Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Schoharie County, NY
Environmental Review Record

Photo credit: Schoharie County Soil and Water District

Prepared by Tetra Tech Inc.
1999 Harrison Street, Suite 500
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New York State Homes and Community Renewal
Governor's Office of Storm Recovery
38-40 State Street
Albany, NY 12207

October 5, 2017

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements

Environmental Review Record

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Project Name:	Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements Project
Project Location:	Grove Street, Clauverwie Road, and Gorge Creek, Village of Middleburgh, Schoharie County, NY
Federal Agency:	US Department of Housing and Urban Development
Responsible Entity:	New York State Homes and Community Renewal
Responsible Agency's Certifying Officer:	Lori A. Shirley, Governor's Office of Storm Recovery, Certifying Officer
Project Sponsor:	Schoharie County Soil and Water Conservation District
Primary Contact:	Peter Nichols Stream Program Manager (518) 823-4535 p.nichols@schoharieswcd.org
Project NEPA Classification:	24 CFR 58.36 (Environmental Assessment)

Environmental Finding:	**X** 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

Environmental Assessment Prepared By: Consultant: **Tetra Tech, Inc.**
Address: 1999 Harrison Street, Suite 500
Address: Oakland, CA 94612

CERTIFICATION OF NEPA CLASSIFICATION

It is the finding of the New York State Housing Trust Fund Corporation that the activity(ies) proposed in its 2017 NYS CDBG-DR project, Gorge Creek Stormwater Management Improvements Project 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.

Lori A Shirley

Signature of Certifying Officer	October 5, 2017 Date

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

CERTIFICATION OF SEQRA CLASSIFICATION

It is the finding of the New York State Housing Trust Fund Corporation that the activity(ies) proposed in its 2107 NYS CDBG-DR project, Gorge Creek Stormwater Management Improvements Project constitute a:

Check the applicable classification:

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

Check if applicable:

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

Lori A Shirley

Signature of Certifying Officer

October 5, 2017

Date

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

Description of the Proposed Project [24 CFR 50.12 & 58.32; 40 CFR 1508.25]**:**
The Schoharie County Soil and Water Conservation District (SWCD) is proposing the Gorge Creek culvert repair and storm water and drainage infrastructure improvements project for the Village of Middleburgh in the Town of Middleburgh, Schoharie County, New York (see **Appendix A**, Figures). The project would be constructed in three areas: Middleburgh Junior/Senior High School at Clauverwie Road and Main Street (State Route 145); Gorge Creek upstream, between Straub Lane and slightly east of Hayes Lane along the south side of Gorge Creek where it parallels the road M T Path; and from Grove Street down to Schoharie Creek. Improvements include a new box culvert, upstream expansion of the Gorge Creek floodplain and installation of a sedimentation pond, and a new or improved storm sewer system, provided sufficient funding is available.

The new box culvert would cross under New York State (NYS) Route 145 to Clauverwie Road, continue under Clauverwie Road for approximately 320 feet, proceed underground on the west side of Clauverwie Road and south of the Middleburgh Junior/Senior High School, and discharge to Gorge Creek approximately 175 feet south of the school. Approximately 140 linear feet of gabion baskets would be installed along the west side of Gorge Creek, between the creek and the school ball fields, to protect the ball fields from increased flow in Gorge Creek during storm events.

The box culverts would be complemented by expansion of the Gorge Creek floodplain. Grading of the floodplain expansion and the sedimentation pond would require removal of approximately 15,430 cubic yards of fill, which would be incorporated into grading of the site outside the existing and proposed floodplain. Approximately 300 linear feet of the deepest part of the stream channel would be shifted 20 to 25 feet south. The floodplain expansion and sedimentation basin are intended to reduce stream flow velocity during storm events and provide a location for sediment and debris to settle. The debris basin will be located slightly upstream of the existing pipe at the beginning of the project on Gorge Creek. The basin will be significantly wider than the stream, slowing the velocity of the flow. As the velocity decreases, the debris will settle out and drop, reducing the potential for plugging the pipes just downstream. This portion of the Project would minimize the accumulation of sediment and associated reduction in the flow capacity in the proposed box culvert. Construction will require obtaining a permanent easement on two parcels: 0.75 acre on parcel number 106.20-1-24 (total parcel size 3.86 acres), and 3.16 acres on parcel number 106.20-1-5.111 (total parcel size 18.6 acres). The required easement area on the two parcels involved is currently vacant land and under the Project will remain vacant land.

The storm sewer improvements would be constructed on all or a portion of the following streets: Railroad Avenue, Grove Street, Main Street (NYS Route 145), and Baker Avenue. The system would discharge to the Schoharie Creek on the west side of Dexter Avenue. The Project is not expected to result in a change in land use, but could require land acquisition.

The Project is designed to accommodate potential storm water runoff from a 100-year storm. During previous storm events, significant flooding occurred at Middleburgh High School and the surrounding area resulting from the undersized drainage infrastructure. The Project is anticipated to entail substantial earthwork.

The Project would be undertaken in two phases. Phase I of the Project includes a hydrology and hydraulics (H and H) and detailed drainage study. Phase II includes construction of the improvements. The Village of Middleburgh will evaluate solutions offered in the H and H study to provide solutions to address deficiencies in the storm water control infrastructure. The Project is not expected to result in a change in land use. Land acquisition could be required for construction and implementation of this Project. It is anticipated that the Village of Middleburgh would maintain the storm water improvement portion of the Project that is not located in the New York State highway right-of-way. It is also anticipated that the New York State Department of Transportation (NYSDOT) will maintain the portion of the improvements in the New York State highway right-of-way, as well as the Gorge Creek culvert repair portion of this Project.

Statement of Purpose and Need for the Proposal [40 CFR 1508.9(b)]:
Hurricane Irene and Tropical Storm Lee caused significant flooding at the Middleburgh High School because of the lack of drainage for Gorge Creek. Its channel runs under the school, where drainage infrastructure was overwhelmed by the volume of storm water and debris. Without mitigation, this channel will continue to flood in major storm events, potentially stranding the approximately250 students who attend Middleburgh High School. This project will reduce the risk of localized flooding and increase access to emergency shelter when future storm events occur. The purpose of the proposed improvements is to mitigate future system failures and associated property loss by providing secure and reliable drainage infrastructure. The proposed Project will ensure a safe and healthy environment for the local residents, businesses, and visitors.

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

The Village of Middleburgh is situated in the central portion of the Town of Middleburgh and lies almost entirely within the floodplain of Schoharie Creek. It is surrounded by steep slopes. The main transportation routes are State Route 30 (River Street) and State Route 145 (Main Street) that meet in at the bridge over Schoharie Creek in the center of the Village. Middleburgh has experienced a steady increase in population and an overall increase in population age. The largest employer in the Village is the Central School district. (**Source: 2**)

<u>Standard Conditions for All Projects</u>
Any change to the approved scope of work will require re-evaluation by the Certifying Officer for compliance with the National Environmental Policy Act (NEPA) and other laws and Executive Orders.

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

Funding Information

Estimated Total HUD Funded Amount:
$3,000,000

Estimated Total Project Cost (HUD and non-HUD funds) [24 CFR 58.32(d)]**:**
$3,000,000

Compliance with 24 CFR 58.5 and 58.6 Laws and Authorities

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

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 58.6		
Airport Hazards 24 CFR Part 51 Subpart D	Yes ☐ No ☒	Based on HUD guidance in Fact Sheet #D1, the National Plan of Integrated Airport Systems (NPIAS) was reviewed for civilian commercial service airports near the Project site, as projects within 2,500 feet of a civil airport require consultation with the appropriate civil airport operator. There are no military airports within 15,000 feet of the Project site, and it is not within 2,500 feet of any civil airport. (See **Appendix A**, Figures) **Source: 3, 4**
Coastal Barrier Resources Coastal Barrier Resources Act, as amended by the Coastal Barrier Improvement Act of 1990 [16 USC 3501]	Yes ☐ No ☒	The Project site is not in a Coastal Barrier Resources Area as defined by the state's Coastal Zone Management Program. (See **Appendix A**, Figures) **Source: 5, 6**
Flood Insurance Flood Disaster Protection Act of 1973 and National Flood Insurance Reform Act of 1994 [42 USC 4001-4128 and 42 USC 5154a]	Yes ☐ No ☒	Approximately 4.9 acres of the Project area is within the 100-year Special Flood Hazard Area (SFHA) Zone AE, 1.4 acres of which is within the floodway, as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel Number 36059C0302E, dated April 2, 2004. The floodway includes

		the channel of the stream plus any adjacent floodplain areas that must be kept free of encroachments so that a one percent annual chance flood (100-year flood) can be accommodated without substantial increases in flood height. A 1.4-acre portion of the Project area parallel to MT Path is in Zone X, within the limits of the 500-year floodplain; and the remaining 6.9 acres is in the area of minimal flood hazard. A local floodplain development permit would be obtained prior to construction activities. The Project would not involve financial assistance for construction, rehabilitation, or acquisition of a mobile home, building, or insurable personal property or the purchase of machinery, equipment, fixtures, or furnishings insurable under the National Flood Insurance Program (NFIP).- **Source: 7**
STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 58.5		
Clean Air Clean Air Act, as amended, particularly section 176(c) & (d); 40 CFR Parts 6, 51, 93	Yes No ☐ ☒	The Project site is not included in the most recent listing of nonattainment or maintenance areas for inhalable particulate matter ($PM_{2.5}$) or the 2008 8-hour ozone standard, as defined by the U.S. Environmental Protection Agency (EPA) Green Book Nonattainment Areas for Criteria Pollutants. Therefore, no air conformity analysis is required. The Project will not introduce new construction or convert land use, facilitating the development of public, commercial, or industrial facilities, or five or more dwelling units. Air quality effects related to the Project will be limited to the area and duration of construction and will not contribute to an increase in ozone or its precursors. 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 will not exceed conformity thresholds, does not require notification, and will likely not result in direct or indirect adverse impacts to air quality. The Project is of a size that is consistent with the New York State Implementation Plan (SIP). 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. (See **Appendix A**, Figures) **Source: 8**
Coastal Zone Management Coastal Zone Management Act, sections 307(c) & (d)	Yes ☐ No ☒	The Project sites are not in a coastal zone as defined by the state's Coastal Zone Management Program or a Local Waterfront Revitalization Program. (See **Appendix A**, Figures) **Source: 5**
Contamination and Toxic Substances 24 CFR Part 50.3(i) & 58.5(i)(2)	Yes ☐ No ☒	The Project area is mix of disturbed but undeveloped stream banks, residential development, and road rights-of-way. The Project will not disturb any of the residential structures. No hazardous or solid waste storage is evident in the area of disturbance for the Project, and the Project will not expose new populations to hazards or nuisances because no new populations would reside on the Project site. A search of the New York State Department of Environmental Conservation (NYSDEC) Bulk Storage Program Database identified

		nine petroleum bulk storage facilities within one mile of the Project site (See **Appendix A**, Figures), five of which are within 1,000 feet of the Project. None of these facilities is within the Project area. A search of the NYSDEC Remedial Site Database containing records of the sites being addressed under one of the NYSDEC remedial programs (State Superfund, Brownfield Cleanup, Environmental Restoration and Voluntary Cleanup, the Registry of Inactive Hazardous Waste Disposal Sites, and Institutional and Engineering Controls) identified no facilities within one mile of the Project. EPA's NEPAssist mapping tool identified five Resource Conservation and Recovery Act (RCRA) sites, one site with a National Pollutant Discharge Elimination System (NPDES) individual permit (the Middleburgh Wastewater Treatment Plant on Main Street on Schoharie Creek) , and one air emissions facility (Middleburgh Middle and High School at 181 Main Street) within one mile of the Project area. The Project sites were not identified by NEPAssist. The five RCRA facilities include two Conditionally Exempt Small Quantity Generators (The Dollar General Store at 4503 State Route 30 and Warner's Body Shop at Main Street and Route 145) and three facilities for which no hazardous waste type was identified (The U.S. Postal Service at 162 Main Street, Agway, Inc. at 1 Wells Avenue, and Middleburgh Substation at Scribner Avenue). No violations were identified for the listed facilities, except the wastewater treatment plant, which was in non-compliance with its permit for five of the last 12 quarters. This facility is closest to the

		Project area; however, there is no evidence of a serious violation or the potential for this facility to negatively affect the Project. The Project will not result in the exposure of people or sensitive environmental resources to the facilities identified in these databases. **Source: 9, 10, 11**
Endangered Species Endangered Species Act of 1973, particularly section 7; 50 CFR Part 402	Yes ☒ No ☐	The U.S. Fish and Wildlife Service (USFWS) on-line review process, completed on December 8, 2015, found one threatened species potentially associated with the Project site – the threatened northern long-eared bat (NLEB) (*Myotis septentrionalis*). Several migratory birds of concern that could be affected by the proposed Project were identified in the on-line review process, including the bald eagle. (See **Appendix B**, USFWS, NYSDEC, and New York Natural Heritage Program [NYNHP] Correspondence). The bald eagle has year-round habitat in Schoharie County that could be affected by activities in the Project area. However, the Project area is not located within the vicinity of documented bald eagle breeding, and removal of these trees will not significantly affect foraging bald eagle, as extensive areas of suitable, undisturbed foraging habitat are available nearby the site. The Project area is not within 0.25 mile of known or assumed hibernacula for the NLEB, nor are there documented maternity roosts within 150 feet of the Project area. The site is not within 5 miles of NLEB hibernacula. The main impact of concern for bats is cutting or removing potential hibernacula or roost trees. Earthwork and tree removal will be required along Gorge

		Creek to install new culverts. Therefore, the Governor's Office of Storm Recovery (GOSR) determined that the proposed project may affect, but is not likely to adversely affect, the NLEB. Trees will be removed between November 1 and March 31 to avoid potential direct impacts to the northern long-eared bat. In a letter dated January 13, 2016, USFWS concurred with this determination. An updated species list was generated on August 24, 2017, and consultation with USFWS was re-initiated as a result of the length of time between the original consultation and the completion of the environmental review process. In an electronic communication on August 24, 2017, USFWS confirmed that nothing has changed in terms of potential impacts or determination. In correspondence dated December 14, 2015, GOSR requested that the NYNHP provide any records of occurrence of NYS-listed species in the vicinity of the project site. The response received from the NYNHP on January 8, 2016, stated that it has no records of rare or state-listed animals or plants, or significant natural communities at the Project site or in its immediate vicinity. Consultation with NYNHP was re-initiated on August 22, 2017, as a result of the length of time between the original consultation and the completion of the environmental review process. The response received from the NYNHP on August 29, 2017, stated that it has no records of rare or state-listed animals or plants, or significant natural communities at the Project site or in its immediate vicinity. (See **Appendix B**, USFWS and NYNHP Correspondence.) **Source: 12, 13**

Explosive and Flammable Hazards 24 CFR Part 51 Subpart C	Yes ☐ No ☒	The Project will not introduce housing or sensitive public uses at the site that could be exposed to explosive or flammable hazards. The Project does not constitute a HUD-funded hazardous facility, so 24 CFR Part 51 Subpart C does not apply. HUD-assisted projects must be located at an Acceptable Separation Distance (ASD) from stationary hazardous operations that store, handle or process chemicals or petrochemicals of an explosive or flammable nature. These tanks include: • Aboveground storage tanks (ASTs) that store flammable or explosive gasses (such as propane) within a 1,000-foot radius of the Project site; • ASTs exceeding 100 gallons that store flammable or explosive liquids within a 1,000-foot radius of the Project site; or • ASTs that exceed 20,000 gallons and are within 1 mile of the site. There are two facilities with ASTs within 1,000 feet of the Project. Binder Auto and Truck Repair has four registered ASTs with greater than 100 gallons of used heating oil (one 250-gallon and three 330-gallon tanks). Middleburgh Elementary School has one 8,000-gallon #2 fuel oil AST. No known ASTs that exceed 20,000 gallons are identified in the NYSDEC Bulk Storage Program Database within one mile of the Project sites. However, the capacity and contents of the ASTs visible in aerial photography at Laraway's Inc., 169 Main Street, is not known. No new explosive or thermal hazards will result from the Project. **Source: 9, 14**

Farmlands Protection Farmland Protection Policy Act of 1981, particularly sections 1504(b) and 1541; 7 CFR Part 658	Yes No ☒ ☐	The 13.3-acre Project area is on prime farmland soils. However, the Project area is not in a New York state agricultural district. (See **Appendix A**, Figures) The Project area will be disturbed during construction but will return to its existing land use once it is completed. The area is previously disturbed and is occupied by residential land, stormwater drainage, and road rights-of-way. It is not in active cultivation. These soils qualify for Farmland Protection Policy Act regulatory protection. In compliance with the Farmland Protection Policy Act of 1981 (FPPA), Parts I and III of the Farmland Conversion Impact Rating Form and Project maps were submitted to the Natural Resources Conservation Service (NRCS) on May 19, 2016, for determination of whether any part of the Project site is farmland subject to the FPPA. On June 9, 2016, NRCS responded, having filled out Parts IV and V of the Farmland Conversion Impact Rating Form and requesting that GOSR complete Parts VI and VII to compute the site assessment score. Based on 7 CFR Part 658.4, sites with a score of less than 160 receive a minimal level of consideration for protection, and no additional evaluation is required. GOSR completed the form and the site assessment score. The Project scored a total of 123 points, based on the NRCS input for Part V and the total site assessment value for Part VI. As such, no additional evaluation is required for the Project. (See **Appendix C**, Farmland Protection) **Source: 15**

Floodplain Management Executive Order 11988, particularly section 2(a); 24 CFR Part 55	Yes ☒ No ☐	Approximately 4.9 acres of the Project area is within the 100-year SFHA Zone AE, 1.4 acres of which is within the floodway, as shown on the FEMA FIRM Community Panel Number 36059C0302E, dated April 2, 2004. The floodway includes the channel of the stream plus any adjacent floodplain areas that must be kept free of encroachments so that a one percent annual chance flood (100-year flood) can be accommodated without substantial increases in flood height. A 1.4-acre portion of the Project area parallel to MT Path is in Zone X, within the limits of the 500-year floodplain; and the remaining 6.9 acres is in the area of minimal flood hazard. A local floodplain development permit would be obtained prior to construction. Although the Project is located within a floodplain, the Project is a functionally dependent use and constitutes a replacement-in-kind of a previously existing structure. It is an improvement of existing nonresidential buildings and structures that does not meet the thresholds for "substantial improvement" under 24 CFR §55.2(b)(10) and where the footprint of the structure and paved areas is not significantly increased. In accordance with 24 CFR Part 55, Floodplain Management and Protection of Wetlands, an Early Notice of a Proposed Activity in a 100-Year Floodplain and Wetlands was published on September 16, 2017 in the *Schenectady Daily Gazette* (see **Appendix D**, Floodplains and Wetlands, and **Appendix A**, Figures). Citizens who may be affected by activities in floodplains and those who have an interest in the protection of the natural environment had the opportunity to express their concerns and provide information about these areas

		by October 2, 2017. This notice initiates the eight-step decision making process for complying with the floodplain management requirements of 24 CFR 55.20. This project does not meet any of the exceptions at 24 CFR 55.12 and therefore required an 8-step analysis of the direct and indirect impacts associated with the construction, occupancy, and modification of the floodplain (**Appendix D**; Floodplains and Wetlands, and **Appendix A**, Figures). Alternatives to proposed location for the Project were reviewed in the 8-step analysis, which concluded that there are no practicable alternatives. The analysis concluded that there would be long-term direct impacts to the stream channel and wetland in the area of the proposed sedimentation basin. The stream channel would be shifted to the south. After the stream channel is altered, it would continue to function as a riverine area. No new impermeable surfaces will result from the Project. The Project would not have adverse impacts on the natural and beneficial values of the floodplain or lives and property because no additional impermeable surfaces would be created. Implementing the floodplain expansion and sedimentation basin would result in a beneficial increase of the 100-year floodplain for a new total of 4.47 acres. Approximately 0.93 acre of the floodplain expansion area and the sedimentation basin area are within the 500-year floodplain, and with the Project, this would be reduced to about 0.64 acre within the 500-year floodplain. The direct and indirect impacts associated with the development within the floodplain would be minimal.

		In a response to the Early Notice of a Proposed Activity in a 100-Year Floodplain and Wetlands, the NYS Department of Transportation (NYSDOT) stated that any work occurring in the right-of-way of NYS Route 145 would require a Highway Work Permit. The permit process may require submission of a stormwater management and pollution prevention plan (**Appendix D**; Floodplains and Wetlands) **Source: 7**
Historic Preservation National Historic Preservation Act of 1966, particularly sections 106 and 110; 36 CFR Part 800; Tribal notification for new ground disturbance.	Yes ☒ No ☐	Consultation with the New York State Historic Preservation Office (SHPO) and the Division for Historic Preservation (DHP) in the Office of Parks, Recreation and Historic Preservation (OPRHP) in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA) was initiated through the Cultural Resource Information System (CRIS) on October 26, 2015. On October 27, 2015, SHPO recommended a Phase I archaeological survey for all portions of the Project that will involve ground disturbance because the project is located in an archaeologically sensitive area. The results of the Phase I archaeological investigation were submitted on May 31, 2016. Two archaeological sites were identified as result of the survey: Gorge Creek 1 and Gorge Creek 2. On June 2, 2016, SHPO concurred with the Phase I and determined that Gorge Creek 2 did not meet the eligibility criteria of the National Register of Historic Places (NRHP) and, therefore, no additional archaeological work was necessary for that site. For Gorge Creek 1, SHPO determined that there was insufficient information to determine the potential eligibility for listing in the NRHP, and that a Phase II site evaluation should be

		conducted if the Project could affect the site. SHPO was notified of an update to the area of potential effect on June 15, 2016. The revised consultation letter was submitted to SHPO identifying that portions of the sewer project pass through the Middleburgh Main Street-Railroad Avenue Historic District, which is historically and architecturally significant. The Phase II site evaluation was submitted on November 2, 2016. The Phase II site evaluation determined that Gorge Creek 1 was eligible for listing in the National Register of Historic Places. On January 5, 2017, SHPO stated that impacts to the site should be avoided by Project-related activities. If site avoidance is selected, then an avoidance plan should be created, including both short-term and long-term methods to ensure site preservation, and submitted to SHPO for review. If impacts to the site could not be avoided, then a Phase III data recovery investigation should be conducted to mitigate the adverse effects to the site and a Memorandum of Agreement (MOA) between the lead agency, SHPO, and other potential consulting parties should be prepared and signed before the data recovery excavation is initiated. GOSR requested a letter expressing no cultural resource concerns with culvert work to allow that portion of the Project to proceed, which SHPO provided on January 5, 2017. In a letter dated January 19, 2017, GOSR invited comments on the Project from the Advisory Council on Historic Preservation (ACHP). In a letter on February 6, 2017, ACHP declined to participate.

		A MOA between the New York State Housing Trust Fund Corporation as responsible entity for the U.S. Department of Housing and Urban Development, NYS Historic Preservation Office, Schoharie County Soil and Water Conservation District, Village of Middleburgh, U.S. Army Corps of Engineers (USACE), and the St. Regis Mohawk Tribe detailing the required USACE Permit under Section 404 of the Clean Water Act and the disposition of cultural resources that would be disturbed by the Project, was signed by GOSR on February 6, 2017, SHPO on February 16, 2017, and the applicant on February 8, 2017. It states that the USACE can use the MOA to show compliance with Section 106 of the NHPA. The MOA recognizes that SHPO, GOSR, and the St. Regis Tribe agree that Gorge Creek 1 is of historic and prehistoric value and should be excavated in accordance with published guidance. It states that it is in the public interest that funds be provided for recovery of significant information that may be identified at this site and for mitigation of disturbance from the Project. It requires development of a data recovery plan in consultation with the St. Regis Tribe. As partial mitigation for disturbance at this site, representatives of the St. Regis Tribe are authorized to be present during the field work phase of the monitoring and data recovery process. Copies of any publications or presentations that arise from the data gathering will be provided to the Tribe. The MOA provides a protocol for handling human remains in the event that unanticipated human remains are encountered during the archaeological investigation or Project construction.

		The Phase III draft data recovery plan was submitted on March 6, 2017. On March 7, 2017, SHPO concurred with the proposed scope of work for the data recovery and recommended two changes to the wording in the document. The final Phase III report, documenting the data recovery excavations between April 26 and June 15, 2017, was completed and submitted to SHPO for comment on September 5, 2017. The Phase III report described the methodology and results of the excavation of Gorge Creek Site 1. The report concluded that only a very small percentage of the artifacts are whole or fragmentary formed tools, preforms, or utilized flakes and that Gorge Creek appears distinctive from other Schoharie Creek sites for its very high proportion of biface thinning flakes. In a letter dated September 20, 2017, based on the Phase III investigation, SHPO stated that the proposed undertaking will have no adverse effect to historic properties listed in or eligible for inclusion in the State or National Register of Historic Places. (See **Appendix E**, SHPO Correspondence.) Representatives of the Mohawk Nation Council of Chiefs of Haudenosaunee Six Nations Confederacy and St. Regis Mohawk Tribe, Stockbridge-Munsee Community, Band of Mohicans, were sent a letter on with the site description, photographs, site plan, and map. The Mohawk Nation and St. Regis Mohawk Tribe were sent letters on March 22, 2016, and the Stockbridge-Munsee Community, Band of Mohicans, were sent this letter on April 22, 2016. In an electronic mail communication on April 12, 2016, the representatives of the Saint Regis Mohawk Tribe stated that the Tribe would like to participate in the Project, which is in

		an area considered culturally sensitive to the Tribe. The Tribe also requested a copy of the Phase I survey for further comment. On April 25, 2016, the Stockbridge-Munsee Community, Band of Mohicans, stated that the Project is not in its area of interest. The Phase I site evaluation was mailed to the St. Regis Mohawk Tribe on June 10, 2016, requesting comments The Phase II site evaluation was mailed to the St. Regis Mohawk Tribe on November 14, 2016, requesting comments. The Draft Data Recovery Plan was mailed to the St. Regis Mohawk Tribe on March 9, 2017. No comments concerning either the Phase II site evaluation or Draft Data Recovery Plan have been received. On September 5, 2017, the Phase III Data Recovery Report was submitted to the St. Regis Mohawk Tribe for comment. (See **Appendix F**, Tribal Correspondence) **Source: 16**
Noise Abatement and Control Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978; 24 CFR Part 51 Subpart B	Yes ☐ No ☒	The Project is not a noise sensitive use and the policies of 24 CFR 51.101(a)(3) do not apply to any action or emergency assistance under disaster assistance provisions or appropriations that are provided to save lives and protect public health and safety. The Project involves improvement of stormwater drainage facilities and will not introduce any new or rehabilitate any existing noise-sensitive uses. No noise-sensitive receptors are present or proposed at the Project site.
Sole Source Aquifers Safe Drinking Water Act of 1974, as amended, particularly section 1424(e); 40 CFR Part 149	Yes ☐ No ☒	The Project area is not in the bounds of a Sole Source Aquifer Designated Area (see **Appendix A**, Figures). **Source: 11, 17**

Wetlands Protection Executive Order 11990, particularly sections 2 and 5	Yes ☒ No ☐	Approximately 0.22 acre of the Project site is in riverine wetlands, as identified National Wetlands Inventory (NWI). (See **Appendix A**, Figures.) The affected wetland areas lie within the stream channel of Gorge Creek. No New York State Regulatory Freshwater Wetlands or tidal/coastal wetlands are on or adjacent to the Proposed Activity site. In the area of Middleburgh High School where the new box culvert would be constructed, Gorge Creek flows within an undersized culvert. The stream channel would be shifted to the south in the area of the proposed sedimentation basin. After the stream channel is altered, it would continue to function as a riverine area. Although the Project is located within a wetland, the Project is a functionally dependent use and constitutes a replacement-in-kind of previously existing drainage facilities. In accordance with 24 CFR Part 55, Floodplain Management and Protection of Wetlands, an Early Notice of a Proposed Activity in a 100-Year Floodplain and Wetlands was published on September 16, 2017, in the *Schenectady Daily Gazette* (see **Appendix D**, Floodplains and Wetlands, and **Appendix A**, Figures). Citizens who may be affected by activities in wetlands and those who have an interest in the protection of the natural environment had the opportunity to express their concerns and provide information about these areas by October 2, 2017. This notice initiates the eight-step decision making process for complying with the floodplain and wetland management requirements of 24 CFR 55.20. The analysis concluded that the Project will not alter the survival or quality of the wetlands.

		In a letter dated March 21, 2016, the NYSDEC stated that a Water Quality Certification permit from DEC, indicating that the proposed activity will not violate water quality standards, is required in accordance with Section 401 of the Clean Water Act. As identified in the executed MOA, the Project will require a permit from the USACE pursuant to Section 404 of the Clean Water Act, authorizing the removal of sediment or fill of waters within the United States. The Project will adhere to all applicable conditions in these permits and the requirements of the MOA for the Recovery of Significant Archaeological Information, which states that a Section 404 Permit a Section 401 Water Quality Certification Permit will be required for the Project. (See **Appendix D**, Floodplains and Wetlands) **Source: 18, 19, 20**
Wild and Scenic Rivers Wild and Scenic Rivers Act of 1968, particularly section 7(b) and (c)	Yes No ☐ ☒	There are no state or federally designated wild and scenic rivers at or in the vicinity of the project. (See **Appendix A**, Figures) **Source: 21, 22, 23**
ENVIRONMENTAL JUSTICE		
Environmental Justice Executive Order 12898	Yes No ☐ ☒	The Project site is not in or adjacent to areas with environmental justice populations, as defined by NYSDEC based on data from the 2000 U.S. Census. (See **Appendix A**, Figures) **Source: 24**

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 or approvals have been obtained or noted. Citations, dates/names/titles of contacts, and page references are clear. Additional documentation is attached, as appropriate. **All conditions, attenuation or mitigation measures have been clearly identified.**

Impact Codes: Use an impact code from the following list to make the determination of impact for each factor.
(1) Minor beneficial impact
(2) No impact anticipated
(3) Minor Adverse Impact – May require mitigation
(4) Significant or potentially significant impact requiring avoidance or modification which may require an Environmental Impact Statement

Environmental Assessment Factor	Impact Code	Impact Evaluation
LAND DEVELOPMENT		
Conformance with Plans / Compatible Land Use and Zoning / Scale and Urban Design	2	The Project will not change the existing land use or zoning, or alter the residential character of the community. Easements and potentially land acquisition may be required to complete Project construction. Construction of the floodplain expansion and sediment basin will require obtaining a permanent easement on two parcels: 0.75 acre on parcel number 106.20-1-24 (total parcel size 3.86 acres) and 3.16 acres on parcel number 106.20-1-5.111 (total parcel size 18.6 acres). The required easement area on the two parcels involved is currently vacant land and under the Project will remain vacant land. The Towns and Villages of Esperance, Schoharie, and Middleburgh are part of a multi-jurisdictional planning area. They regularly cooperate in regional assessments, plans, and infrastructure. The Town and Village of Middleburgh Comprehensive Plan contributed to the background for the community overview and vision portions of the Towns and Villages of Esperance,

		Schoharie, and Middleburgh NY Rising Community Reconstruction (NYRCR) Plan. It was used to develop the goals and recommendations in the NYRCR Plan for land use, housing, resource protection, and economic development. Schoharie County participates in several regional planning efforts that also were incorporated into the NYRCR Plan. These efforts include the Mohawk Valley Regional Economic Development Council, the Mohawk Valley Regional Sustainability Plan, and Schoharie County Multi-Jurisdictional Hazard Mitigation Plan. The greatest hazard identified by the Hazard Mitigation Plan is flooding. The NYRCR Plan addresses a number of the Hazard Mitigation Plan's core strategies. These core strategies include hazard reduction through taking advantage of development funding opportunities, pursuit of cost-effective hazard mitigation projects, emphasis on mitigation measures that prevent or reduce losses in designated high hazard flood zones and those that enhance and compliment local goals; and encouragement of mitigation measures that manage development and protect natural features. The Project is part of the NYRCR Plan and is specifically identified to address flooding at the Middleburgh High School by addressing the drainage of Gorge Creek. The Project recommends replacement of the existing culverts and enhancement of the stormwater system in the area to build capacity for future storm events. The Project is designed to reduce flooding caused by Gorge Creek and protect to Village residences, businesses, infrastructure, and Middleburgh High School. **Source: 2**
Soil Suitability/ Slope/ Erosion/ Drainage/ Storm Water Runoff	3	The Project area is on land that slopes to the west toward the Schoharie Creek and is surrounded by steeper topography that drains into Schoharie Creek. Elevations range between approximately 620 to 700 feet above mean sea level. Gorge Creek drains from the east into Schoharie Creek through the Village of Middleburgh in a natural channel and a series of culverts drainage structures beneath Village Streets.

		Soils in the Project area include Barbour and Tioga loams, on slopes that range from zero to 15 percent; Holly and Papakating silt loams; and Tunkhannock and Chenango gravelly loams, on fans at 0 to 5 percent slopes. The Tunkhannock and Chenango gravelly loams cover the majority of the Project area and are found in the areas of Middleburgh High School and the proposed floodplain expansion. The representative slope of the soils throughout the Project area is approximately 3 percent. Stormwater protection measures will include a box culvert under NYS Route 145 to Clauverwie Road and under Clauverwie Road, a sedimentation basin upstream of the box culverts, storm water drainage improvements along Gorge Creek, and expansion of the Gorge Creek floodplain. Construction and operation of the stormwater control system and all Project construction will be in accordance with Section 402 of the Clean Water Act that requires authorization by an NPDES permit or by a state permit program. New York's State Pollutant Discharge Elimination System (SPDES) is an NPDES-approved program. Coverage under the NYSDEC GP-15-002 permit will be obtained before construction begins. A Soil Erosion and Sediment Control Plan will be developed for the Project and approved by the Schoharie County Water and Soil Conservation District prior to construction. **Source: 15**
Hazards and Nuisances including Site Safety and Noise	2	Approximately 4.9 acres of the Project area is within the 100-year SFHA Zone AE, 1.4 acres of which is within the floodway. No other known natural hazards, including earthquake fault zones, landslide zones, or hazardous terrain, are at or near the Project site. The Project will generate noise during construction that would be minimized through compliance with local noise ordinances, including time-of-day work limitations. Exterior construction activities would take place during normal working hours and would employ commonly accepted engineering and administrative controls that would minimize noise impacts to neighbors. **Source: 7**

Energy Consumption	2	The Project will not result in additional energy consumption because no changes in land use, population, or energy infrastructure would occur. No impacts will occur to existing nearby suppliers.

Environmental Assessment Factor	Impact Code	Impact Evaluation
SOCIOECONOMIC		
Employment and Income Patterns	2	There will be a temporary, minor increase in employment during construction and no increase in long-term employment.
Demographic Character Changes, Displacement	2	No direct or indirect population changes will result from the Project, and there will be no demographic, character, or displacement impacts.

Environmental Assessment Factor	Impact Code	Impact Evaluation
COMMUNITY FACILITIES AND SERVICES		
Educational and Cultural Facilities	2	Because the Project involves no changes in population, there will be no impact on demand for educational or cultural facilities.
Commercial Facilities	2	Because the Project involves no changes in population, there will be no impact on demand for commercial facilities.
Health Care and Social Services	2	Because the Project involves no changes in population, there will be no impact on demand for health care and social services.
Solid Waste Disposal / Recycling	3	Construction may result in a temporary increase in solid waste. Construction debris would be collected on site and disposed of or recycled as appropriate. There will be no increase in solid waste disposal or recycling from operation of the Project because it will not result in any changes in population or land use. The proposed improvements will reduce disruption of public services that could result from flooding.

Waste Water / Sanitary Sewers	2	The proposed Project will not generate wastewater and sewage. Because the Project involves no changes in population, there will be no impact on wastewater and sewage generated in the Project area.
Water Supply	3	This Project will not change the residences' use of water or wastewater. No changes to the water supply system are anticipated. There are no drinking water wells within one-half mile of the Project site.
Public Safety - Police, Fire and Emergency Medical	2	Because the Project involves no changes in population, there will be no impact on demand for police, fire, or emergency medical services. The proposed improvements to the drainage system will allow better fire protection, rescue, and police responses in times of storms.
Parks, Open Space and Recreation	2	Because the Project involves no changes in population, there will be no impact on demand for parks, open space, or other recreational facilities.
Transportation and Accessibility	2	Because the Project involves no changes in population, there will be no impact on use of transportation infrastructure.

Environmental Assessment Factor	Impact Code	Impact Evaluation
NATURAL FEATURES		
Unique Natural Features, Water Resources	2	The Project site is on institutional land and within road rights-of-way and adjacent areas in an established neighborhood and on undeveloped land along Gorge Creek. Gorge Creek is classified by NYSDEC as a Class C stream, with for waters supporting fisheries and suitable for non - contact activities and is also considered a wetland under 24 CFR Part 55. (See **Appendix A**, Figures, and **Appendix D**, Floodplains and Wetlands). A Water Quality Certification is required permit from DEC, indicating that the proposed activity will not violate water quality standards, is required in accordance with Section 401 of the Clean Water Act. As identified in the executed MOA, the Project will require a permit from the USACE pursuant to Section 404 of the Clean Water Act, authorizing removal of sediment or fill of waters within the United States. Construction and operation of the stormwater control system and all Project construction will be in accordance with Section 402 of the Clean Water Act that requires authorization by an NPDES permit or by a state permit program. New York's SPDES is an NPDES-approved program. Coverage under the NYSDEC GP-15-002 permit will be obtained before construction begins. The Project will adhere to all applicable conditions in these permits and the requirements of the MOA. **Source: 25**
Vegetation, Wildlife	2	Approximately 0.22 acre of the Project site is in riverine wetlands, as identified in the NWI. The eight-step decision making process for complying with the floodplain and wetland management requirements of 24 CFR 55.20 concluded that the Project will not alter the survival or quality of the wetlands. Consultation with the USFWS found the threatened NLEB potentially associated with the Project site. Several migratory birds of concern that could be affected by the proposed Project were identified in the on-line review process, including the bald eagle. Trees will be removed between November 1 and March 31 to avoid potential

		direct impacts to the northern long-eared bat. The project area is not located within the vicinity of documented bald eagle breeding, and removal of these trees would not significantly affect foraging bald eagle, as extensive areas of suitable, undisturbed foraging habitat are available nearby the site. In a letter on January 13, 2016, the USFWS concurred with GOSR's determination that the proposed Project may affect, but is not likely to adversely affect, the NLEB. An updated species list was generated on August 24, 2017, and consultation with USFWS was re-initiated as a result of the length of time between the original consultation and the completion of the environmental review process. The species list has not changed since the December 2015 consultation letter to USFWS. In an electronic communication on August 24, 2017, USFWS confirmed that nothing has changed in terms of potential impacts or determination. (See **Appendix B**, USFWS and NYNHP Correspondence)**.** Construction of the expanded floodplain would have a temporary impact on aquatic life in Gorge Creek during construction. The impacts would be temporary and of a short duration. Construction will result in the removal of approximately 390 trees with a diameter at breast height (DBH) greater than or equal to 3-inches. This will have a temporary, long-term impact on the floodplain habitat until new trees and shrubs that will be planted in the expanded floodplain reach sufficient size to mimic pre-construction conditions. Trees will be replanted along the banks of the stream to provide shading of the stream. **Source: 7, 12, 13, 18**
Other Factors	2	No additional factors would be impacted by the project, and no additional impacts would occur.

Additional Studies Performed:
Comparative analysis of existing and proposed hydraulic conditions.
Phase I archaeological survey
Phase II site evaluation
Phase III data recovery
State Environmental Quality Review Act Type I evaluation

Field Inspection (Date and completed by)**:**
Field inspections were conducted during all Phases of the archaeology surveys: Phase I archaeological investigation submitted on May 31, 2016, Phase II site evaluation submitted on November 2, 2016, and the Phase III data recovery between April 26 and June15, 2017

List of Sources, Agencies and Persons Consulted [40 CFR 1508.9(b)]**:**
1. New York State. 2013. State of New York Action Plan for Community Development Block Grant Program Disaster Recovery (Action Plan, issued April 25, 2013, amended July 3, 2012) New York State. 2013.

2. New York State. 2014. Towns and Villages of Esperance, Schoharie, and Middleburgh NY Rising Community Reconstruction Plan. March 2014).

3. Federal Aviation Administration. Report to Congress – National Plan of Integrated Airport Systems. Internet Website: http://www.faa.gov/airports/planning_capacity/npias/reports/media/ npias-2015-2019-report-appendix-b-part-4.pdf.

4. Federal Aviation Administration. Report to Congress – National Plan of Integrated Airport Systems. Internet Website: http://www.faa.gov/airports/planning_capacity/npias/reports/media/npias-2015-2019-report-narrative.pdf.

5. New York State Department of State, Office of Communities and Waterfronts – Coastal Boundary Map. Internet Website: http://appext20.dos.ny.gov/coastal_map_public/map.aspx.

6. U.S. Fish and Wildlife Service. 2015. Coastal Barrier Resources Mapper – Beta. Internet Website: http://www.fws.gov/cbra/Maps/Mapper.html.

7. Federal Emergency Management Agency. Current FEMA issued Flood Maps. Internet Website: https://msc.fema.gov/portal/.

8. U.S. Environmental Protection Agency. Green Book Nonattainment Areas. Internet Website: http://www.epa.gov/oaqps001/greenbk/ancl.html.

9. New York State Department of Environmental Conservation Bulk Storage Database Search. Internet Website: http://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=4.

10. New York State Department of Environmental Conservation Environmental Site Remediation Database Search. Internet Website: http://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=3.

11. U.S. Environmental Protection Agency. 2015. NEPAssist Internet Mapping Tool. https://nepassisttool.epa.gov/nepassist/nepamap.aspx.

12. U.S. Fish and Wildlife Service. 2016. Northern Long-eared Bat Hibernacula and Maternity Roost Tree Location Information. Internet Website: https://www.fws.gov/northeast/nyfo/es/MYSE%20bat%20sites_2016.xlsx.

13. U.S. Fish and Wildlife Service. 2016. Endangered Species Act Official Species List. December 8, 2015, and August 24, 2017.

14. New York State Department of Environmental Conservation. 2015. Regulation of Petroleum Tanks. Internet Website: http://www.dec.ny.gov/chemical/2642.html.

15. United States Department of Agriculture (USDA). Natural Resources Conservation Service. Internet Website: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

16. New York State Cultural Resource Information System. 2015 to 2017. October 2015 through September 2017. Internet Website: https://cris.parks.ny.gov/.

17. U.S. Environmental Protection Agency Region 2. 2007. Sole Source Aquifers for NY and NJ. September 2007. Internet Website: http://www.epa.gov/region02/gis/data/downloads/r2sole_source_aquifer.zip.

18. U.S. Fish and Wildlife Service. 2014. National Wetlands Inventory, New York. Internet Website: http://www.fws.gov/wetlands/Data/State-Downloads.html.

19. New York State Department of Environmental Conservation. Regulatory Freshwater Wetlands – New York State – 2002 GIS data. Internet Website: http://cugir.mannlib.cornell.edu/datatheme.jsp?id=111.

20. New York State Department of Environmental Conservation. Tidal Wetlands - NYC and Long Island - 1974. Internet Website: https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1139

21. National Wild and Scenic Rivers System. Internet Website: http://www.rivers.gov/new-york.php.

22. New York State Department of Environmental Conservation. Wild Scenic and Recreational Rivers. Internet Website: http://www.dec.ny.gov/permits/32739.html.

23. USDA Forest Service - Automated Lands Program. 2015. Wild and Scenic Rivers GIS data. November 30, 2015.

24. New York State Department of Environmental Conservation. Potential Environmental Justice Areas in the City of Schenectady, Schenectady County, New York. Internet Website: http://www.dec.ny.gov/docs/permits_ej_operations_pdf/schoharieej.pdf.

25. New York State Department of Environmental Conservation (NYSDEC). Environmental Resource Mapper. Internet Website: http://www.dec.ny.gov/imsmaps/ERM/viewer.htm.

Appendix A Figures

Appendix B USFWS and NYNHP Correspondence

Appendix C Farmland Protection

Appendix D Floodplains and Wetlands

Appendix E SHPO Correspondence

Appendix F Tribal Correspondence

List of Permits Obtained or Required:

- State Pollutant Discharge Elimination System (SPDES) Permit for Construction Activities
- NYSDEC Section 401 Water Quality Certification
- USACE Section 404 of the Clean Water Act Permit
- Coverage under the NYSDEC GP-15-002 permit
- A Soil Erosion and Sediment Control Plan to be approved by the Schoharie County Water and Soil Conservation District prior to construction
- A local floodplain development permit
- A road opening permit issued by the Village of Middleburgh and NYSDOT

Additional Approvals

- CDBG-DR grant funding
- SEQRA determination of non-significance (negative declaration) per Section 617.5(c)(7)

Public Outreach [24 CFR 50.23 & 58.43]**:**
On October 5, 2017, a combined Notice of Finding of No Significant Impact, Notice of Intent to Request Release of Funds, and Final Notice of a Proposed Activity in a 100-Year Floodplain and Wetlands will be published in the *Schenectady Daily Gazette*. Any individual, group, or agency may submit written comments on the Environmental Review Record to:

Lori A. Shirley, GOSR, HCR
38-40 State Street
Albany, NY 12207
(518) 474-0755
NYSCDBG_DR_ER@nyshcr.org

Cumulative Impact Analysis [24 CFR 58.32]**:**
The Project is not expected to trigger cumulative impacts, including degradation of important natural resources, socioeconomic resources, human health, recreation, quality of life issues, and cultural and historic resources. The Project is not of a scale large enough to contribute significantly to cumulative impacts. It will create positive impacts, as the proposed improvements to the drainage system would reduce flooding and damage to homes, lawns and landscaping. The

Project will directly contribute to the rebuilding and recovery of the area with a focus on resiliency and mitigation.

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

Proposed Project. As fully described in this Environmental Assessment, the improvements to the Gorge Creek stormwater management system will involve a new box culvert, upstream expansion of the Gorge Creek floodplain and installation of a sedimentation pond, and a new or improved storm sewer system provided sufficient funding is available. The Project is designed to accommodate potential storm water runoff from a 100-year storm. During previous storm events, significant flooding occurred at Middleburgh High School and the surrounding area due to undersized drainage infrastructure. The Project is anticipated to entail substantial earthwork.

Alternative Options. With the exception of the no action alternative, no other alternatives were available the proposed box culvert and storm sewer systems and, therefore, no other alternatives for these elements were considered. The following alternatives were considered for the floodplain expansion/sedimentation pond phase of the project:

- In-stream sediment traps and debris catchers;
- Floodplain expansion with no sedimentation pond; and,
- Alternative sediment pond configurations.

This alternatives analysis presents reasonable alternatives for reducing or eliminating project impacts while substantively meeting the objectives of the floodplain expansion and sedimentation pond construction. The analysis compares potential impacts under alternative approaches for meeting project objectives. The alternative analysis evaluation criteria include:

- Land use;
- Environmental impacts both aquatic and terrestrial;
- Cost; and
- Attainment of Project Objectives.

In-Stream Sediment Traps and Debris Catchers. This alternative would create a sediment trap by grading the channel to three or four times its current width and over a distance of approximately 10 times the current width. Debris catchers consisting of pipes or posts would be installed at two- to eight-foot centers across the stream channel with the top of the catchers at an elevation equivalent to the top of bank.

The proposed sediment traps would have the potential to cause erosion of the existing stream channel, which would increase sediment migration and negate the intent of the sediment traps. The in-stream debris catchers could obstruct the existing channel during flood conditions, thereby exacerbating potential flooding upstream and around the debris catchers.

Erosion of the stream channel would cause stream siltation with a resulting negative impact on stream macroinvertebrates. Although the construction costs of the sediment trap/debris catcher would be significantly less than the Proposed Project, the objective of reducing sediment and debris loading at the culverts would not be achieved. Therefore, this alternative was eliminated from further consideration.

Floodplain Expansion No Sedimentation Basin. Expansion of the floodplain as proposed in the Proposed Project without construction of a sedimentation basin was considered. This alternative would have similar terrestrial and aquatic environmental impacts as the Proposed Project. Similar to the Proposed Project, there would be no changes to land use, and the required easement acreage would be slightly less than the Proposed Project. The construction costs would be less than the Proposed Project, since less cut and fill would be required.

The floodplain would be effective in retention of woody debris. However, without a sediment basin, the capacity to remove sediment would be significantly reduced. Recent CCTV inspection of the existing five-foot-diameter culvert indicated approximately 25 percent of the culvert near the culvert inlet was filled with sediment since the previous cleaning in 2013. Without sediment detention, frequent cleaning of the existing culverts and the proposed culvert would be required to maintain the capacity of the culverts. Therefore, construction the floodplain expansion without a sedimentation basin was eliminated for further consideration.

Floodplain Expansion and 95,000 Cubic Foot Sedimentation Basin. Similar to the Proposed Project, this alternative would expand the existing floodplain on the south side of Gorge Creek approximately 50 feet in width for a distance of approximately 935 feet. A sedimentation basin with a storage volume of approximately 95,000 cubic feet would be constructed at the western, downstream end of the expanded floodplain. This sedimentation basin would be significantly larger than the Proposed Project sedimentation basin volume of 29,000 cubic feet

This alternative would have similar effects on the terrestrial and aquatic habitat in the floodplain as the Proposed Project and would not change the current land use. However, this alternative would require obtaining larger permanent easements on the same two parcels as the Proposed Project: 1.5 acres verses 0.75 acre on parcel no 106.20-1-24 (total parcel size 3.86 acres) and 3.88 acres verses 3.16 acres on parcel no 106.20-1-5.111 (total parcel size 18.6 acres).

Grading of the floodplain expansion and the sedimentation pond would require removal of approximately 30,300 cubic yards of fill, compared with the 17,130 cubic yards for the This alternative would have similar terrestrial and aquatic environmental impacts as the Proposed Project. The estimated cost for construction of the expanded floodplain and sedimentation basin for this alternative is approximately $723,768, including a contingency of $107,225 and an estimated construction inspection/administration cost of $80,418. The cost of this alternative would be approximately $100,628 higher than the Proposed Project.

This alternative will meet the project objective of reducing stream flow velocity during storm events and providing a location for sediment and debris to settle to minimize any reduction in the flow capacity of the proposed box culvert caused by accumulation of sediment and debris. However based on the higher cost and need for larger permanent easement areas that the proposed alternative, this alternative was eliminated from further consideration.

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

Not undertaking the Project would not be consistent with the goals and objectives of the Towns and Villages of Esperance, Schoharie, and Middleburgh NYRCR Plan and other local and state plans because, without augmentation of flow capacity by installation of an additional culvert, flooding from Gorge Creek at Main Street would continue.

The No Action Alternative would not minimize sediment and debris deposition in the existing culverts, which would continue to be subjected to a reduction in flow capacity. Recent CCTV inspection of the existing five-foot-diameter culvert indicated approximately 25 percent of the culvert near the culvert inlet was filled with sediment since the previous cleaning in 2013. Costs associated with the No Action Alternative would include the on-going cost related to potential flooding from Gorge Creek at the inlet of the existing culverts at Main Street, including property loss.

Summary of Findings and Conclusions:

The proposed stormwater management improvements to Gorge Creek would mitigate future system failures and associated property loss by providing secure and reliable drainage infrastructure. The proposed Project will ensure a safe and healthy environment for the local residents, businesses, and visitors. The proposed Project will not result in a significant impact on the quality of the human environment or result in other direct, indirect, or cumulative impacts. The Project will comply with all relevant regulations listed in 24 CFR Subparts 58.5 and 58.6.

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

GOSR has summarized 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 or 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
Endangered Species	To minimize the potential for disturbance of NLEB caused by tree removal, Trees will be removed between November 1 and March 31.

Endangered Species Act of 1973, particularly section 7; 50 CFR Part 402	
Historic Preservation National Historic Preservation Act of 1966, particularly sections 106 and 110; 36 CFR Part 800; Tribal notification for new ground disturbance.	The Project will adhere to the requirements of the NHPA and the requirements of the MOA for the Recovery of Significant Archaeological Information, which details the disposition of cultural resources
Wetlands Protection Executive Order 11990, particularly sections 2 and 5	A Water Quality Certification permit will be obtained from NYSDEC, indicating that the proposed activity will not violate water quality standards, in accordance with Section 401 of the Clean Water Act. A permit from the USACE pursuant to Section 404 of the Clean Water Act, authorizing the removal of sediment or fill of waters within the United States will be obtained prior to construction. The Project will adhere to all applicable conditions in these permits and the requirements of the MOA for the Recovery of Significant Archaeological Information, which states that a Section 404 Permit a Section 401 Water Quality Certification Permit will be required for the Project.
Soil Suitability/ Slope/ Erosion/ Drainage/ Storm Water Runoff	Construction and operation of the stormwater control system and all Project construction will be in accordance with Section 402 of the Clean Water Act that requires authorization by an NPDES permit or by a state permit program. New York's SPDES is a NPDES-approved program. Coverage under the NYSDEC GP-15-002 permit will be obtained before construction begins. A Soil Erosion and Sediment Control Plan will be developed for the Project and approved by the Schoharie County Water and Soil Conservation District prior to construction.
Vegetation, Wildlife	Trees will be replanted along the banks of the stream to provide shading of the stream.

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: Genevieve Kaiser ______________ Date: October 5, 2017

Name/Title/Organization: Genevieve Kaiser, Senior Environmental Planner, Tetra Tech, Inc.

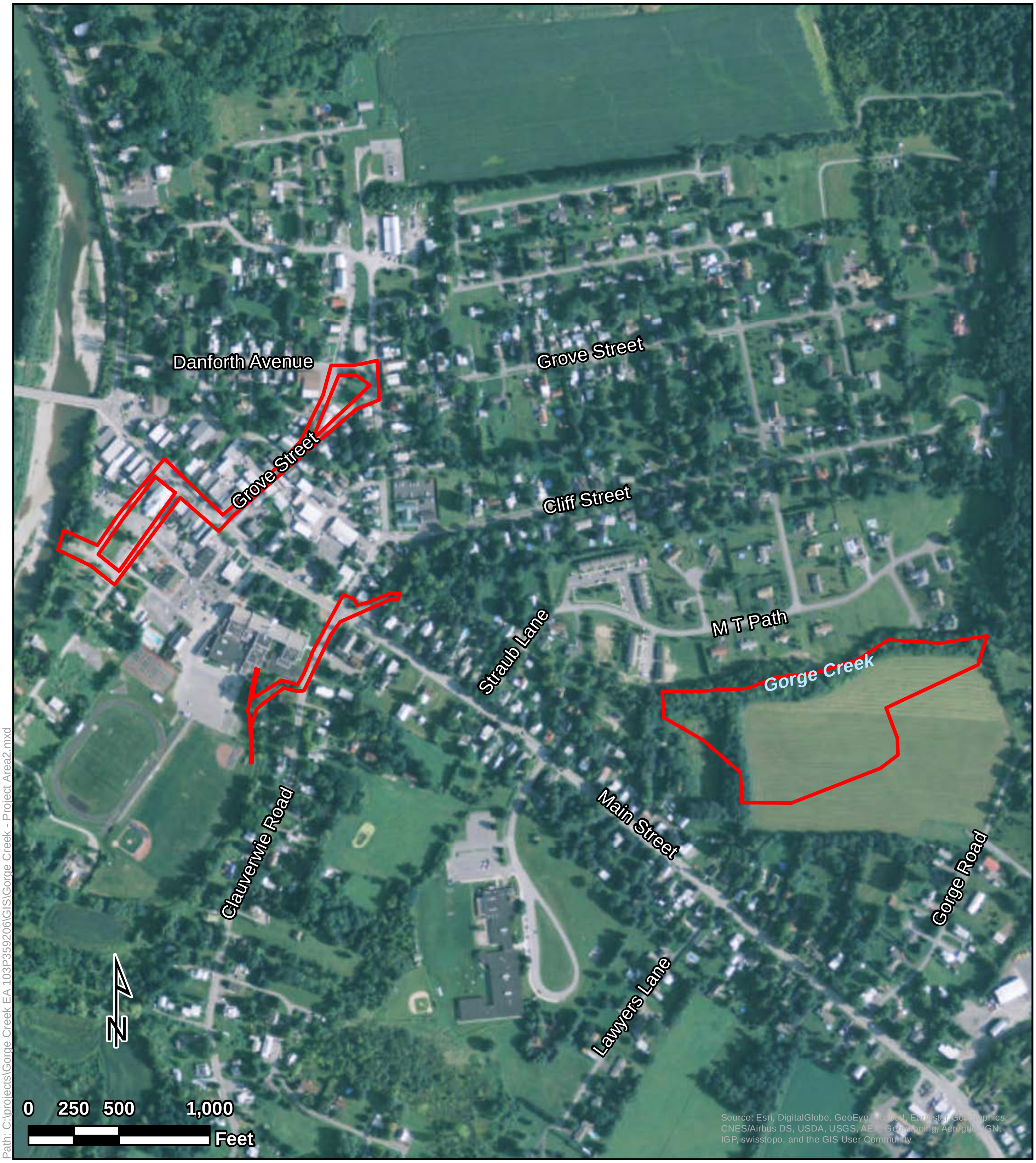
Certifying Officer Signature: Lori A Shirley ______________ Date: October 5, 2017

Name/Title: Lori A. Shirley, Certifying Officer, Governor's Office of Storm Recovery

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

APPENDIX A

FIGURES



Path: C:\projects\Gorge Creek EA 103P3592061\GIS\Gorge Creek - Project Area2.mxd

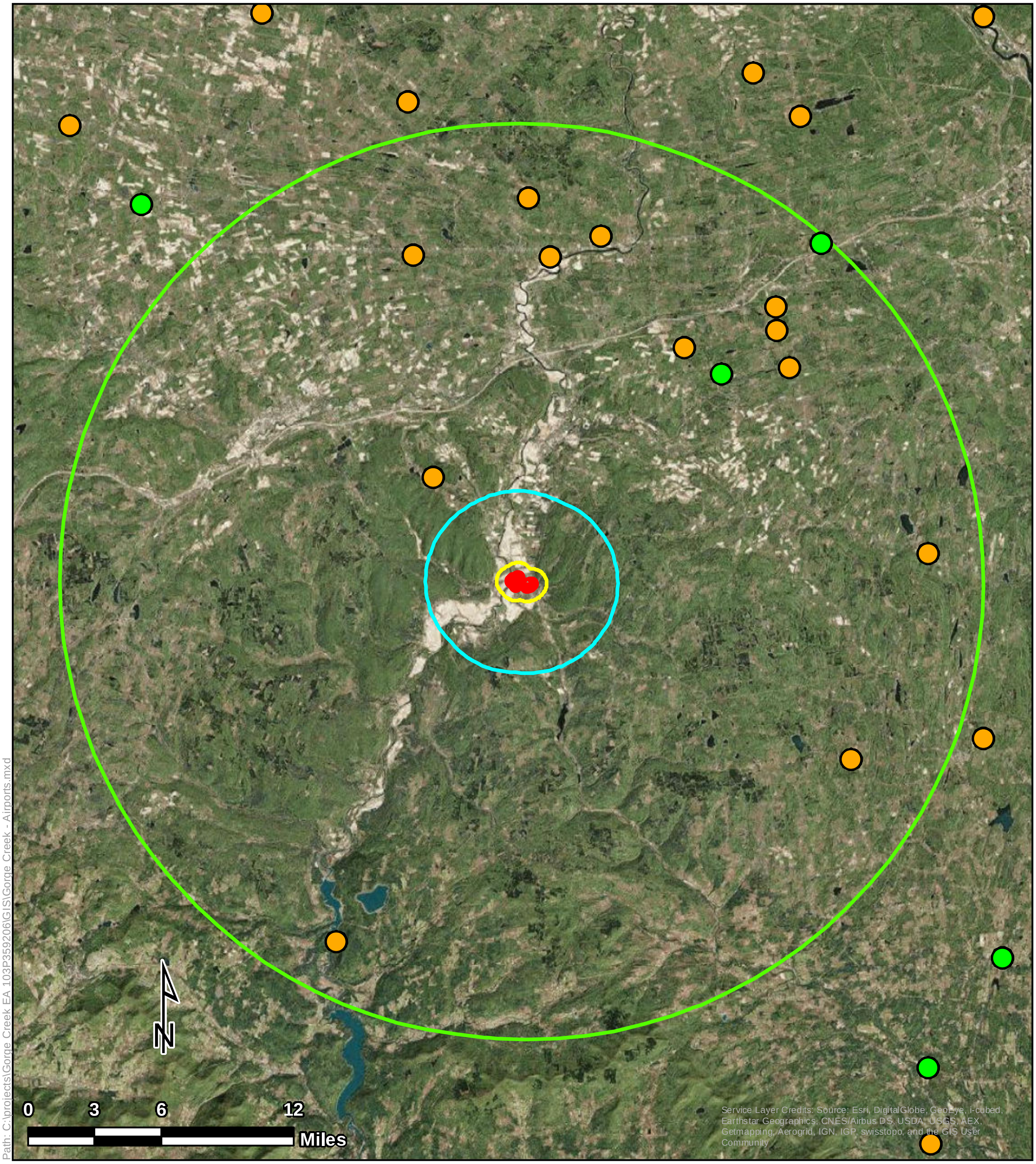
Project Area

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Legend

Project Area

Tetra Tech, Inc



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Legend

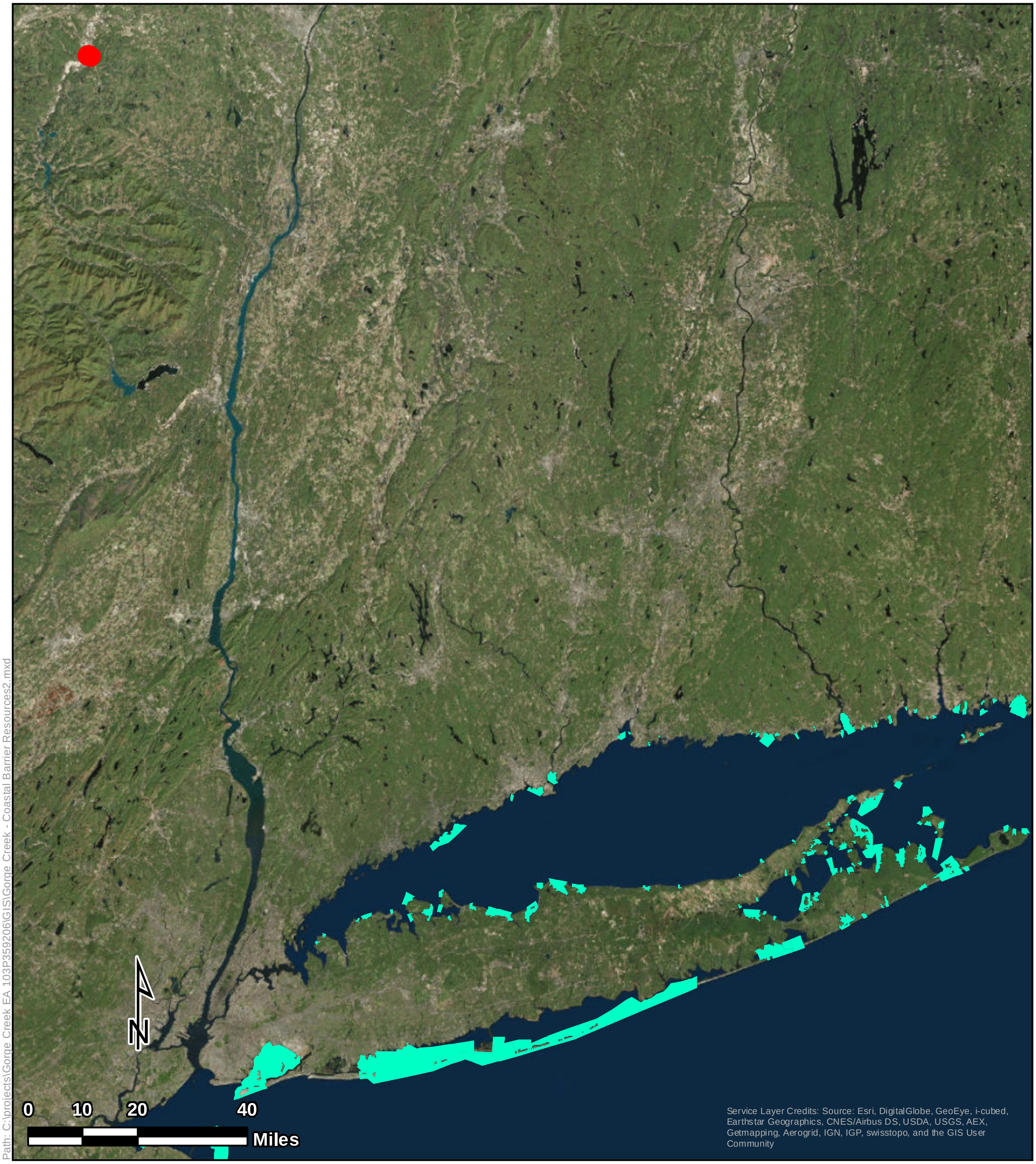
Airports

- Public Use
- Private Use
- Project Area
- 2,500-Foot Project Site Buffer
- 15,000-Foot Project Site Buffer
- 15-Mile Project Site Buffer

Airports

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Tetra Tech, Inc



Path: C:\projects\Gorge Creek EA 103P359206\GIS\Gorge Creek - Coastal Barrier Resources2.mxd

Coastal Barrier Resources

Legend

Project Area

CBRS Polygons

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

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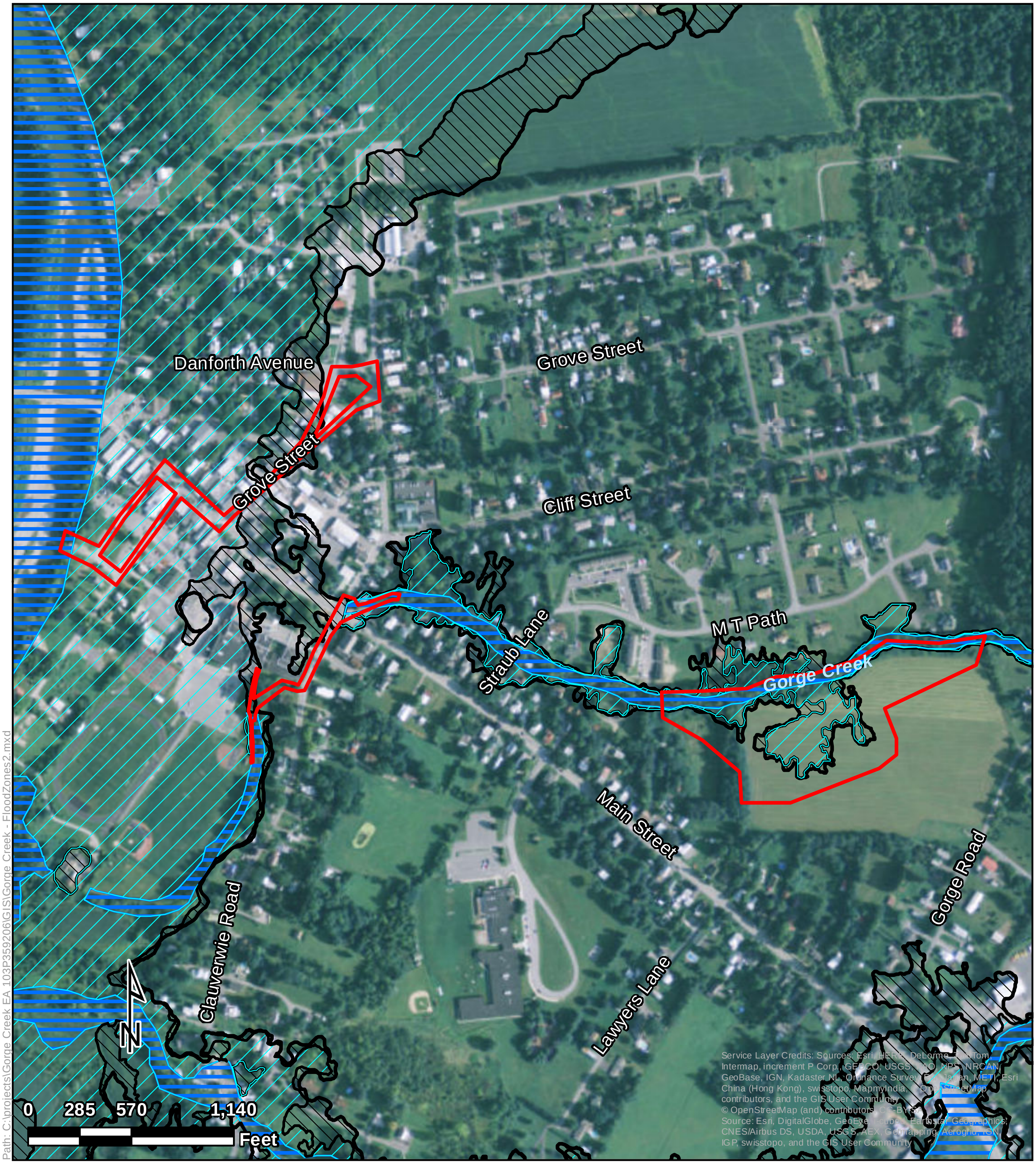

Path: C:\projects\Gorge Creek EA 103P3592061\GIS\Gorge Creek - FloodZones2.mxd

Flood Zones

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Legend

Flood Zones

- Zone AE- within the 1% annual chance flood
- Zone AE- floodway
- Zone X-within the 0.2% annual chance of flood
- Zone X- area of minimal flood hazard

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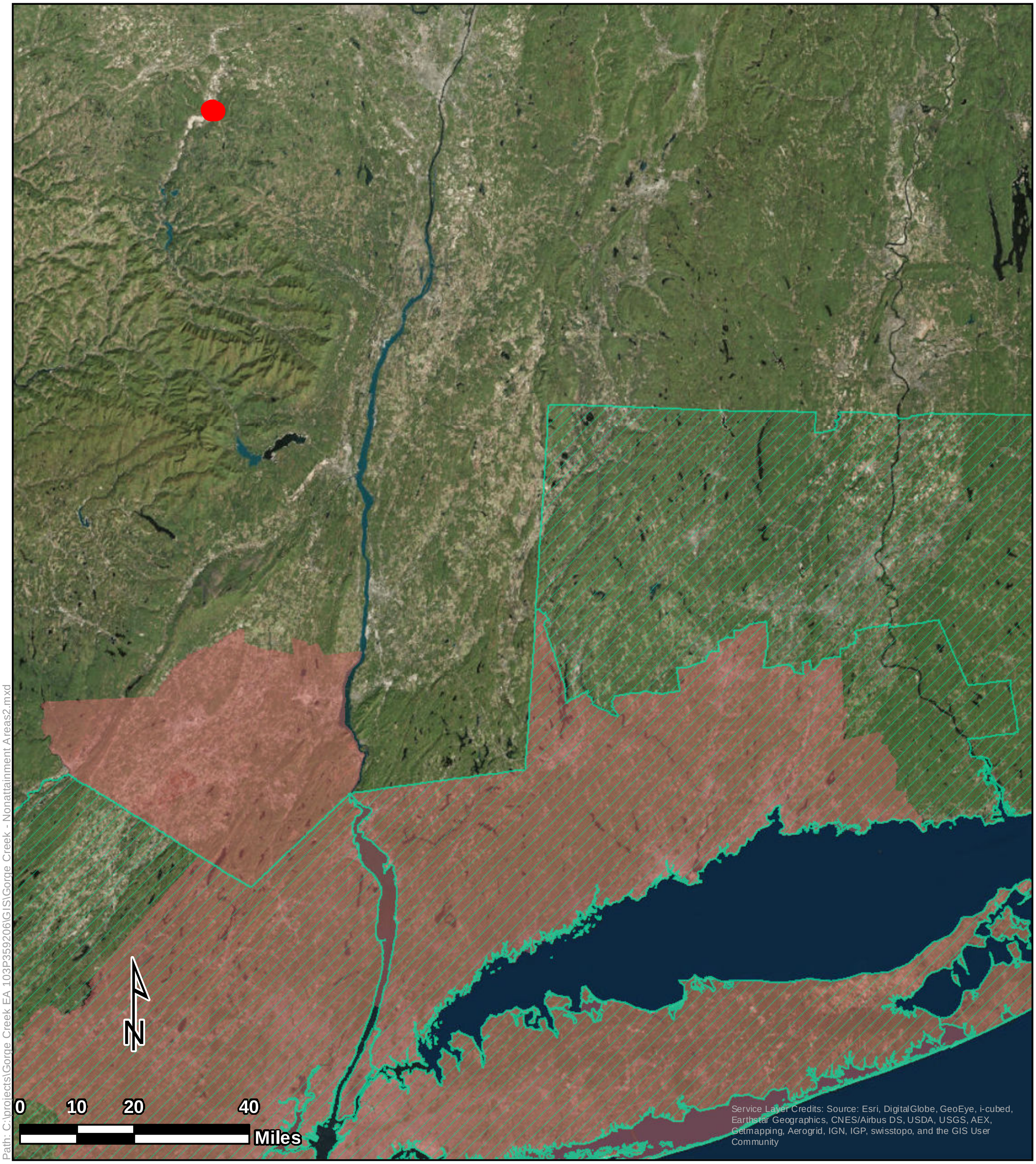


Path: C:\projects\Gorge Creek\Gorge Creek EA 103P359206\GIS\Gorge Creek - Nonattainment Areas2.mxd

Nonattainment Areas

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Legend

- Project Area
- Pb_NAA_2008
- so2_2010std_naa
- Ozone_8hr_2008std_naa
- PM25_2006Std_NAA

Tetra Tech, Inc

DEPARTMENT OF STATE, OFFICE OF PLANNING & DEVELOPMENT
ANDREW M. CUOMO, GOVERNOR   CESAR A. PERALES, SECRETARY OF STATE

Welcome to the NYS Coastal Boundary Map

Help

Search

Address:

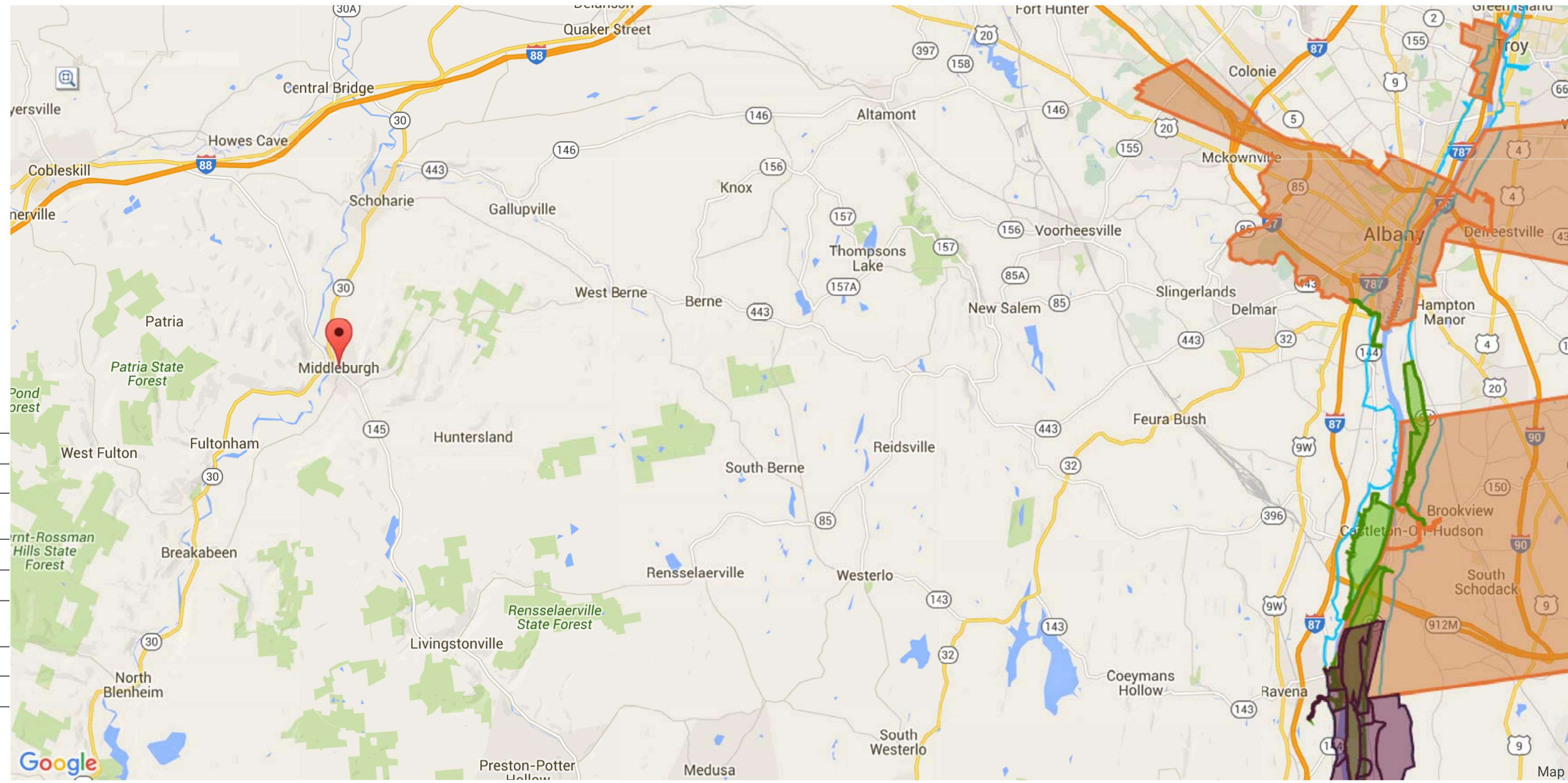
Village of middleburbh

Find Address

Please note that the address marker is automatically placed along the street while certain activities may take place along the waterward property boundary. Please make sure to click and drag the marker to the exact location of the proposed activity for an accurate assessment of whether or not the activity would be located within any DOS Special Management Areas.

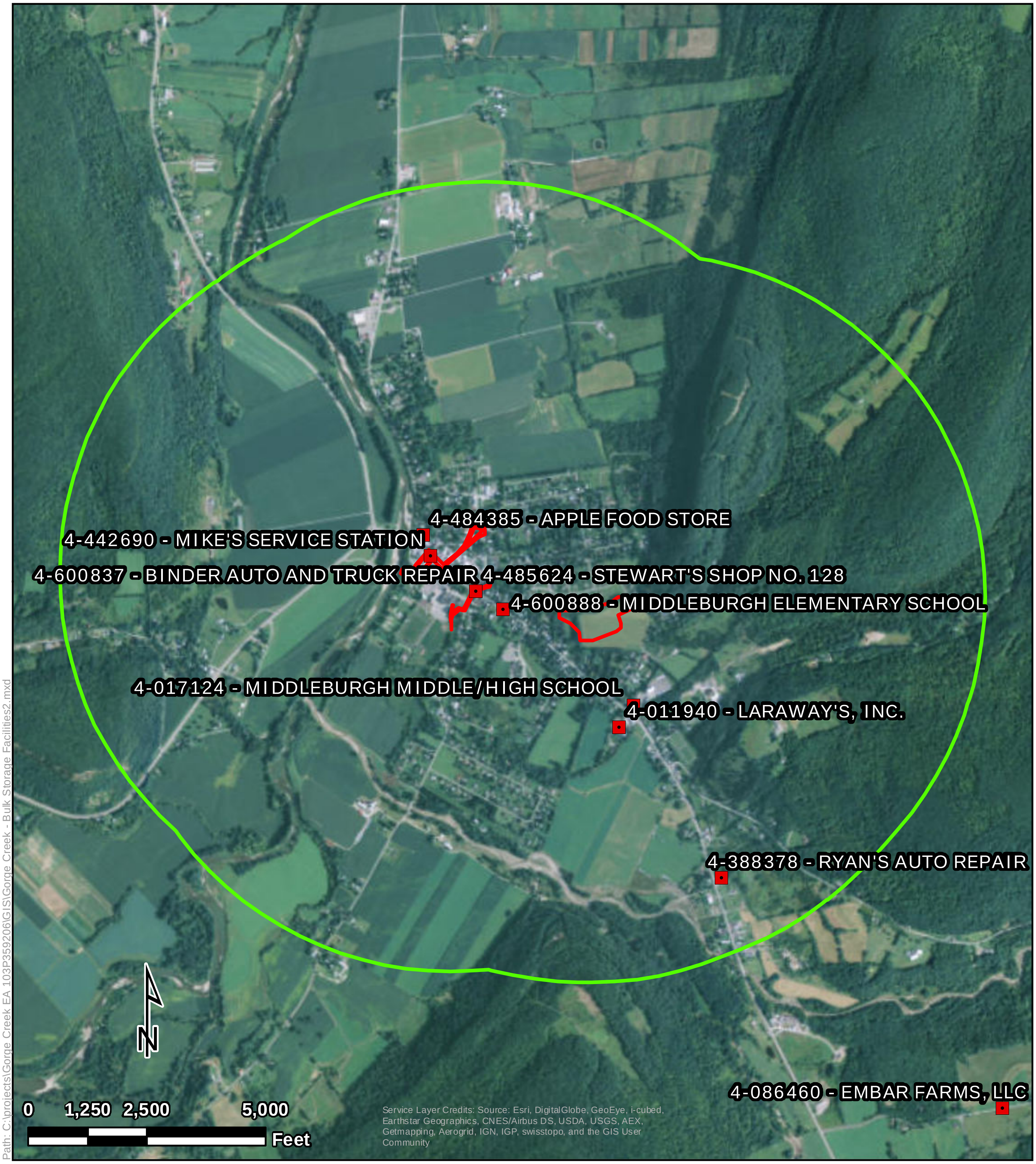
Layers

- [x] Landward Coastal Boundary
- [x] Scenic Areas
- [x] Local Waterfront Revitalization Areas
- [x] Local Waterfront Revitalization Program Communities
- [x] Significant Coastal Fish and Wildlife Habitats
- [x] DOS Identified Canals
- [x] Long Island Sound CMP (excludes LWRP communities)
- [ ] Federally Owned Lands
- [ ] Native American Lands



Latitude: 42.803 Longitude: -75.399

The New York State Department of State makes every effort to post accurate and reliable information on this website. The Department of State does not guarantee or warrant that the information on this web site is complete, accurate or current. The information on this website is intended solely for the purpose of electronically providing the public with general coastal consistency-related information and convenient access to data resources. The Department of State neither assumes responsibility for the use or application of any material posted on this website nor responsibility for any error, omission or other discrepancy between the electronic and printed versions of documents.



