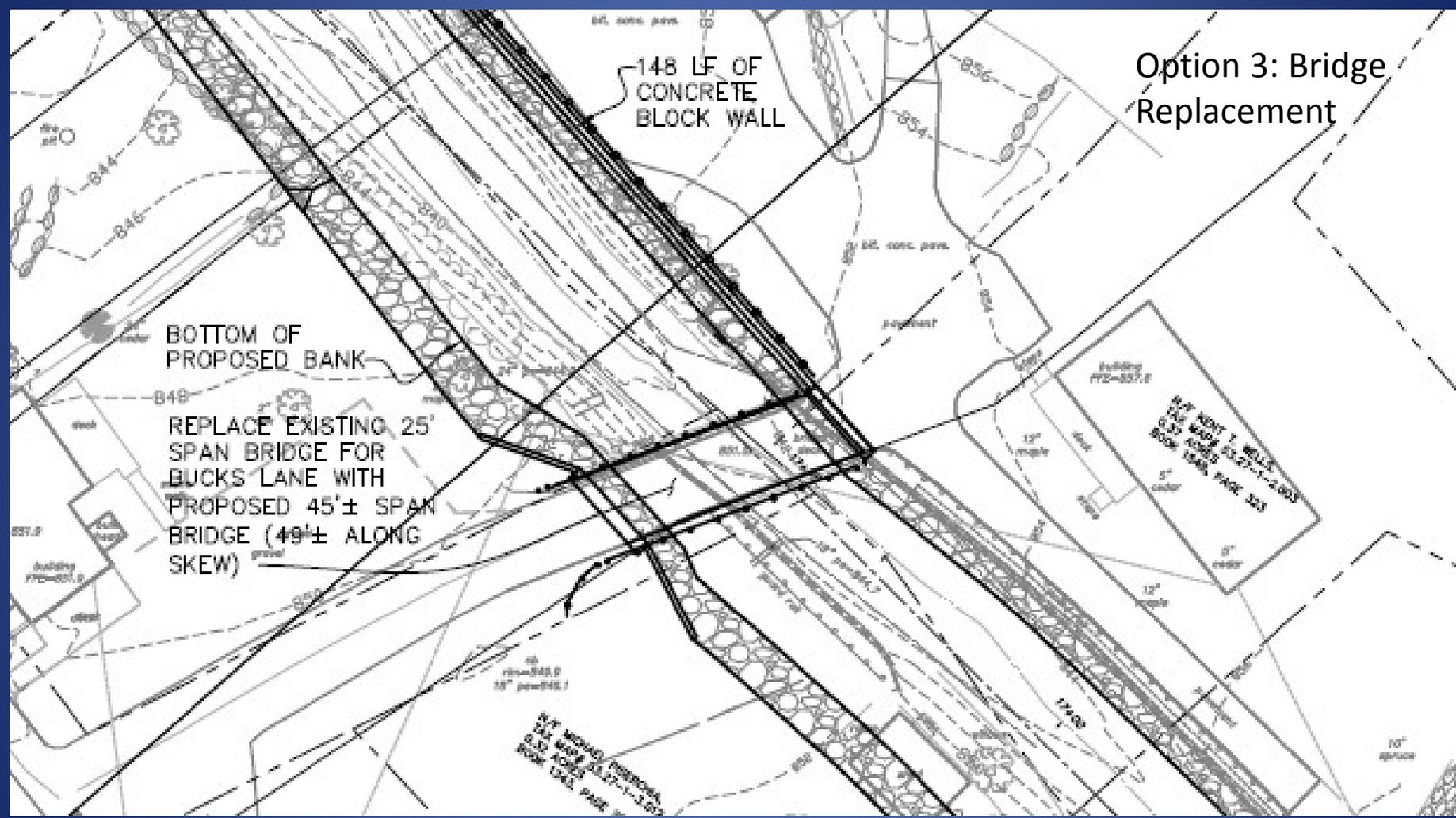
# Option 2: Bypass Culvert





### Option 3: Replacement Bridge

### Option 3: Bridge Replacement





12/16/2015

10/01/2013

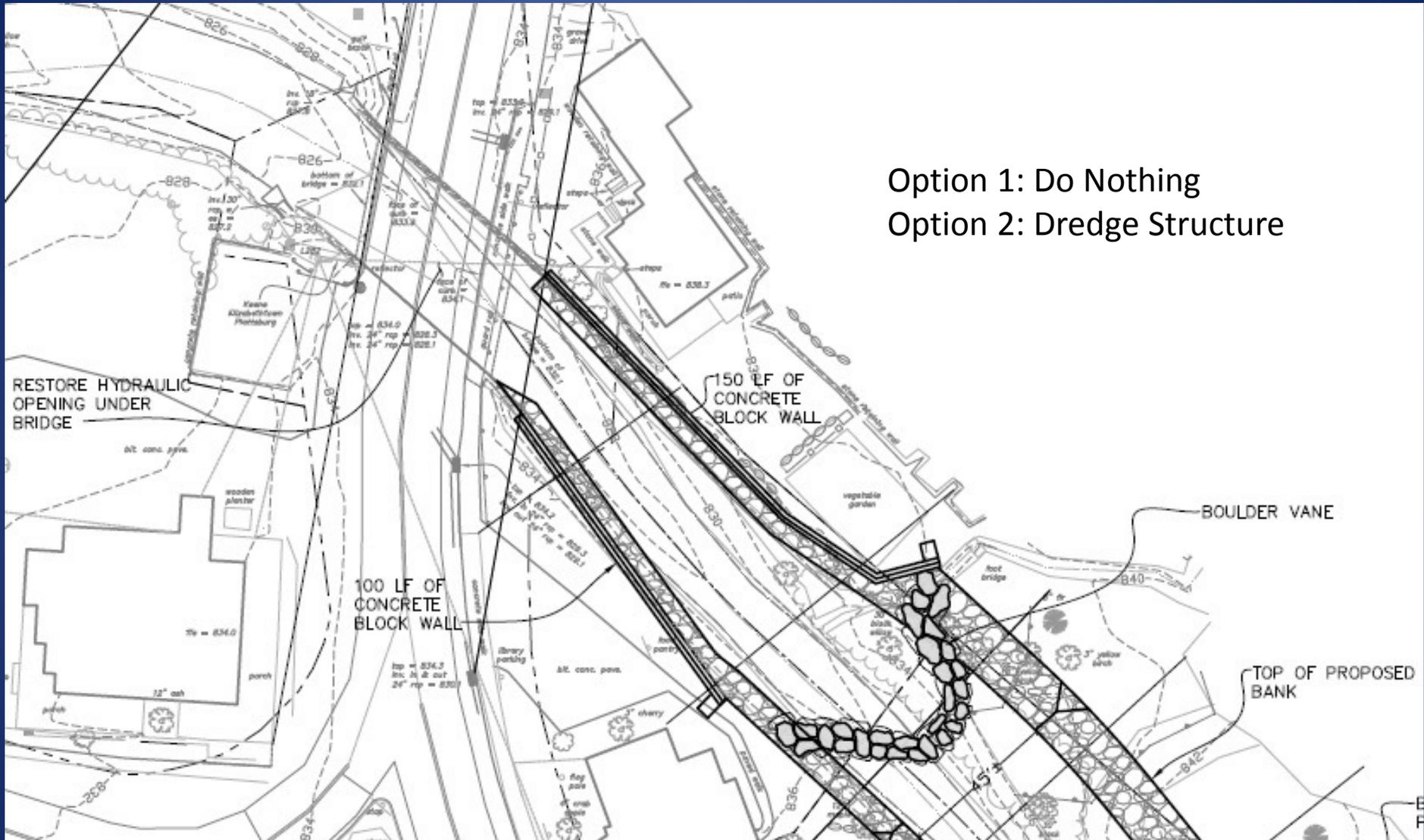


10/01/2013

12/16/2015

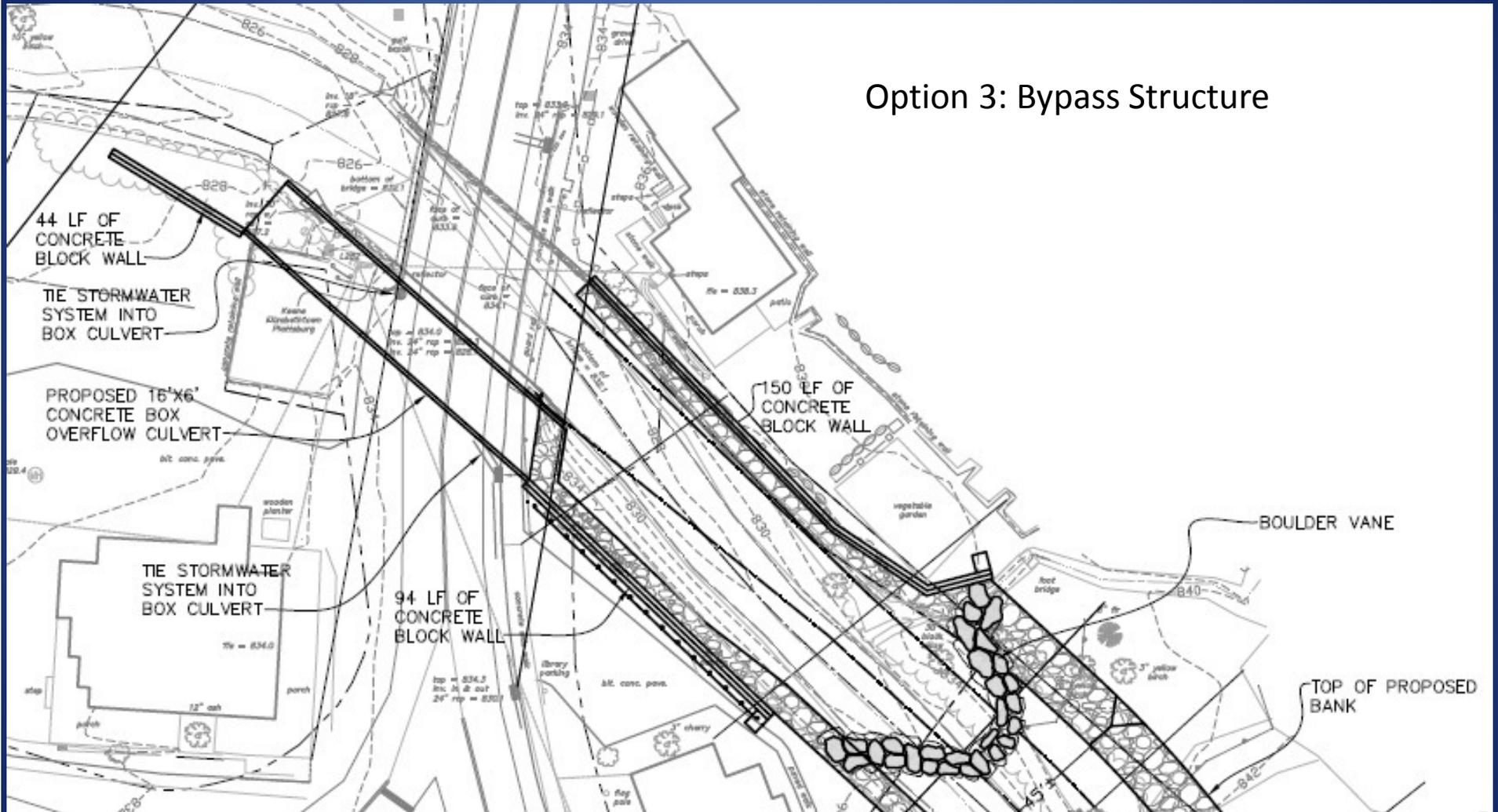
23

# Alternatives – Route 9N Bridge

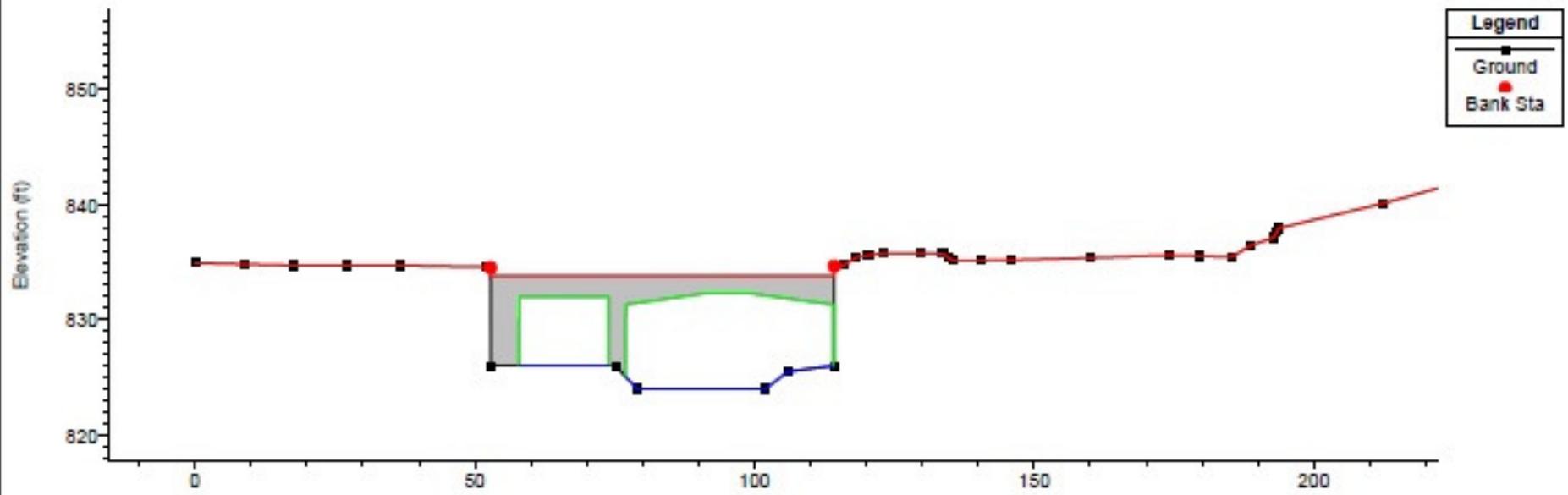


Option 1: Do Nothing  
 Option 2: Dredge Structure

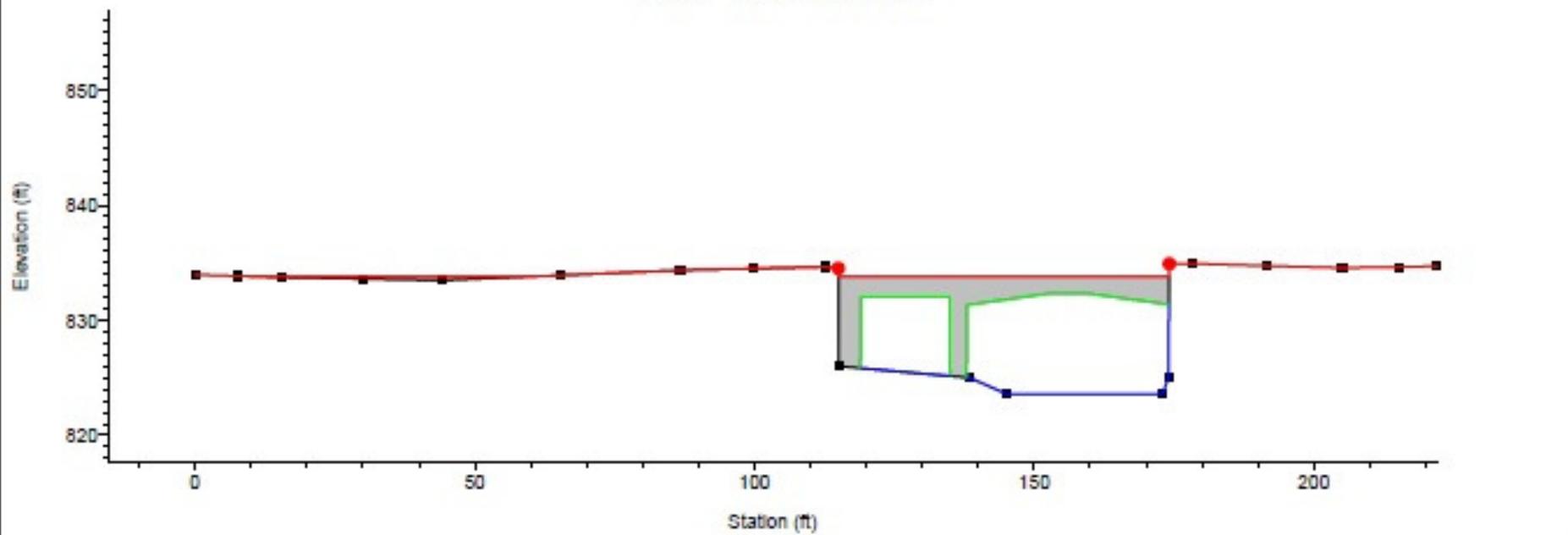
## Option 3: Bypass Structure



RS-3.5 Upstream (Bridge)



RS-3.5 Downstream (Bridge)







12/16/2015

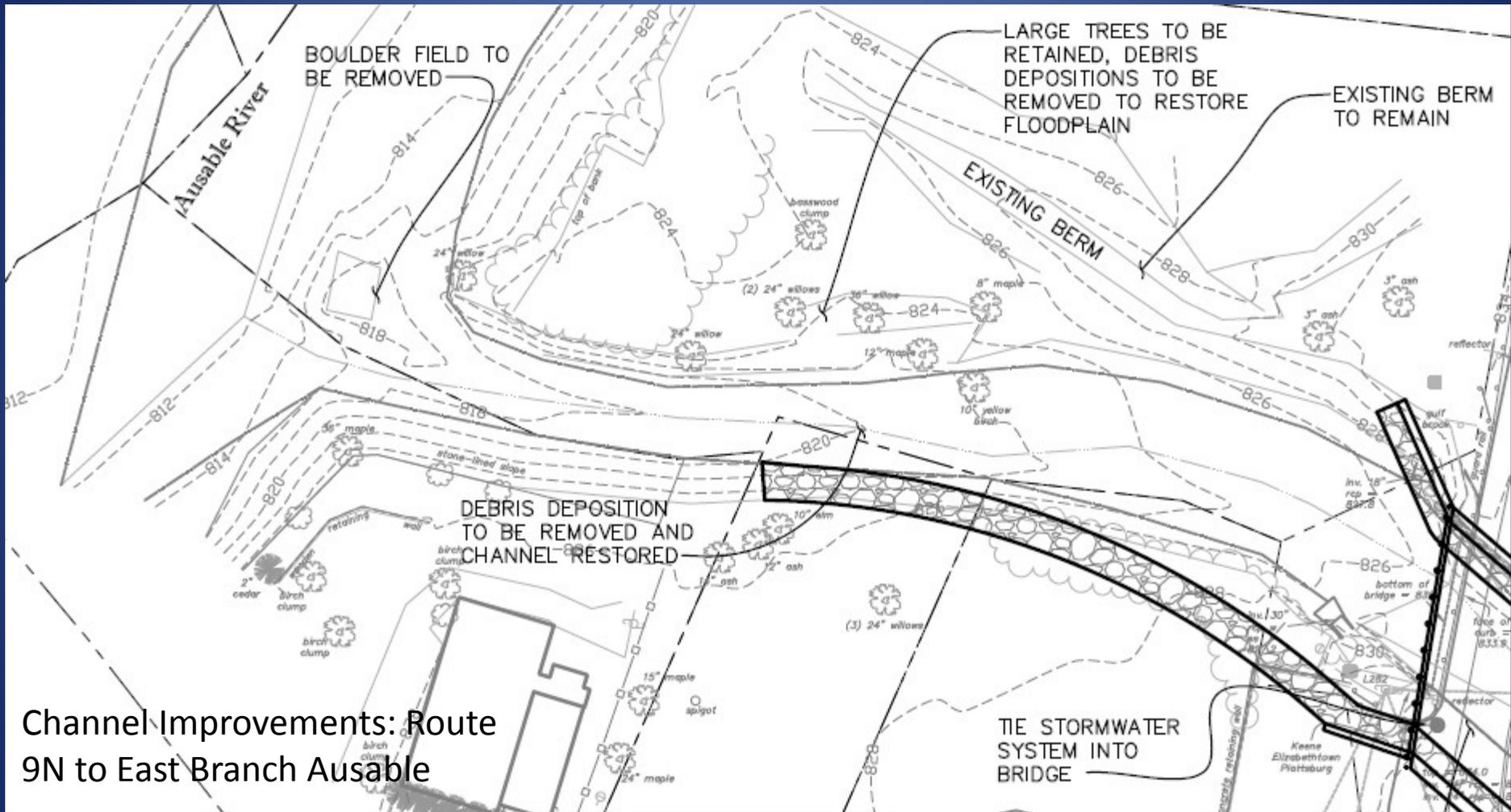


12/16/2015

30

# Alternatives – Channel Improvements





Channel Improvements: Route 9N to East Branch Ausable

## Gulf Brook Channel Improvement Project Evaluation Matrix

Scope	Alternative	Flood Resiliency Improvements		Ecological Considerations		Economic Considerations		Priority Ranking
		Overbank Flood Risk Reduction	Channel Maintenance Reductions	Geomorphic Stability Enhancement	Riparian & Aquatic Habitat Enhancement	Relative Implementation Cost*	Feasibility / Longevity	
Buck Lane Bridge	1) Do nothing	None	None; Maintenance required upstream after moderate and large floods	None	None; Bankfull channel remains constricted	Least Expensive to implement but costly due to continued flood vulnerability	Does not meet the project objectives – Not Feasible / Poor Longevity due to continued flood vulnerability	3
	2) Add bypass culvert adjacent to bridge	Large floods stay in the channel but debris snagging risk remains	Sediment and debris maintenance likely required upstream after moderate and large floods	Somewhat reduced risk of bank erosion upstream and downstream	None; Bankfull channel remains constricted	Middle Cost Range, somewhat less than Option 3	Feasible / Acceptable Longevity	2
	3) Replace existing bridge	Large floods stay in the channel; much lower risk of debris snagging	Reduced sediment and debris deposition; Some maintenance may be required after large floods	Significantly reduced risk of bank erosion upstream and downstream	Bankfull channel achieved; Bed habitat features improved over long term	Highest Cost for Implementation	Feasible / Acceptable Longevity	1
Route 9N Bridge	1) Do nothing	None	None; Maintenance required upstream after moderate and large floods	None	None; Bankfull channel remains constricted	Least Expensive to implement but costly due to continued flood vulnerability	Does not meet the project objectives – Not Feasible / Poor Longevity due to continued flood vulnerability	4
	2) Restore original bridge hydraulic opening	Large floods stay in the channel but it is still a restricted opening and any future aggradation could increase risk	Sediment & debris maintenance likely required upstream and under the bridge in the long term after large and moderate flood events	Somewhat reduced risk of bank erosion upstream and downstream	None; Bankfull channel remains constricted	Moderate Cost	Moderately Feasible / Longevity will require periodic maintenance	1**
	3) Add bypass culvert adjacent to bridge	Large floods stay in the channel but debris snagging risk remains	Sediment and debris maintenance likely required upstream after moderate and large floods	Somewhat reduced risk of bank erosion upstream and downstream	None; Bankfull channel remains constricted	High Cost	Feasible (pending NYSDOT feedback) / Acceptable Longevity	2