Legend

Project Area

One Mile Project Site Buffer

Bulk Storage Facilities

Chemical Bulk Storage

Petroleum Bulk Storage

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Bulk Storage Facilities

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Path: C:\projects\Gorge Creek EA 103P3592061GIS\Gorge Creek - Remediation Sites2.mxd

Remediation Sites

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Legend

- Project Area
- One Mile Project Site Buffer
- State Superfund Program Hazardous Waste Sites

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Legend

- Project Area
- Seabeach_Amaranth
- Roseate_Tern
- Roseate_Tern_1000Mbuffer
- Piping_Plover
- Piping_Plover_Buffer

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Selected Protected Species

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Protected Soils

Legend

- Project Area
- All areas are prime farmland
- Farmland of statewide importance
- Prime farmland if drained

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

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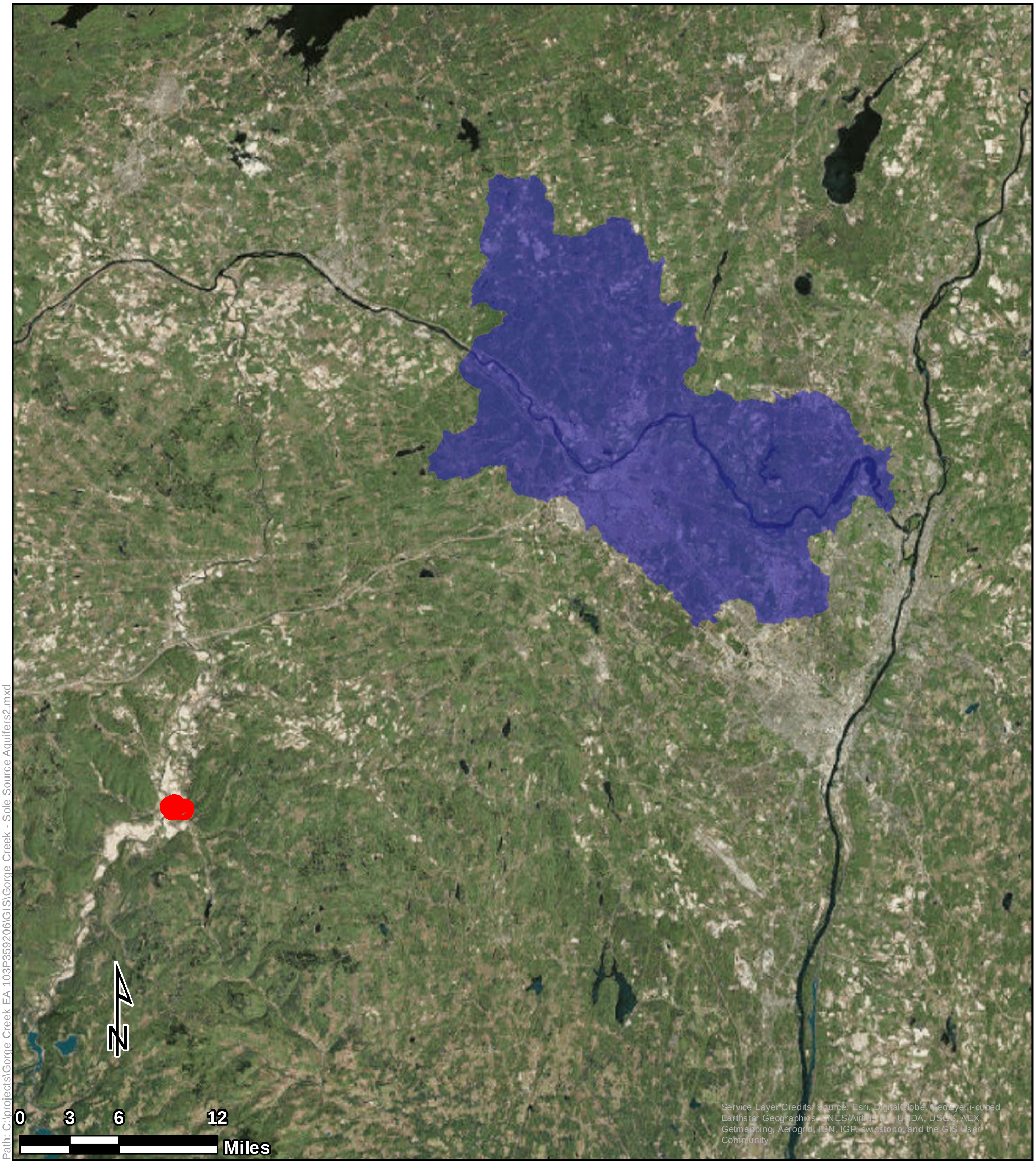

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Sole Source Aquifers

Legend

Project

Schenectady-Niskayuna SSA

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh,
Schoharie County, New York

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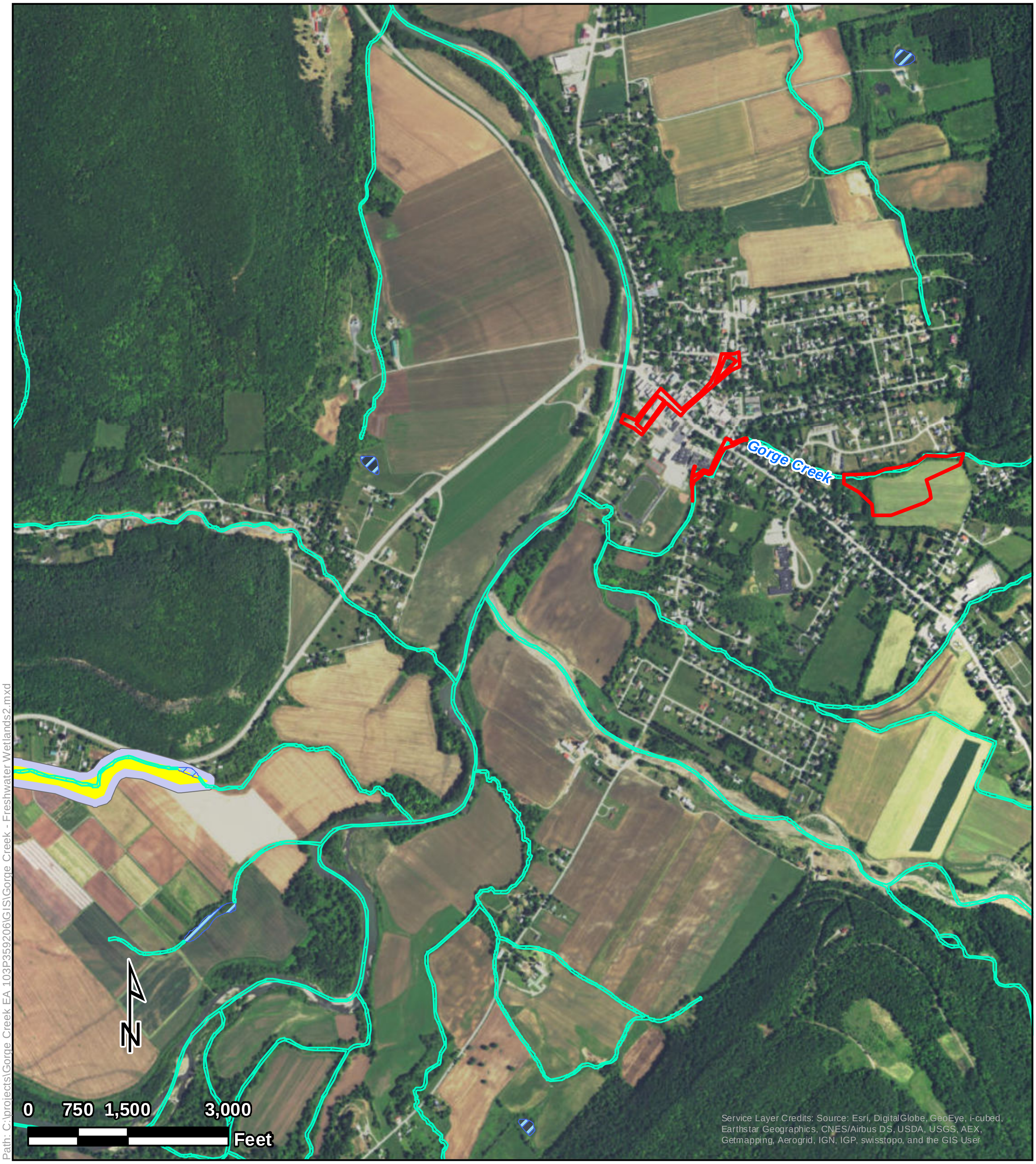

Legend

NYS Freshwater Wetlands

NYS Freshwater Wetlands Buffer

NWI Wetlands

Freshwater Pond

Riverine

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Freshwater Wetlands

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Path: C:\projects\Gorge Creek\Gorge Creek EA 103P359206\GIS\Gorge Creek - Tidal-Coastal Wetlands2.mxd

Tidal-Coastal Wetlands

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Legend

- Project Area
- Tidal - Coastal Wetlands
- Tidal - Coastal Wetlands 300ft Buffer

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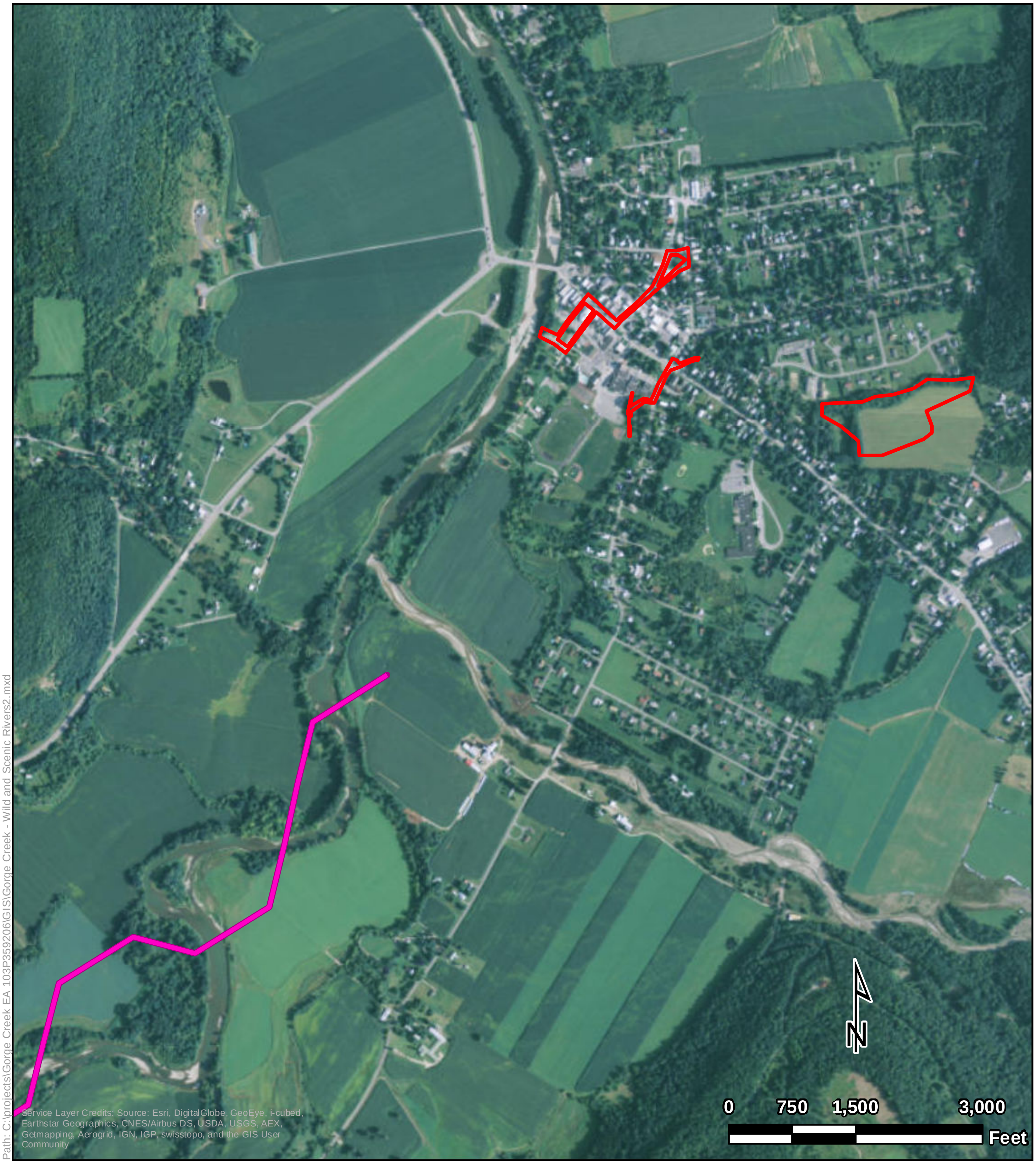


Path: C:\projects\Gorge Creek EA 103P359206\GIS\Gorge Creek - Wild and Scenic Rivers2.mxd

Wild and Scenic Rivers

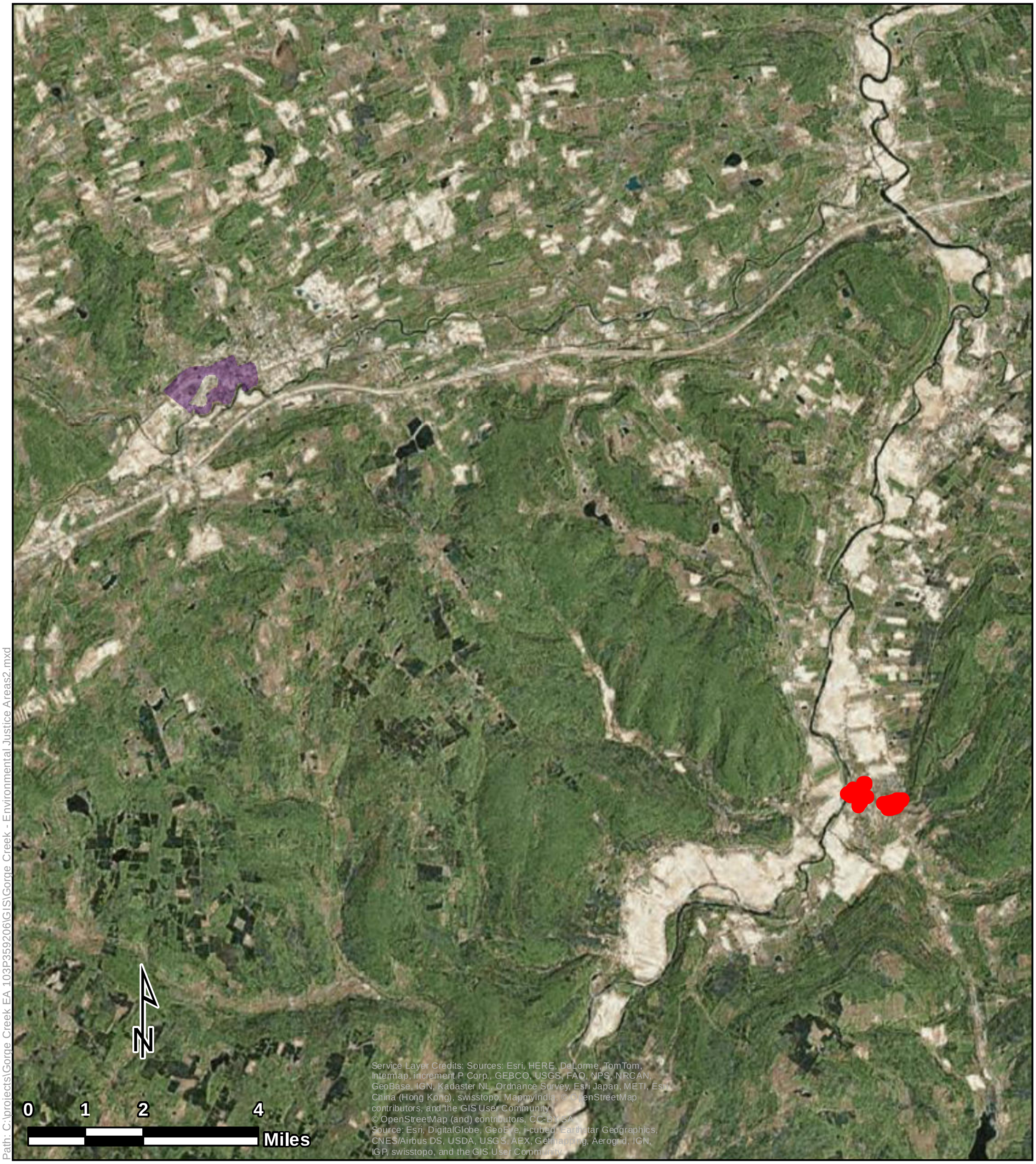
Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Legend

Project Area

Wild and Scenic Rivers

Tetra Tech, Inc



Path: C:\projects\Gorge Creek EA 103P3592061\GIS\Gorge Creek - Environmental Justice Areas2.mxd

Environmental Justice Areas

Gorge Creek Culvert Repair and Stormwater and
Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh,
Schoharie County, New York

Legend

Project

Environmental Justice Areas

Tetra Tech, Inc

APPENDIX B
USFWS AND NYNHP CORRESPONDENCE

Kaiser, Genevieve

From: Niver, Robyn <robyn_niver@fws.gov>
Sent: Thursday, August 24, 2017 11:09 AM
To: Shultz, Alicia (NYSHCR)
Cc: megan_patch@fws.gov; VanDonsel, MaryEllen; Kaiser, Genevieve; Fischl, Joseph
Subject: Re: Gorge Creek USFWS letter - updated species list

Sounds like nothing has changed in terms of potential impacts or determination. Thank you for the update.
Robyn

On Thu, Aug 24, 2017 at 11:06 AM, Shultz, Alicia (NYSHCR) <Alicia.Shultz@nyshcr.org> wrote:

Dear Robyn,

GOSR sent a consultation to the USFWS in December 2015. The project has been hold while conducting archeological investigation. Since December 2015 the USFWS has issued a final 4(d) rule for the northern long-eared bat (NLEB) that removes prohibitions that would otherwise be in place on "incidental take" of the bat in areas of the country not affected by white-nose syndrome. GOSR's December 2015 letter documented a determination that the proposed project **may affect, but is not likely to adversely affect**, the federally-listed threatened northern long-eared bat (*Myotis septentrionalis*). GOSR stated that trees will be removed between November 1 and March 31 to avoid direct impacts to the northern long-eared bat. **Winter tree removal would not cause prohibited incidental take.** GOSR has obtained an updated list of species under the USFWS jurisdiction us the IPaC and jurisdictional letter from NYSDEC. The species list has not changed since the December 2015 consultation letter to USFWS. The attached letter documents GOSR's updated review of the project activities and species potentially impacted by the proposed project.

Please let me know if you require additionally documentation in light of the 4(d) for the NLEB.

Thanks.

Alicia Shultz

Senior Environmental Scientist

New York State Homes & Community Renewal

Governor's Office of Storm Recovery

38-40 State St.,408N, Hampton Plaza, Albany, NY 12207

(518) 474-0647 | cell (917) 376-9003 Alicia.Shultz@nyshcr.org |

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****

Robyn A. Niver
Endangered Species Biologist
USFWS
New York Field Office
Cortland, NY 13045
607-299-0620

"Let us have faith that right makes might, and in that faith, let us to the end, dare to do our duty as we understand it." - Abraham Lincoln

Governor's Office of Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

August 24, 2017

Robyn A. Niver
Endangered Species Biologist
U.S. Fish & Wildlife Service
New York Field Office (Region 5)
3817 Luker Rd.
Cortland, NY 13045

Re: Determination and Request for Concurrence under Section 7 of the Endangered Species Act for the for the Improvements to the Gorge Creek Culvert for the Village of Middleburgh, Town of Middleburgh, Schoharie County, NY

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 & Urban Development (HUD), is preparing an Environmental Assessment (EA) for the improvements to the Gorge Creek culvert, which is required to reduce the risk of localized flooding and increase access to emergency shelter when future storm events occur. 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 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.

GOSR sent a consultation to the USFWS in December 2015. The project has been hold while conducting archeological investigation. Since December 2015 the USFWS has issued a final 4(d) rule for the northern long-eared bat that removes prohibitions that would otherwise be in place on "incidental take" of the bat in areas of the country not affected by white-nose syndrome. GOSR's December 2015 letter documented a determination that the proposed project **may affect, but is not likely to adversely affect**, the federally-listed threatened northern long-eared bat (*Myotis septentrionalis*). GOSR stated that trees will be removed between November 1 and March 31 to avoid direct impacts to the northern long-eared bat. **Winter tree removal would not cause prohibited incidental take.** GOSR has obtained an updated list of species under the USFWS jurisdiction us the IPaC and jurisdictional letter from NYSDEC. The species list has not changed since the December 2015 consultation letter to USFWS. This letter documents GOSR's updated review of the project activities and species potentially impacted by the proposed project.

Project Description

The project would construct two culverts to accommodate potential storm water runoff from a 100-year storm. The culverts also would include panels at 150 foot intervals to allow for regular cleaning and flushing. Five new storm water systems would be installed at Main Street, River Street, Railroad Avenue, Shelton Street and Railroad Court, and Danforth Avenue, in the Village of Middleburgh, Town of Middleburgh, Schoharie County, New York. The box culverts will be complemented by expansion of the Gorge Creek floodplain and construction of a sedimentation basin upstream of the box culverts. Grading of the floodplain expansion and the sedimentation pond will require removal of approximately 28,715 cubic yards of fill. Approximately 300 linear feet of the stream thalweg will be shifted approximately twenty to twenty-five feet south. The project is anticipated to entail substantial earthwork. The enclosed Figure 1 shows the estimated project area (the area outlined in red on the aerial photograph). **The estimated number of trees to be removed are 391**.

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

Alicia Shultz
Senior Environmental Scientist
New York State Homes & Community Renewal
Governor's Office of Storm Recovery
38-40 State St., 408N, Hampton Plaza, Albany, NY 12207
Alicia.Shultz@nyshcr.org
(518) 474-0647

Attachment:
USFWS IPaC Trust Resource Report
NYSDEC Jurisdictional Review

IPaC **U.S. Fish & Wildlife Service**

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

Schoharie County, New York

Not for consultation

Local office

New York Ecological Services Field Office

(607) 753-9334
(607) 753-9699

3817 Luker Road
Cortland, NY 13045-9349

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

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[1] are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service.

Not for consultation

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.

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

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	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[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

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

- Conservation measures for birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The migratory birds species listed below are species of particular conservation concern (e.g. Birds of Conservation Concern) that may be potentially affected by activities in this location. It is not a list of every bird species you may find in this location, nor a guarantee that all of the bird species on this list will be found on or near this location. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. To view available data on other bird species that may occur in your project area, please visit the AKN Histogram Tools and Other Bird Data Resources. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

NAME	SEASON(S)
American Bittern Botaurus lentiginosus https://ecos.fws.gov/ecp/species/6582	Breeding
Bald Eagle Haliaeetus leucocephalus https://ecos.fws.gov/ecp/species/1626	Year-round
Black-billed Cuckoo Coccyzus erythropthalmus https://ecos.fws.gov/ecp/species/9399	Breeding
Blue-winged Warbler Vermivora pinus	Breeding
Canada Warbler Wilsonia canadensis	Breeding
Golden-winged Warbler Vermivora chrysoptera https://ecos.fws.gov/ecp/species/8745	Breeding
Least Bittern Ixobrychus exilis https://ecos.fws.gov/ecp/species/6175	Breeding
Louisiana Waterthrush Parkesia motacilla	Breeding
Olive-sided Flycatcher Contopus cooperi https://ecos.fws.gov/ecp/species/3914	Breeding
Peregrine Falcon Falco peregrinus https://ecos.fws.gov/ecp/species/8831	Breeding
Pied-billed Grebe Podilymbus podiceps	Breeding
Prairie Warbler Dendroica discolor	Breeding
Red-headed Woodpecker Melanerpes erythrocephalus	Breeding
Short-eared Owl Asio flammeus https://ecos.fws.gov/ecp/species/9295	Wintering
Willow Flycatcher Empidonax traillii https://ecos.fws.gov/ecp/species/3482	Breeding
Wood Thrush Hylocichla mustelina	Breeding

Not for consultation

What does IPaC use to generate the list of migratory bird species potentially occurring in my specified location?

Landbirds:

Migratory birds that are displayed on the IPaC species list are based on ranges in the latest edition of the National Geographic Guide, Birds of North America (6th Edition, 2011 by Jon L. Dunn, and Jonathan Alderfer). Although these ranges are coarse in nature, a number of U.S. Fish and Wildlife Service migratory bird biologists agree that these maps are some of the best range maps to date. These ranges were clipped to a specific Bird Conservation Region (BCR) or USFWS Region/Regions, if it was indicated in the 2008 list of Birds of Conservation Concern (BCC) that a species was a BCC species only in a particular Region/Regions. Additional modifications have been made to some ranges based on more local or refined range information and/or information provided by U.S. Fish and Wildlife Service biologists with species expertise. All migratory birds that show in areas on land in IPaC are those that appear in the 2008 Birds of Conservation Concern report.

Atlantic Seabirds:

Ranges in IPaC for birds off the Atlantic coast are derived from species distribution models developed by the National Oceanic and Atmospheric Association (NOAA) National Centers for Coastal Ocean Science (NCCOS) using the best available seabird survey data for the offshore Atlantic Coastal region to date. NOAANCCOS assisted USFWS in developing seasonal species ranges from their models for specific use in IPaC. Some of these birds are not BCC species but were of interest for inclusion because they may occur in high abundance off the coast at different times throughout the year, which potentially makes them more susceptible to certain types of development and activities taking place in that area. For more refined details about the abundance and richness of bird species within your project area off the Atlantic Coast, see the Northeast Ocean Data Portal. The Portal also offers data and information about other types of taxa that may be helpful in your project review.

About the NOAANCCOS models: the models were developed as part of the NOAANCCOS project: Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf. The models resulting from this project are being used in a number of decision-support/mapping products in order to help guide decision-making on activities off the Atlantic Coast with the goal of reducing impacts to migratory birds. One such product is the Northeast Ocean Data Portal, which can be used to explore details about the relative occurrence and abundance of bird species in a particular area off the Atlantic Coast.

All migratory bird range maps within IPaC are continuously being updated as new and better information becomes available.

Can I get additional information about the levels of occurrence in my project area of specific birds or groups of birds listed in IPaC?

Landbirds:

The Avian Knowledge Network (AKN) provides a tool currently called the "Histogram Tool", which draws from the data within the AKN (latest,survey, point count, citizen science datasets) to create a view of relative abundance of species within a particular location over the course of the year. The results of the tool depict the frequency of detection of a species in survey events, averaged between multiple datasets within AKN in a particular week of the year. You may access the histogram tools through the Migratory Bird Programs AKN Histogram Tools webpage.

The tool is currently available for 4 regions (California, Northeast U.S., Southeast U.S. and Midwest), which encompasses the following 32 states: Alabama, Arkansas, California, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey, New York, North, Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin.

In the near future, there are plans to expand this tool nationwide within the AKN, and allow the graphs produced to appear with the list of trust resources generated by IPaC, providing you with an additional level of detail about the level of occurrence of the species of particular concern potentially occurring in your project area throughout the course of the year.

Not for consultation

Atlantic Seabirds:

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 NOAANCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Facilities

Wildlife refuges

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

THERE ARE NO REFUGES 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.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

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 tuberficid 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.

Not for consultation

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

August 23, 2017

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

RE: Improvements to the Gorge Creek Culverts
Village of Middleburgh, Town of Middleburgh, Schoharie County, NY

Dear Ms. Shultz,

We received your jurisdictional inquiry request for the improvement project for the Gorge Creek culverts in Schoharie County. It is our understanding that a detailed drainage study will be completed on Gorge Creek. After the completion of the hydrology and hydraulics study, two culverts will be constructed and panels will be installed at 150-foot intervals. In addition, five new stormwater systems will be installed throughout the project area. Based on our understanding of the project and the NYS Resources map created by Amanda Bailey on 8/22/2017 (attached), we have the following comments on the project:

STATE-LISTED SPECIES

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

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

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

DEC Northern long-eared bat protective measures guidance, available at: http://www.dec.ny.gov/animals/106090.html.

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

OTHER

USFWS Cortland Field Office

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

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

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

Sincerely,

Amanda Bailey

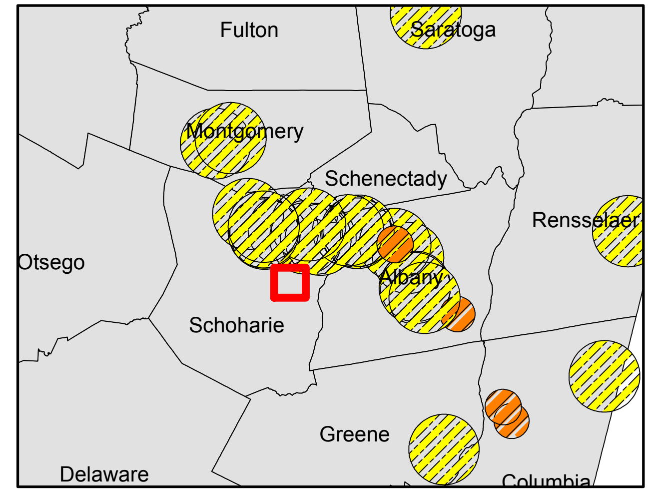
Amanda Bailey
Division of Fish and Wildlife
Amanda.bailey@dec.ny.gov
518-402-8859

Cc: Paul Novak, NYSDEC Regional Wildlife Biologist, Region 4
Martha Bellinger, NYSDEC Deputy Regional Permit Administrator, Region 4
May O’Malley, NYSDEC Division of Environmental Permits

NYS Resources Map

Gorge Creek Culvert Improvements
Town of Middleburgh, Schoharie County

Prepared by AMB on 8/22/2017



Project Area

Bat Occurrences

Indiana Bat

Northern Long-eared Bat

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

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

0 0.075 0.15 0.3 0.45 0.6 Miles

1 inch = 1,250 feet

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

August 29, 2017

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

Re: Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
County: Schoharie   Town/City: Middleburgh

Dear Ms. Schultz:

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 or in its immediate vicinity.

The absence of data does not necessarily mean that rare or state-listed species, significant natural communities, or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain information that 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 resources may be required to fully assess impacts on biological resources.

This response applies only to known occurrences of rare or state-listed animals and plants, significant natural communities, and other significant habitats maintained in the Natural Heritage database. Your project may require additional review or permits; 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 4 Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Sincerely,

Nick Conrad

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

1048

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

August 22, 2017

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

Re: Natural Heritage Compliance Process Request for the Improvements to the Gorge Creek Culverts for the Village of Middleburgh, Town of Middleburgh, Schoharie County, NY

To Whom it May Concern:

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), is preparing an Environmental Assessment (EA) for the improvements to the Gorge Creek culverts for the Village of Middleburgh, which is required to reduce the risk of localized flooding and increase access to emergency shelter when future storm events occur. GOSR also is preparing documentation under the State Environmental Quality Review Act (SEQRA).

The purpose of this letter is to request a search of the files of the New York Natural Heritage Program for records of the occurrence of any rare animals, plants, and natural communities and/or significant wildlife habitats in the vicinity of this project. The information we receive from you will be used in SEQRA documentation and/or any permit applications. We will retain the confidentiality, as needed, of any information received.

Program Overview

During Hurricane Irene and Tropical Storm Lee, significant flooding at the Middleburgh High School, due to the lack of drainage for Gorge Creek. Its channel runs under the school, where conveyances were overwhelmed by the volume of stormwater and debris. Without mitigation, this channel will continue to flood in major storm events, potentially stranding the approximate 259 students that attend Middleburgh High School.

This project will be a part of a regional and municipal strategy of flood drainage improvements in the Village of Middleburgh. The first phase of the project includes the completion of a hydrology and hydraulics (H and H) and detailed drainage study. The project is not expected to result in a change in land use. Land acquisition is not anticipated; however, following the H and H study, property easements may be needed for the construction of this project. The Village of Middleburgh will maintain the stormwater improvement portion of the project that is not located in the New York State Highway right-of-way. The New York State Department of Transportation (NYSDOT) will maintain the portion of the improvements in the New York State Highway right-of-way, as well as the Gorge Creek culvert repair portion of this project. The project would occur within currently developed or disturbed areas.

The project would construct two culverts to accommodate potential stormwater runoff from a 100-year storm. The culverts also would include panels at 150-foot intervals to allow for regular cleaning and flushing. Five new stormwater systems would be installed at Main Street, River Street, Railroad Avenue, Shelton Street and Railroad Court, and Danforth Avenue in the Village of Middleburgh. The project location is shown on attached **Figure 1, Project Location Map**, **Figure 2**, **Topographic Map**, and **Figure 3, Project Area Map**.

The New York Rising Community Reconstruction Planning Committee and members of the public consider the improvements to the Gorge Creek culverts in Middleburgh to be an important project for enhancing flood disaster mitigation, preparedness, and response and recovery efforts in both a local and regional capacity. It is expected that improving the stormwater drainage system for Gorge Creek will directly protect dozens of homes in local neighborhoods that were heavily impacted during Hurricane Irene and Tropical Storm Lee by the creek overflowing its banks, which in turn overwhelmed the existing stormwater system. Implementation of this infrastructure project is expected to reduce flooding caused by Gorge Creek and therefore provide protection to Village residences, businesses and a school on and around Main Street.

Compliance

According to information reviewed from the New York State Environmental Resource Mapper, natural communities or rare plants or animals are known to exist in the eastern portion of the project area (see **Figure 4**). Therefore, as the proposed project may result in the removal of trees, GOSR respectfully requests that the New York Natural Heritage Program review its records of concern for any rare or state-listed animals or plants, or significant natural communities, at this site or in its immediate vicinity.

According to the US Fish and Wildlife Service (USFWS), there is one threatened species that is potentially associated with the project area – the Northern Long-Eared bat. In addition, there are several migratory birds of concern that could potentially be affected by the proposed project. In order to avoid any chance of direct effects to this species, GOSR will only approve the project subject to the condition that trees are removed between November 1 and March 31.

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

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

Enclosures:
Figure 1: Project Location Map
Figure 2. Topographic Map
Figure 3: Project Area Map
Figure 4: Environmental Resource Mapper Findings
Figure 5: Flood Zones Map

Figure 1. Project Location Map

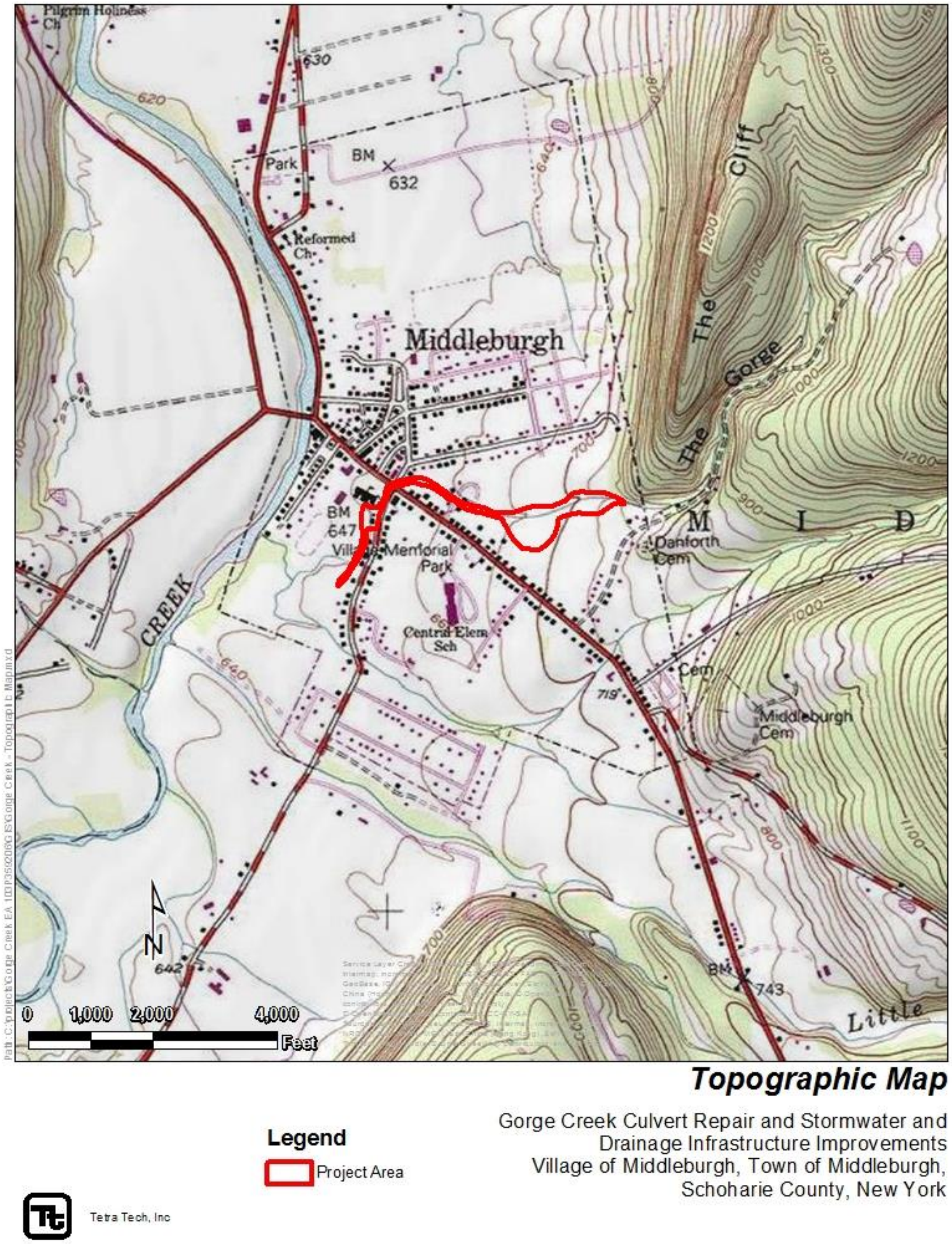


Figure 2. Topographic Map

Figure 3. Project Area Map

Gorge Creek

August 22, 2017

1:9,028

0 0.1 0.2 0.4 mi

0 0.175 0.35 0.7 km

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Author: GOSR
Not a legal document

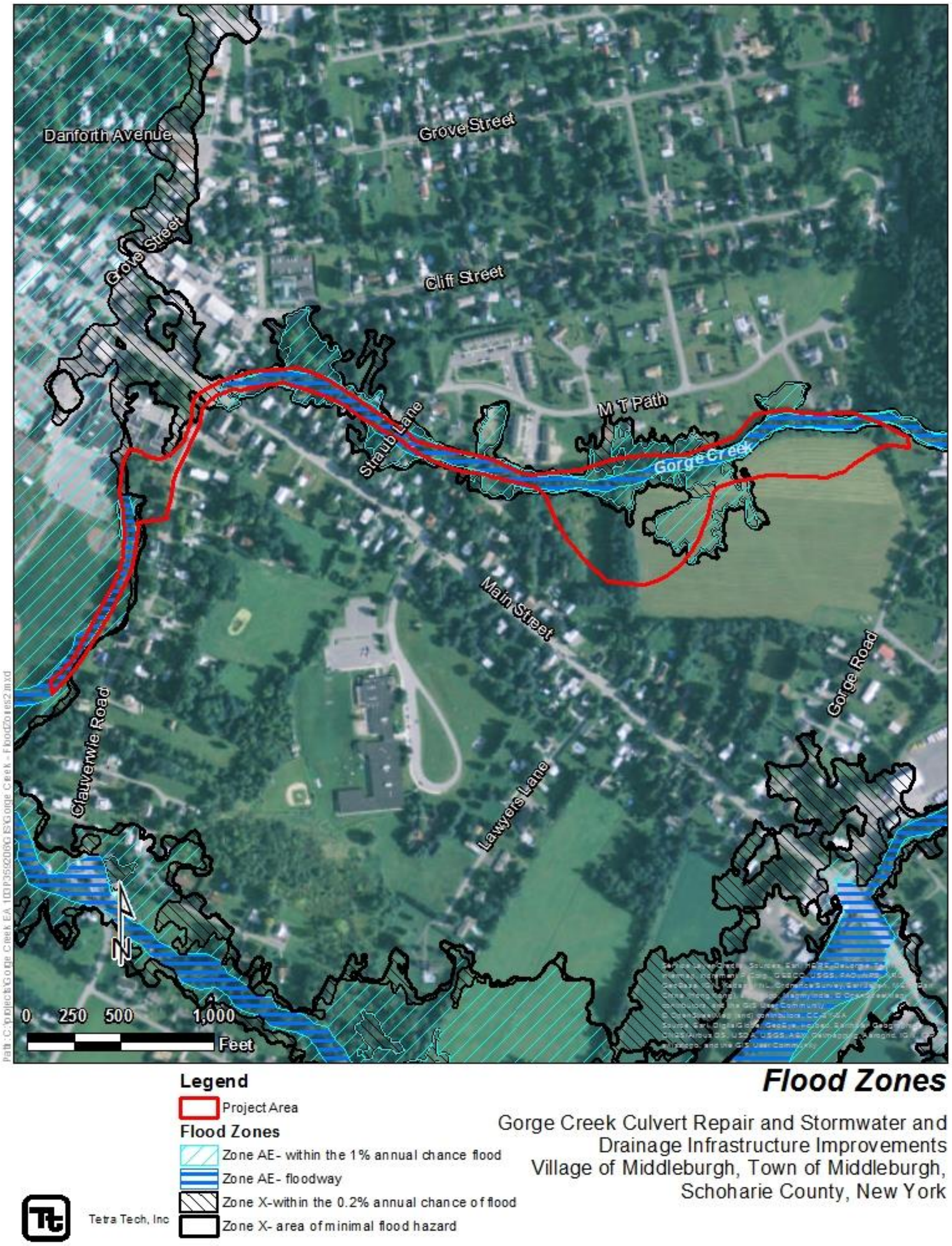


Figure 5: Flood Zones Map

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

January 13, 2016

Ms. Alicia Shultz
Community Developer - Environmental Services
NYS Homes and Community Renewal
38-40 State Street Hampton Plaza
Albany, NY 12207

Dear Ms. Shultz:

This responds to your December 14, 2015, letter regarding the proposed improvements to the Gorge Creek culvert located in the Village of Middleburgh, Schoharie County, New York. We understand that the U.S. Department of Housing and Urban Development (HUD) is involved with the proposed project and that the New York State Governor's Office of Storm Recovery (GOSR) has been designated the HUD's non-federal representative for the purposes of conducting informal consultation pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

In your letter you indicated that village flooding is caused by undersized culverts along the creek which must be replaced to avoid future damage to dozens of homes and businesses and the possible stranding of nearby high school students. Earthwork and tree removal will be required along Gorge Creek to install new culverts. Therefore, the GOSR has determined that the proposed project may affect, but is not likely to adversely affect, the federally-listed threatened northern long-eared bat (*Myotis septentrionalis*). The GOSR has stated that trees will not be removed between November 1 and March 31 to avoid direct impacts to the northern long-eared bat. Given the proposed project description (tree removal when bats are not active and the urban nature of the project site) we concur with your determination.

No further coordination or consultation under the ESA is required with the U.S. Fish and Wildlife Service (Service) at this time. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered. The most recent compilation of federally-listed and proposed endangered and threatened species in New York is available for your information. Until the proposed project is complete, we recommend that you check our website every 90 days from the date of this letter to ensure that listed species presence/absence information for the proposed project is current.*

The above comments pertaining to endangered species under our jurisdiction are provided pursuant to ESA. This response does not preclude additional Service comments under other legislation.

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

If you require additional information or assistance please contact Tim Sullivan at 607-753-9334.

Sincerely,

for Patricia Cole

David A. Stilwell
Field Supervisor

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

cc: NYSDEC, Stamford, NY (Env. Permits)

December 14, 2015

Robyn A. Niver
Endangered Species Biologist USFWS
New York Field Office
Cortland, NY 13045

Re: Determination and Request for Concurrence under Section 7 of the Endangered Species Act for the for the Improvements to the Gorge Creek Culvert for the Village of Middleburgh, Town of Middleburgh, Schoharie County, NY

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 & Urban Development (HUD), is preparing an Environmental Assessment (EA) for the improvements to the Gorge Creek culvert, which is required to reduce the risk of localized flooding and increase access to emergency shelter when future storm events occur. The project would construct two culverts to accommodate potential storm water runoff from a 100 year storm. The culverts also would include panels at 150 foot intervals to allow for regular cleaning and flushing. Five new storm water systems would be installed at Main Street, River Street, Railroad Avenue, Shelton Street and Railroad Court, and Danforth Avenue, in the Village of Middleburgh, Town of Middleburgh, Schoharie County, New York. The project is anticipated to entail substantial earthwork. The enclosed **Figure 1** shows the estimated project area (the area outlined in red on the aerial photograph). 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 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.

Program Overview

Hurricane Irene and Tropical Storm Lee caused significant flooding at the Middleburgh High School, due to the lack of drainage for Gorge Creek. Its channel runs under the school, where conveyances were overwhelmed by the volume of storm water and debris. Without mitigation, this channel will continue to flood in major storm events, potentially stranding the approximate 259 students that attend Middleburgh High School.

This project will be a part of a regional and municipal strategy of flood drainage improvements in the Village of Middleburgh. The first phase of the project includes the completion of a hydrology and hydraulics (H and H) and detailed drainage study. The project is not expected to result in a change in land use. Land acquisition is not anticipated; however, following the H and H study, property easements may be needed for the construction of this project. The Village of Middleburgh will maintain the stormwater improvement portion of the project that is not located in the New York State Highway Right-of-Way. The New York State Department of Transportation (NYSDOT) will maintain the portion of the improvements in the New York State Highway right-of-way, as well as the Gorge Creek culvert repair portion of this project. The project would occur within currently developed or disturbed areas.

The New York Rising Community Reconstruction Planning Committee and members of the public consider the improvements to the Gorge Creek Culvert in Middleburgh to be an important project for enhancing flood disaster mitigation, preparedness, and response and recovery efforts in both a local and regional capacity. It is expected that improving the stormwater drainage system for Gorge Creek will directly protect dozens of homes in local neighborhoods that were heavily impacted by the creek overflowing its banks, which in turn overwhelmed the existing stormwater system during Hurricane Irene and Tropical Storm Lee. Implementation of this infrastructure project is expected to reduce flooding caused by Gorge Creek and therefore provide protection to Village residences, businesses and a school on and around Main Street.

Compliance

According to the USFWS IPaC Trust Resource Report and list of threatened and endangered species, there is one threatened species that is potentially associated with the project site – the Northern Long Eared Bat (NLEB) (see attached list). In addition, there are 16 migratory birds of concern that could potentially be affected by the proposed project (see attached list). The official species list for the proposed project indicated that there is no critical habitat in the project area. If tree removal is deemed necessary during final plan design, GOSR will only approve the project subject to the condition that trees are removed between November 1 and March 31. There are no known hibernacula or maternity roosts in the vicinity of this location per communication with USFWS on December 8, 2015. On this basis, GOSR has determined that the proposed action is not likely to adversely affect NLEB or migratory birds. We request your concurrence with this determination.

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
Community Developer - Environmental Services
New York State Homes & Community Renewal
NYS Homes and Community Renewal

cc:
Laurice Salamack
Regional Lead
Governor's Office of Storm Recovery

Enclosures:
Attachment 1: Figures
Attachment 2: USFWS IPaC Trust Resource Report
Attachment 3: USFWS Consultation Species List

Danforth Avenue
Grove Street
Grove Street
Cliff Street
M T Path
Straub Lane
Gorge Creek
Main Street
Gorge Road
Clauverwie Road
Lawyers Lane
N
0 250 500 1,000
Feet
Project Area
Legend
Project Area
Gorge Creek Culvert Repair and Stormwater and
Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh,
Schoharie County, New York
Tetra Tech, Inc

Figure 1.

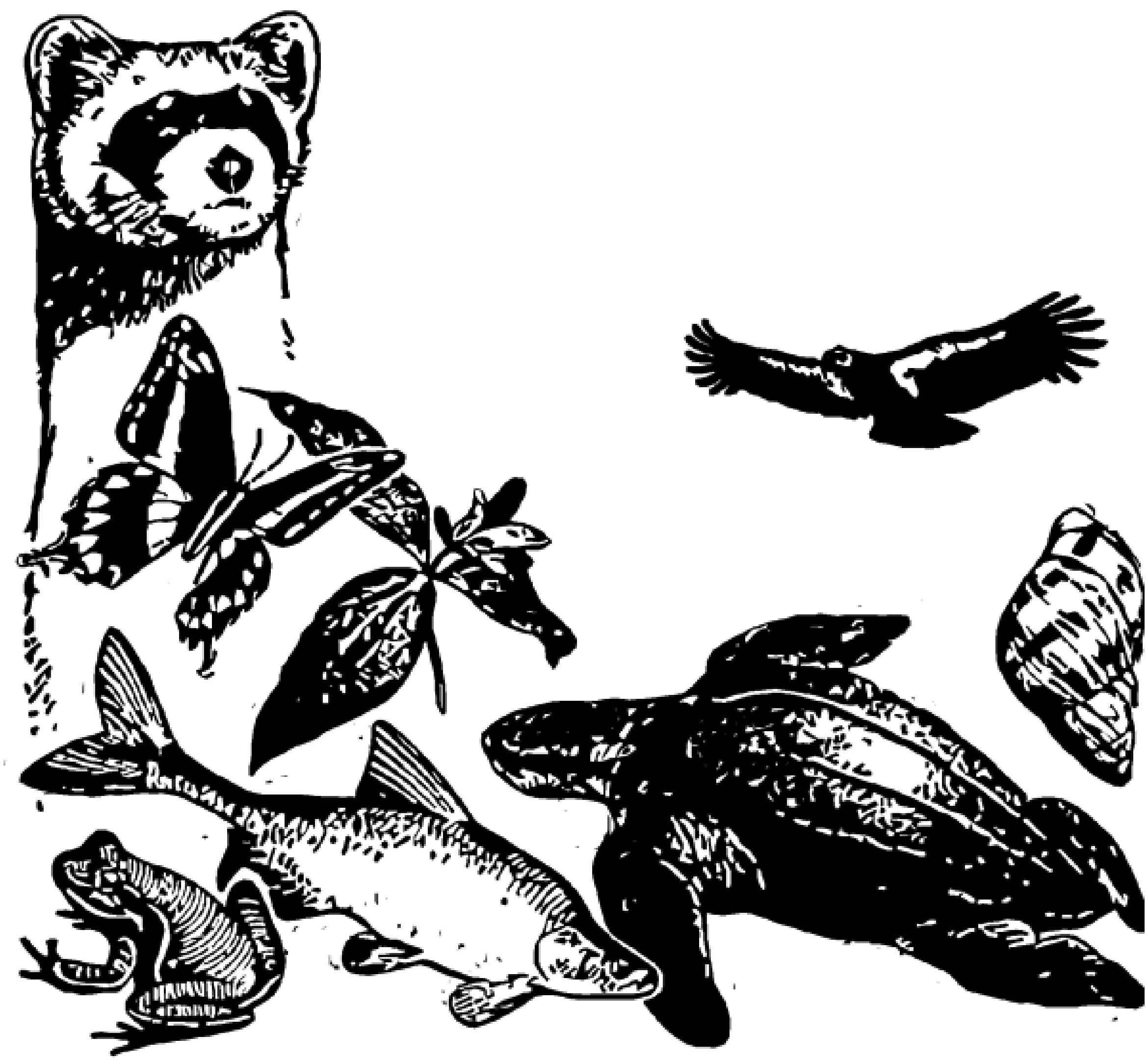
U.S. Fish & Wildlife Service

Gorge Creek Culvert Improvements

IPaC Trust Resource Report

Generated December 08, 2015 04:14 PM MST

This report is for informational purposes only and should not be used for planning or analyzing project-level impacts. For projects that require FWS review, please return to this project on the IPaC website and request an official species list from the Regulatory Documents page.



US Fish & Wildlife Service

IPaC Trust Resource Report

Project Description

NAME

Gorge Creek Culvert Improvements

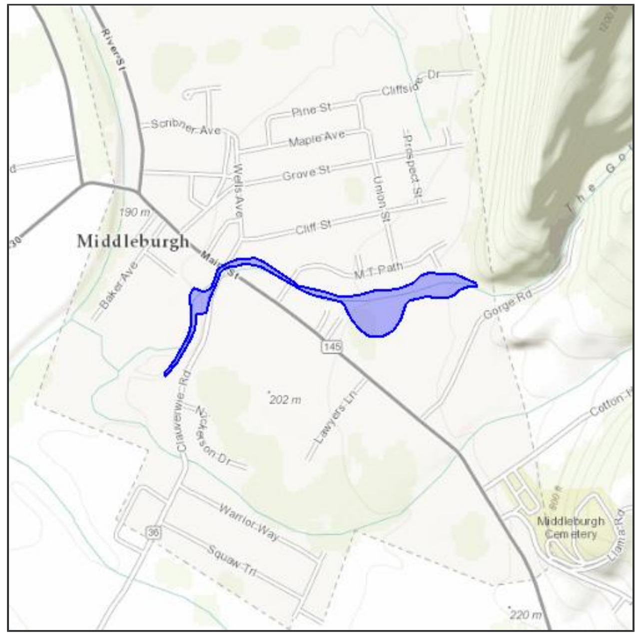
PROJECT CODE

KJ6EB-LKKFR-HAXNB-LLX7H-AT6VU4

LOCATION

Schoharie County, New York

DESCRIPTION



The project would construct two culverts to accommodate potential storm water runoff from a 100 year storm. The culverts would also include panels at 150 foot intervals to allow for regular cleaning and flushing. Five new storm water systems would be installed at Main Street, River Street, Railroad Avenue, Shelton Street and Railroad Court, and Danforth Avenue, in Middleburgh, New York. The project is anticipated to entail substantial earthwork.

U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

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

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the Endangered Species Program and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under Section 7 of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an official species list on the Regulatory Documents page.

Mammals

Northern Long-eared Bat Myotis septentrionalis Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A0JE

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

There is no critical habitat within this project area

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

American Bittern Botaurus lentiginosus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0F3

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008

Black-billed Cuckoo Coccyzus erythropthalmus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HI

Blue-winged Warbler Vermivora pinus — Bird of conservation concern
Season: Breeding

Canada Warbler Wilsonia canadensis — Bird of conservation concern
Season: Breeding

Golden-winged Warbler Vermivora chrysoptera — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0G4

Least Bittern Ixobrychus exilis — Bird of conservation concern
Season: Breeding

Louisiana Waterthrush Parkesia motacilla — Bird of conservation concern
Season: Breeding

Olive-sided Flycatcher Contopus cooperi — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0AN

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FU

Pied-billed Grebe Podilymbus podiceps — Bird of conservation concern
Season: Breeding

Prairie Warbler Dendroica discolor — Bird of conservation concern
Season: Breeding

Red-headed Woodpecker Melanerpes erythrocephalus — Bird of conservation concern
Season: Breeding

Short-eared Owl Asio flammeus — Bird of conservation concern

Season: Wintering

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD

Willow Flycatcher Empidonax traillii — Bird of conservation concern

Season: Breeding

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0F6

Wood Thrush Hylocichla mustelina — Bird of conservation concern

Season: Breeding

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

Wetlands

Impacts to NWI wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

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 tuberficid 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.

Wetland data is unavailable at this time.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 LUKER ROAD
CORTLAND, NY 13045
PHONE: (607)753-9334 FAX: (607)753-9699
URL: www.fws.gov/northeast/nyfo/es/section7.htm

Consultation Code: 05E1NY00-2016-SLI-0426 December 08, 2015
Event Code: 05E1NY00-2016-E-01057
Project Name: Gorge Creek Culvert Improvements

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

Official Species List

Provided by:

New York Ecological Services Field Office
3817 LUKER ROAD
CORTLAND, NY 13045
(607) 753-9334
http://www.fws.gov/northeast/nyfo/es/section7.htm

Consultation Code: 05E1NY00-2016-SLI-0426
Event Code: 05E1NY00-2016-E-01057

Project Type: LAND - FLOODING

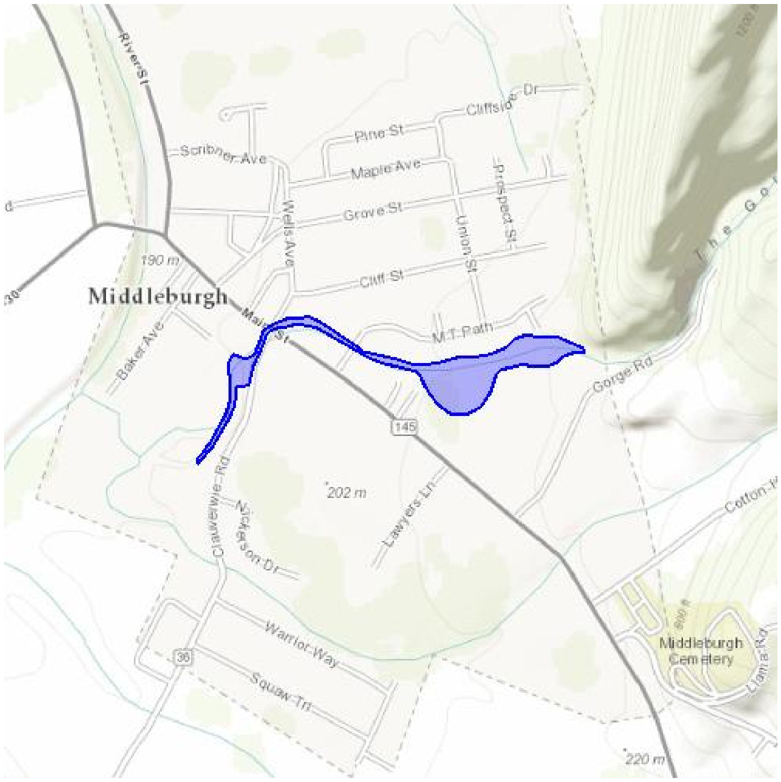
Project Name: Gorge Creek Culvert Improvements
Project Description: The project would construct two culverts to accommodate potential storm water runoff from a 100 year storm. The culverts would also include panels at 150 foot intervals to allow for regular cleaning and flushing. Five new storm water systems would be installed at Main Street, River Street, Railroad Avenue, Shelton Street and Railroad Court, and Danforth Avenue, in Middleburgh, New York. The project is anticipated to entail substantial earthwork.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

United States Department of Interior
Fish and Wildlife Service

Project name: Gorge Creek Culvert Improvements

Project Location Map:



Project Coordinates: The coordinates are too numerous to display here.

Project Counties: Schoharie, NY

Endangered Species Act Species List

There are a total of 1 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Mammals	Status	Has Critical Habitat	Condition(s)
Northern long-eared Bat *(Myotis septentrionalis)*	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife and Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • Fax: (518) 402-8925
Website: www.dec.ny.gov

January 08, 2016

Alicia Shultz
New York State Homes & Community Renewal
38-40 State Street
Albany, NY 12207

Re: Improvements to Gorge Creek culverts, Village of Middleburgh
Town/City: Middleburg. County: Schoharie.

Dear Alicia 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 concern of rare or state-listed animals or plants, or significant natural communities, at your site or in its immediate vicinity.

The absence of data does not necessarily mean that rare or state-listed species, significant natural communities or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain information that 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 resources may be required to fully assess impacts on biological resources.

This response applies only to known occurrences of rare or state-listed animals and plants, significant natural communities, and other significant habitats maintained in the Natural Heritage database. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Sincerely,

Nick Conrad

Nicholas Conrad
Information Resources Coordinator
New York Natural Heritage Program

1463

December 14, 2015

Nicholas Conrad
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
VIA EMAIL: nick.conrad@dec.ny.gov

Re: Natural Heritage Compliance Process Request for the Improvements to the Gorge Creek Culverts for the Village of Middleburgh, Town of Middleburgh, Schoharie County, NY

Dear Mr. Conrad:

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), is preparing an Environmental Assessment (EA) for the improvements to the Gorge Creek culverts for the Village of Middleburgh, which is required to reduce the risk of localized flooding and increase access to emergency shelter when future storm events occur. GOSR also is preparing documentation under the State Environmental Quality Review Act (SEQRA).

The purpose of this letter is to request a search of the files of the New York Natural Heritage Program for records of the occurrence of any rare animals, plants, and natural communities and/or significant wildlife habitats in the vicinity of this project. The information we receive from you will be used in SEQRA documentation and/or any permit applications. We will retain the confidentiality, as needed, of any information received.

Program Overview

During Hurricane Irene and Tropical Storm Lee, significant flooding at the Middleburgh High School, due to the lack of drainage for Gorge Creek. Its channel runs under the school, where conveyances were overwhelmed by the volume of stormwater and debris. Without mitigation, this channel will continue to flood in major storm events, potentially stranding the approximate 259 students that attend Middleburgh High School.

This project will be a part of a regional and municipal strategy of flood drainage improvements in the Village of Middleburgh. The first phase of the project includes the completion of a hydrology and hydraulics (H and H) and detailed drainage study. The project is not expected to result in a change in land use. Land acquisition is not anticipated; however, following the H and H study, property easements may be needed for the construction of this project. The Village of Middleburgh will maintain the stormwater improvement portion of the project that is not located in the New York State Highway right-of-way. The New York State Department of Transportation (NYSDOT) will maintain the portion of the improvements in the New York State Highway right-of-way, as well as the Gorge Creek culvert repair portion of this project. The project would occur within currently developed or disturbed areas.

The project would construct two culverts to accommodate potential stormwater runoff from a 100-year storm. The culverts also would include panels at 150-foot intervals to allow for regular cleaning and flushing. Five new stormwater systems would be installed at Main Street, River Street, Railroad Avenue, Shelton Street and Railroad Court, and Danforth Avenue in the Village of Middleburgh. The project location is shown on attached **Figure 1, Project Location Map**, **Figure 2**, **Topographic Map**, and **Figure 3, Project Area Map**.

The New York Rising Community Reconstruction Planning Committee and members of the public consider the improvements to the Gorge Creek culverts in Middleburgh to be an important project for enhancing flood disaster mitigation, preparedness, and response and recovery efforts in both a local and regional capacity. It is expected that improving the stormwater drainage system for Gorge Creek will directly protect dozens of homes in local neighborhoods that were heavily impacted during Hurricane Irene and Tropical Storm Lee by the creek overflowing its banks, which in turn overwhelmed the existing stormwater system. Implementation of this infrastructure project is expected to reduce flooding caused by Gorge Creek and therefore provide protection to Village residences, businesses and a school on and around Main Street.

Compliance

According to information reviewed from the New York State Environmental Resource Mapper, natural communities or rare plants or animals are known to exist in the eastern portion of the project area (see **Figure 4**). Therefore, as the proposed project may result in the removal of trees, GOSR respectfully requests that the New York Natural Heritage Program review its records of concern for any rare or state-listed animals or plants, or significant natural communities, at this site or in its immediate vicinity.

According to the US Fish and Wildlife Service (USFWS), there is one threatened species that is potentially associated with the project area – the northern long-eared bat. In addition, there are several migratory birds of concern that could potentially be affected by the proposed project. In order to avoid any chance of direct effects to this species, GOSR will only approve the project subject to the condition that trees are removed between November 1 and March 31.

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

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

cc:
Governor's Office of Storm Recovery
Enclosures:
Figure 1: Project Location Map
Figure 2. Topographic Map
Figure 3: Project Area Map
Figure 4: Environmental Resource Mapper Findings
Figure 5: Flood Zones Map

Figure 1. Project Location Map

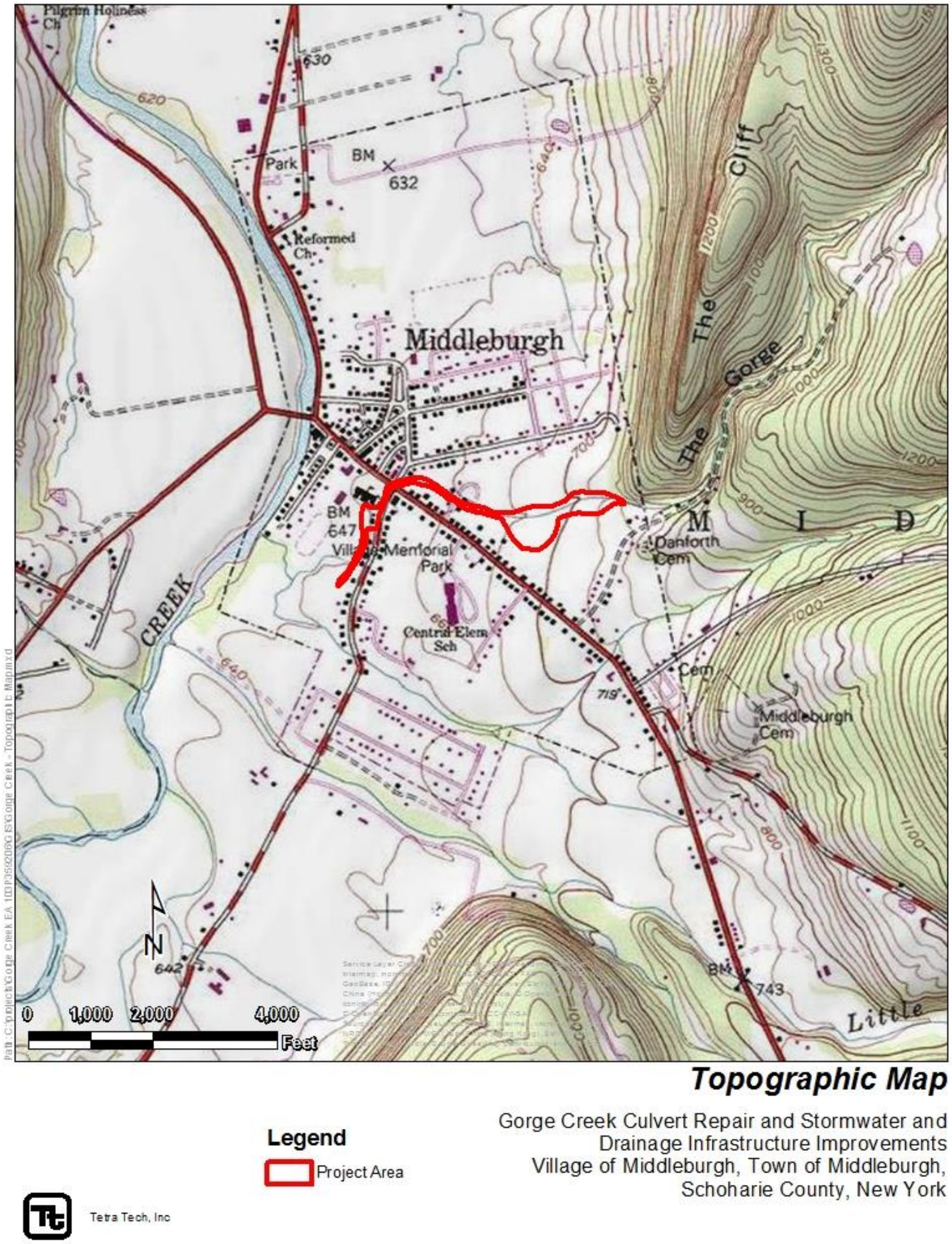


Figure 2. Topographic Map

Figure 3. Project Area Map

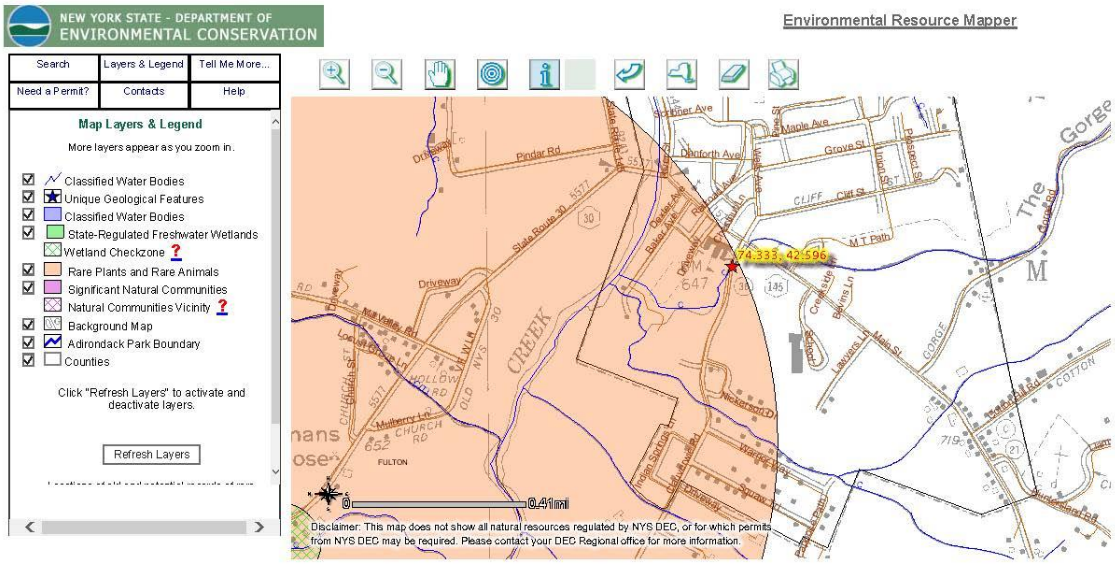


Figure 4. Environmental Resource Mapper Findings

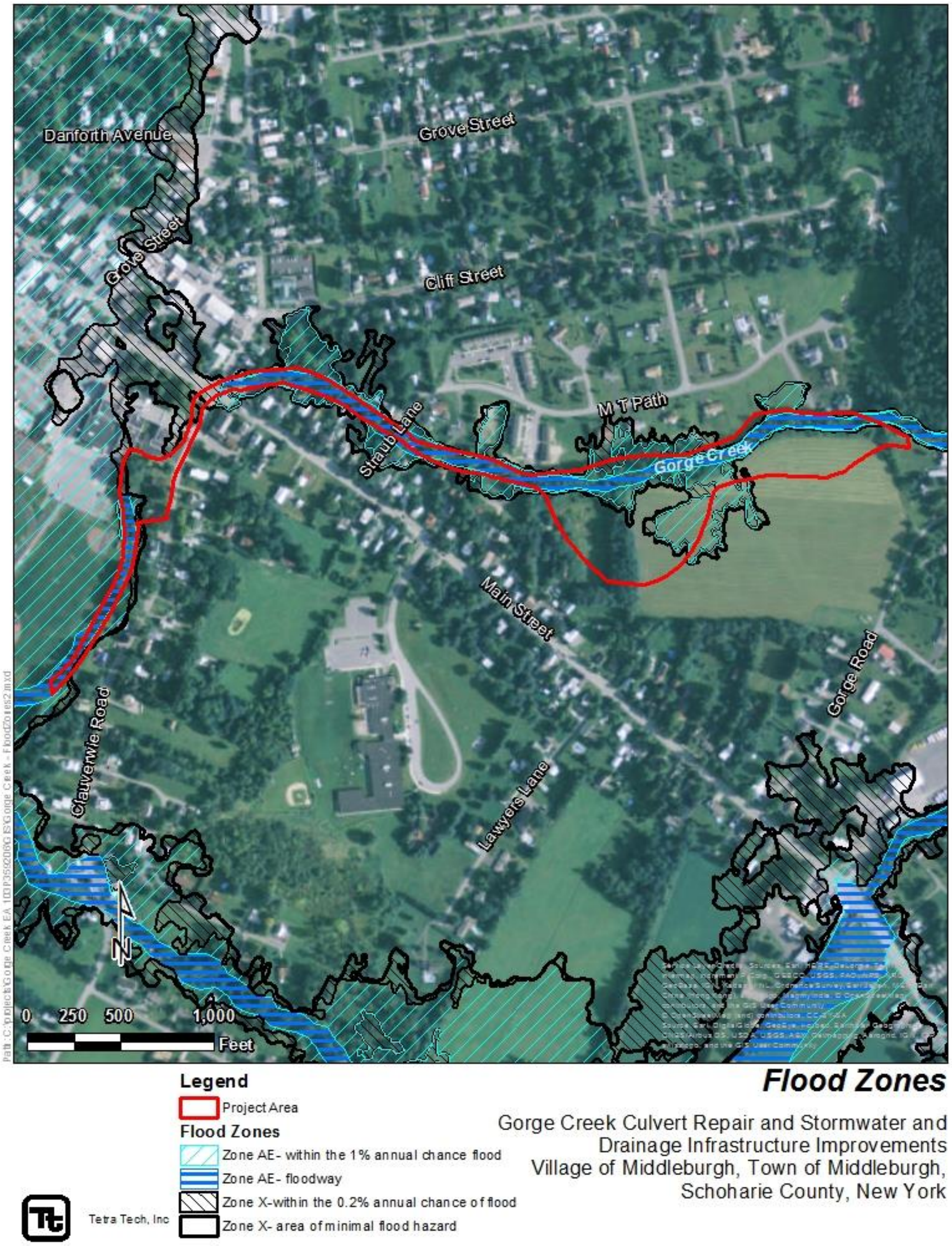


Figure 5: Flood Zones Map

APPENDIX C

FARMLAND PROTECTION

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 5/20/16
Name Of Project Gorge Creek Drainage Improvements	Federal Agency Involved US Department of Housing and Urban Develo
Proposed Land Use Sediment pond, culverts, floodplain	County And State Schoharie, NY
PART II *(To be completed by NRCS)*	Date Request Received By NRCS

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).*	Yes ☑ No ☐	Acres Irrigated 527	Average Farm Size 182
Major Crop*(s)* corn, hay	Farmable Land In Govt. Jurisdiction Acres: 95,490 % 24	Amount Of Farmland As Defined in FPPA Acres: 137,508 % 35	
Name Of Land Evaluation System Used Delaware Co. LESA	Name Of Local Site Assessment System none	Date Land Evaluation Returned By NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	13.3			
B. Total Acres To Be Converted Indirectly	0.0			
C. Total Acres In Site	13.3	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	13.3			
B. Total Acres Statewide And Local Important Farmland	0.0			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.0			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	3.9			
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	78	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Nonurban Use	15	15			
2. Perimeter In Nonurban Use	10	9			
3. Percent Of Site Being Farmed	20	11			
4. Protection Provided By State And Local Government	20	0			
5. Distance From Urban Builtup Area	15	0			
6. Distance To Urban Support Services	15	0			
7. Size Of Present Farm Unit Compared To Average	10	0			
8. Creation Of Nonfarmable Farmland	10	0			
9. Availability Of Farm Support Services	5	5			
10. On-Farm Investments	20	0			
11. Effects Of Conversion On Farm Support Services	10	0			
12. Compatibility With Existing Agricultural Use	10	5			
TOTAL SITE ASSESSMENT POINTS	160	45	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	78	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	45	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	123	0	0	0

Site Selected: Site A	Date Of Selection 9/20/17	Was A Local Site Assessment Used? Yes ☐ No ■

Reason For Selection: Site A is the only location that meets the purpose and need of the Project, minimizes effect on the natural and human environment, and is cost effective. Based on 7 CFR Part 658.4, sites with a score of less than 160 receive a minimal level of consideration for protection, and no additional evaluation is required. GOSR completed the form and the site assessment score. The Project scored a total of 123 points, based on the NRCS input for Part V and the total site assessment value for Par VI. As such, no additional evaluation is required is required for the Project.

(See Instructions on reverse side) **Form AD-1006 (10-83)**

This form was electronically produced by National Production Services Staff

USDA
United States Department of Agriculture

Natural Resources
Conservation Service

441 South Salina St.
Suite 354
Syracuse, NY 13212
315-477-6506
kathryn.duncan@ny.usda.gov

June 9, 2016

Alicia Shultz
Community Developer - Environmental Services
New York State Homes & Community Renewal
38-40 State St., 408N
Hampton Plaza, Albany, NY 12207

Re: Gorge Creek Culvert/Replacement & Sediment Pond, Village of Middleburgh
NRCS FPPA review

Dear Ms. Shultz,

The Farmland Conversion Impact Rating Form (NRCS-AD-1006) for the project cited above is attached for your use with sections II and IV filled out. Thank you for the information needed to complete section I & III. The funding agency will need to complete the rest of the form.

For your information the name of the Land Evaluation System used normally would be Schoharie County but due to the data not yet developed for that county a soil scientist in our office substituted Delaware County data which corresponds well to the soils in that area of Schoharie County.

In the future please address any FPPA requests to Cathy Crotty at the same address. The original letter took some time to get through the office to the correct person. Thank you!

If you have any questions, please to not hesitate to call.

Kathryn Duncan

Kathryn Duncan
Cartographer

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 5/20/2016
Name of Project Gorge Creek Sediment Pond	Federal Agency Involved US Department of Housing and Ur
Proposed Land Use Culverts and Sediment Pond	County and State Schoharie, NY
PART II *(To be completed by NRCS)*	Date Request Received By NRCS / Person Completing Form: Katie Duncan

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated 527	Average Farm Size 182 ac
Major Crop(s) corn, hay	Farmable Land In Govt. Jurisdiction Acres: 95,490 % 24	Amount of Farmland As Defined in FPPA Acres: 137,50 % 34.5	
Name of Land Evaluation System Used Delaware Co. LESA	Name of State or Local Site Assessment System none	Date Land Evaluation Returned by NRCS 6/9/2016	

PART III *(To be completed by Federal Agency)*		Alternative Site Rating			
		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly		13.3			
B. Total Acres To Be Converted Indirectly		0			
C. Total Acres In Site		13.3			
PART IV *(To be completed by NRCS)* Land Evaluation Information					
A. Total Acres Prime And Unique Farmland		13.3			
B. Total Acres Statewide Important or Local Important Farmland		0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		.001			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		3.9			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)		78			
PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)				
2. Perimeter In Non-urban Use	(10)				
3. Percent Of Site Being Farmed	(20)				
4. Protection Provided By State and Local Government	(20)				
5. Distance From Urban Built-up Area	(15)				
6. Distance To Urban Support Services	(15)				
7. Size Of Present Farm Unit Compared To Average	(10)				
8. Creation Of Non-farmable Farmland	(10)				
9. Availability Of Farm Support Services	(5)				
10. On-Farm Investments	(20)				
11. Effects Of Conversion On Farm Support Services	(10)				
12. Compatibility With Existing Agricultural Use	(10)				
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	78	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	0	0	0	0
TOTAL POINTS ***(Total of above 2 lines)***	260	78	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side)

Form AD-1006 (03-02)

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map, or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \text{ X } 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

May 20, 2016

New York State Office
USDA Natural Resources Conservation Service
The Galleries of Syracuse
441 South Salina Street, Suite 354
Syracuse, New York 13202-2450

Re: Gorge Creek Culvert Repair and Storm Water and Drainage Infrastructure Improvements Project, Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

To Whom It May Concern:

The Governor's Office of Storm Recovery (GOSR), an office 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), is preparing a NEPA environmental review under 24 CFR Part 58.35a for the Schoharie County Soil and Water Conservation District proposed culvert repair and storm water and drainage infrastructure improvements in the Village of Middleburgh, Town of Middleburgh, Schoharie County, New York. (See **Figures 1** and **2**)

This project is designed to reduce the risk of localized flooding and increase access to emergency shelter when future storm events occur. The project would be constructed in three areas: Middleburgh Junior/Senior High School at Clauverwie Road and Main Street (State Route 145), at Grove Street and Main Street, and Gorge Creek upstream, between Straub Lane and slightly east of Hayes Lane along the south side of Gorge Creek where it parallels the M T Path roadway. The undertaking involves construction in existing roadways, as well as extensive earthwork to create a sedimentation pond/floodplain and would disturb approximately 13.3 acres. (See **Figure 3** for a site plan of the proposed sedimentation pond.)

GOSR is acting as HUD's non-federal representative for the purposes of conducting consultation pursuant to the Farmland Protection Policy Act (FPPA). The purpose of this letter is to provide the Natural Resources Conservation Service (NRCS) notice of the proposed project and to document FPPA compliance. The soils on the parcel are shown as prime farmland (See **Figure 4**). Please find attached the Form AD-1006 for your review and use.

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

Sincerely,

Alicia Shultz
Community Developer - Environmental Services
New York State Homes & Community Renewal
38-40 State St., 408N
Hampton Plaza, Albany, NY 12207

Enclosures:
Form AD-1006
Figure 1: Project Location Map
Figure 2: Project Area Map
Figure 3: Site Design Plan
Figure 4: Protected Soils Map

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request
Name of Project Gorge Creek Culvert Repair/Improvment	Federal Agency Involved US Department of Housing and Url
Proposed Land Use Culverts and Sedimentation Pond	County and State Schoharie County, New York

PART II *(To be completed by NRCS)*	Date Request Received By NRCS	Person Completing Form:

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☐ NO ☐	Acres Irrigated	Average Farm Size
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %	Amount of Farmland As Defined in FPPA Acres: %	
Name of Land Evaluation System Used	Name of State or Local Site Assessment System	Date Land Evaluation Returned by NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	13.30			
B. Total Acres To Be Converted Indirectly	NA			
C. Total Acres In Site	13.30			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide Important or Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)				

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)				
2. Perimeter In Non-urban Use	(10)				
3. Percent Of Site Being Farmed	(20)				
4. Protection Provided By State and Local Government	(20)				
5. Distance From Urban Built-up Area	(15)				
6. Distance To Urban Support Services	(15)				
7. Size Of Present Farm Unit Compared To Average	(10)				
8. Creation Of Non-farmable Farmland	(10)				
9. Availability Of Farm Support Services	(5)				
10. On-Farm Investments	(20)				
11. Effects Of Conversion On Farm Support Services	(10)				
12. Compatibility With Existing Agricultural Use	(10)				
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	0	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form: Alicia Shultz	Date: 05/20/2019

(See Instructions on reverse side)

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

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Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

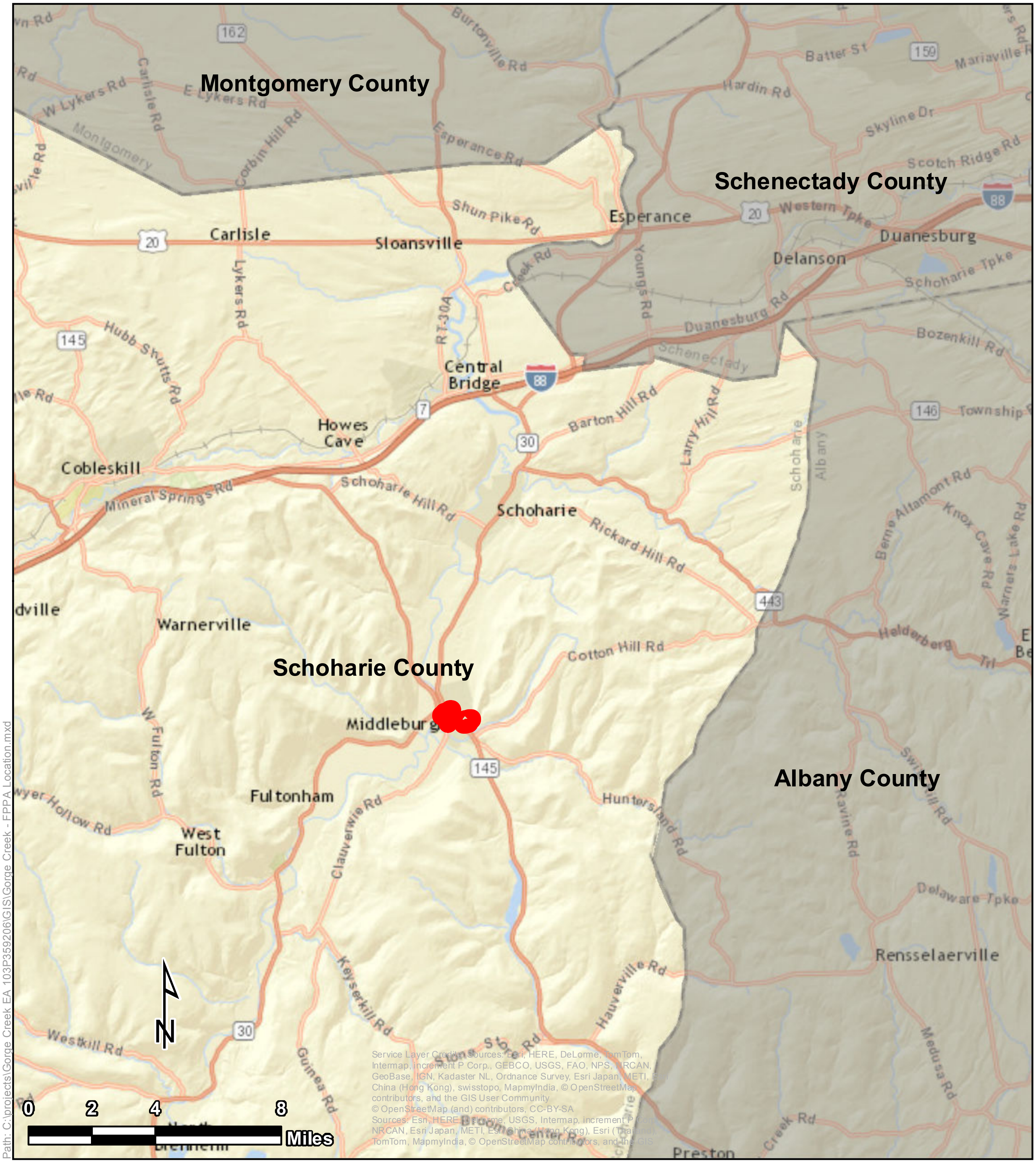
2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.



Path: C:\projects\Gorge Creek\Gorge Creek EA 103P359206\GIS\Gorge Creek - FPPA Location.mxd

Project Location

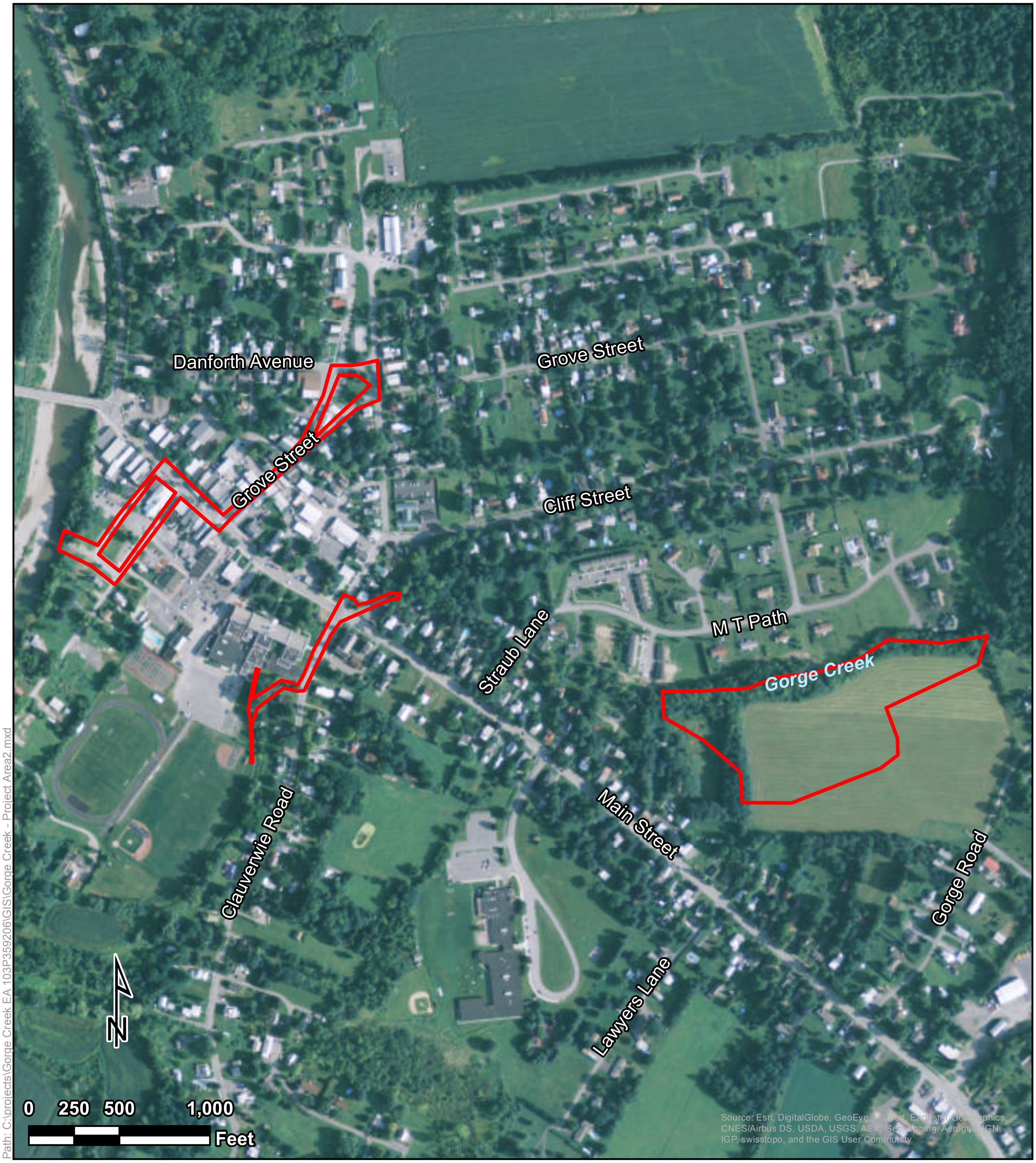
Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Legend

Project Location

Tetra Tech, Inc

Figure 1



Path: C:\projects\Gorge Creek\Gorge Creek EA 103P359206\GIS\Gorge Creek - Project Area2.mxd

Project Area

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Legend

Project Area

Tetra Tech, Inc

Figure 2

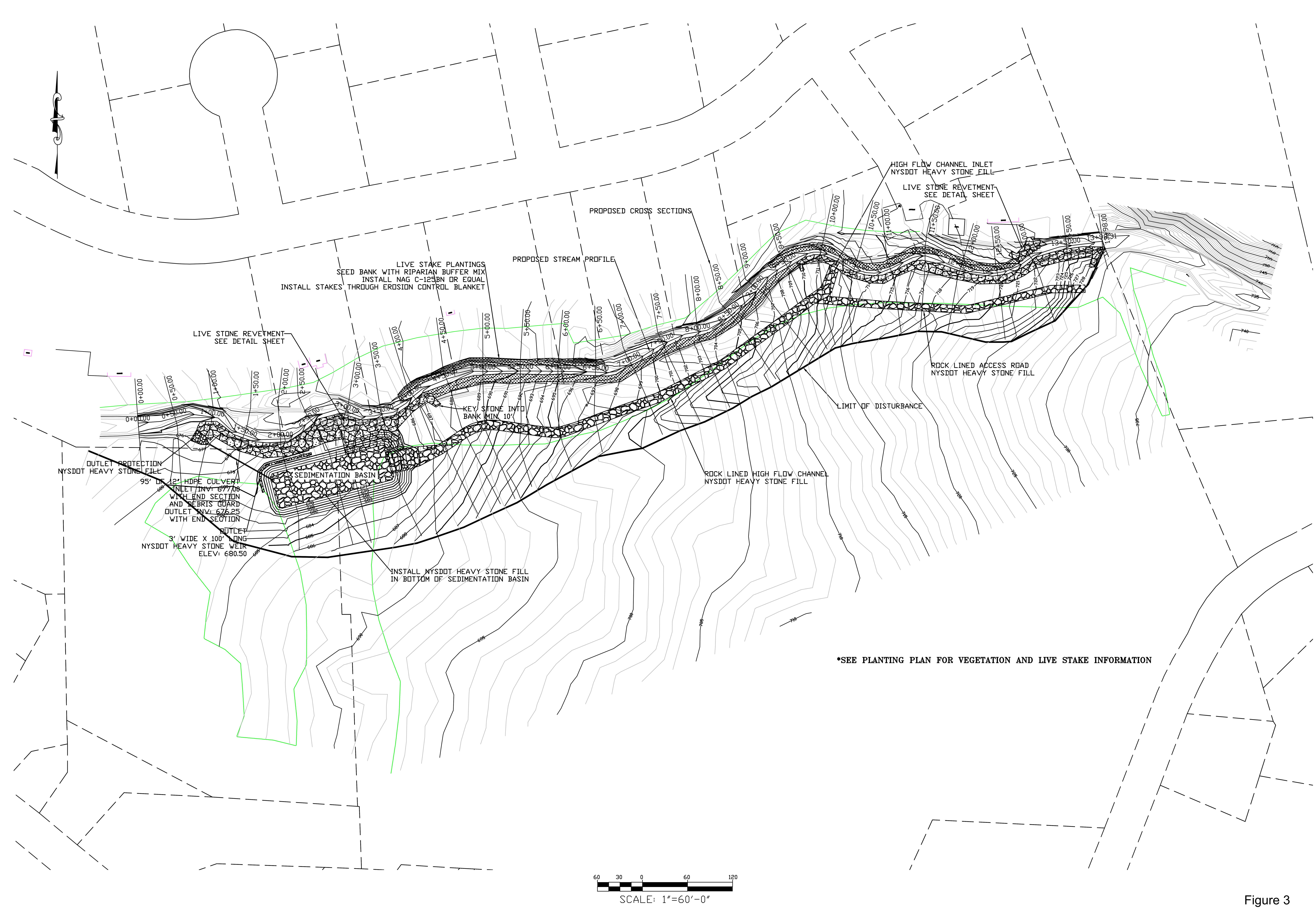


Figure 3

90% DESIGN DRAWINGS

DATE: 3/2016
DRAWN BY: JJF
SCALE: AS SHOWN
REVIEWED BY: XXX
PROJECT NO.: XX-XXX
FILE:

DELAWARE ENGINEERING, D.P.C.
CIVIL AND ENVIRONMENTAL ENGINEERING

28 MADISON AVENUE EXTENSION, ALBANY, NY 12203 - 518.452.1290
8-12 DIETZ STREET, SUITE 303, ONEONTA, NY 13820 - 607.432.8073

REVISIONS

NO.	DATE	DESCRIPTION

GORGE CREEK CULVERT REPAIR AND STORM WATER IMPROVEMENTS
VILLAGE OF MIDDLEBURGH
SCHOHARIE COUNTY, NY

UPPER GORGE CREEK
PROPOSED PLAN

SHEET:
C101

WARNING - IT IS A VIOLATION OF NEW YORK EDUCATION LAW SECTION 7209.2, FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER OR LAND SURVEYOR, TO ALTER THIS DOCUMENT IN ANY WAY. IF ALTERED THE ALTERING PERSON SHALL COMPLY WITH THE REQUIREMENTS OF NEW YORK EDUCATION LAW, SECTION 7209.2.

Legend

- Project Area
- All areas are prime farmland
- Farmland of statewide importance
- Prime farmland if drained

Tetra Tech, Inc

Protected Soils

Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Figure 4

APPENDIX D

FLOODPLAINS

AND WETLANDS

EARLY NOTICE OF A PROPOSED ACTIVITY IN A 100-YEAR FLOODPLAIN AND WETLANDS

GORGE CREEK BOX CULVERT REPLACEMENT AND STORM WATER DRAINAGE INFRASTRUCTURE IMPROVEMENTS VILLAGE OF MIDDLEBURGH, TOWN OF MIDDLEBURGH, SCHOHARIE COUNTY, NEW YORK SEPTEMBER 16, 2017

To: All interested Agencies, Groups, and Individuals

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

The Proposed Activity is needed to address the risk of localized flooding and increase access to emergency shelter when future storm events occur in the Village of Middleburgh. The Village of Middleburgh was heavily impacted by flood waters during Hurricane Irene and Tropical Storm Lee, as Gorge Creek overflowed its banks and overwhelmed the existing stormwater system. Gorge Creek runs under the Middleburgh High School through two culverts that cannot handle the volume of stormwater and debris during major storms.

The Proposed Activity entails construction of a box culvert and a sedimentation basin upstream of the box culverts, storm water drainage improvements along Gorge Creek, and expansion of the Gorge Creek floodplain. These improvements would benefit the community and environment by reducing the probability of flooding along the creek and decrease the flow velocity of the creek in the increased floodplain area. The new box culvert would supplement two existing under-sized culverts. The new box culvert would cross under NYS Route 145 to Clauverwie Road, continue under Clauverwie Road for approximately 320 feet, proceed underground on the west side of Clauverwie Road and south of the Middleburgh Junior/Senior High School, and discharge to Gorge Creek approximately 175 feet south of the school. Approximately 140 linear feet of gabion baskets would be installed along the west side of Gorge Creek, between the creek and the school ball fields, to protect the ball fields from increased flow in Gorge Creek during storm events.

The box culverts would be complemented by expansion of the Gorge Creek floodplain. Grading of the floodplain expansion and the sedimentation pond would require removal of approximately 15,430 cubic yards of fill, which would be incorporated into grading of the site outside the existing and proposed floodplain. Approximately 300 linear feet of the deepest part of the stream channel would be shifted approximately 20 to 25 feet south. The floodplain expansion and sedimentation basin are intended to reduce stream flow velocity during storm events and provide a location for sediment and debris to settle. This portion of the Proposed Activity would minimize the accumulation of sediment and associated reduction in the flow capacity in the proposed box culvert.

Provided sufficient funding is available, a new or improved storm sewer system would be constructed on all or a portion of the following streets: Railroad Avenue, Grove Street, Main Street (NYS Route 145) and Baker Avenue. The system would discharge to the Schoharie Creek on the west side of Dexter Avenue. The Proposed Activity is not expected to result in a change in land use but is expected require land acquisition. The Proposed Activity would involve construction in existing roadways, as well as extensive earthwork to create a sedimentation pond/floodplain and would disturb approximately 13.2 acres.

The Proposed Activity would result in temporary impacts to approximately 0.22 acres of National Wetlands Inventory (NWI)-mapped wetlands. The Proposed Activity would result in permanent impacts to 4.94 acres of a 100-year floodplain and 1.45 acres of a 500-year floodplain, as indicated on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Community Panel Number 36095C0302E, dated April 4, 2004, and 0.65 acres of NWI-mapped wetlands. Approximately 1.39 acres of the Proposed Activity area within the 100-year floodplain are also within a floodway, which includes the channel of the stream plus any adjacent floodplain areas that must be kept free of encroachments so that a one percent annual chance flood (100-year flood) can be accommodated without substantial increases in flood height. Approximately 3.54 acres of the area for the proposed floodplain expansion area and sedimentation basin are within the 100-year floodplain, and implementing the floodplain expansion and sedimentation basin would result in a beneficial increase for a new total of 4.47 acres. Approximately 0.93 acres of the floodplain expansion area and the sedimentation basin area are within the 500-year floodplain, and with the Proposed Activity, this would be reduced to about 0.64 acres within the 500-year floodplain.

The affected wetland areas are classified by the NWI as riverine and lie within the stream channel of Gorge Creek. No New York State Regulatory Freshwater Wetlands or tidal/coastal wetlands are on or adjacent to the Proposed Activity site. In the area of Middleburgh High School where the new box culvert would be constructed, Gorge Creek flows within an undersized culvert. In the area of the proposed sedimentation basin, the stream channel would be shifted to the south. Following alteration of the stream channel, it would continue to function as a riverine area.

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

Any individual, group, or agency may submit written comments on the Proposed Activity or request further information by contacting Lori A. Shirley, Certifying Officer, Governor's Office of Storm Recovery, 99 Washington Avenue, Suite 1224, Albany, NY 12260; email: NYSCDBG_DR_ER@nyshcr.org. Standard office hours are 9:00 AM to 5:00 PM Monday through Friday. For more information call 518-474-0755. All comments received by October 2, 2017, will be considered.

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT **CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of Alameda)

On 9/22/17 before me, Adam Joseph Rubinfeld, A Notary Public
Date *Here Insert Name and Title of the Officer*

personally appeared Cora Le Man
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature [signature]
Signature of Notary Public

ADAM JOSEPH RUBINFELD
COMM. # 2130481
NOTARY PUBLIC - CALIFORNIA
CONTRA COSTA COUNTY
My Comm. Exp.10-16-2019
HRE1

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document
Title or Type of Document: Affidavit of Mailing Document Date: 9/22/17
Number of Pages: 1 Signer(s) Other Than Named Above: ———

Capacity(ies) Claimed by Signer(s)

Signer's Name: Cora LeMan
☐ Corporate Officer — Title(s):
☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator
☒ Other: employee
Signer Is Representing: Tetra Tech, Inc.

Signer's Name:
☐ Corporate Officer — Title(s):
☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator
☐ Other:
Signer Is Representing:

©2014 National Notary Association • www.NationalNotary.org • 1-800-US NOTARY (1-800-876-6827) Item #5907

AFFIDAVIT OF MAILING

Cora LeMar, being duly sworn, deposes and states:

1. I am over the age of 18 years.
2. On September 14, 2017, I mailed true and correct copies of the George Creek Early Floodplain Notice, Town of Middleburgh, Schoharie County, New York, dated September 16, 2017 by placing the same in first-class, postage-paid, certified mail envelopes addressed to the recipients on the attached list.
3. On said day, I deposited said envelopes with a USPS representative at the US Postal Service Civic Center Station, 201 13th Street, Oakland, CA 94612.

Cora LeMar 9/22/17

Cora LeMar DATE
Tetra Tech, Inc.

Early Floodplain Notice Distribution List
Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure and Improvements Project
Schoharie County, New York

Tennille Smith Parker, Director
U.S. Dep. of Housing and Urban Development
Disaster Recovery and Special Issues Division
451 7th Street SW, Room 7272
Washington, DC 20410 (SEND BY UPS OR CERTIFIED MAIL)

Ms. Therese J. Fretwell, Enviro. Officer, R 1 & 2
U.S. Dep. of Housing and Urban Development
26 Federal Plaza, Room 3541
New York, NY 10278-0068

Jerome Hatfield, Regional Administrator
U.S. Dep. of Homeland Security Federal Emergency Management Agency, R II
26 Federal Plaza
New York, NY 10278-0002

By email only:
Ms. Grace Musumeci
U.S. Environmental Protection Agency
Musumeci.Grace@epa.gov

Ms. Robyn Niver
U.S. Fish and Wildlife Service
New York Field Office
3817 Luker Rd
Cortland, NY 13045

Mr. Richard Lord
Chief of Mitigation Programs & Agency Preservation Officer
NYS Division of Homeland Security & Emergency Services
1220 Washington Avenue
Bldg 7A, Floor 4
Albany NY 12242

William J. Clarke, Regional Permit Administrator
New York State Department of Environmental Conservation Region 4 Office
1130 North Westcott Rd
Schenectady, NY 12306-2014

Jack Williams, P.E., Regional Director
New York State Department of Transportation Region 9
44 Hawley Street

Binghamton, NY 13901

Roger C. Sokol, Ph.D., Director
NYS Department of Health
Bureau of Water Supply Protection
Empire State Plaza
Corning Tower Rm. 1110
Albany, NY 12237

Michael J. Montysko, P.E., Chief
NYS Department of Health
Bureau of Water Supply Protection
Design Section
Empire State Plaza
Corning Tower Rm. 1110
Albany, NY 12237

Mr. Ron Rausch, Director
Environmental Management Bureau
Office of Parks, Recreation and Historic Preservation
625 Broadway, 2nd Floor
Albany, New York 12238

Larry Moss, Technical Specialist
Division for Historic Preservation
New York State Historic Preservation Office
Peebles Island Resource Center
P.O. Box 189
Waterford, NY 12188-0189

Earl VanWormer III, Chairman
Schoharie County Board of Supervisors
County Office Building, Room 365
284 Main Street
Schoharie, New York 12157

Dr. Amy Gildemeister, Ph.D, Director of Public Health
Schoharie County Department of Health
County Office Building, 3rd Floor
284 Main Street
Schoharie, New York 12157

Shane Nickle, Senior Planner
Schoharie County Office of Community Development Services
276 Main Street, Suite 2
Schoharie, NY 12157

Sheryl Largeteau, Clerk
Schoharie County Board of Supervisors
County Office Building, Room 365
284 Main Street
Schoharie, New York 12157

Dan R. Crandell, P.E., Commissioner
Schoharie County of Public Works
P.O. Box 249
Schoharie, NY 12157

Matthew Avitabile, Mayor
P.O. Box 789
Middleburgh, NY 12122

Gerald Pete Coppolo Sr., Supervisor
Town of Middleburgh
P.O. Box 946
Middleburgh, NY 12122

Steve Kowalski, Superintendent of Public Works
Village of Middleburgh
309 Main Street, Suite 1
Middleburgh, NY 12122

Michele R. Weaver, Superintendent
Middleburgh Central School District
291 Main Street
Middleburgh, NY 12122

Melanie Laraway, Clerk/Treasurer
Middleburgh Village
309 Main Street, Suite 1
Middleburgh, NY 12122

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Permits & Pollution Prevention
625 Broadway, 4th Floor, Albany, New York 12233-1750
P: (518) 402-9167 | F: (518) 402-9168 | deppermitting@dec.ny.gov
www.dec.ny.gov

March 21, 2016

Mr. Thomas J. King
Governor's Office of Storm Recovery
99 Washington Avenue
Suite 1224
Albany, NY 12260

RE: Gorge Creek Culvert Repair/Stormwater and Drainage Infrastructure Improvements
Town of Middleburgh, Schoharie County

Dear Mr. King:

We have received your jurisdictional inquiry request for Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements located on Main Street, River Street, Railroad Avenue, Shelton Street and Railroad Court, and Danforth Avenue in the Village of Middleburgh, Schoharie County. It is our understanding that new box culverts will be installed to accommodate potential storm water runoff from a 100 year storm and will include panels at 150 foot intervals to provide access to the culvert for regular cleaning and flushing. This will also include the installation of five new storm water systems located on the above name streets. Based on our understanding of the project and review of the Schoharie County Soil & Water Conservation District map provided in the Pre-Application New York Rising report dated 12/2/14, we have the following comments on the project:

WATER

Water Quality Certification

A Water Quality Certification permit is required. In accordance with Section 401 of the Clean Water Act, applicants for a Federal license or permit for activities are required to apply for and obtain a Water Quality Certification from DEC indicating that the proposed activity will not violate water quality standards.

Article 15 Permit is not required, however 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.

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. 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

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

Water Quality Certification

Work in certain wetlands and other waters of the United States may require a permit from the U.S. Army Corps of Engineers (USACOE). If a USACOE permit is required, the Department may need to make a determination that discharges from the proposed activities will comply with the applicable effluent limitations, water quality standards, and any other applicable conditions of the State Law. A Water Quality Certification, pursuant to Section 401 of the Federal Clean Water Act, is required from this Department for impacts to federally regulated wetlands. It is recommended that you contact the Corps at (518) 266-6350 to discuss their permitting requirements.

In addition, 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/8694.html.

It is important to note that even if Department approvals are not required for this work, the activity shall not result in the degradation or contravening of water quality standards.

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

Please feel free to contact me if you have questions regarding the above information.

Sincerely,

May O'Malley

May O’Malley
Environmental Analyst
NYS DEC Division of Environmental Permits
may.omalley@dec.ny.gov
518-402-9154

Cc: Kristy Primeau, Environmental Analyst NYS DEC Region 4
US Army Corps
OPRHP

MEMORANDUM OF AGREEMENT

BETWEEN

The New York State Housing Trust Fund Corporation,
as responsible entity for the United States
Department of Housing and Urban Development;
The New York State Historic Preservation Office;
The Schoharie County Soil & Water Conservation District;
The Village of Middleburgh;
The United States Army Corps of Engineers;
The Saint Regis Mohawk Tribe

PERSUANT TO
36 C.F.R. 800

FOR THE RECOVERY OF SIGNIFICANT ARCHAEOLOGICAL INFORMATION

IN CONNECTION WITH

The Gorge Creek Culvert Repair and Storm Water Improvements Project
Village of Middleburgh
Schoharie County, New York
PR # 15PR06219

WHEREAS, the Schoharie County Soil & Water Conservation District proposes a federally-funded project in the Village of Middleburgh to design and construct culvert improvements and create a sediment basin (the "Undertaking"); and

WHEREAS, 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") is acting under the auspices 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") and is the entity responsible for compliance with the HUD environmental review procedures set forth in 24 C.F.R. Part 58 and Section 106 of the National Historic Preservation Act ("NHPA" 16 USC § 470f); and

WHEREAS, The Schoharie County Soil & Water Conservation District has applied to GOSR for funding associated with the Undertaking; and

WHEREAS, the Undertaking proposed by the Schoharie County Soil & Water Conservation District in its GOSR funding application, and to be described in its USACE permit application, is identified as "the Undertaking" below; and

WHEREAS, the Undertaking will require a permit pursuant to Section 404 of the Clean Water Act (33 USC § 1344), to be issued by the United States Army Corps of Engineers New York District ("USACE"), authorizing removal of sediment and fill within waters of the United States in order to effectuate the installation of a culvert box, creation of a sedimentation basin and dewatering of sediment, all as components of the Undertaking; and

WHEREAS, GOSR has conducted cultural resource studies and determined pursuant to 36 C.F.R. 800.4(c) in consultation with the New York State Historic Preservation Office (SHPO); and

WHEREAS, in accordance with Section 101(d)(6)(B) of the National Historic Preservation Act, GOSR has contacted the Saint Regis Mohawk Tribe and The Stockbridge-Munsee Community, Band of the Mohicans, federally-recognized tribal nations in New York State that have identified aboriginal territory in Schoharie County, and engaged the tribal nations in consultation to evaluate archaeological properties and to consider measures that would avoid, minimize, or mitigate effects on site(s) that may be identified that are part of prehistoric site Gorge Creek Site 1 (09542.000116) within the APE; and

WHEREAS, GOSR, the St. Regis Mohawk Tribe, and the New York State Historic Preservation Office ("SHPO") have consulted in accordance with Section 106 of the NHPA; implementing regulations at 33 C.F.R. Part 325 Appendix C and 36 C.F.R. Part 800; and agency guidance; and

WHEREAS, the SHPO has determined that Gorge Creek Site 1 (09542.000116) is eligible for listing on the State and National Registers of Historic Places, and to which GOSR and the Saint Regis Mohawk Tribe have concurred; and

WHEREAS, GOSR, as responsible entity has determined that funding the Undertaking would have an Adverse Effect on Gorge Creek Site 1 (09542.000116) and be subject to NHPA and its implementing regulations; and

WHEREAS, GOSR has consulted with SHPO and the St. Regis Mohawk Tribe and determined that the Area of Potential Effects ("APE") of the Undertaking, as that term is defined at 36 C.F.R., Part 800.16(d), is, in this case, the site of the sediment basin near Gorge Creek, upstream between Straub Lane and slightly east of Hayes Lane along the south side of Gorge Creek where it parallels the road M T Path, Village of Middleburgh, Schoharie County, New York; and

WHEREAS, in accordance with 36 C.F.R. Section 800.6(a)(1), on January 19, 2017, GOSR notified the Advisory Council on Historic Preservation ("ACHP") of its Adverse Effect determination with specified documentation and the ACHP notified GOSR on February 6, 2017, of its decision to not participate in the consultation pursuant to 36 C.F.R. Section 800.6(a)(1)(iii); and

WHEREAS, after public notice and response thereto, the public has been made aware of the proposed undertaking; and

WHEREAS, in accordance with 36 C.F.R. Part 800, GOSR ensures that Conditions 1 through 12 outlined in the Advisory Council on Historic Preservation's ("Council") "Recommended

Approach for Consultation on the Recovery of Significant Information from Archaeological Sites," and attached as Appendix I to this document shall be satisfied; and

WHEREAS the SHPO, the St. Regis Mohawk Tribe, and GOSR agree that Gorge Creek Site 1 (09542.000116) is of significance and of value for information on prehistory and/or history that they are likely to yield through archaeological, historical, and scientific methods of information recovery, including archaeological excavation; and

WHEREAS, the SHPO, the St. Regis Mohawk Tribe, and GOSR agree that recovery of significant information from the archaeological site(s) listed above may be done in accordance with the published guidance; and

WHEREAS, the SHPO, the St. Regis Mohawk Tribe, and GOSR agree that it is in the public interest to expend funds to implement the Undertaking through the recovery of significant information that may be identified at the prehistoric site, Gorge Creek Site 1 (09542.000116), and mitigate the adverse effects of the Undertaking at the site; and

WHEREAS, based on available information, no human remains, associated or unassociated funerary objects, or sacred objects, or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001), are expected to be encountered in the archaeological work;

NOW, THEREFORE, in accordance with the NHPA, GOSR, SHPO, and the St. Regis Mohawk Tribe agree that implementation of the Undertaking covered by this Agreement shall take into account effects on historic properties, and that completion of the steps set forth in the Stipulations below will serve to mitigate the adverse effects of the Undertaking.

STIPULATIONS

GOSR, in coordination with the Schoharie County Soil & Water Conservation, shall ensure the following stipulations are carried out:

1. GOSR and USACE Authorization. GOSR shall condition any grant of funding issued regarding the Undertaking to ensure implementation of the stipulations of this Agreement. Should USACE choose to utilize this agreement to demonstrate compliance with Section 106 of the NHPA in accordance with Stipulation 9 of this Agreement, USACE shall condition any approval issued regarding the Undertaking to ensure implementation of the stipulations of this Agreement.

2. Recordation. Pursuant to Section 110(b) of the NHPA, GOSR shall ensure that a data recovery plan is developed in consultation with the SHPO and the St. Regis Mohawk Tribe for the recovery of archeological data from the Gorge Creek Site 1 (09542.000116). GOSR shall ensure that the data recovery plan is consistent with Secretary of the Interior's Standards and Guidelines for Archeological Documentation (48 F.R. 44734-37) and takes into account the recommendations of the SHPO publication dated January 5, 2017.

A. GOSR shall ensure that the data recovery plan describes and justifies the studies to be carried out, including, but not limited to:

The research questions to be addressed, and why the research questions are worth addressing in the public interest;

Why it is likely that the research questions can be addressed using data from the Gorge Creek Site 1 (09542.000116);

The methods to be used in fieldwork and analysis, with an explanation of their relevance to the research questions;

The methods to be used in conservation, data management, and dissemination of data, with a justification for any unusual methods, and including a schedule;

How the recovered materials and records will be disposed of, consistent with 36 C.F.R. 79;

How the SHPO and the St. Regis Mohawk Tribe will be kept informed of the progress of data recovery, and afforded the opportunity to participate in the work;

A schedule for completing the data recovery, including analysis, reporting, and disposition of materials and records;

A schedule for providing progress reports to the SHPO, The St. Regis Mohawk Tribe, and GOSR;

A schedule for completing a final report meeting the SHPO's Report Format Standards, including draft analytical articles for submission to professional journals if warranted; and

A preliminary plan for public interpretation of the data recovery results, subject to revision based on the results of the data recovery proceeds.

B. GOSR shall ensure that the data recovery plan is submitted to the SHPO and the St. Regis Mohawk Tribe for 30 days review. Unless the SHPO or the St. Regis Mohawk Tribe object(s) within 30 days after receipt of the data recovery plan, GOSR shall ensure that the data recovery plan is implemented prior to and in coordination with those project activities that could disturb the Gorge Creek Site 1 (09542.000116). If the SHPO or St. Regis Mohawk Tribe objects within 30 days after receipt, GOSR will consult with the objecting party to resolve the objection

C. The Federal Agency Official should ensure that the data recovery plan is developed and will be implemented by or under the direct supervision of a person, or persons, meeting at a minimum the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738- 44739) and Standards for *Cultural Resource Investigations and the Curation of Archaeological Collections in New York* by the New York Archaeological Council (NYAC 1994) and adopted by the SHPO.

3. Mitigation. As partial mitigation for disturbance of the site(s) may be identified that are part of prehistoric site **Gorge Creek Site 1 (09542.000116)**:

A. The Saint Regis Mohawk Tribe Tribal Historic Preservation Officer, Tribal Historic Preservation Representatives, Historic Resource Specialists, Directors of Cultural Preservation, or other representative designated by the Tribe will be afforded the opportunity to visit the Undertaking site during the fieldwork portion of the monitoring and data recovery process.

B. The Saint Regis Mohawk Tribe will be provided copies of any and all academic and professional presentations and publications that arise from information gathered in full or in part from the site(s) that may be identified that are part of prehistoric site Gorge Creek Site 1 (09542.000116).

4. Treatment of Unanticipated Human Remains or Associated Artifacts. In the event that human remains are encountered during construction or archeological investigations, GOSR shall implement the following protocol:

A. At all times human remains shall be treated with the utmost dignity and respect. Should human remains be encountered, work in the vicinity of the discovery will stop immediately and the location will be immediately secured and protected from damage and disturbance.

B. Human remains or associated artifacts will be left in place and not disturbed. No skeletal remains or materials associated with the remains will be collected or removed until appropriate consultation has taken place and a plan of action has been developed.

C. The county coroner and local law enforcement as well as GOSR and SHPO will be notified immediately. The coroner and local law enforcement will make the official ruling on the nature of the remains, being either forensic or archeological. If the remains are archeological in nature, a bio-archaeologist will confirm the identification as human.

D. If human remains are determined to be Native American, the remains will be left in place and protected from further disturbance until a plan for their protection or removal can be generated. Consultation with GOSR, SHPO and appropriate Native American groups will be required, to determine a plan of action that is consistent with the Native American Graves Protection and Repatriation Act ("NAGPRA") guidance.

E. If human remains are determined to be Euro-American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Consultation with GOSR, SHPO and other appropriate parties will be required to determine a plan of action.

F. If human remains are encountered, consultation among GOSR, SHPO and the St. Regis Mohawk Tribe will be undertaken regarding the adjustment of the level of effort for archeological investigation.

5. Modification. Modification or amendment of this Agreement as necessary shall be accomplished by the signatories in the same manner as the original agreement. Notwithstanding any other provision in this Agreement, any signatory to this Agreement may request that it be amended, whereupon the signatories will consult to consider such amendment. Any amendment shall be in writing and signed by all signatories.

6. Disputes. The signatories shall look to resolve disputes regarding the completion of the terms of this Agreement among themselves. If the signatories cannot agree regarding a dispute, the St. Regis Mohawk Tribe, GOSR, or SHPO may request the participation of the ACHP to assist in resolving the dispute.

7. Termination. Unless extended by written agreement between GOSR and SHPO, the signatories' obligations under this Agreement shall terminate upon completion or abandonment of the project.

8. GOSR and HUD Compliance. The signatories agree that by execution and implementation of this Agreement, GOSR, and therefore by operation of law HUD, have satisfied their requirements for compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (16 U.S.C. 470f), with regard to funding the Undertaking.

9. USACE Compliance. The signatories agree that USACE may rely on this Agreement to demonstrate compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (16 U.S.C. 470f), with regard to permitting the Undertaking.

10. EXECUTION of this MOA by GOSR and the SHPO and implementation of its terms evidence that GOSR has taken into account the effects of this Undertaking on historic properties and afforded the ACHP an opportunity to comment.

HOUSING TRUST FUND CORPORATION

By: ____________________
Date: 2·6·17
Name: Lisa Bova-Hiatt
Title: Executive Director of Storm Recovery

NEW YORK STATE HISTORIC PRESERVATION OFFICER

By: ____________________
Date: ____________________
Name: Michael F. Lynch, P.E. AIA
Title: Deputy State Historic Preservation Officer

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HOUSING TRUST FUND CORPORATION

By: ____________________________
Date: __________________________
Name: Lisa Bova-Hiatt
Title: Executive Director of Storm Recovery

NEW YORK STATE HISTORIC PRESERVATION OFFICER

By: Michael F. Lynch
Date: 2/16/17
Name: Michael F. Lynch, P.E. AIA
Title: Deputy State Historic Preservation Officer

SCHOHARIE COUNTY SOIL & WATER CONSERVATION DISTRICT

By:____________________________
Date: 2/8/17
Name: Stephen Hoerz
Title: District Field Manager

VILLAGE OF MIDDLEBURGH

By:____________________________
Date: ____________________________
Name: Matthew Avitable
Title: Mayor

ST. REGIS MOHAWK TRIBE

By:____________________________
Date: ____________________________
Name: Ron LaFrance, Jr; Paul Thompson; and Beverly Cook
Title: Chiefs of St. Regis Mohawk Tribe

Optional Signatory

United States Army Corps of Engineers

By:____________________________
Date: ____________________________
Name:
Title:

Attachments:

Appendix A – Area of Potential Effect
Appendix B – Advisory Council on Historic Preservation Conditions: Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites.

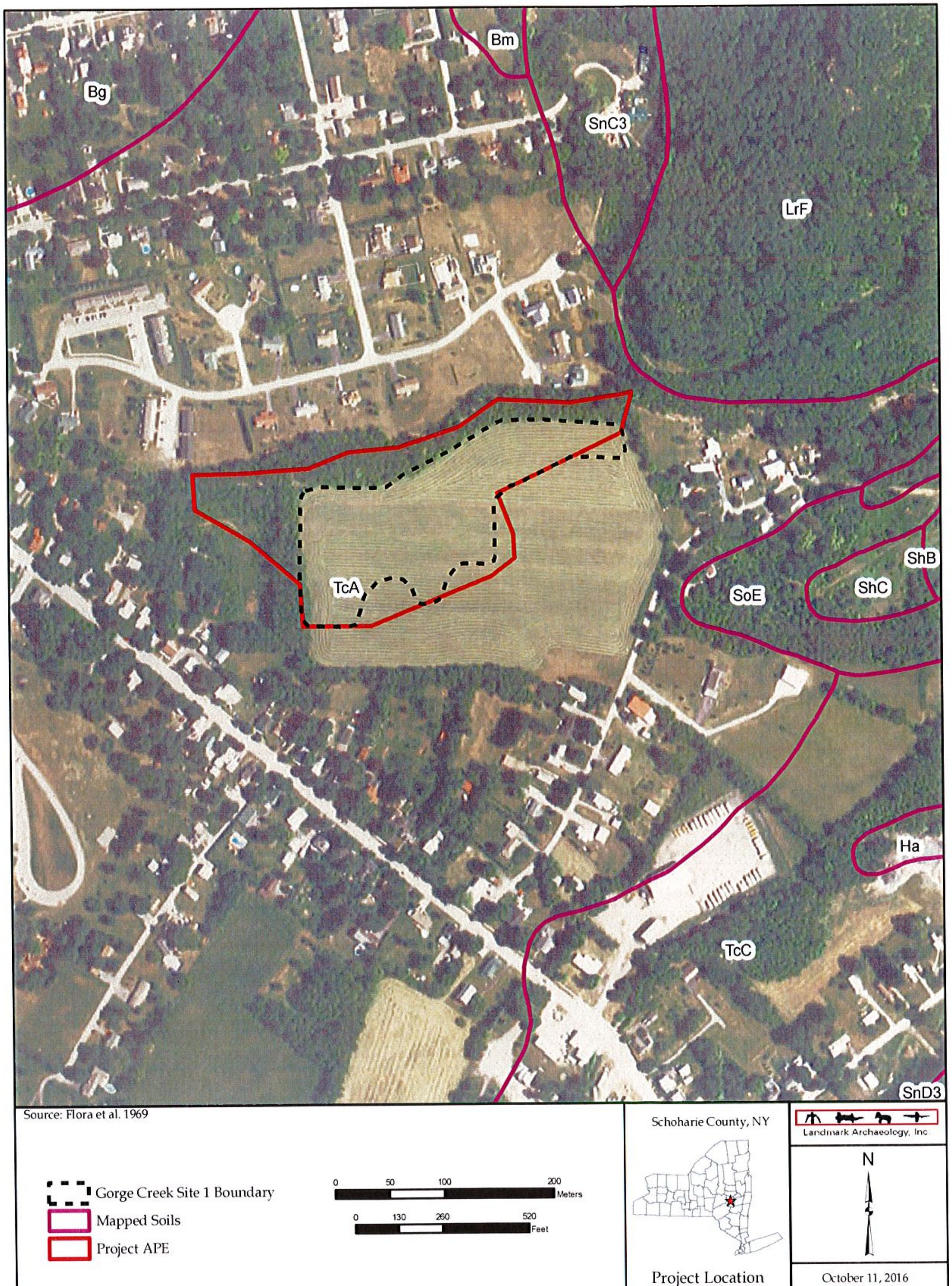

Figure 4: Mapped Soils

Appendix B

1. The archaeological site(s) should be significant and of value chiefly for the information on prehistory or hi story they are likely to yield through archaeological, historical, and scientific methods of information recovery, including archaeological excavation.

2. The archaeological site should not contain or be likely to contain human remains, associated or unassociated funerary objects, sacred objects, or items of cultural patrimony as those terms are defined by the Native American Graves Protection and Repatriation Act (25 U.S .C. 3001).

3. The archaeological site should not have long-term preservation value, such as traditional cultural and religious importance to an Indian tribe or a Native Hawaiian organization.

4. The archaeological site should not possess special significance to another ethnic group or community that historically ascribes cultural or symbolic value to the site and would object to the site's excavation and removal of its contents.

5. The archaeological site should not be valuable for potential permanent in-situ display or public interpretation, although temporary public di splay and interpretation during the course of any excavations may be highly appropriate.

6. The Federal Agency Official should have prepared a data recovery plan with a research design in consultation with the SHPO and other stakeholders that is consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties, the Secretary of the Interior' s Standards and Guidelines for Archaeology and Historic Preservation and the Advisory Council on Historic Preservation's Treatment of Archaeological Properties: A Handbook. The Plan should specify:

    (a) The results of previous research relevant to the project;
    (b) research problems or questions to be addressed with an explanation of the irrelevance and importance;
    (c) the field and laboratory analysis methods to be used with a justification of their cost effectiveness and how they apply to this particular property and these research needs;
    (d) the methods to be used in artifact, data and other records management;
    (e) explicit provisions for disseminating the research findings to professional peers in a timely manner;
    (f) arrangements for presenting what has been found and learned to the public, focusing particularly on the community or communities that may have interests in the results;
    (g) the curation of recovered materials and records resulting from the data recovery in accordance with 36 CFR part 79 (except in the case of unexpected discoveries that may need to be considered for repatriation pursuant to NAGPRA); and

(h) procedures for evaluating and treating discoveries of unexpected remains or newly identified historic properties during the course of the project, including necessary consultation with other parties.

7. The Federal Agency Official should ensure that the data recovery plan is developed and will be implemented by or under the direct supervision of a person, or persons, meeting at a minimum the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-44739)

8. The Federal Agency Official should ensure that adequate time and money to carry out all aspects of the plan are provided, and should ensure that all parties consulted in the development of the plan are kept informed of the status of its implementation.

9. 9. The Federal Agency Official should ensure that a final archaeological report resulting from the data recovery will be provided to the SHPO. The Federal Agency Official should ensure that the final report is responsive to professional standards, and to the Department of the Interior's Format Standards for Final Reports of Data Recovery Programs (41 FR 5377-79).

10. Large, unusual, or complex projects should provide for special oversight, including professional peer review.

11. The Federal Agency Official should determine that there are no unresolved issues concerning the recovery of significant information with any Indian tribe or Native Hawaiian organization that may attach religious and cultural significance to the affected property.

12. Federal Agency Officials should incorporate the terms and conditions of this recommended approach into a Memorandum of Agreement or Programmatic Agreement, file a copy with the Council per§ 800.6(b)(iv), and implement the agreed plan. The agency should retain a copy of the agreement and supporting documentation in the project files.

APPENDIX E

SHPO CORRESPONDENCE

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

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

September 20, 2017

Alicia Shultz
New York State Homes & Community Renewal
38-40 State Street
Albany, NY 12207

Re: NYSHCR/ GOSR/ NY Rising Program
Gorge Creek Culvert Improvements
Middleburgh/ Schoharie County
15PR06219

Dear Ms. Shultz:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 (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 the proposed undertaking will have No Adverse Effect to Historic Properties listed in or eligible for inclusion in the State or National Register of Historic Places.

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

Sincerely,

L Moss

Larry K Moss, Historic Preservation Technical Specialist

CC: Mary Barthelme, GOSR
Andrew Dangler, USACE
Ed Fahrenkopt, Delaware Engineering
Genevieve Kaiser, Tetratech

PHASE III DATA RECOVERY GORGE CREEK SITE 1 (09542.000116)

Village of Middleburgh, Schoharie County, New York

THIS REPORT CONTAINS CONFIDENTIAL INFORMATION
NOT FOR PUBLIC DISTRIBUTION

Prepared for:

Governor's Office of Storm Recovery
99 Washington Avenue, Suite 1224
Albany, New York 12260

Prepared by:

Louis Berger
20 Corporate Woods Blvd.
Albany, New York 12211

Final Report
September 5, 2017

Management Summary

Involved Agencies	Village of Middleburgh Schoharie County New York State Governor's Office of Storm Recovery (GOSR) New York State Homes and Community Renewal (HCR) New York State Office of Parks, Recreation and Historic Preservation (OPRHP)
Phase of Survey	Phase III Data Recovery
Location Information	Gorge Creek Site 1 (09542.000116), in agricultural field off Gorge Creek Road and along Gorge Creek
Village	Middleburgh
County	Schoharie
Site Size	2.47 hectares (6.1 acres)
USGS 7.5-Minute Quadrangle Map	*Middleburgh, NY*, 7.5-Minute Series Topographic Quadrangle, 2000
Data Recovery Overview	
Methods Used	Manual block excavation: 36 square meters (388 square feet) in 4 blocks, 9 square meters [97 square feet] each) Mechanical stripping (12 areas of various sizes totaling 3,691 square meters [39,730 square feet])
Artifacts Recovered/ Features Identified	3,076 lithic artifacts
Results of Data Recovery	
No./Name(s) of Prehistoric Sites Identified	Gorge Creek Site 1 (09542.000116)
No./Name(s) of Historic Sites Identified	None
Recommendations	Site deemed eligible for listing in the National Register of Historic Places. Impacts mitigated by data recovery excavations; no further work recommended.
Report Author	Stuart J. Fiedel, Ph.D., RPA, Christopher Morine, RPA, Delland Gould
Date of Report	September 5, 2017

Abstract

Louis Berger U.S., Inc. (Louis Berger) conducted Phase III archaeological data recovery excavations of the Gorge Creek Site 1 (09542.000116) April 26–June 15, 2017. This prehistoric site had been deemed eligible for the National Register of Historic Places as a result of Phase I and II investigations by Landmark Archaeology, Inc. in 2016. The site is located in the Area of Potential Effect (APE), or project area, for the proposed Gorge Creek Culvert Repair and Storm Water Improvements (OPRHP No. 15PR06219) in the Village of Middleburgh, Schoharie County, New York. Louis Berger performed the date recovery work on behalf of the Housing Trust Fund Corporation.

Louis Berger manually excavated 36 square meters (388 square feet) arrayed in four blocks of nine units each. The placement of these excavation blocks was determined primarily by the quantities of artifacts reported from the Phase I and Phase II shovel tests and units. Block 1 was located between Phase II Units 2 and 4. Block 2 was placed south of Phase II Unit 11. Block 3 was located just north of Shovel Test 28-2, and Block 4 was placed west of Shovel Test 20-5.

After block excavation, the plowzone was mechanically stripped from 12 areas for a total exposure of 3,691 square meters (39,730 square feet). The exposed subsoil was generally very rocky. Several patches of red-stained, oxidized soil were evident, generally with associated charcoal. These patches were amorphous and did not appear to be of cultural origin. Nevertheless, three patches, designated as Features 3, 4, and 5, were sectioned to reveal their profiles. None proved to be prehistoric cultural features.

The block excavations produced 3,076 lithic artifacts. In addition, a small number of chert chunks (n=44) were collected that, upon closer laboratory inspection, proved not to be artifacts. Only a very small percentage of the artifacts (n= 37; just over 1 percent) are whole or fragmentary formed tools, preforms, or utilized flakes. Almost all of this material came from the plowzone. By far the greatest percentage of the lithic material is dark gray Onondaga chert with brownish overtones. A minority is a lighter gray with a bluish tendency. The only temporally diagnostic artifact recovered is the basal portion of a Brewerton Corner-notched point found at the base of the plowzone in the northeast part of Block 3. This type indicates an occupation of the site ca. 6000 to 5000 cal BP.

Lithic debitage, including all types of flakes created in the lithic reduction sequence, was counted and measured. Raw material type, lithic reduction stage (blocky shatter, decortication, early stage, biface reduction, thinning) and presence/absence of cortex were also recorded. Whole and broken flakes (lacking the original striking platform or termination) were distinguished. Contrary to results of previous investigations, utilized flakes constitute only a small fraction of the assemblage.

A spatial analysis sought to determine horizontal variation in the distribution of lithic tool types and debitage, focusing on any perceptible differences between the northeast area of the site (Blocks 2 and 4), putatively dominated by Orient phase materials based on a surface collection, and the central area (Blocks 1 and 3), where the Brewerton point was found. The data for each block were also compared to data from other assemblages from the Schoharie Creek drainage, the mid-Hudson, and western New York. The results appear to indicate subtle differences in lithic reduction activities in the northeast area from those in the central area. Informative variables for this purpose proved to be the percentages of biface thinning flakes and flake fragments and the platform widths of biface reduction flakes. Gorge Creek appears distinctive from other Schoharie Creek sites for its very high proportion of biface thinning flakes (56 percent). Narrower platform widths distinguish flakes in Blocks 2 and 4 from those in Blocks 1 and 3. However, no distinctive attributes allow identification of the artifacts from the northeast sector as Orient-associated.

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I. Introduction

Louis Berger U.S., Inc. (Louis Berger) has completed Phase III archaeological data recovery excavations of the Gorge Creek Site 1 (09542.000116). This prehistoric site was deemed eligible for the National Register of Historic Places as a result of Phase I and II investigations by Landmark Archaeology, Inc. (Gade et al. 2016; Gade and Schreyer 2016). The site is located in the Area of Potential Effect (APE), or project area, for the proposed Gorge Creek Culvert Repair and Storm Water Improvements (OPRHP No. 15PR06219) in the Village of Middleburgh, Schoharie County, New York (Figure 1).

Louis Berger performed the work on behalf of the Housing Trust Fund Corporation. The Governor's Office of Storm Recovery (GOSR), operating under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation (HTFC), is the Responsible Entity for direct administration of U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant-Disaster Recovery (CDBG-DR) funds. The Schoharie County Soil and Water Conservation District (SWCD) is requesting funding under the New York Rising Community Reconstruction Program for Phase I and Phase II of the Gorge Creek Culvert Repair and Storm Water Improvements project. This storm water management improvement project involves culvert installation, expansion of the floodplain and sedimentation basin construction, and improvements to the storm water system under selected streets in the village. Development of the floodplain expansion and sedimentation basin portion of the project will affect the Gorge Creek Site 1.

This data recovery was conducted in accordance with guidelines established by the New York Office of Parks, Recreation and Historic Preservation (OPRHP) and the *Standards for Cultural Resource Investigations and Curation of Archaeological Collections in New York State* and the *Cultural Resource Standards Handbook*: *Guidance for Understanding and Applying the New York State Standards for Cultural Resource Investigations* published by the New York Archaeological Council (1994, 2000). This report conforms to all professional standards and requirements. The cultural resource specialists who performed this work meet or exceed the qualifications specified in 36 CFR 66.3(6)(2).

This report has been organized into eight chapters. The following chapter presents the project background, consisting of the project area description and environmental and cultural contexts for the project vicinity as well as regional comparative site research completed as part of the mitigation effort. Chapter III outlines the research design. Chapter IV describes the field methods and techniques applied to the Phase III data recovery excavations. Chapter V provides the Phase III archaeological testing results for Gorge Creek Site 1 (09542.000116), and Chapter VI contains the artifacts analysis and discussion. Chapter VII provides the summary and conclusions. Chapter VIII lists the references cited. Appendix A contains the methods for artifact cataloging and analysis, Appendix B contains the artifact inventory, and the data recovery plan is presented in Appendix C.

Louis Berger Archaeologist Lauren Hayden, RPA, ENV SP served as project manager. Stuart Fiedel, Ph.D. served as Principal Investigator. Louis Berger Principal Field Director Dell Gould and Archaeologist Christopher Morine served as field supervisors. The field crew consisted of Archaeological Technicians Amanda Burt, Brittany Faulkner, and Eric Ferraro. Stanley Jasinski of Blue Diamond Septic provided excavation services. Dr. Fiedel, Mr. Gould, and Mr. Morine wrote the report. Principal Editor Anne Moiseev edited and produced the report. The graphics were prepared by Principal Draftsperson/GIS Analyst Jacqueline L. Horsford.

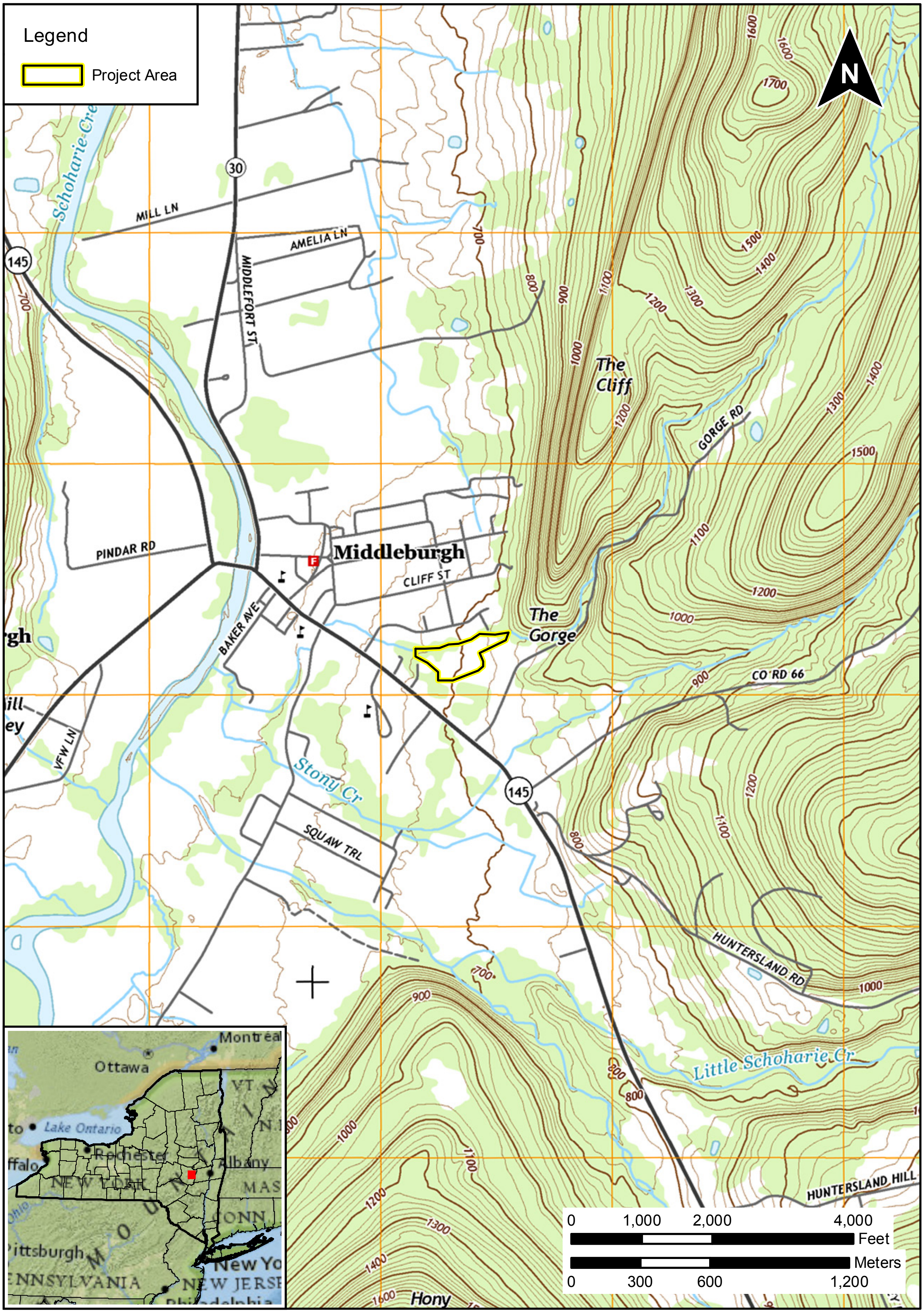

FIGURE 1: Location of Project Area (APE) (USGS Middleburgh 2016)

II. Project Background

A. Project Area Description

Southern Schoharie County is located in the glaciated portion of the Allegheny Plateaus physiographic province (Isachsen et al. 2000). The north part of the county lies within the Hudson-Mohawk Lowlands Section (a north extension of the Ridge and Valley Province). The Allegheny Plateaus province is a broad belt of flat-lying and relatively unfolded layers of sedimentary rock—sandstones, shales, limestones, and conglomerates. The bedrock of this region consists mainly of uplifted marine rocks of Devonian age (circa 365 to 405 million years ago). The modern topography encompasses flat-topped hills (indicative of erosion-resistant bedrock) and deeply dissected, broad to narrow valleys (formed in areas of eroded bedrock). The maturely dissected plateau was reshaped by Pleistocene ice sheets. The edges of the plateau, particularly in the east, form escarpments or dissected mountain fronts. The topography thus appears mountainous, for example, in the Catskill Mountains and the Poconos.

Gorge Creek is a small stream that flows west toward Schoharie Creek, which flows north to join the Mohawk River. The headwaters of Schoharie Creek rise in the Catskills, and the upper and middle reaches flow through the mountains. The largely arbitrary division between the upper and middle valley is at North Blenheim (east of Stamford). The middle valley was once occupied by the waters of post-glacial Lake Schoharie. Downstream from the lacustrine floodplain is the kilometer-long Schoharie Gorge, which leads into the lower valley that forms a corridor through the Mohawk Lowlands. Relatively few tributary streams drain these hills and rolling plains.

The Gorge Creek Site 1 (09542.000116) lies on a high Late Pleistocene glacial terrace, at the base of a prominent upland mountain nose/slope overlooking Middleburgh, in the central area of the county (see Figure 1). Gorge Creek, the site's north boundary, has incised into 2 to 3 meters of glacial till sediment. The terrace has undulating microtopography that may reflect the former presence of an ancient braided stream channel. Phase I testing revealed shallow (less than 0.5 meter [1.6 feet]) alluvium deposited by Gorge Creek on the surface in several areas of the site, and also pockets of deeper (1 meter [3.3 feet]) alluvium in swales (Gade et al. 2016:3). The only soil mapped within the site is Tuckhannock gravelly loam, fans (0 to 5 percent slope) (Flora et al. 1969). This is a well to somewhat excessively drained gravelly loam that formed in glacial outwash deposits. Currently the site is in a grass-covered, formerly cultivated field.

B. Environmental Context

The Pleistocene glaciers not only swept away the watershed's previous soils, they also spread a mantle of rock that has been subjected to erosion throughout the Holocene, either during or after soil formation. The glacial deposits are mostly unconsolidated till, heterogeneous in particle size, with inclusions of cobbles and boulders. This material is subject to gullying and mass movements, which have created some unstable cliffs along streams. Scattered glacial outwash beds, kames, and deltas supply gravels and sands to the streams; the lacustrine deposits left behind by Lake Schoharie in the middle valley are mainly silts and clays.

Schoharie Creek flows through a deeply entrenched valley cut into gently dipping Devonian bedrock. The village of Middleburgh is situated mostly on a large alluvial/fluvial fan complex at the confluence of Little Schoharie Creek and Schoharie Creek. Van Nest (2004) ran a transect of cores across the floodplain west of Middleburgh. She obtained two radiocarbon dates from the lowest strata that suggest that the Holocene alluvial deposits there are no older than ca. 2700 rcbp[1]. She suggests that the oldest floodplain sediments north of Middleburgh are also relatively young, dating to the late Holocene.

[1] "rcbp" or "rcybp" refers to uncalibrated radiocarbon years before present ("present" by accepted convention is AD 1950); "cal BP" refers to calibrated or calendrical years before 1950 (generally earlier than radiocarbon ages, by as much as 2000 years at 11,000 BP [=13,000 cal BP]); "cal AD" and "cal BC" denote calibrated calendar ages according to standard western usage.

During the Pleistocene this region was repeatedly covered by ice sheets, which left behind glacial tills and outwash as they receded. The Harbor Hill Moraine on Long Island represents the terminal moraine of the most recent glacial advance of the Wisconsin stage; the ice reached this final advanced position about 28,000 cal BP and started to retreat from it about 24,000 cal BP (Ridge 2003). Terminal moraine deposits also occur across northern Staten Island and extend westward across New Jersey into Pennsylvania. Most of the local soil types formed in the glacial till or outwash.

As the ice retreated, it left in its wake meltwater lakes in low-lying areas. One of these lakes ultimately filled, becoming the 55-square-mile "Black Dirt" bog, now drained farmland in the southwest part of Orange County, New York. It is noteworthy that at least 41 mastodont fossils have been discovered in the muck deposits of the Black Dirt and other swampy areas in Orange County (Dumont and Ehlers 1973). This area is about 90 miles south of the project vicinity.

When the retreating ice front halted temporarily between 18,200 and 17,400 cal BP (Ridge 2003), glacial meltwater began to flood the Schoharie Valley. In the middle reaches of the valley, a glacial lake formed, with a shoreline at an elevation of 213 meters (700 feet) above sea level (Dineen 1986). The ice pushed south again at 17,400 cal BP, stopping when it reached the Catskills. As the glacier again retreated, the new glacial Lake Schoharie rose to a shoreline elevation of 354 to 366 meters (1,160 to 1,200 feet) above sea level. When the Delmar ice margin stabilized around 16,200 cal BP (Ridge 2004), water from glacial Lake Schoharie drained to the northeast, through the Delanson spillway (LaFleur 1969). This spillway fed the Delanson River, which emptied into glacial Lake Albany (LaFleur 1976). The Stage 3 shoreline of glacial Lake Schoharie was established at 256 to 213 meters (840 to 700 feet) above sea level (Dineen and Hanson 1985; LaFleur 1969).

For some time during the glacial retreat, glacial Lake Iroquois—much larger than modern Lake Ontario—was connected to glacial Lake Albany, in the Hudson Valley, through the Mohawk Valley (Ridge 1997). This channel may have been occupied by a torrential river for a few centuries after 13,800 cal BP. Around 13,300 cal BP, glacial Lake Iroquois drained catastrophically through Lake Albany, and then through the Narrows, into the North Atlantic. The floodwaters flowing out of Lake Iroquois at that time seem to have been channeled, not through the Mohawk Valley, but rather north of the Adirondacks, where the water breached the Covey Hill Ice Dam into glacial Lake Vermont. This meltwater input may have caused a disruption of thermohaline circulation in the ocean, which triggered a cold episode known in Europe as the Intra-Allerod Cold Period (Donnelly et al. 2005). It is unclear from the geological literature whether Lake Schoharie had already drained or was involved somehow in this massive discharge event.

Deglacial warming accelerated at the onset of the Bølling-Allerød interstadial, 14,700 cal BP. Vegetation responded to the warming trend. Initially, treeless tundra prevailed in the wake of the ice sheets; in response to Bølling-Allerød warming, spruce trees colonized this region, accompanied by pine and fir in some areas, such as the lower Wallkill Valley (Connally and Sirkin 1970). Oak was also present, in small numbers, by 14,700 cal BP. At Tannersville Bog, near Stroudsburg in eastern Pennsylvania, the pollen sequence records successive colonization between 16,000 and 10,000 cal BP by spruce, fir, pine (*Pinus banksiana*), paper birch, tamarack, white pine (*Pinus strobus*), gray birch, and pitch pine (*Pinus rigida*) (Watts 1979).

Pollen cores from Lake Mohonk and Lake Minnewaska in the Shawangunk Mountains (Menking et al. 2012) indicate a cool and humid climate from ca. 14,000 to 12,900 cal BP. The mixed thermophilous deciduous-boreal forest included birch, spruce, and oak (which accounted for 15 to 20 percent of the pollen).

Post-glacial warming was abruptly interrupted at 12,850 cal BP by the Younger Dryas cold episode, which lasted 1,200 years. Pollen sequences from northern New Jersey show the effect of the nearly glacial Younger Dryas climate on the regional flora, which responded very rapidly (Peteet et al. 1990; Yu 2007). Spruce increased to a maximum during this period. Tree macrofossils dating from about 12,600 to 11,600 cal BP, the middle to the end of the Younger Dryas, were found recently in an organic deposit in Cohoes, on the southwest side of the Mohawk River, near its junction with the Hudson. The wood fragments and plant remains were associated with pollen. They indicate a local forest of white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), and tamarack (*Larix laricina*). The presence of white rather than black or red spruce was probably a result of the local riverbank environment. Beaver tooth marks were found on some of the wood fragments (Miller and Griggs 2012). In the Shawangunk Mountains the climate during the Younger Dryas is reconstructed as cold and wet based on the abundance of alder and birch pollen in the lake sediment cores (Menking et al. 2012). Hemlock (*Tsuga canadensis*) arrived here ca. 12,700 cal BP.

Within only a few decades, at 11,650 cal BP, temperatures soared in the Northern Hemisphere (about 4 degrees C in the northeastern U.S.), marking the onset of the present Holocene interglacial. The climate of the Holocene has not been as dramatically variable as that of the late Pleistocene, but oscillations have been substantial enough to affect biota and the human cultures that depended upon them. Vegetation changes through the Holocene, as represented by shifting pollen frequencies, were first recognized by Deevey (1939) in New England. Using radiocarbon dates, Wendland and Bryson (1974) discerned a succession of Holocene climate episodes: Pre-Boreal (10,800 to 9200 rcbp), Boreal (9200 to 8000 rcbp), Atlantic (8000 to 4200 rcbp), Sub-Boreal (4200 to 2500 rcbp), Sub-Atlantic (2500 to 1800 rcbp), Scandic (1800 to 1100 cal BP), Neo-Atlantic (1100 to 700 cal BP) and Pacific (700 cal BP to present).

More recently, analyses of North Atlantic sediments have demonstrated a roughly 1,500-year recurrence of ice-rafted debris (IRD) events, which are interpreted as markers of sudden cold episodes accompanied by major reorganizations of atmospheric circulation (Bond et al. 1997, 2001). A growing collection of data (from pollens, carbonates, midges, plant macrofossils) shows both pan-continental episodes (e.g., Hypsithermal warming) but also local variability and out-of-phase changes of climate. Some of the salient Holocene climate episodes for northeastern North America, after the 11,650 cal BP warming, include the following.

The sharpest of the Holocene cold oscillations occurred early on; these are the Pre-Boreal Oscillation at about 11,300 cal BP and the 8200 cal BP cold event. The latter has been attributed to the final massive draining of glacial Lake Agassiz into the North Atlantic, an event which would have disrupted thermohaline circulation. The flood event may also be related to accelerated wasting of the remnant Laurentide ice sheet between 9900 and 8400 cal BP (Shuman et al. 2002). The effects of the 8200 cal BP event may have lasted for about 400 years.

The Laurentian ice sheet shrank rapidly after 10,000 cal BP. A lowering of the ice mass may have caused significant environmental changes around 9000 cal BP. Between 9000 and 8000 cal BP, summer monsoon rains intensified in the southeastern U.S., causing a rise of lake levels and expansion of the range of moisture-tolerant southern pines. In the same period the mid-continent was arid; lake levels dropped and prairie expanded eastward. This was also a period of maximum aridity in the Northeast. After the collapse of the Hudson Bay ice dome about 8200 cal BP, a decreased albedo effect, along with increasing influence of the Bermuda subtropical high, resulted in more moisture in the Northeast; lake levels rose and pines were replaced by beech and hemlock.

There appears to have been a 200-year cooling event at 10,300 cal BP (9100 rcbp) (Björck et al. 2001). This event has been theoretically linked to reduced solar forcing, as inferred from a ^{10}Be flux peak (i.e., more intense cosmic radiation was affecting the atmosphere as insolation weakened).

Variations in solar output also seem to have been responsible for the “Bond events,” cooling episodes in the North Atlantic that occurred about every 1,500 years throughout the Holocene and probably also during the Pleistocene (Bond et al. 1997, 2001). The eight Holocene events are dated to about 11,100, 10,300, 9400, 8100, 5900, 4200, 2800 and 1400 cal BP. The modeled mechanism involves reduced solar irradiance, triggering changes in stratospheric ozone that cause cooling of the atmosphere in high north latitudes, a slight southward shift of the north subtropical jet stream, and decreased Northern Hadley circulation. These atmospheric changes would then lead to increased North Atlantic drift ice, cooling of the ocean surface and atmosphere above Greenland, and reduced precipitation in low latitudes (Bond et al. 2001).

Viau et al. (2002) examined radiocarbon dates obtained for more than 700 pollen diagrams from across North America. These dates tend to cluster at significant discontinuities in the climate record. The major transitions identified by Viau et al. within the past 14,000 calendar years occur at 13,800, 12,900, 10,190, 8100, 6700, 4030, 2800, 1600, and 600 cal BP. Their analysis did not attach a direction (cooling or warming) to the vegetation changes observed at each transition, but it is clear that those changes were pan-continental. Four of the vegetation events correspond rather closely to Bond events (10,190=10,300, 8100=8100, 4030=2200, 2850=2800 cal BP). More recently, Gajewski et al. (2007) have synthesized dates for North American and European pollen transitions, Bond events in the North Atlantic, and cold spikes in the Greenland ice cores, to identify trans-hemispheric “climate transitions” at 13,900, 12,800, 11,100, 10,300, 9000, 8100, 6800, 5900, 4200, 2800, 1600, 600, and 350 cal BP.

Pollen sequences from the beds of several lakes in the Catskills and Hudson Valley, relatively close to the Gorge Creek 1 Site, offer records of local Holocene vegetation changes and inferred regional climate shifts. These records come from Lake Mohonk and Lake Minnewaska in the Shawangunk Mountains (Menking et al. 2012); Balsam Lake in the west Catskill Mountains (Ibe 1982, 1985); Sutherland Pond in Orange County and Spruce Pond near Tuxedo Park in Rockland County (Maenza-Gmelch 1997); and Ballston Lake between Saratoga and Schenectady (Toney et al. 2003).

At the onset of the Holocene, the climate in the Shawangunk Mountains became warm and dry from 11,500 to 8700 cal BP. The forest was dominated by white pine while oak increased. At Balsam Lake fir and spruce had been dominant around 14,000 cal BP but were largely replaced by pine, which peaked ca. 10,200 cal BP. In the Shawangunk Mountains a wet interval from 8700 to 8000 cal BP is indicated by increased hemlock, beech, and birch pollen while oak declined. Maximum wetness there is dated to 8100 cal BP, possibly connected with the 8200 cal BP cold event. By 7800 cal BP the pines had been replaced by hemlock, birch, beech, and maple.

At Ballston Lake near Saratoga, about 135 kilometers north of the Shawangunk ridge, minimal loss-on-ignition values from about 10,000–7000 cal BP, with minor oscillations, also indicate aridity. At 11,000 cal BP, spruce declined abruptly; white pine and birch became the predominant trees for several centuries. Smaller quantities of pollen indicate the presence in the Early Holocene mixed forest of tamarack, hemlock, oak, elm, basswood, aspen, hornbeam, ash, walnut/butternut, hickory, maples (sugar, red, and mountain), willow, alder, and sedge. At 10,800 cal BP, pine declined as hemlock and oak became prevalent; hickory remained present at low percentages (Toney et al. 2003).

To the south, in Orange and Rockland counties (the Hudson Highlands), the oak-dominated forest was invaded by white pine (*Pinus strobus*) at the end of the Younger Dryas (ca. 11,700 cal BP). Hemlock arrived here at 11,000 cal BP, followed by beech at 9000 cal BP.

Farther east, the period from 10,100 to 7700 cal BP appears to have been very dry in southern New England. *Ambrosia* (ragweed) pollen indicates the existence of open savanna-like areas on ridgetops and knolls. These areas were probably created mainly by fire, although deer-browsing and anthropogenic ignition may have played a role in maintaining these open patches (Faison et al. 2006). It is interesting to note that, in the Hudson Highlands sequence, high percentages of oak pollen correlate with a continuous charcoal influx throughout the record, which suggests that fire was a factor in the expansion and maintenance of oaks in the forest. A temporary reduction in fire frequency around 11,000 cal BP seems to have encouraged expansion of hemlock (Maenza-Gmelch 1997).

The climate in this area was warm and dry from 7900 to 7300 cal BP. The landscape became unstable as soil erosion increased. There is an uptick in charcoal particles in the cores, indicating that drought led to frequent outbreaks of fire. In these conditions oak thrived while hemlock declined and beech was slightly less abundant than before.

A Middle Holocene wet interval in the Shawangunk Mountains, from 7100 to 5700 cal BP, saw a decline in oak, increased hemlock, and limited prevalence of pine; however, at Davis Pond in southwest Massachusetts, low water levels indicate a drought from 6600 to 6400 cal BP (Newby et al. 2011). There are also indications of aridity in central New York; the water level in White Lake dropped at ca. 6100 cal BP (Li et al. 2006) and Cayuga Lake fell to a lowstand at 6830 cal BP (Mullins et al. 2011). Hickory pollen increased slightly at 7000 cal BP in the Shawangunk Mountains cores, which suggests a warming trend. This corresponds to the first occurrence of hickory in the Hudson highlands records at 7100 cal BP.

Multiple changes in climate and environment coincided at ca. 5800 to 5400 cal BP, including Bond event 4, droughts in the Northeast and Middle Atlantic, and hemispheric climate changes. This is also the time of transition from the Middle to Late Holocene (Zhao et al. 2010). Hemlock populations collapsed abruptly throughout the Middle Atlantic and Northeast at ca. 5500 cal BP (4750±50 rcbp) (Bennett and Fuller 2002). The proximate cause was probably a pathogen or insect infestation (Bhiry and Filion 1996); but the trees may already have been weakened by drought. The collapse involved two successive events, around 5800 and 5200 cal BP; these correspond to two coeval lake-level drops in the Northeast, which indicate drought conditions (Haas and McAndrews 1999). The first drought event seems coeval with the 5900 to 5800 cal BP Bond event. Low water levels at Davis Pond indicate an extended drought from 5600 to 4900 cal BP (Newby et al. 2011). Winters seem to have become colder at the same time (Calcote 2003). Peteet et al. (2011) reported evidence of droughts in the lower and mid-Hudson Valley at 5745 and 5480 cal BP. These droughts and temperature changes in the Northeast could have weakened the trees so that they became susceptible to pathogen outbreaks (Foster et al. 2006; Haas and McAndrews 1999).

In the Shawangunk Mountains the onset of a Middle Holocene drought at 5700 cal BP appears to have caused the collapse of hemlock. During this drought pitch pine (*Pinus rigida*), a fire-adapted tree, colonized the ridge. This is the only period when it was present in this area. Oak pollen increased. The local collapse of hemlock occurred at ca. 5400 cal BP. Hemlock also collapsed at Ballston Lake at the same time (5300 cal BP) (Toney et al. 2003), but the hemlock decline is a little later at Balsam Lake (ca. 5100 cal BP) and seems anomalously late in the Hudson Highlands, ca. 4700 to 3800 cal BP (Maenza-Gmelch 1997). The very arid conditions in the Shawangunk Mountains continued until 4100 cal BP. The drought and the hemlock die-off may have facilitated an expansion of chestnut (*Castanea*), which became very abundant in this vicinity. Chestnut is drought-tolerant but shade-intolerant, and thrives in disturbed areas. When the hemlock collapsed, the forest canopy opened and allowed more sunlight to reach the floor; the reduced shade favored chestnut growth. Chestnut arrived a little later in the Hudson Highlands, ca. 3900 cal BP.

There is evidence of roughly contemporaneous aridity both in central New York and northern New Jersey. Cayuga Lake dropped to a lowstand at 4770 cal BP (Mullins et al. 2011) and White Lake dropped to a low level ca. 4400 cal BP (Li et al. 2006).

On the Shawangunk ridge, the climate seems to have been wetter between 4100 and 2300 cal BP. Hemlock recovered and beech flourished. At Balsam Lake a partial hemlock recovery is also evident in this period. Chestnut had appeared here by 2600 cal BP (Ibe 1982, 1985).

Pollen sampled from Ballston Lake shows a gradual increase of conifers, hardwoods, and boreal taxa starting at about 2680 cal BP (2520 rcbp). This is interpreted as marking a shift to a colder climate (Toney et al. 2003). At Davis Pond low water levels indicate droughts ca. 4100, 3500 to 3000, 3000 to 2800, 2700 to 2300, and 1600 cal BP. A drop of the water level of White Lake in northern New Jersey indicates aridity ca. 3000 cal BP (Li et al. 2006). Cayuga Lake fell at 3200 cal BP and reached its lowest level around 1950 cal BP, after which it rose until around 950 cal BP. An abrupt cold, dry episode may have started around 3000 cal BP and persisting to 2400 cal BP; Mullins et al. (2011) hypothesize that it may have been caused by reduced solar activity.

The last drought occurred on the Shawangunk ridge between 2300 and 1000 cal BP. This arid episode was less intense than the middle Holocene drought. In fact there are indications of a more humid climate starting ca. 1400 cal BP. The inferred aridity here appears out-of-phase with records from New England, where many lakes rose to maximal levels after 3000 cal BP. In central New York a lowstand of Cayuga Lake implies a drought around 1950 cal BP. At White Lake in northern New Jersey, a lowered water level indicates an arid episode about 1300 cal BP (Li et al. 2006).

A recent synthesis of environmental proxies across the Northeast finds a long-term cooling trend from 3000 cal BP to AD 1700. An abrupt transition from wet to dry conditions occurred around AD 550 to 750 (1400 to 1200 cal BP). It was warmer and drier than today during the Medieval Climate Anomaly (ca. AD 950 to 1250) (Marlon et al. 2016). Peteet et al. (2011) reported charcoal peaks and coincident pollen frequency changes in cores at Tivoli Bay and Piermont in the Hudson Valley. They interpret these as records of severe aridity from about AD 850 to 1350. Tree rings indicate another major precontact drought in the Catskills that lasted from AD 1555 to 1578 (Pederson et al. 2013), as well as other episodes in the sixteenth and seventeenth centuries.

At the time of European arrival, this region hosted a north prong of the Oak-Chestnut Forest Region (Braun 1950). However, there is some ambiguity about the native vegetation because of the pervasive impact of nineteenth-century logging. The Catskills contained the most abundant hemlock trees in New York in the early nineteenth century, but these trees were cut and stripped of their bark for tanneries (Fox 1902:61). Until around 1850, the lumbermen in the Catskills mostly felled white pine. The more numerous hardwoods were not removed as logs because they did not float well. This situation changed once the logs could be transported by the railroads after 1860 (Fox 1902:11, 51–52). In the late nineteenth century spruce trees of all sizes were cut down for wood pulp, before forestry conservation practices were instituted (Fox 1902:12, 77–78, 86). By 1920 the Allegheny Plateau had been almost completely cleared of trees by logging.

Except for a few isolated patches of remnant old growth, the extant forests began to grow back only after 1920. Although the component species are probably the same as in the pre-logging forest, their relative numbers and distribution may be significantly different. Logging favored hardwoods and left extensive coniferous slash in its wake. This debris fueled intense fires that nearly eliminated white pine and hemlock in the Allegheny forests. Frequent burning also reduced the proportion of sugar maple, beech, and other hardwoods while encouraging growth of aspen, pin cherry, sedges, grasses, and honeysuckles. Currently, the secondary forest in the Catskills is dominated by oaks, red maple, and pignut hickory. Pitch pine, white pine, and sassafras are also common (Sullivan County Park & Recreation Commission n.d. a,b).

Funk (1993a:47) notes that charred butternuts and walnuts are very common in contexts dating from the Late Archaic through Late Woodland periods on the Upper Susquehanna. Butternut trees are abundant today in the lowlands, although Braun (1950) did not mention them. Butternut shell fragments dominated the samples from Vosburg phase (ca. 5300 to 5000 cal BP) features at the Kingston Armory Site. Black walnut (*Juglans nigra*) and hickory (*Carya*) nutshells were recovered from the Vergennes phase occupation (ca. 6000 rcbp, 6800 cal BP) at the Kingston Armory Site (Gould et al. 2008).

According to Fenton (1978:297), “the sugar maple, the American elm, and the white pine were the climax forms important to Iroquois technology; they were venerated and appealed to in political metaphors. Elm bark was crucial for shelter, containers, and vessels; indeed, the culture could not function without it because birch of sufficient girth for covering canoes, shingling lodges, and making vessels does not grow south of a line encompassing the Adirondacks.”

Eastern North America had been depleted of its largest native mammals—e.g., mastodont, mammoth, stag-moose, giant beaver—by the Terminal Pleistocene megafaunal extinction at 13,000 to 12,700 cal BP (11,000 to 10,700 cal BC). Elk, cougar, and wolf were probably locally extirpated by the mid-nineteenth century. Among the extant native mammals of the region are deer, raccoon, beaver, black bear, fox, bobcat, rabbit, opossum, woodchuck, and muskrat. Small numbers of passenger pigeon (extinct since 1914), grouse, goose, and turkey were recognized in the bone sample from the Late Woodland Nahrwold site (Ritchie and Funk 1973). Schoharie Creek is inhabited today by bullhead, sucker, chub, and small mouth bass.

C. Prehistoric Context

Archaeologists have divided the vast expanse of New York culture history into five general periods: Paleoindian (12,000 to 9500 years before present [BP]); Archaic (9500 to 3000 BP); Woodland (3000 to 500 BP); Contact (500 to 300 BP); and Historic (300 BP to present). The first three subdivisions (Paleoindian, Archaic, and Woodland) are thought to represent Native American cultural adaptation to changing climatic conditions since the arrival of humans in the New York region around 12,000 years ago—from Pleistocene (Ice Age) to Holocene (modern) norms. The region’s natural environment and geomorphology have greatly influenced the nature of Native American settlement, land use, and cultural development. One important factor in the interpretation of New York prehistory is the impact of glaciation on the topographic and hydrologic conditions in the area since the end of the Pleistocene.

1. Paleoindian Period (12,000 to 9500 BP)

The first inhabitants of this region were Paleoindians, who arrived circa 11,000 rcbp (13,000 cal BP, 11,000 cal BC). The diagnostic artifacts of these terminal Pleistocene hunters were fluted spearpoints made of high-quality cryptocrystalline stone. Many of these distinctive points have been found with few or no associated artifacts on the surfaces of fields.

Ritchie (1965:5) depicted no fluted points in Schoharie County, but he mapped two find-spots in adjacent Delaware County, not far from the headwaters of Schoharie Creek. Wellman (1982) presented data on 290 fluted points in New York. She listed only one point from Schoharie County. When the county-specific data are corrected for biases (e.g., numerous points from a single site, as in Greene County) and controlled for area, point densities can be compared. Greene County still has the highest density, but it is notable that two counties on the Appalachian Plateau, Chenango and Otsego, are among the 10 counties with the highest fluted point densities (Lothrop and Bradley 2012).

Although classic Clovis fluted spearpoints resembling points from the Plains and Southwest have been found in Pennsylvania and eastern New York, they appear to be absent or very rare farther east. In New England the pioneering Paleoindians made fluted points that resemble the Gainey type of the northern Midwest. Few secure radiocarbon dates are associated with Gainey, but the minor stylistic differences from the ancestral Clovis form suggest a date of ca. 12,900 to 12,600 cal BP. Across a vast area, the stylistic trends among point-makers descended from Clovis are similar—the channels or flutes become longer, a discrete nipple at the base of the preform is isolated and used to detach the long fluting flake, and the base becomes more concave. In the northern Midwest this trend leads to the Barnes/Parkhill type that follows Gainey. In New England one suggested stylistic sequence (Lothrop and Bradley 2012) begins with King's Road/Whipple (Gainey-like), followed by the Vail/Debert points with very deep basal concavities (which lack obvious Great Lakes counterparts, except for the cache from the Lamb Site in Genesee County, New York). Next are Bull Brook/West Athens Hill points, followed by Michaud/Neponset (equivalent to Barnes). These are followed by the last fluted point type, Crowfield (ca. 12,200 to 11,600 cal BP). Small unfluted points called Cormier/Nicholas are the New England equivalent of the Holcombe type (ca. 11,600 cal BP). Long, unfluted points that resemble the Agate Basin type of the Plains are sparsely distributed in New England and New York; they also were found at the Plenge Site in northern New Jersey. These date to about 11,800 to 11,000 cal BP.

South of Albany, several Paleoindian sites in Greene County (Kings Road, Swale, West Athens Hill) show that the Normanskill chert sources of this area attracted early quarrying and camping (Funk 2004). Morrow (personal communication 2016) has recently examined artifacts from the Greene County sites and confirms that they include early Clovis-style bifaces.

The Greene County chert sources are located near small tributaries of Catskill Creek. Paleoindians could readily have followed Catskill Creek to the Schoharie Valley, some 40 miles distant. The absence of Paleoindian traces from the latter area is therefore somewhat surprising.

Notable Paleoindian sites in the region south of the Gorge Creek project area include Dutchess Quarry Cave, Shawnee-Minisink, Twin Fields, Plenge, and Port Mobil.

At Dutchess Quarry Cave 1, near the village of Florida in Orange County, New York, a Cumberland-like fluted point, with flutes extending along nearly the entire length of the point, was found in the same stratum as fragments of caribou bone. A radiocarbon date of 12,530±370 rcbp was obtained from the bones (Funk et al. 1970). For some time this date was thought probably to be applicable to the Paleoindian point, although it was markedly earlier than other dates for fluted point assemblages. In fact the Cumberland style appears to be rather late in the stylistic sequence that begins with Clovis points at 11,000 cal BC. It was shown subsequently that the early date is accurate but is associated only with the extirpated Pleistocene fauna, *not* with the subsequent human occupation of the cave (Steadman et al. 1996). Three additional fluted point fragments, again Cumberland-like, were found in disturbed contexts in Dutchess Quarry Cave 8 (Kopper et al. 1980), 12 meters north of Dutchess Quarry Cave 1. Lothrop and Bradley (2012) ascribe these points to the Michaud/Neponset style. Small corner-notched points recovered from this cave are probably examples of the Early Archaic Amos type, dating from circa 9500 to 8300 cal BC.

The Shawnee-Minisink Site is located in Monroe County, Pennsylvania, at the confluence of the Delaware River and Brodhead Creek. Don Kline discovered the site in 1972 by digging three test units reaching a depth of 10 feet. A hearth found at the lowest level, associated with Paleoindian artifacts, produced a radiocarbon date of 10,590±300 rcbp (W-2994). Additional excavation of this multi-component stratified site was conducted by American University students directed by Charles McNett (1985). One Clovis point was found, along with numerous endscrapers. A hearth contained evidence of a broad-spectrum diet: fish bones and seeds and pits of acalypha, blackberry, hackberry, hawthorn plum, and grape (Dent 1991:125). The Paleoindian camp's setting is reconstructed as a grassy open patch amid a pine and birch-dominated woodland. Another radiocarbon date was obtained for the Paleoindian level: 10,750±600 rcbp (W-3134). Seeds from the hearth were retained, and two samples were submitted years later by Dent (1999) for AMS (accelerator mass spectrometry) radiocarbon dating. This improved technique employs direct counting of carbon atoms and yields more precise dates for much smaller samples. The seeds dated to 10900±40 bp (Beta-127163) and 10940±90 bp (Beta-101935). Renewed recent excavation by Kline and his associates (Gingerich 2007, 2011, 2013) has produced a second fluted point, more scrapers, blades, and carbonized seeds (as well as hickory nuts) from another feature. Additional AMS dates have been obtained for these hawthorn plum seeds: 10,820±50, 10,915±25, and 11,020±30 rcbp. The averaged age is calculated as 10,935±15 rcbp; Shawnee-Minisink is currently the most precisely dated Paleoindian site in North America (Waters and Stafford 2007).

Twin Fields is located on a sandy bluff above the Dwaar Kill, near Wallkill in Ulster County. Two fragments of fluted points and numerous unifacial tools were recognized in a mixed assemblage from near-surface soils (Eisenberg 1978:79). The abundance of scrapers here suggests a specialized wood-working camp.

Numerous fluted points of both early and late styles, and a few unfluted Plano-like points, were collected from the surface of the Plenge Site in New Jersey (Gingerich 2013; Kraft 1973). Fluted points were found near the Arthur Kill on Staten Island at the Port Mobil Site (Kraft 1977).

Experiments with replica points, mounted on spears and thrown using an atlatl, have demonstrated that fluted points were well designed to penetrate elephant hide; their use in hunting of mammoths is amply evidenced at a dozen kill sites in the Plains and Southwest. A few Clovis points were found in loose association with mastodont (*Mammut americanum*) skeletons at the Kimmswick Site near St. Louis; however, no clear evidence of hunting or butchering of mastodons or other terminal Pleistocene megafauna has been found at any other site east of the Mississippi. Instead, the few tiny preserved bone fragments that have been recovered from Eastern Paleoindian sites represent still extant species that moved north during the Holocene, such as caribou and Arctic fox. Along with the evidence of fishing and fruit-harvesting at Shawnee-Minisink, the absence of kill sites has led many archeologists to conclude that megafauna had mostly vanished from the Middle Atlantic region by the time Paleoindians arrived (e.g., Boulanger and Lyman 2014; Dent 1991).

The question of human-mastodont temporal and behavioral association is particularly relevant because the greatest concentration of mastodont fossils in the Northeast is located in Orange County, about 90 miles (140 kilometers) south of the Gorge Creek project vicinity (Ritchie 1965:11). Ritchie (1965:9) speculated that evidence of Paleoindian predation on megafauna might be found in the Wallkill River valley or the Black Dirt, which is drained by the Wallkill. Dutchess Quarry Cave, it may be noted, looks out over the Black Dirt, which had already become a bog by the time of Paleoindian occupation. Several radiocarbon dates for Orange County mastodonts have placed them late enough to have encountered human predators, e.g., 9860±225 rcbp for the Sugar Loaf specimen and 10,000±160 rcbp for the Arborio mastodont, found in a bog south of Montgomery (Dumont and Ehlers 1973). A bone from another extinct species, the stag-moose *Cervalces scotti* found at the Dewey-Parr Site in Orange County, produced a Clovis-era date of 10,950±150 rcbp (I-4016) (Funk et al. 1970). Bone has been a notoriously difficult material for radiocarbon dating, however, and unrecognized contaminants often result in dates that are obviously too recent. These dates obtained in the 1970s may reflect such problems. New procedures for extraction of pure collagen from ancient bone seem to yield more credible dates, which are usually older than those previously obtained from the same samples. A new date for the Arborio specimen is 11,750±60 rcbp (Feranec and Kozlowski 2012). However, recent dates do place many mastodonts late enough to overlap with the earliest Paleoindians in the region. Another Orange County find, the Temple Hill mastodont, has been dated to 11,000±80 rcbp (Robinson et al. 2005) and 10,900±40 rcbp (Feranec and Kozlowski 2012). The Otisville mastodont yielded a date of 10,970±40 rcbp (Robinson et al. 2005), and a mastodont from Ellenville (Ulster County) has been dated to 10,850±45 rcbp (Feranec and Kozlowski 2012, 2016). The Cohoes mastodont dates to 11,070±60 rcbp. The Chittenango mammoth from Madison County has been dated to 11,250±65 rcbp, and a mammoth from Watkins Glen in Schuyler County dates to 10,890±50 rcbp. If a date on tooth-derived collagen is accurate, the Randolph mammoth from Cattaraugus County died ca. 10350±45 rcbp (Boulanger and Lyman 2014). Apparently reliable dates for mastodont bones from the Hiscock Site in western New York include 10,850±140, 10,790±70, 10,705±80, and 10,630±80 rcbp (Laub 2003). Six fluted points and other Paleoindian tools have been found at Hiscock but not in close association with the mastodon remains. Note that these dates are statistically indistinguishable from those obtained for the Paleoindian occupation of Shawnee-Minisink. Paul Martin has argued since the 1960s (Martin 2005) that human predation was primarily responsible for the simultaneous extinction of 32 genera of North American megamammals at 13,000 to 12,700 cal BP (11,000 to 10,700 cal BC). Paradoxically, the extinction was so rapid—only some 400 years of overlap of the last megafauna and the first Paleoindians—that one should not expect to find many preserved kill and butchery sites (Fiedel 2009; Fiedel and Haynes 2004).

2. Archaic Period (9500 to 3000 BP)

The Archaic period is characterized by climatic amelioration that eventually resulted in greater biodiversity in the resource base, and changes in technology, site size, and site locations that reflect use of a broader spectrum of resources.

a. Early Archaic Period

Although the megafauna seem to have been extinct by 12,600 cal BP (10,600 cal BC), the use of fluted points continued for another thousand years. Perhaps they had proven effective in the pursuit of caribou, which may have lingered in the cold conifer-dominated forests of the Younger Dryas period. The appearance of new notched projectile point types around 10,000 rcbp (11,500 cal BP, 9500 cal BC) is a convenient marker for the initiation of a new cultural period known as the Early Archaic. Despite this stylistic change, the similarity of Paleoindian and Early Archaic settlement patterns has been cited as evidence that the basic lifeway, entailing restricted wandering between seasonally available resources in patchy mosaic environments, did not change very much (Custer 1990; Eisenberg 1978:138–139).

The style change is evident at Shawnee-Minisink, where a single side-notched “Kline” point was recovered from the “Early Early Archaic” level, estimated to date to about 9500 cal BC. This point bears some resemblance to the Early Archaic St. Charles type of the Midwest. The only reported find of similar points in the Northeast is the discovery of four at a workshop site (Site 194-3-1) located near West Athens during a survey for the Iroquois Pipeline (Funk 1996:15).