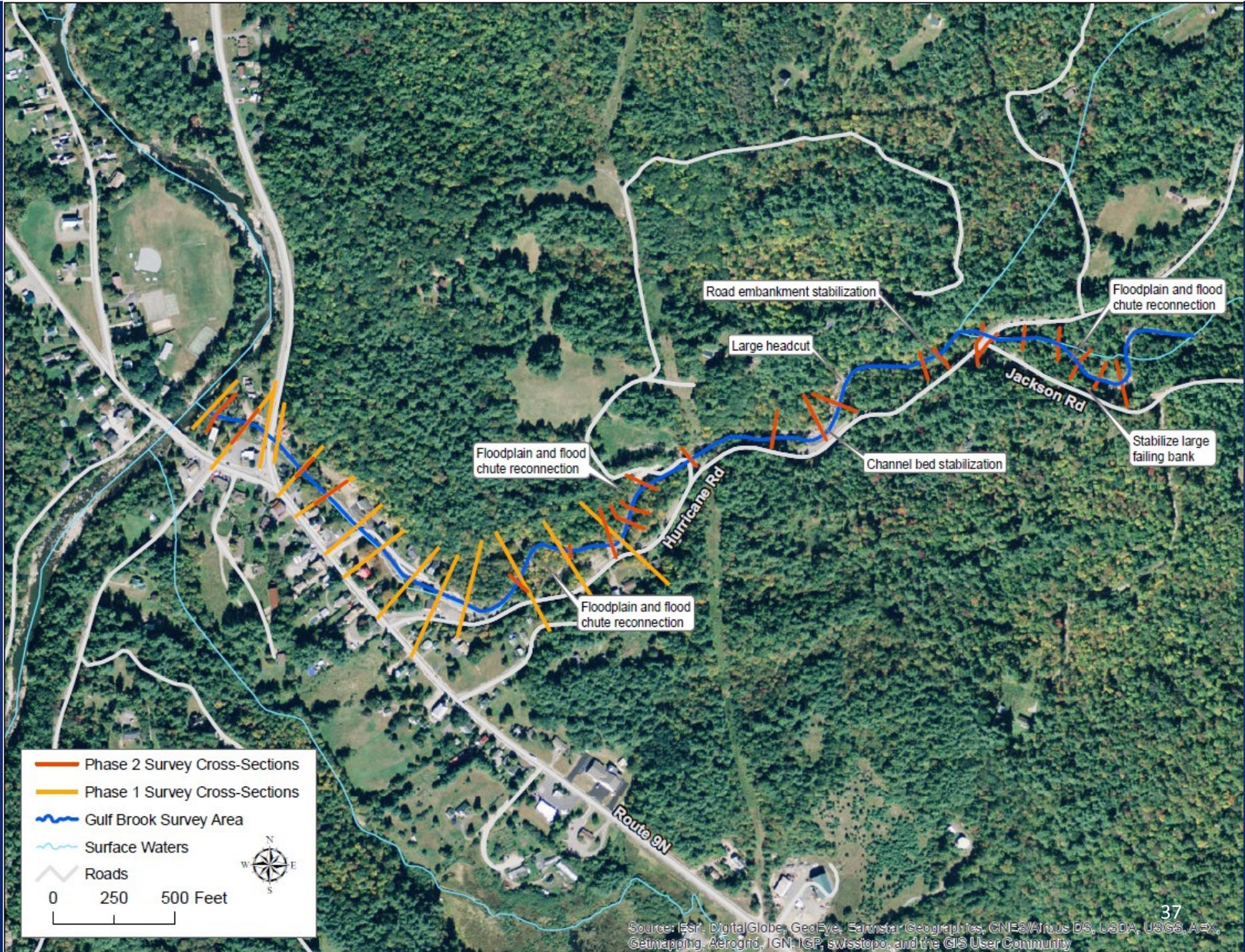
## Gulf Brook Channel Improvement Project Evaluation Matrix

Scope	Alternative	Flood Resiliency Improvements		Ecological Considerations		Economic Considerations		Priority Ranking
		Overbank Flood Risk Reduction	Channel Maintenance Reductions	Geomorphic Stability Enhancement	Riparian & Aquatic Habitat Enhancement	Relative Implementation Cost*	Feasibility / Longevity	
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Channel between Buck Lane and Route 9N	1) Do nothing	None	None; Maintenance likely required after moderate and large floods	None	None; Bankfull channel remains constricted	Least Expensive to implement but costly due to continued flood vulnerability	Not Feasible, particularly if bridge options not implemented	2
	2) Modify Channel Geometry for 35-40ft bankfull width	Large floods stay in the channel; much lower risk of debris snagging	Reduced sediment and debris deposition; Some maintenance may be required after large floods	Restoration of natural channel and flood bench dimensions	Low flow and bankfull channel achieved; Bed habitat features improved over long term; Weirs or other engineered features could improve habitat	Moderate Cost	Moderately Feasible / Good Longevity with maintenance	1
Channel between Route 9N and East Branch	1) Do nothing	None	None; Maintenance likely required after moderate and large floods	None	None; Berms and rock armor are devoid of woody vegetation	Least Expensive to implement but costly due to continued flood vulnerability	Not Feasible, particularly if bridge options not implemented	2
	2) Reshape channel geometry (berm to remain)	Marginal; Adjacent properties still at risk during moderate to large floods	Marginal; Maintenance likely required after moderate and large floods	Minor restoration of natural channel and flood bench dimensions	Planting native woody vegetation along berms and rock armor (i.e., joint plantings) would improve habitat	Moderate Cost	Highly Feasible / Good Longevity with maintenance	1

Notes: \*Implementation costs are very rough relative estimates for the purposes of planning only.

\*\*For Route 9N bridge it is recommended to implement Alternative 2 – Restore the Original Hydraulic Opening, while pursuing Alternative 4 – Bridge Replacement, with the NYSDOT.

# Upstream Recommendations



## Project Area 1



## Project Area 2



## Project Area 3



## Project Area 4



# Project Area 5



## Gulf Brook Channel Improvement Project Evaluation Matrix

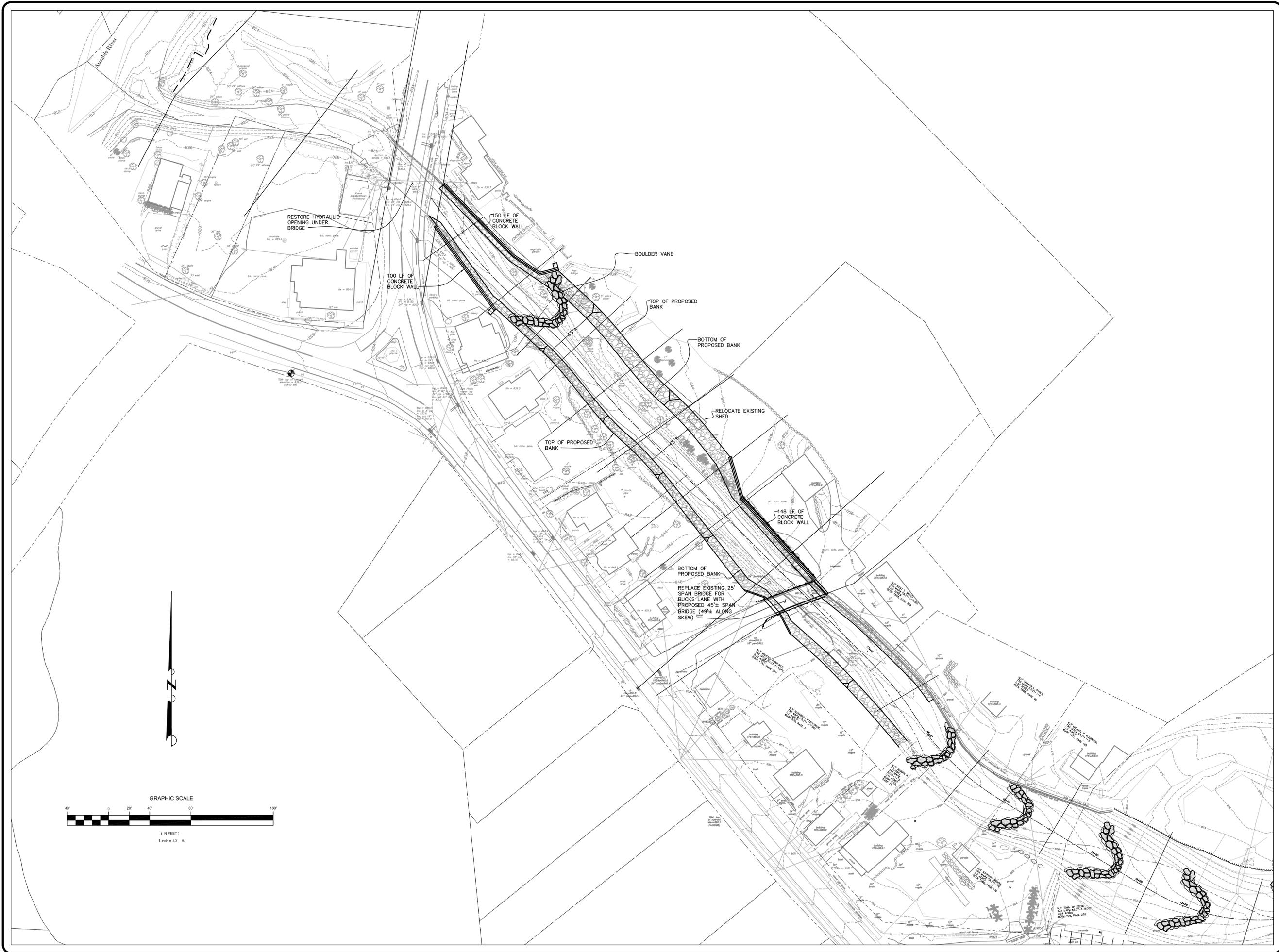
Scope	Alternative	Flood Resiliency Improvements		Ecological Considerations		Economic Considerations		Priority Ranking
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## Gulf Brook Channel Improvement Project Evaluation Matrix

Scope	Alternative	Flood Resiliency Improvements		Ecological Considerations		Economic Considerations		Priority Ranking
		Overbank Flood Risk Reduction	Channel Maintenance Reductions	Geomorphic Stability Enhancement	Riparian & Aquatic Habitat Enhancement	Relative Implementation Cost*	Feasibility / Longevity	
	4) Replace existing bridge	Large floods stay in the channel; much lower risk of debris snagging	Reduced sediment and debris deposition; Some maintenance may be required after large floods	Significantly reduced risk of bank erosion upstream and downstream	Bankfull channel achieved; Bed habitat features improved over long term	Highest Cost	Not Feasible within project timeline and budget	3**
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Notes: \*Implementation costs are very rough relative estimates for the purposes of planning only.

\*\*For Route 9N bridge it is recommended to implement Alternative 2 – Restore the Original Hydraulic Opening, while pursuing Alternative 4 – Bridge Replacement, with the NYSDOT.



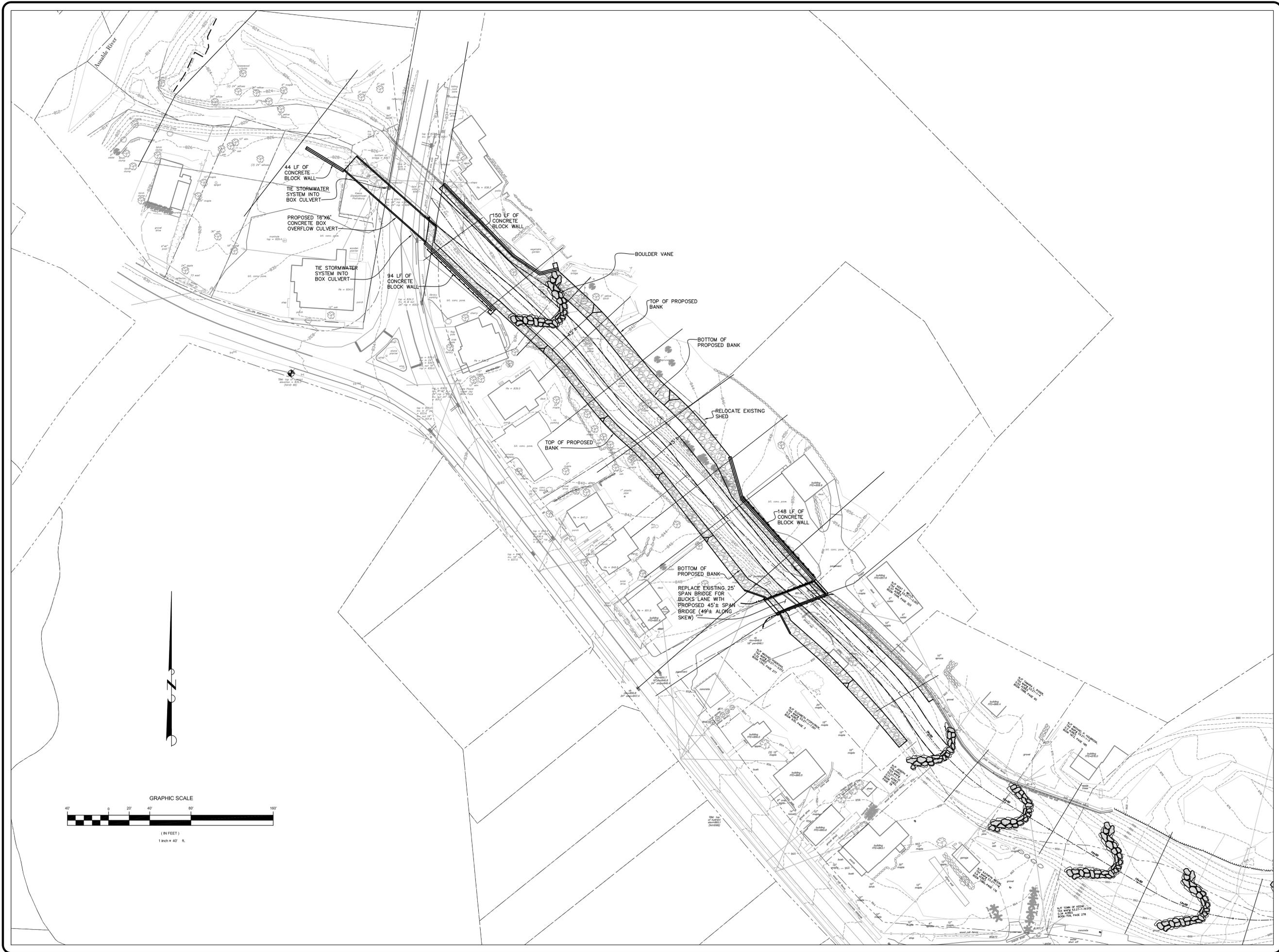
REVISIONS	BY

**ESPC**  
 CIVIL AND ENVIRONMENTAL ENGINEERING  
 P.O. BOX 2787 / 43 DURKEE STREET, STE 500, PLATTSBURGH, NY 12901  
 WWW.ESPC-CONSULTING.COM  
 TEL: 518-563-9445 FAX: 518-562-5189

GULF BROOK CHANNEL  
 RESTORATION PROJECT  
 PHASE II  
 ALTERNATIVES ANALYSIS  
 KEENE, NY

DRAWN	SJD
CHECKED	SJD/ES
DATE	10/29/14
SCALE	1"=40'
JOB NO.	ESPC # 20141253

ALT.1



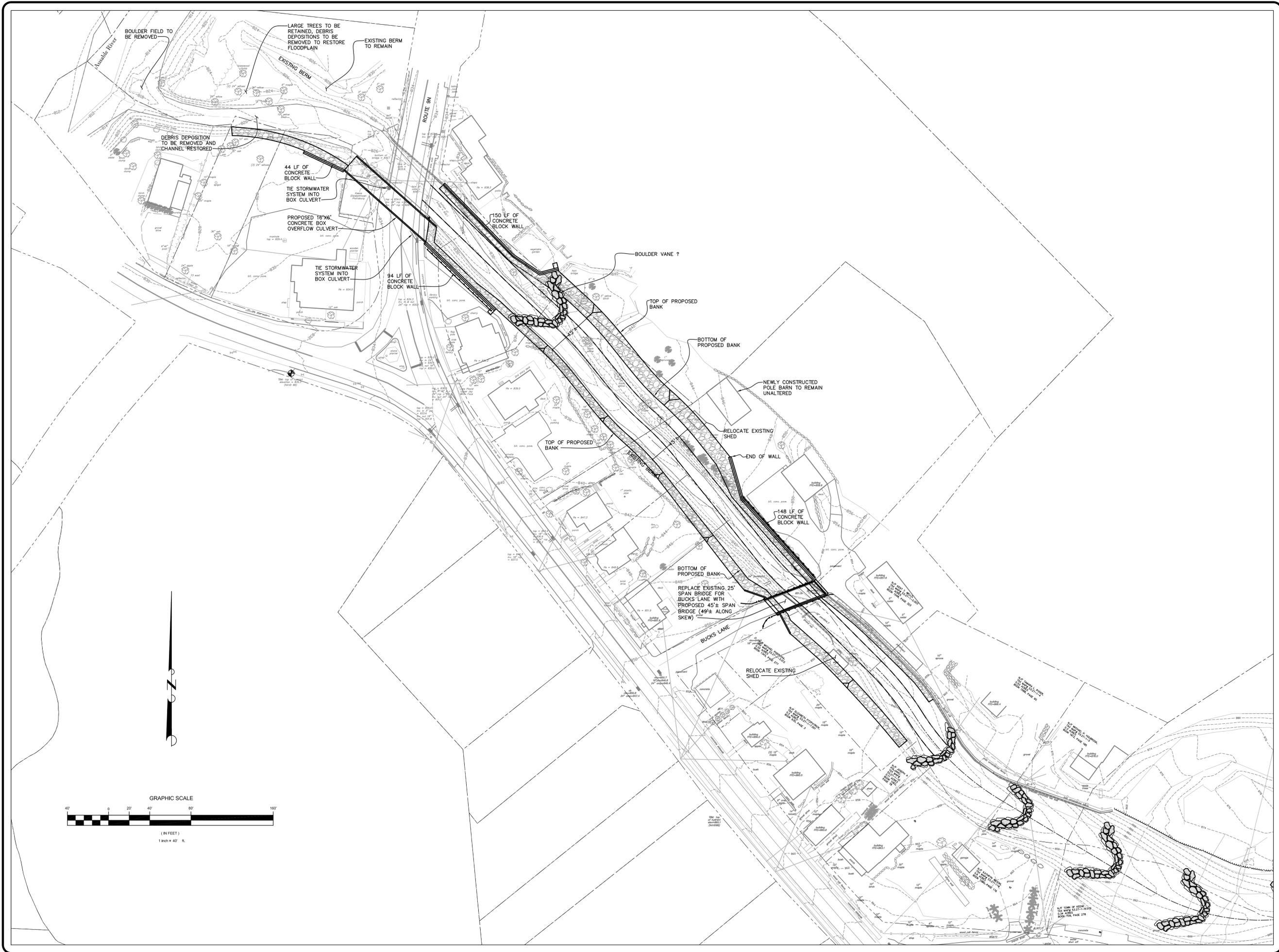
REVISIONS	BY

**ESPC**  
 CIVIL AND ENVIRONMENTAL ENGINEERING  
 P.O. BOX 2787 / 43 DURKEE STREET, STE 500, PLATTSBURGH, NY 12901  
 WWW.ESPC-CONSULTING.COM  
 TEL: 518-563-9445 FAX: 518-562-5189