Funk (1996) observed the dearth of both Early and Middle Archaic sites and surface-collected diagnostic artifacts in the Northeast. The “Ritchie-Fitting” hypothesis (Fitting 1970; Ritchie 1971a) attributed the near-absence of cultural remains of these periods to the regional prevalence of a closed boreal forest that offered few resources for human foragers. Subsequent paleoecological research has shown that oaks and other deciduous trees colonized the region earlier than had been thought, and several deeply buried Early Archaic sites have been discovered (e.g., Johnsen No. 3 and Russ on the Upper Susquehanna) (Funk 1993b). Nevertheless, the paucity of Early and Middle Archaic diagnostics and components has not changed substantially and must be explained, probably in terms of paleoclimate or vegetation.

Corner-notched points of the Kirk series, dated to circa 9500 to 8500 rcbp (11,100 to 9600 cal BP, 9100 to 7600 cal BC) in the South, are very rare from New Jersey northward. At the Rockelein Site on the Upper Delaware, near the Orange County border, a Kirk-like assemblage was radiocarbon-dated to 7520±120 rcbp (6400 cal BC) (Dumont and Dumont 1979). This date is anomalously late in comparison to dates for this type from the south. The same site also yielded points of the LeCroy bifurcate, Eva, and Stanly/Neville types, indicating subsequent occupations between 8500 and 7000 rcbp (7600 and 5900 cal BC).

b. Middle Archaic Period

In the Middle Atlantic region bifurcate points are currently interpreted as diagnostic of the inception of a new period, the Middle Archaic (8500 to 5500 rcbp, 9600 to 6300 cal BP, 7600 to 4300 cal BC). This period roughly corresponds to the Hypsithermal climatic period, a warm, dry period when the oak-chestnut-deer-turkey biome became established in much of the Northeast. The warmest temperatures of the entire Holocene actually occurred at the beginning of this period, around 10,000 to 9500 cal BP (8000 to 7500 cal BC) (Lecavalier et al. 2017). In Tennessee and Illinois, Middle Archaic sites contain evidence of nut-harvesting as well as hunting and fishing (Chapman 1975, 1977).

A rare occurrence of bifurcate points in the Mid-Hudson region was reported from the Haviland Site, located near Cobleskill, about 12 miles northwest of the Gorge Creek project area (Ferguson 1995). Charcoal loosely associated with the artifacts was dated to 8405±65 rcbp. Several points found here most closely resemble the Kanawha type; another point seems to be a miniature Neville. Numerous pointed, thin ovate preforms or knives were recovered. As utilized flakes seem to be very common at the Gorge Creek Site 1, it is pertinent to note that at the Haviland Site, “Almost all flakes larger than 2 cm [n=862] show utilization in a variety of ways (e.g., scrapers, spokeshaves, knives, gravers, or awl-perforators)” (Ferguson 1995:8). These artifacts were made of locally procured Esopus chert. It is noteworthy that a similar date of 8450±340 rcbp was obtained on charcoal from a small, deeply buried feature at Site 303 on Schoharie Creek. Only a few pieces of debitage were associated (Wellman 1996).

At the Rockelein Site on the Delaware, the Neville-Stanly component included pitted stones, anvils, milling stones, and netsinkers. On the middle Delaware nut-harvesting is attested at the Sandts Eddy Site (north of Easton), where burnt hazelnut shells in Level IX were radiocarbon-dated to circa 7330±60 rcbp (6250 cal BC) (Bergman et al. 1994). The underlying occupation level (XI) yielded a LeCroy bifurcate point and an anomalous radiocarbon date of 9420±90 rcbp (9100 cal BC), too early for this type.

A substantial Middle Archaic occupation is attested in the Mohonk Rockshelter, located on a ridge west of the Wallkill Valley in Ulster County, New York. A total of 73 Neville points were found at this site, as well as four very similar points ascribed to the Kanawha bifurcate type (Eisenberg 1991). The rockshelter deposits were entirely mixed, so no stratigraphic associations were observed. To the north, in Saratoga County, Neville points have been reported from testing at the Clifton Park-Halfmoon Public Library (Landmark Archaeology, Inc. 2015).

The latter part of the Middle Archaic, circa 7000 to 5500 rcbp (7900 to 6400 cal BP, 5900 to 4400 cal BC), is not well attested in this region. Diagnostic points of this age may include Stark, Poplar Island, and Otter Creek types. Hunterbrook or Beekman triangles, originally described in Westchester County and later discovered in deep strata at Area D of the Abbott Farm Site near Trenton, New Jersey, may also belong in this period (Stewart 1990). At the Sylvan Lake Rockshelter in Dutchess County, a few Beekman triangles were recovered from Stratum 3 and radiocarbon-dated to circa 6600 to 6000 rcbp (7600 to 6900 cal BP, 5600 to 4900 cal BC). Beekman triangles were intermixed with stemmed points and Brewerton and Vosburg points in Level 5 of the Friedman II Site, located in New Jersey near the Dingmans Ferry Bridge on the Upper Delaware (Kinsey 1972; Marchiando 1967). Beekman triangles were found in a stratified context, associated with Vosburg points and broad side-notched points, at the Ten Mile River Rockshelter, northeast of Tunsten on the Upper Delaware. An associated radiocarbon date on a composite sample of bone fragments from Stratum 3 was 4450±130 rcbp (I-4837) (Funk et al. 1971). This date seems too recent, although Funk (1989) accepted it as a valid date for the Vosburg component.

c. Late Archaic Period

In the Upper Susquehanna drainage Funk (1993a) defined the regional Late Archaic as beginning with the appearance of side-notched “Proto-Laurentian” Otter Creek points at about 6000 rcbp (7000 cal BP). At the McCulley No. 1 Site in Delaware County, charcoal from two hearths associated with an Otter Creek component was dated to 5730±110 rcbp (ca. 6500 cal BP) (Funk and Hoagland 1972a). Otter Creek points may ultimately be derived from the side-notched types of the mid-continent (e.g., Big Sandy, Raddatz). Otter Creek points also occur in the mid-Hudson Valley; this type and the affiliated Vergennes phase were originally defined on the basis of finds in western Vermont (Ritchie 1965:87). There the Otter Creek points are associated with ground slate knives and ulus. It is noteworthy that Ritchie also reported a copper gorge from the KI Site. One of the slate points he illustrates (plate 27:2) is clearly imitative of a typical point form of the Old Copper Culture of the Great Lakes. A copper point of this type and other copper artifacts were found at the Sandy Lake Dam Site (21AK11) in northeastern Minnesota. A loosely associated piece of calcined bone was dated to 5690±30 rcbp, or ca. 6500 cal BP (Bradford 2013). Organic materials adhering to Old Copper artifacts have been dated to 5940±90, 4630±60, 4590±50, and 4420±60 rcbp (6900 to 5000 cal BP) (Beukens et al. 1992). Chemical traces identified recently in Lake Superior sediments indicate that intensive copper mining occurred there between 6500 and 5400 cal BP (Pompeani et al. 2015).

This evident population expansion/migration from the Great Lakes to New England may have been linked to an environmental change. A widespread pollen transition is evident at 6800 cal BP (Gajewski et al. 2007). In New Jersey lake sediments a sharp excursion in oxygen isotope ratios occurred in at that time. In some Maine lakes the water level dropped to a stable minimum ca. 7200 to 5800 cal BP (Almquist et al. 2001), while an episode of severe storms is seen in lake sediments in New England at 6800 cal BP (Parris et al. 2009). Events are also observed in lake sediments in western New York at 7100 and 6600 cal BP (Ellis et al. 2004).

At the Kingston Armory Site in Ulster County, three components were identified: Vergennes (Otter Creek), Late Archaic (Vosburg), and Terminal Archaic (Snook Kill, River, Frost Island, and Orient phases). Radiocarbon dates for the Vergennes phase occupation are 6170±40 rcbp (5260 to 4940 cal BC) and 5820±40 rcbp (4780 to 4590 cal BC) (Gould et al. 2008).

Otter Creek points were found at Site 303 (also known as the Shafer Site) on the Schoharie Creek floodplain near Breakabeen; they were associated with a radiocarbon date of 6290±190 rcbp (ca. 7200 cal BP, 5200 cal BC), which was obtained by combining charcoal from three hearths (Wellman 1996). Funk (1988) assigned this component to a proto-Laurentian “South Hill” phase.

Otter Creek appears to have evolved into the Brewerton complex of side-notched, corner-notched, and eared points. Ritchie (1965) regarded the Brewerton complex as part of a “Laurentian” tradition; Snow (1980) termed it the “Lake

Forest Archaic." Triangular points, not easily distinguished from much later Woodland arrow points, sometimes occur in association with Brewerton notched forms.

Ritchie found no datable charcoal at the type sites of the Brewerton phase, Robinson and Oberlander No. 1. He was certain that this phase persisted as late as 4000 rcbp (4500 cal BP) in central New York, but he could not ascertain when it began. Subsequently, Funk (1993a:190) reported a radiocarbon date of 5010±30 rcbp (5770 cal BP) on scraps of bone from Burial 4 at the Oberlander No. 1 Site. Ritchie (1971a) supposed that Brewerton was coeval with the Vosburg phase of eastern New York. "The Brewerton culture, then, probably constituted the dominant, and probably the sole Late Archaic occupation of north and north-central New York at around 2500 B.C., when the Lamoka culture flourished in the same role in south-central New York." Charcoal from the Brewerton horizon at the base of the stratified O'Neil Site in Cayuga County produced radiocarbon dates of 4000±220 rcbp and 3960 ± 100 rcbp. A date of 3850± 5 rcbp was obtained on a sample of bone from Burial 78 on Frontenac Island, also in Cayuga County. The grave goods in this burial included a ground slate point and a chopper. The grave goods of the apparently contemporaneous adjacent Burial 79 included two stone plummets and a bird effigy comb made of bone. Ritchie (1971a) noted that a bird effigy comb had also been found in the Maritime Archaic cemetery at Port au Choix, Newfoundland, which dates to 4500 to 4000 cal BP. Hearth charcoal from Frontenac Island was dated to 3963±80 and 3673±250 rcbp. Ritchie believed a date of 4000 rcbp was appropriate for the Frontenac phase, which he saw as a fusion of the Lamoka and Brewerton phases. Notably, Genesee point also were present in the Frontenac phase (Ritchie 1965: plate 34), indicating some affiliation with Broadspear cultures that spread northward ca. 4000 cal BP.

Ritchie (1965: plates 32 and 33) illustrated copper tools of Old Copper type, including a gouge or "spud," a celt, and awls, from the Robinson site, and he noted that other copper tools had been found in the nearby plowed fields. Based on this it seems there must be some temporal overlap of the Brewerton phase with the peak production period of the Old Copper culture as inferred from the Lake Superior sediments (6500 to 5400 cal BP). This is consistent with the available radiocarbon dates.

Louis Berger (Wall et al. 2006) identified typical Brewerton projectile points as well as other untyped projectile forms in association with a large and diverse cobble tool assemblage (although without a groundstone component) from the Mansfield Bridge Site (36Ti116) on the Tioga River near the New York-Pennsylvania border. Dates for features associated with this component ranged from 6600 to 6020 rcbp (7500 to 6800 cal BP) (Wall et al. 2006).

Points resembling the Brewerton side and corner-notched types were found on Morrison's Island in the Ottawa River, between Ontario and Quebec. Twenty-four percent of these points were made of Onondaga chert. This site included both campsite remains and intermingled burials. Copper was used to make diverse tools: barbs, awls, gorges, fishhooks, and points. Two of the burials had pairs of copper bracelets. Radiocarbon dates for the burials are 4620±40, 4630±40 and 4860±50 rcbp on human bone, and 4700±150 rcbp on charcoal from a grave (Clermont and Chapdelaine 1998; Ellis et al. 2009). Taken together these indicate a span from ca. 5600 to 5300 cal BP.

In the Hudson Valley a distinctive variant of the Late Archaic notched type is the Vosburg corner-notched type. At the Sylvan Lake Rockshelter the Vosburg component dated to 4780±80 rcbp (5500 cal BP) (Funk 1966). At the Kingston Armory Site in Ulster County, a Vosburg phase occupation yielded radiocarbon dates of 4550±40 rcbp (5200 cal BP), 4520±40 rcbp (5200 cal BP), and 5130±40 rcbp (5800 cal BP) (Gould et al. 2008). At the Camelot #2 Site on the Upper Susquehanna, Feature 22 was closely associated with three Brewerton eared triangles. Funk (1993a:160, 1993b:216) reports a date of 4795±230 rcbp (ca. 5500 cal BP) for this feature, which also contained charred butternuts.

On the Upper Delaware the Faucett Site yielded radiocarbon dates for three stratified Late Archaic components (Kinsey 1972:398). A component lacking diagnostics dated to 6170±135 rcbp (I-5238). Above this, a Vosburg component dated to 5570±200 rcbp (I-5237). An overlying component contained a Brewerton eared-notched point, with a date of 5180±200 rcbp (Y-2479). The Lackawaxen component (with stemmed points) provided three dates: 4560±110, 4445±130, and 4130±180 rcbp.

During the Late Archaic, circa 6000 or 5500 to 3700 rcbp (6400 to 4000 cal BP, 4400 to 2000 cal BC), the regional population seems to have increased dramatically. Multiple changes in climate and environment coincided at ca. 5800 to 5400 cal BP: Bond event 4 (iceberg rafting of debris southward in the North Atlantic [Bond et al. 1997, 2001]); droughts in New England, New Jersey, and West Virginia; and hemispheric-scale climate changes. This is also the time of transition from the mid- to late Holocene (Zhao et al. 2010). Hemlock (*Tsuga canadensis*) populations collapsed abruptly throughout the Middle Atlantic and Northeast at ca. 5500 cal BP (4750±50 rcbp) (Bennett and Fuller 2002; Bhiry and Filion 1996; Calcote 2003; Foster et al. 2006; Haas and McAndrews 1999).

The hemlock demise provided an opportunity for the growth of a diverse understory and the florescence of northern hardwoods (Sanger et al. 2007). This new vegetation, combined with a possible reduction of snowfall, would have provided prime habitat for deer. Coeval with the hemlock decline there is a sudden, dramatic increase in radiocarbon dates associated with human occupation in New England and New York (Fiedel 2001; Hoffman 1988; Reeve and Forgacs 1999; Munoz et al. 2010). It is probably no coincidence that, around 5500 to 5000 cal BP, Lamoka and other narrow stemmed points replaced notched points of the Brewerton tradition in New England.

Late Archaic people hunted deer and other animals of the deciduous forest (dominated by oak and hickory, after the hemlock decline), collected nuts and seeds, and took fish and shellfish from the rivers. Corner-notched Vosburg and related Beekman Triangle and Brewerton points (circa 5000 to 4000 rcbp, 5800 to 4500 cal BP, 3800 to 2500 cal BC) are somewhat more common than Otter Creek points, but the predominant form in Late Archaic assemblages is the narrow stemmed point. This type, variously named in southeastern New York “Taconic” (Brennan 1968) or “Sylvan Stemmed” (Funk 1976), dates from circa 4500 to 3500 rcbp (5300 to 3800 cal BP, 3300 to 1800 BC). A side-notched type (Sylvan Side-Notched or Twombly Side-Notched) apparently co-occurred with these stemmed points. In central New York the narrow stemmed variant is known as Lamoka. At the Lamoka Lake Site in Schuyler County, dated to circa 4500 rcbp (5300 cal BP), hunting, fishing, and acorn-harvesting produced a sufficient resource base to support a semi-sedentary occupation by about 150 people; their prolonged occupation is indicated by a multitude of postmolds and numerous storage pits. On the Upper Delaware the equivalent, contemporary type is known as Lackawaxen (Leslie 1967), with three sub-types: straight stem, expanded stem, and converging stem. A distinctive trait of Lackawaxen points is their raw material, which is frequently shale, argillaceous shale, or argillite.

On the Upper Susquehanna, Lamoka components were dated to between 4185±120 and 3750±100 rcbp at the Fortin Site, between 4490±90 and 3920±95 rcbp at Mattice No. 2, and have similar associated ages at other sites (Funk 1993a:158–164). Vestal corner-notched and side-notched points, apparently contemporaneous with Lamoka, are very numerous in the area around Binghamton. Funk (1993a:193), however, rejected many dates and argued for the “true” age of Vestal assemblages as circa 3900 to 3800 rcbp, based on the stratigraphic superposition of Vestal above Lamoka components at several sites. Also partially contemporaneous or slightly later than Lamoka and Vestal (from about 3900 to 3700 rcbp [2400 to 2000 cal BC]) is the side-notched Normanskill point type, which was prevalent in the mid-Hudson, Susquehanna, and Mohawk valleys. Vestal points are very rarely found on the Upper Delaware, but Normanskill-like forms are present there.

At Site 303 on Schoharie Creek, a Lamoka component was stratified above the Otter Creek component. Radiocarbon dates of 4340±190 and 4110±140 rcbp were associated with the narrow stemmed points (Wellman 1996).

d. Terminal Archaic/Transitional Period

Broadspear makers from the Southeast seem to have spread northward along the coastal plain, circa 4000 to 3500 rcbp (4500 to 3800 cal BP, 2500 to 1800 cal BC) (Kinsey 1972:359). The prototypical broad-bladed form is the Savannah River point, which developed in the Mill Branch culture of Georgia around 2800 cal BC (Sassaman 2006). The earliest broad-bladed form in New York is Snook Kill, probably derived from the similar Lehigh/Koens-Crispin points of Pennsylvania and New Jersey. Lehigh/Koens-Crispin points have been dated by a few radiocarbon assays in the Delaware Valley to about 3700 rcbp. At the Savich Farm, east of Philadelphia, dates of 3640±60, 3530±70, and 3820±60 rcbp were obtained for graves containing Koens-Crispin points and bannerstones (atlatl weights) (Regensburg 1982). In the Upper Susquehanna drainage dates of 3830±80 and 3620±130 rcbp are associated with Snook Kill points (Funk 1993a:162). Both forms were ancestral to the later Susquehanna and Perkiomen broad-bladed points; these coeval types date to about 3600 to 3200 rcbp. Four precise AMS dates for a hearth associated with Susquehanna and Dry Brook fishtail points and steatite bowl fragments at the Little Wood Creek Site in Fort Edward are 3160±30, 3070±30, 2970±30, and 2980±30 rcbp, or 1450 to 1200 cal BC (Grossman et al. 2015)

A noteworthy change in lithic raw materials occurred in the Delaware Valley when the broadspears replaced the narrow stemmed Lackawaxen points. The latter are made of shale and argillite, but preferred materials for broadspears are rhyolite, chert, and jasper. There does not appear to be as radical a shift in the Upper Hudson Valley, where chert continued to be used for broadspears.

Broadspear occupations tend to be focused on river floodplains and levees. In the absence of organic remains, it is unclear if this tendency is indicates the importance of fish (and perhaps also seed-bearing plants and tubers) in the diet, or simply reflects the importance of rivers as transportation routes. An innovation associated with broadspears is the construction of large platform hearths or pavements, full of fire-cracked rock (FCR). Many of these were found in Level 3 of the Zimmermann Site on the Upper Delaware (Werner 1972). Despite an absence of actual fish remains, it is generally assumed that these features were devoted to some kind of fish-processing, such as drying or smoking. This use would imply occupation sometime between March and June, when five species of shad migrate up the Delaware. Moeller (2005) notes a lack of diversity in the toolkits typically associated with these hearths and interprets this as indicative of short-term occupations rather than extended base-camps. He also suggests that the frequent burning of wood to heat the rock platforms may have severely diminished the local population of deciduous trees, causing an ecological catastrophe that led to the Early and Middle Woodland abandonment of the area. Whether or not this is a plausible explanation of local population dynamics, trans-regional climatic oscillations, particularly at 800 cal BC, may have caused the apparent Early Woodland population collapse throughout much of the Northeast (Fiedel 2001).

Tub-shaped vessels carved from soapstone (steatite) occur for the first time in association with Perkiomen or Susquehanna broadspears, both in the Upper Susquehanna and Upper Delaware drainages. This technology, interpreted as a step toward ceramic manufacture, was formerly seen as demarcating a Transitional cultural stage prior to the ceramic-producing Early Woodland cultures. Today, *Terminal Archaic* is the term more often applied to the period characterized by soapstone and broadspears.

In the Delaware Valley there is good evidence of the stylistic evolution of Orient Fishtail points from broadspears, by way of the intermediate Dry Brook type. Orient Fishtail points (circa 3200 to 2700 rcbp, 1500 to 800 cal BC) were found in elaborate mortuary deposits at the northeast tip of Long Island, associated with carved soapstone bowls. Ceramics, imitative of soapstone (steatite) vessels in shape, are a minor part of Orient assemblages in the Delaware Valley and eastern Long Island (Ritchie 1965:172); their appearance marks the onset of the Early Woodland. Marcey Creek steatite-tempered pottery was found in the Orient assemblage at Miller Field, New Jersey (dated to 3170±120 rcbp). At the Faucett Site in the Upper Delaware Valley, Exterior Corded/Interior Smoothed pottery appeared to be associated with an Orient component (Kinsey 1972:360).

Orient components are found at sites along the Hudson as far north as Saratoga County (they were recovered from the Church Site near Stillwater). At the stratified Coffin Site near Schuylerville, the Orient component yielded dates of 2820±110 and 3040±95 rcbp (Funk 1976:264). Orient points do not seem to occur farther west; they may overlap temporally with the Meadowood points that are predominant in central and western New York. Coeval Meadowood and Orient groups may have alternated habitation of the Pethick Site in Schoharie County (Rafferty et al. 2014). Vinette 1 pottery, quartz-tempered, conical-shaped, and cordmarked on both exterior and interior surfaces, is frequently associated with Meadowood points and is the index trait for the beginning of the Early Woodland.

Rafferty et al. (2014) suggest that sites along Schoharie Creek were located at the boundary between contemporaneous, distinct cultural zones: Orient Fishtail to the east and Meadowood to the west. They do not address the obvious question of whether those zones, defined by sharply distinct projectile point styles, represent discrete ethnic, linguistic, or political entities. Nevertheless, "We argue that the Pethick site was occupied by populations exhibiting Early Woodland and Transitional tool kits not sequentially, but consecutively (i.e., two populations alternatively occupying the site over time) and perhaps simultaneously" (Rafferty et al. 2014:184).

Orient Fishtail, clearly derived from the preceding aceramic Terminal Archaic or Transitional Savannah River/Snook Kill/Susquehanna/Perkiomen tradition, is generally regarded as the final expression of this tradition. The temporal division between Terminal Archaic (without pottery) and Early Woodland (with pottery) has generally been set at 3000 rcbp (3200 cal BP). Most Orient-associated radiocarbon dates fall on the early side of the boundary, beginning about 3200 rcbp (3400 cal BP) (Fiedel 1988); however, a few dates are as late as ca. 2800 rcbp (2900 cal BP) (albeit with large standard errors). Orient points are associated with carved soapstone vessels but also, rarely, with soapstone-tempered clay pots. Meadowood points are often associated with Vinette I pottery and are therefore assigned unambiguously to the Early Woodland. Radiocarbon dates for Meadowood generally fall between ca. 2900 and 2400 rcbp (3000 and 2500 cal BP); an anomalously early outlier from the Fortin Site on the Upper Susquehanna is 3180±95 (ca.3300 to 3500 cal BP). Meadowood points seem to have developed from the small, notched points (e.g., of the Hind type) that are found in southern Ontario and the northern Midwest between ca. 3500 and 2800 rcbp.

No credible Orient-associated dates are later than ca. 2750 rcbp (2850 cal BP or 880 cal BC). The end of the Terminal Archaic tradition thus appears temporally and perhaps causally associated with an abrupt climate event. Numerous environmental records in Europe indicate a climatic downturn around 800 to 750 cal BC, which coincides with a radiocarbon "cliff" indicating weakened solar activity. Atmospheric ^{14}C increases and dates drop abruptly from 2750 to 2450 rcbp (Fiedel 2001; Martin-Puertas et al. 2012; Van Geel and Mauquoy 2010). The "cliff" is followed by a plateau; between 2750 and 2400 cal BP, radiocarbon dates are indistinguishable, always ca. 2450 rcbp. Martin-Puertas et al. (2012) have recently shown that a simultaneous sharp increase in windiness and increase in cosmogenic beryllium (^{10}Be) occurred at ca. 2760 cal BP in central Europe; they infer that "changes in atmospheric circulation amplified the solar signal and caused abrupt climate change about 2800 years ago, coincident with a grand solar minimum." This climate change is coincident with Bond event 2 in the North Atlantic, and a probably associated climate episode shows up very strongly in the strontium/calcium ratios from Buckeye Creek Cave in West Virginia (Springer et al. 2008: figure 1). Shuman et al. (2009) infer numerous prehistoric episodes of regional drought from the occurrence of sand layers attributed to lowered water levels in New Long Pond, Massachusetts. Among these is a drought dated to ca. 2980 to 2760 cal BP. Newby et al. (2011) report a similar drought record from Davis Pond in southwestern Massachusetts. Low water levels are inferred for most of the period from 3500 to 2300 cal BP. Pollen sampled from Ballston Lake, located between Saratoga and Schenectady, shows an increase of conifers, hardwoods, and boreal taxa at about 2680 cal BP (2520 rcbp); this is interpreted as marking a shift to a colder climate (Toney et al. 2003).

At the Kingston Armory Site Vinette I sherds were recovered in association with a hearth that was dated to 2980±40 rcbp (ca. 1320 to 1060 cal BC). Orient fishtail points also were found near this feature. Another date for this component is 2790±40 rcbp (ca. 950±50 cal BC) (Gould et al. 2008).

3. Woodland Period (3000 to 500 BP)

a. Early and Middle Woodland Periods

The period from about 2700 to 1700 rcbp (800 cal BC to cal AD 400), corresponding to the Early Woodland and early Middle Woodland, is not well known; as Funk (1993a:200) observed, "Next to the Early Archaic this is the most poorly understood substage in the Northeast" and overall, "The evidence for this phase in New York State remains meager" (Funk 1993a:200).

An *in situ* transition from Orient to succeeding cultures has not been established. A sharp stylistic break occurred, along with reduced numbers of recognizable Early Woodland components. Other than a real population collapse, the most plausible alternative explanation might be a period of severe riverine erosion (which, however, would not explain the comparably small numbers of Early Woodland components in upland settings) (Fiedel 2001).

In the Upper Delaware Valley there is sparse evidence of a fleeting presence of the Meadowood phase; at the Faucett Site side-notched Meadowood points were stratified above the Orient component, and an associated radiocarbon date was 2700±100 rcbp (Kinsey 1972:361). A similarly ephemeral manifestation of the Adena complex of the Ohio region was discovered at the Rosencrans Site in Sussex County, New Jersey. The 13 cremation graves there contained blocked-end tubular pipes, slate gorgets, pendants, cones, slate and copper boatstones, a copper celt, copper beads, conch shell beads, Cresap stemmed points, and side-notched points. Associated radiocarbon dates were 2560±120 rcbp (Ritchie 1965:203) and 2400±60 rcbp (Kraft 1976).

Small Meadowood habitation sites appear to be anomalously concentrated in a linear zone stretching from the Mohawk to the Upper Susquehanna (Taché 2011). This group includes Nahrwold 2 along Schoharie Creek (Ritchie 1969), where the small Meadowood component was dated to 2710±80 rcbp.

At the Pethick Site on Schoharie Creek, 27 of the 81 identified points are Meadowood, and three of the reported radiocarbon dates are appropriate for the Meadowood phase (2510±40, 2640±60, and 2670±110 rcbp). Only one

Meadowood point was recovered from the Schoharie Creek II Site, but a radiocarbon date of 2500±40 rcbp was obtained that is appropriate for this component. Another Early Woodland date of 2070±40 rcbp is also reported (Rieth 2012). At the Vroman 1 Site, near Fox Creek, a probable Meadowood component yielded a radiocarbon date of 2460±40 rcbp. A date of 3060±40 rcbp may indicate an earlier Orient occupation, although no diagnostic artifacts were recovered (Rieth 2016).

Abundant carbonized plant remains were recovered by test excavations by the New York State Museum in 1999 at the Parlsow Field Site on Schoharie Creek near Breakabeen. Hart et al. (2003) report a date of 2386±48 rcbp for a fragment of wild rice from this site.

Curtin (2015) recently reported a substantial Meadowood component at the Esmond 2 and 3 sites in Saratoga County. The occupants used mostly Onondaga chert, which Curtin believes was derived from Terrace Mountain in the Schoharie Valley or some other source south of the Mohawk River. Charcoal from a feature at Esmond 2 was dated to 2420±30 rcbp. Another feature was dated to 2060±30 rcbp, which presumably relates to a post-Meadowood occupation.

Kinsey (1972) designated the seemingly indigenous Early to early Middle Woodland occupations of the Upper Delaware Valley as the Bushkill complex, with an estimated date range of 2500 to 2100 rcbp. Contracting-stemmed Rossville points are the most common diagnostic form of this period in the Upper Delaware Valley; Lagoon points and small numbers of nondescript side-notched forms were contemporaneous. Kinsey noted that the resemblance of Lagoon points to Adena forms is only superficial, and observed some similarity to Fox Creek/Steubenville points. The lithic assemblage appears to have been associated with several ceramic types (Vinette 1, Fabric-Impressed, Wiped, and Dentate-Stamped); however, the dominant ceramic type was Brodhead Net-Marked, a quartz-tempered ware that appears similar to the Popes Creek pottery of Virginia and Maryland as well as the North Beach type of coastal New York. Kinsey (1972:369) cautioned that the Bushkill complex seemed to be a grab-bag of distinct incoherent traits: "…it is likely that too many projectile point and pottery types have been identified as traits for the complex to represent the original ethnological conditions. When additional information is derived from a satisfactory context, it may be possible to subdivide the present complex into several phases."

Only a few sites in the Upper Susquehanna drainage contain Bushkill-like assemblages or have been dated to the same period. At Kuhr No. 1 an Adena-like stemmed point and clusters of Vinette 1 and Point Peninsula Plain pottery were found in a level dated to 2330±85 rcbp.

At the Westheimer Site in the Schoharie Valley, Stratum 5 contained Adena-like and Turkey Tail-like stemmed points, small triangular points or knives, and a few net-marked sherds. A hearth in this stratum yielded a date of 2520±100 rcbp (ca. 2700 to 2400 cal BP) (Ritchie and Funk 1973). Upstream on Schoharie Creek, the Lopuch 3 Site yielded Point Peninsula sherds, a triangular biface resembling those from Westheimer, and 15 microdrills. These artifacts were associated with two hearths dated to 2405±145 and 2315±105 rcbp (Lindner 1991). Although Lindner had speculated that these tools had been used to create shell beads, use-wear analysis instead suggested their use on wood or antler (Lindner and Folb 1996).

Given the presence of a Turkey Tail-like point in Anderson's surface collection from Gorge Creek Site 1, recent evidence pertaining to the date of this type should be noted. Gramly (n.d.) reports dates for two Turkey Tail caches in northeastern Kentucky: 2700±70 and 2570±40 rcbp. The only other date previously reported for a Turkey Tail cache, from Ohio, is 2340±80 rcbp (Grandstaff and Davis 1985).

Dentate and rocker-stamped pots of Early Point Peninsula type are markers of the Canoe Point phase (circa 1800 to 1700 rcbp) in New York. It is possible that these Middle Woodland ceramics, distributed from Manitoba to the New England coast, mark the expansion of Proto-Algonquians outward from the eastern Great Lakes region (Fiedel 1991). The ceramics seem to be associated with crude, nondescript side-notched points. At the Cottage Site a midden located on the Susquehanna near Binghamton, an assemblage of this phase was dated to 1810±100 rcbp (Funk 1993a:204). A later stage of the same cultural tradition seems to be represented at the Davenport Creamery Site, near Oneonta (Funk and Hoagland 1972b). Dentate and rocker-stamped sherds were associated with well-made, thin, side-notched points, resembling Ritchie's (1971b) Long Bay type. A feature there was dated to 1625±95 rcbp. Apparently, Fox Creek points and Petalas "blades" (large bifaces) formed part of the same assemblage. Hart and Brumbach (2005) have recently reported dates from central New York, on organic residues adhering to sherds, that extend the temporal range of Point Peninsula rocker-stamped pottery: 2270±35, 2205±30, and 1620±35 rcbp.

Funk (1993a) recognized a small (1 to 1.5 inches long) stemmed point type of the Middle Woodland period in the Upper Susquehanna drainage; he referred to this type as "Sand Hill Stemmed." At Harry's Farm (Site 28Wa2) in the Upper Delaware, Kraft (1975a) excavated points of the Tocks Island type, in association with Abbott Horizontal Dentate, Brodhead Net-Marked, and Exterior Corded/Interior Smoothed pottery, and a radiocarbon date of 1660±95 rcbp. The corner- or side-notched Tocks Island points are restricted to that vicinity. A noteworthy feature at Harry's Farm was a 47x26-foot platform of FCR, which was surrounded by pits and hearths.

Elsewhere, Fox Creek points date to between circa cal AD 300 and 700. Many of these were made of argillite obtained near present-day Trenton, New Jersey. The wide distribution of this lithic material shows that the Middle Woodland people of southern New York participated in a trade network that extended along the coastal plain from Maryland to Massachusetts. Ceramic styles diffused throughout the same exchange sphere. At sites in coastal New York, Fox Creek points were associated with North Beach Net-Marked and Abbott Zoned Net-Impressed and Incised ceramics. At the Ford Site in Columbia County, a similar net-marked ware was associated with Fox Creek points (Funk 1976:131). The Ford Site also yielded several sherds of zoned-incised Abbott ware that resemble Middle Woodland sherds from New Jersey. A typical Fox Creek component on the Upper Susquehanna, dated to circa 1590 rcbp, was excavated at the Fredenburg Site near Otego (Hesse 1968).

Fox Creek points were named by Funk, based on examples he excavated from Stratum 3 of the Westheimer Site, at the confluence of Schoharie Creek and Fox Creek (Funk 1968). The points were associated with net-marked sherds, including part of an Abbott Zoned vessel. This component produced overlapping radiocarbon dates of 1500±80 and 1540±80 rcbp (ca. cal AD 500 to 530) (Ritchie and Funk 1973). A residue deposit on a Ford Netmarked sherd from Westheimer was recently dated to 1600±35 rcbp (ca. cal AD 470) (Hart and Brumbach 2005).

Jack's Reef pentagonal and corner-notched points demarcate a late Middle Woodland horizon, the Kipp Island phase, ca. cal AD 600 to 900. Unlike earlier points, which were used as spear or dart tips, these points may have been used as arrow tips. Associated ceramic types include Point Peninsula Plain, Corded, and Rocker-Stamped; Jack's Reef Corded and Corded Punctate; and Vinette Dentate. Recently obtained residue dates for Jack's Reef Corded pottery are 1430±40, 1428±41, and 1315±50 rcbp (Hart and Brumbach 2005).

A particularly noteworthy find of late Middle Woodland age is a cremated burial on Minisink Island in the Upper Delaware (Ritchie 1965:234). The grave goods included "the calcined remains of a large, decorated comb of classic Kipp Island style, two perforated shark teeth, and a fragmentary straight-based platform pipe, all index markers for this phase." These artifacts bespeak an obvious cultural relationship to the coeval Island Field cemetery in Delaware and the cremated burial discovered beside the Whitehurst Freeway in Washington, D.C. (Knepper et al. 2006).

At the Schoharie Creek II Site no Middle Woodland diagnostic artifacts were found in data recovery; however, a Fox Creek point was found in previous testing, and five grit-tempered sherds could be derived from Point Peninsula pottery. In any case two radiocarbon dates would be appropriate for a Middle Woodland occupation: 1370±40 and 1420±40 rcbp (Rieth 2012).

b. Late Woodland Period

Archaeologists once believed that a commitment to horticulture was one on the main innovations that distinguished the Woodland from the preceding Archaic era. In this respect the Archaic/Woodland distinction has become very blurry, however, as more data have accumulated that show, on the one hand, intensive plant-collecting and even cultivation at very early dates in the Archaic, and on the other, very limited reliance on cultigens of tropical origin until quite late in the Woodland era. Based upon his experience in the Hudson and Upper Susquehanna valleys, Robert Funk (1993a:139) suggested that the whole cultural sequence from Early Archaic through Middle Woodland ought to be collectively lumped as a "Forager" stage of cultural development; Funk saw the transition from Middle to Late Woodland as the shift from this stage to the "Village Farmer" stage.

In Connecticut there is evidence that hazelnuts and cattails were gathered at the Sandy Hill Site by 9500 cal BP. A fragment of "gourd" (*Cucurbita*) rind recovered from the Sharrow Site in Maine was directly dated to 5695±100 rcbp (about 6500 cal BP) (Hart 2008; Petersen and Asch-Sidell 1996). This plant has very bitter flesh, so it may have been grown and used for containers or fishing floats rather than consumed. Laurentian occupants of the Bliss-Howard Site in Connecticut were collecting goosefoot seeds (*Chenopodium*) around 5500 cal BP. Similar gathering of diverse plants by Archaic peoples of the mid-continent resulted in the coalescence by 3800 cal BP of an indigenous horticultural complex, recognized at the Riverton Site in Illinois. The cultivated plants of this complex included domesticated bottle gourd (*Lagenaria siceraria*), marshelder (*Iva annua* var. *macrocarpa*), sunflower (*Helianthus annuus* var. *macrocarpus*), and two cultivated varieties of chenopod (*Chenopodium berlandieri*), and possibly also *Cucurbita pepo* squash and little barley (*Hordeum pusillum*) (Smith and Yarnell 2009). But there is no evidence that millennia of plant-gathering in the Northeast resulted in cultivation and sedentism.

John Hart's project of radiocarbon-dating carbonized residues on sherds at the New York State Museum has produced a date of 2905±35 rcbp for a sherd from the Scaccia Site, in Livingston County, that contains squash phytoliths. A sherd from the Vinette Site contains maize phytoliths in residue dated to 2270±35 rcbp. Some researchers assert that maize was common in central New York by ca. cal AD 500, but it should be cautioned that freshwater reservoir effects can make such residue dates too old by centuries (Fischer and Heinemeier 2003; Roper 2013; but see Hart and Lovis 2014).

Surprisingly old maize, directly dated to 1210±40 rcbp (cal AD 770 to 890) has been reported from the Deposit Airport I Site in Delaware County, New York (Knapp 2009). Site 211-1-1, located on Roeliff Jansen Kill, a small tributary on the east side of the Hudson River, was excavated as part of the Iroquois Pipeline survey (Cassedy and Webb 1999). A date of 810±50 rcbp was reported for maize, but corrected for ^{13}C, this date should be 1050±50 rcbp, or ca. cal AD 985. Hart has emphasized that beans spread into the Northeast much later than maize, but the temporal gap in New England is not great; a bean has been directly dated to 765 rcbp (cal AD 1275) at the Skitchewaug Site in the Connecticut River drainage in Vermont (Petersen and Cowie 2002).

A squash *(Cucurbita*) seed fragment was recovered from a feature at Smithfield Beach on the Upper Delaware along with Clemson Island Punctate pottery; wood charcoal from this feature was dated to 890±60 rcbp. Maize was recovered from the Owasco component of the Medwin Knoll II Site (28Sx266), dated to 720±50 rcbp. Beans were reported from the Intermediate component of the Minisink Site, dated to later than cal AD 1250 (Fischler and French 1991).

About cal AD 900 cordmarked ceramics of the Owasco complex replaced the Point Peninsula types in New York, marking the beginning of the Late Woodland period. In central New York Owasco cultural development can be divided into three sequential phases, based mainly on ceramic style changes: Carpenter Brook (cal AD 1000 to 1200), Canandaigua (cal AD 1200 to 1275), and Castle Creek (cal AD 1275 to 1350) (Ritchie 1965:272; Snow 1980, 1995). Owasco vessels are less conical than Point Peninsula pots but not as globular as later Iroquoian vessels. They had defined necks and flaring rims, and most were decorated with cord impressions around the neck. Collars, sometimes decorated with appliqued human effigies or incised designs, began to appear on Castle Creek phase pots. Stone and clay elbow pipes are also characteristic of Owasco.

The abruptness of the Point Peninsula/Owasco transition is debatable. Ritchie (1965) recognized a brief Hunter's Home phase, transitional between Kipp Island and Owasco. Snow (1995) argued that an abrupt style change took place from Point Peninsula to Owasco, and that Hunter's Home is an artificial construct attributable to assemblage mixing. He hypothesized that Owasco represents the intrusion of Proto-Iroquoians, migrants from a homeland somewhere in the Appalachian uplands. The Owasco economy, unlike their predecessors', was committed to cultivation of maize and squash (beans were a later addition to the diet, after AD 1300) supplemented by fishing, hunting, and gathering. Snow's migration model was weakened by the discovery of maize in Princess Point complex sites in Ontario, dating to as early as AD 600 (Crawford and Smith 1996). As noted above, Hart et al. (2007) have reported even earlier dates for organic residues on ceramic sherds that contain maize phytoliths. Princess Point ceramics are quite distinct from those of the Point Peninsula tradition and resemble Clemson's Island pottery from Pennsylvania in some respects, such as the decoration of vessel necks with punctates. It may be that Princess Point and early Clemson's Island actually represent the Iroquoian intrusion (as Fiedel [1991] suggested).

Particularly on the Upper Susquehanna, the Owasco culture's close relationship to, and perhaps derivation from, the Clemson's Island culture of central Pennsylvania is evident. This can be seen in the near identity of Clemson's Island ceramics, dated to between AD 1000 and 1300, to types of the early Owasco Carpenter Brook phase (Stewart

1988:VIII-2). At the Deposit Airport Site located on the West Branch of the Delaware in Delaware County, New York, early Owasco and punctated Clemson's Island sherds were recovered from the same features, dated to ca. 930 rcbp (ca. cal AD 1100) (Knapp 2009). At Smithfield Beach on the Upper Delaware, a date of 890±60 rcbp (ca. cal AD 1130) was associated with Clemson's Island Punctate sherds (Fischler and French 1991). Notably, several sites that figured in the definition of Owasco phases are located in Broome County, New York (e.g., Castle Creek, Willow Point, Roundtop). Owasco ceramics are associated with triangular points of the Levanna and, after AD 1100, Madison types, which were certainly arrowheads. Owasco assemblages also include a wide variety of bone and antler tools.

Because the geographic extension of particular styles of pottery decoration requires frequent face-to-face interactions between potters (almost certainly women in the Middle and Late Woodland Northeast), archaeologists tend to assume that the distributional boundaries of recognized ceramic types roughly correspond to socio-linguistic entities. This assumption has led to a particularly thorny problem in the interpretation of Owasco. Ritchie (1965) had originally, in the 1940s, accepted Arthur C. Parker's identification of the Owasco culture as the material manifestation of Algonquian speakers, but as he later adopted the *in situ* theory of Iroquoian origins, he envisioned a gradual developmental continuum from Point Peninsula to Owasco to incipient Iroquois culture (e.g. Ritchie 1965:210). But this left the Munsee culture, which Ritchie investigated at the Bell-Philhower Site on Minisink Island, unexplained:

> The Munsee division of the Lenni Lenape or Delaware Nation, of known Algonkian linguistic affiliation, were participants in the Owasco culture in a late prehistoric phase of their development. There seems to be no equally logical alternative to the judgment that Munsee culture, as it first appeared at their Minisink Island capital, conformed with the Castle Creek phase of the Owasco; that it underwent, prior to European impingement, progressive acculturation from neighboring groups, and from developing cultures upriver to the north which can historically be related to Iroquoian-speaking people.… Owasco culture was produced and shared by various groups whose linguistic affiliation included both Algonkians and Iroquoians [Ritchie 1965:299].

It must be emphasized that Algonquian and Iroquoian languages are radically distinct in all respects (phonology, grammar, and vocabulary); if they share a common ancestor, it can only be at great time depth, i.e., Paleoindian or Early Archaic.

There is a similar lack of fit in the ethnolinguistic and archaeological evidence in the Hudson drainage. When the Dutch arrived in the early sixteenth century, the lower Hudson was occupied by the Munsee, who spoke a distinct regional dialect of the Delaware language (a member of the Algonquian family) (Goddard 1978:213). Munsee speakers were divided into numerous social and political units (bands), but these formed a loose network, connected by kinship and marriage ties, that permitted frequent movement of individuals between bands. The Middle and Upper Hudson Valley was occupied by the Mahican. They were not Delaware-speakers, but their Eastern Algonquian language was much more closely related to Delaware than to the Algonquian languages of the native peoples of New England. Nevertheless, as Funk (1976:311) observed, in the Hudson Valley "the fragmentary data for post-Owasco manifestations leave little doubt that there was an unbroken development into ceramic stages similar to the Oak Hill, Chance, and Garoga horizons of the Mohawk Iroquois."

Herbert Kraft (1975b), well aware of the linguistic problem, attempted to define a regionally specific variant of Owasco on the Upper Delaware, ancestral to the Munsee; he called it "Pahaquarra," and contended that it could be distinguished from New York Owasco on five criteria. However, a subsequent re-evaluation of the regional Late Woodland sequence (Williams et al. 1982) concluded that Pahaquarra was not really different from Owasco. Most recently, Hart and Brumbach (2003) have argued that Owasco is a miscellaneous hodgepodge of unrelated traits that should not have been regarded as a coherent, temporally and spatially bounded cultural entity in the first place.

The complete correspondence of presumably ancestral Munsee ceramics to Iroquoian, and specifically Mohawk, types continues through the post-Owasco period, when Upper Delaware types are variations on Chance Incised pottery. Kinsey (1972:393) remarked, "In brief, there is the ambiguity of Iroquoian-speaking and Algonquian-speaking Indians possessing an identical ceramic tradition. This is not what we would expect, and it is regarded as an important and unresolved Late Woodland problem."

The earliest Owasco pottery types in central New York are Wickham Corded Punctate, Carpenter Brook Cord-on-Cord, Levanna Cord-on-Cord, and Canandaigua Plain. The generally accepted ages of the successive Owasco phases are cal AD 1150 to 1200 for Carpenter Brook, cal AD 1200 to 1275 for Canandaigua, and cal AD 1275 to 1350 for Castle Creek. However, recently reported dates on residues suggest that some Owasco types may be substantially older than previously thought, although possible reservoir effects should be borne in mind. New dates for Wickham Corded Punctate are 1425±45, 1260±39, and 1228±42 rcbp. Carpenter Brook Cord-on-Cord sherds have been dated to 1470±43, 1247±48, and 1231±44 rcbp (Hart and Brumbach 2005). Sackett Corded is dated to 810±150 rcbp at the Sackett Site in central New York. Sackett Corded is the predominant middle and late Owasco type; it encompasses Owasco Corded Horizontal, Owasco Herringbone, Owasco Platted, and Owasco Corded Oblique variants (Kinsey 1972:380). Hart and Brumbach (2005) have reported residue dates of 1211±46 rcbp for Owasco Corded Horizontal and 781±42 rcbp for Owasco Corded Oblique. On Minisink Island Sackett Corded and Levanna Cord-on-Cord sherds were dated to 730±50 rcbp (Kraft 1978).

The transition from Owasco into a recognizable proto-Mohawk culture occurred during the Oak Hill phase (AD 1350 to 1400). During the following Chance phase (AD 1400 to 1525) ancestral Mohawk moved into nucleated, fortified villages. Their characteristic Chance Incised pottery was decorated with alternate triangular plats and oblique lines. Deowongo Incised, Durfee Underlined, and Garoga Incised are recognized on the basis of slight design elaborations on the Chance prototype. The culture of the protohistoric Mohawk is ascribed to the Garoga phase (AD 1525 to 1550).

At the Nahrwold No. 1 Site near Middleburgh, most of the pottery (80 percent of diagnostic rims) represents a late Castle Creek Owasco occupation. This occupation continued into the Oak Hill phase; however, the site was virtually abandoned after ca. AD 1400, as only six sherds of Chance Incised and Deowongo Incised were recovered. A feature containing Castle Creek sherds yielded a radiocarbon date of 640±95 rcbp (ca. cal AD 1330). Another feature was dated to 500±80 rcbp (ca. cal AD 1410). This Late Woodland village was not protected by a palisade, which is unusual. Subsistence remains, some recovered from storage pits, included maize and beans as well as acorns, walnuts, butternuts, hickory nuts, and wild plums. Game was hunted with bows and arrows tipped with Levanna triangular points. The meat sources included deer, beaver, woodchuck, bear, fox, elk, turkey, mussels, and fish. Burials of both dogs and humans were encountered at Nahrwold No. 1.

Although the Nahrwold Site was rarely visited after AD 1400, numerous Chance phase villages were located in the Schoharie Creek floodplain, to a point beyond the Fox Creek confluence (Lenig 2013:55). The inhabitants were presumably proto-Mohawk.

D. Contact (Protohistoric) and Historic Periods

It is often speculated that Basque and English fishermen may have been landing on the coast of Labrador or Newfoundland as early as 1480, well before Columbus's discovery of the West Indies; however, there is no concrete evidence of their presence, and the first documented exploration of the northeast shores is John Cabot's expedition of 1497, which resulted in his discovery of Newfoundland. The official record of subsequent sixteenth-century expeditions to North America is rather sparse, but there are two lines of evidence about the high frequency of undocumented interactions between Basque, French, and English fishermen and native inhabitants of the Northeast coast. One is the existence of a Basque-based trade pidgin, used by the Micmac Indians of the Gaspe Peninsula (Bakker 1988). The second is archeological evidence (complemented by a few contemporary observations) of European trade goods, such as glass beads and brass kettles, which began to appear sporadically after 1500 but were already fairly common at interior sites by the 1580s (Noble 2004). They occur particularly in Susquehannock graves of this period, in southeastern Pennsylvania. A Basque whalers' camp, dating to the mid-1500s, has been excavated at Red Bay in Labrador.

In 1524 Giovanni da Verrazzano, financed by a Lyonnaise silk merchants' syndicate and authorized by the king of France, sailed along the Atlantic coast from Florida to Newfoundland. On this voyage he sailed across Delaware Bay, which he named Vandoma, but he did not explore the river. Verrazzano spent less than a day in New York Bay; thinking it was a lake, he called it Santa Margarita and the surrounding lands Angouleme. In Narragansett Bay, Rhode Island, Verrazzano observed that the natives had "many sheets of worked copper which they prize more than gold" (Wroth 1970:137–140). Presumably this was European copper, already obtained from French or Basque traders by "down-the-line" exchange. Similarly, when Jacques Cartier encountered Micmac Indians in Chaleur Bay near the Gaspe Peninsula in 1534, these natives were prepared to trade their furs for hatchets, knives, and beads. Evidently, the Micmacs already knew, from previous encounters, what the Europeans craved.

The first English colonization efforts on the coast of North Carolina, from 1584 to 1587, failed. They made another effort at Jamestown, Virginia, in 1607. In 1608 John Smith set out from Jamestown to explore the shores of the Chesapeake Bay. When he visited the Tockwoghs on the Sassafras River, Smith was surprised to discover that they already had many trade goods, "hatchets, knives, peeces of iron and brasse," which they reportedly had obtained from the Susquehannocks.

In 1609 Henry Hudson, an Englishman financed by the Dutch East India Company, searched for the Northwest Passage to Asia. Instead, he found the Hudson River (first known as the Mauritius, then the North River). He sailed upriver as far as present-day Albany. Hudson also entered the Delaware Bay, on August 28, 1609. Robert Juet, the mate of Hudson's ship, the *Halve Maen* (*Half Moon*), kept a journal in which he remarked that the local Indians (a branch of the Munsees) along the Hudson possessed "red Copper Tobacco pipes, and other things of Copper [which] they did wear about their neckes" (Juet 1609 [1909]:18). These seem to have been trade goods, and the Indians' cautious behavior toward Hudson's crew suggests that they had already had hostile encounters with other Europeans.

Dutch merchants quickly dispatched trading ships to exploit Hudson's discovery by acquiring beaver pelts. The first venture of this sort was in 1611. Ten thousand pelts were reportedly acquired from the Hudson River Indians in the winter of 1613 to 1614 (Kraft 1989). A fortified trading post, Fort Nassau, was established in 1614 on Castle Island in present-day Albany to trade with the Mohawks and their Algonquian-speaking neighbors, the Mahicans. The Dutch agents induced these warring rivals to sign a peace treaty. At about the same time the Dutch built another small fort at Esopus, and in 1615 they built a small fort on Manhattan. Both the British and French attempted to oust the Dutch interlopers, but their attacks were rebuffed. In 1621 the new Dutch West India Company took control of the Hudson River fur trade. In 1624 the company ordered construction of a new fort, Fort Orange, to replace Fort Nassau, which had been destroyed by a flood. Fort Orange served to draw Iroquois hunters away from the French traders on the St. Lawrence; however, the Dutch had some political problems at Fort Orange as they became embroiled in the ongoing hostility between the Mohawks and the Mahicans..

A 1616 map discovered in the Royal Archives in the Hague in 1841 was probably based on a map drawn in 1614 by the explorer and fur trader Captain Adriaen Block (O'Callaghan 1856; Williamson 1959:8). This map shows the upper reaches of a major river west of the Hudson. The names of the Indian nations located along the west bank of this river persisted on Dutch maps as late as the 1680s. Proceeding downriver, these were Maquaas (Mohawk), Canomakers, Senecas (possibly referring to Oneida rather than Senecas), Gacheos, and Capitannasses. According to Weslager (1961:112–113), notations in Dutch in the west portion of this Figurative Map actually refer to the adventures of a Dutchman called Kleytjen and two companions from the crew of the *Fortune*. They left the newly constructed Fort Nassau (now Albany) in the spring of 1614 and wandered toward the southwest. They probably traveled along the Mohawk River before reaching the headwaters of the Susquehanna. They were reportedly ransomed from the Minquaas (Susquehannock) several months later by Captain Hendricksen in the yacht *Onrust* on the lower Delaware.

In the late seventeenth century the Mohawk lived in three "castles" or principal villages, plus several smaller villages. In 1634 and in the 1640s, Dutch and French visitors reported that these villages were located on the south side of the Mohawk River. In 1666 these villages were burned by the French, and afterward the Mohawk rebuilt them north of the river. The easternmost castle was also called the Lower or First Castle. Its name changes often in the oldest accounts, perhaps indicating that it was moved several times. In 1634 it was called Onekagoncka; in 1643 it was Ossernenon or Asserue. At that time the village was located 0.25 mile south of the river, southeast of modern Auriesville (and thus near the mouth of Schoharie Creek). In 1659 this village was called Kaghnuwage (a variant of Caughnawaga) from the Mohawk *kahnawa.ke*, meaning "at the rapids." After it was destroyed by a French expedition in 1666, the village was rebuilt on the north side of the river, west of present-day Fonda, New York (Fenton and Tooker 1978). Given its location west of Fort Nassau (Albany), it seems reasonable to identify the "Canomakers" village shown on the 1616 map as a faulty transcription of *kahnawa.ke* or Caughnawaga. If this equation is correct, this could have been the last Mohawk town Kleytjen and his companions visited before they turned south. The small stream shown on the map as running southeast could then be Schoharie Creek. This would have been a logical route for the Dutchmen to have traversed as they entered Mahican country. If so, they would have been the first European visitors to this area.

Dutch relations with the Indians deteriorated through the mid-seventeenth century, resulting in several wars. In 1664 Britain seized New Netherland, but the Hudson Valley retained a strong Dutch linguistic and cultural imprint for a century and a half after Dutch political sovereignty ended.

The precise chronology and severity of pandemics of European diseases that hit native populations during the Contact period remain matters of debate. On the one hand it would seem that the evident coastal trade contacts starting in the early 1500s provided the setting for transmission of contagious viruses. On the other hand archaeologists familiar with the record of village development in Iroquoia and Huronia (Snow 1995; Warrick 2003) see no evidence of population decline caused by disease prior to 1634. In 1634–1635 the Mohawks were hit by a smallpox epidemic. The cumulative effect of successive waves of European-introduced disease (17 epidemics are recorded in the Northeast between 1624 and 1783) reduced the native population of the Northeast to a small remnant by the mid-eighteenth century—to perhaps 10 percent of the pre-Contact population. While native numbers declined, Euro-American numbers were growing rapidly, from both intrinsic growth of the seventeenth-century settlements and a surge of new immigration after 1710, particularly from Scotland and Germany. Land-hungry settlers pressed on Indian lands.

The first European settlers in the Schoharie Valley arrived almost simultaneously, but they acquired their lands by different means. The Dutchman Adam Vrooman began operating a mill in Schenectady in 1683. In 1711 he purchased about 600 acres from the Mohawks. This tract, located southwest of present-day Middleburgh, became known as Vrooman's Land. Vrooman had two deeds drafted in Schenectady to record the purchase. The first deed, dated August 22, 1711, lists the Indian sellers as Pennonequieeson, Canquothoo, Hendrick the Indian, Kawnawahdeakeoe, Turthyowriss, Sagonadiet, Tucktahraessoo, Onnadahsea, Kahenterunkqua, Amos the Indian, Cornelius the Indian, Gonhe Wannah, Oneedyea, Leweas the Indian, Johanis the Indian, Tuquaw-in-hunt, and Esras the Indian. They represented "the three races or tribes of the Maquase, the Turtle, Wolf and Bear." The tract of 260 acres—200 flats, 60 woodland—was located near the hill "called Onitstagrawa." Vrooman's second deed, dated April 30, 1714, lists eight Mohawk sellers as Sinonneequerison, Tanuryso, Nisawgoreeatah, Turgourus, Honodaw, Kannakquawes, Tigreedontee, and Onnodeegondee. The transferred land was 340 acres of woodland, east of the 60 acres previously sold.

Impelled by their poverty, the effects of a French invasion, glowing reports of available land in the Carolinas, and an invitation from Queen Anne, thousands of Palatine Germans emigrated to England in 1709 (Otterness 1996). From there, 3,000 Germans shipped out to New York in April 1710. The new English governor, Robert Hunter, settled some 700 of them on the Hudson at two temporary camps about 90 miles north of New York City. The East Camp is present-day Germantown; the West Camp was opposite, on the west bank of the river. Hunter's plan was that the Germans would be settled in the pine forests and produce tar for the royal navy. This plan was abandoned and de-funded in September 1712. Some of the German colonists then set out for the Schoharie Valley, arriving in the winter. They had no patents for the land, so the British authorities regarded them as squatters. The Germans settled in seven clusters, or villages, called *dorfs*, each under a leader or headman for whom the dorf was usually named. Johann Conrad Weiser, Sr. (1662–1746) was the headman of Weiser's Dorf (or Wiserdorp), which would become Middleburgh.

The Germans harassed both Vrooman, who settled nearby in 1715, and governmental agents from Albany. The continuing disputes over their land rights led 60 families to emigrate with Weiser to Berks County, Pennsylvania. In 1726 Vrooman obtained another deed from the Mohawks affirming his ownership of Vrooman's Flats. The Indians reserved land for their "castle" at Wilder Hook. John M. Brown (1816), a longtime resident of the area (since 1757, when he was 12 years old), identified the inhabitants of the flats as the "Karigh Ondonte" tribe. He ascribed their origin to:

> a French Indian prisoner; married to a Mohawk Squaw. His name was Karigondonte, whose father-in-law sent him there, and gave him land, for fear that the Mohawk Indians would kill him when they got drunk, and gave him land, as the Mohawk bore a great enmity to the French.
>
> Other Indians, Mohawk, Mohegan, Discarora, Delaware, and Onidas, flocked to him, so that he increased to a nation to about three hundred strong, and established chiefs among them; who then pretended to be the owners of all that vast territory of land, and granted conveyances thereof….
>
> Their chiefs, that remained in my time, were Seth, 'Hansyerry, Joseph Hanelie and Aggy Awner, together with their squaws of the direct line of Karigh Ondonte, namely: Lisiquet, Wawly and Catoline, who always pretended to have the exclusive title of the soil, in the very best of this tract they settled….Here they gave names to three particular hills, namely; Onisto Graw, Conegena and Mohegan, by which they continue to be named this day [Brown 1816].

Brown also reports that the Karigh Ondonte people were devastated by an outbreak of yellow fever in 1775.

Starting in 1713, the German settlers of the valley grew wheat. After a century of cultivation by a growing population, the soil was giving out in the early nineteenth century. In 1819 a farmers' magazine called the soils of the famously fertile Schoharie Flats "totally inert" (Ellis 1946: 136). The 1819 county fair in the village of Schoharie promoted soil conservation (Ellis et al. 1967:171). The local farmers began using deeper-cutting plows to compensate for declining crop yields in the bottom lands (Ellis 1946:142), but this practice accelerated erosion. After ca. 1850, erosion was reduced by reforestation and selective planting. Wheat farming continued into the 1870s, but it was largely replaced by dairying in the middle and lower Schoharie valley (Thompson 1966:210–211).

E. Previous Investigations

Phase I testing of the project area was conducted in May 2016 (Gade et al. 2016). Ninety-eight shovel tests in the floodplain expansion and sedimentation basin area were located within the boundaries of the artifact concentration designated as the Gorge Creek Site 1. Based on the Phase I data, the extent of the Gorge Creek Site 1 was estimated at approximately 6.1 acres. Fifty-eight of the 98 tests contained prehistoric artifacts. In total, 183 artifacts were recovered from the shovel tests. A feature (Feature 1) was identified in Transect 11, Shovel Test 1.

Most of the artifacts (n=136; 74 percent) were found in the plowzone (Ap horizon), 28 artifacts (15 percent) were found in B soils, and 19 artifacts (10 percent) were found in Feature 1. The shovel tests revealed an Ap-B soil sequence within the site and across the entire area of the proposed floodplain expansion and sedimentation basin. The plowzone consisted of dark brown (10YR 3/3) gravelly silt loam that extended to a maximum depth of 40 centimeters below ground surface (bgs). The underlying B horizon soils were dark yellowish brown (10YR 4/4–4/6) gravelly silt loam or silt loam. In several shovel tests a B/C horizon, consisting of dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand, was encountered below the B soil.

The artifact assemblage recovered by Phase I testing consisted of 183 artifacts: four bifaces, one endscraper, four retouched flakes, 21 utilized flakes, 10 cores (845.3 grams), 129 flakes, two cobble tools (199.0 grams), and 12 pieces of FCR (489.6 grams). The assemblage did not include any culturally/temporally diagnostic artifacts.

Feature 1 was identified in Transect 11, Shovel Test 1. Charcoal flecking was encountered at depths of 40 and 60 centimeters bgs within soils similar to the plowzone. Feature 1 contained 19 artifacts, including one retouched flake, three utilized flakes, 13 flakes, one core (113.7 grams), and one piece of FCR (20.1 grams). Because of limited exposure, the feature's size, type, and function could not be determined. The overlying plowzone in this shovel test yielded 11 artifacts, the greatest number found in the plowzone of any of the shovel tests at the site.

The Phase II field investigation was conducted August 23–September 9, 2016 (Gade and Schreyer 2016). It entailed excavation of 102 shovel tests and 16 1x1-meter test units. The shovel tests were spaced 10 meters apart and were arrayed along transects that were located parallel to or on selected Phase I transects. This procedure created transects spaced 7.5 meters apart across the site area. The subsequent placement of units was based on shovel test results and the character of the landform.

Consistent with the Phase I shovel tests, Phase II excavations documented an Ap-B soil sequence across much of the site. The plowzone (Ap) consisted of dark brown (10YR 3/3) gravelly silt loam and typically extended between 20 and 30 centimeters below the surface. B horizon soils were dark yellowish brown to yellowish brown (10YR 4/6-5/6) gravelly silt loam or silt loam. In several shovel tests a B/C horizon was encountered below the B soil; it was a dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand with dense cobbles. In low-lying terrain in the west section of the site, an unplowed remnant of the A horizon was encountered in several shovel tests along Transects 22 and 23, and also in Units 2, 3, 4 and 7. These excavations were located along the lower elevations of the terrace, within a noticeable swale. In these tests, the unplowed A soil lay directly below the plowzone; it was a dark yellowish brown (10YR 4/4-4/6) gravelly silt loam ranging in thickness from 10 to 18 centimeters.

Phase II excavations yielded a total of 1,264 artifacts: nine bifaces, two scrapers, two other chipped stone implements, 101 flake tools, 18 cores, 1,112 flakes, five cobble tools, and 15 pieces of FCR. Of the total, 394 artifacts were recovered from 70 positive shovel tests. The great majority of these (327) came from the plowzone; 56 artifacts were found in the B horizon, and 11 came from the unplowed A horizon soil. Another 870 artifacts were recovered from the 16 units.

Artifacts were found in all units, but the totals varied widely, ranging from 237 artifacts in Unit 2 to two artifacts in Unit 15. After Unit 2, Units 11 and 4 had the next highest artifact totals with 158 and 123, respectively. The remaining units all contained fewer than 100 artifacts; Units 6, 15, and 16 each yielded fewer than 10 artifacts. Sub-plowzone artifacts were found in all but three units (Units 9, 15, and 16). Units 2, 3, 4, and 7 were placed in the portion of the site where shovel tests had encountered unplowed A horizon soils under the plowzone. Combined, these four units yielded a total of 409 artifacts, accounting for almost half (47 percent) of all artifacts found in the 16 1x1-meter units. A total of 163 [175?] artifacts were recovered from the unplowed A horizon soils in these four units (mostly from Units 2 and 4), and 14 artifacts were found in their upper B horizon.

A few of the Phase I and II shovel tests were exceptional for their density of lithic artifacts: Shovel Tests 32:5 (n=29), 20:5 (n=38), 22:2 (n=27), and 11:1 (n=27). These unusual concentrations triggered the placement of Phase II units in the vicinities of these productive shovel tests. Those units generally confirmed patchy artifact concentrations near the most artifact-rich shovel tests. Units 2 (n=237) and 4 (n=123) were placed west of Shovel Test 22:2 and 11:1. Unit 1 (n=63) was located east of Shovel Test 22:2 and west of Shovel Test 22:1 (n=16). Unit 11 (n=158) was placed just west of Shovel Test 32:5. The concentrated patches seemed to be small and isolated. No unit was placed immediately adjacent to Shovel Test 20:5. Unit 16, located about 15 meters southwest of this most productive shovel test, yielded only four artifacts; Unit 13, about 20 meters southeast of Shovel Test 20:5, produced only 17 artifacts. There appeared to be a sharp jump in artifact density represented by shovel tests with more than about 12 artifacts. Phase II units placed near shovel tests with 11 or fewer artifacts generally produced relatively few artifacts: Unit 13, Unit 9 (n=22), Unit 10 (n=19), and Unit 12 (n=26). Some units located near shovel tests with three or fewer artifacts predictably yielded very few artifacts, such as Unit 6 (n=6) and Unit 15 (n=2); however, Units 5 (n=27) and 14 (n=33), although not very productive, contained more artifacts than would be expected from the very low yields of the nearest shovel tests.

The only feature identified in Phase II was Feature 2. This pit feature was first identified in a Phase II shovel test (Shovel Test 22:2) and was further exposed by excavation of Unit 1. The feature became evident at the base of the plowzone, at a depth of 30 centimeters bgs, as a soil stain of reddened (thermally altered) earth with charcoal. It extended into the north and east walls of the unit. Roughly rectangular in shape, Feature 2 measured 70x55 centimeters. A concentration of burned earth measuring 55x23 centimeters was located along the unit's east wall. In profile the feature exhibited relatively straight walls and a flat bottom, and it extended 23 centimeters into the B horizon. The feature matrix consisted of mottled dark yellowish brown (10YR 4/6) and strong brown (7.5YR 4/6) silt loam. A total of seven artifacts were recovered from the feature, consisting of five flakes and two pieces of FCR weighing 62.1 grams.

Apart from the artifacts found in Feature 2, 68 additional artifacts were recovered from Unit 1. This unit did not have an unplowed A horizon soil; the plowzone lay directly atop the B horizon. Sixty-two artifacts were recovered from the plowzone and six artifacts were found in the B horizon.

Unit 11 had the second highest number of artifacts at the site with a total of 158: 131 artifacts from the plowzone and 27 artifacts from the B horizon. This unit was located in the northeast part of the site near Gorge Creek and on a relatively higher elevation of the terrace. Unit 8, located about 30 meters upslope from and east of Unit 11, contained 72 artifacts: 65 from the plowzone and seven from the B horizon.

In shovel tests and units together, 943 artifacts, or 74.6 percent of the total assemblage, were recovered from the plowzone. One hundred seventy-five artifacts (13.8 percent) came from intact A horizon soils below the plowzone, and 139 artifacts (11.0 percent) were found in B soils. The remaining seven artifacts were recovered from Feature 2.

The basal portion of a stemmed point typed as a Lamoka was recovered from the plowzone of Unit 13. An untypable basal fragment of another, side-notched point came from the plowzone of Unit 11. The Lamoka-like point suggests a Late Archaic presence at the site. A pre-Woodland date (older than 3000 rcbp) is also suggested by the apparent absence of pottery.

Gade and Schreyer examined artifacts found on the plowed surface of the site by Tom Anderson, a local collector. They recognized in his collection several Late Archaic Lamoka and Snook Kill points, as well as Orient Fishtail points. They also noted a basal fragment of what seemed to be a Turkey Tail point. Their photograph of the collection also seems to include two triangles, which could date to the Late Woodland or alternatively to the Middle or early Late Archaic. A side-notched point in the same photograph could be a Meadowood or Brewerton.

Anderson showed Gade and Schreyer a map he had drawn showing artifact locations and the relative distribution of Lamoka and Orient Fishtail points on the terrace. According to the map, he found Lamoka and stemmed points in an area southeast and outside the Gorge Creek project area. Anderson collected Oriental Fishtail points in the northeast portion of Gorge Creek Site 1 where the east portions of Phase I Transect 1 and Phase II Transect 20 were located.

If one combines the Phase I (n=183) and Phase II (n=1264) artifacts, the total assemblage from the Gorge Creek Site 1 numbers 1,447 prehistoric artifacts. All of these are lithics; no pottery has been recovered. The paucity of projectile points is clearly attributable to previous surface collection.

The variety of tool types recognized in the Phase I and II assemblages suggests that multiple and varied activities occurred at the site. Many expedient flake tools with flaking or wear on one or several edges were found across the site. Gade and Schreyer (2016) noted that only 15 pieces of FCR were found in the Phase II excavations. It is unlikely that collectors would have removed any FCR, so this rarity is probably representative of the actual low frequency of FCR on the site. Their near-absence may indicate that few long-term hearths were created during occupations. This could imply that cooking was rarely undertaken, or that the site was mainly inhabited in the summer, when the warmth of fires was not needed. Despite the absence of preserved bone or macrobotanical remains, Gade and Schreyer suggest that the inhabitants procured and processed plant and animal resources. They interpret the Gorge Creek Site 1 as a composite of short-term camps and seasonal occupations that occurred throughout the Late Archaic period. They also note the likelihood that the site extends beyond the APE boundary and that artifacts may be present elsewhere on the terrace outside the APE as well as on the other side of Gorge Creek.

Historic-era agriculture severely affected the integrity of the prehistoric cultural deposits at Gorge Creek Site 1. The great majority of the artifacts were recovered from the plowzone (74 percent in Phase I, 74.6 percent in Phase II). However, artifacts also were recovered from the upper B horizon soils, usually within the first 10 centimeters (about 11 percent of the Phase II assemblage). Additional analysis (e.g., of the relative sizes of flakes in the A vs. B horizons) would be necessary to determine if the artifacts in the lower zone are *in situ* or have been redeposited from the plowzone due to cryo- or bioturbation. In several shovel tests and Units 2, 3, 4, and 7, artifacts were found in a distinct stratum intervening between the plowzone and the B horizon. Gade and Schreyer designated this stratum as an unplowed A horizon that contained *in situ* archaeological deposits. They did not reconstruct the depositional processes that formed this horizon. Does it represent overbanking of the stream, or incorporation of organic detritus from the prehistoric campsites, or an old plowzone? Whatever its origin, on the basis of Phase II data, Gade and Schreyer estimated that this unplowed A horizon extends over an area of about 760 square meters of the terrace. Thirteen percent (n=175) of all Phase II artifacts came from the unplowed A horizon in this part of the site.

Gade and Schreyer (2016:12) recommended Gorge Creek Site 1 as eligible for the National Register of Historic Places under Criterion D (i.e., it has yielded, or may be likely to yield, information important in prehistory or history). They emphasized the presence of artifacts in the unplowed A horizon soils and in the upper B horizon soils as well as the recognition of a pit feature. The latter raised the possibility that other features may be present. “Specifically, the site provides an opportunity to examine and expand our knowledge regarding settlement, subsistence and community patterning of Late Archaic period occupations along Gorge Creek, a small tributary in the Schoharie Creek valley” (Gade and Schreyer 2016:12).

III. Research Design

A. Feasible Research Issues

Phase I and II investigations exposed only a small percentage of the Gorge Creek Site 1, but they were sufficient to perceive the general character of the site. An absence of pottery indicates that the occupations were Archaic. Lithic debitage was fairly abundant, but diagnostic projectile points were very rare. Formal tools were also rare, but flakes reportedly were used frequently as expedient tools. Almost all of the debitage came from the plowzone, making it impossible to distinguish successive occupation episodes by their vertical relationships. It was reported, however, that Orient fishtail points had been collected from the surface mainly in the northeast sector of the field. No calcined bones or carbonized botanical remains were recovered. Two "features" were encountered below the plowzone, but based on the brief descriptions and minimal analyses, it is unclear if the excavators determined these to be either anthropogenic or of prehistoric age. In one area of the site, a stratum was recognized below the plowzone that was reported as possibly a buried A horizon, although its process of formation was not explicated.

Gade and Schreyer (2016:12) suggested that these research topics could be addressed by additional recovery of cultural deposits from the Gorge Creek Site 1:

1. Settlement System/Site Function
2. Subsistence Patterns
3. Community Pattern
4. Cultural History

In view of the data available from the previous investigations, however, it appeared unlikely that subsistence patterns and community patterns could be addressed. Given the absence of any organic remains (apart from charcoal flecks), subsistence patterns could not be studied directly. Nevertheless, analysis of wear traces on utilized flakes could possibly indicate whether predominantly plants (e.g., grasses, wood) or animal materials (bone, meat, hides) were being processed on-site.

It would also be difficult to retrieve any information about "community pattern." It was not impossible that Archaic postmold patterns might be revealed. Woodland-age postmolds have been exposed at other sites along Schoharie Creek (Rafferty et al. 2014; Ritchie and Funk 1973; Rieth 2008, 2012); however, such traces of older Archaic dwellings are very infrequently encountered. Nothing found in previous investigations of the Gorge Creek Site 1 suggested that postmolds would be present. Lacking clear evidence of the locations of residential households, little can be said about the community's spatial organization.

Given the probability that Phase III excavations would recover mainly additional debitage, perhaps more temporally diagnostic projectile points, and possibly a few sub-plowzone features with datable charcoal, the Phase III research design focused on issues of (1) "cultural history" (chronology) and (2) site function as inferred from aspects of lithic technology.

B. Chronology

Basically, there are two ways to construct a chronology for this site. One is to assemble a substantial collection of projectile points. Based on their distinctive basal morphology and radiocarbon-dated associations at numerous sites, these artifacts can be assigned to temporal spans of approximately 500 to 1,500 years. The relative numbers of points of each type may be used as an index of the frequency/intensity of site use during each period.

A complementary or alternative strategy for establishing the site's chronology is to recover organic material from hearths or pit features, which can be sampled for dating by radiocarbon assays. This was the primary rationale for targeting most of the data recovery effort at the portion of the site where features were most likely to be encountered. Features could also yield material such as charred nut shells, seeds, and calcined bones that would be useful for reconstruction of subsistence and environment. Additionally, charred nuts and seeds are the preferred samples for radiocarbon dating because the “old wood effect” is minimized. A piece of wood may be burned in a hearth many years after the tree’s death, and radiocarbon dating establishes the time of death (after which atmospheric carbon dioxide was no longer absorbed), not the time of burning. In contrast, nuts and seeds are likely to have been burned very soon after they were harvested.

Recovery of datable charcoal from features in the central and northeast sectors of the site might provide samples for several accelerator mass spectroscopy) (AMS) radiocarbon assays. Many of the extant radiocarbon dates that underpin regional chronology predate introduction of the AMS technology in the late 1980s. AMS dates are much more precise and often more accurate than the older assays. An example of the improved chronological resolution provided by AMS is the recent re-dating of the Terminal Archaic and Late Woodland components at the Little Wood Creek Site in Fort Edward (Grossman et al. 2015).

In principle, the most frequent and intensive occupations of a site should leave behind both the greatest numbers of artifacts, including typologically diagnostic specimens, and also the greatest numbers of features and organic detritus suitable for radiocarbon dating. However, because site function changes over time, and preservation and sampling techniques are not exact, these kinds of evidence may not coincide precisely. An example of such incongruity can be seen at the Pethick Site. Of the 81 typable points, only two (2.5 per cent) (a Perkiomen and a Susquehanna Broad) can be attributed to the portion of the Terminal Archaic between ca. 4000 and 3600 cal BP. However, two (20 percent) of the 10 radiocarbon dates reported for the site fall within this period. On the other hand, 27 (33 percent) of the 81 identified points from Pethick are Meadowood, and similarly three (30 percent) of the 10 dates are appropriate for the Meadowood phase (2510±40, 2640±60, and 2670±110 rcbp). For comparison, it may be noted that Funk (1993a:299–307) reported a fairly close correspondence of the relative frequencies of projectile point types and components of each period, both in the Upper Susquehanna Valley and the Hudson Valley; however, in both regions Late Archaic points (Sylvan Stemmed in the Hudson Valley, Vestal in the Upper Susquehanna Valley) were over-represented relative to the numbers of components of these phases.

The only typable artifact recovered in previous investigations at the Gorge Creek Site 1 was the basal portion of a Lamoka-like point; however, the points collected in this vicinity by local amateur Tom Anderson include Lamoka-like points, Snook Kill, Dry Brook, Orient Fishtail, a possible Turkey Tail, and a few side-notched (Meadowood or Brewerton) points. This evidence suggests that the site was occupied intermittently between ca. 5500 and 2500 cal BP. A few triangles in Anderson’s collection might indicate either a discrete Late Woodland presence or another Middle or early Late Archaic occupation. The preponderance of Orient and Dry Brook fishtail points in the collection suggested that the site was occupied most intensively around 3500 to 3200 cal BP.

The likely presence of an Orient Fishtail component at the Gorge Creek Site 1 offered an opportunity to address a research issue that has been raised by recent work at the Pethick Site. Rafferty et al. (2014) suggest that this site, and others along Schoharie Creek, were located at the boundary between contemporaneous, distinct cultural zones: Orient Fishtail to the east and Meadowood to the west. They do not explicitly address the obvious question of whether those zones, defined by sharply distinct projectile point styles, represent discrete ethnic, linguistic, or political entities. Nevertheless, “We argue that the Pethick site was occupied by populations exhibiting Early Woodland and Transitional tool kits not sequentially, but consecutively (i.e., two populations alternatively occupying the site over time) and perhaps simultaneously” (Rafferty et al. 2014:184).

Orient Fishtail, clearly derived from the preceding aceramic Terminal Archaic or Transitional Savannah River/Snook Kill/Susquehanna/Perkiomen tradition, is generally regarded as the final expression of this tradition. The temporal division between Terminal Archaic (without pottery) and Early Woodland (with pottery) has generally been set at 3000 rcbp (3200 cal BP). Most Orient-associated radiocarbon dates fall on the early side of the boundary, beginning about 3200 rcbp (3400 cal BP) (Fiedel 1988), although a few dates are as late as ca. 2800 rcbp (2900 cal BP) (albeit with large standard errors). Orient Fishtail points are associated with carved soapstone vessels but also, rarely, with soapstone-tempered clay pots. Meadowood points are often associated with Vinette I pottery and therefore are assigned unambiguously to the Early Woodland. Radiocarbon dates for Meadowood generally fall between ca. 2900 and 2400 rcbp (3000 and 2500 cal BP); an anomalously early outlier from the Fortin Site on the Upper Susquehanna is 3180±95 (ca. 3300 to 3500 cal BP). Meadowood points seem to have developed from the small, notched points (e.g., Hind) that are found in southern Ontario and the northern Midwest between ca. 3500 and 2800 rcbp.

No credible Orient-associated dates are later than ca. 2750 rcbp (2850 cal BP or 880 cal BC). The end of the Terminal Archaic tradition thus appears temporally and perhaps causally associated with an abrupt climate event.

Numerous environmental records in Europe indicate a climatic downturn around 800 to 750 cal BC, which coincides with a radiocarbon "cliff" indicating weakened solar activity. Atmospheric ^{14}C increases and dates drop abruptly from 2750 to 2450 rcbp (Fiedel 2001; Martin-Puertas et al. 2012; Van Geel and Mauquoy 2010). The "cliff" is followed by a plateau; between 2750 and 2400 cal BP, radiocarbon dates are indistinguishable, always ca. 2450 rcbp. Martin-Puertas et al. (2012) have recently shown that a simultaneous sharp increase in windiness and increase in cosmogenic beryllium (^{10}Be) occurred at ca. 2760 cal BP in central Europe; they infer that "changes in atmospheric circulation amplified the solar signal and caused abrupt climate change about 2800 years ago, coincident with a grand solar minimum." This climate change is coincident with Bond event 2 in the North Atlantic, and a probably associated climate episode shows up very strongly in the strontium/calcium ratios from Buckeye Creek Cave in West Virginia (Springer et al. 2008: figure 1).

Shuman et al. (2009) infer numerous prehistoric episodes of regional drought from the occurrence of sand layers attributed to lowered water levels in New Long Pond, Massachusetts. Among these is a drought dated to ca. 2980 to 2760 cal BP. Newby et al. (2011) report a similar drought record from Davis Pond. Low water levels are inferred for most of the period from 3500 to 2300 cal BP. Pollen sampled from Ballston Lake, located between Saratoga and Schenectady, shows an increase of conifers, hardwoods, and boreal taxa at about 2680 cal BP (2520 rcbp); this is interpreted as marking a shift to a colder climate (Toney et al. 2003). Very close to the Gorge Creek Site 1, Van Nest (2004) ran a transect of cores across the floodplain of Schoharie Creek west of Middleburgh, and two radiocarbon dates from the lowest strata show that the Holocene alluvial deposits there are no older than ca. 2700 rcbp (see Chapter II.B). This evidence suggests that a change in the creek's sediment load and overbanking behavior coincides with the ca. 800 cal BC climate event.

C. Site Function: Inferences from Lithic Technology

The uniformity of raw material, the lack of stratigraphic separation, and the ubiquity of utilized flake tools across the site combined to create a probably erroneous impression of the unchanging function of the Gorge Creek Site 1 through time, However, Anderson's collection suggested at least three discrete occupation episodes, each separated by centuries from the next: Lamoka (ca. 5500 to 5000 cal BP); Snook Kill (ca. 4200 to 3800 cal BP) and Dry Brook-Orient (ca. 3500 to 2900 cal BP). Both earlier (Brewerton or Middle Archaic) and later (Meadowood and Late Woodland) occupations might also be present. It would be surprising if the site were used in exactly the same way in each of these episodes, particularly as a cultural discontinuity probably occurred between the Lamoka and Snook Kill horizons. On the other hand, if the resources available in this location did not change significantly in the course of millennia, the basic processing tasks that entailed the use of many expedient flake tools may have varied little from one occupation episode to the next.

It is doubtful whether the entire site would have been occupied during any single occupation episode. The possibility of isolating a Terminal Archaic camp was raised by Anderson's observation that Orient Fishtail points were concentrated in the northeast sector of the site.

Previous investigations indicated the existence of several discrete clusters of high-density debitage across the site. Louis Berger investigators anticipated that wider exposure of these areas by manual excavation and mechanized stripping might clarify their character. Are they simply patches where historic-era plowing was less intense, so that artifacts were less dispersed than elsewhere? Alternatively, do they represent the remnants of discrete lithic reduction/processing areas? In that case do the separate clusters represent distinctive lithic reduction strategies? If so, can these strategies be tied to particular cultural phases? To do so, it would be helpful to tie any perceptible artifact concentrations to closely associated sub-plowzone features dated by radiocarbon and/or typological dating of their artifact contents.

The uniformity of the lithic materials used at the site (almost all locally available Onondaga chert, with just a few pieces of Esopus chert), indicated that any toolstones that may have been procured elsewhere during other seasonal phases of the settlement round were not transported here. Similarly, the apparent absence of exotic toolstones suggested that interactions with neighboring societies, or with more distant groups, were not manifested in the exchange of lithics. The uniformity of lithics at the Gorge Creek Site 1 also makes it more difficult to tease out assemblages attributable to distinct Archaic sub-periods because such culturally diagnostic exotic materials as jasper, rhyolite, Ramah chert, or Flint Ridge chert are not present. Curiously, the absence of exotic lithics at this site contrasts with the nearby (about 11 kilometers [7 miles] to the north) Schoharie Creek II Site, where, in addition to Eastern Onondaga chert, the Early Woodland component included debitage of chalcedony, Pennsylvania jasper, Kalkburg, and Normanskill chert (Rieth 2008, 2012).

Nevertheless, some insights into regional settlement patterns may be possible by comparing the Gorge Creek Site 1 assemblage with those recovered from Schoharie Creek II (Rieth 2012) and the nearby Pethick sites (Rafferty et al. 2014). A cursory comparison reveals that the Gorge Creek Site 1 chipped stone assemblage from Phase II (n=1,244) has a much lower proportion of shatter and broken flakes (n=247; 19 percent) than Schoharie Creek II, where these constitute about 64 percent of the lithics (22,772 out of a total of 35,837). At the Pethick Site an even greater percentage of the lithics is classified as shatter (177,889 of a total 188,406, or about 94 percent) (Rafferty et al. 2104:186). At the Gorge Creek Site 1, a much higher proportion of flakes were utilized (n=101; 8 percent of all lithics) than at Schoharie Creek II, where only 383 flakes had use wear (a little more than 1 percent of the lithic assemblage). Only 723 utilized flakes (less than 0.5 percent of total lithics) have been recognized at the Pethick Site.

At Schoharie Creek II, projectile points represented a remarkably small proportion of the total lithic assemblage; only nine points were found. Many more points have been recovered from the Pethick Site; the 180 points include 33 Levanna, 27 Meadowood, six Orient, five Adena, four Brewerton, two Madison, two Jack's Reef, one Perkiomen, one Susquehanna, and 99 unidentifiable points (Rafferty et al. 2014:186). Although only two points were found in the excavations at the Gorge Creek Site 1, many more were collected from the surface by Anderson. It is noteworthy that one of the few typable points from Schoharie Creek II is an Orient Fishtail, another appears to be a Dry Brook Fishtail, and a third is a Meadowood. The Terminal Archaic fishtail types are well represented in Anderson's surface collection from the Gorge Creek Site 1. Of course, the differing scales of the total assemblages may be affecting these comparisons. One of the rationales for additional excavation at the Gorge Creek Site 1 was to obtain a larger artifact sample, which might clarify whether these ostensible inter-site differences are real or only a statistical result of small sample size.

It is possible that the ostensible high frequency of utilized flakes at the Gorge Creek Site 1 may be a culturally diagnostic trait. Kraft (1970:9) reported his recovery of nearly three dozen utilized flakes from the Orient Fishtail component of the Miller Field Site in northern New Jersey. These were mainly of a specialized form with convex or concave edges. Kraft also reported utilized flakes from the slightly older Broadspear component of the site; such tools had not previously been recognized in Terminal Archaic assemblages. It would be necessary to closely examine utilized flakes from the Phase III excavations to determine if (1) the edge wear was really caused by prehistoric use or by plow damage or other post-depositional processes; and (2) if there is any morphological consistency that might indicate a cultural template similar to the specialized Orient forms from Miller Field.

IV. Archaeological Methods and Techniques

A. Fieldwork

In the data recovery plan (attached as Appendix B) Louis Berger proposed Phase III data recovery procedures that would address the research issues described in Chapter III by means of two complementary strategies: (1) manual excavations in the locations where previous research indicated the highest densities of artifacts and features, and (2) mechanical stripping of areas with lower artifact densities to identify features at the plowzone/B horizon interface.

The placement of individual test unit excavations addressed two specific archaeological objectives. First, the excavations were located to recover sufficient quantities of artifacts needed to address the research issues. Second, areas were exposed to identify additional features and discrete or clustered activity areas, such as those focused around prehistoric hearths or storage pits. If features were exposed, flotation samples would be taken for attempted recovery of the faunal and floral remains needed for radiocarbon dating and inference of prehistoric subsistence practices and seasonality.

Louis Berger manually excavated 36 square meters (388 square feet) arrayed in four blocks of nine units each. The placement of these excavation blocks was determined primarily by the quantities of artifacts reported from the Phase I and Phase II shovel tests and units. During manual excavation, all soil horizons were removed using shovels and trowels. The excavation of block units began with removal of the plowzone, about 20 to 30 centimeters deep. The buried A horizon and B horizon were then excavated by 10-centimeter intervals within natural/cultural horizons. All soils were screened through 0.25-inch hardware cloth. The locations of diagnostics identified *in situ* were recorded with three-dimensional coordinates.

The Phase III data recovery anticipated discovery of a few features. Any cultural features encountered would be numbered, photographed, and mapped; they would then be bisected and profiled. A sample for flotation from each feature would be taken, consisting of up to approximately half of the feature. This general sample size might be adjusted in cases where the features were larger. Charcoal or other carbonized materials present in feature fill would be sampled for radiocarbon assay. In fact, however, only a few non-cultural soil anomalies were encountered below the plowzone.

Field observations and excavation data were recorded on standardized forms developed by Louis Berger. Excavated soils were recorded and described in terms of both texture and color, using USDA soil classifications and Munsell charts. Digital photographs of the site area and excavations were taken as appropriate. All excavations were backfilled upon completion, and all safety regulations were strictly followed during the investigations.

Following manual excavations, a straight-bladed backhoe was used to mechanically strip off the 30-centimeter plowzone from selected portions of the site in an effort to identify features at the plowzone-subsoil interface. Louis Berger estimated that approximately 3,700 square meters (40,000 square feet) would be stripped. In actuality, 3,691 square meters (39,730 square feet) were stripped from 12 areas.

Louis Berger archaeologists monitored the mechanical stripping operations at all times, examining the stripped surface for soil anomalies and guiding the depth of excavations. Once the interface potentially containing cultural deposits and features had been exposed by the machine, archaeologists hand-skimmed the remnant overburden and examined the surface for prehistoric cultural features, rock and artifact clusters, and soil anomalies. All soil stains identified during this process were pin-flagged for further review to determine their cultural vs. natural status. A number designation was assigned to each potential cultural feature. All numbered potential features were mapped using global positioning system (GPS) technology, and where multiple features were identified, digital photographs were taken of the feature clusters.

B. Artifact Analysis

At the conclusion of the field investigations, all recovered materials were transported to Louis Berger's laboratory where artifact analysis was undertaken.

Specific laboratory tasks for preliminary treatment of cultural materials included the following.

- All recovered materials were cleaned and conserved to ensure their stability. Prehistoric bifaces, flake tools, utilized flakes, and other artifacts that might be examined for edge-wear traces were minimally processed pending appropriate analysis.

- All materials were fully provenienced and labeled. The artifacts were prepared for permanent curation.

- To the extent possible, all recovered lithic artifacts were identified as to cultural and temporal affiliation, raw material type, and formal and functional categories.

As discussed in Chapter III, the research orientation of the data recovery focused on the site's chronology, cultural affiliations, and definition of site function(s) in the regional settlement systems of several periods. Laboratory classification and analyses of artifacts were oriented toward these research issues.

As a first step in analysis of the lithic artifacts, they were sorted into tool and debitage classes. Following this, they were sorted and analyzed with respect to functional morphology, technological stages, and metrical and other attributes (e.g., color, texture and inferred source of the stone).

Projectile points were assigned to recognized regional types. This classification is crucial for establishing the chronology of the site as a whole, and possibly for distinguishing sectors occupied by distinct social groups, whether sequentially or simultaneously. Breakage patterns, edge and tip wear, and re-working were noted. Other formed tools were classified as end- or sidescrapers, knives, drills, or other functional classes based on a combination of morphology and any observed use wear or breakage.

A major goal of the analyses of debitage, cores, and incomplete bifaces was to determine the intensity, stages, and distinctive strategies of lithic reduction activities at the site. For the bifaces the presence/absence of cortical surfaces and width-to-thickness ratios indicated stage of reduction. For cores the size, shape, extent of cortex, and flaking patterns were recorded.

Lithic debitage, including all types of flakes created in the lithic reduction sequence, was counted and measured. Raw material type, lithic reduction stage (blocky shatter, decortication, early stage, biface reduction, thinning) and presence/absence of cortex were also recorded. Whole and broken flakes (lacking the original striking platform or termination) were distinguished.

Based on reported Phase I and II data, the Gorge Creek Site 1 lithic assemblage appeared to contain an unusually high percentage of utilized flakes. To confirm or refute this finding, which has important implications for the site's function and role in the regional settlement system, it was necessary to devote special attention to this artifact class. All debitage was visually inspected for patterned edge damage and/or retouching. A sample of those artifacts with ostensible edge alteration were examined using low-power microscopy to identify micro-flake scars, snap fractures, step fractures, and edge rounding.

The Phase I and II investigations found no ceramic sherds; nevertheless, given the presence of a likely Meadowood point and a few triangles in Anderson's surface collection, Woodland occupations appeared to be present, so finding potsherds was considered possible. Although the laboratory had procedures in place for ceramic analysis, the Phase III excavations recovered no sherds. The laboratory was also prepared to process samples of carbonized material from features; however, no cultural features were identified.

Following analyses of the lithic artifacts, a spatial analysis focused on horizontal variation in the distributions of lithic tool types and debitage. Of particular interest were any perceptible differences between the northeast sector of the site, putatively dominated by Orient phase materials based on a surface collection, and the central sector. The data for each block were also compared to data from other assemblages from the Schoharie Creek drainage, the mid-Hudson, and western New York.

V. Fieldwork Results

A. Block Excavations

Louis Berger began the data recovery excavations on April 26, 2017. The first stage was manual excavation of four blocks, each consisting of nine 1x1-meter units, for a total of 36 square meters (388 square feet) (Photograph 1). The placement of excavation blocks and units was determined primarily by the quantities of artifacts reported from the Phase I and Phase II shovel tests and units (Figure 2). Manual block excavation concluded on June 7, 2017.

Block 1 (Units 1-9) was located between Phase II units 2 and 4. Block 2 (Units 10–18) was placed south of Phase II Unit 11. Block 3 (Units 19–27) was located just north of Shovel Test 28-2, which had produced 16 lithic artifacts. Block 4 (Units 28–36) was placed to the west of Shovel Test 20-5, which had yielded 38 pieces of debitage.

1. Block 1

A total of 1,322 artifacts were recovered from Block 1. The greatest number (n=196) came from Unit 8; Unit 4 was the least productive (n=83) (Table 1).

TABLE 1

LITHIC ARTIFACTS RECOVERED FROM BLOCK 1, GORGE CREEK SITE 1 DATA RECOVERY

UNIT	UTILIZED FLAKE/ FLAKE TOOLS	FINISHING FLAKES	BIFACE REDUCTION FLAKES	FLAKE FRAGMENTS	DECORTICATION FLAKES	IRREGULAR/ SHATTER	CORES	TOTAL
1		4	61	38		16		119
2			55	68		19		142
3	1		85	74		20		180
4	2		39	28		14		83
5		1	91	17		18		127
6		1	88	32	1	58		180
7			89	15	1	16		121
8		1	80	70		45		196
9			75	77	2	19	1	174
All	3	7	663	419	4	225	1	1322

Thirty-six artifacts (a little less than 3 percent of the total) came from Stratum B. These undoubtedly represent downwards drift from the plowzone (Stratum A).

Stratum A was an Ap horizon that consisted of a dark brown (10YR 3/3) silt loam that terminated between 25 and 39 centimeters (0.82 and 1.28 feet) bgs. This overlaid a yellowish brown (10YR 5/6) sandy loam subsoil that was excavated at least 10 centimeters (0.33 foot) below the plowzone. Rock content was significantly greater in the subsoil compared to the plowzone (Figure 3; Photograph 2).

2. Block 2

A total of 525 artifacts were recovered from Block 2. The greatest number (n=82) came from Unit 12, and the lowest number (n=48) came from Unit 18 (Table 2). Fifteen chert chunks were collected during excavation but were discarded as non-cultural upon later examination in the laboratory.

PHOTOGRAPH 1: Block Excavation, View East

PHOTOGRAPH 2: Plan View of Block 1, View North

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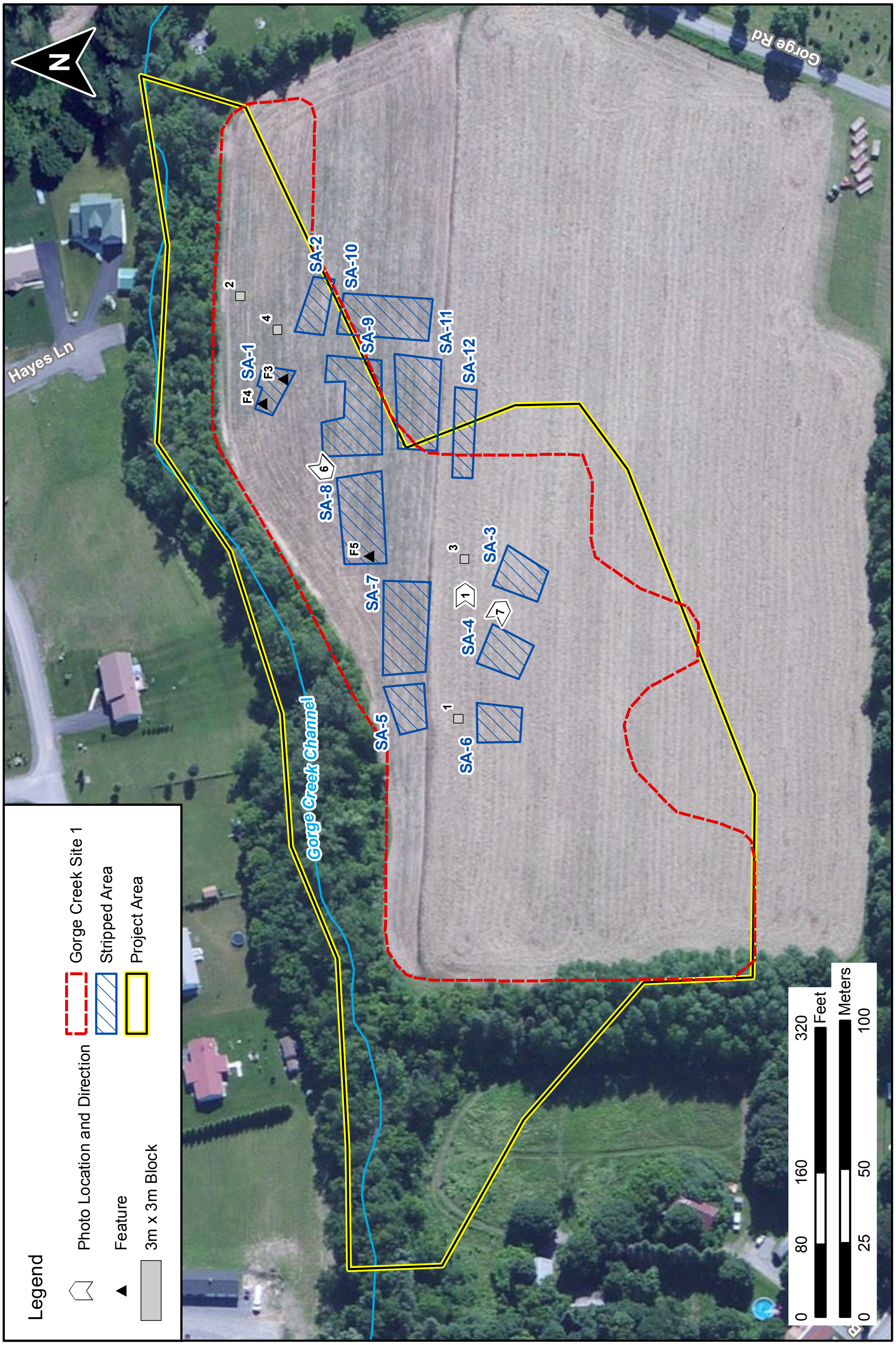


FIGURE 2: Locations of Phase III Block Excavations and Mechanically Stripped Areas (ESRI World Imagery 2015)

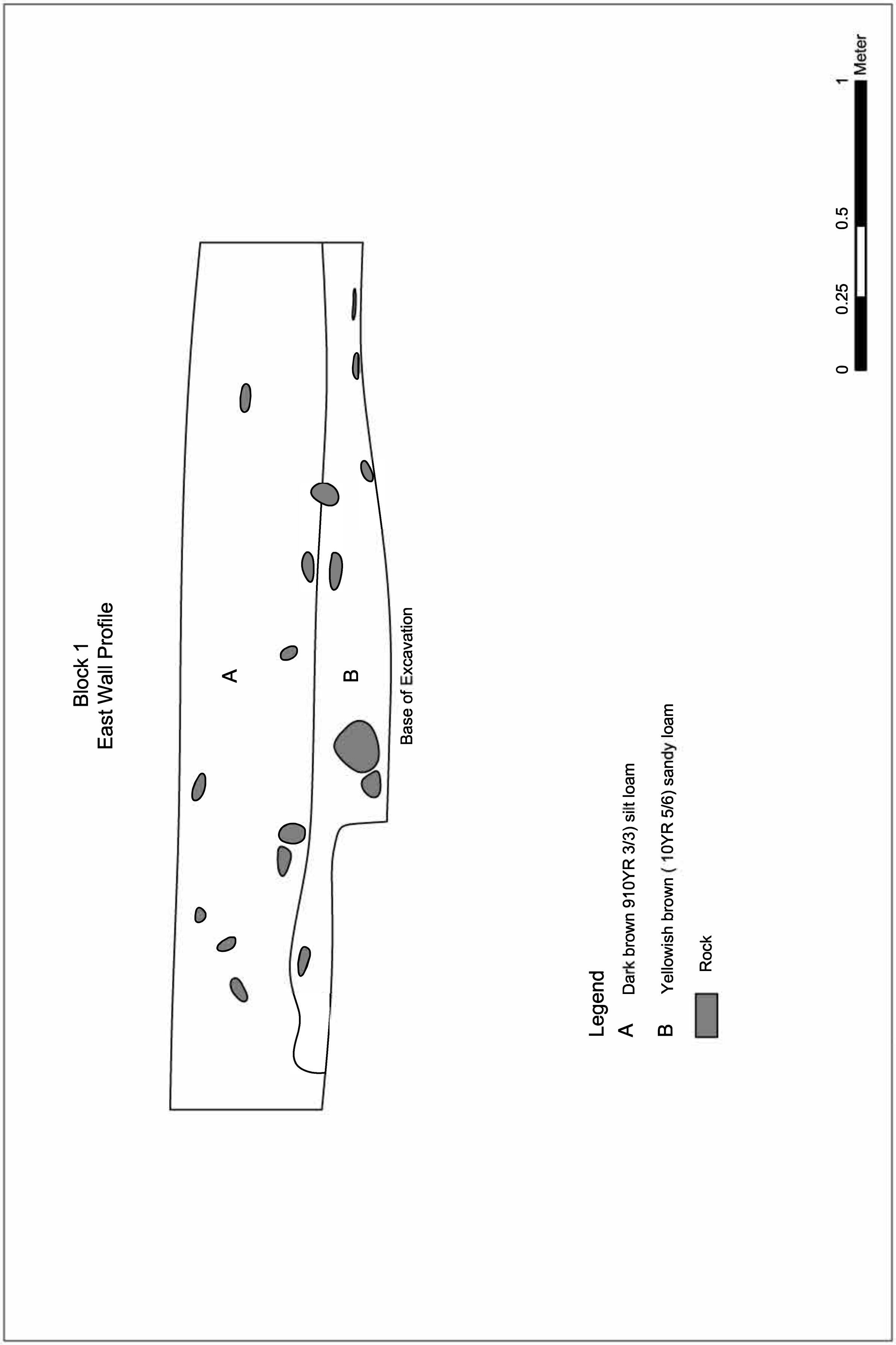


FIGURE 3: Stratigraphic Profile of East Wall, Block 1

TABLE 2

LITHIC ARTIFACTS RECOVERED FROM BLOCK 2, GORGE CREEK SITE 1 DATA RECOVERY

UNIT	BIFACES/ TOOLS	FINISHING FLAKES	BIFACE REDUCTION FLAKES	EARLY FLAKES	FLAKE FRAGMENTS	DE-CORT.	IRREGULAR /SHATTER	CORES	TOTAL
10			27		19		4		50
11	3		41		19				63
12	1	1	53	5	4		17	1	82
13			29			1	1		31[+11]
14			39	1	4		11		55
15	1		51		6		19		77[+4]
16			42		2		18		62
17			34				23		57
18			31		8		9		48
All	5	1	347	6	62	1	102	1	525[+15]

Fifty-nine artifacts (11 percent of the total) were recovered from uppermost Stratum B. These are interpreted as the result of downward drift from the plowzone and have not been distinguished in analyses.

Stratum A consisted of a dark brown (10YR 3/3) silt loam Ap horizon with 1 to 5 percent subrounded to subangular cobbles. The depth of the plowzone ranged from 25 to 41 centimeters (0.82 to 1.35 feet) bgs. Stratum B consisted of a fine-grained olive brown (2.5Y 4/4) sandy loam. This was primarily located along the north and east portions of the block. The west and south portions of the block contained a brown (10YR 4/3) gravel intrusion consisting of loose granules and pebbles (Figure 4; Photograph 3).

3. Block 3

A total of 412 artifacts were recovered from Block 3. The greatest number (n=64) came from Unit 21; nearly as many (n=63) were found in Unit 23. The lowest number (n=25) came from Unit 19 (Table 3). Twenty-eight chert chunks were collected during excavation but were discarded as non-cultural upon later examination in the laboratory. The basal portion of a Brewerton Corner-notched point was found at the base of the lower plowzone (Stratum B) of Unit 21 in the northeast part of the block.

The stratigraphy of Block 3 was more complex than that of the other blocks. The plowzone contained an upper and a lower division (Strata A and B). About half of the artifacts came from the lower plowzone (Stratum B) or from the underlying Stratum C. The stratigraphic distinction does not appear to be temporally meaningful and therefore the artifacts were not separated for analytical purposes.

Stratum A consisted of a brown (10YR 4/3) rocky silt loam, terminating between 31 and 39 centimeters (1.02 to 1.28 feet) bgs. This overlaid Stratum B, a dark brown (10YR 3/3) rocky silt loam. Stratum B extended for two levels in the north two thirds of the block and only one level in the south third. Beneath Stratum B was Stratum C, a yellowish brown (10YR 5/6) silt loam with 15 to 20 percent pebbles and cobbles also extending for two levels in thenorth two thirds of the block (Figure 5; Photograph 4).

4. Block 4

A total of 817 artifacts were recovered from Block 4. The greatest number (n=162) came from Unit 28; the lowest number (n=28) came from Unit 31 (Table 4). One chert chunk was collected during excavation but was discarded as non-cultural upon later examination in the laboratory.

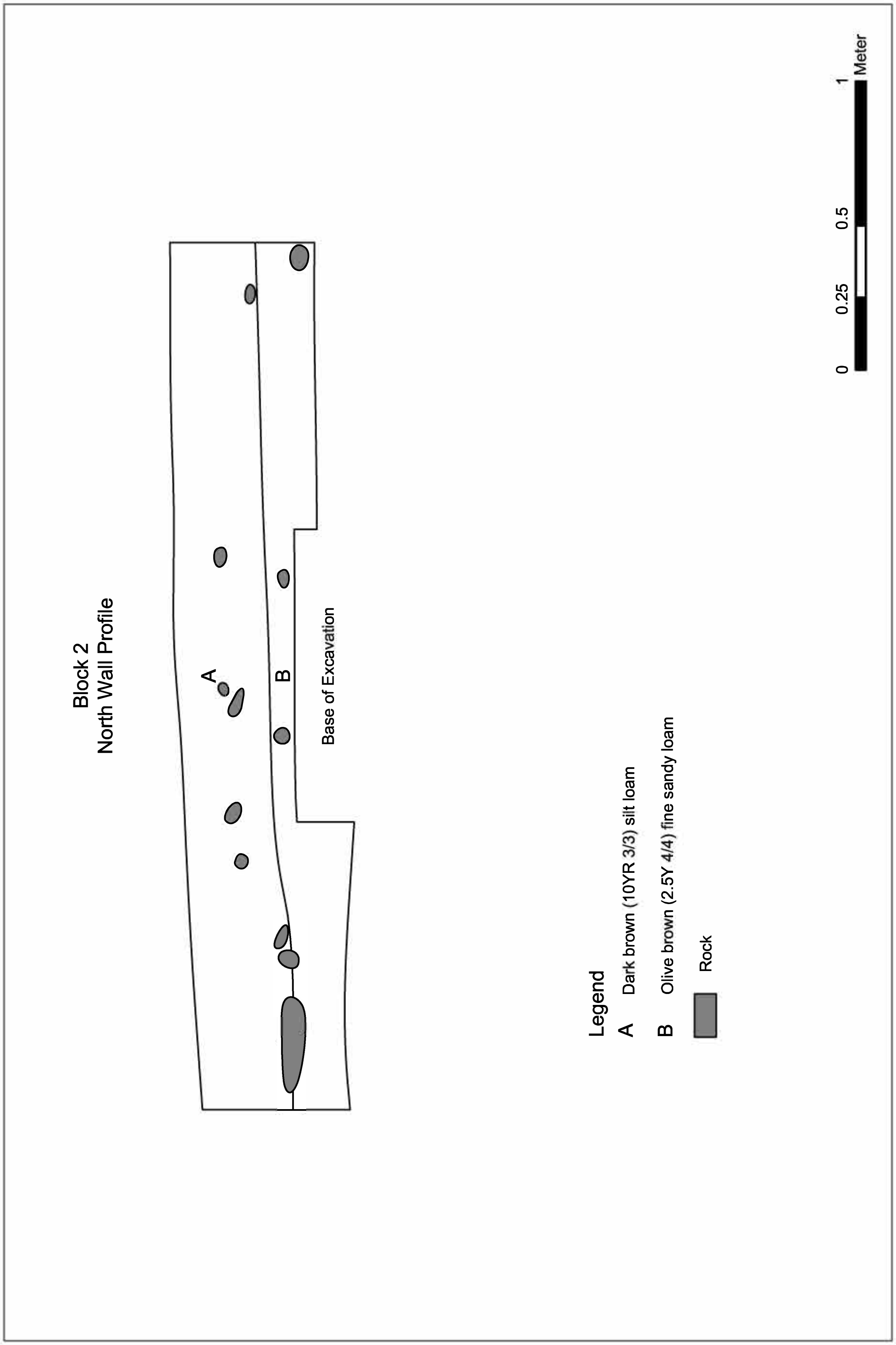


FIGURE 4: Stratigraphic Profile of North Wall, Block 2

PHOTOGRAPH 3: Plan View of Block 2, View North

PHOTOGRAPH 4: Plan View of Block 3, View North

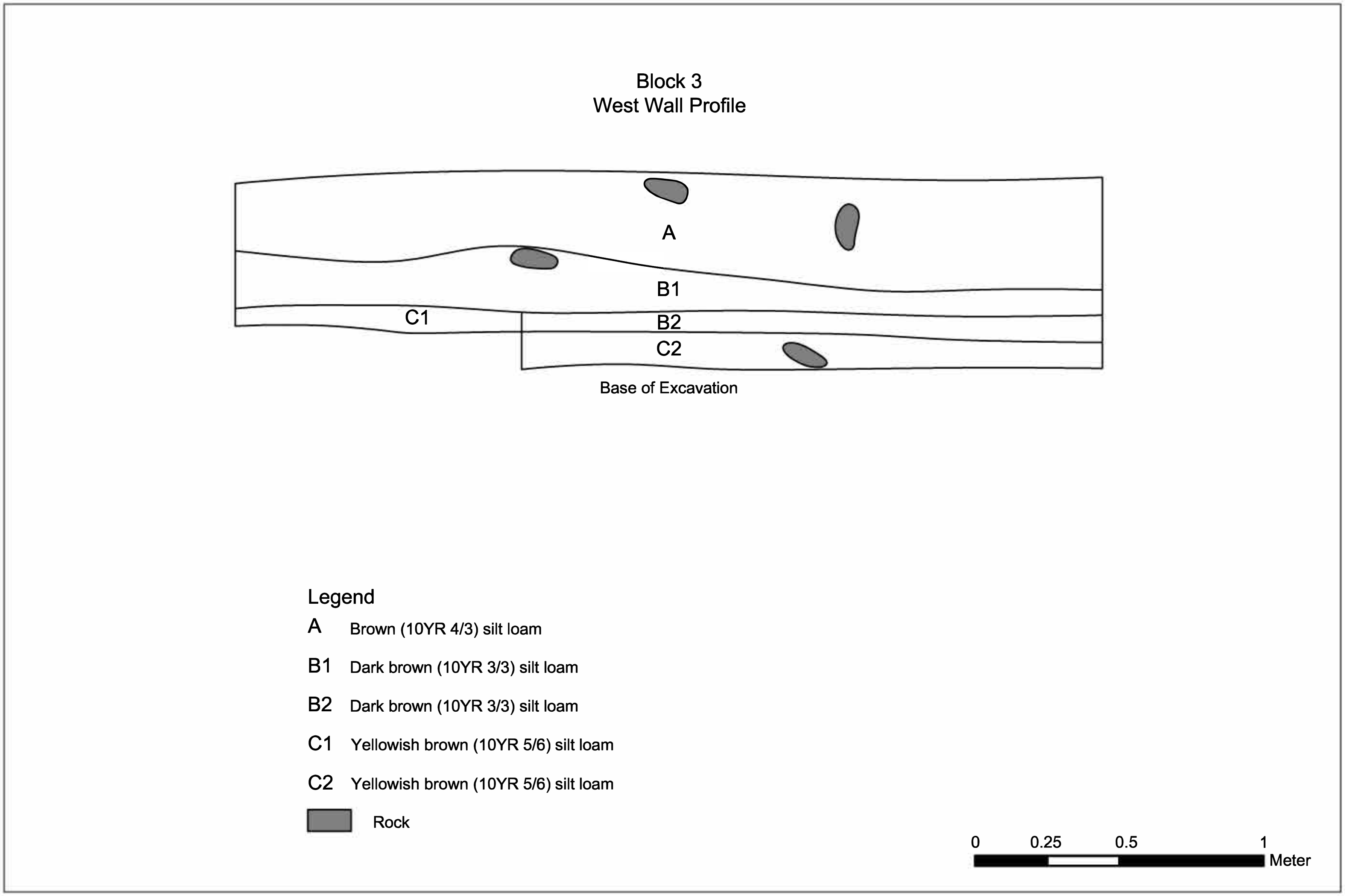


FIGURE 5: Stratigraphic Profile of West Wall, Block 3

TABLE 3

LITHIC ARTIFACTS RECOVERED FROM BLOCK 3, GORGE CREEK SITE 1 DATA RECOVERY

UNIT	BIFACES/ TOOLS	FINISH'G FLAKES	BIFACE REDUCTION FLAKES	EARLY FLAKE	FLAKE FRAGS	IRREG./ SHATTER	DECORT.	TESTED COBBLE	CORE	TOTAL
19		1	16		2	6				25
20			19	2	1	34				56
21	1 (point)		41	1		21				64
22	2		8			32				42
23	1		20		2	38	1	1		63[+5]
24	1		34			12				47[+5]
25	3		11		2	11				27
26			28	1		27				56[+14]
27			12	1		18			1	32[+4]
All	8	1	189	5	7	199	1	1	1	412[+28]

TABLE 4

LITHIC ARTIFACTS RECOVERED FROM BLOCK 4, GORGE CREEK SITE 1 DATA RECOVERY

UNIT	BIFACES/ TOOLS	FINISHING FLAKES	BIFACE REDUCTION FLAKES	EARLY FLAKE	FLAKE FRAGS	IRREG./ SHATTER	DECORT.	TOTAL
28	1		119		19	23		162[+1]
29		1	45		11	13	3	73
30	3	1	61	9	40	19	1	134
31			26			2		28
32	3		43	5	5	5		61
33	3		57		18	10		88
34	4		66		11	15	2	98
35		1	61	2	30	1		95
36	7		39	8	13	11		78
All	21	3	517	24	147	99	6	817[+1]

The plowzone yielded a small teardrop-shaped biface, probably a late-stage preform. Two biface preforms were recovered from the plowzone of Unit 36. One is relatively narrow. The other is relatively wide and thick. It has overshot flake scars that are superficially reminiscent of Paleoindian knapping techniques.

About 8 percent of the artifacts (n=69) were recovered from the uppermost part of Stratum B. These are interpreted as downward drift and were not separated from Stratum A material for analyses.

Stratum A was dark brown (10YR 3/3) gravelly silt loam Ap horizon that terminated between 40 and 46 centimeters (1.31 and 1.51 feet) bgs. This overlaid Stratum B, a yellowish brown (10YR 5/6) rocky silt. The west sixth of Stratum B was cut by a gravel deposit similar to the intrusion in Block 1 (Figure 6; Photograph 5).

B. Mechanized Stripping

After block excavation was completed, mechanized stripping of the plowzone was initiated on June 8 and continued through June 15, 2017 (Photographs 6 and 7). The plowzone was stripped from 12 areas for a total exposure of 3,691 square meters (39,730 square feet) (see Figure 2).

The east edge of Stripped Area 1 (SA-1) was about 10 meters west of Block 4. Putative Features 3 and 4 were exposed in this area. SA-2 was located south of Block 4. SA-3 was located south of Block 3, and SA-6 nearly abutted the south

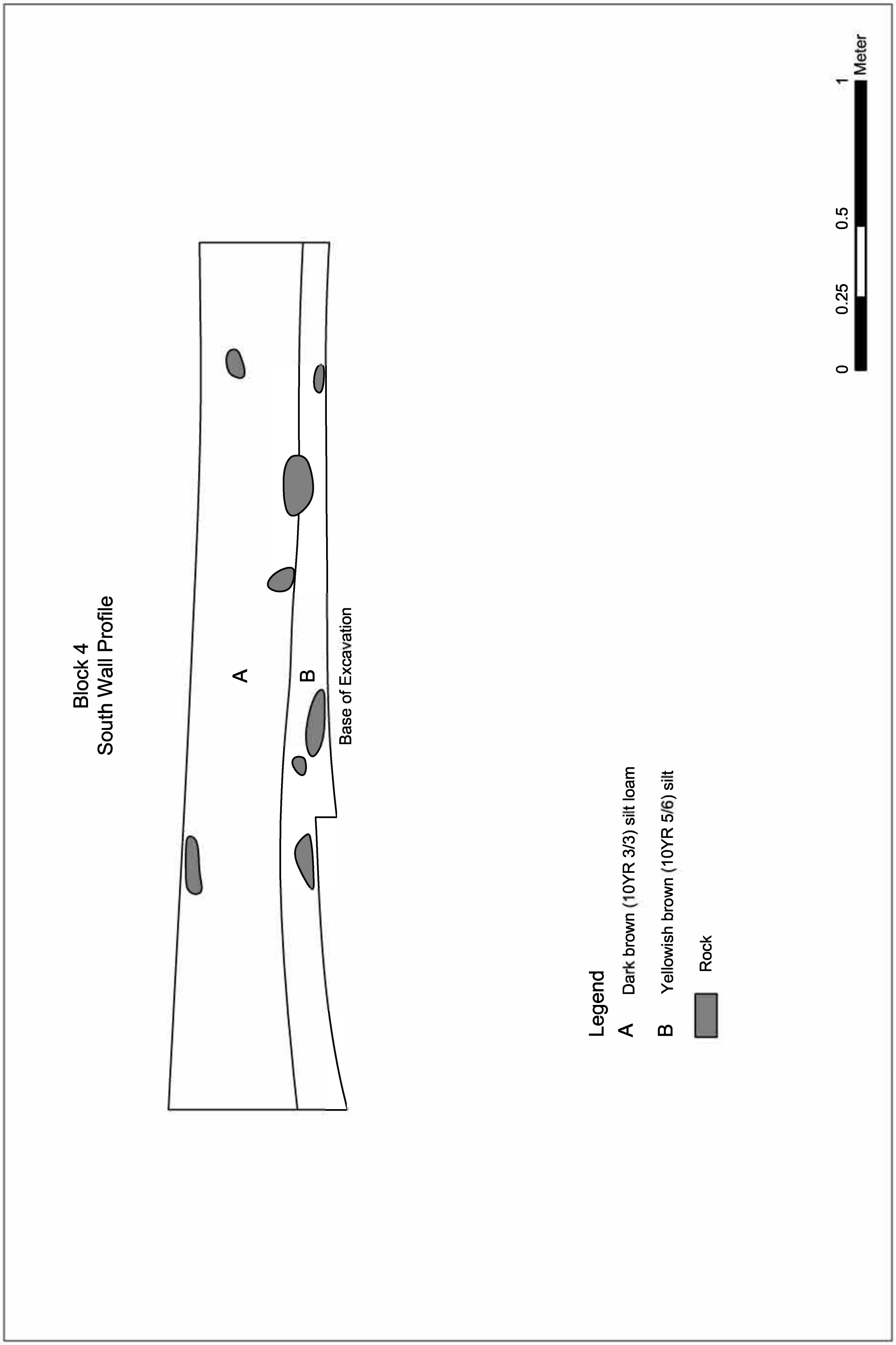


FIGURE 6: Stratigraphic Profile of South Wall, Block 4

PHOTOGRAPH 5: Plan View of Block 4, View South

PHOTOGRAPH 6: Mechanical Stripping, View Southwest

PHOTOGRAPH 7: Mechanical Stripping, View Southeast

side of Block 1. SA-4 was located between SA-3 and SA-6. SA-5 was placed north of Block 1, and SA-7 was located east of SA-5. SA-12 was a narrow strip located about 25 meters east of Block 3. Four large stripped areas were placed between Block 3 to the southwest and Block 4 to the northeast: SA-8, SA-9, SA-10, and SA-11.

The subsoil exposed immediately below the plowzone interface was generally very rocky, although patches with fewer clasts were observed. Three patches of red-stained, oxidized soil were evident, generally with associated charcoal. These patches were amorphous and did not appear to be of cultural origin; however, they were designated as potential features and numbered from 3 to 5 (as two putative features had been identified in previous investigations). These features were sectioned to reveal their profiles.

Feature 3 was elliptical and measured approximately 45 centimeters (1.48 feet) long by 18 centimeters (0.59 feet) wide (Figure 7; Photograph 8). It presented as a red stain as the excavator removed the plowzone. Louis Berger archaeologists bisected the feature, excavated the northwest section, and also photographed a profile (Photograph 9) and created a line drawing (see Figure 7) of the southeast wall. The feature consisted of a red (2.5YR 4/8) silt loam with fleck of charcoal surrounded by a yellowish brown (10YR 5/8) silt loam subsoil. From the stripped surface to the bottom of the feature was generally 7 centimeters (0.23 foot). A portion of the feature’s end extended approximately 14 centimeters (0.46 foot) below the stripped surface. No artifacts were identified during the feature bisection.

Feature 4 was oblong, approximately 140 centimeters (4.59 feet), with widths varying from 10 to 30 centimeters (0.33 to 0.98 foot) (Figure 8; Photograph 10). This feature was identified through the presence of red-stained soils and abundant charcoal beneath the stripped plowzone. The north section contained a red (2.5YR 4/8) circular stain with large charcoal fragments. This was surrounded by a very dark grayish brown (10YR 3/2) silt loam with charcoal flecking. These feature soils were within a yellowish brown (10YR 5/8) subsoil. Louis Berger archaeologists bisected the feature and excavated the east portion. During excavation, archaeologists encountered a partially burned wood fragment, approximately 4 to 5 centimeters (0.13 to 0.16 foot) long between 5 and 10 centimeters (0.16 and 0.33 foot) bgs. At that point Louis Berger archaeologists abandoned the feature because the staining and related charcoal were likely the result of a burn, probably within the more recent past. No profile drawing was constructed.

Feature 5 was elliptical and measured approximately 60 centimeters (1.97 feet) long by 41 centimeters (1.35 feet) at its widest point (Figure 9; Photograph 11). Two large charcoal stains were identified in the west portion of a red (2.5YR 4/8) stain on the surrounding dark yellowish brown (10YR 4/4) subsoil. Louis Berger archaeologists bisected Feature 5 from west to east and excavated the north portion. From west to east the feature extended deeper into the subsoil until it reached a void, likely the result of a rodent borough (see Figure 9; Photograph 12). Charcoal flecks were noted through the bisection, but no artifacts were identified.

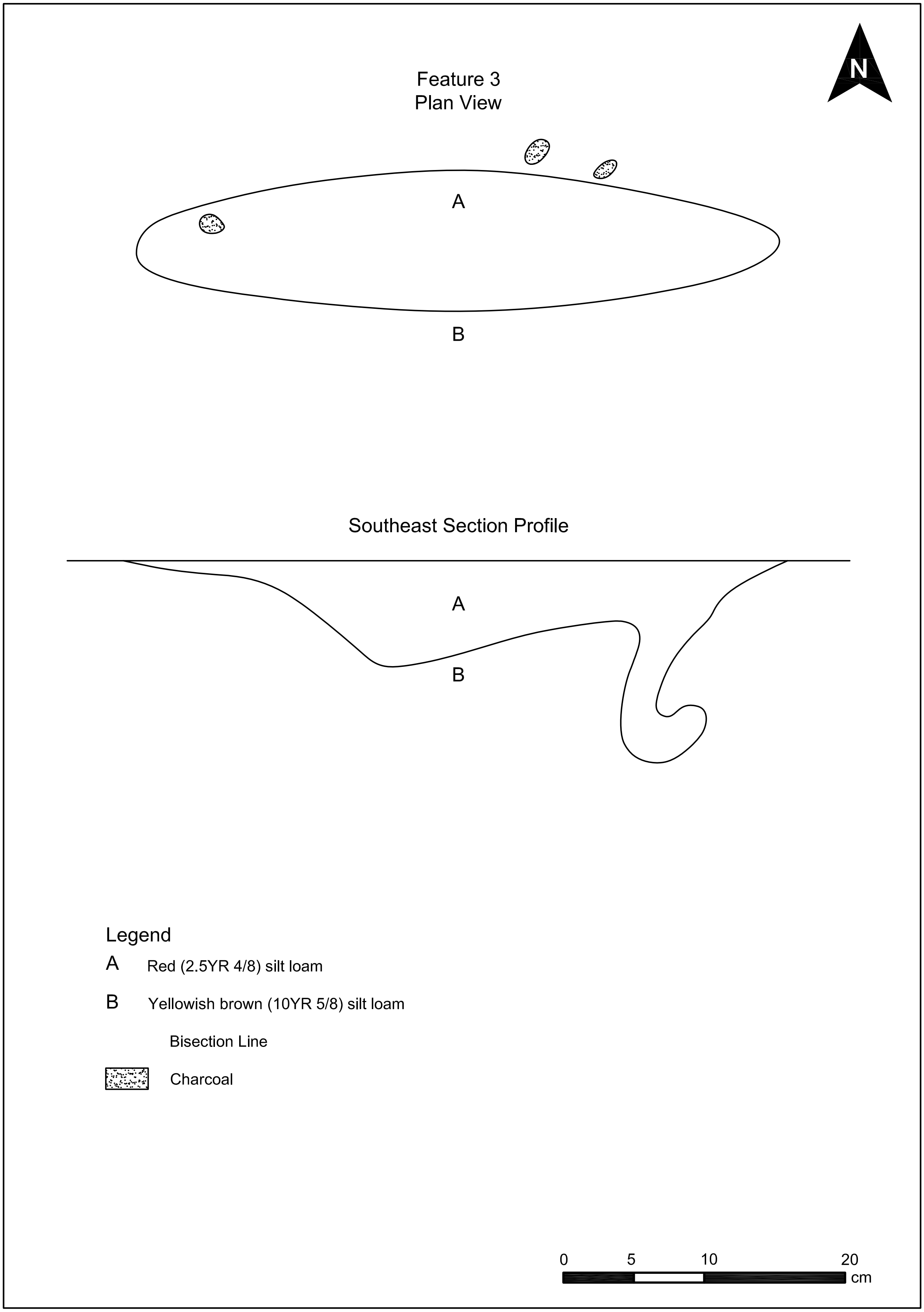


FIGURE 7: Feature 3 Plan View and Profile of Southeast Section

PHOTOGRAPH 8: Plan View of Feature 3, View North

PHOTOGRAPH 9: Profile of Feature 3, Southeast Section

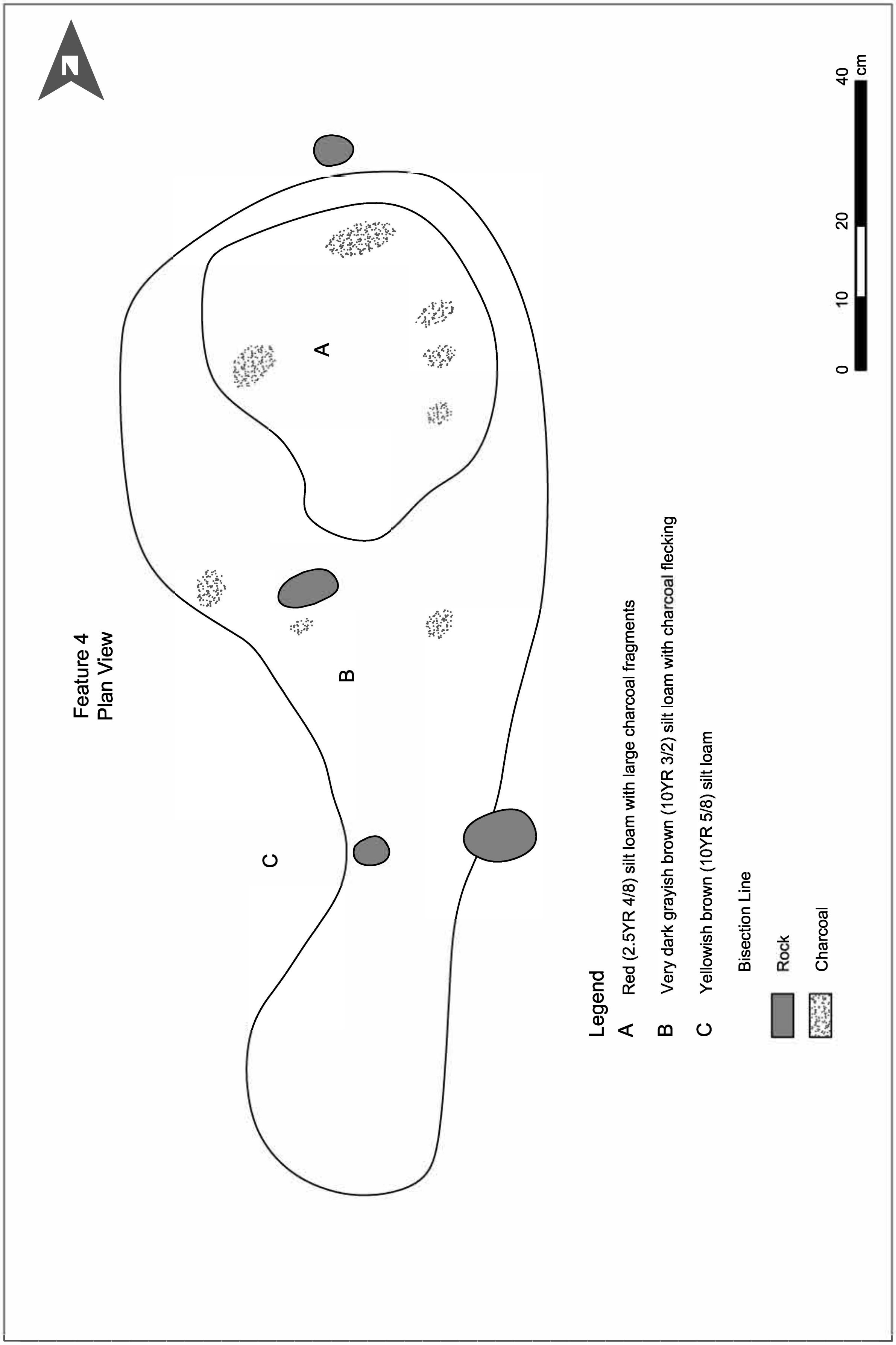


FIGURE 8: Feature 4 Plan View

PHOTOGRAPH 10: Plan View of Feature 4, View North

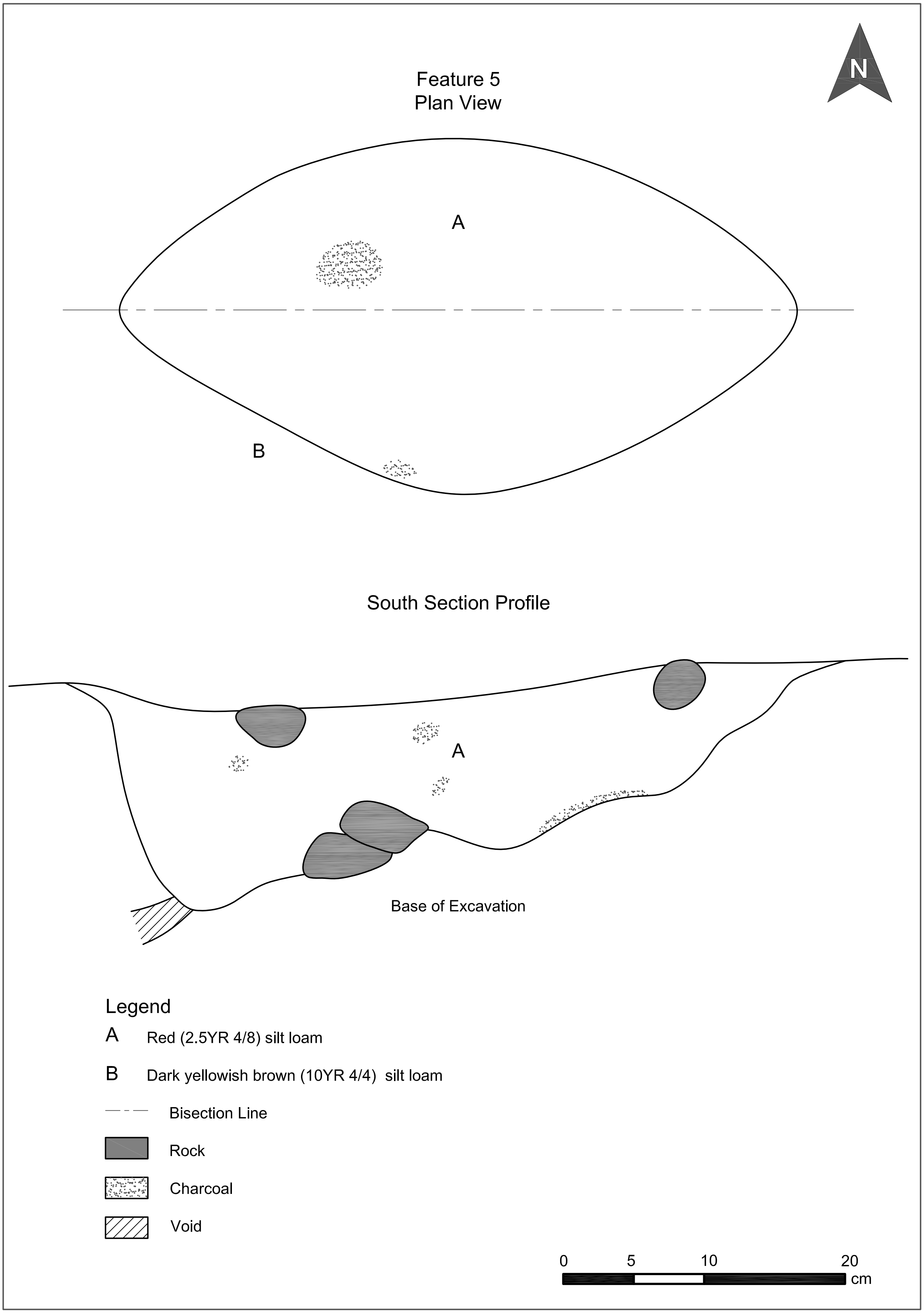


FIGURE 9: Feature 5 Plan View and Profile of South Section

PHOTOGRAPH 11: Plan View of Feature 5, View West

PHOTOGRAPH 12: Profile of Feature 5, South Section

VI. Artifact Analysis and Discussion

A. Individual Artifacts

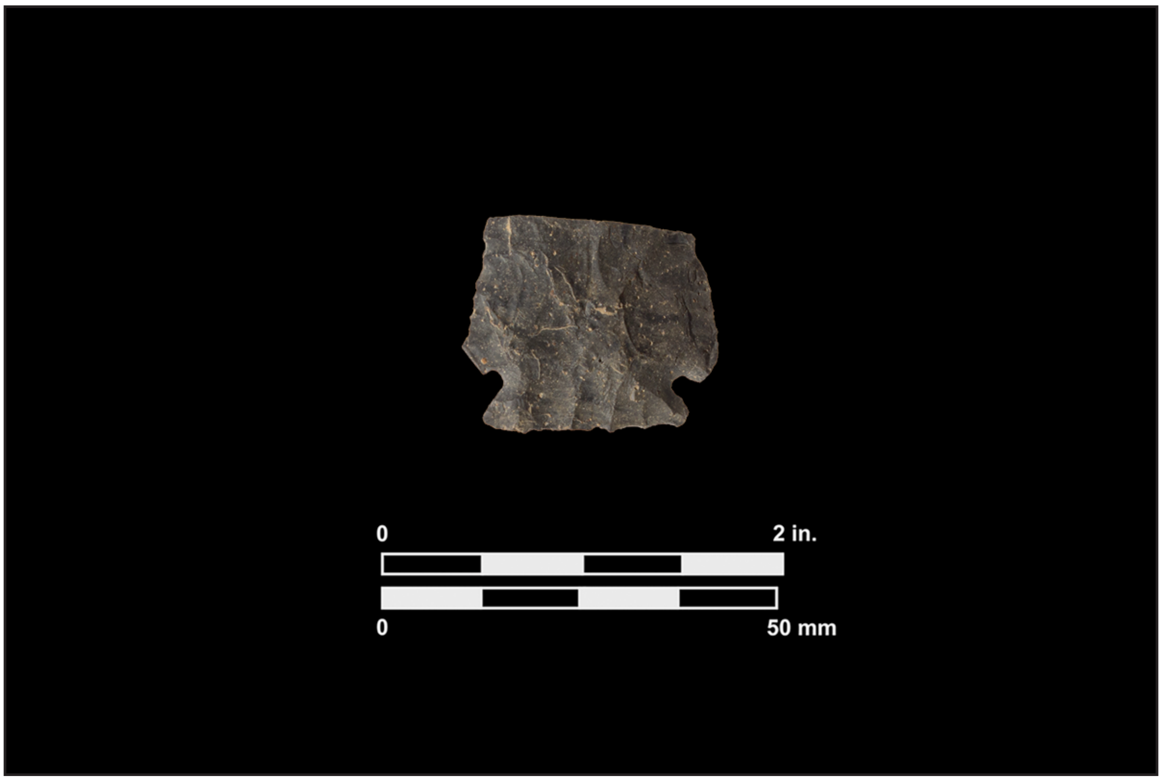
The block excavations produced 3,076 lithic artifacts. In addition, a small number of chert chunks (n=44) were collected that, upon closer inspection in the lab, proved not to be artifacts. Only a very small percentage of the artifacts (n= 37, just over 1 percent) are whole or fragmentary formed tools, preforms, or utilized flakes.

Almost all of the artifacts came from the plowzone. That means that artifacts have been repeatedly exposed on the surface of the field since the arrival of Palatine farmers circa 1715 and local collectors have likely gathered a large number of them; certainly, local collector Tom Anderson has found points on the surface. A similar scarcity of finished bifaces was recorded in data recovery at Schoharie Creek II, where only nine projectile points (three of them typable) are among the 35,837 lithic artifacts (Rieth 2012). It seems likely that this low ratio also reflects collector activity.

The basal portion of a Brewerton Corner-notched point, made of dark gray Onondaga chert, was found at the base of the lower plowzone in Unit 21, in the northeast part of Block 3 (Photograph 13). This point is slightly unusual for the type in that the basal edge is not ground; Ritchie (1971b) noted that about two thirds of the points of this type have ground bases. However, it is not difficult to find published examples without basal grinding; for one such specimen see Funk (1993b:453, figure 159, no. 16), from the Russ Site near Wells Bridge. As discussed above, this type indicates an episode of occupation of the site at some time roughly between 6000 and 5000 cal BP. With benefit of hindsight, it seems likely that two points in Anderson's collection, photographed for the Phase II report, are probably Brewerton side-notched points (Gade and Schreyer 2016: photograph 5).

Apart from the Brewerton Corner-notched point and the ubiquitous debitage, the following artifacts found in data recovery are particularly noteworthy.

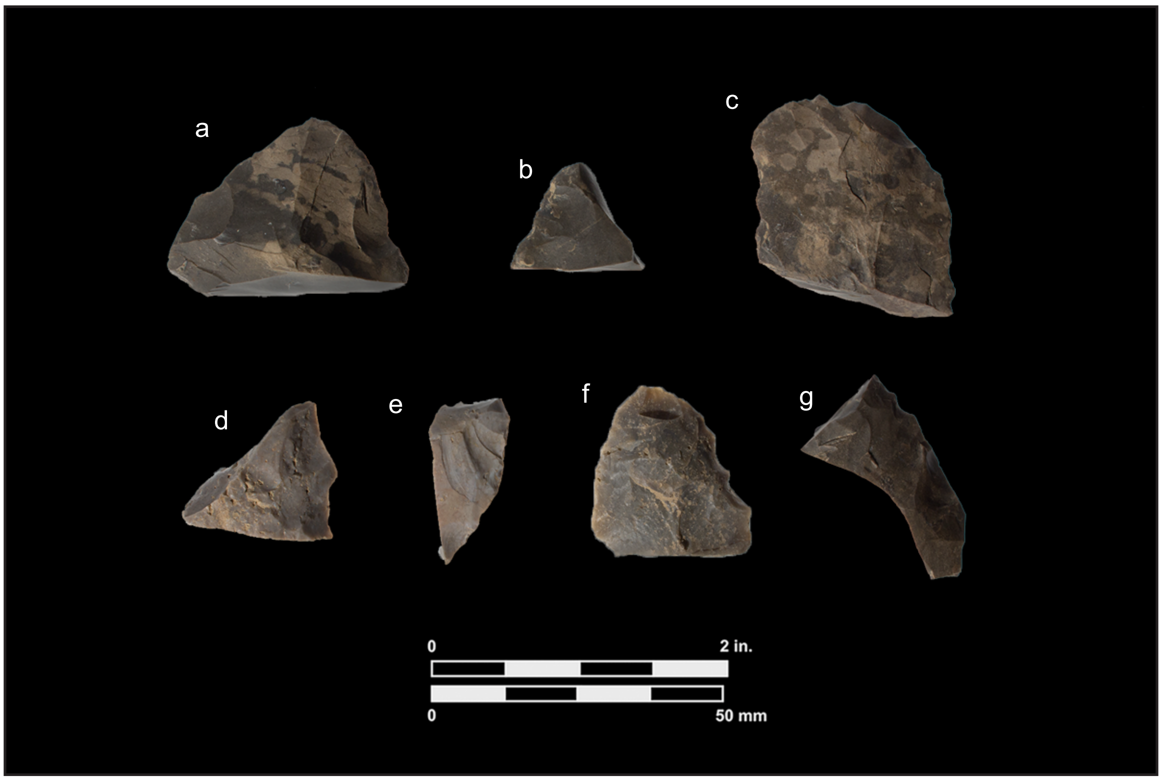
- In Unit 3 a broad, flat flake was bifacially worked along two edges, with pronounced bulbs of percussion; one long edge is snapped or broken (Photograph 14).
- Two utilized flakes were recovered from Unit 4. They are broad and flat, probably retouched intentionally along the edges. They lack cortex, and there is no indication of heat treatment (see Photograph 14).
- A probable core fragment was found in Unit 9. It is made of dark gray chert and retains a small amount of cortex, a prominent platform, and flake scars.
- A biface fragment including a partial lateral edge was found in Unit 11 (Photograph 15). Made of dark gray chert, it has no remnant cortex. Two flake tools with retouched or utilized edges also came from this unit. They are made of dark gray chert without cortex.
- Unit 12 produced a core and a tip fragment of an early-stage biface. The intact core, made of dark gray chert that retains some cortex, has multiple striking platforms. The biface tip, made of mottled chert, weighs 19 grams (see Photograph 15).
- A utilized chert flake was recovered from Unit 15. This is a large biface reduction flake, with no cortex, that has been pressure-flaked on one lateral edge.
- An early reduction flake found in Unit 22 may have been used as a scraper (see Photograph 14). Scars from pressure flake removal are present on the corticated dorsal surface. Another flake tool recovered from this unit is a utilized biface reduction flake bearing small flake scars caused by edge wear on the ventral surface near the bulb of percussion.
- Unit 23 yielded the only tested cobble recovered from the excavations. This is a large blocky fragment from which flakes have been removed, perhaps intentionally. It has no cortex but contains impurities.



PHOTOGRAPH 13: Basal Portion of Brewerton Corner-Notched Point (Field No. 144, Spec. No. 5)

PHOTOGRAPH 14: Scrapers and Utilized Flakes

(a) Flake tool (Field No. 148, Spec. No. 4)
(b) Flake tool (Field No. 104, Spec. No. 1)
(c) Utilized flake (Field No. 184, Spec. No. 12)
(d) Utilized flake (Field No. 105, Spec. No. 1)
(e) Endscraper (Field No. 148, Spec. No. 3)
(f) Sidescraper (Field No. 155, Spec. No. 4)



PHOTOGRAPH 15: Fragmentary Bifaces

(a) Early-stage biface fragment (Field No. 121, Spec. No. 13)
(b) Biface fragment (Field No. 119, Spec. No. 1)
(c) Biface fragment (Field No. 168, Spec. No. 11)
(d) Biface fragment (Field No. 172, Spec. No. 13)
(e) Biface fragment (Field No. 178, Spec. No. 11)
(f) Biface fragment (Field No. 178, Spec. No. 12)
(g) Biface fragment (Field No. 172, Spec. No. 12)

- A biface fragment was also found in this unit. Its surfaces are worn, with micro-flake scars present along the edge. The snapped fragment has a convex shape and may have been retouched for use as a scraper.

- An endscraper was recovered from Unit 24 (see Photograph 14). This is a small thumb scraper with a convex, retouched edge.

- Two scrapers and a flake tool were found in Unit 25. One scraper, with a chisel-like shape and worn edges, was made of light gray chert. The other scraper is on a snapped flake with an intentionally worked edge. It was made of light gray Onondaga chert with an unusually waxy texture. The flake tool, made of dark gray chert, has pressure flaking along the lateral edge, with remnant cortex on the dorsal surface.

- A possible core was recovered from Unit 27. It has multiple flake scars and worn edges. No cortex is present.

- A fragment of a snapped biface was recovered from Unit 28. It is made of mottled Onondaga chert (see Photograph 15).

- An unfinished late-stage biface (Photograph 16) and two medial biface fragments were found in Unit 30. One fragment has a pressure-flaked edge and was possibly utilized. The other midsection is a fragment of a thick, unfinished tool made of waxy light gray chert, probably Onondaga.

- The medial and distal portion of a snapped middle stage biface was found in Unit 32. Two other tools came from this unit. A piece of debitage had been worked into a crude bifacial tool with a retouched edge. A flake seems to have been utilized and possibly pressure-flaked.

- A large utilized flake and two biface fragments were found in Unit 33. One lateral edge of the dark gray flake has small flake scars produced by wear and/or intentional retouch. One biface fragment was made of light bluish gray chert with red mottling. The other, made of dark gray chert, consists of a midsection and tip.

- Three utilized flakes and a small biface were found in Unit 34. Two flakes are dark gray chert. The third is made of dark gray chert with red staining; it has flaking on the ventral surface. The biface was made on an early reduction flake, with dorsal cortex present, which was flaked on both surfaces. There is no evidence of use wear or edge retouch, so it appears to be an ovoid preform. The intended final product must have been some sort of miniature tool (Photograph 17).

- Two bifaces, a scraper, and a utilized flake were recovered from Unit 36. An early-stage biface was made of mottled chert. One edge was flaked, the other was unworked. This is a large, thick preform, weighing 57.7 grams (see Photograph 16). A middle-stage biface is made of mottled chert. This unbroken biface is long and narrow and weighs 8.2 grams. The scraper is a large flake of dark gray chert and weighing 37.6 grams. Its steep lateral edges are retouched and utilized. The utilized flake of dark gray chert weighs 10.6 grams. Its edges are retouched and possibly damaged by use.

B. Assemblage Characteristics

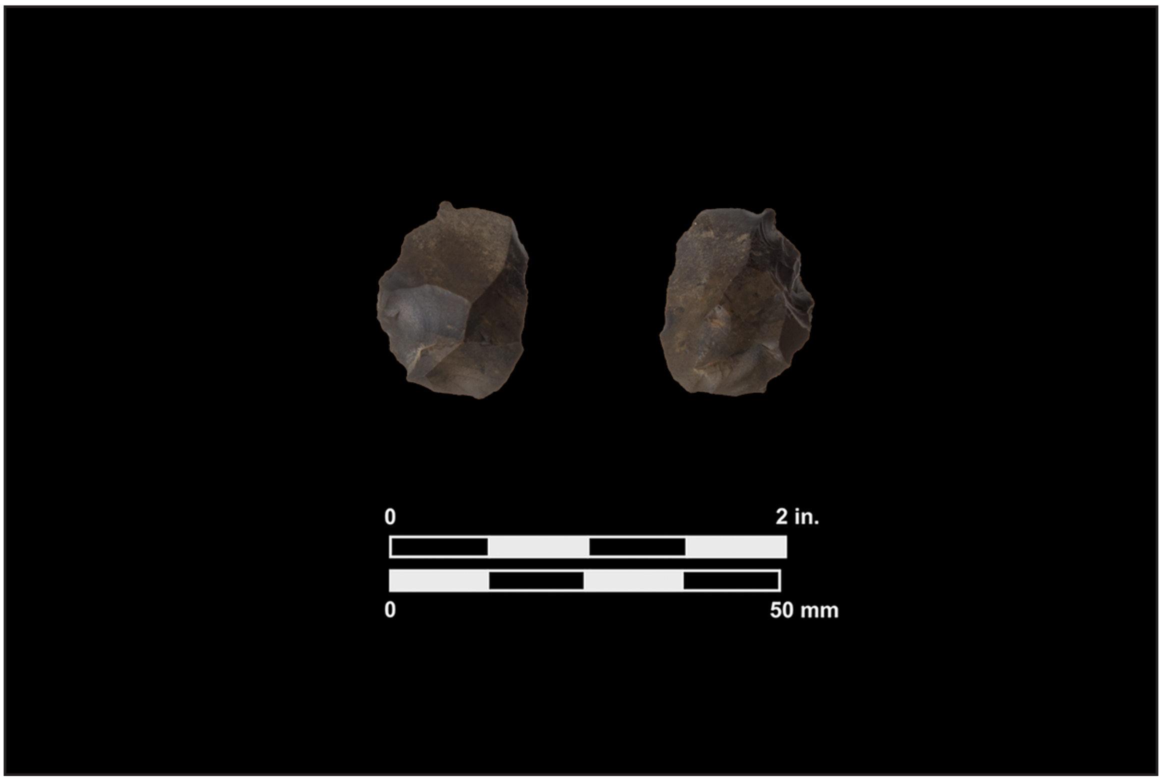
The Gorge Creek 1 assemblage includes many medium-sized, thin flakes indicative of biface reduction. A small number have platforms that include both sides of the edge of the biface preform ("biface edged flakes" [Rondeau and Rondeau 1993]). Twelve early through late-stage biface preforms, both whole and fragmentary, were recovered. These display variable shapes, including lanceolate, ovoid, narrow, and extremely narrow (see Photographs 16 and 17). Obviously, these preforms were not intended for production of points of a single type. The narrow bifaces could not have been made into broad Brewerton notched points like the one found in Block 3.

The ratio of bifaces to total debitage (12:3,076) is somewhat lower than that reported in the previous investigations. For the Phase I survey it was four out of 169; for the Phase II, nine out of 1,244.

The natural stony soil at the site includes chert clasts of varying size. Apart from biface reduction, there is some evidence that blocky chert chunks were occasionally collected at or near the site and tested for quality with a few

PHOTOGRAPH 16: Whole Bifaces

(a) Early-stage biface (Field No. 184.9)
(b) Middle-stage biface (Field No. 184.1)
(c) Late-stage biface (Field No. 172, Spec. No. 14)



PHOTOGRAPH 17: Small Biface (Field No. 180, Spec. No. 11)

blows. Some of these chunks were selected as cores and reduced further by removal of large, parallel, blade-like flakes. A tested cobble was recovered from Unit 23. Cores were found in Units 9, 12, and 27, and possible cores were found in Units 19 and 20. Notably, none of these cores come from Block 4.

Gade and Schreyer (2016) reported a relatively high percentage of flake tools and expediently utilized flakes among the artifacts from Phase I and II investigations. In the Phase I survey 25 of the total 169 chipped stone artifacts (14 percent) were classified as retouched or utilized flakes. During Phase II, 101 artifacts out of 1,244 flaked lithics (8 percent) were regarded as flake tools (apart from two scrapers and two “chipped stone implements”).

The utilized and retouched flakes found at the Gorge Creek site 1 during data recovery represent a much smaller proportion of the total assemblage (less than 0.5 percent) than anticipated. Five artifacts were classified as flake tools, and nine were identified as utilized flakes. These were recovered from Units 3, 4, 11, 15, 22, 25, 32, 33, 34, and 36. In addition, five artifacts (from Units 22, 24, 25 and 36) were identified as scrapers, with steep intentional retouch either at the distal edge or on one or both lateral edges.

A few of the utilized flakes display crescentic or “half-moon” scars along the edge. Keeley (1980:25) observed that this kind of edge damage is caused “when low-angled edges are tightly held in the material being worked and the edge is moved laterally.” Lewenstein (1987) observed that similar-shaped edges were caused by scraping manioc. Obviously, given the site’s location in New York, manioc was not processed here, but processing of some other native tuber (e.g., ground nut) is possible. It is also possible that Gade and Schreyer interpreted the nibbling or irregular scars seen on flake edges as use wear; Louis Berger analysts regard most of this as post-depositional damage caused by plowing or trampling. The latter could reflect either prehistoric pedestrian traffic or the activities of farm animals.

C. Raw Materials

Several varieties of chert, presumably almost all from local cobble or bedrock sources, can be distinguished in the Gorge Creek assemblage, mainly by color (Table 5; Photograph 18). By far the greatest percentage of the material is dark gray Onondaga chert with brownish overtones. A minority is a lighter gray with a bluish tendency. A few flakes and a biface edge fragment are a very light bluish gray, and one small thinning flake is very light gray with darker flecks. In analysis the following color variants were recorded (excluding 43 non-cultural pieces that were mainly dark gray): dark gray (n=2,647), light gray (n=309), light gray/red (n=18), dark gray/red (n=28), bluish gray (n=8), bluish light gray (n=10), dark gray/purple mottled (n=2), dark/light gray mottled (n=2), light gray/brown mottled (n=3), light brown/red (n=1), and black (n=2). The two black flakes, from Unit 8 and Unit 30, are both biface reduction flakes less than 1.3 centimeters (0.5 inch) long. The Unit 8 flake weighs 0.7 gram (see Photograph 18), the Unit 30 flake, 0.2 gram. These small flakes are presumed to be Esopus chert; their size is consistent with their having been detached from a preform carried to the site from a chert source some distance away. The source may not have been very far from the site; Esopus chert is available both on the south side of the Mohawk Valley and the west side of the Hudson (Fisher 1980).

D. Comparisons

Block 1 is distinctive from the other blocks in that the proportion of flake fragments (defined as lacking the striking platform at the proximal end) to complete biface reduction flakes is much greater (419:663; the comparable ratios are 62:347 in Block 2, 7:189 in Block 3, and 147:517 in Block 4). Most of these fragments are small; in Block 1 only 24 of the 419 fragments are larger than 1.3 centimeters (0.5 inch). The distinction between the analytical categories of “flake fragment” and irregular, amorphous “general debitage” or shatter is admittedly somewhat vague. If we consider only the latter, it is Block 3 that appears anomalous, with 199 pieces of amorphous debitage, only seven flake fragments, and 189 biface reduction flakes. If we combine fragments and general debitage, the ratios to biface reduction flakes are 644:663 in Block 1, 164:347 in Block 2, 206:189 in Block 3, and 246:517 in Block 4.

At Schoharie Creek II Rieth (2012) recovered 35,307 flakes. Of this total, 22,772 (64.5 percent) are broken flakes and shatter. The remainder of the debitage consists of 982 primary/secondary flakes (2.8 percent), 2,542 tertiary flakes (7.2 percent), 5,701 bifacial thinning flakes (16.1 percent), 2,962 pressure flakes (8.4 percent), and 348 utilized flakes (1 percent).

TABLE 5

DISTRIBUTION OF CHERT ARTIFACTS BY COLOR PER UNIT

UNIT	TOTAL LITHICS	LIGHT GRAY	LT GRAY/ RED	DARK GRAY/RED	LT BROWN/ RED	DARK GRAY PURPLE	BLUISH GRAY	BLUE/ LIGHT GRAY	DARK/ LIGHT GRAY	LIGHT GRAY BROWN	BLACK
1	119	25	3					1			
2	142	11									
3	180	31		1							
4	83	18									
5	127	33	3			1					
6	180	44	1	2							
7	121	35	1				1				
8	196	49					1				1
9	174	16		1							
10	50	0									
11	63	0									
12	82	3							1		
13	31	0									
14	55	0									
15	77	0		2							
16	62	2	3								
17	57	1		2							
18	48	0									
19	25	3									
20	56	5									
21	64	5									
22	42	2									
23	63	1		1							
24	47	0		1			1		1		
25	27	3				1					
26	56	0		1							
27	32	3						1			
28	162	3	1	3							
29	73	2		4							
30	134	4	4	1			5	1			1
31	28	0									
32	61	1	2	1				4		3	
33	88	2		4	1			3			
34	98	1		3							
35	95	2									
36	78	4		1							

PHOTOGRAPH 18: Color Variants of Onondaga Chert

(a) Dark gray/red (Field No. 158, Spec. No. 1)
(b) Light gray/red (Field No. 107, Spec. No. 5)
(c) Black (Field No. 113, Spec. No. 5)
(d) Dark/light gray mottled (Field No. 155, Spec. No. 1)
(e) Dark gray (Field No. 133, Spec. No. 3)
(f) Dark gray (Field No. 148, Spec. No. 1)
(g) Light gray (Field No. 113, Spec. No. 4)
(h) Light bluish gray (Field No. 172, Spec. No. 9)

Rieth (2012: figure 24) compares the Schoharie Creek II lithic assemblage with those from the Winnie IV and Vroman I sites (Rieth 1999, 2016; Sopko 1999). Vroman I is a small campsite on a small alluvial terrace on the valley wall overlooking Fox Creek. Although no diagnostic artifacts were recovered, a partial point may be a Meadowood, and two radiocarbon dates indicate probable Orient and Meadowood components. Winnie IV is a small seasonal camp in the uplands overlooking Onesquethaw Creek, a tributary of Schoharie Creek, and is attributed to the Woodland period. At Vroman I a total of 959 lithic artifacts were recovered, 645 from non-fill contexts. Of these 645 artifacts, 13 percent are primary/secondary flakes, 16.9 percent are tertiary flakes, 22.8 percent are bifacial thinning flakes, 1.6 percent are pressure flakes, 37.7 percent are broken flakes, 14.3 percent are shatter, and 1.4 percent are utilized flakes. At Winnie IV about 24 percent are primary/secondary flakes, 16 percent are tertiary flakes, 12 percent are bifacial thinning flakes, 1 percent are pressure flakes, 46 percent are broken flakes and shatter, and 1 percent are utilized flakes.

Citing a model derived from Magne (1989) and utilized by Cesarski (1996) in a study of collections from the Hoosic River drainage, Rieth (2012) interprets these data as indicative of a logistic settlement pattern. Major base camps were located on the valley floor. Upland sites represent small task-specific camps for resource procurement. Lithics brought as rough cores to these small sites were reduced there to render them more transportable. Rieth interprets Schoharie Creek II as a "small repeated logistical camp." Sites of this type, according to Magne's model, should contain a high percentage of late-stage flakes and diverse bifacial tools, and these criteria fit the actual assemblage characteristics of Schoharie Creek II.

The debitage categories used by Louis Berger in sorting the lithics from Gorge Creek 1 are not precisely equivalent to Rieth's, which complicates comparison of the data. Broken flakes plus general debitage can be equated unequivocally with Rieth's broken flakes and shatter. We may provisionally equate early reduction and decortication flakes with her primary/secondary flakes, biface reduction flakes with tertiary flakes and bifacial thinning flakes, and finishing flakes with pressure flakes. If we combine material from all four blocks (a total of 3,058 after subtracting the 18 formed bifaces and scrapers), only 51 artifacts (1.7 percent) are primary/secondary (35 early reduction flakes, 12 decortication flakes, plus three cores and a tested cobble). Biface reduction flakes number 1,716 (56 percent). Fragments and amorphous debitage account for 1,260 pieces (41 percent). The 12 finishing (pressure) flakes constitute only 0.4 percent, and the 14 flake tools also account for just 0.4 percent. Comparing the percentages to Rieth's sites, we see that early phase reduction is even less prevalent at Gorge Creek 1 than at Schoharie Creek II. Fragments and shatter are less common than at any of the three sites. Gorge Creek 1 appears distinctive for its very high proportion of biface thinning flakes (56 percent); combining the tertiary and bifacial thinning flakes at Schoharie Creek II, they account for only 23.3 percent of the lithic total. The same percentages are 28 percent at Winnie IV and 39.7 percent at Vroman I.

At Schoharie Creek II, 33 bifaces, 11 side- and endscrapers, one drill, and one uniface were recovered from features and living floors. Three of these tools are made of Normanskill chert; the rest are all are made of the gray Eastern Onondaga chert that outcrops at Terrace Mountain (Rieth 2012).

Rieth's analysis of the biface fragments showed that 81 per cent of them could be assigned to the production Stages II, III, and IV defined by Callahan (1979:3). Based on the presence of these unfinished bifaces, along with large numbers of non-cortical flakes, she suggests that both initial edging and thinning of bifaces were performed at the Schoharie Creek II site. Stage I bifaces were relatively rare (under 10 percent), as were primary (cortical) flakes; their rarity suggests that initial reduction of cores probably occurred at or near the chert outcrop. A similar separation of initial and later reduction stages is evident in other Early Woodland assemblages in eastern New York, including Nahrwold 2 (Ritchie and Funk 1973), Dennis (Ritchie and Funk 1973:96–97), and Schoharie Creek I (Rieth 1998; Rieth and LoRusso 1996).

Seventeen percent of the bifaces at Schoharie Creek II site have hinge fractures indicating damage by impact or force applied to the tip of the tool. Such fractures may result from use of a hand-held tool for puncturing or prying. Edge damage consistent with "crushing usewear" (Pagoulatos 1992:92) was observed on six scrapers and four bifaces; this wear may have been caused by processing both hard and soft materials. Similar use wear also was seen on expedient flake tools.

Snyder (2016) has recently analyzed 12 sites in western New York containing Late Archaic and Early Woodland workshops and camps. These sites are located in a cluster just north of the chert-bearing Onondaga escarpment and consist mainly of Onondaga chert debitage, like the Gorge Creek Site 1. At all but one of these sites, flake fragments account for more than 40 percent of the assemblage; at six sites they constitute more than 50 percent of the assemblage (Snyder 2016:157–158). The greatest percentage of fragments is about 65 percent, at Site 32L3. Snyder (2016:160) interprets fragments and broken flakes as indicators of biface reduction, and whole flakes as indicating "non-intensive core reduction."

As already observed, the 14 flake tools at Gorge Creek 1 account for just 0.4 percent of the total lithic assemblage, and at Schoharie Creek II utilized flakes account for just under 1 percent of the lithic assemblage (Rieth 2012). Snyder (2016:164) found a comparably low percentage of utilized flakes in his Spaulding Green sites in western New York. Retouched flakes typically account for about 1 to 4 percent of the total debitage in these assemblages; one site has only .02 percent. It should also be pointed out, however, that Snyder reports much higher percentages (up to 33 percent) for several small assemblages with fewer than about 30 artifacts.

Recovery of a Brewerton point fragment at the Gorge Creek Site 1 was unexpected, based on previous finds at the site, and also highlights a curious hiatus in the local archaeological sequence. Otter Creek points were found at Site 303 (the Shafer Site) on Schoharie Creek near Breakabeen. They were associated with a radiocarbon date of 6290±190 rcbp (7165±210 cal BP, 5215 cal BC), which was obtained by combining charcoal from three hearths (Wellman 1996). Funk (1988) assigned this component to a proto-Laurentian "South Hill" phase. A Lamoka component was stratified above the Otter Creek component. Radiocarbon dates of 4340±190 and 4110±140 rcbp (ca. 4700 cal BP) were associated with the narrow stemmed points (Wellman 1996). A ca. 2,500-year hiatus intervened between these occupations—precisely the period when people of the Brewerton phase should have been present. Among the 180 points found at the Pethick Site, only four are typed as Brewerton (Rafferty et al. 2014:186). A deeply buried A horizon at that site yielded few artifacts but two features: one dated to 3490±60 rcbp, the other to 3510±40 rcbp. Although Rafferty et al. (2014:185) believe that these features are "probably associated with the Brewerton Phase," these dates are typical of the Terminal Archaic Broadspear complex, represented at the Pethick Site only by one Perkiomen and one Susquehanna Broad point.

In the nearby Cobleskill drainage a lithic assemblage recovered in the Phase II evaluation of the Overlook Precontact Site in the village of Cobleskill has been ascribed to the Laurentian phase based on the presence of a black siltstone gouge fragment (Curtin and Vidulich 2010). In data "retrieval" at the Birches precontact site in the Village of Schoharie, an Otter Creek point and two Lamoka points were found (Krievs and Kirk 2014), but most of the material found there was of Woodland age.

Ritchie and Funk (1973:340) noted that "Some Brewerton materials have been found at the Divers Lake flint quarries in Genesee County, New York. The western Onondaga flint which occurs in these and other related quarries was much utilized by Brewerton groups for chipped stone artifacts." Prisch (1976) counted 52 Brewerton side-notched and 27 corner-notched points among the artifacts surface-collected from the fields near the quarry.

Louis Berger's excavations at the Kingston Armory Site (Gould et al. 2008) revealed features and associated lithic artifacts of stratified Vergennes (Otter Creek) and Vosburg phase occupations. These assemblages illuminate the composition of Laurentian lithic assemblages in the mid-Hudson Valley; comparison with the Gorge Creek assemblage (Table 6) may indicate whether the latter (and Block 3 in particular, where the Brewerton point was found) has any attributes that are specifically Brewerton or, more broadly, Laurentian.

A few observations can be made based upon Table 6. The most striking difference is in the numbers of flake fragments; these account for 45.5 percent of the Kingston Vergennes assemblage, 48.7 percent of the Vosburg assemblage, but only 1.7 percent of the Block 3 debitage and 20.9 percent of the entire Gorge Creek assemblage. Both the assemblages from Block 3 and from the site as a whole have a much greater percentage of amorphous debitage and shatter (49.5 percent and 20.6 percent, respectively) than either the Vergennes (8.1 percent) or Vosburg (11.9 percent) phase assemblages from Kingston Armory. The proportion of decortication flakes is much greater at Gorge Creek (although the sample is quite small in absolute number), but there are only about half as many early reduction flakes as in the Kingston assemblages.

TABLE 6

COMPARISON OF DEBITAGE, GORGE CREEK 1 AND KINGSTON ARMORY SITES LAURENTIAN COMPONENTS

COMPONENT	DECORT. FLAKES	EARLY REDUCTION	BIFACE REDUCTION FLAKES	FINISHING FLAKES	FLAKE FRAGS.	IRREG./ SHATTER	OTHER	TOTAL
Gorge Creek 1 (All)	12 (0.4 %)	35 (1.1 %)	1716 (56.5 %)	12 (0.4 %)	635 (20.9 %)	625 (20.6 %)	0	3035
Gorge Creek 1 (Block 3)	1 (0.2 %)	5 (1.2 %)	189 (47 %)	1 (0.2 %)	7 (1.7 %)	199 (49.5 %)		402
Vergennes (Kingston)	3	188 (2.4 %)	2529 (32.6 %)	873 (11.3 %)	3526 (45.5 %)	630 (8.1 %)	1	7750
Vosburg (Kingston)	2	193 (2.9 %)	1742 (26.4 %)	661 (10 %)	3218 (48.7 %)	786 (11.9 %)	1	6603

On the presumption that the artifacts from the northeast portion of Gorge Creek 1 are mainly associated with an Orient phase occupation, one would expect the debitage to reflect a *chaine operatoire* resembling that observed in other Orient assemblages. Unfortunately, there are very few well-defined Orient assemblages to which this material can be compared. The Orient fishtail points at the Miller Field Site in northern New Jersey were made of chert, but few details about their manufacture were provided (Kraft 1970).

In contrast to Miller Field, the great majority of Orient fishtail points surface-collected from the Marshlands Conservancy in Rye, New York, were made of quartz, like most specimens from Long Island (Fiedel 1988). Because there was no stratigraphy, it is speculative to relate any of the preforms or debitage from the Marshlands to any of the points. Nevertheless, given the relative percentages of points of various types, it is likely that a comparably large proportion of the debitage relates to manufacture of fishtail-style projectile points. In any case many broken, incomplete preforms were recovered, which can be identified as fishtail-derived because of their shape and/or the presence of partially finished “tails” on the basal fragments. The quartz cobble was initially worked into a long ovoid, 8 to 10.5 centimeters long and 3 to 5.5 centimeters wide. The cortex was often left intact on one side, with unifacial flaking creating a central hump on the other face. Thickness of these first-stage blanks ranges from 2.5 to 3.5 centimeters. Early in the reduction process, the artisan began to shape the projecting ears of the fishtail base, presumably because the ears were the most delicate part of the point. If the preform tip snapped accidentally, the tip could be resharpened, although the resulting finished point would be shorter than planned; but if the basal ears broke, the preform would be irreparable. On one broken basal fragment the ears were already roughed out and the body was still 2.5 centimeters thick. On a few other preforms the delicate ears of the base were fully delineated but the blade and tip were only roughly chipped. Late-stage preforms seem to fall into two groups. Some were designed to produce a long point of about 6 to 7 centimeters, others to make shorter points, about 4.5 to 5.5 centimeters.

It is impossible to state whether this procedure was standard for point fishtail production regardless of the raw material or was specifically tailored to knapping quartz cobbles. Thousands of similar “turtleback” preforms were excavated at the Piney Branch quarry in Washington, D.C. (Holmes 1897), where they are presumed to date mainly from the Terminal Archaic. So, this may have been a culturally mandated manufacturing technique rooted deeply in the Savannah River complex from which the Orient culture was derived. On the other hand, it may simply have been an expedient way to reduce ovoid corticated cobbles.

Intermediate in time and stylistic evolution between Savannah River and Orient, Susquehanna and Perkiomen broadspears (ca. 3600 to 3200 rcbp) were almost never made of quartz or quartzite. The preferred materials for these points were rhyolite, chert, and jasper. From Virginia to northern New England, the production sequence for these broadspears was very uniform and entailed creation of a thin, flat, pentagonal late-stage preform (e.g., Fiedel and Galke 1996).

Two sites designated as 191-2-1 and 191-1-3 were identified near Hollister Lake in Athens during the Iroquois Pipeline survey in 1990 (Cassedy 1998; Cobb and Webb 1995). Site 191-1-3 was a quarry of Onondaga chert, and nearby Site

191-2-1 was interpreted as short-term encampment occupied during procurement trips to the quarry. A Normanskill point and the basal portion of an Orient fishtail were found at Sites 191-1-3. At Site 191-2-1 diagnostic artifacts indicated episodes of occupation in the Late Archaic, Terminal Archaic, early Woodland, and late Middle Woodland. In addition to 35 projectile points and 38 bifaces, 5,508 pieces of debitage were recovered and nine hearths were excavated. The diagnostic points included two Vosburg, 10 Sylvan Stemmed, one "Large Stemmed" (Snook Kill?), three Early Woodland points (Meadowood and Rossville), and four Levanna points. Lithic production at the Hollister Lake sites entailed both an expedient amorphous core technology and a formal biface core technology.