GULF BROOK CHANNEL  
 RESTORATION PROJECT  
 PHASE II  
 PREFER ALTERNATIVE PLAN  
 KEENE, NY

DRAWN	SJD
CHECKED	SJD/ES
DATE	10/29/14
SCALE	1"=40'
JOB NO.	ESPC # 20141253

ALT.2



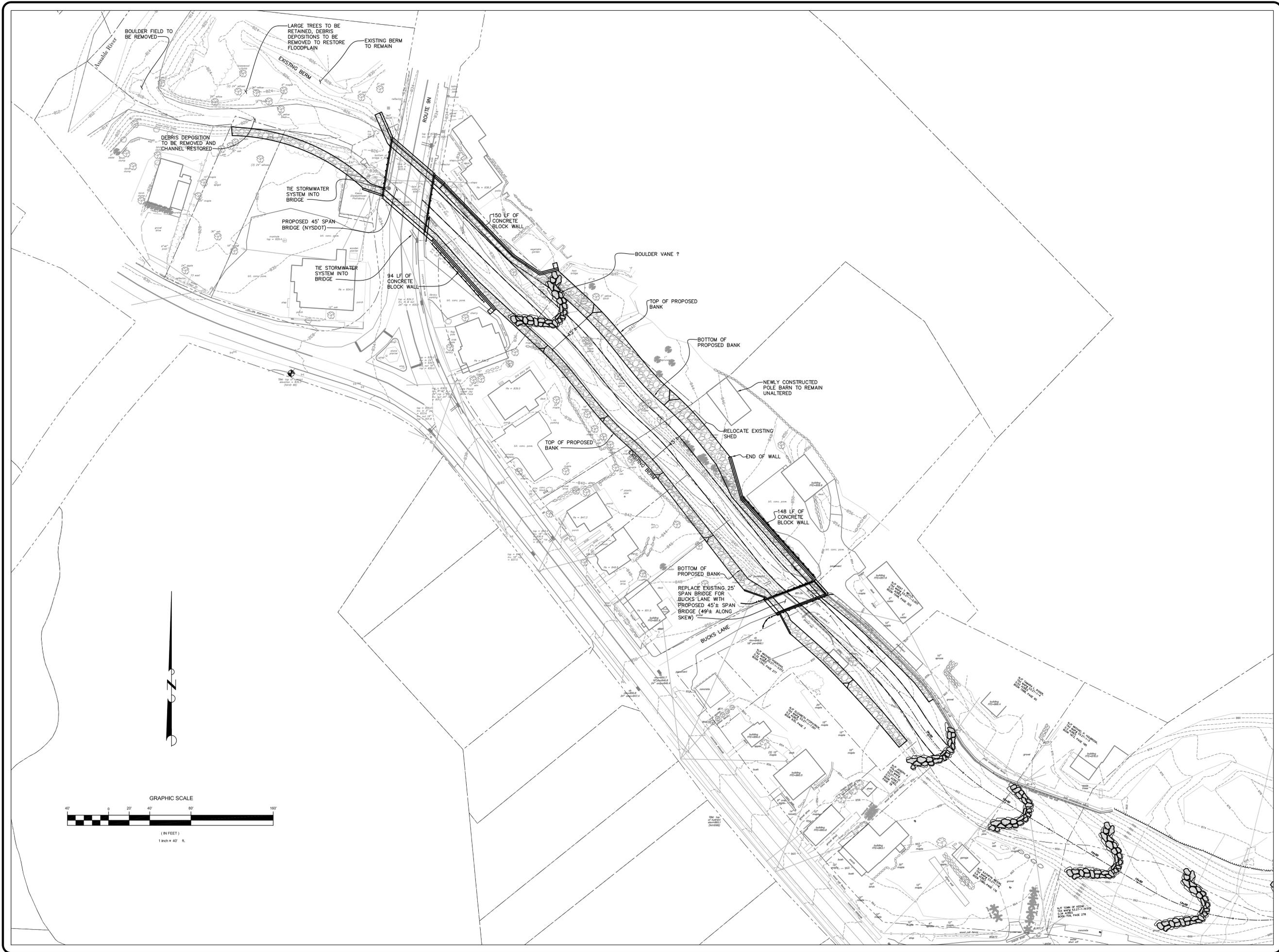
REVISIONS	BY

**ESPC**  
 CIVIL AND ENVIRONMENTAL ENGINEERING  
 P.O. BOX 2787 / 43 DURKEE STREET, STE 500, PLATTSBURGH, NY 12901  
 WWW.ESPC-CONSULTING.COM  
 TEL: 518-563-9445 FAX: 518-562-5189

GULF BROOK CHANNEL  
 RESTORATION PROJECT  
 PHASE II  
 ALTERNATIVE 3 PLAN  
 KEENE, NY

DRAWN	SJD
CHECKED	SJD/ES
DATE	12/8/15
SCALE	1"=40'
JOB NO.	ESPC # 20141253

**ALT.3**



REVISIONS	BY

**ESPC**  
 CIVIL AND ENVIRONMENTAL ENGINEERING  
 P.O. BOX 2787 / 43 DURKEE STREET, STE 500, PLATTSBURGH, NY 12901  
 WWW.ESPC-CONSULTING.COM  
 TEL: 518-563-9445 FAX: 518-562-5189

GULF BROOK CHANNEL  
 RESTORATION PROJECT  
 PHASE II  
 ALTERNATIVE 4 PLAN  
 KEENE, NY

DRAWN	SJD
CHECKED	SJD/ES
DATE	10/29/14
SCALE	1"=40'
JOB NO.	ESPC # 20141253

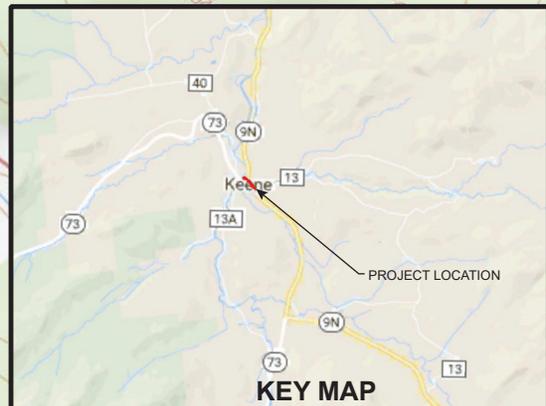
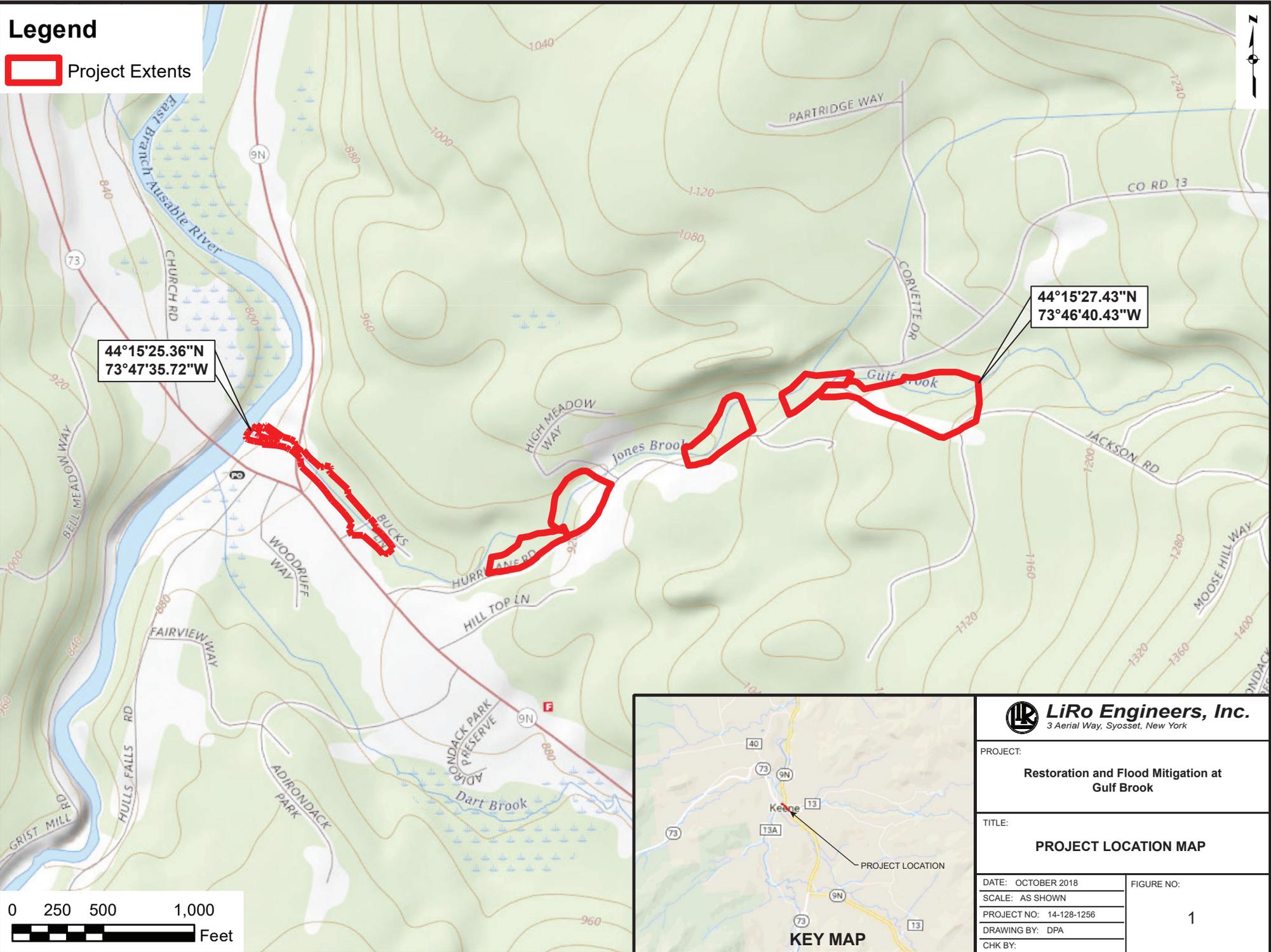
ALT.4

**GULF BROOK RESTORATION AND FLOOD MITIGATION PROJECT  
ESSEX COUNTY, NY**

**APPENDIX A  
FIGURES**

# Legend

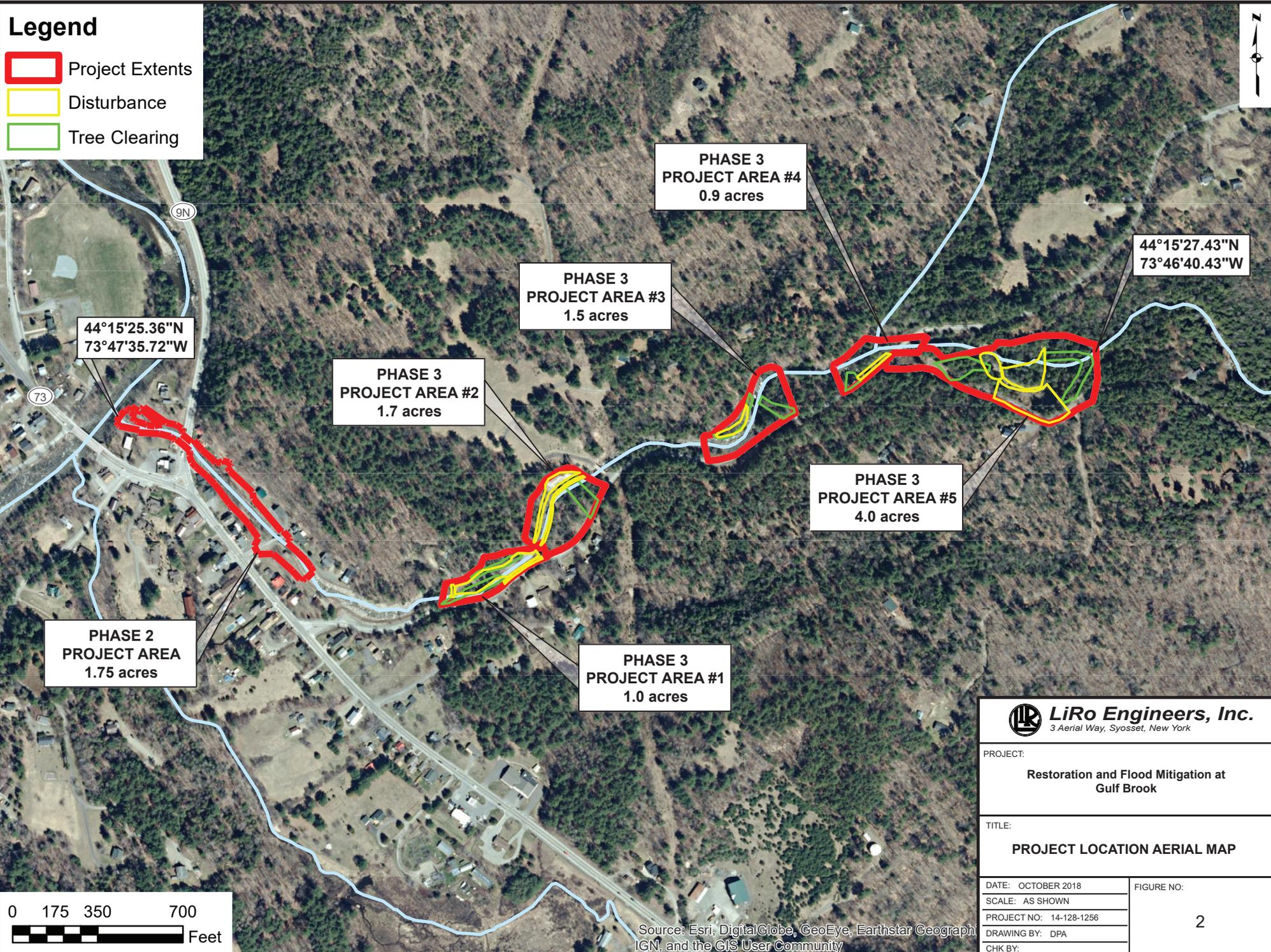
 Project Extents



 <b>LiRo Engineers, Inc.</b> <small>3 Aerial Way, Syosset, New York</small>	
PROJECT: <p style="text-align: center;"><b>Restoration and Flood Mitigation at Gulf Brook</b></p>	
TITLE: <p style="text-align: center;"><b>PROJECT LOCATION MAP</b></p>	
DATE: OCTOBER 2018 SCALE: AS SHOWN PROJECT NO: 14-128-1256 DRAWING BY: DPA CHK BY:	FIGURE NO: <p style="text-align: center;">1</p>

# Legend

- Project Extents
- Disturbance
- Tree Clearing



44°15'25.36"N  
73°47'35.72"W

PHASE 3  
PROJECT AREA #4  
0.9 acres

PHASE 3  
PROJECT AREA #3  
1.5 acres

44°15'27.43"N  
73°46'40.43"W

PHASE 3  
PROJECT AREA #2  
1.7 acres

PHASE 3  
PROJECT AREA #5  
4.0 acres

PHASE 2  
PROJECT AREA  
1.75 acres

PHASE 3  
PROJECT AREA #1  
1.0 acres

 **LiRo Engineers, Inc.**  
3 Aerial Way, Syosset, New York

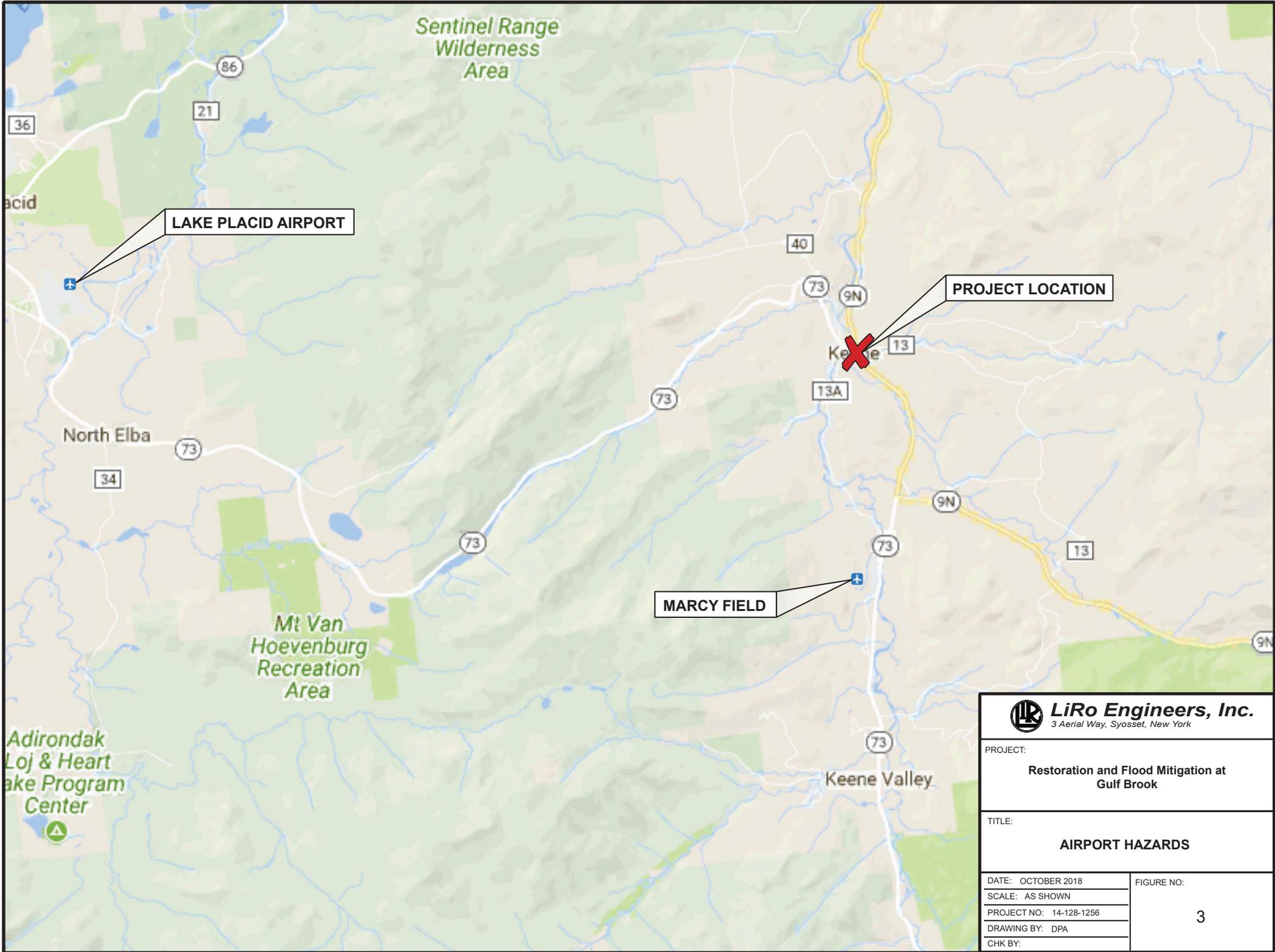
PROJECT:  
**Restoration and Flood Mitigation at  
Gulf Brook**

TITLE:  
**PROJECT LOCATION AERIAL MAP**

DATE: OCTOBER 2018  
SCALE: AS SHOWN  
PROJECT NO: 14-128-1256  
DRAWING BY: DPA  
CHK BY:

FIGURE NO:  
**2**





PROJECT:  
**Restoration and Flood Mitigation at Gulf Brook**

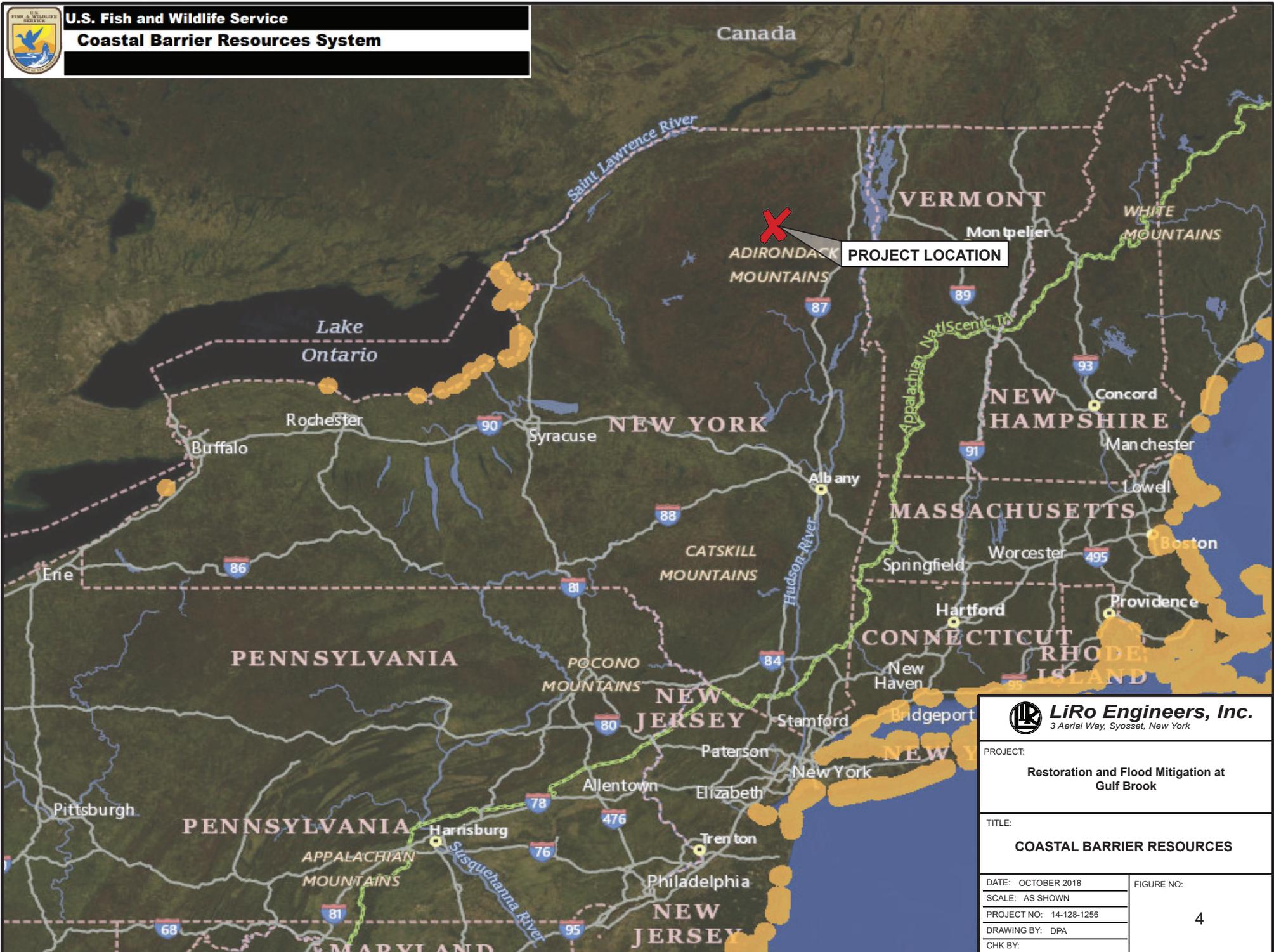
TITLE:  
**AIRPORT HAZARDS**

DATE: OCTOBER 2018  
SCALE: AS SHOWN  
PROJECT NO: 14-128-1256  
DRAWING BY: DPA  
CHK BY:

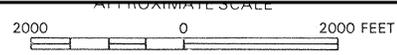
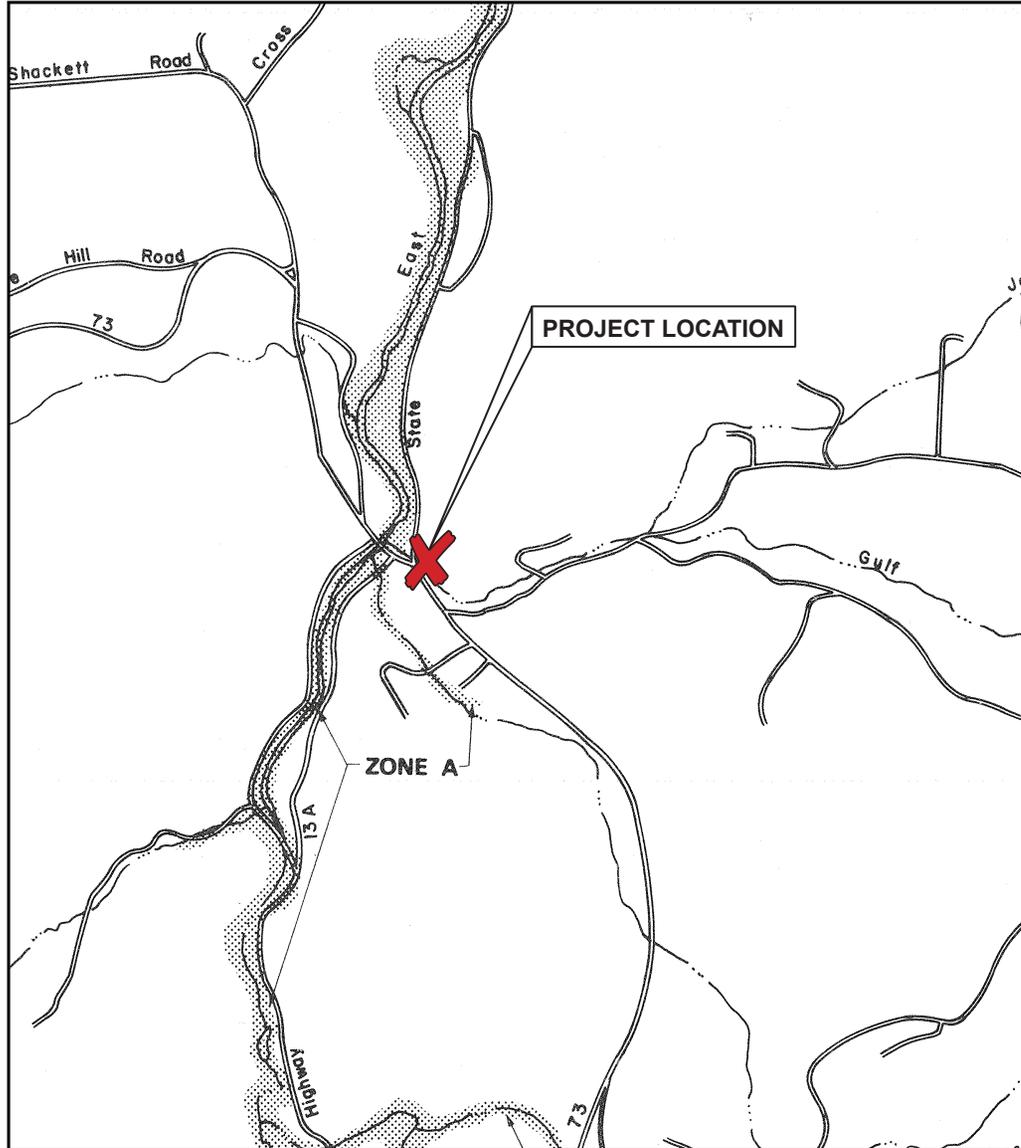
FIGURE NO:  
**3**



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



 <b>LiRo Engineers, Inc.</b> 3 Aerial Way, Syosset, New York	
PROJECT: <b>Restoration and Flood Mitigation at Gulf Brook</b>	
TITLE: <b>COASTAL BARRIER RESOURCES</b>	
DATE: OCTOBER 2018	FIGURE NO.:
SCALE: AS SHOWN	4
PROJECT NO: 14-128-1256	
DRAWING BY: DPA	
CHK BY:	



**NATIONAL FLOOD INSURANCE PROGRAM**

**FIRM**  
FLOOD INSURANCE RATE MAP

TOWN OF  
KEENE, NEW YORK  
ESSEX COUNTY

PANEL 25 OF 75  
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER  
361151 0025 C

EFFECTIVE DATE:  
JUNE 5, 1985



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

 **LiRo Engineers, Inc.**  
3 Aerial Way, Syosset, New York

PROJECT:  
**Restoration and Flood Mitigation at  
Gulf Brook**

TITLE:  
**FLOOD INSURANCE MAP**

DATE: OCTOBER 2018

SCALE: AS SHOWN

PROJECT NO: 14-128-1256

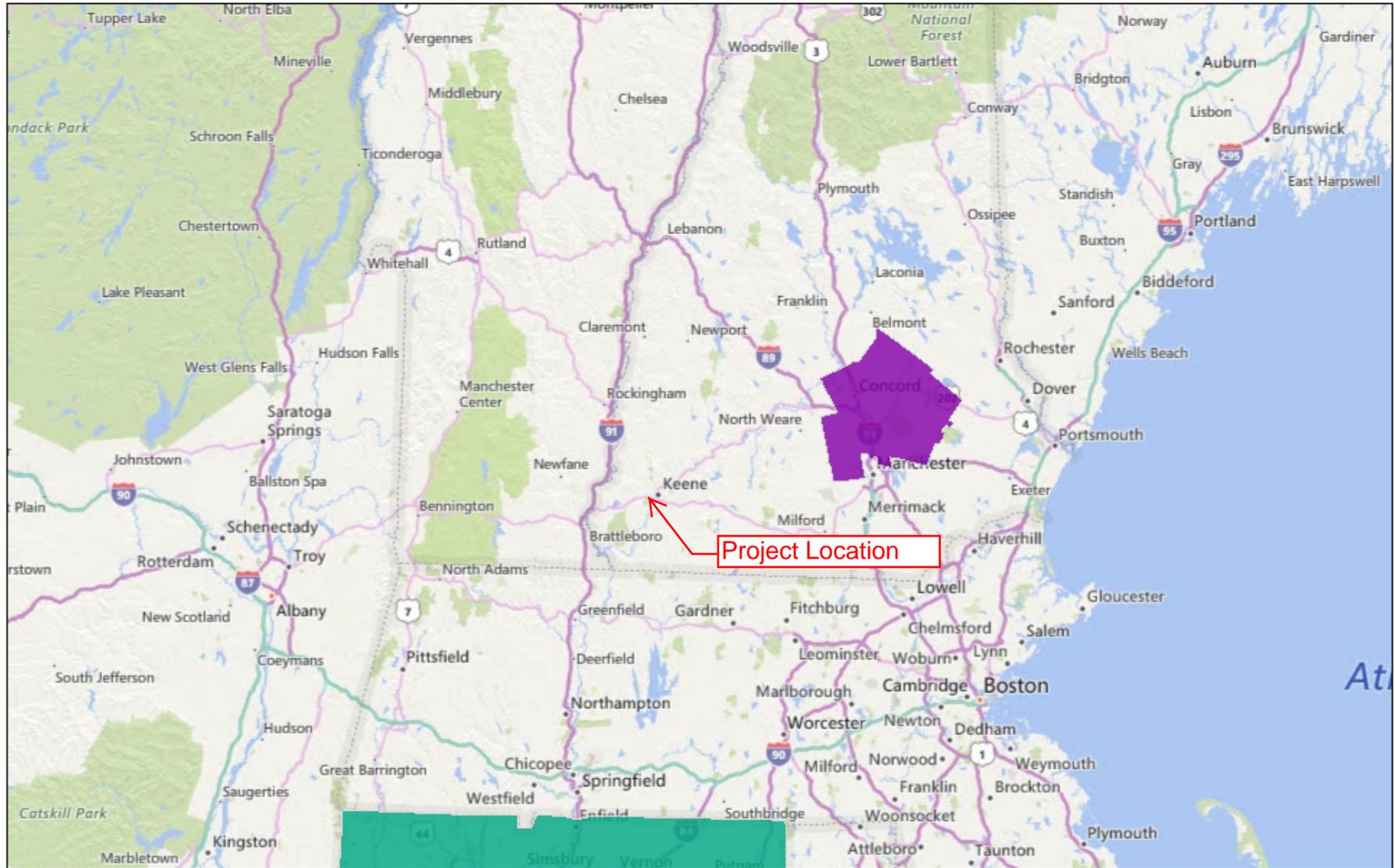
DRAWING BY: DPA

CHK BY:

FIGURE NO:

**5**

# GULF BROOK

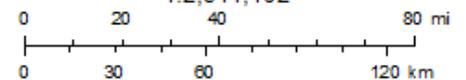


October 22, 2018

Ozone 8-hr (2015 Standard)   Lead (2008 standard)   SO2 1-hr (2010 standard)   PM2.5 24hr (2006 standard)   PM2.5 Annual (2012 standard)

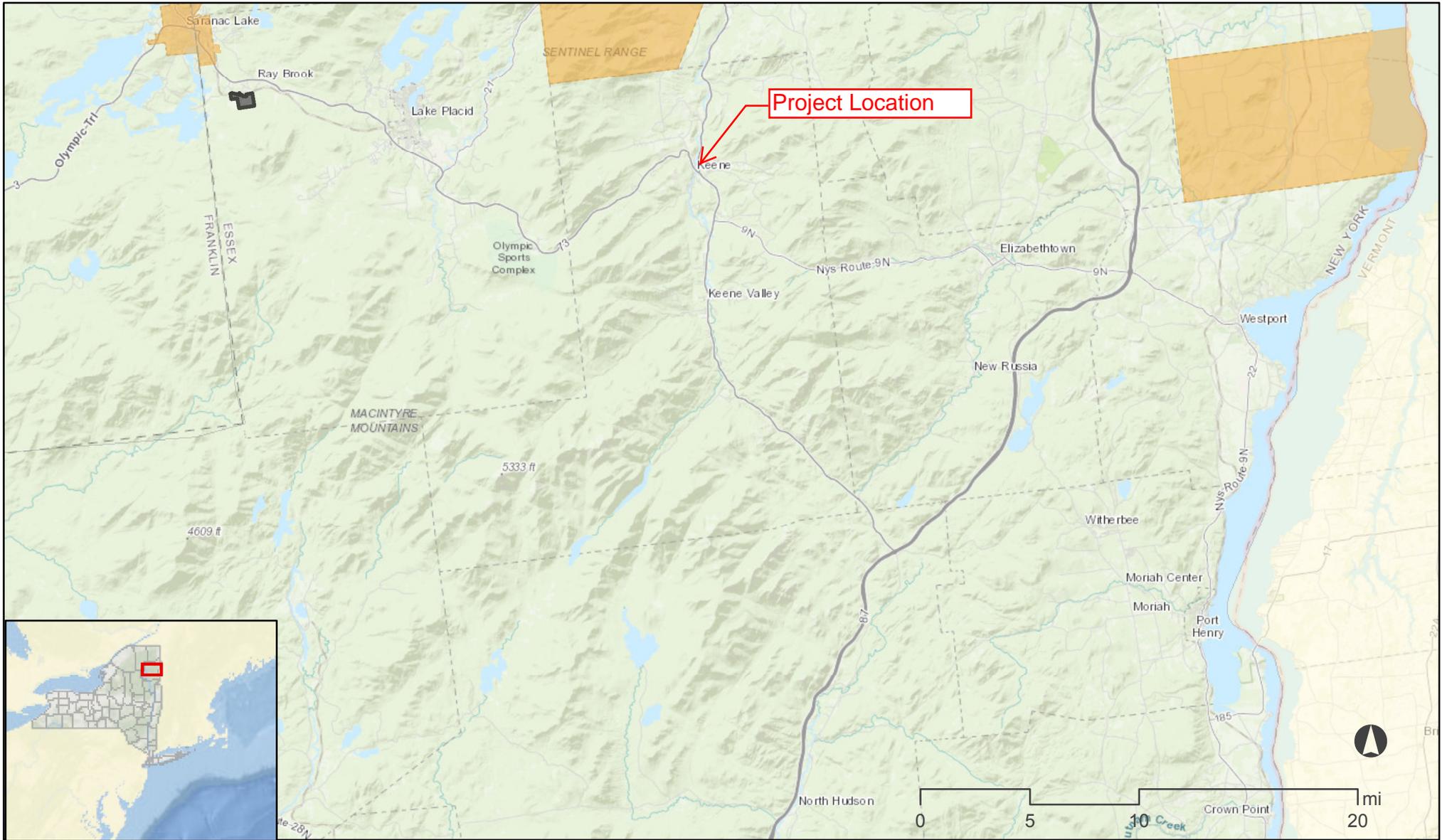
<span style="color: cyan;">■</span> Maintenance	<span style="color: yellow;">■</span> Maintenance	<span style="color: lightpurple;">■</span> Maintenance	<span style="color: gray;">■</span> Maintenance	<span style="color: lightgreen;">■</span> Maintenance
<span style="color: darkcyan;">■</span> Nonattainment	<span style="color: olive;">■</span> Nonattainment	<span style="color: purple;">■</span> Nonattainment	<span style="color: black;">■</span> Nonattainment	<span style="color: darkgreen;">■</span> Nonattainment

1:2,311,162



U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS)

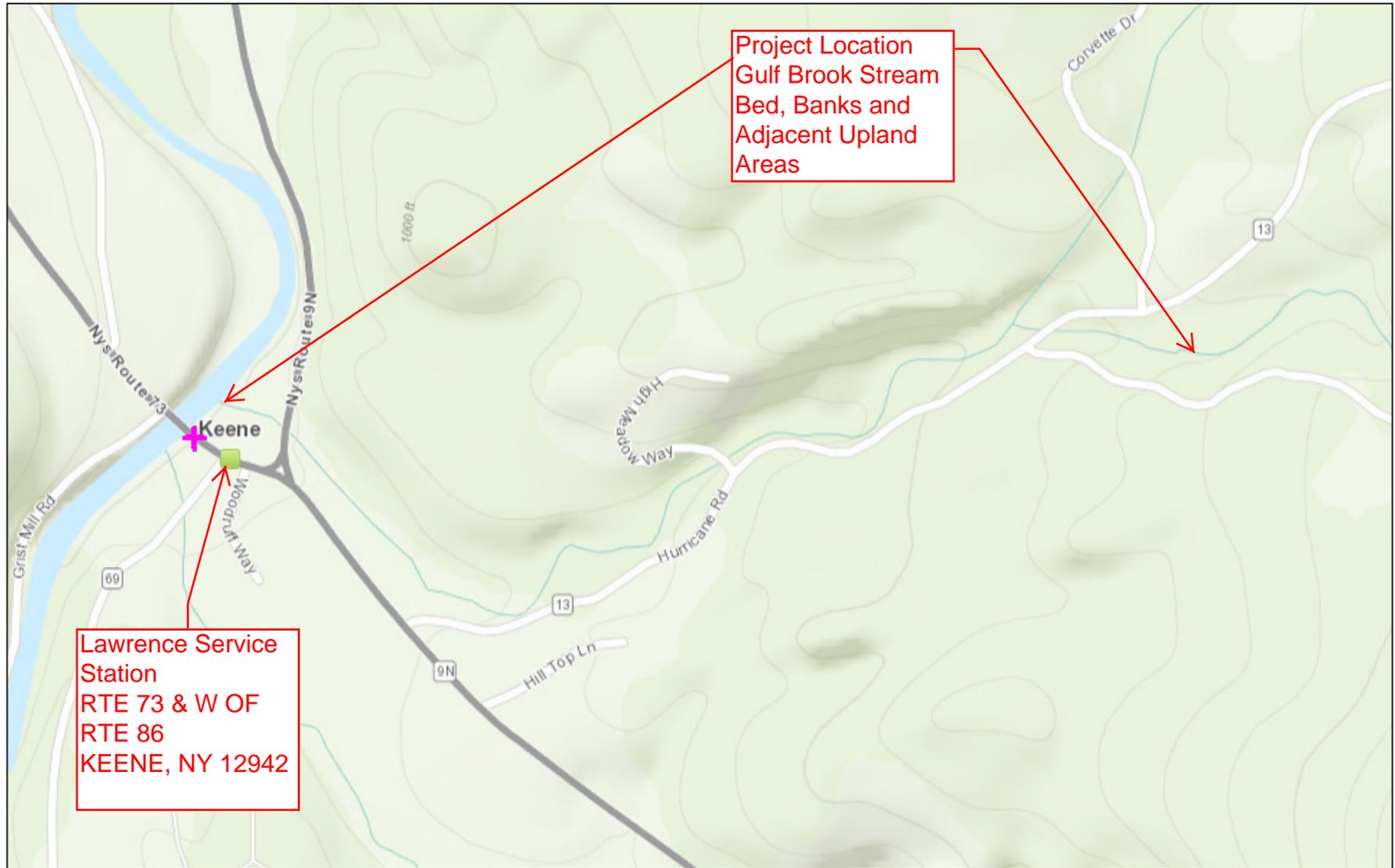
# GULF BROOK



**FIGURE 7**

- |  |   |   |   |
|--|---|---|---|
|  DOS_identified_artificial_canals                                 |  Coastal_Boundary_Polyline_update  |  Long_Island_Sound_Program |  FederalLands_NY                   |
|  Significant_coastal_fish_&_wildlife_habitats_-_NYS_Dept_of_State |  Local_Waterfront_Revitalization_Program_[LWRP]_Community_Boundaries,_Approved |  NativeAmericanLands       |  CoastalBoundary_Polygon_March2017 |

# GULF BROOK



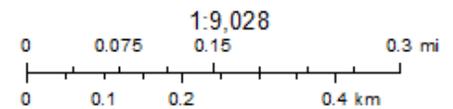
Lawrence Service Station  
 RTE 73 & W OF  
 RTE 86  
 KEENE, NY 12942

Project Location  
 Gulf Brook Stream  
 Bed, Banks and  
 Adjacent Upland  
 Areas

October 22, 2018

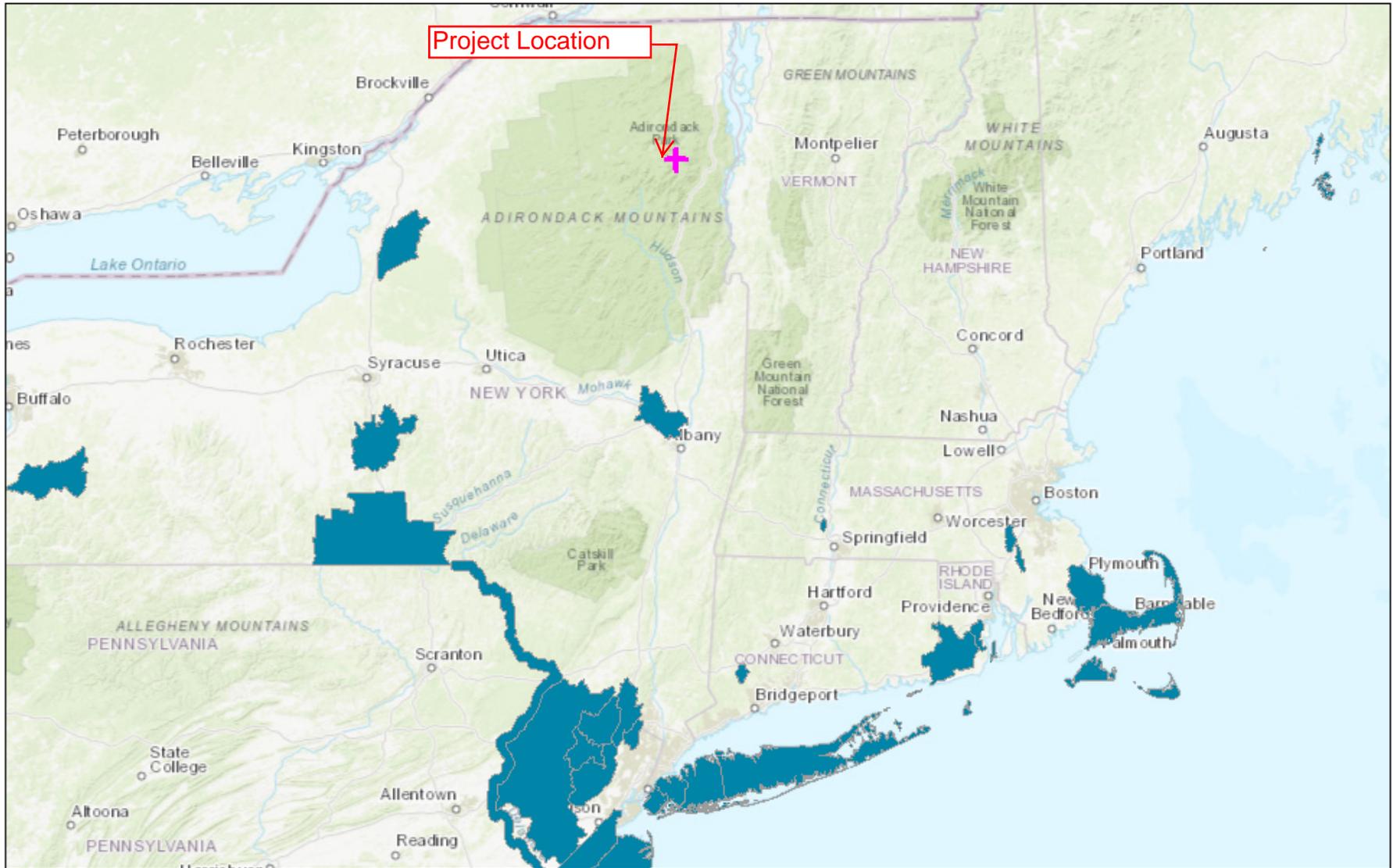
- + Search Result (point)
- RCRINFO (single)

### FIGURE 8



Sources: Esri, HERE, Garmin, Intermap, Incentiv P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, KadasterNL, Ordnance Survey, Esri

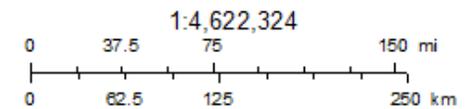
# GULF BROOK



October 22, 2018

- ✚ Search Result (point)
- Sole Source Aquifers

**FIGURE 9**



Sources: Esri, HERE, Garmin, Intermap, Increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, KadasterNL, Ordnance Survey, Esri



October 22, 2018

**Wetlands**

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

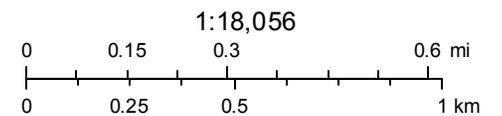
**FIGURE 10**

# GULF BROOK (NYSDEC WELANDS)



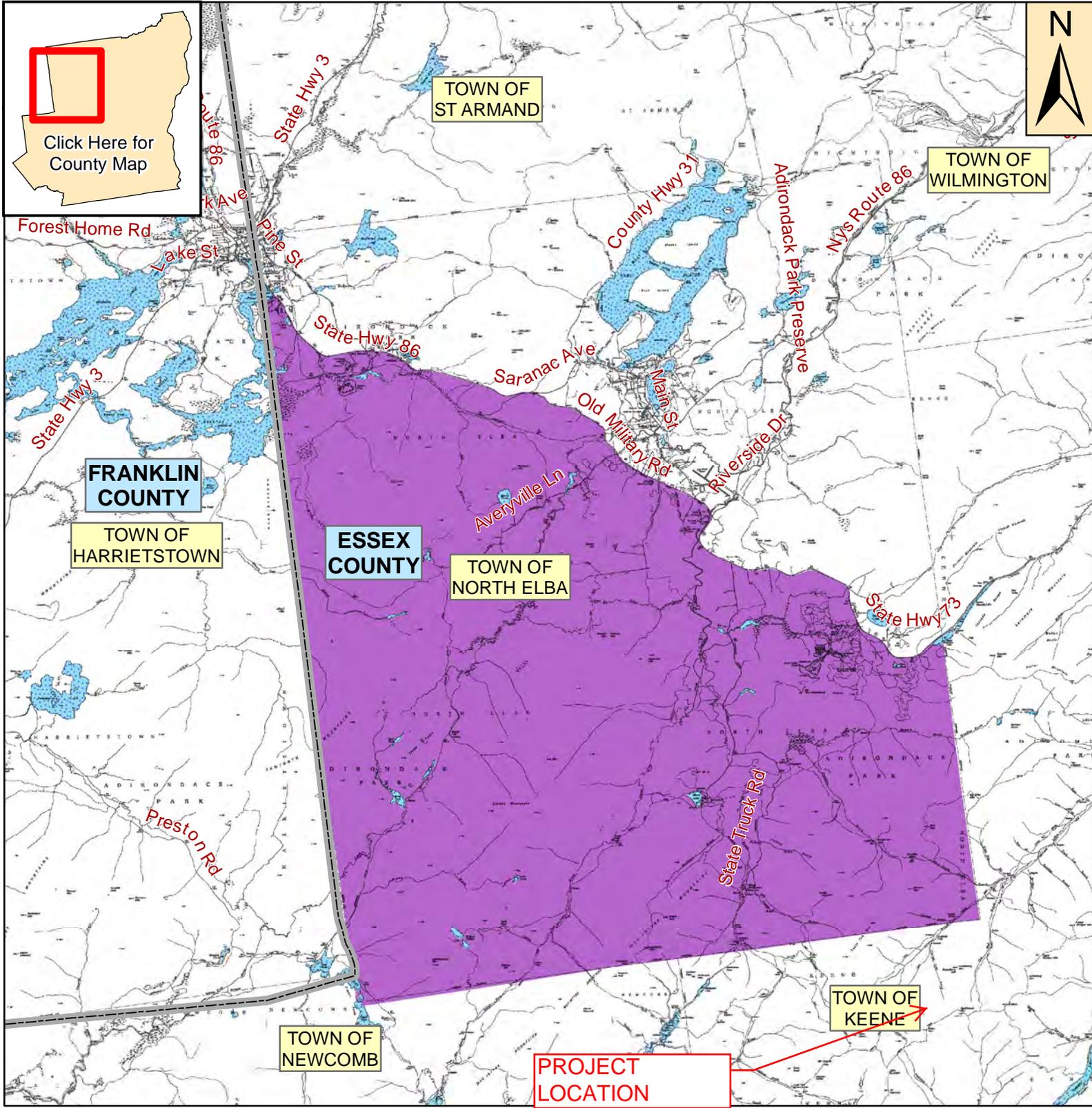
October 22, 2018

**FIGURE 11**



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri

# Potential Environmental Justice Area in the Town of North Elba, Essex County, New York



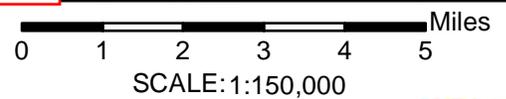
This computer representation has been compiled from supplied data or information that has not been verified by NYSDEC. The data is offered here as a general representation only and is not to be used for commercial purposes without verification by an independent professional qualified to verify such data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

NYSDEC does not 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** **FIGURE 12**

- Potential EJ Area
- County Boundary
- Waterbodies



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



**GULF BROOK RESTORATION AND FLOOD MITIGATION PROJECT  
ESSEX COUNTY, NY**

**APPENDIX B  
USFWS CONSULTATION LETTER**



**Governor's Office of  
Storm Recovery**

**ANDREW M. CUOMO**  
Governor

**LISA BOVA-HIATT**  
Executive Director

November 5, 2018

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

Re: ESA/MBTA/BGEPA Consultation for Essex County Gulf Brook Restoration and Flood Mitigation Phase 3 Project

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 Essex County Gulf Brook Restoration and Flood Mitigation Project (the "Proposed Action"). Funding is being provided by the HUD Community Development Block Grant Disaster Recovery (CDBG-DR) program. The project described herein was analyzed pursuant to Section 7 of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d); and the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat 755).

The purpose of this letter is to provide the U.S. Fish and Wildlife Service – New York Field Office (USFWS) notice of the proposed project and to document compliance with Section 7 of the Endangered Species Act. We are requesting concurrence from the U.S. Fish and Wildlife Service that the proposed Essex County Gulf Brook Restoration and Flood Mitigation Phase 3 Project **may affect, but is not likely to adversely** affect the Indiana Bat and Northern Long-eared Bat.

**Program Overview**

During Hurricane Irene, rainfall caused Gulf Brook to overflow its banks and flow down the center of Route 9N. Floodwater inundated roadways, homes and businesses and caused severe damage. Completion of the proposed project fosters the recovery of the community by reducing the risk of localized flooding for the residences and businesses in the Town of Keene and by providing a flood-safe area for redevelopment of residential and commercial facilities in the Town.

The severe slopes and instability of the stream bank contributed to slope failure, deposition of tons of debris and degradation of aquatic habitat. The impacts to the project area from Hurricane Irene caused unprecedented

destruction of the natural features of the riparian environment. Since the storm, some efforts have succeeded in the reconstruction of much of the damaged infrastructure and to protect some properties from damage in future storms, but while these measures have stabilized the channel banks and provided flood mitigation in specific areas, properties adjacent to other parts of the stream, particularly downstream of the Bucks Lane Bridge still remain vulnerable.

The project is the implementation of various stream restoration and flood mitigation measures within Gulf Brook (also identified as Jones Brook). The proposed project area is within the bed, banks and adjacent upland areas of Gulf Brook. The proposed project actions are located upstream approximately 1,000 feet east of the intersection of Jackson Road and Hurricane Road to the downstream confluence of Gulf Brook and the East Branch of the Ausable River. The project starts at the northwest (upstream) coordinate of 44°15'25.46" North and - 73°46'40.41" to the southeast (downstream) coordinate of 44°15'22.95" North and - 73°47'31.87" (See Figures 1 and 2). USFWS has previously reviewed Phase 2 acknowledged GOSR determination of a "may affect, but not likely to adversely affect," determination for the federally listed Indiana bat (*Myotis sodalis*; Endangered) and the northern long-eared bat (*Myotis septentrionalis*; Threatened) as habitat suitable for summer roosting is present within the project area. The Service concurs with this determination as no known roosts are within or near the project area, a small amount of trees are proposed to be removed (approximately 12 trees), and tree removal will occur between November 1 and March 31, when bats are still in hibernation. However, Phase 3 has not been reviewed.

Phase 3 project activities are summarized below.

### **Gulf Brook Phase 3**

The Gulf Brook Phase 3 project will include approximately 2,500 linear feet in the upper portion of Gulf Brook. Phase 3 has **five distinct projects areas** (see attached figures) These areas begin immediately upstream of the Ticknor property and continue upstream for approximately 1,000 feet east of the intersection of Jackson Road and Hurricane Road. During Tropical Storm Irene, damage to these five areas included the destruction of an undersized bridge; undermining of the road embankment and stream banks; severe deposition of woody debris and coarse sediment; severe erosion and down cutting in the river channel (i.e., incision); and large slope failure which contributed significant amounts of sediment and debris to the stream channel. The following flood mitigation and restoration measures will be implemented along this segment of Gulf Brook to protect downstream infrastructure, homes and businesses from future storm events:

- Removal of spoils, debris, and sediment;
- Replacement of the undersized bridge;
- Floodplain / flood chute reconnection by re-grading and "roughening" the floodplain;
- Installation of grade control structures (i.e. weirs) to slow flood flow velocity and encourage the capture of debris and sediment;
- Stabilizing road banks (armoring and bioengineered stabilization techniques);
- Slope and toe protection at the base of the steep banks that failed; and
- Bioengineering to stabilize the upper slope.

A conceptual design and resilience Improvement Recommendation have been completed. No design has been performed at the time of this environmental review.

Proposed improvements will increase water and sediment transport capacity of Gulf Brook and restore its natural function. The design goals are to mitigate flood risk and also to enhance the environmental health by addressing bank erosion, thereby improving water quality, and improving aquatic and riparian habitat. The project may require the replacement of the County Bridge and realignment of the outfall in to the East Branch of the Ausable River.

The construction for the project will involve the excavation and digging for changes in channels and bank stabilization. In addition, the existing County Bridge (Bucks Lane Bridge) may be dismantled, removed and replaced with a new steel and concrete structure, and culverts may be constructed or replaced. Construction will require digging/earthwork.

Tree removal at each site is required.

## **Compliance**

### **Endangered Species Act - Effect Determinations**

According to the USFWS Information, Planning and Conservation (IPaC) online planning tool and Trust Resource List generated for the proposed project (**Attachment 2**) the endangered Indiana Bat (*Myotis sodalis*) and the threatened Northern Long-eared bat (NLEB) (*Myotis septentrionalis*) can be found within the vicinity of the project area. The official species list for the proposed project indicated that there is no critical habitat in the project area.

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 are no known maternity roost trees or hibernacula known to be occupied by the IB within 2.5 miles of the Project area (**Attachment 3**).

The Northern Long-eared bat (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 remaining solitary until mating season at the end of the summer, and pregnant females forming maternity colonies in which to rear young. Summer habitat of the NLEB generally includes upland and riparian forest within heavily forested landscapes (Ford et al. 2005, Henderson et al. 2008). Roost trees are usually intact forest, close to the core and away from large clearings, roads, or other sharp edges (Menzel et al. 2002, Owen et al. 2003, Carter and Feldhammer 2005). The project site consists of a cleared stream bank lined with residential yards on either side, and the project site is surrounded by residential development. There are no known maternity roost trees or hibernacula known to be occupied by NLEB in the vicinity of the Project (**Attachment 3**).

NYSDEC conducted a summer habitat assessment for Indian bat habitat at the project site and found.

**Project Areas 2–5:** these areas are at a **high enough** location that Indiana bats would not be a concern (IPaC only lists NLEB). The project areas are about 11.5 – 12.5 miles from the nearest known NLEB hibernation site, and is nearly 17 miles from the nearest Indiana bat occurrence.

**Project Area 1:** this project area is low enough that IPaC lists both **NLEB and Indiana bats**. There is a datasheet of a habitat evaluation in the attached assessment. There are a few snags and trees that are large enough to be potential roosts.

To minimize potential impacts to the IB and NLEB, tree clearing will take place from **November 1 to March 31**, which is outside of the active season of the IB and NLEB. Trees that are proposed to be removed are part of a small strip of forested habitat located immediately adjacent to residential development and residential yard habitat. Any bats living in the vicinity of the Project area would still be able to breed, feed, and find shelter. Similar habitat (forested creek corridor surrounded by residential development) is located immediately north and south of the Project area (see aerial map in Attachment 1). Bats would not have to fly long distances or traverse open areas to get to alternative foraging habitat, as tracts of forested habitat are located immediately adjacent to the proposed Project. These forested tracts of land are accessible via strips of forested habitat surrounding the Project area and along Gulf Brook.

Since 1) tree clearing will be conducted when bats are hibernating, 2) the Project will not impact a large area of suitable habitat relative to the surrounding landscape, and 3) the Project will not impact high-quality habitat, a **‘may affect, not likely to adversely affect’** determination is warranted for the IB and NLEB.

If winter tree is determined at latter to be infeasible, an acoustic survey will be completed after May 15, 2019 or an emergence surveys will be completed as determined by consultation with USFWS.

GOSR understands that the USFWS presumes that all activities are implemented as described herein. GOSR will promptly report any departures from the described activities that would change the effect determination above to the New York Field Office. GOSR will provide the New York Field Office with the results of any surveys conducted for the IB and NLEB. Involved parties will promptly notify the New York Field Office upon finding a dead, injured, or sick IB or NLEB.

### **Migratory Bird Treaty Act**

According to the USFWS Information for Planning and Conservation (IPaC) Resource List, accessed June 14, 2017 (Attachment 2), there are several migratory birds that could potentially be affected by the proposed Project. The primary nesting season for migratory birds is early April to mid-July. To minimize impacts to migratory birds, tree clearing will be performed from November 1 to March 31, which is outside of the primary nesting season. Precautions will be used to protect any migratory birds that may be found in or near the Project area. Such precautions include minimizing construction noise to the extent practicable, using care to avoid birds when operating machinery or vehicles near birds, and general contractor awareness of potential bird presence. We anticipate these measures should avoid any take of migratory birds. It is anticipated that passerine birds would temporarily leave the area during construction due to noise and disturbance.

## **Bald and Golden Eagle Protection Act**

The bald eagle (*Haliaeetus leucocephalus*) is a long-lived bird, with a life span of more than 30 years in the wild. Bald eagles prefer undisturbed areas near large lakes and reservoirs, marshes and swamps, or stretches along rivers where they can find open water and their primary food, fish. Bald eagles generally produce one or two, and rarely three, offspring per year. In New York, the young fledge by mid to late summer at about 12 weeks of age. A bald eagle nest is a large structure, usually located high in a tall, live white pine tree near water. The nest is re-used and added to each year, often becoming eight or more feet deep, six feet across, and weighing hundreds of pounds. Once a pair selects a nesting territory, they use it for the rest of their lives. Bald eagles mate for life, returning to nest in the general area (within 250 miles) from which they fledged.

Bald eagle overwintering and nesting sites are found in Essex County. GOSR consulted with the New York Natural Heritage Program (NYNHP) to determine if any of bald eagle nest sites are located within 660 feet of the Project area. No bald eagle nest was identified within 660 feet of the Project area.

### **Conclusion**

For the reasons listed above, we conclude that the Gulf Brook Restoration and Flood Mitigation Phase 3 Project may affect, but is not likely to adversely affect the Indiana Bat and 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](mailto:Alicia.Shultz@nyshcr.org). Thank you for your time and consideration.

Sincerely,



### **Enclosures:**

- Attachment 1 – Figures
- Attachment 2 – IPaC Trust Resource Report
- Attachment 3 – NYSDEC Jurisdictional Review
- Attachment 4 – Habitat Assessment

### **Literature Cited**

- Broders, H.G., G.J. Forbes, S. Woodley, and I.D. Thompson. 2006. Range extent and stand selection for forest-dwelling northern long-eared and little brown bats in New Brunswick. *Journal of Wildlife Management* 70: 1174-1184.
- Carter, T.C., and G.A. Feldhamer. 2005. Roost tree use by maternity colonies of Indiana bats and northern long-eared bats in southern Illinois. *Forest Ecology and Management* 219:259-268.
- Ford, W.M., M.A. Menzel, J.L. Rodriguez, J.M. Menzel, and J.B. Johnson. 2005. Relating bat species presence to simple habitat measures in a central Appalachian forest. *Biological Conservation* 126: 528-539.
- Foster, R.W. and A. Kurta, A. 1999. Roosting ecology of the northern bat (*Myotis septentrionalis*) and comparisons with the endangered Indiana bat (*Myotis sodalis*). *Journal of Mammalogy* 80: 659-672.