At another Iroquois Pipeline site in Athens, Site 193-2-2, the assemblage, made mostly of local Normanskill chert, was dominated by early- to middle-stage bifaces interpreted as preforms for Terminal Archaic Snook Kill and Perkiomen points. These preforms were 7 to 8 centimeters long and 3.5 to 4.5 centimeters wide (Cassedy 1998).
Returning to consideration of the Gorge Creek Site 1 assemblage, there was no evidence of either turtleback cores or incomplete fishtail-eared basal fragments in any of the excavation blocks. To completely reduce a turtleback core, decortication would have been necessary, but only 12 decortication flakes are present in the assemblage. Only one of these was found in Block 2, which was located in the northeast part of the site, where surface finds of Orient Fishtail points had been reported. The absence of turtlebacks and early-stage fishtail base fragments can be explained in various ways. They may all have been collected previously. The fishtail points may all have been made elsewhere, so that broken preforms were never produced here. Or, when working relatively tractable chert derived by flaking blocky cores, fishtail-makers may have used an entirely different procedure that did not entail making turtleback preforms.

Snyder (2016) was particularly interested in examining the stages of production of Meadowood cache blades in western New York. In addition to the surface scatters, he analyzed debitage from a few sealed features; one feature at the Renaissance House Site contained over 3,000 flakes, a fragment of a cache blade, and charcoal dated to 2840±30 rcbp. Another feature, from the Howard Ott 1 Site, could be assigned to a Meadowood occupation because it contained broken cache blades. Snyder measured 24 variable attributes of the debitage, although, based on knapping experiments (Williams and Andrefsky 2011) and archaeological analyses (Williams et al. 2013), he assumed that only six variables might be informative: maximum length, maximum width, platform width, platform thickness, maximum length/maximum width ratio, and platform width/platform thickness ratio. Snyder (2016:197) concluded that only platform width and, to a lesser extent, platform thickness were highly consistent between the two Meadowood feature assemblages and differentiated them from the undated but presumed Archaic assemblages from surface-collected sites. The mean platform width for the Meadowood flakes is about 5.9 millimeters. He was able tentatively to assign an otherwise undated debitage assemblage to the Meadowood phase because the graphed distribution of platform widths matched those of the known Meadowood sites.

For purposes of both intra-site (between blocks) and inter-site comparison, Louis Berger measured the platform widths of a randomly selected 10 percent sample of complete flakes from each of the four excavation blocks at Gorge Creek 1. The results are shown in Figures 10–21 and Table 7.

The data from Table 7 seem to indicate that the knappers responsible for the Block 4 assemblage were using narrower platforms for both large and small (less than 0.5 inch) flakes than those in the other three areas. The evident difference from the nearby Block 2 is surprising. In fact, as the histograms in Figures 10–21 illustrate, both the Block 2 and Block 4 assemblages are dominated by platforms in the range of 5 to 8 millimeters; they differ from Blocks 1 and 3 in that, in the latter flake assemblages, platform widths of 10 millimeters and more are common (Photograph 19). Only the patterns seen in Blocks 2 and 4 bear any resemblance to the Meadowood-specific platform width profiles presented by Snyder (2016), in which widths are typically 3 to 6 millimeters and rarely wider than 7 millimeters.

TABLE 7

PLATFORM WIDTHS (MILLIMETERS) OF WHOLE FLAKES SAMPLED FROM BLOCKS 1–4

BLOCK	ALL FLAKES, MEAN	ALL FLAKES, MEDIAN	FLAKES>0.5", MEAN	FLAKES >0.5", MEDIAN	FLAKES<0.5", MEAN	FLAKES<0.5", MEDIAN
1	9.72	9.18	10.64	9.2	8.87	8.09
2	8.02	6.47	10.22	9.81	6.55	6.29
3	8.67	8.4	10.42	9.5	7.76	8.1
4	6.91	6.43	7.88	7.34	6.38	5.63

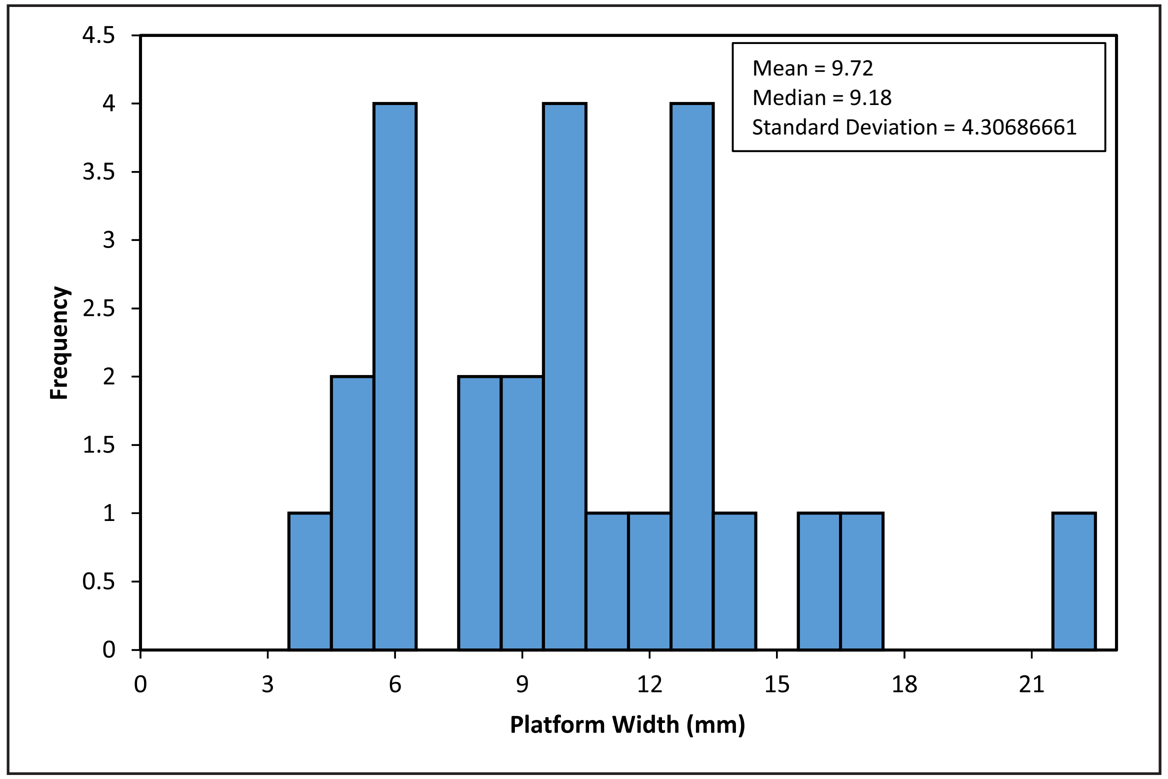


FIGURE 10: Block 1 Histogram, Biface Reduction Flake Platform Width (mm)

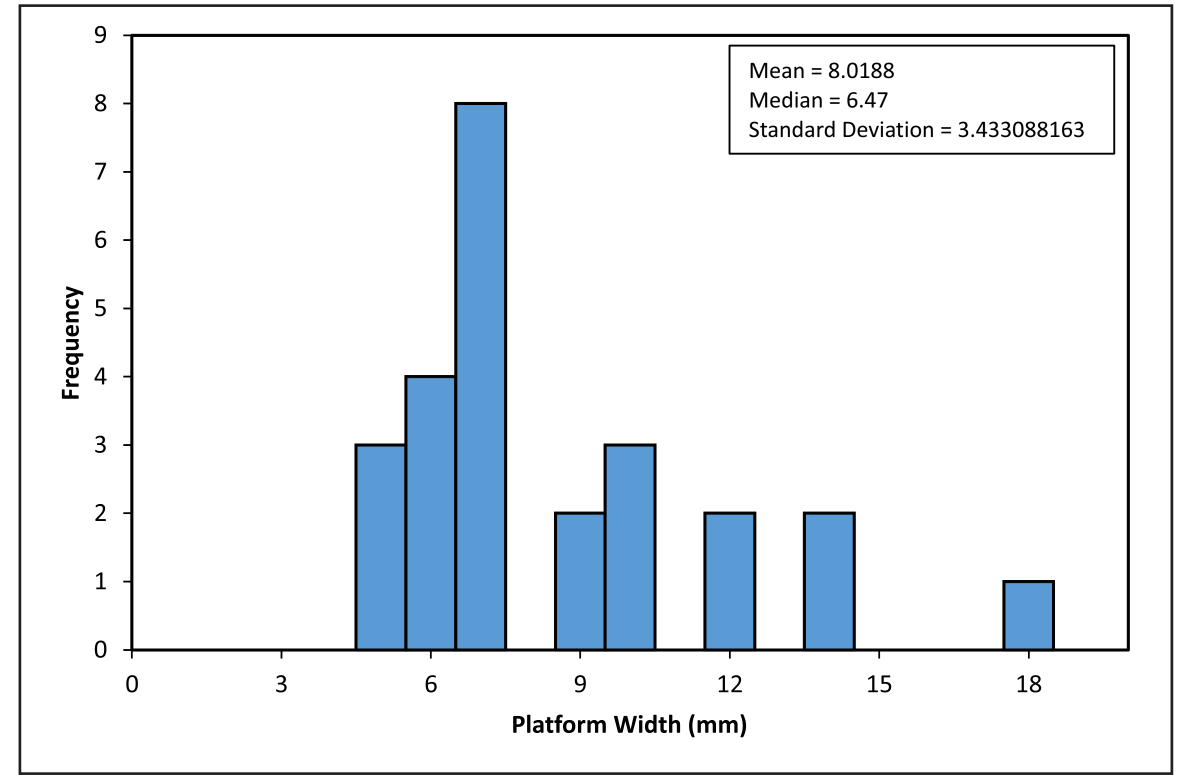


FIGURE 11: Block 2 Histogram, Biface Reduction Flake Platform Width (mm)

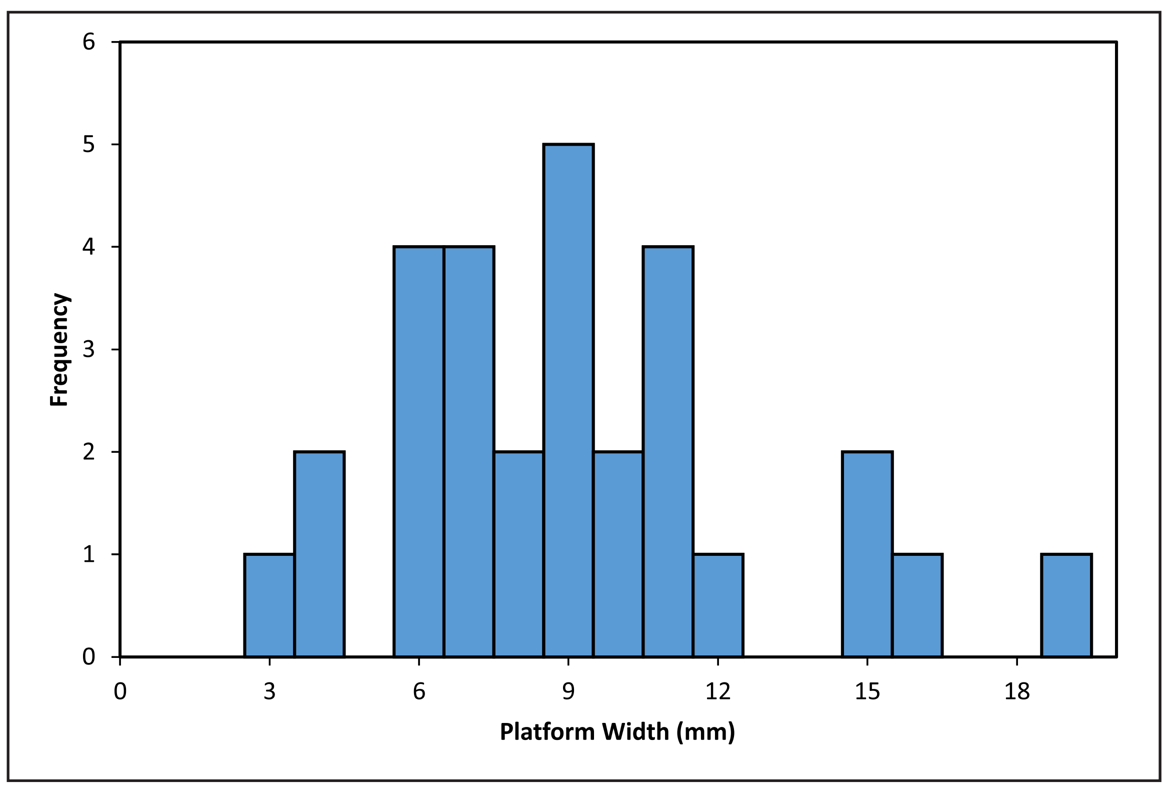


FIGURE 12: Block 3 Histogram, Biface Reduction Flake Platform Width (mm)

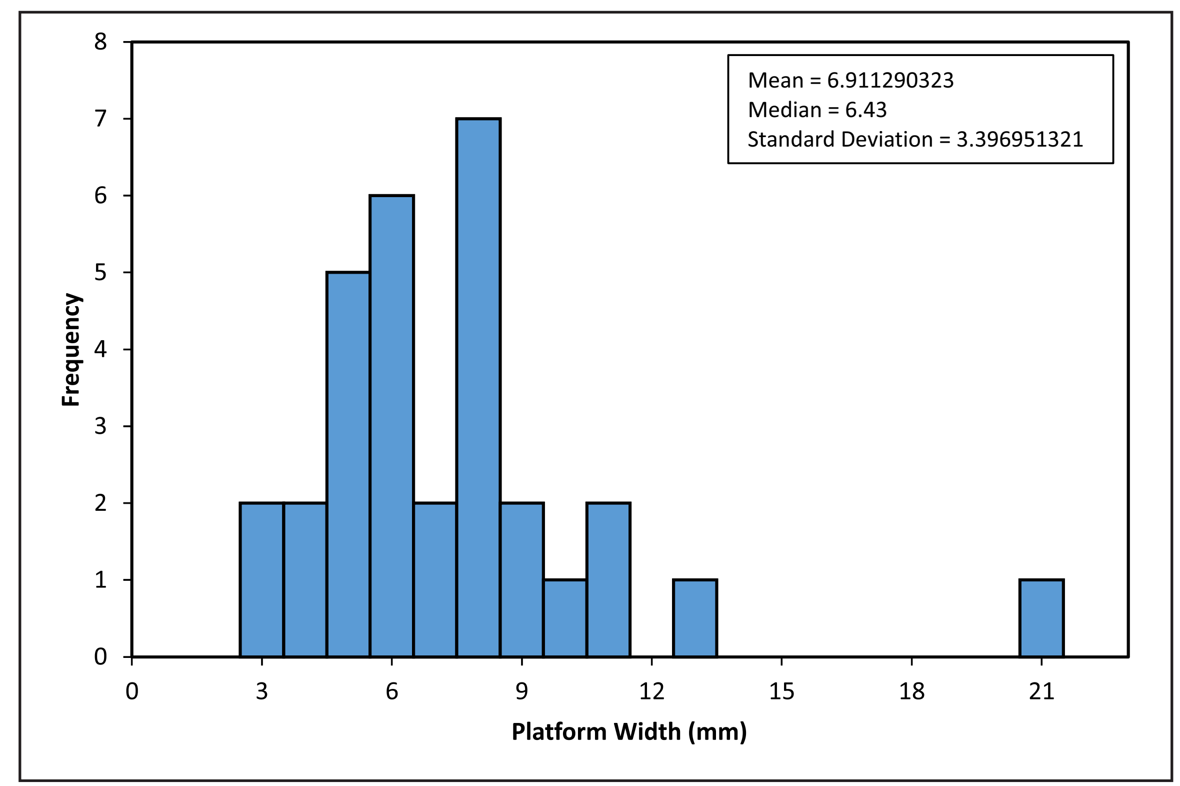


FIGURE 13: Block 4 Histogram, Biface Reduction Flake Platform Width (mm)

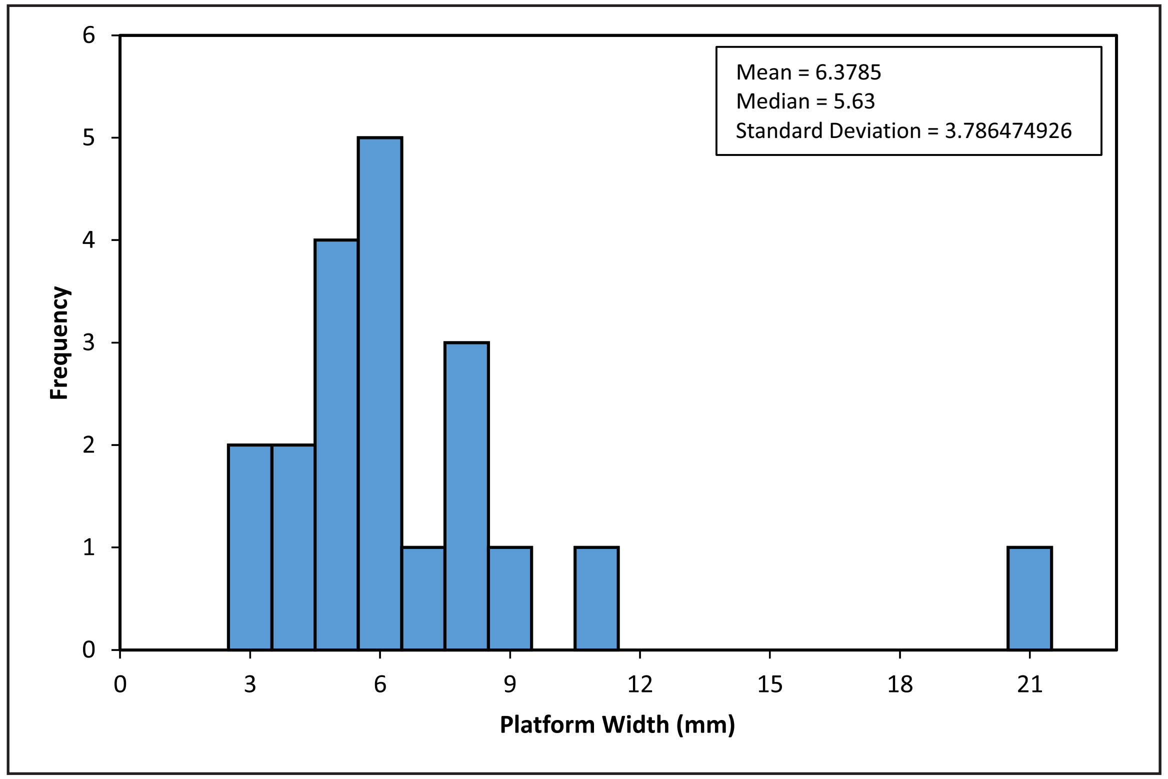


FIGURE 14: Block 1 Histogram, Biface Reduction Flake Platform Width (mm) Size <1/2"

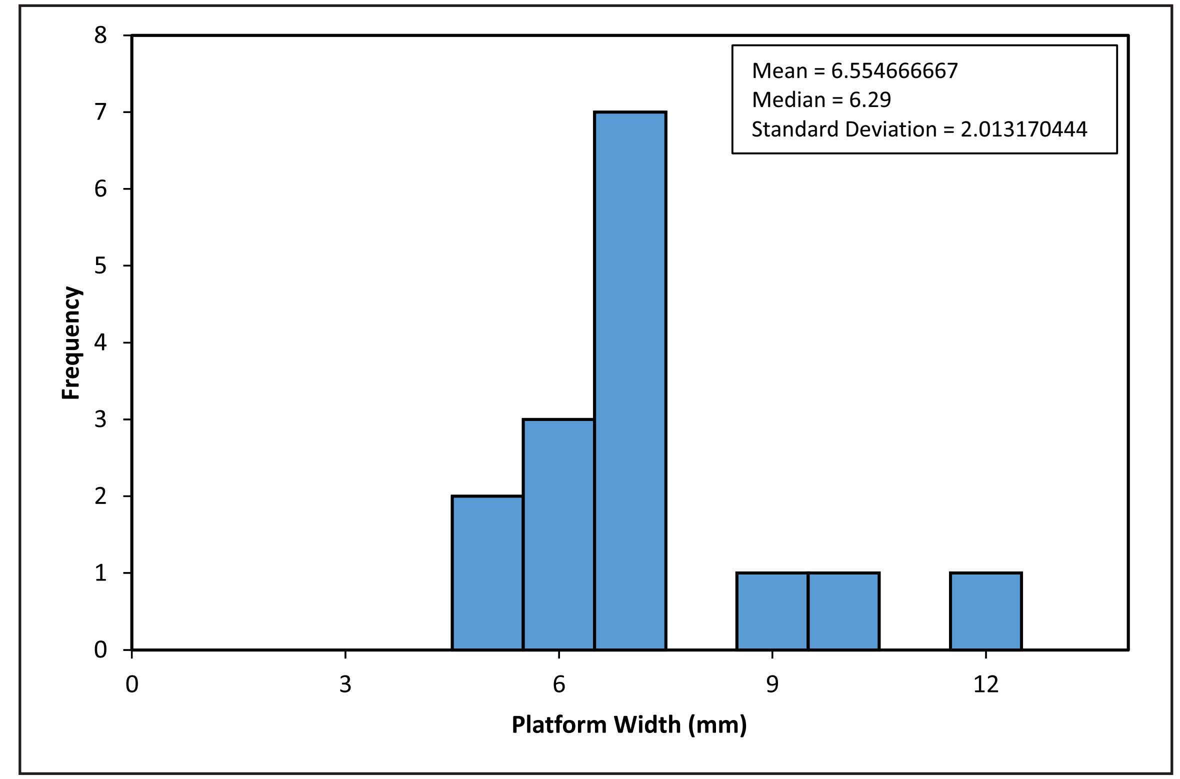


FIGURE 15: Block 2 Histogram, Biface Reduction Flake Platform Width (mm) Size <1/2"

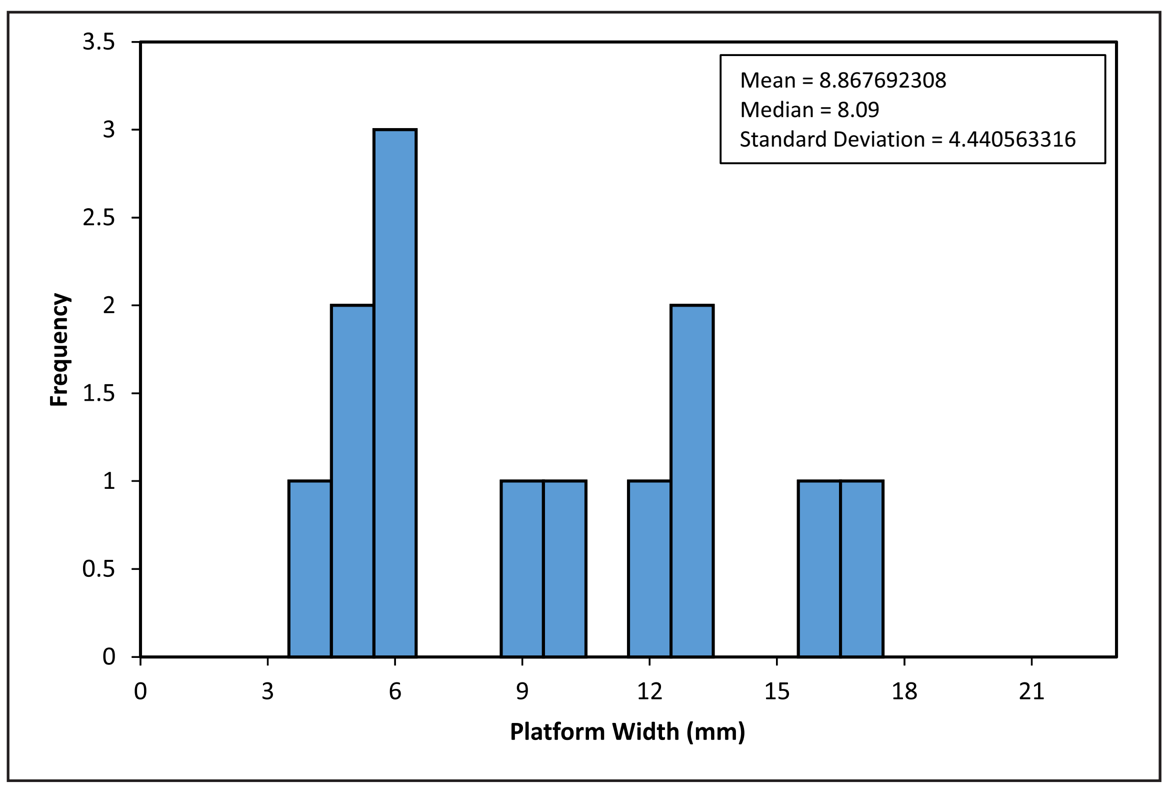


FIGURE 16: Block 3 Histogram, Biface Reduction Flake Platform Width (mm) Size <1/2"

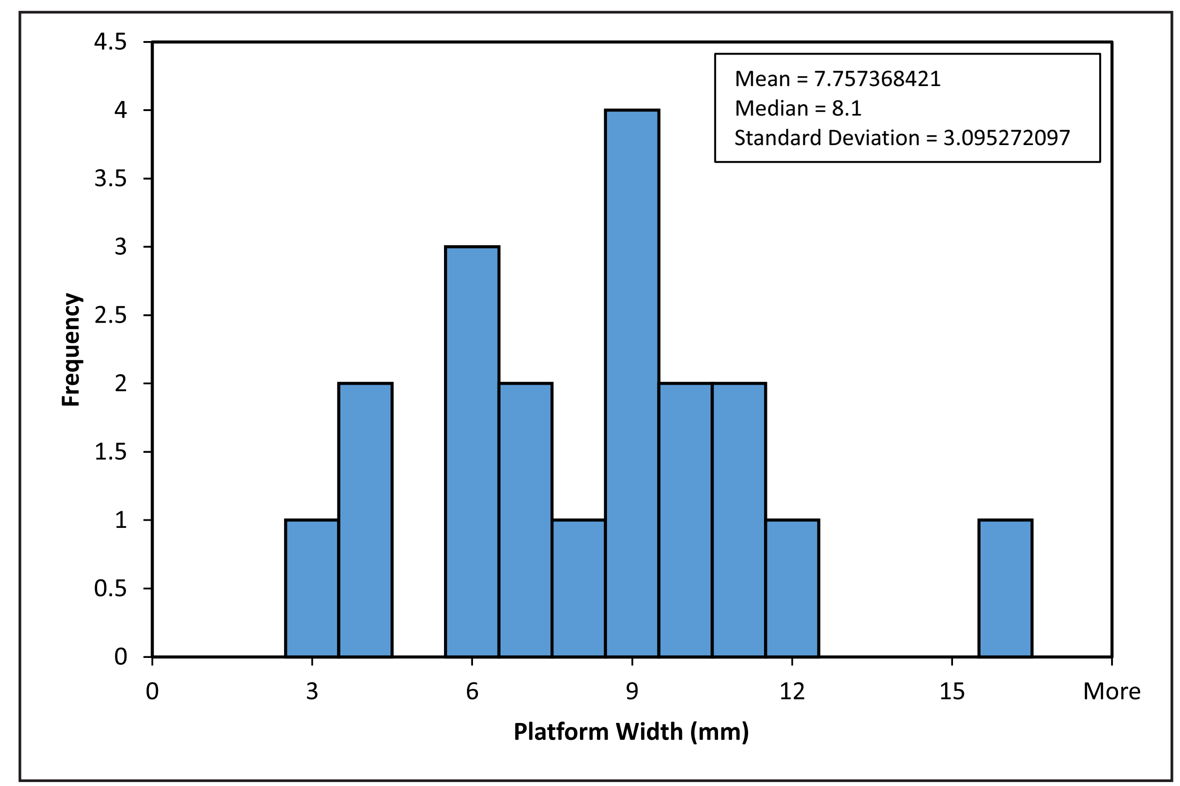


FIGURE 17: Block 4 Histogram, Biface Reduction Platform Width (mm) Size <1/2"

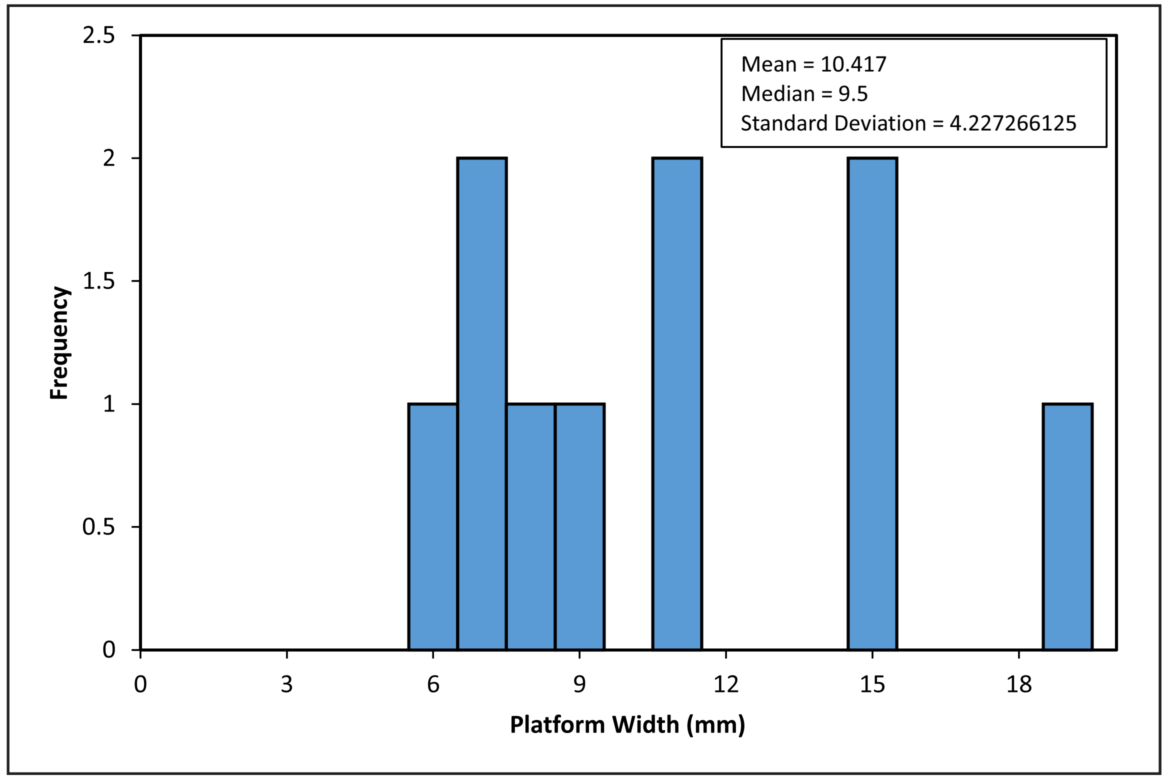


FIGURE 18: Block 1 Histogram, Biface Reduction Flake Platform Width (mm) Size >1/2"

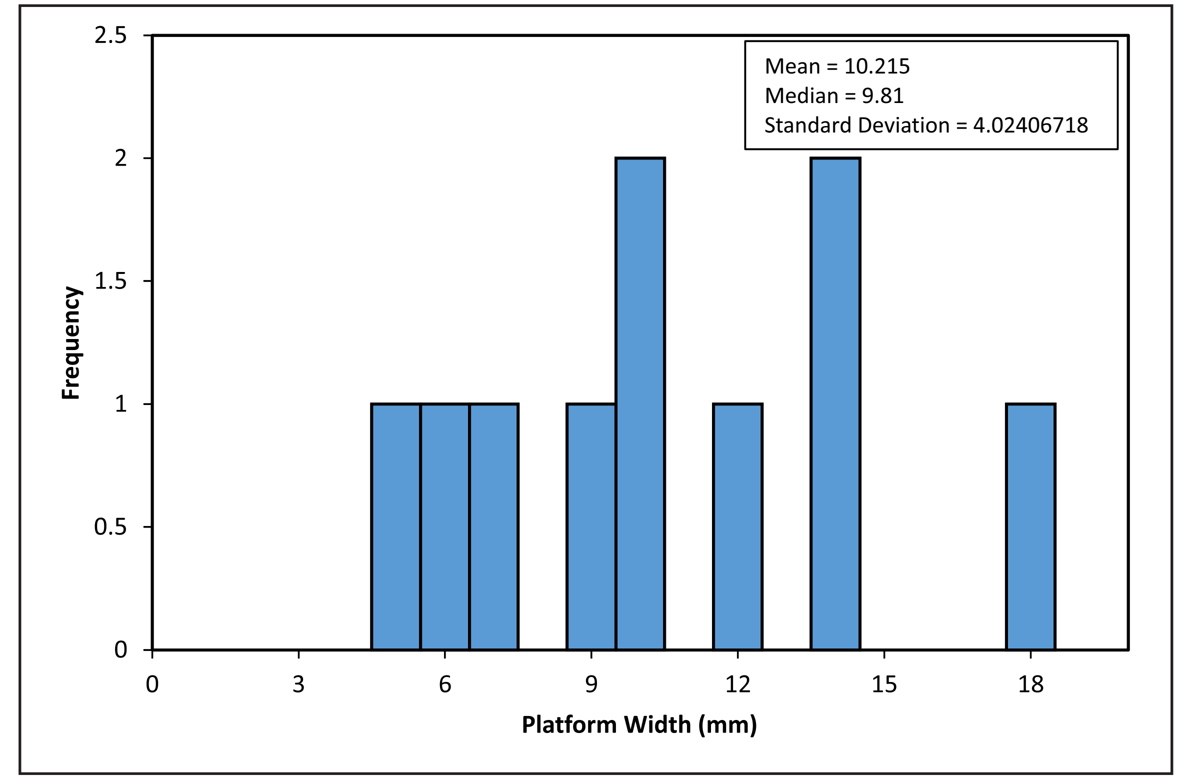


FIGURE 19: Block 2 Histogram, Biface Reduction Flake Platform Width (mm) Size >1/2"

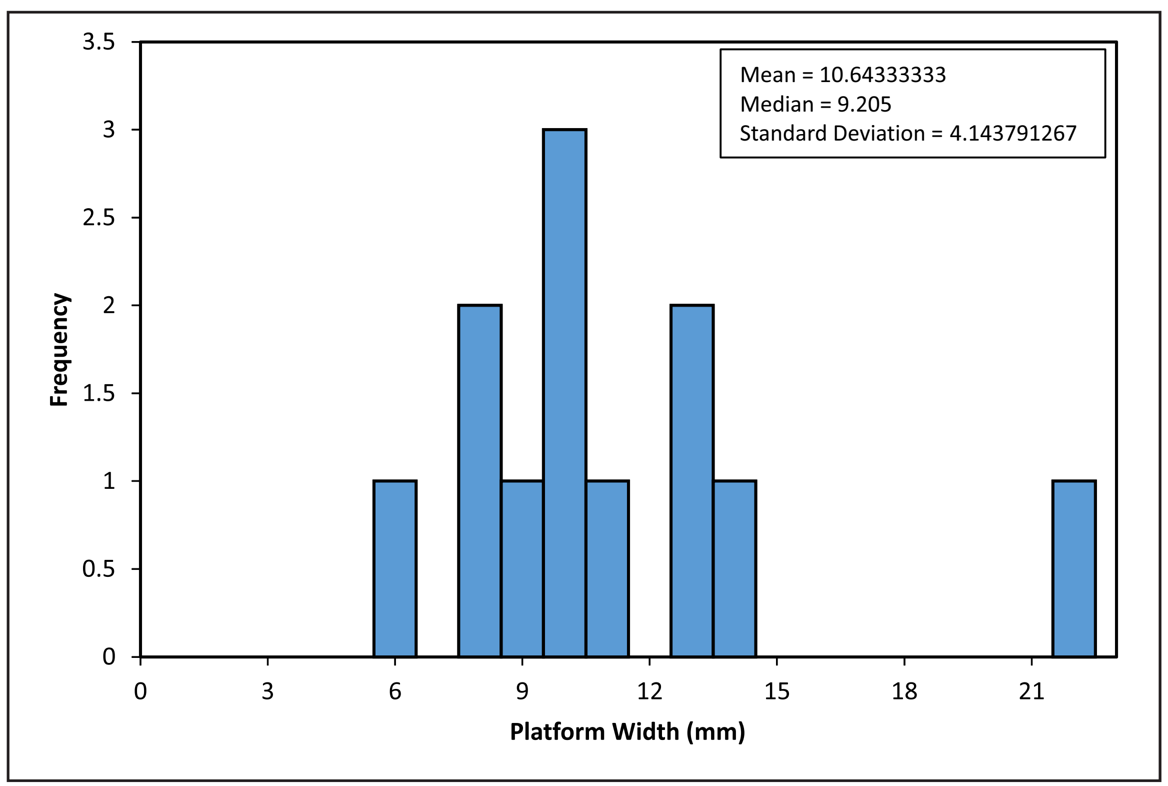


FIGURE 20: Block 3 Histogram, Biface Reduction Flake Platform Width (mm) Size >1/2"

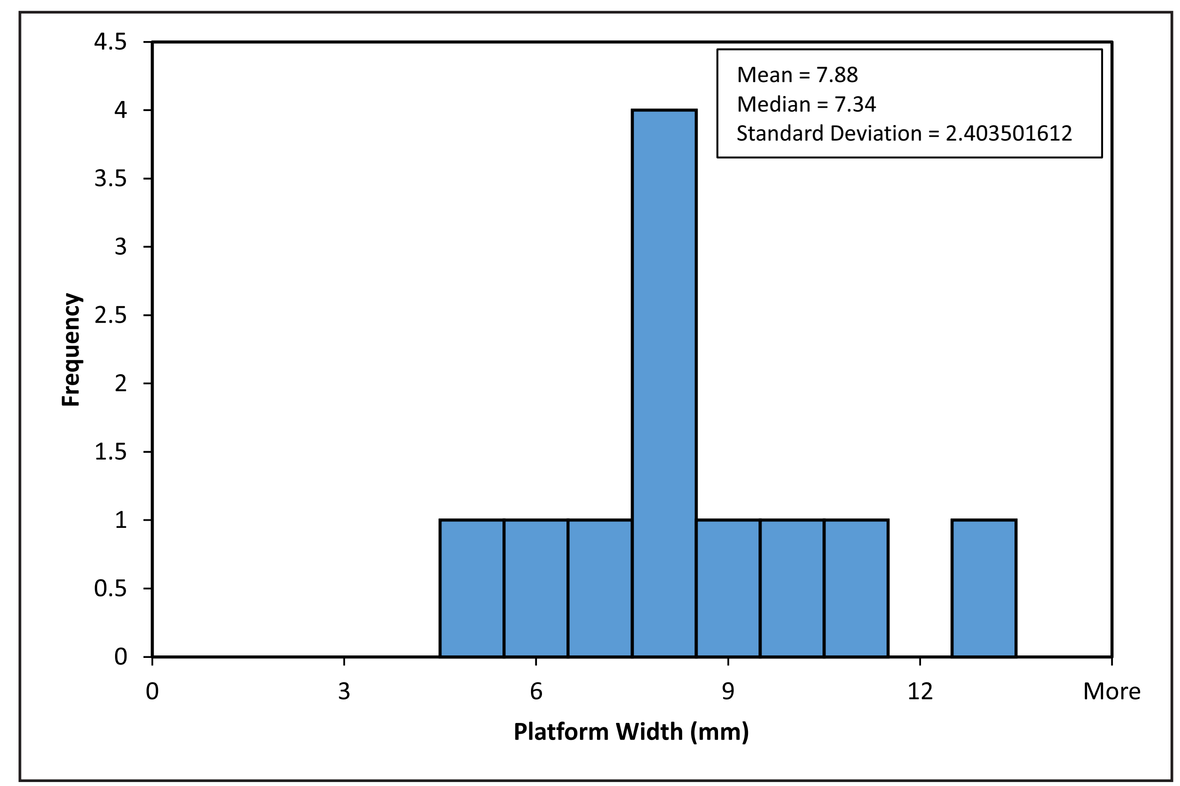
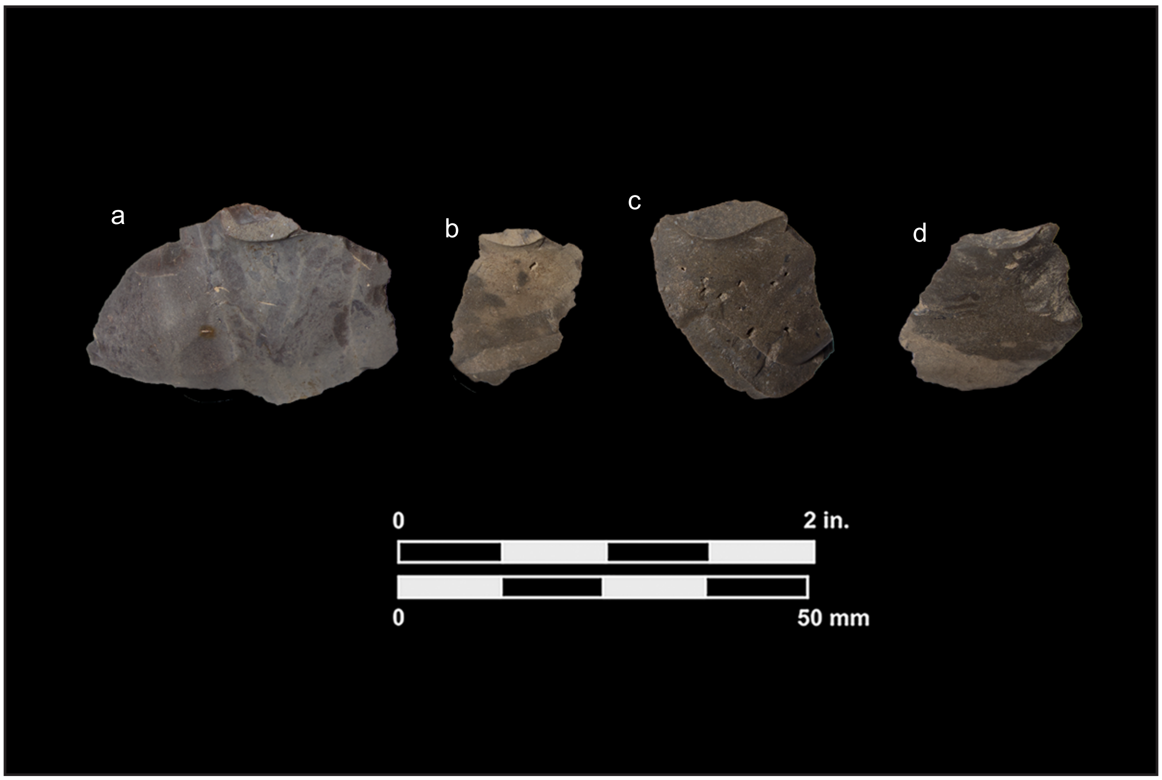


FIGURE 21: Block 4 Histogram, Biface Reduction Flake Platform Width (mm) Size >1/2"



PHOTOGRAPH 19: Platforms on Biface Reduction Flakes

(a) Block 1 (Field No. 109, Spec. No. 2)
(b) Block 2 (Field No. 123, Spec. No. 3)
(c) Block 3 (Field No. 166, Spec. No. 2)
(d) Block 4 (Field No. 178, Spec. No. 1)

VII. Summary and Conclusions

Louis Berger conducted Phase III archaeological data recovery excavations of the Gorge Creek Site 1 (09542.000116) April 26–June15, 2017. This prehistoric site had been deemed eligible for the National Register of Historic Places as a result of Phase I and II investigations by Landmark Archaeology, Inc. (Gade et al. 2016; Gade and Schreyer 2016). The site is located in the APE for the proposed Gorge Creek Culvert Repair and Storm Water Improvements (OPRHP No. 15PR06219) in the Village of Middleburgh, Schoharie County, New York. Louis Berger performed the work on behalf of the Housing Trust Fund Corporation.

Louis Berger manually excavated 36 square meters (388 square feet) arrayed in four blocks of nine units each. The placement of these excavation blocks was determined primarily by the quantities of artifacts reported from the Phase I and Phase II shovel tests and units. Block 1 was located between Phase II Units 2 and 4. Block 2 was placed south of Phase II Unit 11. Block 3 was located just north of Shovel Test 28-2, and Block 4 was placed west of Shovel Test 20-5.

After block excavation, the plowzone was mechanically stripped from 12 areas for a total exposure of 3,691 square meters (39,730 square feet). The exposed subsoil was generally very rocky. Several patches of red-stained, oxidized soil were evident, generally with associated charcoal. These patches were amorphous and did not appear to be of cultural origin. Nevertheless, three patches, designated as Features 3, 4, and 5, were sectioned to reveal their profiles. None proved to be prehistoric cultural features.

The block excavations produced 3,076 lithic artifacts. In addition, a small number of chert chunks (n=44) were collected that, upon closer laboratory inspection, proved not to be artifacts. Only a very small percentage of the artifacts (n= 37; just over 1 percent) are whole or fragmentary formed tools, preforms, or utilized flakes. Almost all of this material came from the plowzone. By far the greatest percentage of the lithic material is dark gray Onondaga chert with brownish overtones. A minority is a lighter gray with a bluish tendency. The only temporally diagnostic artifact recovered is the basal portion of a Brewerton Corner-notched point found at the base of the plowzone in the northeast part of Block 3. This type indicates an occupation of the site ca. 6000 to 5000 cal BP.

Lithic debitage, including all types of flakes created in the lithic reduction sequence, was counted and measured. Raw material type, lithic reduction stage (blocky shatter, decortication, early stage, biface reduction, thinning) and presence/absence of cortex were also recorded. Whole and broken flakes (lacking the original striking platform or termination) were distinguished. Contrary to results of previous investigations, utilized flakes constitute only a small fraction of the assemblage.

A spatial analysis sought to determine horizontal variation in the distribution of lithic tool types and debitage, focusing on any perceptible differences between the northeast area of the site (Blocks 2 and 4), putatively dominated by Orient phase materials based on a surface collection, and the central area (Blocks 1 and 3), where the Brewerton point was found. The data for each block were also compared to data from other assemblages from the Schoharie Creek drainage, the mid-Hudson, and western New York. The results appear to indicate subtle differences in lithic reduction activities in the northeast area from those in the central area. Informative variables for this purpose proved to be the percentages of biface thinning flakes and flake fragments and the platform widths of biface reduction flakes. Gorge Creek appears distinctive from other Schoharie Creek sites for its very high proportion of biface thinning flakes (56 percent). Narrower platform widths distinguish flakes in Blocks 2 and 4 from those in Blocks 1 and 3. However, no distinctive attributes allow identification of the artifacts from the northeast sector as Orient-associated.

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Appendix A

Methods of Artifact Cataloging and Analysis

METHODS OF ARTIFACT CATALOGING AND ANALYSIS

A. LABORATORY PROCESSING

All artifacts were transported from the field to the Louis Berger laboratory. In the field, artifacts were bagged in 4-mil, resealable polyethylene bags. Artifact cards bearing provenience information were included in the plastic bags. A Field Number was assigned to each unique provenience in the field. This number appears with all the provenience information and is used throughout processing and analysis to track artifacts.

Prehistoric lithics were washed in water with a soft toothbrush. Fragile artifacts were wet-brushed with a soft natural-bristle paintbrush or were simply dry-brushed. All artifacts were laid out to air-dry in preparation for analysis.

During analysis, individual Specimen Numbers were assigned to artifacts. After analysis, the artifacts were re-bagged into clean, perforated 4-mil resealable polyethylene bags. Artifacts are organized sequentially first by Site Number, then Field Number and finally by Specimen Number. Before submitting for curation, catalog numbers were assigned in accordance with curation facility guidelines. An acid-free artifact card listing full provenience information and analytical class was included in each bag. No conservation treatment on the artifacts was needed nor performed.

B. ANALYTICAL METHODS

All artifact analyses were conducted by the Laboratory Supervisor and/or Material Specialist(s). Louis Berger maintains an extensive comparative collection and laboratory research library to contribute to the completeness and accuracy of the analyses.

Louis Berger has developed a flexible analytical database system that fully integrates all artifacts in one database for use in data manipulation and interpretation. The computerized data management system is written using Microsoft Access, a relational database development package that runs on a Windows® platform. Each class of artifacts (lithics, historic ceramics, curved (vessel) glass, small finds/architectural, historic tobacco pipes, and faunal) has a series of attributes, sometimes unique to that class, that are recorded to describe each artifact under analysis. Artifact information (characteristics) was entered into the system during the process of analysis. The system was then used to enhance the artifact records with the addition of provenience information. Louis Berger maintains a complete type and attribute coding system maintained in the database.

The Notes field allows individual written comments applicable to a specific entry. In general notes are used to describe particulars of decorative motifs or unusual characteristics, or to record bibliographic references used for identification or dating.

C. LITHIC ARTIFACT ANALYSIS

The analytical approach to stone tool production and use that was used in this analysis can be described as technomorphological; that is, artifacts were grouped into general classes and then further divided into specific types based upon key morphological attributes, which are linked to or indicative of particular stone tool production (reduction) strategies. Function was inferred from morphology as well as from use wear. Data derived from experimental and ethnoarchaeological research were relied upon in the identification and interpretation of artifact types. The works of Callahan (1979), Clark (1986), Crabtree (1972), Flenniken (1981), Justice (1987), and Parry (1987) were drawn upon most heavily. All types were quantified by both count and weight (in grams). Each artifact type was separated by material first (Onondaga chert, Esopus chert, etc.), and then further grouped by size (< 0.5 inch or > 0.5 inch) and color (dark gray, 2.5Y 4/1 to 3/1; light gray, 2.5Y 5/1 or 6/1).

a. Debitage

Debitage is the byproduct of lithic reduction and includes all types of chipped-stone refuse that bear no obvious traces of having been utilized or intentionally modified. There are two basic forms of debitage: flakes and shatter. Observations on raw material and cortex were recorded. The following descriptions are for the debitage types identified, but not the full range of types described in Taylor et al. (1996).

Decortication Flakes are intact or nearly intact flakes with 50 percent or more cortex covering their dorsal surface. These are the first series of flakes detached during lithic reduction.

Early Reduction Flakes are intact or nearly intact flakes with less than 50 percent dorsal cortex, fewer than four dorsal flake scars, on the average, and irregularly shaped platforms with minimal faceting and lipping. Platform grinding is not always present. These flakes could have been detached from early-stage bifaces or cores of the freehand and bipolar types.

Biface Reduction Flakes are intact or nearly intact flakes with multiple overlapping dorsal flake scars and small elliptically shaped platforms with multiple facets. Evidence of platform grinding is usually present. Platforms are distinctive because they represent tiny slivers of what once was the edge of a biface. Biface reduction flakes are generated during the middle and late stages of biface reduction and also during biface maintenance (resharpening).

Pressure Flakes are made using a flaker. Because the force is applied by pressing and not striking, there are some morphological differences as compared with hard and soft hammer flakes. The platform is not a flat surface, but a slightly crushed edge. The edge grinding appears as the result of the edge preparation procedure.

Bipolar Reduction Flakes are intact or nearly intact flakes that have been struck from a bipolar core. They typically exhibit sheared cones, diffuse bulbs, closely spaced ripples, and crushed and splintered platforms. Crushing can also occur on the termination of flakes (distal end).

Finishing Flakes are small flakes, usually detached through pressure flaking, and are used to create the final cutting edge of the blade.

Resharpening Flakes are small, often rounded flakes that are usually detached through pressure flaking and exhibit evidence of prior use on the dorsal surface. These flakes are the byproduct of resharpening the blade edge for further use.

Uniface Resharpening Flakes are small J-shaped flakes that have been removed from the margins of a uniface. Their platforms often bear traces of use damage or polish.

Flake Fragments are sections of flakes that are too fragmentary to be assigned to a particular flake type.

Block Shatter refers to angular or blocky fragments that do not possess platforms or bulbs. Generally the result of uncontrolled fracturing along inclusions or internal fracture planes, block shatter is most frequently produced during the early reduction of cores and bifaces. Block shatter is also common in bipolar reduction, and it is equivalent to Binford and Quimby's (1963) "primary shatter." Thermal fracturing can also produce block shatter.

Flake Shatter refers to small, flat fragments or splinters that lack platforms, bulbs, and other obvious flake attributes. Flake shatter is generated throughout a reduction sequence but is most common in later stages. It is a common by-product of bipolar reduction, and it is equivalent to "secondary shatter" (Binford and Quimby 1963). Trampling of debitage on living surfaces also generates flake shatter, whereas thermal fracturing produces both flake and block shatter.

Other Flake Types are those types for which there is no Lithica (Taylor et al. 1996) designation. Their characteristics are described in the Notes field, as needed.

Indeterminate Flakes are flakes that cannot be assigned to a specific type because their surface has been damaged (e.g., pot lidding) or severely eroded (e.g., argillite debitage).

b. Cores

Cores are cobbles or blocks of raw material that have had one or more flakes detached and that have not been shaped into tools or used extensively for tasks other than as a nucleus from which flakes have been struck. The types of cores identified are listed below, but this does not represent the full range of types possible as discussed in Taylor et al. (1996).

Freehand Cores are blocks or cobbles that have had flakes detached in multiple directions by holding the core in one hand and striking it with a hammerstone held in the other (Crabtree 1972). This procedure generates flakes that can be used as expedient tools or can be worked into formalized tools. Freehand percussion cores come in various shapes and sizes, depending upon the raw material form and degree of reduction.

Bipolar Cores are blocks or cobbles that have had flakes detached by direct hard-hammer percussion on an anvil: the core is placed on the anvil and struck vertically with a hammerstone (Crabtree 1972; Hayden 1980). Cores typically take on a tabular shape, exhibit heavy crushing and battering, and flake scars tend to run between areas of crushing and battering. Bipolar cores are normally smaller than freehand cores because bipolar reduction is a technique for maximizing available raw materials. Most flakes that are detached are only suitable for expedient flake tools.

Bifacial cores are specific types of freehand, amorphous cores flaked on both sides, i.e., reduced along one or more bifacially prepared edges for the purpose of flake production. Flaking occurs on both sides of a nodule to fully exploit the material.

Flake cores are made from tubular large flakes usually flaked on one side, often with a defined flaking pattern. Some large early reduction flakes could have been used as flake cores to produce flake-based scrapers or perhaps burins.

Tested Cobbles are unmodified cobbles, blocks, or nodules that have had a few flakes detached to examine raw-material quality.

Other Core Types are cores that do not easily fit into existing types as for example, formalized blade cores. The Notes field is used to record important attributes.

c. Bifaces

A biface is a flake or cobble that has had multiple flakes removed from the dorsal and ventral surfaces. Bilateral symmetry and a lenticular cross section are common attributes; however, these attributes vary with the stages of production, as do thickness and uniformity of edges (see Callahan 1979). Included in this artifact class are all hafted and unhafted bifaces that functioned as projectile points and/or knives, as well as bifacially worked drill bits and unfinished bifaces. Specific types of bifaces represented in the collection are described below.

Projectile Points are finished bifaces that were usually hafted and functioned primarily as projectiles. Projectile points are usually triangular in overall form, with various types of hafting elements.

Knives are finished bifaces that were usually hafted and functioned primarily as cutting implements. Knives are characterized by one or more elongate cutting edges.

Finished Bifaces are finished bifaces that were probably hafted, but are too fragmentary or ambiguous to assign to a functional category (e.g., projectile point or knife).

Late-Stage Bifaces are basically finished bifaces; they are well thinned, symmetrical in outline and cross section, and edges are centered. Small areas of cortex may still exist on one or both faces. These bifacial preforms are analogous to Callahan’s Stage 4 bifaces (1979).

Middle-Stage Bifaces look more like bifaces; they have been initially thinned and shaped. A lenticular cross section is developing, but edges are sinuous, and patches of cortex may still remain on one or both faces. These bifaces are roughly equivalent to Callahan’s Stage 3 bifaces (1979). Biface reduction is a continuum; therefore, middle-stage bifaces are often difficult to distinguish from early- and late-stage bifaces, depending upon the point at which their reduction was halted. Rejected bifaces may have also been used for other tasks (recycled).

Early-Stage Bifaces are cobbles, blocks, or large flakes that have had their edges bifacially trimmed and a few large reduction flakes detached. These bifacial blanks are equivalent to Callahan’s Stage 2 bifaces (1979). Because of their crude condition, these bifaces can be confused with freehand percussion cores and choppers.

Choppers or cleavers are sizable bifaces that may have been employed in tasks that required heavy-duty cutting, chopping, or severing. These implements are often crudely formed and can be mistaken for cores or early-stage bifaces.

Drills are slender bifaces that could have been used to perforate or pierce various materials.

Adzes or gouges are bifaces that were hafted and used as heavy duty woodworking tools.

Other Bifaces are bifaces that do not easily fit into the above types. The Notes field is used to record distinctive attributes.

Indeterminate Bifaces are sections of bifaces that are too badly damaged to be assigned to a specific type.

d. Unifaces

A uniface is a formalized tool fashioned from a flake by uniformly retouching its edges to create a specific working edge and a standardized shape. There are two basic types of formal unifaces: endscrapers and sidescrapers. In the former, the working edge is transverse to the long axis of the tool; in the latter, the working edge (or edges) parallels the long axis of the tool.

Endscrapers are formalized unifaces that have uniformly retouched edges, which creates a working edge and a standardized shape. The working edge is transverse to the long axis of the tool, and retouching often erases obvious indications that the tool is made on a flake.

Sidescrapers are formalized unifaces that have uniformly retouched edges, which creates a working edge and a standardized shape. The working edge parallels the long axis of the tool, and retouching often erases obvious indications that the tool is made on a flake.

Other Uniface Types are unifaces that do not fit easily into existing types. The Notes field is used to record distinctive attributes.

Indeterminate Uniface Fragments are unifaces that are too fragmentary to be assigned to a specific type.

e. Flake Tools

Utilized and edge-retouched flakes are informal expedient tools. They are flakes that were struck from a core or a biface and used to perform one or more tasks, with little or no prior modification. In some cases, it is difficult to distinguish intentional retouch from use damage.

Utilized Flakes are expedient tools that exhibit traces of use damage and/or polish on one or more edges. These flakes could have been detached from cores or bifaces.

Retouched Flakes are expedient tools that have had one or more edges retouched, either to resharpen the working edge, to create a dulled edge for grasping, or to form a specific edge angle or shape. The flake itself could have been detached from a core or a biface.

Notched Flakes or spokeshaves are a special type of retouched flake. The retouching of one or more flake edges into a concavity distinguishes this morphological type.

Graver Flakes are a special type of retouched flake. The retouching of one or more edges into acute projections distinguishes this type.

Denticulated Flakes are a special type of retouched flake. They are distinctive because appropriately spaced flakes have been detached from one or more edges to form a toothed or serrated edge.

f. Cobble Tools

Alluvial cobbles or slabs of bedrock were used for various tasks, with little or no prior modification. These simple tools were used as hammers, anvils, grinding stones, abraders, or for a combination of functions. Battered, crushed, pitted, and/or smooth surfaces identify these stones as tools.

Netsinkers are notched cobbles. Direct hard hammer percussion was used to remove a few flakes from both ends of a cobble to facilitate the cobble's attachment to a net. Some specimens could have functioned as bolas stones.

Hammerstones are cobbles that show evidence of battering and crushing along their margins, indicating that they were intentionally used as percussors either for flaking siliceous materials or working other resistant materials.

Manos or grinding stones are hand-sized cobbles with one or more flat surfaces that were used to crush and grind various materials, as is evidenced by smoothed and polished surfaces.

Metates or grinding slabs are large cobbles or blocks of bedrock with one or two flat or concave surfaces, which exhibit evidence of grinding and crushing.

Pestles are linear (oblong) cobbles that exhibit crushing and smoothing on one or both ends or poles. Pestles can also be formalized tools that were shaped by pecking and grinding.

Mortars are large cobbles or blocks of bedrock with at least one deeply concave surface, which was used to hold various materials to be crushed and ground.

Pitted Cobbles or "nutting stones" are cobbles or blocks of bedrock with at least one smooth depression smaller than 4 centimeters in diameter. Unlike anvil depressions, these are smooth and tend to be circular or oval. These depressions may be the result of processing nuts, differing from anvil depressions created by bipolar lithic reduction.

Abraders are chunks of sandstone or related materials that were used to shape and sharpen tools made of various materials. Slotted abraders are believed to have been used in the manufacture and maintenance of bone and wood tools (e.g., needles, awls, shafts), and flat abraders are believed to have been used in the manufacture and maintenance of stone tools in addition to bone and wood tools.

Anvil Stones are cobbles or blocks of bedrock that were used as a base on which to rest materials while they were struck with a hammer. Anvil surfaces tend to possess shallow, coarse-textured depressions with amorphous outlines.

Other Cobble Tools are cobble tools that do not have pre-existing Lithica codes. A description of the specimen appears in the Notes field.

g. Groundstone Tools

Groundstone tools are formal stone tools and ornaments that were manufactured by pecking, grinding, and sometimes flaking. Typical artifact types are grooved axes, pipes, pendants, etc.

Stone Bowls are stone cooking vessels that were manufactured by carving, grinding, and polishing.

Grooved Axes are formal tools that were designed to be hafted, and their primary function was heavy duty woodworking.

Celts are ungrooved axes; they were hafted by a different method than grooved axes.

Adzes or gouges manufactured from granitic materials by pecking and grinding were hafted and functioned as heavy duty woodworking tools, much like their chipped stone tool counterparts.

Mauls are large, heavy-duty, round implements with a blunt bit and are most commonly associated with quarrying activities. Mauls are usually grooved and have defined polls. Mauls are often made from granite, diorite, basalt, or other hard stone. Ungrooved mauls are generally defined as hammerstones.

Other Groundstone Tools are those tools and ornaments that are not covered by the above types, for example, bannerstones, pipes, and pendants.

Indeterminate Groundstone Fragments are sections of groundstone tools or ornaments that are too badly damaged to be assigned to a specific type.

D. FLORAL ANALYSIS

The floral analysis identifies species, element, and any modifications to the specimen (e.g., Burning). Identifications were made with the aid of a comparative floral type collection and the use of reference materials, including Martin and Barkely (1961).

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Appendix B

Artifact Inventory

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	1	A	1	101	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	9	39.1	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	1	A	1	101	2	Lithics	Biface Reduction Flake	Light grey	> 1/2"	6	14.4	Light grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	1	A	1	101	3	Lithics	Biface Reduction Flake	Light grey/red	> 1/2"	1	5	Light grey with red mineral staining present Onondaga chert; cortex absent; platform and bulb of percussion present.
09542.0001	Block 1	1	A	1	101	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	30	19.3	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	1	A	1	101	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	7	5.4	Light gray Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	1	A	1	101	6	Lithics	Biface Reduction Flake	Bluish light grey	< 1/2"	1	0.7	Light bluish-gray chert with slight red mineral staining; cortex absent; platform and bulb of percussion present.
09542.0001	Block 1	1	A	1	101	7	Lithics	Finishing Flake	Dark grey	< 1/2"	4	0.3	Dark grey Onondaga chert; cortex absent; small, mostly complete flakes with platforms and/or bulbs of percussion present.
09542.0001	Block 1	1	A	1	101	8	Lithics	Flake Fragment	Dark grey	> 1/2"	1	2.1	Dark grey Onondaga chert; cortex absent; snapped/broken edges and ends.
09542.0001	Block 1	1	A	1	101	9	Lithics	Flake Fragment	Light grey	> 1/2"	3	3.5	Light grey Onondaga chert; cortex absent; broken/snapped ends and edges.
09542.0001	Block 1	1	A	1	101	10	Lithics	Flake Fragment	Dark grey	< 1/2"	26	14.3	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	1	A	1	101	11	Lithics	Flake Fragment	Light grey	< 1/2"	6	3.5	Light grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	1	A	1	101	12	Lithics	Flake Fragment	Light grey/red	< 1/2"	1	1	Light gray with red mineral staining Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	1	A	1	101	13	Lithics	Debitage / General	Dark grey	> 1/2"	3	30.2	Dark grey Onondaga chert; cortex absent; irregular forms.
09542.0001	Block 1	1	A	1	101	14	Lithics	Debitage / General	Dark grey	> 1/2"	2	75.3	Dark grey Onondaga chert; cortex present; one fragment with microfossils; irregular forms.
09542.0001	Block 1	1	B	2	102	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	6	2.4	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	1	B	2	102	2	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	1	1.4	Light grey with red mineral staining Onondaga chert; cortex absent; partial platform present.
09542.0001	Block 1	1	B	2	102	3	Lithics	Flake Fragment	Dark grey	< 1/2"	1	0.3	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	1	B	2	102	4	Lithics	Debitage / General	Dark grey	> 1/2"	2	11.1	Dark grey Onondaga chert; cortex absent; irregular/blocky forms.
09542.0001	Block 1	1	B	2	102	5	Lithics	Debitage / General	Dark grey	< 1/2"	5	4.2	Dark grey Onondaga chert; cortex absent; irregular forms.
09542.0001	Block 1	1	B	2	102	6	Lithics	Debitage / General	Dark grey	< 1/2"	4	3.3	Dark grey Onondaga chert; cortex present; irregular forms.
09542.0001	Block 1	2	A	1	103	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	16	69.4	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	2	A	1	103	2	Lithics	Biface Reduction Flake	Light grey	> 1/2"	5	14.7	Light grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	2	A	1	103	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	30	15.1	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	2	A	1	103	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	4	2.4	Light grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	2	A	1	103	5	Lithics	Flake Fragment	Dark grey	> 1/2"	7	12.6	Dark grey Onondaga cher; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	2	A	1	103	6	Lithics	Flake Fragment	Dark grey	< 1/2"	59	31	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	2	A	1	103	7	Lithics	Flake Fragment	Light grey	< 1/2"	2	1.8	Light grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	2	A	1	103	8	Lithics	Debitage / General	Dark grey	> 1/2"	4	19.9	Dark grey Onondaga chert; cortex absent; irregular forms.
09542.0001	Block 1	2	A	1	103	9	Lithics	Debitage / General	Dark grey	< 1/2"	10	11.9	Dark grey Onondaga chert; cortex absent; irregular forms.
09542.0001	Block 1	2	A	1	103	10	Lithics	Debitage / General	Dark grey	> 1/2"	5	56.1	Dark grey Onondaga chert; cortex present; irregular and blocky forms.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	3	A	1	104	1	Lithics	Flake Tool / General	Dark grey	> 1/2"	1	7.7	Onondaga chert, broad, flat flake bifacially worked along two edges, with pronounced bulbs of percussion, one long edge snapped/broken.
09542.0001	Block 1	3	A	1	104	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	20	50	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	3	A	1	104	3	Lithics	Biface Reduction Flake	Light grey	> 1/2"	7	26.4	Light gray Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	3	A	1	104	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	53	23.1	Dark gray Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	3	A	1	104	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	5	4.5	Light gray Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	3	A	1	104	6	Lithics	Flake Fragment	Light grey	> 1/2"	3	4	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	3	A	1	104	7	Lithics	Flake Fragment	Dark grey	< 1/2"	55	26.5	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	3	A	1	104	8	Lithics	Flake Fragment	light grey	< 1/2"	16	7.5	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	3	A	1	104	9	Lithics	Debitage / General	Dark grey	< 1/2"	12	14	Dark grey Onondaga chert, cortex absent; irregular forms.
09542.0001	Block 1	3	A	1	104	10	Lithics	Debitage / General	Dark grey	< 1/2"	7	7.6	Onondaga chert; cortex present, heating absent; irregular forms.
09542.0001	Block 1	3	A	1	104	11	Lithics	Debitage / General	Dark grey/red	< 1/2"	1	4.7	Onondaga chert, dark grey with red staining; cortex absent; one possible platform present; blocky, irregular form.
09542.0001	Block 1	4	A	1	105	1	Lithics	Utilized Flake	Dark grey	> 1/2"	2	17.1	Onondaga chert; cortex absent, heating absent; broad, flat flakes with probable retouching along edges.
09542.0001	Block 1	4	A	1	105	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	6	20.4	Onondaga chert; cortex absent, heating absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	4	A	1	105	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	18	9.1	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	4	A	1	105	4	Lithics	Biface Reduction Flake	Light grey	> 1/2"	6	24.3	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	4	A	1	105	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	7	3.9	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	4	A	1	105	6	Lithics	Flake Fragment	Dark grey	> 1/2"	2	4.2	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	4	A	1	105	7	Lithics	Flake Fragment	Dark grey	< 1/2"	22	9.1	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	4	A	1	105	8	Lithics	Flake Fragment	Light grey	< 1/2"	4	2.3	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	4	A	1	105	9	Lithics	Debitage / General	Dark grey	< 1/2"	3	12.1	Onondaga chert; cortex absent, heating absent; irregular forms.
09542.0001	Block 1	4	A	1	105	10	Lithics	Debitage / General	Dark grey	< 1/2"	1	3.6	Onondaga chert; cortex present, heating absent; irregular form.
09542.0001	Block 1	4	B	2	106	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	0.3	Onondaga chert, grey; no heating, no cortex; flaking scars on dorsal surface
09542.0001	Block 1	4	B	2	106	2	Lithics	Debitage / General	Dark grey	> 1/2"	1	6.8	Onondaga chert, mottled dark grey; no heating, no cortex; blocky
09542.0001	Block 1	4	B	2	106	3	Lithics	Debitage / General	Light grey	< 1/2"	1	0.5	Grey/brown Onondaga chert; cortex on platform
09542.0001	Block 1	4	B	2	106	4	Lithics	Debitage / General	Dark grey	< 1/2"	8	4.4	Grey Onondaga chert; impurities present; blocky fragments
09542.0001	Block 1	5	A	1	107	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	13	49.2	Dark grey Onondaga chert; cortex absent; bulb present with platform
09542.0001	Block 1	5	A	1	107	2	Lithics	Biface Reduction Flake	Light grey	> 1/2"	12	25.9	Light grey Onondaga chert; contex absent; bulb present
09542.0001	Block 1	5	A	1	107	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	44	25.5	Dark grey mottled; Onondaga chert, no cortex, bulb present
09542.0001	Block 1	5	A	1	107	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	17	10.1	Onondaga chert; cortex absent; bulb present; mottled
09542.0001	Block 1	5	A	1	107	5	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	3	2.8	Light grey Onondaga chert, mottled with red; no cortex, bulb present

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	5	A	1	107	6	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.1	Very small whole reduction flake; bulb present; Onondaga chert
09542.0001	Block 1	5	A	1	107	7	Lithics	Flake Fragment	Dark grey	< 1/2"	13	8.7	Small Onondaga fragments; bulb absent
09542.0001	Block 1	5	A	1	107	8	Lithics	Flake Fragment	Light grey	< 1/2"	4	0.7	Very small Onondaga fragments; mottled; bulb absent
09542.0001	Block 1	5	A	1	107	9	Lithics	Debitage / General	Dark grey/purpl	> 1/2"	1	27.4	Large, block fragment; impurities present; mottled dark grey and purple; heating indeterminate
09542.0001	Block 1	5	A	1	107	10	Lithics	Debitage / General	Dark grey	> 1/2"	4	14	Blocky fragments; no cortex
09542.0001	Block 1	5	A	1	107	11	Lithics	Debitage / General	Dark grey	< 1/2"	10	3.9	Small blocky fragment; possible shatter; dark grey mottling
09542.0001	Block 1	5	B	2	108	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	0.4	Onondaga grey chert; bulb present; no heating; no cortex
09542.0001	Block 1	5	B	2	108	2	Lithics	Debitage / General	Dark grey	< 1/2"	3	2.4	Onondaga grey chert; blocky fragments; no heating, no cortex
09542.0001	Block 1	6	A	1	109	1	Lithics	Decortication Flake	Dark grey	> 1/2"	1	6.3	Cortex on dorsal surface; no heating, grey Onondaga chert
09542.0001	Block 1	6	A	1	109	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	16	72.5	Onondaga chert; no heating present, no cortex; large reduction fragments with bulb of percussion
09542.0001	Block 1	6	A	1	109	3	Lithics	Biface Reduction Flake	Light grey	> 1/2"	16	79.5	Onondaga chert; no heating present, no cortex; large reduction fragments with bulb of percussion
09542.0001	Block 1	6	A	1	109	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	36	17.7	Onondaga chert; no heating, cortex absent; bulb present
09542.0001	Block 1	6	A	1	109	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	16	10.4	Onondaga chert; no heating, no cortex; bulb present
09542.0001	Block 1	6	A	1	109	6	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	2	3.8	Onondaga chert, dark grey, red mottling; no cortext; bulb present
09542.0001	Block 1	6	A	1	109	7	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.2	Onondaga chert; dark grey, whole flake with bulb and dorsal scars
09542.0001	Block 1	6	A	1	109	8	Lithics	Flake Fragment	Dark grey	< 1/2"	18	8	Onondaga chert; no heating, no cortex; snapped fragments

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	6	A	1	109	9	Lithics	Flake Fragment	Light grey	< 1/2"	11	5.4	Onondaga chert; no heating, no cortex; snapped fragments
09542.0001	Block 1	6	A	1	109	10	Lithics	Debitage / General	Dark grey	> 1/2"	3	13.8	Mottled chert fragments; cortex present; blocky
09542.0001	Block 1	6	A	1	109	11	Lithics	Debitage / General	Dark grey	> 1/2"	6	27.7	Blocky chert fragments; cortex absent; fragments
09542.0001	Block 1	6	A	1	109	12	Lithics	Debitage / General	Dark grey	< 1/2"	43	23.8	Small fragments; cortex absent
09542.0001	Block 1	6	B	2	110	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	0.9	Dark grey Onondaga chert; no cortex; bulb peresent
09542.0001	Block 1	6	B	2	110	2	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.6	Dark grey Onondaga chert; snapped; no cortex; no bulb present
09542.0001	Block 1	6	B	2	110	3	Lithics	Flake Fragment	Light grey	< 1/2"	1	1	Light grey Onondaga chert; snapped proximal, no bulb; flaking scars on dorsal surface
09542.0001	Block 1	6	B	2	110	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	1.4	Blocky Onondaga chert; no cortex; small fragments; possibly natural (non-cultural)
09542.0001	Block 1	6	B	2	110	5	Lithics	Debitage / General	Light grey/red	> 1/2"	1	1.6	Spalled Onondaga chert fragment; interior reddish, exterior light grey
09542.0001	Block 1	7	A	1	111	1	Lithics	Decortication Flake	Dark grey	> 1/2"	1	2.8	Cortex present on dorsal surface; bulb present; Onondaga chert mottled
09542.0001	Block 1	7	A	1	111	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	15	59.5	Mottled Onondaga chert no cortex present; bulb present; large fragments
09542.0001	Block 1	7	A	1	111	3	Lithics	Biface Reduction Flake	Light grey	> 1/2"	12	32.8	Light grey Onondaga chert; no cortex, bulb present
09542.0001	Block 1	7	A	1	111	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	42	31.5	Dark grey Onondaga; no cortex, bulb present; mottled
09542.0001	Block 1	7	A	1	111	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	19	10.2	Light grey chert fragments; no cortex, bulb present
09542.0001	Block 1	7	A	1	111	6	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	1	1.1	Light grey with red mottling; no cortex, bulb present; snapped distal
09542.0001	Block 1	7	A	1	111	7	Lithics	Flake Fragment	Dark grey	< 1/2"	11	2.9	Snapped fragments; no bulb present; no cortex; Onondaga chert

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	7	A	1	111	8	Lithics	Flake Fragment	Light grey	< 1/2"	3	1.6	Mottled Onondaga chert; no bulb present; snapped fragments
09542.0001	Block 1	7	A	1	111	9	Lithics	Debitage / General	Dark grey	< 1/2"	15	14.6	Mottled debitage fragments; blocky, no cortex
09542.0001	Block 1	7	B	2	112	1	Lithics	Flake Fragment	Light grey	< 1/2"	1	0.5	Unmottled Onondaga chert; flake scars present; snapped end
09542.0001	Block 1	7	B	2	112	2	Lithics	Debitage / General	Bluish grey	< 1/2"	1	0.5	Blocky fragments; Chert; no cortex present; waxy texture
09542.0001	Block 1	8	A	1	113	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	18	49	Large Onondaga chert flakes; bulb present; no cortex; mottled
09542.0001	Block 1	8	A	1	113	2	Lithics	Biface Reduction Flake	Light grey	> 1/2"	11	24.3	Light grey Onondaga flakes; no cortex, bulb present
09542.0001	Block 1	8	A	1	113	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	27	21.2	Dark grey mottled Onondaga, no cortex; bulb present
09542.0001	Block 1	8	A	1	113	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	23	12.7	Light grey Onondaga; no cortex present; bulb present
09542.0001	Block 1	8	A	1	113	5	Lithics	Biface Reduction Flake	Black	< 1/2"	1	0.7	Esposus chert; no cortex, impurity present; bulb present
09542.0001	Block 1	8	A	1	113	6	Lithics	Flake Fragment	Dark grey	< 1/2"	54	15.5	Fragments; no cortex; no bulb, snapped; small; Onondaga
09542.0001	Block 1	8	A	1	113	7	Lithics	Flake Fragment	Light grey	< 1/2"	15	6.3	Small fragments; no cortex; no bulb, snapped; Onondaga chert
09542.0001	Block 1	8	A	1	113	8	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.1	Small; no cortex, whole with bulb; Dark grey and brown Onondaga chert
09542.0001	Block 1	8	A	1	113	9	Lithics	Debitage / General	Dark grey	> 1/2'	8	77.5	Onondaga chert; cortex present; large blocky fragments with impurites
09542.0001	Block 1	8	A	1	113	10	Lithics	Debitage / General	Dark grey	< 1/2"	34	28.4	Onondaga mottled chert, mostly dark grey; blocky fragments; no cortex
09542.0001	Block 1	8	A	1	113	11	Lithics	Debitage / General	Bluish grey	< 1/2"	1	0.4	Chert blocky fragment; waxy texture; no cortex present
09542.0001	Block 1	8	B	2	114	1	Lithics	Flake Fragment	Dark grey	< 1/2"	1	0.3	Onondaga chert; cortex absent, heating absent; snapped ends.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	8	B	2	114	2	Lithics	Debitage / General	Dark grey	< 1/2"	2	0.7	Onondaga chert; cortex absent, heating absent; irregular forms.
09542.0001	Block 1	9	A	1	115	1	Lithics	Core / General	Dark grey	> 1/2"	1	21	Dark grey Onondaga chert with small amount of cortex present; prominent platform and flaking scars; probable core fragment.
09542.0001	Block 1	9	A	1	115	2	Lithics	Decortication Flake	Dark grey	> 1/2"	1	4.6	Dark grey Onondaga chert with cortex present; platform and bulb of percussion present.
09542.0001	Block 1	9	A	1	115	3	Lithics	Decortication Flake	Dark grey	< 1/2"	1	0.6	Dark grey Onondaga chert with cortex present; platform and bulb of percussion present.
09542.0001	Block 1	9	A	1	115	4	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	20	56.8	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	9	A	1	115	5	Lithics	Biface Reduction Flake	Light grey	> 1/2"	4	10.8	Light grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	9	A	1	115	6	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	8.8	Dark grey and dark olive-grey mottled with possible microfossils, Onondaga variant; cortex absent; partial bulb of percussion present.
09542.0001	Block 1	9	A	1	115	7	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	39	22.4	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	9	A	1	115	8	Lithics	Biface Reduction Flake	Light grey	< 1/2"	8	7.8	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	9	A	1	115	9	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	1	1.3	Reddish dark grey Onondaga chert with cortex absent; platform present.
09542.0001	Block 1	9	A	1	115	10	Lithics	Flake Fragment	Dark grey	> 1/2"	8	16	Dark grey Onondaga chert; cortex absent; snapped and/or broken ends.
09542.0001	Block 1	9	A	1	115	11	Lithics	Flake Fragment	Dark grey	< 1/2"	64	29.4	Dark grey Onondaga chert, cortex missing; snapped/broken ends and edges.
09542.0001	Block 1	9	A	1	115	12	Lithics	Flake Fragment	Light grey	< 1/2"	4	3.6	Light grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	9	A	1	115	13	Lithics	Debitage / General	Dark grey	> 1/2"	3	15.3	Dark grey Onondaga chert; cortex absent; fragmentary, irregular forms.
09542.0001	Block 1	9	A	1	115	14	Lithics	Debitage / General	Dark grey	< 1/2"	13	35.2	Grey Onondaga chert; cortex absent; irregular forms.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	9	B	2	116	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	0.6	Dark grey to grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	9	B	2	116	2	Lithics	Flake Fragment	Dark grey	< 1/2"	1	0.8	Dark grey Onondaga chert; cortex absent; snapped/broken ends.
09542.0001	Block 1	9	B	2	116	3	Lithics	Debitage / General	Dark grey	< 1/2"	2	4	Dark grey Onondaga chert, cortex absent, irregular forms.
09542.0001	Block 1	9	B	2	116	4	Lithics	Debitage / General	Dark grey	< 1/2"	1	1.9	Light grey, possible Onondaga chert; heating absent, small amount of cortex present; irregular form.
09542.0001	Block 2	10	A	1	117	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	6	24.1	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 2	10	A	1	117	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	17	11.5	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 2	10	A	1	117	3	Lithics	Flake Fragment	Dark grey	< 1/2"	15	6.3	Dark grey Onondaga chert; cortex absent; broken ends/snapped edges.
09542.0001	Block 2	10	A	1	117	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	4.3	Dark grey to grey chert, possible Onondaga; corte absent; irregular forms.
09542.0001	Block 2	10	A	1	117	5	Lithics	Debitage / General	Dark grey	> 1/2"	2	32.1	Dark grey Onondaga chert; small amount of cortex on both fragments; irregular forms.
09542.0001	Block 2	10	B	2	118	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	1.5	Dark grey Onondaga chert; cortex absent; platform and bulb of percussion present.
09542.0001	Block 2	10	B	2	118	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	3	0.7	Dark grey Onondaga chert; cortex absent; platform and bulb of percussion present.
09542.0001	Block 2	10	B	2	118	3	Lithics	Flake Fragment	Dark grey	< 1/2"	4	1.7	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 2	11	A	1	119	1	Lithics	Biface / General	Dark grey	> 1/2"	1	2.9	Dark grey Onondaga chert; cortex absent; fragment includes partial edge.
09542.0001	Block 2	11	A	1	119	2	Lithics	Flake Tool / General	Dark grey	> 1/2"	2	7.7	Dark grey Onondaga chert; cortex absent; possible working of edge present on both; possible utlized flakes/non-specific flake tools.
09542.0001	Block 2	11	A	1	119	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	6	20.4	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 2	11	A	1	119	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	23	9.7	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 2	11	A	1	119	5	Lithics	Flake Fragment	Dark grey	> 1/2"	1	1.8	Dark grey Onondaga chert; cortex absent; borken/snapped ends.
09542.0001	Block 2	11	A	1	119	6	Lithics	Flake Fragment	Dark grey	< 1/2"	18	8.3	Dark grey Onondagaa chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 2	11	B	2	120	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	12	5.9	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 2	12	A	1	121	1	Lithics	Early Reduction Flake	Dark grey	> 1/2'	1	7.2	Onondaga chert; cortex present; bulb present; early reduction fragment
09542.0001	Block 2	12	A	1	121	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	6	20.8	Dark grey Onondaga chert; cortex absent; flake scars on dorsal surface; large fragments
09542.0001	Block 2	12	A	1	121	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	1	3.3	Rough texture chert; not Onondaga; flake scars on dorsal surface
09542.0001	Block 2	12	A	1	121	4	Lithics	Biface Reduction Flake	Light grey	> 1/2'	1	1.9	Light grey Onondaga chert; bulb present; no cortex
09542.0001	Block 2	12	A	1	121	5	Lithics	Early Reduction Flake	Dark grey	< 1/2"	4	6.7	Dark grey early reduction flakes; cortex present on platform
09542.0001	Block 2	12	A	1	121	6	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	35	18.1	Dark grey Onondaga chert; bulb present; no cortex
09542.0001	Block 2	12	A	1	121	7	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	1.4	Light grey with bluish tint; Onondaga chert; no cortex; fragment
09542.0001	Block 2	12	A	1	121	8	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	0.1	Onondaga fragment; translucent waxy texture; no cortex present
09542.0001	Block 2	12	A	1	121	9	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.2	Onondaga chert; whole; no cortex; bulb present
09542.0001	Block 2	12	A	1	121	10	Lithics	Flake Fragment	Dark grey	< 1/2"	4	0.4	Onondaga chert, small fragments; snapped ends; no cortex present
09542.0001	Block 2	12	A	1	121	11	Lithics	Debitage / General	Dark grey	< 1/2"	10	7.8	Onondaga chert; blocky fragments; no cortex present
09542.0001	Block 2	12	A	1	121	12	Lithics	Shatter	Dark grey	> 1/2'	2	104.7	Onondaga chert; no cortex present; possibly unmodified

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 2	12	A	1	121	13	Lithics	Early-Stage Biface	Dark grey/Light	> 1/2'	1	19.2	Onondaga chert, mottled; biface fragment, tip only; snapped mid-shaft
09542.0001	Block 2	12	B	2	122	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	8	2	Dark grey Onondaga chert; no cortex, bulb present; small fragments
09542.0001	Block 2	12	B	2	122	2	Lithics	Debitage / General	Dark grey	< 1/2"	5	2.5	Dark grey Onondaga chert; blocky fragments; small; no cortex
09542.0001	Block 2	12	B	2	122	3	Lithics	Core / General	Dark grey	> 1/2'	1	14.4	Dark grey Onondaga chert; cortex present; multiple striking platforms present; whole
09542.0001	Block 2	13	A	1	123	1	Lithics	Decortication Flake	Dark grey	> 1/2'	1	4.6	Dark grey Onondaga chert; cortex fragment; rough texture
09542.0001	Block 2	13	A	1	123	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	7	29.6	Dark grey Onondaga chert with brown mottling; no cortex; large fragments, bulb present
09542.0001	Block 2	13	A	1	123	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	20	11.4	Dark grey Onondaga chert with brown mottlings; no cortex; bulb present
09542.0001	Block 2	13	A	1	123	4	Lithics	Non-Cultural	Dark grey		11	32.4	Dark grey chert; Onondaga; blocky fragments with worn smooth edges
09542.0001	Block 2	13	B	2	124	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	1.1	Dark grey Onondaga chert; bulb present; no cortex
09542.0001	Block 2	13	B	2	124	2	Lithics	Shatter	Dark grey	< 1/2"	1	0.8	Blocky shatter fragment; no cortex present; small
09542.0001	Block 2	14	A	1	125	1	Lithics	Early Reduction Flake	Dark grey	< 1/2"	1	0.5	Small fragment; cortex present on dorsal surface; Onondaga chert
09542.0001	Block 2	14	A	1	125	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	8	30	Onondaga chert; no cortex present; bulb present; mottled
09542.0001	Block 2	14	A	1	125	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	30	10.5	Onondaga chert; no cortex, small fragment; bulb present
09542.0001	Block 2	14	A	1	125	4	Lithics	Flake Fragment	Dark grey	< 1/2"	4	1.5	Onondaga chert; fragments; snapped; no bulb present; no cortex
09542.0001	Block 2	14	A	1	125	5	Lithics	Debitage / General	Dark grey	< 1/2"	8	12	Onondaga chert; blocky fragments; no cortex present
09542.0001	Block 2	14	B	2	126	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	0.3	Onondaga chert; small fragment; no cortex