- Henderson, L.E., L.J. Farrow, and H.G. Broders. 2008. Intra-specific effects of forest loss on the distribution of the forest-dependent northern long-eared bat (*Myotis septentrionalis*). *Biological Conservation* 141:1819-1828.
- Menzel, M.A., S.F. Owen, W.M. Ford, J.W. Edwards, P.B. Wood, B.R. Chapman, and K.V. Miller. 2002. Roost tree selection by northern long-eared bat (*Myotis septentrionalis*) maternity colonies in an industrial forest of the central Appalachian mountains. *Forest Ecology and Management* 155:107-114.
- Owen, S.F., M.A. Menzel, W.M. Ford, B.R. Chapman, K.V. Miller, J.W. Edwards, and P.B. Wood. 2003. Home-range size and habitat used by the northern myotis (*Myotis septentrionalis*). *American Midland Naturalist* 150:352-359.

## **ATTACHMENT 1**

### **Figures**



**Notes**  
 - No mapped wetlands in Phase III project area per Adirondack Park Agency.  
 - NYSODP imagery from 2017.  
**Map By:** EHB and JHB  
**Date:** October 1, 2018

**Depth of Disturbance\***  
 Greater than 2ft  
 \*Tree removal required in depth of disturbance areas.

**Stream Centerline**  
**Parcel Boundary**  
**Potential Tree Clearing Area of Potential Extent (APE)**

**Gulf Brook Phase III  
 Keene, NY**

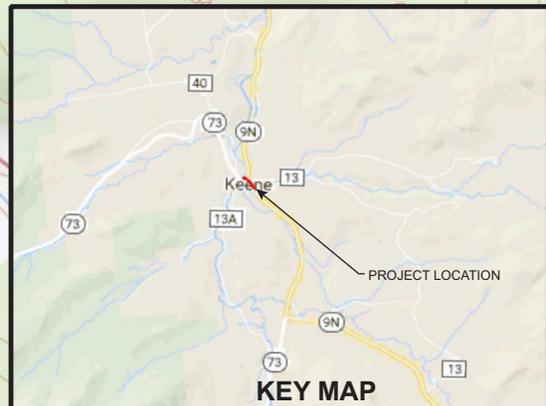
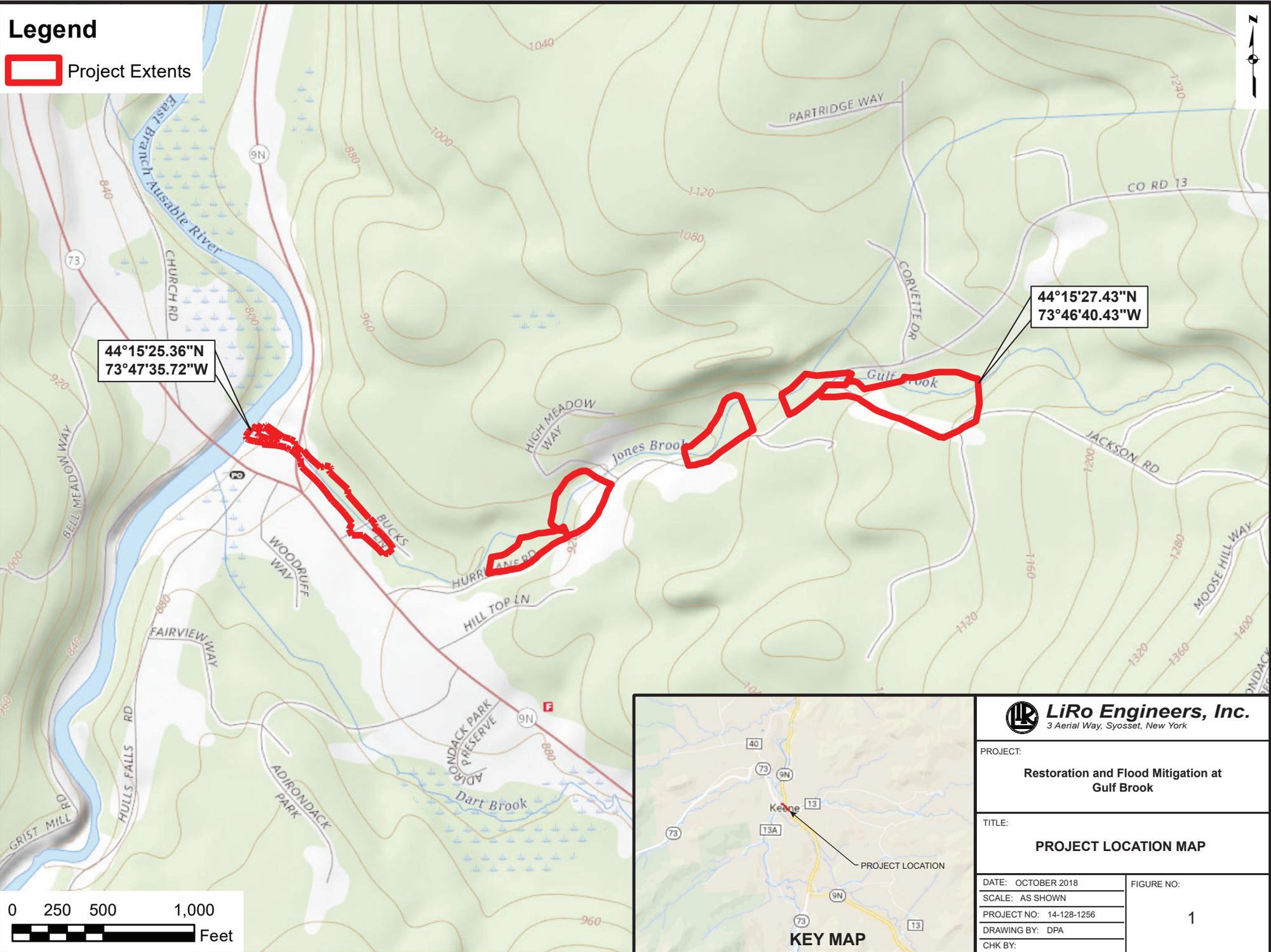
**Project Areas for Review**

**ESPC**  
 civil and environmental engineering

**Fitzgerald Environmental Associates, LLC.**  
 18 Severance Green, Suite 203  
 Colchester, VT 05446  
 Tel: 802-256-7276  
 www.fitzgeraldenvironmental.com

# Legend

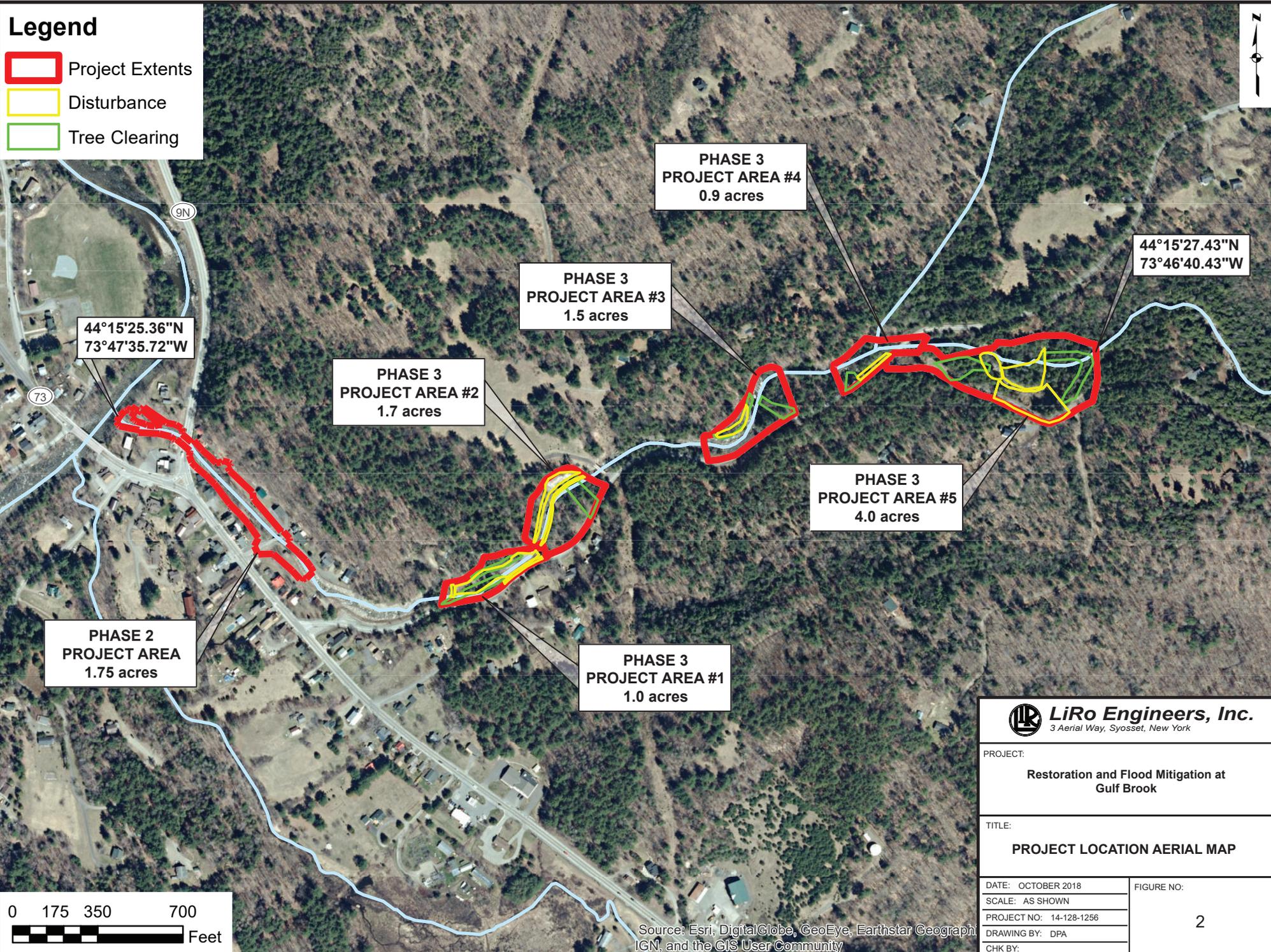
 Project Extents



 <b>LiRo Engineers, Inc.</b> <small>3 Aerial Way, Syosset, New York</small>	
PROJECT: <b>Restoration and Flood Mitigation at Gulf Brook</b>	
TITLE: <b>PROJECT LOCATION MAP</b>	
DATE: OCTOBER 2018 SCALE: AS SHOWN PROJECT NO: 14-128-1256 DRAWING BY: DPA CHK BY:	FIGURE NO: <p style="text-align: center; font-size: 24px;">1</p>

### Legend

- Project Extents
- Disturbance
- Tree Clearing



44°15'25.36"N  
73°47'35.72"W

PHASE 3  
PROJECT AREA #4  
0.9 acres

PHASE 3  
PROJECT AREA #3  
1.5 acres

44°15'27.43"N  
73°46'40.43"W

PHASE 3  
PROJECT AREA #2  
1.7 acres

PHASE 3  
PROJECT AREA #5  
4.0 acres

PHASE 2  
PROJECT AREA  
1.75 acres

PHASE 3  
PROJECT AREA #1  
1.0 acres

 **LiRo Engineers, Inc.**  
3 Aerial Way, Syosset, New York

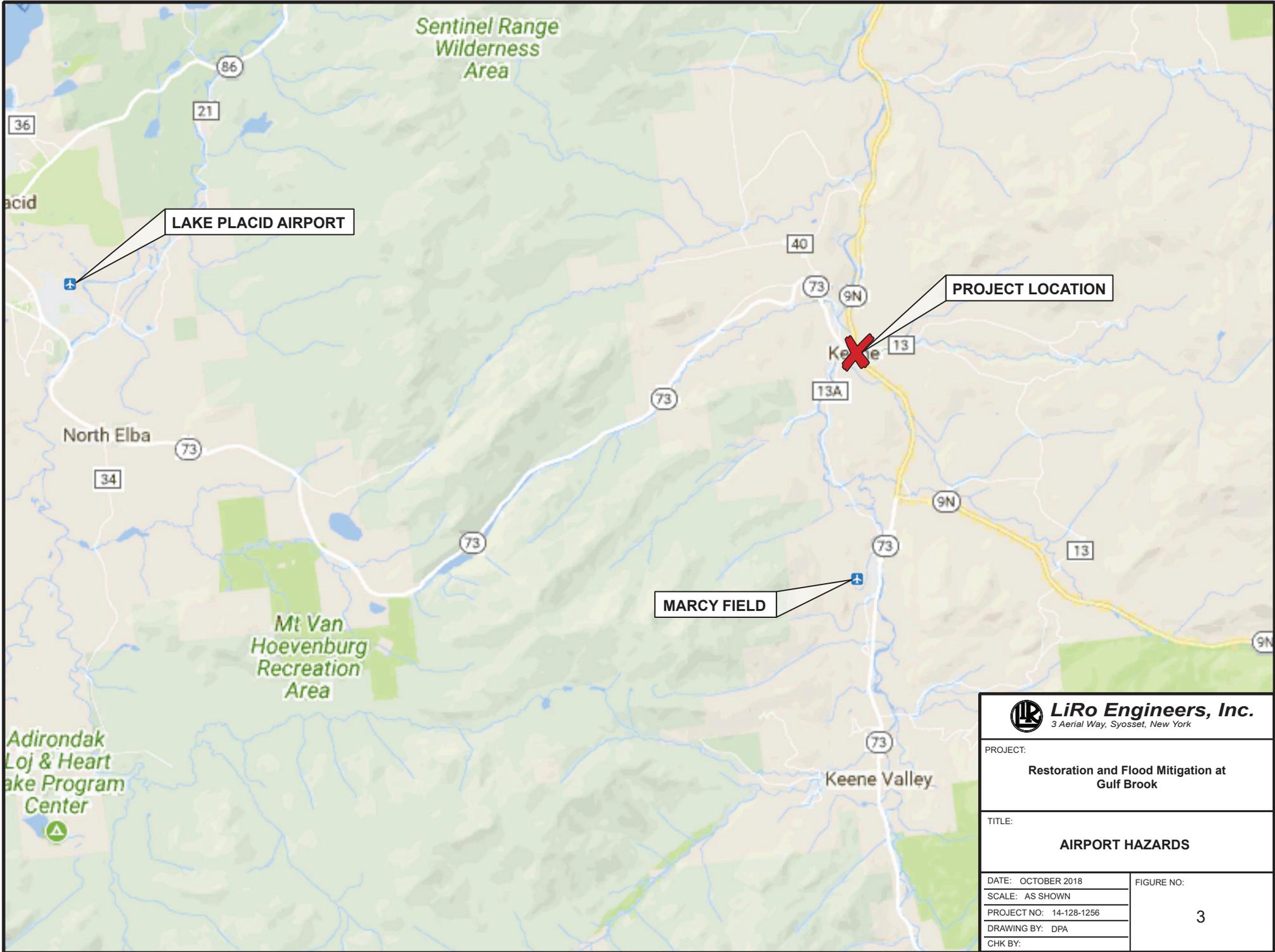
PROJECT:  
**Restoration and Flood Mitigation at  
Gulf Brook**

TITLE:  
**PROJECT LOCATION AERIAL MAP**



DATE: OCTOBER 2018
SCALE: AS SHOWN
PROJECT NO: 14-128-1256
DRAWING BY: DPA
CHK BY:

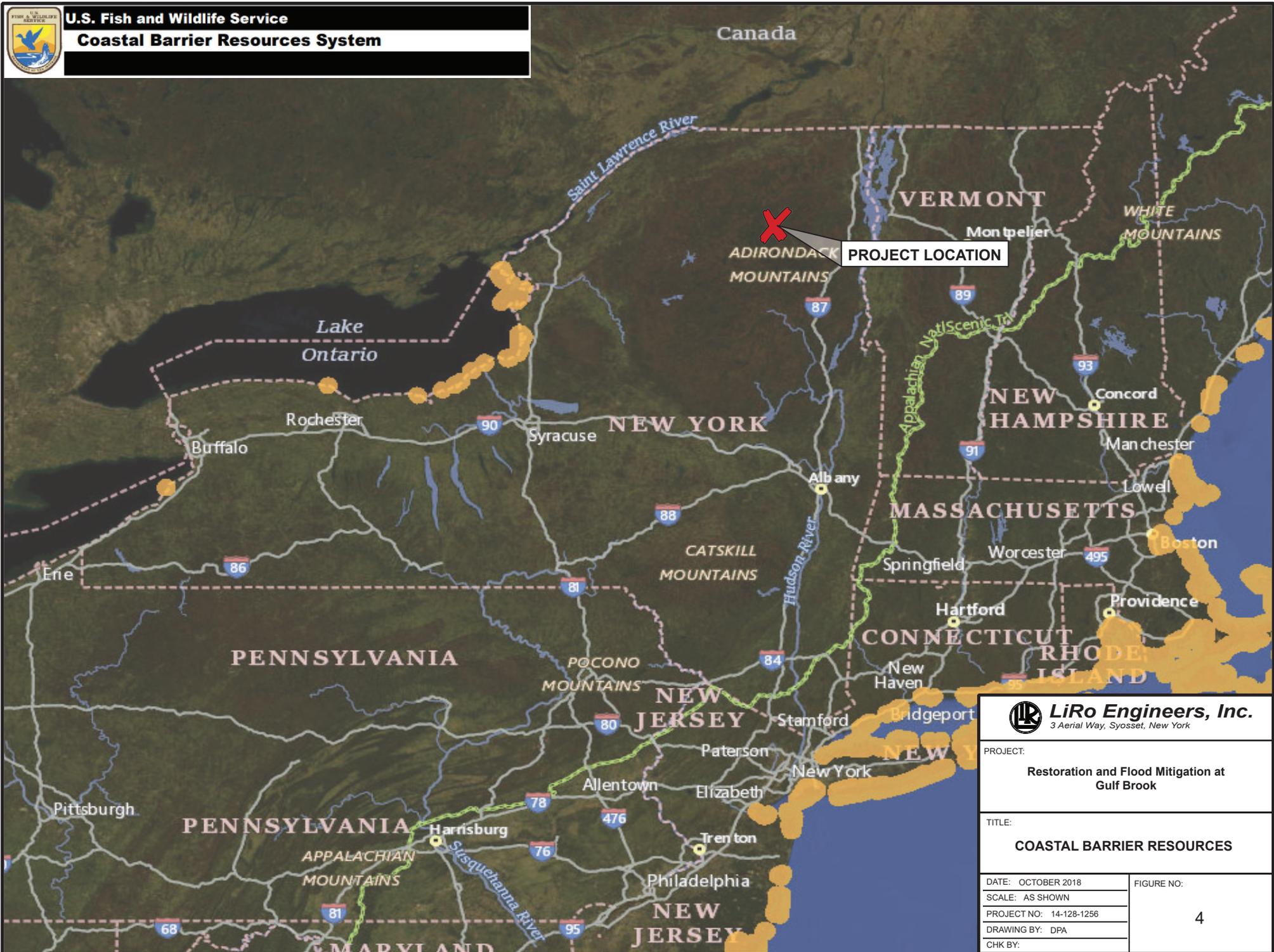
FIGURE NO: <b>2</b>
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 <b>LiRo Engineers, Inc.</b> 3 Aerial Way, Syosset, New York	
PROJECT: <b>Restoration and Flood Mitigation at Gulf Brook</b>	
TITLE: <b>AIRPORT HAZARDS</b>	
DATE: OCTOBER 2018	FIGURE NO: <b>3</b>
SCALE: AS SHOWN	
PROJECT NO: 14-128-1256	
DRAWING BY: DPA	
CHK BY:	



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



 <b>LiRo Engineers, Inc.</b> 3 Aerial Way, Syosset, New York	
PROJECT: <b>Restoration and Flood Mitigation at Gulf Brook</b>	
TITLE: <b>COASTAL BARRIER RESOURCES</b>	
DATE: OCTOBER 2018	FIGURE NO.:
SCALE: AS SHOWN	4
PROJECT NO: 14-128-1256	
DRAWING BY: DPA	
CHK BY:	

**ATTACHMENT 2**

**IPaC**



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
New York Ecological Services Field Office  
3817 Luker Road  
Cortland, NY 13045-9385

Phone: (607) 753-9334 Fax: (607) 753-9699

<http://www.fws.gov/northeast/nyfo/es/section7.htm>

In Reply Refer To:

November 05, 2018

Consultation Code: 05E1NY00-2019-SLI-0283

Event Code: 05E1NY00-2019-E-00928

Project Name: Gulf Brook Phase 3

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 13045-9385

(607) 753-9334

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## Project Summary

Consultation Code: 05E1NY00-2019-SLI-0283

Event Code: 05E1NY00-2019-E-00928

Project Name: Gulf Brook Phase 3

Project Type: \*\* OTHER \*\*

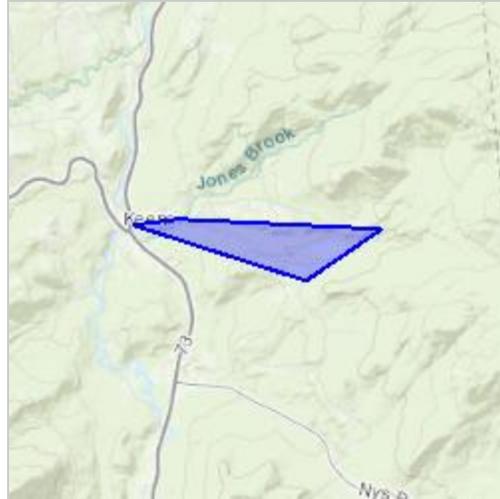
**Project Description:** The Gulf Brook Phase 3 project will include approximately 2,500 linear feet in the upper portion of Gulf Brook. Phase 3 has five distinct projects areas (see attached figures) These areas begin immediately upstream of the Ticknor property and continue upstream for approximately 1,000 feet east of the intersection of Jackson Road and Hurricane Road. During Tropical Storm Irene, damage to these five areas included the destruction of an undersized bridge; undermining of the road embankment and stream banks; severe deposition of woody debris and coarse sediment; severe erosion and down cutting in the river channel (i.e., incision); and large slope failure which contributed significant amounts of sediment and debris to the stream channel. The following flood mitigation and restoration measures will be implemented along this segment of Gulf Brook to protect downstream infrastructure, homes and businesses from future storm events:

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- Replacement of the undersized bridge;
- Floodplain / flood chute reconnection by re-grading and “roughening” the floodplain;
- Installation of grade control structures (i.e. weirs) to slow flood flow velocity and encourage the capture of debris and sediment;
- Stabilizing road banks (armoring and bioengineered stabilization techniques);
- Slope and toe protection at the base of the steep banks that failed; and
- Bioengineering to stabilize the upper slope.

**Project Location:**

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/44.25331438309051N73.76033365057141W>

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Counties: Essex, NY

## Endangered Species Act Species

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

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

## Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/5949">https://ecos.fws.gov/ecp/species/5949</a>	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

## Critical habitats

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

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**ATTACHMENT 3**

**NYSDEC Jurisdictional Review with Bat Location Map**

# 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](http://www.dec.ny.gov)

October 11, 2018

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

RE: Gulf Brook restoration and flood mitigation  
Town of Keene, Essex Co, NY

Dear Ms. Shultz,

We received your jurisdictional inquiry request for the Gulf Brook restoration and flood mitigation project in the town of Keene, Essex County. It is our understanding that flood mitigation will be provided for 4,000 linear feet along Gulf Brook, and will result in tree removal in five locations to facilitate access. Based on our understanding of the project and review of the NYS Resources map created by Amanda Bailey on 10/11/2018 (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>.



Department of  
Environmental  
Conservation

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](http://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,

A handwritten signature in black ink that reads "Amanda Bailey". The signature is written in a cursive, flowing style.

Amanda Bailey  
Division of Fish and Wildlife  
[Amanda.bailey@dec.ny.gov](mailto:Amanda.bailey@dec.ny.gov)  
518-402-8859

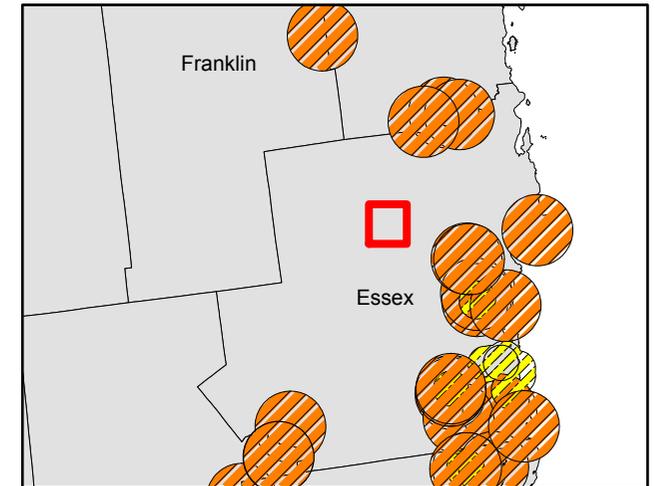
Cc: Lori Shirley, Governor's Office of Storm Recovery  
May O'Malley, NYSDEC Division of Environmental Permits  
Tim Watson, NYSDEC Regional Wildlife Biologist, Region 5  
Marc Migliore, NYSDEC Regional Permit Administrator, Region 5



# NYS Resources Map

## Gulf Brook Phase III Keene, Essex County

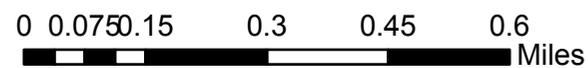
Prepared by AMB on 10/11/2018



-  Project Area
-  Indiana Bat
-  Northern Long-eared Bat



**Department of  
Environmental  
Conservation**



1 inch = 1,250 feet

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.

# NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

## Division of Environmental Permits

625 Broadway, 4th Floor, Albany, New York 12233-1750  
P: (518) 402-9167 | F: (518) 402-9168 | [deppermitting@dec.ny.gov](mailto:deppermitting@dec.ny.gov)  
[www.dec.ny.gov](http://www.dec.ny.gov)

May 1, 2017

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

RE: Restoration and Flood Mitigation at Beede and Gulf Brooks  
Town of Keene , Essex County

Dear Ms. Shirley:

We received your jurisdictional inquiry request for Restoration and Flood Mitigation at Beede and Gulf Brooks located at Gulf Brook as it empties into the Walton Brook near the intersection of NYS Route 9N and State Hwy 73 and Beed Brooks near the intersection of State Hwy 73 and St Huberts Rd in the Town of Keene, Essex County. It is our understanding that the project will be to regrade and roughen the floodplain, design a flood chute for overbank flow, and stabilize the embankment, rebuild the bridge, in-stream restoration work includes change of slope and widening the channel, rebuild washed out road, grade control, and debris removal. For Beede Brook they will install grade contract and drop structures to maintain channel slope and dissipate high flow energy with in the brook, expand the capacity of Gulf Brook to transport water and sediment through restoration of the floodplain and stabilized road embankments. Based on our understanding of the project and review of the Pre-Application Report dated 8/16/16, we have the following comments on the project:

## WATER

Protection of Waters: A *stream/pond* is located within your project/site. The following provides a summary of the *stream(s)/pond(s)* within the project/site:

Name	Class	Waters Index Number
Beede Brook	AA(T)	C-25-27-38
Ausable River	AA	C-25-27
Gulf Brook	AA(T)	C-25-27-26

An Article 15, Protection of Waters Permit, pursuant to 6NYCRR Part 608 is required for any disturbance to the bed and banks of *this/these stream(s)/pond(s)*.



Please note that any project undertaken shall not result in the degradation or contravening of water quality standards of the stream. Activities resulting in sedimentation and/or turbid waters may constitute a violation of water quality standards and the Environmental Conservation Law (ECL). Care needs to be taken to stabilize the disturbed areas promptly after construction, and all necessary precautions be taken to prevent contamination of the stream by silt, sediment, fuels, solvents, lubricants, or any other pollutant associated with the project.

Stormwater Permit: If your project will disturb more than one acre of land, you must comply with the State Pollutant Discharge Elimination System (SPDES) Phase II regulations for Stormwater Discharges Associated with Construction Activities. Information regarding the SPDES General Permit for Stormwater Discharges can be found on the Department's website at: <http://www.dec.ny.gov/chemical/8468.html>.

### **STATE-LISTED SPECIES**

We have reviewed the available information in the New York Natural Heritage Program database on known occurrences of rare or state-listed animals and plants, significant communities and other significant habitats. No records of *known* occurrences were found in the (immediate) vicinity of the project/site.

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. Additional information on the proposal will be required for a determination on the need for a permit.

The absence of data does not necessarily mean that any other rare or state-listed species, natural communities or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain information which indicates their presence. For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on 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.

### **CULTURAL RESOURCES**

Your project/site appears to be located within an area of potential historical or archeological significance. If approvals/permits are needed from this Department, we may require consultation with the Office of Parks, Recreation and Historic Preservation (OPRHP) in order to better evaluate this project's impact to these resources.

For more information, please visit the New York State Office of Historic Preservation website at <http://www.nysparks.com/shpo/>.

**OTHER**

Adirondack Park Agency

Your project/site appears to be located within an area of Adirondack Park Agency. If approvals/permits are needed from this Department, we may require consultation with the Adirondack Park Agency.

For more information, please visit the New York State Adirondack Park Agency website at <https://apa.ny.gov/>.

Please note that this letter only addresses the requirements for the following permits from the Department:

Protection of Waters

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](http://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,

A handwritten signature in black ink that reads "May O'Malley". The signature is written in a cursive, slightly slanted style.

May O'Malley  
Division of Environmental Permits  
[may.omalley@dec.ny.gov](mailto:may.omalley@dec.ny.gov)  
518-402-9154

Cc: NYSDEC Region 5 Environmental Permits

**Attachment 4**  
**Habitat Assessment**

APPENDIX A  
PHASE 1 SUMMER HABITAT ASSESSMENTS

INDIANA BAT HABITAT ASSESSMENT DATASHEET

Project Name: Gulf Brook Phase III Date: 10/26/2018  
 Township/Range/Section: Keene, Essex County, NY  
 Lat Long/UTM/ Zone: 18N 596784.35 E // 4900916.86 N Surveyor: A. Bailey

**Brief Project Description**

This project will work on providing flood mitigation for the Gulf Brook. The total project will address constrictions to the brook at the location of the Bucks Lane Bridge. This bridge may be replaced, and the shore bank will be stabilized. Sediment will be removed to change the channels and stabilize the banks.

**Project Area**

Project	Total Acres	Forest Acres		Open Acres
	~ 1 acre	~1 acre		
Proposed Tree Removal (ac)	Completely cleared	Partially cleared (will leave trees)	Preserve acres- no clearing	
	~0.25 acres		0.75 acres	

**Vegetation Cover Types**

Pre-Project	Post-Project
The project is located along Jones Brook. This brook runs along Hurricane Rd, and the area off the road is primarily forested.	The majority of the area will still be forested, with clearing for access to the project areas. .

**Landscape within 5 mile radius**

**Flight corridors to other forested areas?**

This project does not impact flight corridors to other forested areas. Flight corridors still exist.

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

The project site is located on Gulf Brook, just outside of the town of Keene (0.10 mi from town). The NLCD layer has the project area as partially open space (developed), and partially 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 area is located within the Adirondack Park. It is located approximately 1 mile from the Boreas Ponds Wilderness, and about 3/4 miles from the Hurricane Mountain Wilderness area.

## APPENDIX A PHASE 1 SUMMER HABITAT ASSESSMENTS

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*

<b>Sample Site Description</b>
Sample Site No.(s): <u>  1  </u>

Water Resources at Sample Site			
<b>Stream Type (# and length)</b>	Ephemeral 140 m	Intermittent	Perennial
<b>Pools/Ponds (# and size)</b>	Open and accessible to bats?		
<b>Wetlands (approx. ac.)</b>	Permanent 0	Seasonal 0	
Describe existing condition of water sources:  The project is located on Gulf Brook/ Jones Brook. The water at this location is fast moving, with few pools.			

Forest Resources at Sample Site			
<b>Closure/Density</b>	Canopy (> 50')	Midstory (20-50')	Understory (<20')
	2	2	1
<b>Dominant Species of Mature Trees</b>	White pine, spruce, beech		
<b>% Trees w/ Exfoliating Bark</b>	0	1%	0
<b>Size Composition of Live Trees (%)</b>	Small (3-8 in)	Med (9-15 in)	Large (>15 in)
	60%	40%	0
<b>No. of Suitable Snags</b>	5		

1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%

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?   Yes, see comment  

<p><b>Additional Comments:</b></p> <p>This area may potentially support a roost tree and/or foraging habitat. It is on the slopes of a hill, which quickly rises above 1000 feet, ruling out the potential for Indiana bat at other project areas (this assessment is only for Project Area #1, where IPaC listed a potential for Indiana bats). However, the Project Area #1 does have a number of potential trees that could be used, and is at a suitable elevation. The small number of trees to be removed in the area (based on the current plans) may make an emergence count a feasible way to move forward if winter clearing cannot be completed.</p>
---

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

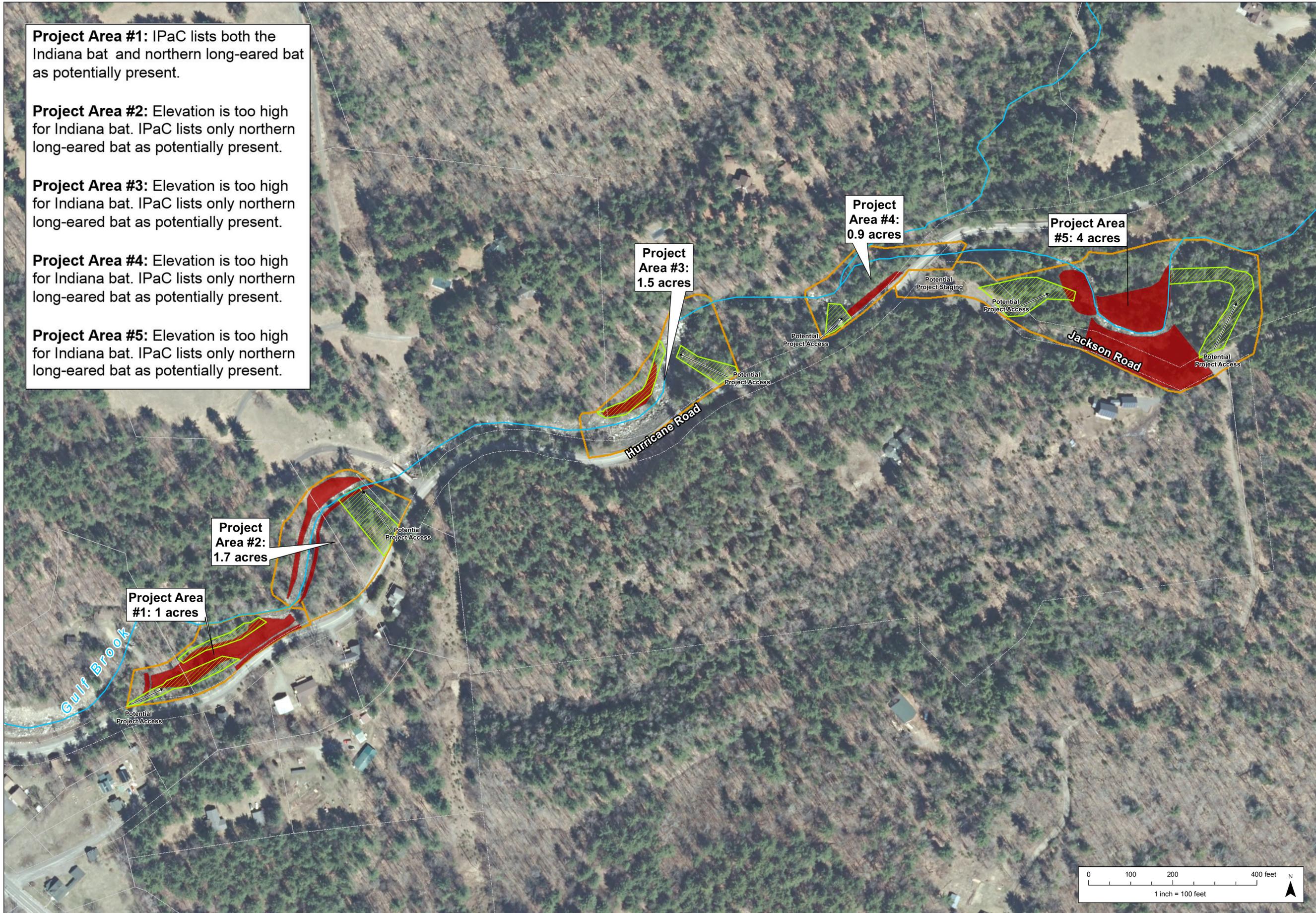
**Project Area #1:** IPaC lists both the Indiana bat and northern long-eared bat as potentially present.

**Project Area #2:** Elevation is too high for Indiana bat. IPaC lists only northern long-eared bat as potentially present.

**Project Area #3:** Elevation is too high for Indiana bat. IPaC lists only northern long-eared bat as potentially present.

**Project Area #4:** Elevation is too high for Indiana bat. IPaC lists only northern long-eared bat as potentially present.

**Project Area #5:** Elevation is too high for Indiana bat. IPaC lists only northern long-eared bat as potentially present.



**Notes**  
 - No mapped wetlands in Phase III project area per Adirondack Park Agency.  
 - NYSODP Imagery from 2017.  
**Map By:** EHB and JHB  
**Date:** October 1, 2018

**Depth of Disturbance\***  
 Greater than 2ft  
 \*Tree removal required in depth of disturbance areas.

**Stream Centerline**  
**Parcel Boundary**  
**Potential Tree Clearing Area of Potential Extent (APE)**

**Gulf Brook Phase III  
 Keene, NY**  
**Project Areas for Review**

**Fitzgerald Environmental Associates, LLC.**  
 18 Severance Green, Suite 203  
 Colchester, VT 05446  
 Tel: 802-256-7276  
 www.fitzgeraldenvironmental.com

**ESPC**  
 civil and environmental engineering

**GULF BROOK RESTORATION AND FLOOD MITIGATION PROJECT  
ESSEX COUNTY, NY**

**APPENDIX C  
NYSDEC NHP RESPONSE**

# 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

October 29, 2018

Alicia Shultz  
RITM2813061  
38-40 State Street  
Albany, NY 12207

Re: Gulf Brook Restoration and Flood Mitigation Project  
County: Essex    Town/City:

Dear Ms. Shultz:

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

We have no records of rare or state-listed animals or plants, or significant natural communities at the project site.

Within 1/4 mile of the western portion of the project site is a documented nesting location of **Cape May warbler** (*Setophaga tigrinia*). While not listed by New York State as Endangered or Threatened, this species is a rare breeder in New York and of conservation concern. It is possible that Cape May warblers may be found in or adjacent to parts of the project site. Should any work under this project be conducted in areas with spruce, fir, or other evergreen trees, we recommend that any removal or disturbance of these trees be avoided or minimized.

For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on 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 resources may be required to fully assess impacts on biological resources.

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 5 Office, Division of Environmental Permits, at [dep.r5@dec.ny.gov](mailto:dep.r5@dec.ny.gov).

Sincerely,



Nicholas Conrad  
Information Resources Coordinator  
New York Natural Heritage Program

1195



## Governor's Office of Storm Recovery

ANDREW M. CUOMO  
Governor

LISA BOVA-HIATT  
Executive Director

October 10, 2018

New York State Department of Environmental Conservation  
Division of Fish, Wildlife & Marine Resources  
New York Natural Heritage Program – Information Services  
625 Broadway, 5th Floor  
Albany, New York 12233-4757

Re: Natural Heritage Compliance Process Request for the Gulf Brook Restoration and Flood Mitigation Project (Essex County, NY)  
Southeast portion of project at 44°15'22.95" North and -73°47'31.87" West  
Northwest portion of project at 44°15'25.46" North and -73°46'40.41" West

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 & Urban Development (HUD), are currently preparing an Environmental Assessment (EA) for the Essex County Gulf Brook Restoration and Flood Mitigation Project (see Figure 1). GOSR is acting as HUD's non-federal representative for the purposes of conducting consultation pursuant to Section 7 of the Endangered Species Act. The proposed project area is defined as Gulf Brook located immediately upstream of the Bucks Lane Bridge and downstream to the confluence of the East Branch of the Ausable River.

In its current state, Gulf Brook is straightened and confined between the bluff and Routes 9N and 73. There are two bridges that span Gulf Brook. One being a New York State Department of Transportation Bridge on Route 9N and a smaller Essex County Bridge (also referred to as Bucks Lane Bridge) that provides access to several private residences.

The project will provide flood mitigation for approximately 1,500 linear feet in the lower portion of Gulf Brook (Gulf Brook Phase II) and approximately 2,500 feet in the upper portion of Gulf Brook (Gulf Brook Phase III). This will address constrictions caused by the two bridges. It has been previously determined that the Bucks Lane Bridge opening is not wide enough to facilitate the design flow of this project.