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 2	14	B	2	126	2	Lithics	Debitage / General	Dark grey	< 1/2"	3	3.8	Onondaga chert; small fragment; no cortex; blocky fragments
09542.0001	Block 2	15	A	1	127	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	1	2.2	Onondaga chert; no cortex present; bulb present
09542.0001	Block 2	15	A	1	127	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	43	14.3	Onondaga chert; no cortex, bulb presence; small
09542.0001	Block 2	15	A	1	127	3	Lithics	Flake Fragment	Dark grey	< 1/2"	6	1.5	Onondaga chert; no cortex, no bulb presence; small fragments
09542.0001	Block 2	15	A	1	127	4	Lithics	Debitage / General	Dark grey	> 1/2'	1	24.1	Onondaga chert; cortex present; large fragment
09542.0001	Block 2	15	A	1	127	5	Lithics	Debitage / General	Dark grey	< 1/2"	16	9.3	Onondaga chert; no cortex, small debitage fragments; blocky
09542.0001	Block 2	15	A	1	127	6	Lithics	Debitage / General	Dark grey/red	< 1/2"	2	0.4	Onondaga chert with red tint; no cortex; small fragments
09542.0001	Block 2	15	A	1	127	7	Lithics	Utilized Flake	Dark grey	> 1/2'	1	4	Onondaga chert flake tool; large biface reduction flake with edge micro pressure flaking present; no cortex
09542.0001	Block 2	15	A	1	127	8	Lithics	Non-Cultural	Dark grey		4	14	Chert fragments; smoothed edges
09542.0001	Block 2	15	B	2	128	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	7	2.2	Onondaga fragments; no cortex present; small fragments
09542.0001	Block 2	16	A	1	129	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	6	20	Onondaga chert fragments; no cortex, bulb present; large flake fragments
09542.0001	Block 2	16	A	1	129	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	35	12	Onondaga chert fragments; no cortex, bulb presence; small
09542.0001	Block 2	16	A	1	129	3	Lithics	Debitage / General	Dark grey	> 1/2'	2	12.8	Onondaga chert debitage; blocky fragments; no cortex present
09542.0001	Block 2	16	A	1	129	4	Lithics	Debitage / General	Dark grey	< 1/2"	12	10.5	Onondaga chert fragments; no cortex; blocky; small
09542.0001	Block 2	16	A	1	129	5	Lithics	Debitage / General	Light grey/red	< 1/2"	3	1.8	Chert fragments; block; no cortex present; light grey to pinkish, waxy texture
09542.0001	Block 2	16	B	2	130	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	0.4	Onondaga chert fragments; bulb present, snapped distal end; no cortex

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 2	16	B	2	130	2	Lithics	Flake Fragment	Dark grey	< 1/2"	1	0.7	Onondaga chert fragment; no bulb, contex absent
09542.0001	Block 2	16	B	2	130	3	Lithics	Flake Fragment	Light grey	< 1/2"	1	0.5	Onondaga chert fragment; no bulb, contex absent
09542.0001	Block 2	16	B	2	130	4	Lithics	Debitage / General	Light grey	< 1/2"	1	0.3	Small fragments; cortex absent
09542.0001	Block 2	17	A	1	131	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	2	3.3	Onondaga chert fragments; no cortex present, bulb present
09542.0001	Block 2	17	A	1	131	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	26	11.4	Onondaga chert fragments; no cortex present, bulb present
09542.0001	Block 2	17	A	1	131	3	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	2	1.5	Onondaga chert; no cortex present, bulb present; reddish mottling
09542.0001	Block 2	17	A	1	131	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	1	Waxy chert flake; whole; no cortex, bulb present
09542.0001	Block 2	17	A	1	131	5	Lithics	Debitage / General	Dark grey	> 1/2"	4	46.6	Onondaga chert, no cortex, large debitage fragments
09542.0001	Block 2	17	A	1	131	6	Lithics	Debitage / General	Dark grey	< 1/2"	12	11.6	Onondaga chert, no cortex, small blocky fragments
09542.0001	Block 2	17	B	2	132	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	3	1.8	Onondaga chert; snapped fragments, bulb present; no cortex
09542.0001	Block 2	17	B	2	132	2	Lithics	Debitage / General	Dark grey	> 1/2"	2	21	Onondaga chert; large blocky fragments; no cortex present
09542.0001	Block 2	17	B	2	132	3	Lithics	Debitage / General	Dark grey	< 1/2"	5	6.7	Onondaga chert; small blocky fragments; no cortex present
09542.0001	Block 2	18	A	1	133	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	25	8.4	Onondaga chert flake; no cortex, bulb present; small
09542.0001	Block 2	18	A	1	133	2	Lithics	Flake Fragment	Dark grey	> 1/2"	1	3.1	2.5Y 3/1 Onondaga chert flake; rough texture, no cortex, no bulb
09542.0001	Block 2	18	A	1	133	3	Lithics	Flake Fragment	Dark grey	> 1/2"	2	3.7	2.5Y 4/1 Onondaga chert flake; snapped both ends; no cortex present
09542.0001	Block 2	18	A	1	133	4	Lithics	Flake Fragment	Dark grey	< 1/2"	5	0.7	Onondaga chert fragments; snapped ends; no bulb present; no cortex

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 2	18	A	1	133	5	Lithics	Debitage / General	Dark grey	> 1/2"	4	65.5	Onondaga chert fragments; large, blocky; cortex present
09542.0001	Block 2	18	A	1	133	6	Lithics	Debitage / General	Dark grey	< 1/2"	5	5.1	Small Onondaga chert fragments; blocky; cortex present
09542.0001	Block 2	18	B	2	134	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	6	1.7	Small Onondaga chert flakes; bulb present; no cortex
09542.0001	Block 3	19	A	1	135	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	5.4	Onondaga chert; no cortex, bulb present; mottled
09542.0001	Block 3	19	A	1	135	2	Lithics	Flake Fragment	Light grey	< 1/2"	1	0.7	Onondaga chert; no cortex, snapped ends
09542.0001	Block 3	19	A	1	135	3	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.1	Small Onondaga chert flake; bulb present, no cortex, whole
09542.0001	Block 3	19	A	1	135	4	Lithics	Debitage / General	Dark grey	> 1/2"	1	98.2	Large blocky Onondaga chert fragment; cortex present; possible core?
09542.0001	Block 3	19	A	1	135	5	Lithics	Debitage / General	Dark grey	< 1/2"	4	13.6	Blocky Onondaga chert fragments; no cortex
09542.0001	Block 3	19	B	2	136	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	3	2.3	Onondaga chert fragments; no cortex, bulb present
09542.0001	Block 3	19	B	2	136	2	Lithics	Biface Reduction Flake	Light grey	< 1/2"	2	2.4	Onondaga chert fragments; no cortex, bulb present
09542.0001	Block 3	19	B	3	137	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	2	Onondaga chert fragments; no cortex, bulb present; small
09542.0001	Block 3	19	B	3	137	2	Lithics	Debitage / General	Dark grey	< 1/2"	1	0.4	Onondaga chert fragment; no cortex, blocky fragment
09542.0001	Block 3	19	C	4	138	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	0.5	Onondaga chert fragment; cortex present, bulb present
09542.0001	Block 3	19	C	4	138	2	Lithics	Flake Fragment	Dark grey	< 1/2"	1	1.5	Onondaga chert fragment, snapped; no cortex, no bulb present; flaking scars on dorsal surface
09542.0001	Block 3	20	A	1	139	1	Lithics	Early Reduction Flake	Dark grey	< 1/2"	2	2.4	Onondaga chert fragment; cortex present; bulb present
09542.0001	Block 3	20	A	1	139	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	8.1	Onondaga chert, large flake; cortex absent; bulb present

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	20	A	1	139	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	9	6.5	Onondaga chert, cortex absent; bulb present
09542.0001	Block 3	20	A	1	139	4	Lithics	Biface Reduction Flake	Light grey	> 1/2"	2	5.4	Onondaga chert; no cortex, bulb present
09542.0001	Block 3	20	A	1	139	5	Lithics	Flake Fragment	Light grey	< 1/2"	1	0.5	Green Siltstone fragment; small
09542.0001	Block 3	20	A	1	139	6	Lithics	Debitage / General	Dark grey	< 1/2"	10	7	Onondaga chert fragments; blocky; no cortex present
09542.0001	Block 3	20	B	2	140	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	7.1	Onondaga chert; large flake; cortex absent; bulb present
09542.0001	Block 3	20	B	2	140	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	4	4.1	Onondaga chert fragments; cortex absent; bulb present
09542.0001	Block 3	20	B	2	140	3	Lithics	Debitage / General	Dark grey	< 1/2"	3	3.1	Onondaga chert fragments; blocky, cortex absent
09542.0001	Block 3	20	B	2	140	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	3.4	Onondaga chert fragments; blocky, cortex present
09542.0001	Block 3	20	B	2	140	5	Lithics	Debitage / General	Dark grey	> 1/2"	1	5.5	Onondaga chert fragment; blocky shatter; cortex absent
09542.0001	Block 3	20	B	2	140	6	Lithics	Debitage / General	Dark grey	> 1/2"	1	42.1	Onondaga chert blocky fragment; cortex present; possible multiple striking platforms present, core?
09542.0001	Block 3	20	B	3	141	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	9.7	Onondaga chert flake; large; cortex absent; bulb present; mottled; flake scars on dorsal surface
09542.0001	Block 3	20	B	3	141	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	0.3	Onondaga chert; small flake; cortex absent; bulb present
09542.0001	Block 3	20	B	3	141	3	Lithics	Debitage / General	Dark grey	> 1/2"	4	54.2	Onondaga chert, blocky fragments; cortex absent
09542.0001	Block 3	20	B	3	141	4	Lithics	Debitage / General	Dark grey	< 1/2"	8	9.6	Onondaga chert, small blocky fragments; cortex absent
09542.0001	Block 3	20	B	3	141	5	Lithics	Debitage / General	Light grey	> 1/2"	2	8.2	Unknown cortex fragments; rough texture
09542.0001	Block 3	20	B	3	141	6	Floral	Charcoal			1	0.2	Small charcoal sample

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	20	C	4	142	7	Lithics	Debitage / General	Dark grey	< 1/2"	3	6.7	Onondaga chert, blocky fragments; bulb and cortex absent
09542.0001	Block 3	21	A	1	143	1	Lithics	Early Reduction Flake	Dark grey	< 1/2"	1	4.4	Onondaga chert, flake with bulb of percussion, cortex present
09542.0001	Block 3	21	A	1	143	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	4	10.9	Onondaga chert; cortex absent, bulb present
09542.0001	Block 3	21	A	1	143	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	13	9.2	Onondaga chert; cortex absent, bulb present; small fragments
09542.0001	Block 3	21	A	1	143	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	4	3.5	Onondaga chert; contex absent, bulb present; light grey rough texture
09542.0001	Block 3	21	A	1	143	5	Lithics	Debitage / General	Dark grey	< 1/2"	6	5.8	Small Onondaga chert fragments; blocky
09542.0001	Block 3	21	B	2	144	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	17	11.3	Small Onondaga chert fragments; cortex absent; bulb presence
09542.0001	Block 3	21	B	2	144	2	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	1.1	Onondaga chert fragment, 2.5Y 5/1; almost no mottling, light grey rough material; cortex absent, bulb present
09542.0001	Block 3	21	B	2	144	3	Lithics	Debitage / General	Dark grey	< 1/2"	3	3	Onondaga fragments; no cortex present
09542.0001	Block 3	21	B	2	144	4	Lithics	Debitage / General	Dark grey	> 1/2"	3	30.5	Onondaga chert, cortex present; blocky fragments
09542.0001	Block 3	21	B	2	144	5	Lithics	Projectile Point	Dark grey		1	6.2	Onondaga chert, base and body portion; straight base, corner-notched, straight sides; thin
09542.0001	Block 3	21	B	3	145	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	0.6	Onondaga chert fragments; small; no cortex, bulb present
09542.0001	Block 3	21	B	3	145	2	Lithics	Debitage / General	Dark grey	< 1/2"	7	7.2	Blocky Onondaga chert fragments; no cortex present
09542.0001	Block 3	21	C	4	146	1	Lithics	Debitage / General	Dark grey	< 1/2"	2	3.1	Possible debitage; rounded, blocky fragments; cortex absent; Onondaga chert
09542.0001	Block 3	22	A	1	147	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	1.5	Onondaga chert, small fragments; bulb present, cortex absent
09542.0001	Block 3	22	A	1	147	2	Lithics	Biface Reduction Flake	Light grey	> 1/2"	1	3.4	Onondaga chert, mottled; bulb present, cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	22	A	1	147	3	Lithics	Debitage / General	Light grey	> 1/2"	1	6.6	Onondaga chert; blocky shatter fragment; cortex absent
09542.0001	Block 3	22	A	1	147	4	Lithics	Debitage / General	Dark grey	< 1/2"	12	13.2	Blocky debitage fragments; cortex absent; Onondaga chert
09542.0001	Block 3	22	B	2	148	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	2.6	Onondaga chert, 2.5Y 3/1; Bulb present, distal portion snapped; cortex absent
09542.0001	Block 3	22	B	2	148	2	Lithics	Debitage / General	Dark grey	< 1/2"	1	1.4	Onondaga chert; blocky fragment; cortex absent
09542.0001	Block 3	22	B	2	148	3	Lithics	Endscraper	Dark grey	> 1/2"	1	3.6	Onondaga chert; large amount of cortex present; early reduction flake utilized on dorsal surface; pressure flaking present; possible scrapper
09542.0001	Block 3	22	B	2	148	4	Lithics	Flake Tool / General	Dark grey	> 1/2"	1	6.2	Onondaga chert; cortex absent; biface reduction flake, utilized microflaking edge on ventral surface near the bulb of percussion
09542.0001	Block 3	22	B	3	149	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	2.9	Onondaga chert fragment; bulb present, cortex absent
09542.0001	Block 3	22	B	3	149	2	Lithics	Debitage / General	Dark grey	> 1/2"	1	5.3	Onondaga chert fragment; blocky, cortex absent
09542.0001	Block 3	22	B	3	149	3	Lithics	Debitage / General	Dark grey	< 1/2"	7	4	Onondaga chert fragments; small, blocky; cortex absent
09542.0001	Block 3	22	C	4	150	1	Lithics	Debitage / General	Dark grey	> 1/2"	2	16.4	Onondaga chert, blocky; cortex absent
09542.0001	Block 3	22	C	4	150	2	Lithics	Debitage / General	Dark grey	< 1/2"	2	2.8	Onondaga chert fragments; small; blocky with cortex present
09542.0001	Block 3	22	C	4	150	3	Lithics	Debitage / General	Dark grey	< 1/2"	6	7.5	Onondaga chert fragments; small, blocky with cortex absent
09542.0001	Block 3	23	A	1	151	1	Lithics	Decortication Flake	Dark grey	> 1/2"	1	2.1	Chert cortex fragment
09542.0001	Block 3	23	A	1	151	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	3	Onondaga chert fragment; snapped distal portion; bulb present, cortex absent
09542.0001	Block 3	23	A	1	151	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	9	9.9	Onondaga chert fragments; cortex absent; bulb present; small fragments

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	23	A	1	151	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	0.8	Onondaga chert; cortex absent; bulb present
09542.0001	Block 3	23	A	1	151	5	Lithics	Debitage / General	Dark grey	< 1/2"	12	11.4	Small Onondaga chert fragments; possilbe debitage; cortex absent
09542.0001	Block 3	23	B	2	152	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	1.8	Onondaga chert fragment; cortex absent, bulb present
09542.0001	Block 3	23	B	2	152	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	0.4	Onondaga chert fragment; small; cortex absent, bulb present
09542.0001	Block 3	23	B	2	152	3	Lithics	Debitage / General	Dark grey	< 1/2"	3	4.9	Onondaga chert fragments; blocky; cortex absent
09542.0001	Block 3	23	B	3	153	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	6	6.7	Onondaga chert fragments; bulb present, cortex absent
09542.0001	Block 3	23	B	3	153	2	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.3	Onondaga chert flake fragments; cortex absent, snapped ends
09542.0001	Block 3	23	B	3	153	3	Lithics	Debitage / General	Dark grey	> 1/2"	3	17	Onondaga chert flake; blocky fragments; cortex absent
09542.0001	Block 3	23	B	3	153	4	Lithics	Debitage / General	Dark grey	< 1/2"	19	25.4	Debitage fragments; Onondaga chert; cortex absent
09542.0001	Block 3	23	B	3	153	5	Lithics	Debitage / General	Dark grey/red	> 1/2"	1	13.4	Onondaga chert fragment; blocky; grey/red color with grey mottling; cortex absent
09542.0001	Block 3	23	B	3	153	6	Lithics	Tested Cobble	Dark grey	> 1/2"	1	203	Large Onondaga chert blocky debitage fragment; possible flakes removed; cortex absent, impurities present
09542.0001	Block 3	23	B	3	153	7	Lithics	Indeterminate Biface	Dark Grey	< 1/2"	1	0.9	Possible tool fragment; worn surfaces; microflaking present along edge; snapped with convex shape; possible retouched scraper
09542.0001	Block 3	23	B	3	153	8	Lithics	Non-Cultural	Dark grey		5	20.1	Onondaga chert fragments; small rounded; cortex absent
09542.0001	Block 3	23	C	4	154	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	1.4	Onondaga chert fragment; cortex absent; bulb present; snapped ends
09542.0001	Block 3	24	A	1	155	1	Lithics	Biface Reduction Flake	Dark grey/light	> 1/2"	1	8.3	Half dark grey, half light grey Onondaga chert; bulb present, cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	24	A	1	155	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	13	8.4	Onondaga chert, small fragments; cortex absent, bulb presence
09542.0001	Block 3	24	A	1	155	3	Lithics	Debitage / General	Dark grey	< 1/2"	4	1.8	Small debitage fragments; cortex present
09542.0001	Block 3	24	A	1	155	4	Lithics	Endscraper	Bluish grey	< 1/2"	1	1.1	Small thumb scraper; convex shape; retouching present
09542.0001	Block 3	24	A	1	155	5	Lithics	Non-Cultural	Dark grey		5	11.3	Small, rounded Onondaga fragments; worn
09542.0001	Block 3	24	B	2	156	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	3	15.4	Onondaga chert flakes; large; cortex absent, bulb present
09542.0001	Block 3	24	B	2	156	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	9	7.2	Onondaga chert flakes; small fragments; bulb presence, cortex absent
09542.0001	Block 3	24	B	2	156	3	Lithics	Debitage / General	Dark grey	> 1/2"	1	36.4	Onondaga chert, large debitage fragment; cortex present
09542.0001	Block 3	24	B	2	156	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	5.1	Onondaga chert fragments; blocky; cortex present
09542.0001	Block 3	24	B	3	157	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	4	3	Onondaga chert fragments; bulb present, cortex absent; small fragments
09542.0001	Block 3	24	B	3	157	2	Lithics	Debitage / General	Dark grey	> 1/2"	1	19.8	Large, blocky Onondaga chert fragment; cortex present
09542.0001	Block 3	24	B	3	157	3	Lithics	Debitage / General	Dark grey	> 1/2"	2	10.7	Large, blocky Onondaga chert fragment; cortex absent
09542.0001	Block 3	24	B	3	157	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	1.5	Small fragments Onondaga chert; cortex absent
09542.0001	Block 3	24	C	4	158	1	Lithics	Biface Reduction Flake	Dark grey/red	> 1/2"	1	7.2	Onondaga chert flake, bulb of percussion present; cortex absent; Dark red with grey mottling
09542.0001	Block 3	24	C	4	158	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	3	0.5	Onondaga chert fragments; small; bulb presence, cortex absent
09542.0001	Block 3	25	A	1	159	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	2	4.7	Onondaga chert flakes; bulb present, cortex absent; flaking scars on dorsal surface
09542.0001	Block 3	25	A	1	159	2	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.5	Onondaga chert fragments; small; cortex absent; snapped ends

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	25	A	1	159	3	Lithics	Debitage / General	Dark grey	< 1/2"	5	4.7	Onondaga chert, blocky fragments; cortex absent
09542.0001	Block 3	25	A	1	159	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	3.3	Onondaga chert, blocky fragments; cortex present
09542.0001	Block 3	25	A	1	159	5	Lithics	Endscraper	Light grey	< 1/2"	1	4	Light grey, unmottled Onondaga chert; chisel-like shape; worn tool
09542.0001	Block 3	25	A	1	159	6	Lithics	Endscraper	Light grey	> 1/2"	1	9.3	Light grey, waxy texture Onondaga chert; endscraper fragment, snapped; worked edge
09542.0001	Block 3	25	A	1	159	7	Lithics	Flake Tool / General	Dark grey	> 1/2"	1	43.3	Dark grey Onondaga chert; cortex present on dorsal surface of flake with pressure flaking along edge; bulb
09542.0001	Block 3	25	B	2	160	1	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	1.1	Onondaga chert flake; cortex absent; mottling absent; bulb present
09542.0001	Block 3	25	B	2	160	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	1.3	Onondaga chert; cortex absent; small fragments; bulb present
09542.0001	Block 3	25	C	3	161	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	10	Onondaga chert flake; bulb present, cortex absent; impurities present; flaking scars on dorsal surface
09542.0001	Block 3	25	C	3	161	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	4	3.3	Onondaga chert, small; bulb present, cortex absent
09542.0001	Block 3	25	C	3	161	3	Lithics	Biface Reduction Flake	Dark grey/purpl	< 1/2"	1	0.6	Chert flake fragment; bulb present, snapped; cortex absent
09542.0001	Block 3	25	C	3	161	4	Lithics	Debitage / General	Dark grey	> 1/2"	1	66.8	Onondaga chert, large blocky fragment; cortex absent, possible flaking scars present
09542.0001	Block 3	25	C	3	161	5	Lithics	Debitage / General	Dark grey	< 1/2"	3	3.1	Onondaga chert; fragments; cortex absent
09542.0001	Block 3	26	A	1	162	1	Lithics	Early Reduction Flake	Dark grey	> 1/2"	1	5.6	Onondaga chert with cortex present; bulb present
09542.0001	Block 3	26	A	1	162	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	2	6.2	Onondaga chert flakes, cortex absent; bulb present
09542.0001	Block 3	26	A	1	162	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	9	5.3	Onondaga chert flakes, small; cortex absent, bulb present
09542.0001	Block 3	26	A	1	162	4	Lithics	Debitage / General	Dark grey	< 1/2"	11	15.9	Blocky Onondaga chert fragment; cortex absent, small fragments

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	26	B	2	163	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	3.2	Onondaga chert fragments; cortex absent, bulb present; snapped ends
09542.0001	Block 3	26	B	2	163	2	Lithics	Debitage / General	Dark grey	> 1/2"	1	14.5	Onondaga blocky fragment; cortex present, shatter fragment
09542.0001	Block 3	26	B	2	163	3	Lithics	Debitage / General	Dark grey	> 1/2"	1	13.1	Onondaga chert, cortex absent; multiple flaking scars present, irregular form
09542.0001	Block 3	26	B	2	163	4	Lithics	Debitage / General	Dark grey	< 1/2"	3	2.6	Onondaga chert fragments; cortex absent; small irregular forms
09542.0001	Block 3	26	C	3	164	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	2	22.6	Onondaga chert, cortex absent; flaking scars on dorsal surface, bulb of percussion present
09542.0001	Block 3	26	C	3	164	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	9	8.9	Onondaga chert fragment; cortex absent; small flakes with bulb present
09542.0001	Block 3	26	C	3	164	3	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	1	0.9	Possible chert flake fragment; flaking scars present; cortex absent; deep red material color
09542.0001	Block 3	26	C	3	164	4	Lithics	Debitage / General	Dark grey	> 1/2"	7	221.3	Large blocky debitage/shatter fragments; Onondaga chert; reduction marks visible; minimal modifications present; cortex absent
09542.0001	Block 3	26	C	3	164	5	Lithics	Debitage / General	Dark grey	< 1/2"	4	3.3	Possible debitage/shatter fragments; small with reduction evidence; cortex absent
09542.0001	Block 3	26	C	3	164	6	Lithics	Non-Cultural	Dark grey	> 1/2"	7	225.2	Large blocky Onondaga chert fragments; no reduction marks visible or no cultural modifications present; cortex absent
09542.0001	Block 3	26	C	3	164	7	Lithics	Non-Cultural	Dark grey	< 1/2"	7	8.2	Small Onondaga chert fragments; no reduction marks visible or no cultural modifications present; cortex absent
09542.0001	Block 3	27	A	1	165	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	7	6.8	Onondaga chert fragments; cortex absent; bulb present
09542.0001	Block 3	27	A	1	165	2	Lithics	Core / General	Dark grey	> 1/2"	1	35	Worn Onondaga chert, possible core; multiple reduction scars present, worn edges; cortex absent
09542.0001	Block 3	27	A	1	165	3	Lithics	Debitage / General	Dark grey	> 1/2"	4	27.8	Worn Onondaga chert fragment; cortex absent
09542.0001	Block 3	27	A	1	165	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	2.1	Onondaga chert debitage/shatter fragments; small fragments, cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	27	A	1	165	5	Lithics	Debitage / General	Bluish light grey	< 1/2"	1	2.9	Possible Onondaga chert debitage; cortex absent; irregular form
09542.0001	Block 3	27	A	1	165	6	Lithics	Non-Cultural	Dark grey/Light	< 1/2"	4	3.6	Small worn fragments; Onondaga chert
09542.0001	Block 3	27	B	2	166	1	Lithics	Early Reduction Flake	Light grey	> 1/2"	1	3.4	Onondaga chert reduction fragment; cortex present, no bulb of persussion present
09542.0001	Block 3	27	B	2	166	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	2	19.8	Large Onondaga chert flakes, cortex absent; bulb of percussion present
09542.0001	Block 3	27	B	2	166	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	3	2.1	Onondaga chert flakes, small; cortex absent; bulb present
09542.0001	Block 3	27	B	2	166	4	Lithics	Debitage / General	Light grey	< 1/2"	2	4.7	Onondaga chert debitabe/shatter fragments; cortex absent; blocky, irregular forms
09542.0001	Block 3	27	C	3	167	1	Lithics	Debitage / General	Dark grey	> 1/2"	4	24.9	Onondaga chert fragments; blocky debitage shatter, irregular forms
09542.0001	Block 3	27	C	3	167	2	Lithics	Debitage / General	Dark grey	< 1/2"	5	7.9	Onondaga chert fragments; small, irregular blocky forms
09542.0001	Block 4	28	A	1	168	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	4	17.2	Onondaga chert flakes, cortex present; bulb present
09542.0001	Block 4	28	A	1	168	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	13	33.9	Onondaga chert flakes, cortex absent; bulb present; mottled fragments
09542.0001	Block 4	28	A	1	168	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	87	38.9	Onondaga chert flakes, cortex absent; bulb present; mottled fragments
09542.0001	Block 4	28	A	1	168	4	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	1	0.3	Onondaga chert, cortex absent, bulb present; snapped fragment; red mottling
09542.0001	Block 4	28	A	1	168	5	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	3	1.4	Onondaga chert with red tint; cortex absent, bulb present
09542.0001	Block 4	28	A	1	168	6	Lithics	Flake Fragment	Dark grey	< 1/2"	19	4.5	Onondaga chert fragments; snapped ends; cortex absent
09542.0001	Block 4	28	A	1	168	7	Lithics	Debitage / General	Dark grey	> 1/2"	2	35	Large Onondaga chert blocky fragments; cortex present
09542.0001	Block 4	28	A	1	168	8	Lithics	Debitage / General	Dark grey	< 1/2"	18	14.1	Small, irregular fragments; Onondaga chert; cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	28	A	1	168	9	Lithics	Debitage / General	Light grey	< 1/2"	2	1.9	Small fragments; cortex present; waxy texture; Onondaga chert
09542.0001	Block 4	28	A	1	168	10	Lithics	Debitage / General	Light grey	< 1/2"	1	0.7	Small fragment Onondaga chert; rough texture; cortex absent
09542.0001	Block 4	28	A	1	168	11	Lithics	Biface / General	Dark grey/Light	> 1/2"	1	12.6	Mottled Onondaga fragment; snapped end; cortex absent
09542.0001	Block 4	28	A	1	168	12	Lithics	Non-Cultural	Dark grey	> 1/2"	1	2.8	Unidentified material, rough texture; smoothed/worn surfaces; no cultural moditications present
09542.0001	Block 4	28	B	2	169	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	11	4.8	Small Onondaga chert fragments; bulb presence; cortex absent
09542.0001	Block 4	29	A	1	170	1	Lithics	Decortication Flake		> 1/2"	3	13.9	Cortex fragments; Possible Onondaga chert reduction material
09542.0001	Block 4	29	A	1	170	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	16	72.3	Onondaga chert fragments; small; cortex absent, bulb presence, some with snapped ends
09542.0001	Block 4	29	A	1	170	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	23	56.9	Onondaga chert fragments; cortex absent; bulb present; reduction flakes
09542.0001	Block 4	29	A	1	170	4	Lithics	Biface Reduction Flake	Light grey	> 1/2"	1	3.2	Onondaga chert; cortex absent; bulb present; light, mottled grey color
09542.0001	Block 4	29	A	1	170	5	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	4	3.3	Onondaga chert, dark grey with red tint; red interior, dark grey exterior; cortex absent
09542.0001	Block 4	29	A	1	170	6	Lithics	Flake Fragment	Dark grey	< 1/2"	9	1.5	Small fragments; onondaga chert; cortex absent; snapped fragments
09542.0001	Block 4	29	A	1	170	7	Lithics	Debitage / General	Dark grey	> 1/2"	1	24.4	Large, blocky Onondaga chert fragment; cortex absent
09542.0001	Block 4	29	A	1	170	8	Lithics	Debitage / General	Dark grey	< 1/2"	12	7.4	Onondaga chert, cortex absent; small irregular fragments
09542.0001	Block 4	29	A	1	170	9	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	0.1	Small flake, snapped ends, bulb present; light grey Onondaga chert
09542.0001	Block 4	29	A	1	170	10	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.1	Possible Onondaga finishing flake; small, bulb present
09542.0001	Block 4	29	B	2	171	1	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.3	Onondaga chert fragments; cortex absent; bulb of percussion absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	30	A	1	172	1	Lithics	Decortication Flake		> 1/2"	1	2.5	Cortex fragment; possible Onondaga chert; early reduction
09542.0001	Block 4	30	A	1	172	2	Lithics	Early Reduction Flake	Dark grey	> 1/2"	5	19.8	Onondaga chert fragments; cortex present; bulb present; mottled fragments
09542.0001	Block 4	30	A	1	172	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	17	54.4	Onondaga chert fragments; cortex absent, bulb present; large fragments
09542.0001	Block 4	30	A	1	172	4	Lithics	Biface Reduction Flake	Light grey	> 1/2"	1	8.1	Onondaga chert, light grey mottled; cortex absent; bulb present; flake scars on dorsal surface prominent
09542.0001	Block 4	30	A	1	172	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	2	1.1	Onondaga chert, light grey unmottled; cortex absent; bulb present; small fragments
09542.0001	Block 4	30	A	1	172	6	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	15	74.5	Onondaga chert; cortex absent, bulb presence; small fragments
09542.0001	Block 4	30	A	1	172	7	Lithics	Biface Reduction Flake	Black	< 1/2"	1	0.2	Possible Espoesus chert; small fragment; cortex absent; black color homogenous
09542.0001	Block 4	30	A	1	172	8	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	4	1.3	Onondaga chert, light grey color with red tint; cortex absent
09542.0001	Block 4	30	A	1	172	9	Lithics	Biface Reduction Flake	Bluish grey	< 1/2"	5	1.6	Light bluish grey flake fragments; cortex absent; small fragments, bulb present
09542.0001	Block 4	30	A	1	172	10	Lithics	Flake Fragment	Dark grey	< 1/2"	40	5.9	Onondaga chert, small fragments; snapped portions, no bulb present; cortex absent
09542.0001	Block 4	30	A	1	172	11	Lithics	Debitage / General	Dark grey	< 1/2"	17	7.5	Small debitage/shatter fragments; Onondaga chert; cortex absent, irregular forms
09542.0001	Block 4	30	A	1	172	12	Lithics	Biface / General	Dark grey	> 1/2"	1	4.1	Onondaga chert biface/tool midshaft fragment; pressure flaking present
09542.0001	Block 4	30	A	1	172	13	Lithics	Biface / General	Light grey	> 1/2"	1	6.4	Waxy light grey chert, possibly Onondaga; midsection portion; thick and unfinished tool fragment
09542.0001	Block 4	30	A	1	172	14	Lithics	Late-Stage Biface	Dark grey	> 1/2"	1	10	Onondaga chert biface; unfinished
09542.0001	Block 4	30	A	1	172	15	Lithics	Early Reduction Flake	Dark grey	< 1/2"	4	3.5	Onondaga chert flake fragments, cortex present; bulb present
09542.0001	Block 4	30	A	1	172	16	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.2	Possible finishing flake; whole; cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	30	B	2	173	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	4.9	Onondaga chert flake; cortex absent, bulb present
09542.0001	Block 4	30	B	2	173	2	Lithics	Biface Reduction Flake	Bluish light grey	> 1/2"	1	3.1	Onondaga chert flake; mottled Gley 2 5/5B bluish grey; cortex absent, bulb present;
09542.0001	Block 4	30	B	2	173	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	13	5.1	Small Onondaga chert flakes; cortex absent, bulb present; snapped ends
09542.0001	Block 4	30	B	2	173	4	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	1	0.8	Small Onondaga chert flake with red tint; 5YR 4/1; Cortex absent, bulb present
09542.0001	Block 4	30	B	2	173	5	Lithics	Debitage / General	Dark grey	> 1/2"	2	8.2	Onondaga chert, blocky fragments; cortex absent
09542.0001	Block 4	31	A	1	174	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	10	28.4	Mottled Onondaga chert fragments; cortex absent, bulb present; large
09542.0001	Block 4	31	A	1	174	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	10	51	Onondaga chert fragments; cortex absent, bulb presence; small fragments
09542.0001	Block 4	31	A	1	174	3	Lithics	Debitage / General	Dark grey	< 1/2"	1	2.6	Blocky Onondaga chert fragment; irregular form; cortex present
09542.0001	Block 4	31	B	2	175	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	6	2.4	Onondaga chert, flake fragments; cortex absent, bulb presence
09542.0001	Block 4	31	B	2	175	2	Lithics	Debitage / General	Dark grey	< 1/2"	1	2.6	Blocky, irregular Onondaga chert fragment; cortex absent
09542.0001	Block 4	32	A	1	176	1	Lithics	Early Reduction Flake	Dark grey	< 1/2"	3	4.9	Early reduction flakes, cortex present; Onondaga chert fragments
09542.0001	Block 4	32	A	1	176	2	Lithics	Early Reduction Flake	Dark grey	> 1/2"	2	12.4	Onondaga chert fragments, cortex present
09542.0001	Block 4	32	A	1	176	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	19	52.4	Onondaga chert flakes; cortex absent; bulb present; large reduction
09542.0001	Block 4	32	A	1	176	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	14	60	Small Onondaga chert flakes; dark grey, mottled, the 2.5Y 3/1 are generally glossier than the 4/1 variety; cortex absent
09542.0001	Block 4	32	A	1	176	5	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	1	0.3	Small fragment; Onondaga chert; cortex absent, bulb present

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	32	A	1	176	6	Lithics	Biface Reduction Flake	Bluish light grey	> 1/2"	1	4.6	Large flake, chert; glossy texture, light blue grey; cortex absent, bulb present
09542.0001	Block 4	32	A	1	176	7	Lithics	Flake Fragment	Bluish light grey	< 1/2"	3	0.4	Small chert flake fragments, light bluish grey; cortex absent; snapped ends
09542.0001	Block 4	32	A	1	176	8	Lithics	Debitage / General	Dark grey	> 1/2"	3	24.2	Debitage/shatter fragments; Onondaga chert; cortex absent
09542.0001	Block 4	32	A	1	176	9	Lithics	Debitage / General	Dark grey	< 1/2"	1	2	Small fragment, Onondaga chert; cortex present
09542.0001	Block 4	32	A	1	176	10	Lithics	Debitage / General	Light grey	< 1/2"	1	0.4	Small shatter/debitage fragment; Onondaga chert, cortex present
09542.0001	Block 4	32	A	1	176	11	Lithics	Middle-Stage Biface	Dark grey	> 1/2"	1	7.8	Biface midshaft and tip fragment; looks to be almost completed, thinning process not started
09542.0001	Block 4	32	A	1	176	12	Lithics	Biface / General	Dark grey	> 1/2"	1	19.1	Debitage fragment worked into crude biface tool; retouched edge present
09542.0001	Block 4	32	A	1	176	13	Lithics	Utilized Flake	Dark grey	> 1/2"	1	2.5	Possible utilized flake, possible pressure flaking present? Cortex absent
09542.0001	Block 4	32	A	1	176	14	Lithics	Flake Fragment	Light grey/red	< 1/2"	2	0.5	Small fragments; translusent chert with red tint; cortex absent
09542.0001	Block 4	32	A	1	176	15	Lithics	Biface Reduction Flake	Light grey/brow	< 1/2"	3	2.3	Small fragments, glassy; mottled grey and brown; cortex absent
09542.0001	Block 4	32	B	2	177	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	4.1	Onondaga chert fragments, mottled; cortex absent, bulb presence
09542.0001	Block 4	33	A	1	178	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	22	58.8	Onondaga chert fragments; cortex absent, bulb present
09542.0001	Block 4	33	A	1	178	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	15	61.7	Onondaga chert fragments; cortex absent, bulb present; small fragments
09542.0001	Block 4	33	A	1	178	3	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	4	2.5	Onondaga chert fragments, red tint; cortex absent; bulb present
09542.0001	Block 4	33	A	1	178	4	Lithics	Biface Reduction Flake	Light Brown/red	< 1/2"	1	0.3	Chert fragment, cortex absent, bulb present; red tint, waxy texture
09542.0001	Block 4	33	A	1	178	5	Lithics	Biface Reduction Flake	Bluish light grey	< 1/2"	2	0.7	Small Chert fragment, cortex absent, bulb present; red tint

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	33	A	1	178	6	Lithics	Biface Reduction Flake	Light grey	< 1/2"	2	0.6	Light grey, Onondaga chert fragments; cortex absent, bulb present
09542.0001	Block 4	33	A	1	178	7	Lithics	Flake Fragment	Dark grey	< 1/2"	18	3.9	Onondaga chert fragments; snapped portions, bulb absent, cortex absent
09542.0001	Block 4	33	A	1	178	8	Lithics	Debitage / General	Dark grey/red	> 1/2"	1	22.8	Onondaga chert fragment; blocky structure, red mottling; cortex absent
09542.0001	Block 4	33	A	1	178	9	Lithics	Debitage / General	Dark grey	< 1/2"	9	7.5	Onondaga chert fragments; small; cortex absent
09542.0001	Block 4	33	A	1	178	10	Lithics	Utilized Flake	Dark grey	> 1/2"	1	6.1	Onondaga chert, large flake; Cortex absent, bulb present; utilized edge with microflaking/retouching present
09542.0001	Block 4	33	A	1	178	11	Lithics	Biface / General	Bluish light grey	< 1/2"	1	2.8	Light bluish grey chert with red mottling; cortex indeterminate; reduction on both surfaces; fragment
09542.0001	Block 4	33	A	1	178	12	Lithics	Biface / General	Dark grey	> 1/2"	1	7.1	Onondaga chert, biface midsection and tip portion; snapped base
09542.0001	Block 4	33	A	1	178	13	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	1	Onondaga chert, large platform; cortex absent
09542.0001	Block 4	33	B	2	179	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	10	4.3	Dark grey Onondaga chert; cortex absent; small fragments
09542.0001	Block 4	34	A	1	180	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	7	17.4	Onondaga chert fragments; cortex absent, bulb presence; large flakes
09542.0001	Block 4	34	A	1	180	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	53	24	Onondaga chert fragments, cortex absent; bulb present; small fragments
09542.0001	Block 4	34	A	1	180	3	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	0.1	Small light grey chert (7.5YR 6/1), cortex absent; bulb present; small fragment
09542.0001	Block 4	34	A	1	180	4	Lithics	Flake Fragment	Dark grey	< 1/2"	6	1.1	Small fragments, Onondaga chert; cortex absent, snapped ends
09542.0001	Block 4	34	A	1	180	5	Lithics	Flake Fragment	Dark grey/red	< 1/2"	2	2.1	Small fragments; dark grey with red exterior; cortex indeterminate, possible Onondaga chert
09542.0001	Block 4	34	A	1	180	6	Lithics	Debitage / General	Dark grey	> 1/2"	1	9.4	Onondaga chert, blocky fragment; cortex present
09542.0001	Block 4	34	A	1	180	7	Lithics	Debitage / General	Dark grey	< 1/2"	9	7.9	Onondaga chert fragments; small, irregular shaped; cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	34	A	1	180	8	Lithics	Utilized Flake	Dark grey	> 1/2"	2	5.4	Onondaga chert, possible utilized flakes; cortex absent
09542.0001	Block 4	34	A	1	180	9	Lithics	Utilized Flake	Dark grey/red	> 1/2"	1	3.2	Possible utilized flake; dark grey Onondaga chert with red staining; flaking evident on ventral surface
09542.0001	Block 4	34	A	1	180	10	Lithics	Debitage / General	Dark grey	> 1/2"	1	12.4	Possible worked debitage fragment; irregular, blocky form; Onondaga chert, cortex absent
09542.0001	Block 4	34	A	1	180	11	Lithics	Biface / General	Dark grey	> 1/2"	1	4.3	Early reduction flake, worked both surfaces; cortex present; possible tool; whole
09542.0001	Block 4	34	B	2	181	1	Lithics	Decortication Flake	Dark grey	< 1/2"	2	1.9	Dark gery Onondaga chert; cortex present; platforms and/or bulbs of percussion present.
09542.0001	Block 4	34	B	2	181	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	4.3	Dark grey Onondaga chert; cortex absent; platforms and bulbs of percussion present.
09542.0001	Block 4	34	B	2	181	3	Lithics	Flake Fragment	Dark grey	< 1/2"	3	0.9	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 4	34	B	2	181	4	Lithics	Debitage / General	Dark grey	> 1/2"	2	33	Dark grey Onondaga chert; cortex present; irregular forms.
09542.0001	Block 4	34	B	2	181	5	Lithics	Debitage / General	Dark grey	< 1/2"	2	2.8	Dark grey Onondaga chert; cortex absent; irregular forms.
09542.0001	Block 4	35	A	1	182	1	Lithics	Early Reduction Flake	Dark grey	> 1/2"	1	2.9	Dark grey Onondaga chert; small amount of cortex present; platform and bulb of percussion present.
09542.0001	Block 4	35	A	1	182	2	Lithics	Early Reduction Flake	Dark grey	< 1/2"	1	0.9	Dark grey Onondaga chert; cortex present; platform and bulb of percussion present.
09542.0001	Block 4	35	A	1	182	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	10	44.1	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 4	35	A	1	182	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	41	25.7	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 4	35	A	1	182	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	2	2.1	Light grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 4	35	A	1	182	6	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	3	5.3	Light grey with red staining Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 4	35	A	1	182	7	Lithics	Flake Fragment	Dark grey	< 1/2"	28	12.3	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	35	A	1	182	8	Lithics	Debitage / General	Dark grey	> 1/2"	1	24.1	Dark grey Onondaga chert; cortex present; blocky form.
09542.0001	Block 4	35	B	2	183	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	3	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 4	35	B	2	183	2	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.1	Dark grey Onondaga chert; cortex absent; platform and bulb of percussion present.
09542.0001	Block 4	35	B	2	183	3	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.8	Dark grey Onondaga chert; cortex absent; broken/snapped ends and edges.
09542.0001	Block 4	36	A	1	184	1	Lithics	Early Reduction Flake	Dark grey	> 1/2"	2	5	Onondaga chert fragments; cortex present, bulb present
09542.0001	Block 4	36	A	1	184	2	Lithics	Early Reduction Flake	Dark grey	< 1/2"	6	5.5	Onondaga chert fragments, cortex present, bulb present, small
09542.0001	Block 4	36	A	1	184	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	16	32	Onondaga chert fragments; large; cortex absent, bulb present
09542.0001	Block 4	36	A	1	184	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	10	50.6	Small Onondaga chert fragments; cortex absent, bulb presence
09542.0001	Block 4	36	A	1	184	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	4	1.2	Small Onondaga chert fragments, cortex absent, bulb present; slight bluish grey tint
09542.0001	Block 4	36	A	1	184	6	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	1	0.1	Onondaga chert fragment, small; slight red tint; cortex absent
09542.0001	Block 4	36	A	1	184	7	Lithics	Flake Fragment	Dark grey	< 1/2"	11	2.2	Onondaga chert fragments; small with snapped ends; cortex absent
09542.0001	Block 4	36	A	1	184	8	Lithics	Debitage / General	Dark grey	< 1/2"	10	9.6	Onondaga chert fragments; irregular forms, debitage/shatter; cortex absent
09542.0001	Block 4	36	A	1	184	9	Lithics	Early-Stage Biface	Dark grey	> 1/2"	1	57.7	Mottled onondaga chert, early biface, whole; reduced on one edge, unworked on the other
09542.0001	Block 4	36	A	1	184	10	Lithics	Middle-Stage Biface	Dark grey	> 1/2"	1	8.2	Mottled Onondaga chert, whole; long and thin, cortex absent
09542.0001	Block 4	36	A	1	184	11	Lithics	Endscraper	Dark grey	> 1/2"	1	37.6	Dark grey Onondaga chert, whole; large flake, retouched edges and utilized
09542.0001	Block 4	36	A	1	184	12	Lithics	Utilized Flake	Dark grey	> 1/2"	1	10.6	Dark grey Onondaga chert, retouched edges; possibly utilized

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	36	A	1	184	13	Lithics	Biface / General	Dark grey	> 1/2"	2	59.7	Dark grey Onondaga chert, cortex present; possible tools?
09542.0001	Block 4	36	B	2	185	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	6.6	Onondaga chert flake; cortex absent, bulb present
09542.0001	Block 4	36	B	2	185	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	7	3.5	Onondaga chert fragments; small; cortex absent, bulb present
09542.0001	Block 4	36	B	2	185	3	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.4	Onondaga chert fragments; small; cortex absent, snapped ends
09542.0001	Block 4	36	B	2	185	4	Lithics	Debitage / General	Dark grey	< 1/2"	1	0.4	Onondaga chert fragment; small, blocky and irregular shaped
09542.0001	Block 4	36	B	2	185	5	Lithics	Biface / General	Dark grey	< 1/2"	1	1.8	Onondaga chert biface body fragment; worked both surfaces; midsection fragment; cortex absent

Appendix C

Data Recovery Plan

DATA RECOVERY PLAN
GORGE CREEK SITE 1(09542.000116)

Village of Middleburgh, Town of Middleburgh,
Schoharie County, New York

Prepared for:

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Revised Draft
March 9, 2017

Data Recovery Plan – Gorge Creek Site 1(09542.000116)

Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

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A. Introduction

Louis Berger U.S., Inc. (Louis Berger), is pleased to submit this Data Recovery Plan (DRP) to the Governor's Office of Storm Recovery (GOSR) for a Phase III archaeological investigation of Gorge Creek Site 1 (09542.000116). This prehistoric site was deemed to be eligible for the National Register of Historic Places (NRHP) as a result of Phase I and II investigations by Landmark Archaeology, Inc. (Gade et al. 2016; Gade and Schreyer 2016). The site is located in the Area of Potential Effect (APE) for the proposed Gorge Creek Culvert Repair and Storm Water Improvements (OPRHP No. 15PR06219) in the Village of Middleburgh, Schoharie County, New York (Figure 1).

GOSR, operating under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation (HTFC), is the Responsible Entity for direct administration of the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant–Disaster Recovery (CDBG-DR) funds. The Schoharie County Soil and Water Conservation District (SWCD) is requesting funding under the New York Rising Community Reconstruction Program for Phase I and Phase II of the Gorge Creek Culvert Repair and Storm Water Improvements project. This is a stormwater management improvement project involving culvert installation, expansion of the floodplain and sedimentation basin construction, and improvements to the stormwater system under selected streets in the village. Development of the floodplain expansion and sedimentation basin portion of the project will affect Gorge Creek Site 1.

This DRP has been developed in accordance with guidelines established by the New York Office of Parks, Recreation and Historic Preservation (OPRHP) and the *Standards for Cultural Resource Investigations and Curation of Archaeological Collections in New York State* and the *Cultural Resource Standards Handbook*: *Guidance for Understanding and Applying the New York State Standards for Cultural Resource Investigations* published by the New York Archaeological Council (1994, 2000). Reporting will conform to all professional standards and requirements. The cultural resource specialists who will perform this work meet or exceed the qualifications specified in 36 CFR 66.3(6)(2).

B. Previous Investigations

1. Phase I

Phase I testing of the project area was conducted in May 2016 (Gade et al. 2016). Ninety-eight shovel tests in the floodplain expansion and sedimentation basin area were located within the boundaries of the artifact concentration designated as Gorge Creek Site 1. Based on the Phase I data, the extent of the Gorge Creek Site 1 was estimated at approximately 6.1 acres. Fifty-eight of the 98 tests contained prehistoric artifacts. In total, 183 artifacts were recovered from the shovel tests. A feature (Feature 1) was identified in Transect 11, Shovel Test 1.

Most of the artifacts (n=136; 74 percent) were found in the plowzone (Ap horizon); 28 artifacts (15 percent) were found in B horizon soils, and 19 artifacts (10 percent) were found in Feature 1. The shovel tests revealed an Ap-B soil sequence within the site and across the entire area of the proposed floodplain expansion and sedimentation basin. The plowzone consisted of dark brown (10YR 3/3) gravelly silt loam that extended to a maximum depth of 40 centimeters below ground surface (bgs). The underlying B horizon soils were dark yellowish brown (10YR 4/4–4/6) gravelly silt loam or silt loam. In several shovel tests a B/C horizon, consisting of dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand, was encountered below the B horizon soil.

The artifact assemblage recovered by Phase I testing consisted of four bifaces, one endscraper, four retouched flakes, 21 utilized flakes, 10 cores (845.3 grams), 129 flakes, two cobble tools (199.0 grams), and 12 pieces of fire-cracked rock (FCR) (489.6 grams). The assemblage did not include any culturally/temporally diagnostic artifacts.

Feature 1 was identified in Transect 11, Shovel Test 1. Charcoal flecking was encountered at depths of 40 and 60 centimeters bgs within soils similar to the plowzone. Feature 1 contained 19 artifacts: one retouched flake, three utilized flakes, 13 flakes, one core (113.7 grams), and one piece of FCR (20.1 grams). The feature's size, type, and function could not be determined from the limited exposure. The overlying plowzone in this shovel test yielded 11 artifacts, the greatest number found in the plowzone of any of the shovel tests at the site.

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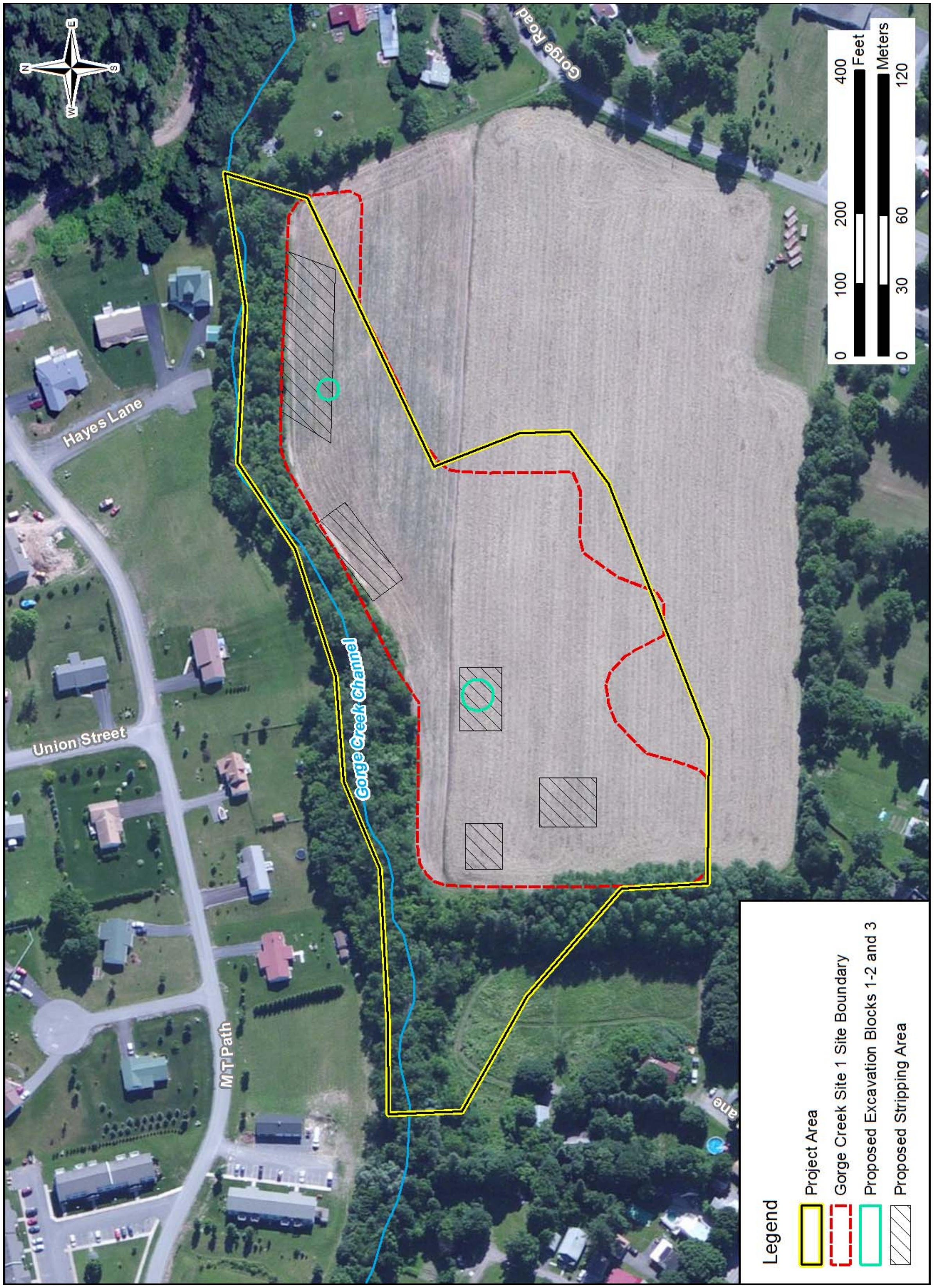

FIGURE 1: Site Map with Provisional Work Locations (ESRI World Imagery 2015)

2. Phase II

The Phase II field investigation was conducted from August 23 to September 9, 2016 (Gade and Schreyer 2016). It entailed excavation of 102 shovel tests and 16 1x1-meter test units. The shovel tests were spaced 10 meters apart and were arrayed along transects that were located parallel to or on selected Phase I transects. This procedure created transects spaced 7.5 meters apart across the site area. The subsequent placement of units was based on shovel test results and the character of the landform.

Consistent with the Phase I shovel tests, Phase II excavations documented an Ap-B soil sequence across much of the site. The plowzone (Ap) consisted of dark brown (10YR 3/3) gravelly silt loam and typically extended between 20 and 30 centimeters bgs. B horizon soils were dark yellowish brown to yellowish brown (10YR 4/6–5/6) gravelly silt loam or silt loam. In several shovel tests a B/C horizon was encountered below the B horizon soil; it was a dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand with dense cobbles. In low-lying terrain in the western section of the site, an unplowed remnant of the A horizon was encountered in several shovel tests along Transects 22 and 23, and also in Units 2, 3, 4, and 7. These excavations were located along the lower elevations of the terrace, within a noticeable swale. In these tests the unplowed A horizon soil lay directly below the plowzone; it was a dark yellowish brown (10YR 4/4–4/6) gravelly silt loam ranging in thickness from 10 to 18 centimeters.

Phase II excavations yielded a total of 1,264 artifacts: nine bifaces, two scrapers, two other chipped stone implements, 101 flake tools, 18 cores, 1112 flakes, five cobble tools, and 15 pieces of FCR. Of the total, 394 artifacts were recovered from 70 positive shovel tests. The great majority of these (n=327) came from the plowzone, 56 artifacts were found in the B horizon, and 11 came from the unplowed A horizon soil. A total of 870 artifacts were recovered from the 16 test units.

Artifacts were found in all units, but the totals varied widely, ranging from 237 artifacts in Unit 2 to two artifacts in Unit 15. After Unit 2, Units 11 and 4 had the next highest artifact totals with 158 and 123, respectively. The remaining units all contained fewer than 100 artifacts; Units 6, 15, and 16 each yielded fewer than 10 artifacts. Sub-plowzone artifacts were found in all but three units (Units 9, 15, and 16). Units 2, 3, 4, and 7 were placed in the portion of the site where shovel tests had encountered unplowed A horizon soils under the plowzone. Combined, these four units yielded a total of 409 artifacts, accounting for almost half (47 percent) of all artifacts found in the 16 1x1-meter units. A total of 163 artifacts were recovered from the unplowed A soils in these four units (mostly from Units 2 and 4), and 14 artifacts were found in their upper B horizon.

A few of the Phase I and II shovel tests are exceptional for their density of lithic artifacts: Shovel Tests 32:5 (n=29), 20:5 (n=38), 22:2 (n=27), and 11:1 (n=27). These unusual concentrations triggered the placement of Phase II units in the vicinities of these productive shovel tests. Those units confirmed that patchy artifact concentrations generally existed near the most artifact-rich shovel tests. Units 2 (n=237) and 4 (n=123) were placed west of Shovel Test 22:2 and 11:1. Unit 1 (n=63) was located east of Shovel Test 22:2 and west of Shovel Test 22:1 (n=16). Unit 11 (n=158) was placed just west of Shovel Test Tr. 32:5. The concentrated patches seemed to be small and isolated. No unit was placed immediately adjacent to Shovel Test 20:5. Unit 16, located about 15 meters southwest of this most productive shovel test, yielded only four artifacts; Unit 13, about 20 meters southeast of Shovel Test 20:5, produced only 17 artifacts. The shovel tests with more than about 12 artifacts appeared to represent a sharp jump in artifact density. Phase II units placed near shovel tests with 11 or fewer artifacts generally produced relatively few artifacts: Unit 13, Unit 9 (n=22), Unit 10 (n=19), Unit 12 (n=26). Some units located near shovel tests with three or fewer artifacts predictably yielded very few artifacts, such as Unit 6 (n=6) and Unit 15 (n=2); however, Units 5 (n=27) and 14 (n=33), although not very productive, contained more artifacts than would be expected from the very low yields of the nearest shovel tests.

The only feature identified during Phase II was Feature 2. This pit feature was first identified in a Phase II shovel test (Shovel Test 22:2) and was further exposed by excavation of Unit 1. The feature became evident at the base of the plowzone, at a depth of 30 centimeters bgs, as a soil stain of reddened (thermally altered) earth with charcoal. It extended into the north and east walls of the unit. Roughly rectangular in shape, Feature 2 measured 70x55 centimeters. A concentration of burned earth measuring 55x23 centimeters was located along the unit's east wall. In profile the feature exhibited relatively straight walls and a flat bottom, and it extended 23 centimeters into the B horizon. The feature matrix consisted of mottled dark yellowish brown (10YR 4/6) and strong brown (7.5YR 4/6) silt loam. A total of seven artifacts were recovered from the feature: of five flakes and two pieces of FCR weighing 62.1 grams.

Apart from the artifacts found in Feature 2, 68 additional artifacts were recovered from Unit 1. This unit did not have an unplowed A horizon soil; the plowzone lay directly atop the B horizon. Sixty-two artifacts were recovered from the plowzone and six artifacts were found in the B horizon.

Unit 11 had the second highest number of artifacts at the site with a total of 158; a total of 131 artifacts came from the plowzone and 27 artifacts from the B horizon. This unit was located in the northeast part of the site near Gorge Creek and on a relatively higher elevation of the terrace. Unit 8, located about 30 meters upslope from and east of Unit 11, contained 72 artifacts: 65 from the plowzone and seven from the B horizon.

In shovel tests and units together, 943 artifacts, or 74.6 percent of the total assemblage, were recovered from the plowzone. One hundred seventy-five artifacts (13.8 percent) came from intact A horizon soils below the plowzone, and 139 artifacts (11.0 percent) were found in B horizon soils. The remaining seven artifacts came from Feature 2.

The basal portion of a stemmed point typed as a Lamoka was recovered from the plowzone of Unit 13. An untypable basal fragment of another, side-notched point came from the plowzone of Unit 11. The Lamoka-like point suggests a Late Archaic presence at the site. A pre-Woodland date (older than 3000 radiocarbon years before present [rcbp]) is also suggested by the apparent absence of pottery.

Gade and Schreyer examined artifacts found on the plowed surface of the site by Tom Anderson, a local collector. They recognized in his collection several Late Archaic Lamoka and Snook Kill points, as well as Orient Fishtail points. They also noted a basal fragment of what seemed to be a Turkey Tail point. Their photograph of the collection also seems to include two triangles, which could be Late Woodland or Middle or early Late Archaic in age. A side-notched point in the same photograph could be a Meadowood or Brewerton.

Anderson showed Gade and Schreyer a map he had drawn showing artifact locations and the relative distribution of Lamoka and Orient Fishtail points on the terrace. According to the map, he found Lamoka and stemmed points in an area southeast of and outside the project area. Anderson collected Oriental Fishtail points in the northeast portion of Gorge Creek Site 1 where the east portions of the Phase I Transect 1 and Phase II Transect 20 were located.

3. Phase I and II Interpretations and Conclusions

If one combines the Phase I (n=183) and Phase II (n=1,264) artifacts, the total assemblage from Gorge Creek Site 1 numbers 1,447 prehistoric artifacts. All of these are lithics; no pottery was recovered. The paucity of projectile points is clearly attributable to previous surface collection.

The variety of tool types recognized in the Phase I and II assemblages suggests that multiple and varied activities occurred at the site. Many expedient flake tools with flaking or wear on one or several edges were found across the site. Gade and Schreyer (2016) noted that only 15 pieces of FCR were found in the Phase II excavations. It is unlikely that collectors would have removed any FCR, so this rarity is probably representative of the actual low frequency of FCR on the site. Their near absence may indicate that few long-term hearths were created during occupations. This could imply that cooking was rarely undertaken, or that the site was mainly inhabited in the summer, when the warmth of fires was not needed. Despite the absence of preserved bone or macrobotanical remains, Gade and Schreyer suggest that the inhabitants procured and processed plant and animal resources. They interpret Gorge Creek Site 1 as a composite of short-term camps and seasonal occupations that occurred throughout the Late Archaic period. They also note the likelihood that the site extends beyond the APE boundary and that artifacts may be present elsewhere on the terrace outside the APE as well as on the other side of Gorge Creek.

Historic-era agriculture has severely affected the integrity of the prehistoric cultural deposits at Gorge Creek Site 1. The great majority of the artifacts were recovered from the plowzone (74 percent in Phase I, 74.6 percent in Phase II). However, artifacts were also recovered from the upper B horizon soils, usually within the first 10 centimeters (about 11 percent of the Phase II assemblage). Additional analysis (e.g., of the relative sizes of flakes in the A vs B horizons) would be necessary to determine if the artifacts in the lower zone are *in situ* or have been redeposited from the plowzone due to cryo- or bioturbation. In several shovel tests and Units 2, 3, 4, and 7, artifacts were found in a distinct stratum intervening between the plowzone and the B horizon. Gade and Schreyer designated this stratum as an unplowed A horizon that contained *in situ* archaeological deposits. They did not reconstruct the depositional processes that formed this horizon. Does it represent overbanking of the stream, or incorporation of organic detritus from the prehistoric campsites, or an old plowzone? Whatever its origin, on the basis of Phase II data, Gade and Schreyer

estimate that this unplowed A horizon extends over an area of about 760 square meters of the terrace. Thirteen percent (n=175) of all Phase II artifacts came from the unplowed A horizon in this part of the site.

Gade and Schreyer (2016:12) recommended Gorge Creek Site 1 as eligible for the NRHP under Criterion D (it has yielded, or may be likely to yield, information important in prehistory or history). They emphasized the presence of artifacts in the unplowed A horizon soils and in the upper B horizon soils, as well as the recognition of a pit feature. The latter raised the possibility that other features may be present. “Specifically, the site provides an opportunity to examine and expand our knowledge regarding settlement, subsistence and community patterning of Late Archaic period occupations along Gorge Creek, a small tributary in the Schoharie Creek valley” (Gade and Schreyer 2016:12).

C. Problem Orientation

Gade and Schreyer (2016:12) suggested that the following research topics could be addressed by additional recovery of cultural deposits from Gorge Creek Site 1.

- Subsistence Patterns
- Community Pattern
- Settlement System/Site Function
- Cultural History

1. Subsistence Patterns

Given the absence of any organic remains (apart from charcoal flecks) from previous investigations and the improbability that they will be recovered in substantial quantities from the proposed excavations, it is unlikely that data will be generated with which to address subsistence patterns directly. It is possible, nevertheless, that analysis of wear traces on utilized flakes, which are common on the site, could indicate whether predominantly plants or animal materials were being processed there.

2. Community Patterns

It will also be difficult to retrieve any information about “community pattern.” It is not impossible that Archaic postmold patterns may be revealed. Woodland-age postmolds have been exposed at other sites along Schoharie Creek (Ritchie and Funk 1973; Rieth 2008, 2012; Rafferty et al. 2014). However, such traces of older Archaic dwellings are very infrequently encountered. Nothing found in previous investigations of Gorge Creek Site 1 suggests that postmolds will be present. Lacking clear evidence of the locations of residential households, little can be said about the community’s spatial organization.

3. Settlement System/Site Function

The uniformity of the lithic materials used at the site (almost all locally available Onondaga chert, with just a few pieces of Esopus chert), indicates that any toolstones that may have been procured elsewhere during other seasonal phases of the settlement round were not transported here. Similarly, the apparent absence of exotic toolstones suggests that interactions with neighboring societies, or with more distant groups, were not manifested in the exchange of lithics. The uniformity of lithics at Gorge Creek Site 1 will also make it more difficult to tease out assemblages attributable to distinct Archaic sub-periods, because such culturally diagnostic exotic materials as jasper, rhyolite, Ramah chert, or Flint Ridge chert are not present. Curiously, the absence of exotic lithics here contrasts with the nearby Schoharie Creek II site, where, in addition to Eastern Onondaga chert, the Early Woodland component included debitage of chalcedony, Pennsylvania jasper, Kalkburg, and Normanskill chert (Rieth 2008, 2012). Perhaps such materials will turn up at Gorge Creek Site 1 when data recovery expands the sample size.

Nevertheless, some insights into regional settlement patterns may be gleaned from comparison of the Gorge Creek Site 1 assemblage with those recovered from other sites located along Schoharie Creek, e.g., Schoharie Creek II (Rieth 2012) and Pethick (Rafferty et al. 2014), both of which are located about 8 kilometers (5 miles) north of Gorge Creek Site 1. A cursory comparison reveals that the Gorge Creek Site 1 chipped stone assemblage from Phase II (n=1,244) has a much lower proportion of shatter and broken flakes (n=247, 19 percent) than Schoharie Creek II, where these

constitute about 64 percent of the lithics (22,772 out of a total of 35,837). At the Pethick Site an even greater percentage of the lithics is classified as shatter (177,889 of a total 188,406, or about 94 percent) (Rafferty et al. 2104:186). At Gorge Creek Site 1 a much higher proportion of flakes was utilized (n=101, 8 percent of all lithics) than at Schoharie Creek II, where only 383 flakes showed use-wear (a little more than 1 percent of the lithic assemblage). Only 723 utilized flakes (less than 0.5 percent of total lithics) have been recognized at the Pethick Site.

At Schoharie Creek II projectile points represented a remarkably small proportion of the total lithic assemblage; only nine points were found. Many more points have been recovered from the Pethick Site; the 180 points include 33 Levanna, 27 Meadowood, six Orient, five Adena, four Brewerton, two Madison, two Jack's Reef, one Perkiomen, one Susquehanna, and 99 unidentifiable points (Rafferty et al. 2014:186). Although only two points were found in the excavations at Gorge Creek Site 1, Anderson collected many more from the surface. It is noteworthy that one of the few typable points from Schoharie Creek II is an Orient Fishtail, another appears to be a Dry Brook Fishtail, and a third is a Meadowood. The Terminal Archaic fishtail types are well represented in Anderson's surface collection from Gorge Creek Site 1. Of course, the differing scales of the total assemblages may be affecting these comparisons. One of the rationales for additional excavation at Gorge Creek Site 1 is to obtain a larger artifact sample, which may clarify whether these ostensible inter-site differences are real or only a statistical artifact of small sample size.

It is possible that the ostensible high frequency of utilized flakes at Gorge Creek Site 1 may be a culturally diagnostic trait. Kraft (1970:9) reported his recovery of nearly three dozen utilized flakes from the Orient Fishtail component of the Miller Field Site in northern New Jersey. These were mainly of a specialized form with convex or concave edges. Kraft also reported utilized flakes from the slightly older Broadspear component of the site; such tools had not previously been recognized in Terminal Archaic assemblage. It will be necessary to closely examine utilized flakes from the Phase III excavations to determine if (1) the edge wear is really caused by prehistoric use or by plow damage or other post-depositional processes, and (2) if there is any morphological consistency that might indicate a cultural template similar to the specialized Orient forms from Miller Field.

4. Cultural History/Chronology

Gade and Schreyer's (2016:12) suggested research focus on "cultural history" of the Gorge Creek Site 1 can be rephrased as a focus on chronology. Basically, there are two ways to construct a chronology for the site. One is to assemble a substantial collection of projectile points. Based on their distinctive basal morphology and radiocarbon-dated associations at numerous sites, these artifacts can be assigned to temporal spans of ca. 500 to 1500 years. The relative numbers of points of each type may be used as an index of the frequency/intensity of site use during each period.

The only typable artifact recovered in previous investigations was the basal portion of a Lamoka-like point. However, the points collected in this vicinity by a local amateur include Lamoka-like points, Snook Kill, Dry Brook, Orient Fishtail, a possible Turkey Tail, and a few side-notched (Meadowood or Brewerton) points. This evidence suggests that the site was occupied intermittently between ca. 5500 and 2500 calibrated years before present (cal BP). A few triangles in Anderson's collection might indicate either a discrete Late Woodland presence or another Middle or early Late Archaic occupation. The preponderance of Orient and Dry Brook fishtail points in the collection suggests that the site was occupied most intensively around 1500 to 1200 cal BP.

A complementary or alternative strategy for establishing the site's chronology is to recover organic material from hearths or pit features, which can be sampled for dating by radiocarbon assays. This is the primary rationale for targeting most of the data recovery effort at the portion of the site where features are most likely to be encountered. Features also may also yield material such as charred nut shells and seeds and calcined bones that would be useful for reconstruction of subsistence and environment. Additionally, charred nuts and seeds are the preferred samples for radiocarbon dating because the "old wood effect" is minimized. A piece of wood may be burned in a hearth many years after the tree's death; radiocarbon dates the time of death (after which atmospheric carbon dioxide was no longer absorbed), not the time of burning. In contrast, nuts and seeds are likely to have been burned very soon after they were harvested.

In principle, the most frequent and intensive occupations of a site should leave behind both the greatest numbers of artifacts, including typologically diagnostic specimens, and also the greatest numbers of features and organic detritus suitable for radiocarbon dating. However, because of differences in site function over time, and the vagaries of

preservation and sampling, these kinds of evidence may not coincide precisely. An example of such incongruity can be seen at the Pethick Site. Of the 81 typable points, only two (2.5 per cent) (a Perkiomen and a Susquehanna Broad) can be attributed to the portion of the Terminal Archaic between ca. 4000 and 3600 cal BP. However, two (20 percent) of the 10 radiocarbon dates reported for the site fall within this period. On the other hand, 27 (33 percent) of the 81 identified points from Pethick are Meadowood, and similarly three (30 percent) of the 10 dates are appropriate for the Meadowood phase (2510±40, 2640±60, and 2670±110 rcbp). For comparison, it may be noted that Funk (1993:299–307) reported a fairly close correspondence of the relative frequencies of projectile point types and components of each period, both in the Upper Susquehanna Valley and the Hudson Valley. However, in both regions Late Archaic points (Sylvan Stemmed in the Hudson Valley, Vestal in the Upper Susquehanna Valley) were over-represented relative to the number of components of these phases.

The uniformity of raw material, the lack of stratigraphic separation, and the ubiquity of utilized flake tools across Gorge Creek Site 1 combine to create a probably erroneous impression of the unchanging function of Gorge Creek Site 1 through time. It should be emphasized, however, that Anderson's collection suggests at least three discrete occupation episodes, each separated by centuries from the next: Lamoka (ca. 5500 to 5000 cal BP); Snook Kill (ca. 4200 to 3800 cal BP) and Dry Brook-Orient (ca. 3500 to 2900 cal BP). Both earlier (Brewerton or Middle Archaic) and later (Meadowood and Late Woodland) occupations may also be present. It would be surprising if the site were used in exactly the same way in each of these episodes, particularly as a cultural discontinuity probably occurred between the Lamoka and Snook Kill horizons. On the other hand, if the resources available in this location did not change significantly in the course of millennia, the basic processing tasks that entailed the use of many expedient flake tools may have varied little from one occupation episode to the next.

It is doubtful whether the entire site would have been occupied during any single occupation episode. The possibility of isolating a Terminal Archaic camp is raised by Anderson's observation that Orient Fishtail points were concentrated in the northeast sector of the site.

The likely presence of an Orient Fishtail component at Gorge Creek Site 1 offers an opportunity to address a research issue that has been raised by recent work at the Pethick Site. Rafferty et al. (2014) suggest that this site, and others along Schoharie Creek, were located at the boundary between contemporaneous, distinct cultural zones: Orient Fishtail to the east and Meadowood to the west. They do not address the obvious question whether those zones, defined by sharply distinct projectile point styles, represent discrete ethnic, linguistic, or political entities. Nevertheless, "We argue that the Pethick site was occupied by populations exhibiting Early Woodland and Transitional tool kits not sequentially, but consecutively (i.e., two populations alternatively occupying the site over time) and perhaps simultaneously" (Rafferty et al. 2014:184).

Orient Fishtail, clearly derived from the preceding aceramic Terminal Archaic or Transitional Savannah River/Snook Kill/Susquehanna/Perkiomen tradition, is generally regarded as the final expression of this tradition. The temporal division between Terminal Archaic (without pottery) and Early Woodland (with pottery) has generally been set at 3000 rcbp (3200 cal BP). Most Orient-associated radiocarbon dates fall on the early side of the boundary, beginning about 3200 rcbp (3400 cal BP). However, a few dates are as late as ca. 2800 rcbp (2900 cal BP) (albeit with large standard errors). Orient points are associated with carved soapstone vessels, but also, rarely, with soapstone-tempered clay pots. Meadowood points are often associated with Vinette I pottery and therefore are assigned unambiguously to the Early Woodland. Radiocarbon dates for Meadowood generally fall between ca. 2900 and 2400 rcbp (3000 and 2500 cal BP); an anomalously early outlier from the Fortin Site on the Upper Susquehanna is 3180±95 (ca. 3300 to 3500 cal BP). Meadowood points seem to have developed from the small, notched points (e.g., Hind) that are found in southern Ontario and the northern Midwest between ca. 3500 and 2800 rcbp.

No credible Orient-associated dates are later than ca. 2750 rcbp (2850 cal BP or 880 cal BC). The end of the Terminal Archaic tradition thus appears temporally and perhaps causally associated with an abrupt climate event. Numerous environmental records in Europe indicate a climatic downturn around 800 to 750 cal BC, which coincides with a radiocarbon "cliff" indicating weakened solar activity. Atmospheric ^{14}C increases and dates drop abruptly from 2750 to 2450 rcbp (Fiedel 2001; Martin-Puertas et al. 2012; Van Geel and Mauquoy 2010). The "cliff" is followed by a plateau; between 2750 and 2400 cal BP, radiocarbon dates are indistinguishable, always ca. 2450 rcbp. Martin-Puertas et al. (2012) have recently shown that a simultaneous sharp increase in windiness and increase in cosmogenic beryllium (^{10}Be) occurred at ca. 2760 cal BP in central Europe; they infer that "changes in atmospheric circulation amplified the solar signal and caused abrupt climate change about 2800 years ago, coincident with a grand solar

minimum." This climate change is coincident with Bond event 2 in the North Atlantic, and a probably associated climate episode shows up very strongly in the strontium/calcium ratios from Buckeye Creek Cave in West Virginia (Springer et al. 2008: figure 1). Shuman et al. (2009) infer numerous prehistoric episodes of regional drought from the occurrence of sand layers attributed to lowered water levels in New Long Pond, Massachusetts. Among these is a drought dated to ca. 2980 to 2760 cal BP. Newby et al. (2011) report a similar drought record from Davis Pond in southwestern Massachusetts. Low water levels are inferred for most of the period from 3500 to 2300 cal BP. At Cayuga Lake in central New York, Mullins et al. (2011) infer an abrupt cold, dry episode starting around 3000 cal BP and persisting to 2400 cal BP; they hypothesize that it may have been caused by reduced solar activity. Pollen sampled from Ballston Lake, located between Saratoga and Schenectady, shows an increase of conifers, hardwoods, and boreal taxa at about 2680 cal BP (2520 rcbp); this is interpreted as marking a shift to a colder climate (Toney et al. 2003).

Recovery of datable charcoal from features in the central and northeast sectors of Gorge Creek Site 1 may provide samples for several AMS (accelerator mass spectroscopy) radiocarbon assays. Many of the extant radiocarbon dates that underpin regional chronology predate introduction of the AMS technology in the late 1980s. AMS dates are much more precise and often more accurate than the older assays. An example of the improved chronological resolution provided by AMS is the recent re-dating of the Terminal Archaic and Late Woodland components at the Little Wood Creek Site in Fort Edward (Grossman et al. 2015).

5. *Lithic Technology*

Almost all of the cultural material recovered in previous investigations of Gorge Creek Site 1 is chipped stone. The assemblage includes bifaces, scrapers, chipped stone tools, expedient flake tools, cores, debitage, utilized cobbles, and thermally altered rocks. We anticipate that additional material excavated in the data recovery will augment this assemblage. Proportionally, very few projectile points were found in the Phase I and II testing; however, an avocational surface collection contained many projectile points; it is possible that excavation and stripping below the plowzone may produce more temporally diagnostic points.

Previous investigations indicated the existence of several discrete clusters of high-density debitage across the site. Wider exposure of these areas by manual excavation and mechanized stripping may clarify their character. Are they simply patches where historic-era plowing was less intense, so that artifacts were less dispersed than elsewhere? Alternatively, do they represent the remnants of discrete lithic reduction/processing areas? In that case do the separate clusters represent distinctive lithic reduction strategies? If so, can these strategies be tied to particular cultural phases? This would be facilitated by radiocarbon and/or typological dating of closely associated features.

D. Proposed Fieldwork

1. *Excavations*

Louis Berger's proposed Phase III data recovery procedures will address the research issues discussed in Section C by means of two complementary strategies: (1) manual excavations in the locations where previous research indicated the highest densities of artifacts and features, and (2) mechanical stripping of areas with lower artifact densities to identify features at the plowzone/B horizon interface.

The placement of individual test unit excavations will address two specific archaeological objectives. First, the excavations will be located to recover sufficient quantities of cultural material to address research issues. Second, areas will be exposed to identify additional features and discrete or clustered activity areas, for example, those focused around prehistoric hearths or storage pits. If features are exposed, flotation samples will be taken for attempted recovery of the faunal and floral remains needed for radiocarbon dating and inference of prehistoric subsistence practices and seasonality.

The proposed units will be 3x3-meter block excavations; individual test units will be excavated within these larger blocks as 1x1-meter units. Individual 1x1-meter units may also be employed to test and sample selected areas prior to mechanical stripping. The use of large 3x3-meter blocks consisting of contiguous test units will facilitate recognition of activity areas manifest as lithic artifact concentrations, FCR clusters, and pit and postmold patterns.

a. Manual Excavations

Louis Berger proposes to manually excavate a maximum of 36 square meters (387 square feet). The placement of excavation blocks and units will be determined primarily by the quantities of artifacts reported from Phase I and Phase II shovel tests and units; however, the disposition of units may be altered in the field in response to contingent circumstances (e.g., discovery in the initial units of large, dense artifact or feature concentrations). As of now, Louis Berger proposes to place two block excavations in the vicinity of Phase II Units 2 and 4 and the recorded buried A horizon, and one block near Phase II Shovel Test 20:5 (see Figure 1). One block will be held in reserve to deploy to one of these areas or elsewhere, as the initial results may dictate.

In manual excavation, all soil horizons will be removed using shovels and trowels. The excavation of block units will begin with removal of the approximately 20 to 30 centimeters of plowzone; the buried A horizon and B horizon will then be excavated by 10-centimeter intervals within natural/cultural horizons. All soils will be screened through 0.25-inch hardware cloth. The locations of diagnostics identified *in situ* will be recorded with three-dimensional coordinates. Any features encountered will be numbered, photographed, and mapped; they will then be bisected and profiled. A sample for flotation from each feature will be taken, consisting of up to approximately half of the feature. This general sample size may be adjusted in cases where the features are larger. Charcoal or other carbonized materials present in feature fill will be sampled for radiocarbon assay.

Field observations and excavation data will be recorded on standardized forms developed by Louis Berger. Excavated soils will be recorded and described in terms of both texture and color, using USDA soil classifications and Munsell charts. Digital photographs of the site area and excavations will be taken as appropriate. All excavations will be backfilled upon completion and all safety regulations will be strictly followed during the investigations.

b. Mechanical Excavations

Following manual excavations, a straight-bladed backhoe will be used to mechanically strip off the approximately 30-centimeter plowzone from selected portions of the site in an effort to identify features at the plowzone-subsoil interface. Louis Berger proposes to mechanically strip 3,700 square meters (40,000 square feet) of the site, comprising approximately 16 percent of the total site area (see Figure 1).

Louis Berger archaeologists will monitor the mechanical stripping operations at all times, examining the stripped surface for soil anomalies and guiding the depth of excavations. Once the interface potentially containing cultural deposits and features has been exposed by the machine, Louis Berger archaeologists will hand-skim the remnant overburden and examine the surface for prehistoric cultural features, rock and artifact clusters, and soil anomalies. All soil stains identified during this process will be pin-flagged for further review to determine their cultural vs. natural status. A number designation will be assigned to each potential cultural feature, including soil anomalies and rock clusters. All numbered potential features will be mapped using sub-foot GPS or total station. Wherever multiple features are identified, digital photographs will be taken of the feature clusters.

2. Health and Safety

Health and safety will be addressed in a site-specific health and safety plan (HASP). The Occupational Safety and Health Administration (OSHA) mandates preparation of this plan. The HASP identifies and evaluates health and safety hazards that may exist in a project area and provides procedures and equipment to be employed to minimize workers' exposure to the potential hazards.

E. Data Processing and Analysis

At the conclusion of the field investigations, all recovered materials will be transported to Louis Berger's laboratory where artifact analysis and flotation processing tasks will proceed. Louis Berger's budget for this task assumes that a maximum of 1,000 artifacts will be recovered.

Specific laboratory tasks for preliminary treatment of cultural materials will include the following.

All recovered materials, including floral and faunal remains, will be cleaned and conserved to ensure their stability. Prehistoric bifaces, flake tools, utilized flakes, and other artifacts that may be examined for edge wear traces will be minimally processed pending appropriate analysis.

All materials will be fully provenienced and labeled. The artifacts will be prepared for permanent curation and transferred to a facility that meets the curation standards published by NYAC (1994) at the conclusion of the project.

To the extent possible, all recovered lithic artifacts will be identified as to cultural and temporal affiliation, raw material type, and formal and functional categories.

As discussed above, the research orientation of the proposed investigation focuses on the site's chronology, cultural affiliations, and definition of its function(s) in the regional settlement systems of several periods. Laboratory classification and analyses of artifacts will thus be oriented toward these research issues. The following section outlines these laboratory procedures.

As a first step in analysis of the lithic artifacts, they will be sorted into tool and debitage classes. Following this, they will be sorted and analyzed with respect to functional morphology, technological stages, metrical, and other attributes (e.g. color, texture and inferred source of the stone).

Projectile points will be assigned to recognized regional types. This classification is crucial for establishing the chronology of the site as a whole, and possibly for distinguishing sectors occupied by distinct social groups, whether sequentially or simultaneously. Breakage patterns, edge and tip wear, and re-working will be noted. Other formed tools may be classified as end- or sidescrapers, knives, drills, or other functional classes based on a combination of morphology and any observed use-wear or breakage.

A major goal of the analyses of debitage, cores, and incomplete bifaces will be to determine the intensity, stages, and distinctive strategies of lithic reduction activities at the site. For the bifaces, presence/absence of cortical surfaces and width-to-thickness ratios will indicate stage of reduction. Size, shape, extent of cortex, and flaking patterns will be recorded for cores.

Lithic debitage, including all types of flakes created in the lithic reduction sequence, will be counted and measured. Raw material type, lithic reduction stage (blocky shatter, decortication, early reduction, biface reduction, thinning) and presence/absence of cortex will also be recorded. Whole and broken flakes (lacking the original striking platform or termination) will be distinguished.

Based on reported Phase I and II data, the Gorge Creek Site 1 lithic assemblage appears to contain an unusually high percentage of utilized flakes. To confirm or refute this finding, which has important implications for the site's function and role in the regional settlement system, it will be necessary to devote special attention to this artifact class. All debitage will be visually inspected for patterned edge damage and/or retouching. A sample of those artifacts with ostensible edge alteration will be examined using low-power microscopy to identify micro-flake scars, snap fractures, step fractures, and edge rounding.

No ceramic sherds were recovered in Phase I and II investigations. Nevertheless, given the presence of a likely Meadowood point and a few triangles in Anderson's surface collection, Woodland occupations appear to be present, so potsherds might be encountered. If ceramic sherds are recovered, they will be sorted into rim, neck, and body categories and will be refitted to the extent possible. The resulting vessel lots will be characterized in terms of temper, paste, and decorative treatment. If recovered ceramics are of sufficient size, measurements of sherd thickness and curvature may be used to infer vessel shape and size.