Proposed improvements will increase water and sediment transport capacity of Gulf Brook and restore its natural function. The design goals are to mitigate flood risk and also to enhance the environmental health by addressing bank erosion, thereby improving water quality, and improving aquatic and riparian habitat. The Proposed Action provide flood mitigation for approximately 4,000 linear feet of Gulf Brook and will address constrictions caused by the two bridges. Portions of Gulf Brook will be excavated for changes in channels and bank stabilization. The banks of the brook will be stabilized with by reinforcing the banks with rip rap, rocks and vegetation. The existing County Bridge (Bucks Lane Bridge) may be dismantled, removed and replaced with a new steel and concrete structure to provide the proper sizing of the hydraulic opening. At the Route 9N bridge, sediment will be removed increasing the opening under the bridge to sufficiently allow passage of significant storm event water. Culverts may be constructed or replaced.

The purpose of this letter is to provide the New York State Department of Environmental Conservation (DEC) Natural Heritage Program (NYNHP) notice of the proposed project and determine whether the proposed project has the potential to impact any state or federal endangered, threatened, or rare species or significant natural communities.

### **Program Overview**

During Hurricane Irene, rainfall caused Gulf Brook to overflow its banks and flow down the center of Route 9N. Floodwater inundated roadways, homes and businesses and caused severe damage. Completion of the proposed project fosters the recovery of the community by reducing the risk of localized flooding for the residences and businesses in the Town of Keene and by providing a flood-safe area for redevelopment of residential and commercial facilities in the Town.

The severe slopes and instability of the stream bank contributed to slope failure, deposition of tons of debris and degradation of aquatic habitat. The impacts to the project area from Hurricane Irene caused unprecedented destruction of the natural features of the riparian environment. Since the storm, some efforts have succeeded in the reconstruction of much of the damaged infrastructure and to protect some properties from damage in future storms, but while these measures have stabilized the channel banks and provided flood mitigation in specific areas, properties adjacent to other parts of the stream, particularly downstream of the Bucks Lane Bridge still remain vulnerable.

### **Compliance**

According to information reviewed from the New York State Environmental Resource Mapper, there are rare plants or animals known to exist in on the site and the Essex County species lists identifies the Indiana Bat (*Myotis sodalists*) and North Long-eared Bat (*Myotis septentrionalis*). **GOSR respectfully requests NYNHP review the proposed project and location and provide consultation on whether or not the proposed project is likely to adversely affect the project location and review locations of proposed project for any records of rare species or significant natural communities in the natural heritage databases which are in the vicinity and which may be impacted by the Project Action.**

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.

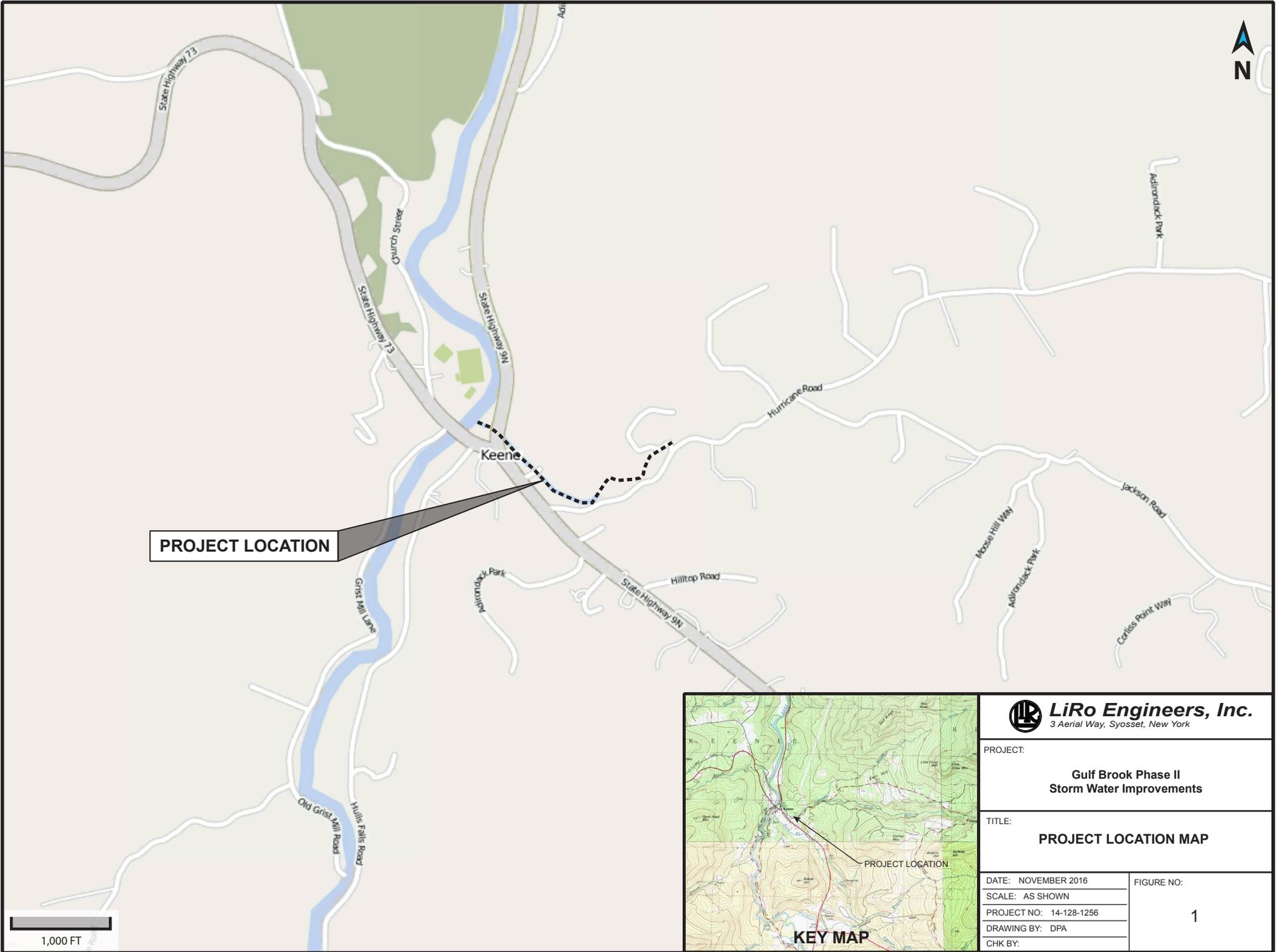
Sincerely,



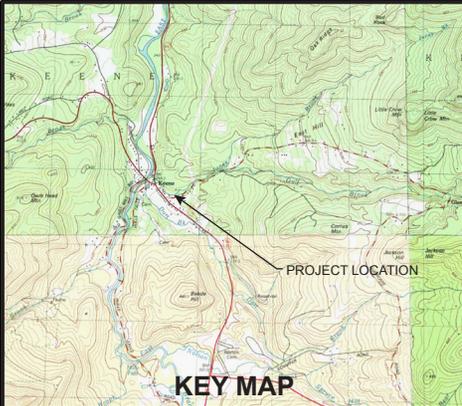
Alicia Shultz  
Senior Environmental Scientist  
New York State Homes and Community Renewal  
38-40 State Street, Hampton Plaza  
Albany NY 12207

Attachments:

Project Location Gulf Brook Phase II  
Project Location Gulf Brook Phase III



**PROJECT LOCATION**



**KEY MAP**

**LiRo Engineers, Inc.**  
3 Aerial Way, Syosset, New York

PROJECT:  
**Gulf Brook Phase II  
Storm Water Improvements**

TITLE:  
**PROJECT LOCATION MAP**

DATE: NOVEMBER 2016  
SCALE: AS SHOWN  
PROJECT NO: 14-128-1256  
DRAWING BY: DPA  
CHK BY:

FIGURE NO:  
**1**



**Notes**  
 - No mapped wetlands in Phase III project area per Adirondack Park Agency.  
 - NYSODP imagery from 2017.  
**Map By:** EHB and JHB  
**Date:** October 1, 2018

**Depth of Disturbance\***  
 Greater than 2ft  
 \*Tree removal required in depth of disturbance areas.

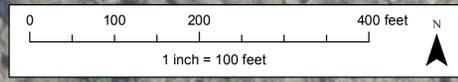
**Stream Centerline**  
**Parcel Boundary**  
**Potential Tree Clearing Area of Potential Extent (APE)**

**Gulf Brook Phase III  
 Keene, NY**

**Project Areas for Review**

**Fitzgerald Environmental Associates, LLC.**  
 18 Severance Green, Suite 203  
 Colchester, VT 05446  
 Tel: 802.256.7276  
 www.fitzgeraldenvironmental.com

**ESPC**  
 civil and environmental engineering



# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Essex County, New York



# Local office

New York Ecological Services Field Office

☎ (607) 753-9334

📅 (607) 753-9699

3817 Luker Road  
Cortland, NY 13045-9385

<http://www.fws.gov/northeast/nyfo/es/section7.htm>

NOT FOR CONSULTATION

# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information.
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

## Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. <a href="https://ecos.fws.gov/ecp/species/5949">https://ecos.fws.gov/ecp/species/5949</a>	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS

ENTIRE RANGE. "BREEDS ELSEWHERE"  
INDICATES THAT THE BIRD DOES NOT  
LIKELY BREED IN YOUR PROJECT AREA.)

### Bobolink *Dolichonyx oryzivorus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Jul 31

### Wood Thrush *Hylocichla mustelina*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 10 to Aug 31

## Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is

the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .

- The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

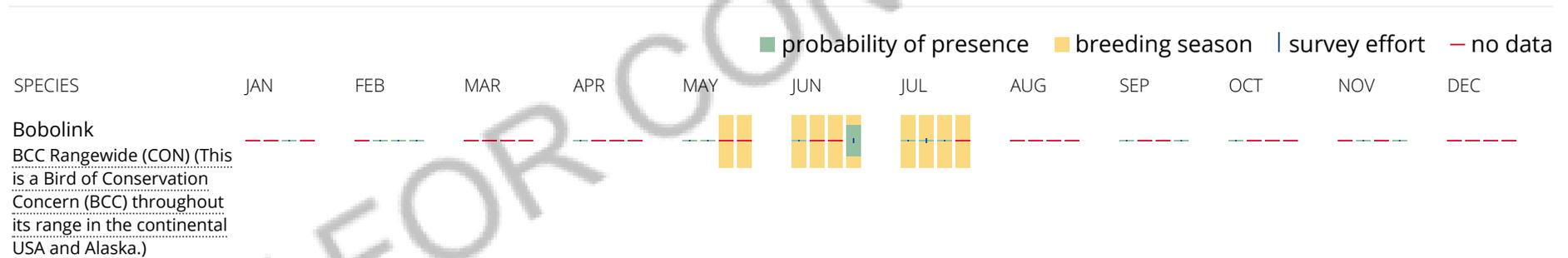
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

### No Data (—)

A week is marked as having no data if there were no survey events for that week.

### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Wood Thrush  
 BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



### Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

### What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [E-bird Explore Data Tool](#).

### What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

### Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

## Facilities

### National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

### Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

### Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

[PFO1E](#)

RIVERINE

[R3UBH](#)

[R5UBH](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

#### Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

#### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

**GULF BROOK RESTORATION AND FLOOD MITIGATION PROJECT  
ESSEX COUNTY, NY**

**APPENDIX D  
SHPO CONSULTATION AND TRIBAL LETTER**



## Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO  
Governor

ROSE HARVEY  
Commissioner

September 20, 2017

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

Re: HTF/ GOSR/ HUD CDBG-DR  
Gulf Brook Restoration and Flood Mitigation Project  
NYS Route 73 at NYS Route 9N, Keene/ Essex County  
16PR08582

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 Section 106 (Title 54, Section 306108) of the National Historic Preservation Act of 1966. These comments 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 this review, it is the opinion of SHPO that there will be No Historic Properties Affected by the proposed undertaking.

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

Sincerely,

A handwritten signature in cursive script that reads "Larry K Moss".

Larry K Moss, Historic Preservation Technical Specialist

CC: Lori Shirley

---

### Division for Historic Preservation

P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • [www.nysparks.com](http://www.nysparks.com)



ANDREW M. CUOMO  
Governor

LISA BOVA-HIATT  
Executive Director

December 15, 2016

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 Gulf Brook Restoration and Flood Mitigation Project,  
Keene, Essex 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. GOSR proposes to fund stream bank restoration and flood mitigation work to a section of Gulf Brook in Keene, New York. 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 Saint Regis Mohawk Tribe and the Mohawk Nation.

Area of Potential Effect: GOSR proposes to fund an application for stream bank restoration and flood mitigation work to a section of Gulf Brook, located in the Hamlet of Keene, within the Town of Keene, which is located at the intersection of NYS Routes 73 and 9N, Essex County, New York. A map depicting the area of potential effect is enclosed with this letter.

Proposed Project Description: During Hurricane Irene, rainfall caused Gulf Brook to overflow its banks and flow down the center of Route 9N. Floodwater inundated roadways, homes and businesses and caused severe damage. Completion of the proposed project fosters the recovery of the community by reducing the risk of localized flooding for the residences and businesses in the Town of Keene and by providing a flood-safe area for redevelopment of residential and commercial facilities in the Town.



**ANDREW M. CUOMO**  
Governor

**LISA BOVA-HIATT**  
Executive Director

The severe slopes and instability of the stream bank contributed to slope failure, deposition of tons of debris and degradation of aquatic habitat. The impacts to the project area from Hurricane Irene caused unprecedented destruction of the natural features of the riparian environment. Since the storm, some efforts have succeeded in the reconstruction of much of the damaged infrastructure and to protect some properties from damage in future storms, but while these measures have stabilized the channel banks and provided flood mitigation in specific areas, properties adjacent to other parts of the stream, particularly downstream of the Bucks Lane Bridge still remain vulnerable.

The proposed project area is defined as Gulf Brook located immediately upstream of the Bucks Lane Bridge and downstream to the confluence of the East Branch of the Ausable River. In its current state, Gulf Brook is straightened and confined between the bluff and Routes 9N and 73. There are two bridges that span Gulf Brook. One being a New York State Department of Transportation Bridge on Route 9N and a smaller Essex County Bridge (also referred to as Bucks Lane Bridge) that provides access to several private residences. The project will provide flood mitigation for approximately 1,500 linear feet and will address constrictions caused by the two bridges. It has been previously determined that the Bucks Lane Bridge opening is not wide enough to facilitate the design flow of this project.

Proposed improvements will increase water and sediment transport capacity of Gulf Brook and restore its natural function. The design goals are to mitigate flood risk and also to enhance the environmental health by addressing bank erosion, thereby improving water quality, and improving aquatic and riparian habitat. The project may require the replacement of the County Bridge and realignment of the outfall in to the East Branch of the Ausable River. The construction for the project will involve the excavation and digging for changes in channels and bank stabilization. In addition, the existing County Bridge (Bucks Lane Bridge) may be dismantled, removed and replaced with a new steel and concrete structure, and culverts may be constructed or replaced. Construction will require digging/earthwork.

With this letter, GOSR respectfully submits for your review the attached documentation for the proposed project(s) described herein. Consultation has been initiated with the State Historic Preservation Office but no comments from SHPO 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 20 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  
Deputy Director, Bureau of Environmental Services  
New York State Homes & Community Renewal  
38-40 State St., 408N, Hampton Plaza  
Albany, NY 12207



**Governor's Office of  
Storm Recovery**

**ANDREW M. CUOMO**  
Governor

**LISA BOVA-HIATT**  
Executive Director

If you have any questions or require additional information regarding this request, please feel free to contact me at (518) 474-0755 or via email at [lori.shirley@nyshcr.org](mailto:lori.shirley@nyshcr.org). Thank you for your time and consideration.

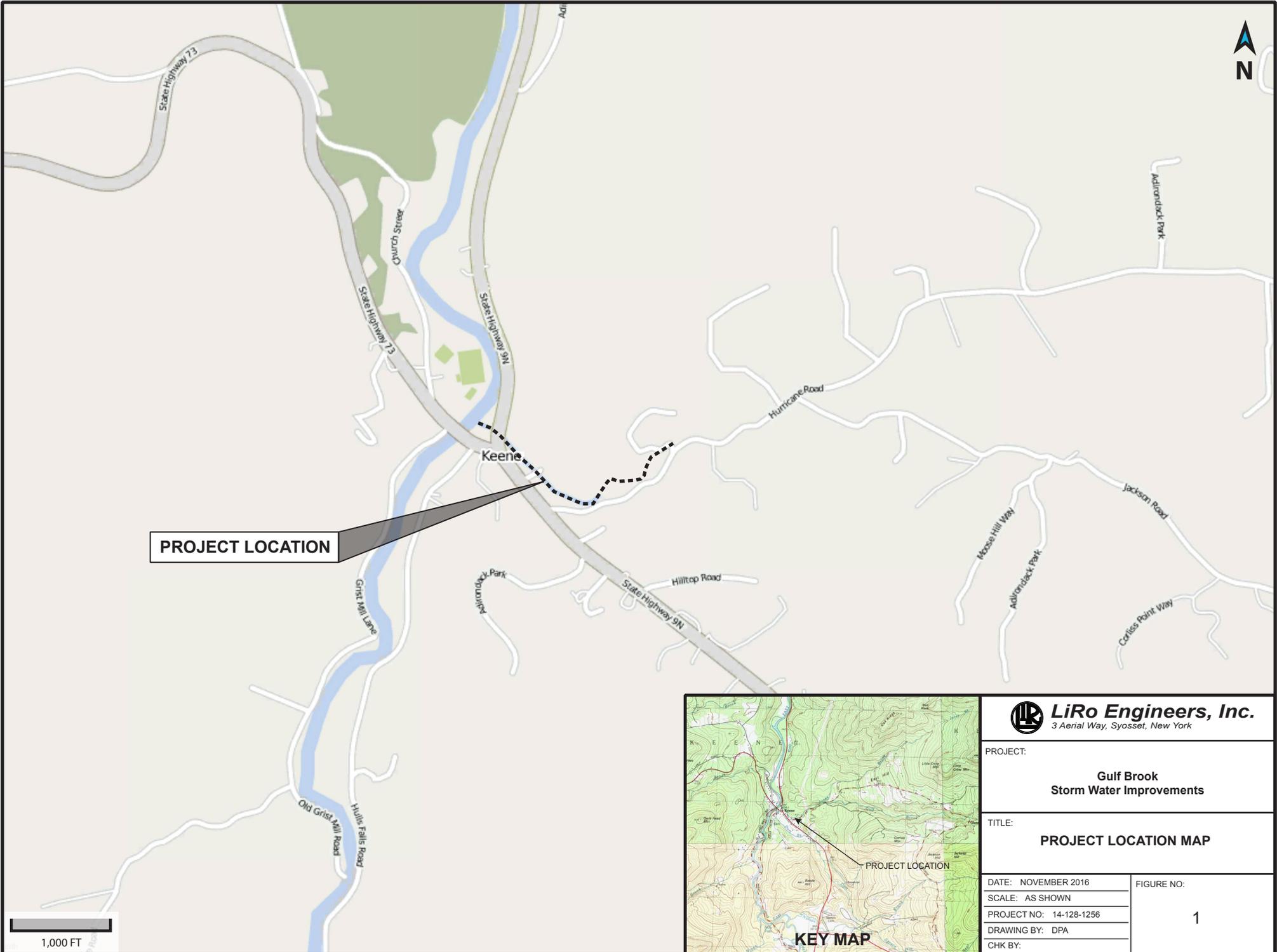
Sincerely,

Lori A. Shirley  
Director  
Bureau of Environmental Review and Assessment  
Governor's Office of Storm Recovery

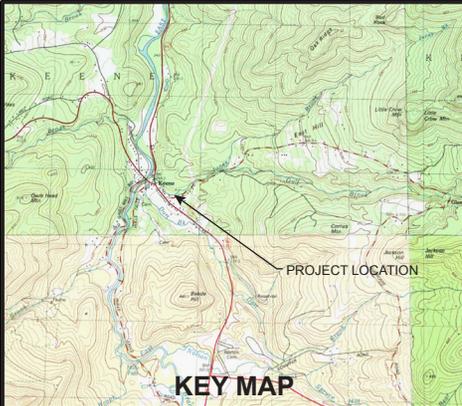
**Enclosures:** Project Location Maps

**Electronic letter sent to:**

Arnold Printup  
Saint Regis Mohawk Tribe, THPO  
412 State Route 37  
Akwesasne, NY 13655



**PROJECT LOCATION**



**KEY MAP**

**LiRo Engineers, Inc.**  
3 Aerial Way, Syosset, New York

PROJECT:  
**Gulf Brook  
Storm Water Improvements**

TITLE:  
**PROJECT LOCATION MAP**

DATE: NOVEMBER 2016  
SCALE: AS SHOWN  
PROJECT NO: 14-128-1256  
DRAWING BY: DPA  
CHK BY:

FIGURE NO:  
**1**



 **LiRo Engineers, Inc.**  
3 Aerial Way, Syosset, New York

PROJECT:  
**Gulf Brook  
Storm Water Improvements**

TITLE:  
**PROJECT LOCATION AERIAL**

DATE: NOVEMBER 2016  
SCALE: AS SHOWN  
PROJECT NO: 14-128-1256  
DRAWING BY: DPA  
CHK BY:

FIGURE NO:  
**2**