If prehistoric FCR features are exposed, the FCR will be counted and weighed in the field. Samples from features will be prepared for flotation. Carbonized pieces of wood and nutshell, whether collected during feature excavation or recovered later by flotation, will be examined by a paleobotany specialist to determine their taxa. Selected credible samples (from known prehistoric taxa such as oak, butternut, and hickory) from secure contexts will be submitted to a laboratory (e.g., Direct-AMS, Beta-Analytic) for radiocarbon assay.

Following analyses of the artifacts, a spatial analysis of the distributions of archaeological classes and features will be performed. This analysis will focus on horizontal variation in the presence/absence and densities of lithic tool types and debitage relative to FCR concentrations and other features identified on the site. Of particular interest will be any differences observed between the northeast sector of the site, putatively dominated by Orient phase materials, and the central sector, of unknown cultural/temporal affiliation.

F. Coordination/Human Remains Policy

Louis Berger will advise GOSR of any problems or significant developments during the data recovery, and will assist GOSR as needed with any notifications required at the onset of fieldwork. In addition, GOSR will be notified immediately if any human remains are encountered during performance of this work. If human remains are encountered, they will be treated at all times with appropriate respect and according to all prescribed procedures. In accordance with the *Human Remains Discovery Protocol* (New York State OPRHP 2015), the discovery of human remains will result in a cessation of work in the vicinity of the remains, and no skeletal or artifactual material will be removed or disturbed. Louis Berger will inform the appropriate local civil or law enforcement authority, OPRHP, the St. Regis Mohawk Tribe, and other involved parties of the finding. The local civil or law enforcement authority shall make an official determination of the nature of the remains. If the remains are identified as a Native American burial, GOSR will consult with OPRHP, the St. Regis Mohawk Tribe, and other appropriate parties regarding the course of treatment of the remains. Efforts will be made to avoid disturbance of any additional burials. Any investigation of skeletal remains will be conducted according to the NPS *Guidelines for the Disposition of Archeological and Historical Human Remains*. Any work or services provided by Louis Berger in association with the investigation of human remains will be coordinated and negotiated with GOSR.

G. Schedule and Reporting

Louis Berger understands that scheduling of the work is a primary concern and is prepared to mobilize a field crew to the project area upon approval of the DRP. Louis Berger has sufficient staff available to complete the work in a timely fashion and is prepared to commit staff resources so that the fieldwork, laboratory processing, and end-of-field letter can be completed within a proposed project schedule. It is anticipated that the fieldwork will begin on or around March 15, 2017, and will be completed in a period of approximately three weeks, weather permitting. Within 15 days of clearing the field, an end-of-field letter will be submitted to OPRHP for review and concurrence that the proposed data recovery fieldwork has been completed. The end-of-field letter is intended to facilitate OPRHP review to comply with the proposed construction scheduling. Following submission of the end-of-field letter and after data analyses are complete, a technical report will be prepared. The technical report will be submitted within one year of the submission of the end-of-field letter. The technical report will consist of the results of fieldwork and analyses of data and will include but not be limited to the following: abstract, introduction, description of the project, environmental setting, chronological and cultural context (including a review of regional archaeological data pertinent to the site), field expectations, field methodology, results of fieldwork, analytical methods, results of analyses, and bibliography. The report will include all appropriate maps, figures, and plates. An inventory of all observed and collected artifacts will be included as an appendix. The report will be submitted in PDF format (one draft and one final).

H. Additional Tasks *(Scheduling/Cost TBD)*

Louis Berger anticipates that, after analyses and report submission, the artifact assemblage recovered from the site will be transferred to a faciltiy that meets the standards speciifed by NYAC (1994) for permanent curation. All the artifacts will be prepared for long-term curation. In addition, all other collections resulting from the data recovery, including ecofacts, analytical samples, field notes, laboratory forms, and photographic documentation, will be packed in archival containers in preparation for curation.

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State Historic Preservation Office/
New York State Office of Parks, Recreation and Historic Preservation
Human Remains Discovery Protocol
(June 2015)

In the event that human remains are encountered during construction or archaeological investigations, the New York State Historic Preservation Office (SHPO) recommends that the following protocol is implemented:

- At all times human remains must be treated with the utmost dignity and respect. Should human remains or suspected human remains be encountered, work in the general area of the discovery will stop immediately and the location will be immediately secured and protected from damage and disturbance.

- Human remains or associated artifacts will be left in place and not disturbed. No skeletal remains or materials associated with the remains will be collected or removed until appropriate consultation has taken place and a plan of action has been developed.

- The SHPO, the appropriate Indian Nations, the involved state and federal agencies, the coroner, and local law enforcement will be notified immediately. Requirements of the corner and local law enforcement will be met. A qualified forensic anthropologist, bioarchaeologist or physical anthropologist will assess the remains *in situ* to help determine if the remains are Native American or non-Native American.

- If human remains are determined to be Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO and the Indian Nations. The involved agency will consult SHPO and appropriate Indian Nations to develop a plan of action that is consistent with the Native American Graves Protection and Repatriation Act (NAGPRA) guidance. Photographs of Native American human remains and associated funerary objects should not be taken without consulting with the involved Indian Nations.

- If human remains are determined to be non-Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO. Consultation with the SHPO and other appropriate parties will be required to determine a plan of action.

Louis Berger

March 07, 2017

Ms. Alicia Shultz
HCR
38 State Street
Albany, NY 12207

Re: GOSR
Gorge Creek Culvert Improvements
Middleburgh, Schoharie County, NY
15PR06219

Dear Ms. Shultz:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. 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 State Environmental Conservation Law Article 8).

We have reviewed the document entitled “Data recovery Plan, Gorge Creek Site 1 (09542.000116), Village of Middleburgh, Town of Middleburgh, Schoharie County, New York” (March 6, 2017). SHPO concurs with the proposed scope of work for the data recovery. SHPO recommends two changes to the document.

First, in Section E (Data Processing and Analysis), the document states that, “The artifacts will be prepared for permanent curation and transferred to the St. Regis Mohawk” (Page 10, Paragraph 2). This is reiterated in Section H (Additional Tasks). SHPO recommends that this be changed to state that the materials will be turned over to a curation facility that meets the New York Archaeological Council’s “Standards for Cultural Resource Investigation and the Curation of Archaeological Collections in New York State” (1994).

Second, in Section F (Coordination/Human Remains Policy), the document references the 2008 SHPO “Human Remains Discovery Protocol.” The protocol was updated in 2015 (see attached). SHPO recommends that the document reference the 2015 version of the protocol, and the protocol should be attached to the document.

If further correspondence is required regarding this project, please refer to the SHPO Project Review (PR) number noted above. If you have any questions I can be reached at 518-268-2186.

Sincerely,

Tim Lloyd, Ph.D., RPA
Scientist - Archaeology
timothy.lloyd@parks.ny.gov via e-mail only

Enc. (1)

Cc: Andrew Dangler (USACE)
Mary Barthelme (GOSR)
Ed Fahrenkopt (Delaware Engineering)
Genevieve Kaiser (Tetra Tech)

State Historic Preservation Office/
New York State Office of Parks, Recreation and Historic Preservation
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- The SHPO, the appropriate Indian Nations, the involved state and federal agencies, the coroner, and local law enforcement will be notified immediately. Requirements of the corner and local law enforcement will be met. A qualified forensic anthropologist, bioarchaeologist or physical anthropologist will assess the remains *in situ* to help determine if the remains are Native American or non-Native American.

- If human remains are determined to be Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO and the Indian Nations. The involved agency will consult SHPO and appropriate Indian Nations to develop a plan of action that is consistent with the Native American Graves Protection and Repatriation Act (NAGPRA) guidance. Photographs of Native American human remains and associated funerary objects should not be taken without consulting with the involved Indian Nations.

- If human remains are determined to be non-Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO. Consultation with the SHPO and other appropriate parties will be required to determine a plan of action.

Preserving America's Heritage

February 6, 2017

Ms. Lori Shirley
Director
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery
25 Beaver Street
New York, NY 10004

Ref: *Proposed Gorge Creek Culvert Repair and Drainage Infrastructure Improvements Project*
Schoharie County, New York

Dear Ms. Shirley:

The Advisory Council on Historic Preservation (ACHP) has received your notification and supporting documentation regarding the adverse effects of the referenced undertaking on a property or properties listed or eligible for listing in the National Register of Historic Places. Based upon the information provided, we have concluded that Appendix A, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, of our regulations, "Protection of Historic Properties" (36 CFR Part 800), does not apply to this undertaking. Accordingly, we do not believe that our participation in the consultation to resolve adverse effects is needed. However, if we receive a request for participation from the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), affected Indian tribe, a consulting party, or other party, we may reconsider this decision. Additionally, should circumstances change, and it is determined that our participation is needed to conclude the consultation process, please notify us.

Pursuant to 36 CFR §800.6(b)(1)(iv), you will need to file the final Memorandum of Agreement (MOA), developed in consultation with the New York State Historic Preservation Office (SHPO), and any other consulting parties, and related documentation with the ACHP at the conclusion of the consultation process. The filing of the MOA, and supporting documentation with the ACHP is required in order to complete the requirements of Section 106 of the National Historic Preservation Act.

Thank you for providing us with the notification of adverse effect. If you have any questions or require further assistance, please contact Ms. Jaime Loichinger at 202-517-0219 or via e-mail at jloichinger@achp.gov.

Sincerely,

LaShavio Johnson

LaShavio Johnson
Historic Preservation Technician
Office of Federal Agency Programs

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

January 19, 2017

Ms. Jaime Loichinger, Program Analyst
Federal Permitting, Licensing, and Assistance Section
Advisory Council on Historic Preservation
401 F Street NW, Suite 308, Washington, DC 20001

RE: CDBG-DR Funding Application for the Gorge Creek Culvert Repair and Storm Water and Drainage Infrastructure Improvements Project

Dear Ms. Loichinger:

On August 7, 2015, the New York State Governor's Office of Storm Recovery ("GOSR") received a funding application from the Schoharie County Soil & Water Conservation District (the "District") to support the design and construction costs for improvements to the Gorge Creek Culvert for the Village of Middleburgh, Schoharie County, New York (the "Undertaking"). The Undertaking is comprised of two sites. Gorge Creek Site 1 is proposed to be excavated to form a sedimentation basin adjacent to Gorge Creek intended to protect the Village of Middleburgh from the risk of flooding during major storms. Gorge Creek Site 2 is proposed to receive a new box culvert that will be able to accommodate potential storm water runoff from a 100-year storm. For additional information, please see Enclosure 1.

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.), GOSR is acting under the auspices 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") and is the entity responsible for compliance with the HUD NEPA environmental review procedures set forth in 24 CFR Part 58 and Section 106 of the National Historic Preservation Act ("NHPA" 16 USC § 470f).

On October 26, 2015, GOSR initiated consultation with the State Historic Preservation Office ("SHPO") regarding the proposed Undertaking. GOSR also initiated consultation with the St. Regis Mohawk Tribe and the Mohawk Nation on March 22, 2016, and with the Stockbridge-Munsee Community, Band of the Mohicans on April 22, 2016. The SHPO and the St. Regis Mohawk Tribe indicated a potential Adverse Effect and requested that GOSR undertake a Phase I Archeological Survey.

In May 2016, the Phase I Archeological Survey, which assessed the entire Undertaking, identified the potentially eligible Gorge Creek Site 1. Gorge Creek Site 2 was deemed not eligible for listing and no further archaeological work was recommended. GOSR provided the results of the Phase I with all consulting parties identified above. No response was received from the Mohawk Nation and the Stockbridge-Munsee Community Band of the Mohicans indicated that the Undertaking is located out of the cultural interest of the Community and declined comment on the project. The SHPO and St. Regis Mohawk Tribe requested GOSR complete a Phase II Archeological Survey of Gorge Creek Site 1.

In October 2016, a Phase II Archeological Survey, which assessed Gorge Creek Site 1, was provided to the SHPO and the St. Regis Mohawk Tribe for review. On January 5, 2017, the SHPO issued a letter stating an Adverse Effect opinion regarding proposed the disturbance at Gorge Creek Site 1 as a National Register eligible site. However, the letter stated a willingness to enter a Memorandum of Agreement ("MOA") that recognizes the associated adverse effect, lists mitigation measures, and includes their office for the continued review of the project. Please see Enclosure 2 for further information.

In evaluating the District's request for funding, GOSR defers to SHPO and the St. Regis Mohawk Tribe with respect to the Adverse Effect determination and is now proceeding in accordance with 36 C.F.R. Part 800. As per 36 C.F.R. § 800.6(a), the Advisory Council on Historic Preservation (the "Council") is invited to participate in the ongoing consultation and preparation of the MOA regarding the Undertaking. Please advise this office within 15 days of receipt of this letter whether the Council desires to participate in this process.

For any questions or concerns regarding, please contact me by phone at (518) 474-0755 or email at Lori.Shirley@nyshcr.org.

Sincerely,

Lori A Shirley

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

Enclosures:

Project Application for Funding
SHPO Affect Finding Letter

cc: Timothy Lloyd, New York State Historic Preservation Office
Stephen Hoerz, District Field Manager, Schoharie County Soil & Water Conservation District
Matthew Avitable, Mayor, Village of Middleburgh
Arnold Printup, St. Regis Mohawk Tribe
US Army Corps of Engineers, Upstate Regulatory Field Office

STATE OF NEW YORK
SCHOHARIE COUNTY SOIL AND WATER CONSERVATION DISTRICT

NY STATE
CDBG-DISASTER RECOVERY PROGRAM

APPLICATION FOR FUNDING
GORGE CREEK CULVERT REPAIR AND STORM WATER AND DRAINAGE INFRASTRUCTURE IMPROVEMENTS

JULY, 2015

PREPARED BY

HUNT, GUILLOT, & ASSOCIATES, LLC
25 BEAVER STREET
2ND FLOOR
NEW YORK, NEW YORK 10004
(646) 797-4993

TABLE OF CONTENTS

General Description Form

Place a check mark in the appropriate box: ☒ Original Application ☐ Amended Application

<table>
<tr><td>Applicant Name, Address, Phone and Fax Nos.:

Schoharie County Soil & Water Conservation District
173 South Grant Street, Suite 3
Cobleskill, New York 12043
Phone: 518-823-4535
Fax: 518-823-4538</td><td>Project Name:

Gorge Creek Culvert Repair and Storm Water and Drainage Infrastructure Improvements

Project Address:

Village of Middleburgh, New York</td></tr>
<tr><td rowspan="2">Applicant's Contact Person Name, Address, Phone Number, Email Address, DUNS Number, and SAM CAGE Code Number.

Stephen Hoerz, District Field Manager
173 South Grant Street, Suite 3
Cobleskill, New York 12043
Phone: (518) 823-4535
Email: District@schohariesoilandwater.org
DUNS Number: 069-30-3801
SAM CAGE Code Number: 78Z45</td><td>Name, Address, Phone Number and Email Address of HGA Administrative Consultant: (if applicable)

Tony Brual, Grant Consultant
Hunt, Guillot & Associates, LLC
99 Washington Avenue, Suite 1224
Albany, New York 12260
Phone: 318-446-3933
Email: TBrual@hga-llc.com</td></tr>
<tr><td>Name, Address, Phone Number and Email Address of GOSR Project Manager:

Amanda Hansen, Director
Governor's Office of Storm Recovery
99 Washington Avenue, Suite 1224
Albany, New York 12260
Phone: 518-473-0099
Email: amanda.hansen@stormrecovery.ny.gov</td></tr>
<tr><td>Name, Address, Phone Number and Email Address of Architectural/Engineering Firm:

N/A</td><td>National Objective to be Addressed (check one).

__X__ Activities Benefiting Low/Moderate Income Persons
_____ Prevention/Elimination of Slums or Blight
_____ Urgent Need
_____ Not Applicable—Planning</td></tr>
</table>

Project Funds	Amount	Source and Status of Funds
CDBG-DR	$2,600,000.00	CDBG-DR
Local Funds	$0.00	
Private Funds	$0.00	

Other State Funds	$0.00	
Federal Funds (non-CDBG-DR)	$0.00	
Other Funds	$0.00	
TOTAL FUNDS	$2,600,000.00	CDBG-DR
Signature (Authorizing Official) and Date Signed Stephen Hoerz 8/7/15		**Typed Name/Title (Authorizing Official)** Stephen Hoerz, District Field Manager

SUPPLEMENTAL INFORMATION

Project Name: Gorge Creek Culvert Repair and Storm Water and Drainage Infrastructure Improvements Mitigation

1. Identify the name, telephone and District # of the State Senator(s) representing your jurisdiction:

Name:	**Senate District #:**
James L. Seward	51
518-455-3131	

2. Identify the name, telephone number, and District # of the State Representative(s) representing your jurisdiction:

Name:	**Representative District #:**
Peter D. Lopez	102
518-295-7250	

3. Identify the U.S. Congressman representing your jurisdiction and congressional district number.

Name:	**Congressional District #:**
Christopher P. Gibson	19
Phone: 518-295-7250	

4. Identify the members of your jurisdiction's governing authority.

Name:	**Member District #:**
Claude Coons - Chairman	At-Large
John Radliff – Vice Chairman	At-Large
Richard Prokop – Secretary/Treasurer	At-Large
Harold Vroman	At-Large
Tony VanGlad	At-Large

5. Target Area Census Tract(s): 740700

6. Indicate by means of an "x" as to whether the proposed project will involve a community-wide benefit or a target area(s) and enter the zip code of the project. If a target area is involved, enter the name(s) and zip code of the target area(s).

___Community-wide (Zip Code:_______) __X_Target Area(s) (Zip Code: 12122)

Name and Zip Code of Target Area:

Name and Zip Code of Target Area:

Name and Zip Code of Target Area:

Community-wide projects should use the zip code of the location of city hall. Target-area projects should use the zip code of the target area where the majority of the construction funds will be spent (for each target area). If the target area(s) does not have a name, please provide a brief geographical description of the area such as "western portion of the city."

7. Provide Lat/Long for the Project Location at or near the geographical center:
   Latitude: 42.598906 Longitude: -74.333889

8. How many other projects funded with CDBG-DR funds relate to the project: none

9. Does the project relate to any other project GOSR should be aware? _____Yes __X__No

10. Does the project encompass multiple counties: _____Yes __X__No

11. If the proposed project is a "covered project," please provide a narrative describing the **"Resilience Performance Standards"** to be used in the design/implementation of the project below.

    NOT APPLICABLE

12. If the proposed project is a "covered project," please provide a narrative describing the **"Green Infrastructure Project Activities"** to be used in the design/implementation of the project below. For the purpose of completing this section, green infrastructure is defined as the integration of natural systems and processes, or engineered systems that mimic natural systems and processes, into investments in resilient infrastructure. "Green Infrastructure" takes advantage of the services and natural defenses provided by land and water systems such as wetlands, natural areas, vegetation, sand dunes, and forests, while contributing to the health and quality of life of those in recovering communities.

    NOT APPLICABLE

13. If the proposed project is a "covered project," please provide a narrative describing the **"Transparent and Inclusive Decision Processes"** undertaken in selection of the proposed project. Include accessible public hearings and other processes to advance the engagement of vulnerable populations.

    NOT APPLICABLE

14. If the proposed project is a "covered project," please provide a narrative describing the **"Long Term Efficacy and Fiscal Sustainability"** plans to monitor and evaluate efficacy and sustainability, including how it will reflect changing environmental conditions (such as sea level rise or development patterns) with risk management tools, and/or alternate funding sources, if necessary.

    NOT APPLICABLE

15. If the proposed project is a "covered project," please provide a narrative describing how the project will align with the commitment expressed in the President's Climate Action Plan to "identify and evaluate additional approaches to improve our natural defenses against extreme weather, protect biodiversity, and conserve natural resources in the face of changing climate…"

    NOT APPLICABLE

16. Has an amendment to the Action Plan to include this project been submitted to HUD?
    ____ Yes; __X_ No;

17. What is the status of the amendment request? Provide a narrative describing the status of the amendment request. (Include date of submission, date of approval, any requests for additional information, and current status)

    NOT APPLICABLE

18. Is this project receiving FEMA Public Assistance funding: ____Yes __X__No

19. Is this project receiving FEMA Public Assistance 406 Hazard Mitigation Funds:
    ____Yes __X_No
    Please provide the FEMA Project Worksheet number(s) for this project application:________
    (The FEMA project work sheet number should include the FEMA disaster declaration number in the first four (4) digits and the project worksheet number in the last five (5) digits. A Hurricane Sandy related project with the project worksheet "567" would be entered as "4085-00567)

20. Is this project receiving FEMA Section 404 Hazard Mitigation funds:
    ____Yes __X__No

21. Is this project receiving any Army Corps of Engineers funding:
    ____Yes __X__No
    If yes, please provide the type of funds applied for and application number:_______________

22. Is this project receiving any Environmental Protection Agency funds:
    ____Yes __X__No
    If yes, please provide the type of funds applied for and application number:_______________

23. Is this project receiving any Department of Energy funds:
    ____Yes __X__No
    If yes, please provide the type of funds applied for and application number:_______________

24. Is this project receiving any Department of Transportation funds:
    ____Yes __X__No
    If yes, please provide the type of funds applied for and application number:_______________

25. Is this project receiving any Department of the Interior fund:
    ____Yes __X__No
    If yes, please provide the type of funds applied for and application number:_______________

BUDGET/COST SUMMARY FORM

PROJECT NAME: **Gorge Creek Culvert Repair and Storm Water and Drainage Infrastructure Improvements**

(A) Costs by Activity	(B) CDBG-DR	(C) Other	(D) Total	(E) Source
1. Acquisition of Real Property	$0.00	$0.00	$0.00	
2a. Public Facilities and Improvements (Phase I)	$152,284.00	$0.00	$152,284.00	CDBG-DR
2b. Public Facilities and Improvements (Phase 2)	$2,447,716.00	$0.00	$2,447,716.00	CDBG-DR
3. Rehabilitation Loans and Grants (Hook-ups)	$0.00	$0.00	$0.00	
4. Clearance Activities	$0.00	$0.00	$0.00	
5. Public Services	$0.00	$0.00	$0.00	
6. Other (identify) - Planning	$0.00	$0.00	$0.00	
7. Project Delivery Costs	$0.00	$0.00	$0.00	
8. Administration	$0.00	$0.00	$0.00	
TOTAL	**$2,600,000.00**	**$0.00**	**$2,600,000.00**	**CDBG-DR**

Architectural/Engineering (A/E) costs must be included in one of the activity costs above.

HUD Matrix Code: (Can be found at http://www.hud.gov/offices/cpd/systems/idis/cdbg/Matrix%20Code%20Definitions.pdf)

HUD Matrix Code 03I – Flood Drainage Improvements

CDBG-DR PROGRAM TIME SCHEDULE – Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvements
APPLICANT NAME: Schoharie County Soil & Water Conservation District

ACTIVITIES	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 5	Quarter 6	Quarter 7	Quarter 8	Quarter 9	Quarter 10	Quarter 11	Quarter 12
Public Facilities & Improvements (Phase 1)												
a. Study (H&H, Feasibility, etc.)	X X											
b. Environmental Review												
c. A/E Design												
d. Construction												
e. Closeout												
Public Facilities and Improvements (Phase 2)												
a. Study (H&H, Feasibility, etc.)												
b. Environmental Review	X	X X X	X X									
c. A/E Design	X	X X X	X X									
d. Construction				X X X	X X X	X X X	X X X	X X X				
e. Closeout								X				

Provide the following dates:
*Required

*ERR Complete Date: 2/29/16
Construction Start Date: 4/1/16
*Construction End Date: 6/30/17

Acquisition/Closing: N/A
Design Complete: 2/29/16

ACTIVITY BENEFICIARY FORM						
Community-Wide X Target Area ☐ Combined			**Project:** Gorge Creek Culvert Repair and Stormwater Infrastructure Improvements			
List name of each activity excluding Admin & Acquisition:	1) Public Facilities and Improvements		2)		3)	
	#	**%**	**#**	**%**	**#**	**%**
Persons (total):	1,580	N/A				
Total LMI Income:	830	52.5%				
Low Income:	440	27.8%				
Owner (*for Rehab activity only, i.e. hookups*):						
Renter *(for Rehab activity only, i.e. hookups):*						
Moderate Income:	390	24.7%				
Owner (*for Rehab activity only, i.e. hookups*):						
Renter *(for Rehab activity only, i.e. hookups):*						
Medium Income:	320	20.3%				
Owner (*for Rehab activity only, i.e. hookups*):						
Renter *(for Rehab activity only, i.e. hookups):*						

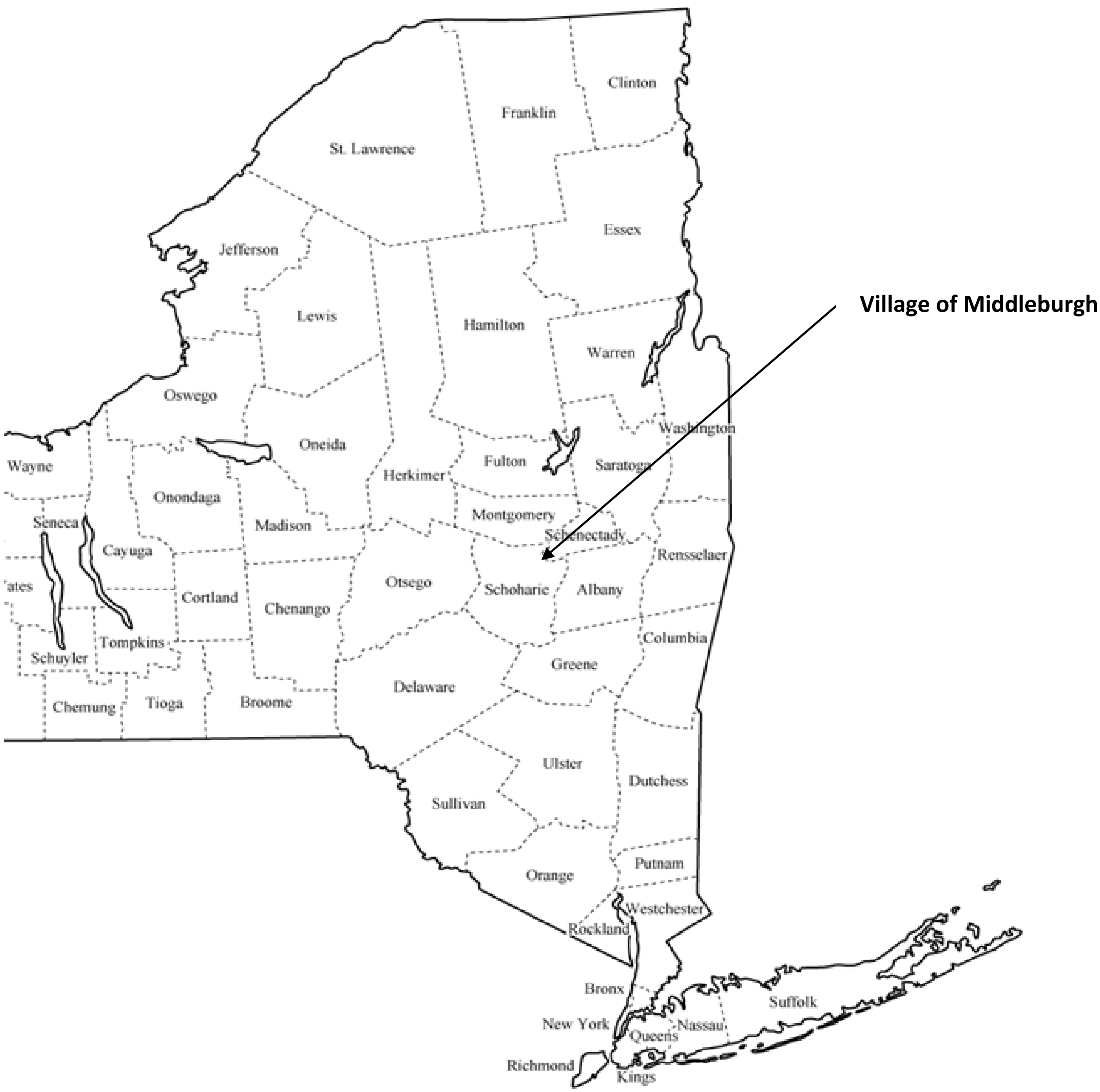
Race and Ethnicity	**Percent (%)**	**Percent (%)**	**Percent (%)**
White:	95.7%		
Black or African American:	0.5%		
American Indian or Alaskan Native:	0.4%		
Asian:	0.6%		
Native Hawaiian or Other Pacific Islander:	N/A		
Other:	2.4%		
Hispanic or Latino	2.7%		

Data Sources:
Low and moderate income persons for area benefit activities were determined using the 2006-2010 American Community Survey.

Percentages for race and ethnicity for area benefit activities were determined using the Census 2010 SF-1 100% data, Tables P3-Race, and P4-Hispanic or Latino Origin.

VICINITY MAP

VILLAGE OF MIDDLEBURGH GORGE CREEK REPAIRS AND STORM WATER AND DRAINAGE INFRASTRUCTURE IMPROVEMENTS LOCATION MAP



TARGET AREA MAP

SCHOHARIE COUNTY SOIL AND WATER CONSERVATION DISTRICT: GORGE CREEK CULVERT REPAIRS AND STORM WATER AND DRAINAGE INFRASTRUCTURE IMPROVEMENTS – TARGET AREA MAP

PROJECT SITE MAP

Schoharie County Soil and Water Conservation District: Gorge Creek Culvert Repairs and Storm Water and Drainage Infrastructure Improvements – Project Site Map

Schoharie County Soil and Water Conservation District: Gorge Creek Culvert Repairs and Storm Water and Drainage Infrastructure Improvements – Project Site Map (Aerial)

PROJECT DESCRIPTION

The Schoharie County Soil and Water Conservation District (SCSWCD) is requesting $2,600,000.00 in CDBG-DR funding to support the design and construction costs for improvements to the Gorge Creek Culvert for the Village of Middleburgh. This application is to request $152,284 to collect additional field data and perform a hydraulic analysis of Gorge Creek upstream of the two culverts at Main Street. Once the collection of the field data and the hydraulic analysis is complete, alternative designs and cost estimates will be developed for each alternative and that will allow the SCSWCD to proceed to the design and implementation phase.

Hurricane Irene and Tropical Storm Lee caused significant flooding at the Middleburgh High School, due to the lack of drainage for Gorge Creek. Its channel runs under the school, where conveyances were overwhelmed by the volume of storm water and debris. Without mitigation, this channel will continue to flood in major storm events potentially stranding the approximate 259 students that attend Middleburgh High School. When complete, this project will reduce the risk of localized flooding and increase access to emergency shelter when future storm events occur.

The Village of Middleburgh and SCSWCD are procuring design/engineering services to collect the necessary field data and hydraulic analysis and carry out improvements. Therefore, it is anticipated that the project will consist of two (2) distinct phases:

Phase I: Collection of Data and Hydraulic Analysis-The first phase includes the completion of an H&H study and detailed drainage study. The results of this study will then be used to design recommended infrastructure improvements and estimate project cost. This phase is estimated to cost $152, 284.00.

Phase II: Implementation- Following the production of the alternative designs and cost estimates, the second phase includes design/engineering services to develop plans and specifications, provide bidding and construction administration, inspection and the construction of infrastructure improvements identified in Phase I. Construction activities will likely include the designing of two (2) culverts to accommodate potential storm water runoff from a 100 year storm. They will also include panels at 150 foot intervals to allow for regular cleaning and flushing. The new box culverts will be complemented by the installation of five new storm water systems located at Main Street, River Street, Railroad Avenue, Shelton Street and Railroad Court, and Danforth Avenue. This phase is estimated to cost $2,447,716.00. This phase is expected to require significant earthwork.

This project will be a part of a regional and municipal strategy of flood drainage improvements in the Village of Middleburgh. It is anticipated that CDBG-DR funds will be used for construction which will fully comply with all programmatic requirements. There are no historic or landmarked properties known at this time and the project will not result in a change in land use. Land acquisition is not anticipated; however, following the H & H study property easements may be needed for the construction of this project. The Village of Middleburgh will be responsible for the maintenance of the Storm Water Improvement portion of the Project that is not located in the New York State Highway Right-of-Way. The New York State Department of Transportation (NYS DOT) will responsible for the maintenance of storm water improvements in the New York State Highway Right-of-Way as well as the Gorge Creek Culvert Repair portion of this Project.

The project is a CDBG-DR eligible activity pursuant to Section 105(a)(2), *Public Facilities and Improvements*, of the Housing and Community Development Act (HCDA) which includes, the acquisition, construction, reconstruction, or installation (including design features and improvements with respect to such construction, reconstruction, or installation that promote energy efficiency) of public works, facilities (except for buildings for the general conduct of government), and site or other improvements.

The national objective for the project is *Activities Benefiting Low-and-Moderate Income Persons (LMI).* The project/activity meets the CDBG-DR national objective criteria under 24CFR§570.483(b)(1), per the following: An activity will be considered to address the objective of benefiting LMI persons if it meets one of the criteria in paragraph (b) of this section, unless there is substantial evidence to the contrary. In assessing any such evidence, the full range of direct effects of the assisted activity will be considered. The activities, when taken as a whole, must not benefit moderate income persons to the exclusion of low income persons. According to the 2006-2010 ACS-LMI, the Village of Middleburgh has a population of 1,580, of which 830 are considered to be LMI persons. This constitutes a LMI percentage of 52.53 percent which exceeds the threshold for consideration of the stated national objective. When complete, this project will reduce the risk of localized flooding and maintain access to the Middleburgh High School when future storm events occur.

The State of New York Action Plan for CDBG-DR states, through its support of County and local infrastructure projects using CDBG-DR funding, New York State will help to repair storm-damaged facilities and replace or upgrade equipment to help them withstand future storms more effectively.[1]. The primary beneficiaries of the project are the residents of the Village of Middleburgh. The Gorge Creek Culvert Repair and Storm Water and Drainage Infrastructure Improvements project was identified in the Towns and Villages of Esperance, Schoharie, and Middleburgh's NY Rising Community Reconstruction Plan.

[1] State of NY Action Plan for CDBG-DR, April 2013, page 34

ARCHITECT/ENGINEER'S COST ESTIMATE	
Estimated Number of Parcels to be Acquired:	Not Applicable
Anticipated Approvals/Permits to be Acquired:	Not Applicable

PROJECT BUDGET

Phase I—Collection of Data and Hydraulic Analysis		**$ 152,284.00**
Scoping	$ 71,550.00	
Topographical Survey	$ 5,500.00	
H&H Analysis	$ 72,444.00	
Geotech Survey	$ 2,800.00	
Phase II—Design and Construction		**$2,447,716.00**
Engineering Design (10%)	$ 244,772.00	
• Design two (2) box culverts		
Construction	$1,958,172.00	
• Build two (2) box culverts		
• Installation of five (5) storm water systems		
Construction Contingencies (10%)	$ 244,772.00	
	Total Project Cost:	**$ 2 , 6 0 0 ,000.00**

Applicant/Recipient Disclosure/Update Report

U.S. Department of Housing and Urban Development

OMB Approval No. 2510-0011 (exp. 8/31/2009)

Instructions (See Public Reporting Statement and Privacy Act Statement and detailed instructions on page 2.)

Applicant/Recipient Information **Indicate whether this is an Initial Report** x **or an Update Report** ____

1. Applicant/Recipient Name, Address, and Phone (include area code): Schoharie County Soil and Water Conservation District 173 South Grant Street, Suite 3 Cobleskill, New York 12043 Phone: (518) 823-4535	2. Social Security Number or Employer ID Number: 14-1504527
3. HUD Program Name Community Development Block Grant – Disaster Recovery Program	4. Amount of HUD Assistance Requested/Received $2,600,000.00

5. State the name and location (street address, City and State) of the project or activity: Gorge Creek at Middleburgh School, Main Street, River Street, Railroad Avenue, Shelton Street, Railroad Court, and Danforth Avenue in the Village of Middleburgh, New York

Part I Threshold Determinations

1. Are you applying for assistance for a specific project or activity? These terms do not include formula grants, such as public housing operating subsidy or CDBG block grants. (For further information see 24 CFR Sec. 4.3).

X Yes ___ No

2. Have you received or do you expect to receive assistance within the jurisdiction of the Department (HUD), involving the project or activity in this application, in excess of $200,000 during this fiscal year (Oct. 1 - Sep. 30)? For further information, see 24 CFR Sec. 4.9

x Yes ___ No.

If you answered "**No**" to either question 1 or 2, **Stop**! You do not need to complete the remainder of this form. ***However***, you must sign the certification at the end of the report.

Part II Other Government Assistance Provided or Requested / Expected Sources and Use of Funds.

Such assistance includes, but is not limited to, any grant, loan, subsidy, guarantee, insurance, payment, credit, or tax benefit.

Department/State/Local Agency Name and Address	Type of Assistance	Amount Requested/Provided	Expected Uses of the Funds

(**Note**: Use Additional pages if necessary.)

Part III Interested Parties. You must disclose:

1. All developers, contractors, or consultants involved in the application for the assistance or in the planning, development, or implementation of the project or activity and
2. Any other person who has a financial interest in the project or activity for which the assistance is sought that exceeds $50,000 or 10 percent of the assistance (whichever is lower).

Alphabetical list of all persons with a reportable financial interest in the project or activity (For individuals, give the last name first)	Social Security No. or Employee ID No.	Type of Participation in Project/Activity	Financial Interest in Project/Activity ($ and %)

(**Note**: Use Additional pages if necessary.)

Certification

Warning: If you knowingly make a false statement on this form, you may be subject to civil or criminal penalties under Section 1001 of Title 18 of the United States Code. In addition, any person who knowingly and materially violates any required disclosures of information, including intentional non-disclosure, is subject to civil money penalty not to exceed $10,000 for each violation. I certify that this information is true and complete.

Signature: X	Date: (mm/dd/yyyy) 08/07/2015

Stephen Hoerz, District Field Manager

APPENDIX A

Cost Price Summary

COST OR PRICE SUMMARY

Part I - General					
	SUBRECIPIENT		Project Identification		
	Schoharie County Soil and Water Conservation District		Gorge Creek		
Part II - Cost Summary					
	DIRECT LABOR (Specify Labor Categories)	ESTIMATED HOURS	HOURLY RATE	ESTIMATED COST	TOTALS
	PRINCIPAL	92.00	$75.00	$6,900.00	
	PROJECT MANAGER/SR ENGINEER	120.00	$66.67	$8,000.40	
	PROJECT ENGINEER II	320.00	$50.00	$16,000.00	
	PROJECT ENGINEER I	120.00	$50.00	$6,000.00	
	SENIOR GIS SPECIALIST	120.00	$50.00	$6,000.00	
	ESTIMATOR	80.00	$62.50	$5,000.00	
	DIRECT LABOR TOTAL				$47,900.00
	INDIRECT COST (Specify Indirect Cost)	RATE	BASE	ESTIMATED COST	
	Indirect Overhead	1.4000	$47,900.00	$67,060.00	
	INDIRECT COST TOTAL				$67,060.00
9.	OTHER DIRECT COST a. Travel	QUANTITY	COST	ESTIMATED COST	
	(1) Transportation	16	$51.75	$828.00	
	90 miles round trip @ $0.575			$0.00	
	Travel Subtotal			$828.00	
	b. Supplies, etc.				
	Equipment, Materials, Supplies Subtotal			$0.00	
	c. Subcontracts	QUANTITY	COST	ESTIMATED COST	
	LAND SURVEYING	1	$5,000.00	$5,000.00	
	LEGAL SERVICES	1	$10,000.00	$10,000.00	
	PIPE CLEANING/INSPECTION	1	$7,500.00	$7,500.00	
	GEOTECHNICAL INVESTIGATION	1	$2,500.00	$2,500.00	
	Subcontracts Subtotal			$25,000.00	
	d. Other (Specify Categories)	QUANTITY	COST	ESTIMATED COST	
				$0.00	
	Other Subtotal			$0.00	
	OTHER DIRECT COST TOTAL				$25,828.00
10.	TOTAL ESTIMATED COST				$140,788.00
11.	PROFIT				$11,496.00
12.	LUMP SUM FEE				$152,284.00

APPENDIX B

Proof of Publication of Public Notice
Requesting Public Comment on Submission of Application for Funding

PUBLIC NOTICE

New York State CDBG-DR Application Available Review

The Schoharie County Soil and Water Conservation District announces that it intends to submit an application for New York State Community Development Block Grant-Disaster Recovery (CDBG-DR) Program funds on or about (insert date) for the following project:

Activity: New York State CDBG-DR funds will be used to pay for: Phase I including preliminary design, Hydrological and Hydraulic Study, detailed drainage study, cost, engineering design and permitting costs; and, Phase II including the construction of culvert repairs, and installation of a new storm water system at various locations in the Village of Middleburgh.

Objective: To provide improvements that will mitigate existing deficiencies in the Gorge Creek culverts at Middleburgh School and the Village of Middleburgh's storm water system and prevention of storm water backing up into the streets and surrounding area. The resiliency measures described will minimize damage from future storms for the residents and businesses of the Village of Middleburgh.

Location: The project area consists of Gorge Creek at Middleburgh School; and, Main Street, River Street, Railroad Avenue, Shelton Street, Railroad Court, and Danforth Avenue in the Village of Middleburgh, New York.

Amount: $2,600,000.00.

A copy of the application will be available for review at 173 South Grant Street, Suite 3, Cobleskill, New York 12043, Monday through Friday between the hours of 9:00 and 5:00.

All citizens, particularly persons of low and moderate income and residents of blighted areas, as well as those affected by the project are encouraged to submit their views and proposals by (insert date) *(this date must allow for a review period of a minimum of seven days prior to application submittal)* to the Schoharie County Soil and Water Conservation District at the following address:

Schoharie County Soil and Water Conservation District
173 South Grant Street, Suite 3
Cobleskill, New York 12043
Telephone: (518) 823-4535
Email: District@SchoharieSoilandWater.org

In addition, the following information is available for review at 173 South Grant Street, Suite 3, Cobleskill, New York 12043 during normal business hours:

a. The amount of funds, including program income, available for proposed community development disaster recovery activities for the current fiscal year;

b. The range of Community Development Block Grant-Disaster Recovery (CDBG-DR) activities that may be undertaken;

c. The estimated amount of CDBG-DR funds proposed to be used for activities that will meet the national objective of benefitting persons of low and moderate income; and,
d. The plan(s) designated for minimizing displacement of persons as a result of activities assisted with such funds and the benefits to be provided by the Schoharie County Soil and Water Conservation District to persons actually displaced as a result of such activities.

INSTRUCTIONS:
Publish one (1) time only as a LEGAL NOTICE
Publication Date: **<u>Need to add date</u>**
Send Invoice To: **Schoharie County Soil and Water Conservation District**
Send Affidavit of Publication (Required) to: **Brenda Weaver, Schoharie County Soil and Water Conservation District**

Newspapers: *Times Journal*
The Mountain Eagle
Schenectady Gazette

Times-Journal
PO Box 339, Cobleskill, NY 12043
www.timesjournalonline.com
518-234-2515

Affidavit of Publication

To: SCHOHARIE COUNTY SOIL & WATER CONSERVATION DISTRICT
173 South Grand Street, Suite 3
COBLESKILL, NY 12043

Re: Legal notice #72198

State of New York }
} *SS:*
County of Schoharie }

I, ASHLEY STANTON, being duly sworn, depose and say: that I am the Authorized Representative of Times-Journal, a weekly newspaper of general circulation published in Cobleskill, County of Schoharie, State of New York; and that a notice, of which the annexed is a printed copy, was duly published in Times-Journal once on 07/29/15.

Ashley Stanton
ASHLEY STANTON

Sworn to before me this 31st day of [illegible]

Michelle A. Davis

[illegible] DAVIS
Notary Public, State of New York
[illegible]
[illegible] Schoharie County
[illegible] 2018

PUBLIC NOTICE NEW YORK STATE CDBG-DR APPLICATION AVAILABLE FOR REVIEW

The Schoharie County Soil and Water Conservation District announces that it intends to submit an application for New York State Community Development Block Grant-Disaster Recovery (CDBG-DR) Program funds on or about August 5, 2015 for the following project: Activity: New York State CDBG-DR funds will be used to pay for: Phase I including preliminary design, Hydrological and Hydraulic Study, detailed drainage study, cost, engineering design and permitting costs; and, Phase II including the construction of culvert repairs, and installation of a new storm water system at various locations in the Village of Middleburgh. Objective: To provide improvements that will mitigate existing deficiencies in the Gorge Creek culverts at Middleburgh High School and the Village of Middleburgh's storm water system and prevention of storm water backing up into the streets and surrounding area. The resiliency measures described will minimize damage from future storms for the residents and businesses of the Village of Middleburgh. Location: The project area consists of Gorge Creek at the Middleburgh High School; and, Main Street, River Street, Railroad Avenue, Sheldon Avenue, Railroad Court and Danforth Avenue in the Village of Middleburgh, New York. Amount: $2,600,000.00. A copy of the application will be available for review at 173 South Grand Street, Suite 3, Cobleskill, New York 12043, Monday t

State of New York, ss.:
City and County of Schenectady

PUBLIC NOTICE
New York State CDBG-DR Application Available for Review
The Schoharie County Soil and Water Conservation District announces that it intends to submit an application for New York State Community Development Block Grant-Disaster Recovery (CDBG-DR) Program funds on or about August 5, 2015 for the following project:
Activity: New York State CDBG-DR funds will be used to pay for: Phase I including preliminary design, Hydrological and Hydraulic Study, detailed drainage study, cost, engineering design and permitting costs; and, Phase II including the construction of culvert repairs, and installation of a new storm water system at various locations in the Village of Middleburgh.
Objective: To provide improvements that will mitigate existing deficiencies in the Gorge Creek culverts at Middleburgh High School and the Village of Middleburgh's storm water system and prevention of storm water backing up into the streets and surrounding area. The resiliency measures described will minimize damage from future storms for the residents and businesses of the Village of Middleburgh.
Location: The project area consists of Gorge Creek at the Middleburgh High School; and, Main Street, River Street, Railroad Avenue, Sheldon Avenue, Railroad Court and Danforth Avenue in the Village of Middleburgh, New York.
Amount: $2,600,000.00
A copy of the application will be available for review at 173 South Grand Street, Suite 3, Cobleskill, New York 12043, Monday through Friday between the hours of 8:30 AM and 4:30 PM.
All citizens, particularly persons of low and moderate income and residents of blighted areas, as well as those affected by the project are encouraged to submit their views and proposals by August 5, 2015 to the Schoharie County Soil and Water Conservation District at the following address:
Schoharie County Soil and Water Conservation District
173 South Grant Street, Suite 3
Cobleskill, New York 12043
Telephone: (518) 823-4535
Email: s.hoerz@schohariеswcd.org
In addition, the following information is available for review at 173 South Grand Street, Suite 3, Co-

Gloria Cabrera of the City of Schenectady, being duly sworn, says that he/she is Principal Clerk in the office of the Daily Gazette Co., published in the City of Schenectady and that the notice/advertisement, of which the annexed is a printed copy, has been regularly published in the Daily Gazette and/or Sunday Gazette as follows:

1 insertion on July 29, 2015

Sworn to me on this 29th day of July, 2015

NOTARY PUBLIC

ALISON COOKE
COMMISSIONER OF DEEDS
MY COMMISSION EXPIRES
4|2|2017

NY Rising Community Reconstruction Program

DUPLICATION OF BENEFITS QUESTIONNAIRE

Subrecipient: Schoharie County Soil and Water Conservation District (SCSWCD)

Project Name: Gorge Creek Culvert Repairs

Federal regulations require a duplication of benefits (DOB) analysis for projects receiving U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant-Disaster Recovery (CDBG-DR) support to ensure that subrecipients do not receive more funds for a project than are needed. Subrecipients must report all assistance they have received for a project from such sources as insurance, Small Business Administration (SBA), Federal Emergency Management Agency (FEMA), and other local, State, or Federal programs, and private or nonprofit charitable organizations. Any funds received from these sources for this project must be considered when the amount of the CDBG-DR grant is determined. While inclusion in a long-term capital plan does not constitute a DOB, if a project has been included in the subrecipient's annual budget, there may be DOB. CDBG-DR is a funding source of last resort, and should funds become available for a project in the future such that some or all of the CDBG-DR funds budgeted for the project would constitute a duplication of benefits, those CDBG-DR funds will be disallowed or, if outlaid, must be returned to the Governor's Office of Storm Recovery (GOSR). Please consult with GOSR staff if you have any questions regarding whether a potential DOB exists. Please use the chart below to describe the funds the subrecipient has received and/or committed for the project.

FUNDS RECEIVED OR BUDGETED FOR THE PROJECT

SOURCE OF FUNDS	Amount received for the project	Additional funds expected
FEMA	0.00	
Other Federal Agencies (Describe)	0.00	
State Agencies	0.00	
Budgeted Subrecipient Funds (Annual Budget)	0.00	

Private Insurance	0.00	
National Flood Insurance	0.00	
Nonprofit Organizations (Describe)	0.00	
Other Funds (Describe)	0.00	
TOTAL	0.00	

Documents Needed:
Please provide documents that show the amounts received for the project from each source listed above. Note that all documents, including the subrecipient's budgets, must be retained produced for review on the request of GOSR or HUD.

SUBRECIPIENT CERTIFICATION
I certify that the information provided in this questionnaire is true and accurate to the best of my ability. I understand that if this information is not correct, it may affect the amount of any grant I may receive or may lead to the recapture of disbursed funds by GOSR and/or HUD.

Subrecipient: Schoharie County Soil and Water Conservation District (SCSWCD)

Signature of Chief Elected Official or Authorized Certifying Official	Stephen Hoerz Printed Name	8/7/2015 Date

WARNING: The information provided on this form is subject to verification by the State of New York and the Department of Housing and Urban Development (HUD) at any time. Title 18, Section 1001 of the U.S.

Code states that knowingly and willingly making a false or fraudulent statement to a department of the United States Government can result in termination of assistance and civil and criminal penalties.

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

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

January 05, 2017

Ms. Alicia Shultz
HCR
38 State Street
Albany, NY 12207

Re: GOSR
Gorge Creek Culvert Improvements
Middleburgh, Schoharie County, NY
15PR06219

Dear Ms. Shultz:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project.

I have reviewed the report entitled "Phase II Archaeological Investigations of Gorge Creek Site 1 (09542.000116), Village of Middleburgh, Town of Middleburgh, Schoharie County, New York" (October 2016). SHPO concurs with the report recommendation that the Gorge Creek Site 1 is eligible for listing in the National Register of Historic Places. Therefore, impacts to the site should be avoided by project-related activities. If site avoidance is selected, then an avoidance plan should be created, including both short-term (i.e., during construction) and long-term methods to insure site preservation, and submitted to SHPO for review.

If impacts to the Gorge Creek Site 1 cannot be avoided, then a Phase III data recovery investigation should be conducted to mitigate the adverse effects to the site. If mitigation is selected, then a Data Recovery Plan (DRP) detailing the mitigation methods should be created and submitted to SHPO for review. Prior to initiating the data recovery excavation, a Memorandum of Agreement (MOA) between the lead agency, SHPO, and other potential consulting parties should be prepared and signed. The MOA should include the final approved DRP.

SHPO also recommends that the Lead Agency invite the pertinent Native American Nations to consult regarding the potential adverse impacts to Gorge Creek Site 1.

If further correspondence is required regarding this project, please refer to the SHPO Project Review (PR) number noted above. If you have any questions I can be reached at 518-268-2186.

Sincerely,

Tim Lloyd, Ph.D., RPA
Scientist - Archaeology
timothy.lloyd@parks.ny.gov via e-mail only

cc: Andrew Dangler (USACE)
Thomas King (GOSR)
Mary Barthelme (GOSR)
Ed Fahrenkopt (Delaware Enginnering)
Genevieve Kaiser (Tetra Tech)

January 05, 2017

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If impacts to the Gorge Creek Site 1 cannot be avoided, then a Phase III data recovery investigation should be conducted to mitigate the adverse effects to the site. If mitigation is selected, then a Data Recovery Plan (DRP) detailing the mitigation methods should be created and submitted to SHPO for review. Prior to initiating the data recovery excavation, a Memorandum of Agreement (MOA) between the lead agency, SHPO, and other potential consulting parties should be prepared and signed. The MOA should include the final approved DRP.

SHPO also recommends that the Lead Agency invite the pertinent Native American Nations to consult regarding the potential adverse impacts to Gorge Creek Site 1.

If further correspondence is required regarding this project, please refer to the SHPO Project Review (PR) number noted above. If you have any questions I can be reached at 518-268-2186.

Sincerely,

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Scientist - Archaeology
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via e-mail only

cc: Andrew Dangler (USACE)
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NEW YORK STATE OF OPPORTUNITY. | **Parks, Recreation, and Historic Preservation**

ANDREW M. CUOMO
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January 05, 2017

Ms. Alicia Shultz
HCR
38 State Street
Albany, NY 12207

Re: GOSR
Gorge Creek Culvert Improvements
Middleburgh, Schoharie County, NY
15PR06219

Dear Ms. Shultz:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We are reviewing the project in accordance with Section 106 of the National Historic Preservation Act of 1966.

SHPO has no concerns with potential impacts to historic cultural resources as a result of the proposed culvert work. It is SHPO's opinion that the culvert work portion of the project can proceed.

If further correspondence is required regarding this project, please refer to the SHPO Project Review (PR) number noted above. If you have any questions I can be reached at 518-268-2186.

Sincerely,

Tim Lloyd, Ph.D., RPA
Scientist - Archaeology
timothy.lloyd@parks.ny.gov

via e-mail only

cc: Andrew Dangler (USACE)
Thomas King (GOSR)
Mary Barthelme (GOSR)
Ed Fahrenkopt (Delaware Engineering)
Genevieve Kaiser (Tetra Tech)

MEMORANDUM OF AGREEMENT

BETWEEN

The New York State Housing Trust Fund Corporation,
as responsible entity for the United States
Department of Housing and Urban Development;
The New York State Historic Preservation Office;
The Schoharie County Soil & Water Conservation District;
The Village of Middleburgh;
The United States Army Corps of Engineers;
The Saint Regis Mohawk Tribe

PERSUANT TO
36 C.F.R. 800

FOR THE RECOVERY OF SIGNIFICANT ARCHAEOLOGICAL INFORMATION

IN CONNECTION WITH

The Gorge Creek Culvert Repair and Storm Water Improvements Project
Village of Middleburgh
Schoharie County, New York
PR # 15PR06219

WHEREAS, the Schoharie County Soil & Water Conservation District proposes a federally-funded project in the Village of Middleburgh to design and construct culvert improvements and create a sediment basin (the "Undertaking"); and

WHEREAS, 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") is acting under the auspices 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") and is the entity responsible for compliance with the HUD environmental review procedures set forth in 24 C.F.R. Part 58 and Section 106 of the National Historic Preservation Act ("NHPA" 16 USC § 470f); and

WHEREAS, The Schoharie County Soil & Water Conservation District has applied to GOSR for funding associated with the Undertaking; and

WHEREAS, the Undertaking proposed by the Schoharie County Soil & Water Conservation District in its GOSR funding application, and to be described in its USACE permit application, is identified as "the Undertaking" below; and

WHEREAS, the Undertaking will require a permit pursuant to Section 404 of the Clean Water Act (33 USC § 1344), to be issued by the United States Army Corps of Engineers New York District ("USACE"), authorizing removal of sediment and fill within waters of the United States in order to effectuate the installation of a culvert box, creation of a sedimentation basin and dewatering of sediment, all as components of the Undertaking; and

WHEREAS, GOSR has conducted cultural resource studies and determined pursuant to 36 C.F.R. 800.4(c) in consultation with the New York State Historic Preservation Office (SHPO); and

WHEREAS, in accordance with Section 101(d)(6)(B) of the National Historic Preservation Act, GOSR has contacted the Saint Regis Mohawk Tribe and The Stockbridge-Munsee Community, Band of the Mohicans, federally-recognized tribal nations in New York State that have identified aboriginal territory in Schoharie County, and engaged the tribal nations in consultation to evaluate archaeological properties and to consider measures that would avoid, minimize, or mitigate effects on site(s) that may be identified that are part of prehistoric site Gorge Creek Site 1 (09542.000116) within the APE; and

WHEREAS, GOSR, the St. Regis Mohawk Tribe, and the New York State Historic Preservation Office ("SHPO") have consulted in accordance with Section 106 of the NHPA; implementing regulations at 33 C.F.R. Part 325 Appendix C and 36 C.F.R. Part 800; and agency guidance; and

WHEREAS, the SHPO has determined that Gorge Creek Site 1 (09542.000116) is eligible for listing on the State and National Registers of Historic Places, and to which GOSR and the Saint Regis Mohawk Tribe have concurred; and

WHEREAS, GOSR, as responsible entity has determined that funding the Undertaking would have an Adverse Effect on Gorge Creek Site 1 (09542.000116) and be subject to NHPA and its implementing regulations; and

WHEREAS, GOSR has consulted with SHPO and the St. Regis Mohawk Tribe and determined that the Area of Potential Effects ("APE") of the Undertaking, as that term is defined at 36 C.F.R., Part 800.16(d), is, in this case, the site of the sediment basin near Gorge Creek, upstream between Straub Lane and slightly east of Hayes Lane along the south side of Gorge Creek where it parallels the road M T Path, Village of Middleburgh, Schoharie County, New York; and

WHEREAS, in accordance with 36 C.F.R. Section 800.6(a)(1), on January 19, 2017, GOSR notified the Advisory Council on Historic Preservation ("ACHP") of its Adverse Effect determination with specified documentation and the ACHP notified GOSR on February 6, 2017, of its decision to not participate in the consultation pursuant to 36 C.F.R. Section 800.6(a)(1)(iii); and

WHEREAS, after public notice and response thereto, the public has been made aware of the proposed undertaking; and

WHEREAS, in accordance with 36 C.F.R. Part 800, GOSR ensures that Conditions 1 through 12 outlined in the Advisory Council on Historic Preservation's ("Council") "Recommended

Approach for Consultation on the Recovery of Significant Information from Archaeological Sites," and attached as Appendix I to this document shall be satisfied; and

WHEREAS the SHPO, the St. Regis Mohawk Tribe, and GOSR agree that Gorge Creek Site 1 (09542.000116) is of significance and of value for information on prehistory and/or history that they are likely to yield through archaeological, historical, and scientific methods of information recovery, including archaeological excavation; and

WHEREAS, the SHPO, the St. Regis Mohawk Tribe, and GOSR agree that recovery of significant information from the archaeological site(s) listed above may be done in accordance with the published guidance; and

WHEREAS, the SHPO, the St. Regis Mohawk Tribe, and GOSR agree that it is in the public interest to expend funds to implement the Undertaking through the recovery of significant information that may be identified at the prehistoric site, Gorge Creek Site 1 (09542.000116), and mitigate the adverse effects of the Undertaking at the site; and

WHEREAS, based on available information, no human remains, associated or unassociated funerary objects, or sacred objects, or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001), are expected to be encountered in the archaeological work;

NOW, THEREFORE, in accordance with the NHPA, GOSR, SHPO, and the St. Regis Mohawk Tribe agree that implementation of the Undertaking covered by this Agreement shall take into account effects on historic properties, and that completion of the steps set forth in the Stipulations below will serve to mitigate the adverse effects of the Undertaking.

STIPULATIONS

GOSR, in coordination with the Schoharie County Soil & Water Conservation, shall ensure the following stipulations are carried out:

1. GOSR and USACE Authorization. GOSR shall condition any grant of funding issued regarding the Undertaking to ensure implementation of the stipulations of this Agreement. Should USACE choose to utilize this agreement to demonstrate compliance with Section 106 of the NHPA in accordance with Stipulation 9 of this Agreement, USACE shall condition any approval issued regarding the Undertaking to ensure implementation of the stipulations of this Agreement.

2. Recordation. Pursuant to Section 110(b) of the NHPA, GOSR shall ensure that a data recovery plan is developed in consultation with the SHPO and the St. Regis Mohawk Tribe for the recovery of archeological data from the Gorge Creek Site 1 (09542.000116). GOSR shall ensure that the data recovery plan is consistent with Secretary of the Interior's Standards and Guidelines for Archeological Documentation (48 F.R. 44734-37) and takes into account the recommendations of the SHPO publication dated January 5, 2017.

A. GOSR shall ensure that the data recovery plan describes and justifies the studies to be carried out, including, but not limited to:

The research questions to be addressed, and why the research questions are worth addressing in the public interest;

Why it is likely that the research questions can be addressed using data from the Gorge Creek Site 1 (09542.000116);

The methods to be used in fieldwork and analysis, with an explanation of their relevance to the research questions;

The methods to be used in conservation, data management, and dissemination of data, with a justification for any unusual methods, and including a schedule;

How the recovered materials and records will be disposed of, consistent with 36 C.F.R. 79;

How the SHPO and the St. Regis Mohawk Tribe will be kept informed of the progress of data recovery, and afforded the opportunity to participate in the work;

A schedule for completing the data recovery, including analysis, reporting, and disposition of materials and records;

A schedule for providing progress reports to the SHPO, The St. Regis Mohawk Tribe, and GOSR;

A schedule for completing a final report meeting the SHPO's Report Format Standards, including draft analytical articles for submission to professional journals if warranted; and

A preliminary plan for public interpretation of the data recovery results, subject to revision based on the results of the data recovery proceeds.

B. GOSR shall ensure that the data recovery plan is submitted to the SHPO and the St. Regis Mohawk Tribe for 30 days review. Unless the SHPO or the St. Regis Mohawk Tribe object(s) within 30 days after receipt of the data recovery plan, GOSR shall ensure that the data recovery plan is implemented prior to and in coordination with those project activities that could disturb the Gorge Creek Site 1 (09542.000116). If the SHPO or St. Regis Mohawk Tribe objects within 30 days after receipt, GOSR will consult with the objecting party to resolve the objection

C. The Federal Agency Official should ensure that the data recovery plan is developed and will be implemented by or under the direct supervision of a person, or persons, meeting at a minimum the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738- 44739) and Standards for *Cultural Resource Investigations and the Curation of Archaeological Collections in New York* by the New York Archaeological Council (NYAC 1994) and adopted by the SHPO.

3. Mitigation. As partial mitigation for disturbance of the site(s) may be identified that are part of prehistoric site **Gorge Creek Site 1 (09542.000116)**:

A. The Saint Regis Mohawk Tribe Tribal Historic Preservation Officer, Tribal Historic Preservation Representatives, Historic Resource Specialists, Directors of Cultural Preservation, or other representative designated by the Tribe will be afforded the opportunity to visit the Undertaking site during the fieldwork portion of the monitoring and data recovery process.

B. The Saint Regis Mohawk Tribe will be provided copies of any and all academic and professional presentations and publications that arise from information gathered in full or in part from the site(s) that may be identified that are part of prehistoric site Gorge Creek Site 1 (09542.000116).

4. Treatment of Unanticipated Human Remains or Associated Artifacts. In the event that human remains are encountered during construction or archeological investigations, GOSR shall implement the following protocol:

A. At all times human remains shall be treated with the utmost dignity and respect. Should human remains be encountered, work in the vicinity of the discovery will stop immediately and the location will be immediately secured and protected from damage and disturbance.

B. Human remains or associated artifacts will be left in place and not disturbed. No skeletal remains or materials associated with the remains will be collected or removed until appropriate consultation has taken place and a plan of action has been developed.

C. The county coroner and local law enforcement as well as GOSR and SHPO will be notified immediately. The coroner and local law enforcement will make the official ruling on the nature of the remains, being either forensic or archeological. If the remains are archeological in nature, a bio-archaeologist will confirm the identification as human.

D. If human remains are determined to be Native American, the remains will be left in place and protected from further disturbance until a plan for their protection or removal can be generated. Consultation with GOSR, SHPO and appropriate Native American groups will be required, to determine a plan of action that is consistent with the Native American Graves Protection and Repatriation Act ("NAGPRA") guidance.

E. If human remains are determined to be Euro-American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Consultation with GOSR, SHPO and other appropriate parties will be required to determine a plan of action.

F. If human remains are encountered, consultation among GOSR, SHPO and the St. Regis Mohawk Tribe will be undertaken regarding the adjustment of the level of effort for archeological investigation.

5. Modification. Modification or amendment of this Agreement as necessary shall be accomplished by the signatories in the same manner as the original agreement. Notwithstanding any other provision in this Agreement, any signatory to this Agreement may request that it be amended, whereupon the signatories will consult to consider such amendment. Any amendment shall be in writing and signed by all signatories.

6. Disputes. The signatories shall look to resolve disputes regarding the completion of the terms of this Agreement among themselves. If the signatories cannot agree regarding a dispute, the St. Regis Mohawk Tribe, GOSR, or SHPO may request the participation of the ACHP to assist in resolving the dispute.

7. Termination. Unless extended by written agreement between GOSR and SHPO, the signatories' obligations under this Agreement shall terminate upon completion or abandonment of the project.

8. GOSR and HUD Compliance. The signatories agree that by execution and implementation of this Agreement, GOSR, and therefore by operation of law HUD, have satisfied their requirements for compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (16 U.S.C. 470f), with regard to funding the Undertaking.

9. USACE Compliance. The signatories agree that USACE may rely on this Agreement to demonstrate compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (16 U.S.C. 470f), with regard to permitting the Undertaking.

10. EXECUTION of this MOA by GOSR and the SHPO and implementation of its terms evidence that GOSR has taken into account the effects of this Undertaking on historic properties and afforded the ACHP an opportunity to comment.

HOUSING TRUST FUND CORPORATION

By: ____________________
Date: 2.6.17
Name: Lisa Bova-Hiatt
Title: Executive Director of Storm Recovery

NEW YORK STATE HISTORIC PRESERVATION OFFICER

By: ____________________
Date: ____________________
Name: Michael F. Lynch, P.E. AIA
Title: Deputy State Historic Preservation Officer

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HOUSING TRUST FUND CORPORATION

By: ___________________________
Date: _________________________
Name: Lisa Bova-Hiatt
Title: Executive Director of Storm Recovery

NEW YORK STATE HISTORIC PRESERVATION OFFICER

By: Michael F. Lynch
Date: 2/16/17
Name: Michael F. Lynch, P.E. AIA
Title: Deputy State Historic Preservation Officer

SCHOHARIE COUNTY SOIL & WATER CONSERVATION DISTRICT

By: ______________________
Date: 2/8/17
Name: Stephen Hoerz
Title: District Field Manager

VILLAGE OF MIDDLEBURGH

By: ______________________
Date: ______________________
Name: Matthew Avitable
Title: Mayor

ST. REGIS MOHAWK TRIBE

By: ______________________
Date: ______________________
Name: Ron LaFrance, Jr; Paul Thompson; and Beverly Cook
Title: Chiefs of St. Regis Mohawk Tribe

Optional Signatory

United States Army Corps of Engineers

By: ______________________
Date: ______________________
Name:
Title:

Attachments:

Appendix A – Area of Potential Effect
Appendix B – Advisory Council on Historic Preservation Conditions: Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites.

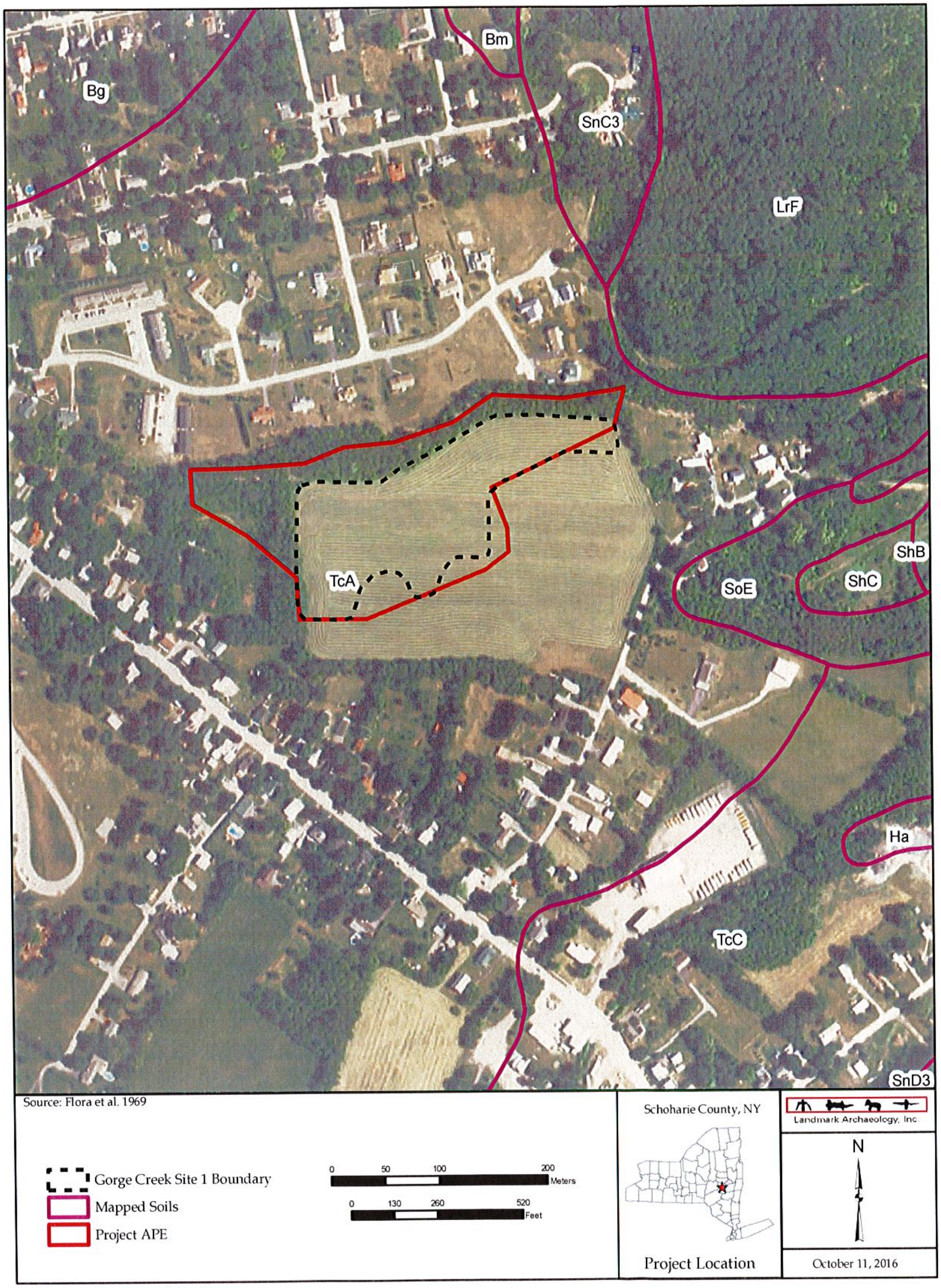

Figure 4: Mapped Soils

Appendix B

1. The archaeological site(s) should be significant and of value chiefly for the information on prehistory or hi story they are likely to yield through archaeological, historical, and scientific methods of information recovery, including archaeological excavation.

2. The archaeological site should not contain or be likely to contain human remains, associated or unassociated funerary objects, sacred objects, or items of cultural patrimony as those terms are defined by the Native American Graves Protection and Repatriation Act (25 U.S .C. 3001).

3. The archaeological site should not have long-term preservation value, such as traditional cultural and religious importance to an Indian tribe or a Native Hawaiian organization.

4. The archaeological site should not possess special significance to another ethnic group or community that historically ascribes cultural or symbolic value to the site and would object to the site's excavation and removal of its contents.

5. The archaeological site should not be valuable for potential permanent in-situ display or public interpretation, although temporary public di splay and interpretation during the course of any excavations may be highly appropriate.

6. The Federal Agency Official should have prepared a data recovery plan with a research design in consultation with the SHPO and other stakeholders that is consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties, the Secretary of the Interior' s Standards and Guidelines for Archaeology and Historic Preservation and the Advisory Council on Historic Preservation's Treatment of Archaeological Properties: A Handbook. The Plan should specify:

    (a) The results of previous research relevant to the project;
    (b) research problems or questions to be addressed with an explanation of the irrelevance and importance;
    (c) the field and laboratory analysis methods to be used with a justification of their cost effectiveness and how they apply to this particular property and these research needs;
    (d) the methods to be used in artifact, data and other records management;
    (e) explicit provisions for disseminating the research findings to professional peers in a timely manner;
    (f) arrangements for presenting what has been found and learned to the public, focusing particularly on the community or communities that may have interests in the results;
    (g) the curation of recovered materials and records resulting from the data recovery in accordance with 36 CFR part 79 (except in the case of unexpected discoveries that may need to be considered for repatriation pursuant to NAGPRA); and

(h) procedures for evaluating and treating discoveries of unexpected remains or newly identified historic properties during the course of the project, including necessary consultation with other parties.

7. The Federal Agency Official should ensure that the data recovery plan is developed and will be implemented by or under the direct supervision of a person, or persons, meeting at a minimum the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-44739)

8. The Federal Agency Official should ensure that adequate time and money to carry out all aspects of the plan are provided, and should ensure that all parties consulted in the development of the plan are kept informed of the status of its implementation.

9. 9. The Federal Agency Official should ensure that a final archaeological report resulting from the data recovery will be provided to the SHPO. The Federal Agency Official should ensure that the final report is responsive to professional standards, and to the Department of the Interior's Format Standards for Final Reports of Data Recovery Programs (41 FR 5377-79).

10. Large, unusual, or complex projects should provide for special oversight, including professional peer review.

11. The Federal Agency Official should determine that there are no unresolved issues concerning the recovery of significant information with any Indian tribe or Native Hawaiian organization that may attach religious and cultural significance to the affected property.

12. Federal Agency Officials should incorporate the terms and conditions of this recommended approach into a Memorandum of Agreement or Programmatic Agreement, file a copy with the Council per§ 800.6(b)(iv), and implement the agreed plan. The agency should retain a copy of the agreement and supporting documentation in the project files.

Phase II Archaeological Investigations of Gorge Creek Site 1 (09542.000116) Village of Middleburgh Town of Middleburgh Schoharie County, New York

Gorge Creek Culvert Repair and Storm Water Improvements
OPRHP# 15PR06219

Prepared for:
Tectonic Engineering & Surveying Consultants, P.C.
PO Box 37
70 Pleasant Hill Road
Mountainville, New York 10953

Prepared by:
Susan Gade and Jessica Schreyer
Landmark Archaeology, Inc.
6242 Hawes Road
Altamont, New York 12009-4606

Susan Gade, RPA and Derrick J. Marcucci, RPA
Principal Investigators

LA# 369
October 2016

MANAGEMENT SUMMARY

SHPO Project Review Number: 15PR06219

Federal Agencies: US Department of Housing and Urban Development (HUD)
State Agencies: Governor's Office of Storm Recovery (GOSR)

Phase of Study: Phase II
Location:
Minor Civil Division: Village of Middleburgh
County: Schoharie
USGS 7.5' Quadrangle Map: Middleburgh, NY (2000)

Survey Area-
Floodplain Expansion and Sedimentation Basin:
Length: 403.0 meters (1322.1 ft)
Width: 210.9 meters (692.0 ft)
Depth: n/a
Size: Total Acres Surveyed: n/a

Gore Creek Site 1-09542.000116:
Total Square Meters Excavated (Phase II): 29.3
Total Square Feet Excavated (Phase II): 315.4
Percentage of Site Excavated (Phase I and II): 0.17

Archaeological Survey Overview
Total and Interval of Shovel Tests (Phase II): 102 at a ten-meter interval
Width of Plowed Strips: n/a
Surface Survey Transect Interval: n/a

Results of Archaeological Survey
Number and name of prehistoric sites identified: Gorge Creek Site 1- 09542.000116
Number and name of historic sites identified: n/a
Sites Recommended for Phase II/Avoidance: Gorge Creek Site 1- 09542.000116

Report Author(s): Susan Gade, RPA and Jessica Schreyer
Landmark Archaeology, Inc.

Date of Report: October 2016

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

This report presents the results of a Phase II archaeological investigation of Gorge Creek Site 1 (09542.000116) which is located within the Area of Potential Effect (APE) for the proposed Gorge Creek Culvert Repair and Storm Water Improvements (OPRHP# 15PR06219) in the village of Middleburgh, Schoharie County, New York (Figures 1 and 2). The investigation was conducted by Landmark Archaeology, Inc. who was retained as a subconsultant by Tectonic Engineering & Surveying Consultants, P.C. of Mountainville, New York. The Governor's Office of Storm Recovery (GOSR), operating under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation, is the Responsible Entity for direct administration of the U.S. Dept. of Housing & Urban Development (HUD) Community Development Block Grant – Disaster Recovery (CDBG-DR) funds. The Schoharie County Soil and Water Conservation District (SWCD) is requesting funding under the New York Rising Community Reconstruction Program for Phase I and Phase II of the Gorge Creek Culvert Repair and Storm Water Improvements project. This is a storm water management improvement project involving culvert installation, expanding the floodplain and sedimentation basin construction, as well as improvements to the storm water system under selected streets in the village. Gorge Creek Site 1 is a prehistoric site that will be impacted by the development of the floodplain expansion and sedimentation basin portion of the project.

Phase II investigations were designed to gather data with which to evaluate the National Register of Historic Places (NRHP) eligibility status of Gorge Creek Site 1. Site eligibility is based on NRHP criteria of significance (36 CFR 60.6, Federal Register 1976). Phase II field efforts consisted of shovel test and unit excavations. All Phase II field and analytical methods were conducted in accordance with guidelines established in *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York* by the New York Archaeological Council (NYAC 1994) and adopted by the Office of Parks, Recreation and Historic Preservation (OPRHP).

The following technical report presents the results of the Phase II study conducted in August and September of 2016. Derrick J. Marcucci, RPA, and Susan Gade, RPA served as the Principal Investigators for the project and they supervised all aspects of the investigation. Fieldwork was conducted by Derrick Marcucci, Susan Gade, Joseph Cusack, Jaclyn Galdun, Devon Guy, Jennifer Lenkewich, Katarina Spero, and Jonathan Wiener. This report is written by Susan Gade and Jessica Schreyer. Graphics were completed by Jessica Schreyer and Devon Guy. All field notes, photographs, and records associated with the project are on file at Landmark Archaeology, Inc., 6242 Hawes Road, Altamont, New York.

2. PROJECT BACKGROUND, SITE DESCRIPTION AND PHASE I SUMMARY

Gorge Creek Site 1 is located in the APE of the Gorge Creek Culvert Repair and Storm Water Improvements project (OPRHP# 15PR06219). This project is designed to reduce flooding during major storms by: 1) culvert installation, floodplain expansion, and sedimentation basin construction along Gorge Creek, and 2) improvements to the storm water system under selected streets in the village. Gorge Creek Site 1 will be impacted by the Gorge Creek floodplain expansion and construction of the sedimentation basin which will require the removal of approximately 28,715 cubic yards of soil and shifting the stream channel 30 to 25 feet to the south (Figure 3).

Schoharie County and Gorge Creek Site 1 is located in the physiographic region known as the Allegheny Plateau (Isachsen et al. 2000). The floodplain expansion and sedimentation basin area of the project is situated on a high Late Pleistocene glacial terrace system. It lies at the base of a prominent upland mountain noseslope that overlooks the village of Middleburgh. Gorge Creek is a small stream that contained little to no water at the time of the Phase II investigations. It forms the site's (and the floodplain expansion and sedimentation basin area's) northern boundary. The stream is incised into two to three meters of glacial till sediment and flows westward into and through the village of Middleburgh.

Gorge Creek Site 1 is situated across the glacial terrace and occupies much of the APE for the floodplain expansion and sedimentation basin. Terrain across the site is fairly level to gently sloping westward toward the Schoharie Creek valley. The terrace is characterized by undulating microtopography that likely marks the remnants of an ancient braided stream channel (Appendix A: Photographs 1 and 2). Phase I work across the terrace documented shallow (<0.5 m) alluvium deposited by Gorge Creek on the surface in several areas of the site and found pockets of deeper (1 m) alluvium in swales (Gade et al. 2016:3). The site lies at an elevation of 685 to 735 feet amsl. It is planted in alfalfa, which had been mowed immediately prior to Phase II fieldwork. Tuckhannock gravelly loam, fans (0-5% slope) is the only soil mapped in the site area (Figure 4; Flora et al. 1969). This soil is well to somewhat excessively drained gravelly loam formed in glacial outwash deposits.

The Phase IA/IB investigations completed in May of 2016 included 122 shovel test excavations in the floodplain expansion and sedimentation basin area (Gade et al. 2016). Of these shovel tests, 98 yielded artifacts and these positive shovel tests define the boundary of Gorge Creek Site 1. The site area was determined to encompass 24,762.8 square meters (6.1 acres). In total, 183 artifacts were collected during Phase I fieldwork. The Phase I assemblage does not include any culturally diagnostic artifacts with which to assign cultural affiliation of the site. A possible feature (Feature 1) was identified in a Phase I shovel test (Tr. 11, STP 1). The feature consisted of charcoal flecking within soils similar the Ap and contained 19 artifacts. Phase I fieldwork found archaeological deposits throughout the Ap horizon and in the upper B-horizon soils. The majority (74%) of the Phase I artifact assemblage was recovered from plowed soils and approximately one-quarter of the artifacts were found in subsoils (Gade et al. 2016:11).

The northeastern portion of Gorge Creek Site 1 overlaps with a previously recorded site (NYSM 8711). Other than it being noted as a prehistoric village site, additional information regarding cultural affiliation or artifacts recovered was not available for NYSM 8711. The site is shown in the Cultural Resources Information System (CRIS) maintained at the OPRHP as a large polygon extending north and south of Gorge Creek. The southern one-third of NYSM 8711 overlaps with Gorge Creek Site 1.

3. PHASE II METHODS

A. PHASE II OBJECTIVES

The Phase II archaeological investigation was designed to gather data with which to evaluate the NRHP eligibility status of Gorge Creek Site 1. Site eligibility is based on NRHP criteria of significance (36 CFR 60.6, Federal Register 1976). The criteria are:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association:

a. that are associated with events that have made a significant contribution to the broad patterns of our history; or

b. that are associated with the lives of persons significant in our past; or

c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction, or

d. that has yielded, or may be likely to yield, information important in prehistory or history.

Typically, Criterion d is the most applicable criterion for evaluation of archaeological resources.

B. PHASE II FIELD METHODS

The Phase II field investigation was conducted from August 23 to September 9, 2016. Fieldwork consisted of the excavation of 102 shovel tests and 16 1x1-meter test units (Figure 5). Shovel tests were spaced ten meters apart and positioned along transects that were located parallel to and in between selective Phase I transects to create a 7.5-meter spacing of transects within the site. Unit placement was based on shovel test results and landform considerations. Units were hand excavated by shovel skimming and trowel excavation. Subplowzone soils were removed in ten-centimeter arbitrary levels within natural soil horizons. Unit excavations extended at least one level into the B horizon. A soil profile was compiled for at least one wall of each unit and color photographs were taken of unit profiles. Cultural features identified in the units were mapped in planview, photographed, and excavated by cross sectioning.

All Phase II excavated soils were screened through ¼-inch hardware cloth. Soil characteristics including texture and color (Munsell) and any disturbances or other noteworthy aspects of the tests were recorded on standardized Landmark Archaeology, Inc. field forms. Soil descriptions for each shovel test are provided in Appendix B. All Phase II excavations were recorded using a submeter, high precision GPS receiver. The georeferenced data were differentially corrected for a horizontal error of less than one meter. All excavations were backfilled after completion.

C. DATA ANALYSIS METHODS

Artifacts were transported to laboratory facilities at Landmark Archaeology, Inc. for processing. Artifacts were washed and sorted into appropriate categories and subcategories for analysis. The flake assemblage was sorted by chert types and by four categories reflecting the stages in the lithic reduction sequence (Callahan 1979). The four categories of chert debitage included decortification (DF), early reduction (ER), late reduction (LR), and retouch (RF). Attributes of each of these flake types include the presence of cortex on DF flakes, a pronounced bulb of percussion on ER flakes, a diffuse bulb of percussion on LR flakes, and RF flakes are very small (<1 cm) and have diffuse bulbs of percussion indicating pressure flaking. A fifth category, shatter (SH), was used for "cubical and irregular shaped chunks that frequently lack well-defined bulbs of percussion or systematic alignment of cleavage scars on the various faces" (Binford and Quimby 1963:278). Finally, a sixth category, broken (BK), was used for broken flakes which could not be assigned to a lithic reduction category. Sources used for projectile point identification and cultural affiliation and age included Justice (1987) and Ritchie (1971). The artifact analysis data including provenience and category frequencies are presented in Appendix C.

All field notes, photographs, and records associated with the project are on file at Landmark Archaeology, Inc., 6242 Hawes Road, Altamont, New York. Artifacts are temporarily curated at Landmark Archaeology, Inc. facilities. For Gorge Creek Site 1, a New York State Archaeological Site Inventory Form was updated with Phase II data and submitted to the OPRHP (Appendix D).

4. GORGE CREEK SITE 1 PHASE II RESULTS

Site Type: Prehistoric
Component: Late Archaic
Approximate Size in APE: 24,762.8 square meters (6.1 ac)
Landform: Late Pleistocene glacial terrace
Soil Type: Tuckhannock gravelly loam, fans (TcA)
Elevation: 685-735 ft amsl
Vegetation: Alfalfa
Subsurface Tests: 102 STPs, 16 1x1-m units
Percentage of Site Excavated (Phase I and II): 0.17%
Artifacts: 1 Lamoka point, 1 untyped point, 7 bifaces, 2 chipped stone tool, 2 scrapers, 101 flake tools, 18 cores, 1112 flakes, 5 cobble tools, and 15 fcr
NRHP Eligibility: Eligible under Criterion d
Recommendation: Preservation and avoidance or Phase III data recovery

A. FIELDWORK

1. Soils

Soils exposed during the Phase II effort included gravelly silt loam. Similar to the Phase I shovel tests, Phase II excavations documented an Ap-B soil sequence across much of the site. The plowzone consisted of dark brown (10YR 3/3) gravelly silt loam and typically extended between 20 and 30 centimeters below the surface (Appendix A: Photograph 3). B-horizon soils were dark yellowish brown to yellowish brown (10YR 4/6-5/6) gravelly silt loam or silt loam. In several shovel tests, a dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand with dense cobbles B/C horizon was encountered below the B soil.

In low-lying terrain in the western section of the site several shovel tests along Transects 22 and 23, and Units 2 through 4 and Unit 7, encountered an unplowed remnant of the A horizon. These excavations were located along the lower elevations of the terrace and were within a noticeable swale. In these tests, the unplowed A soils, which were directly below the plowzone, consisted of dark yellowish brown (10YR 4/4-4/6) gravelly silt loam ranging in thickness from ten to 18 centimeters. The unplowed A is illustrated in the soil profile of Unit 2 (Figure 6).

2. Shovel Tests

Of the 102 Phase II shovel tests, 70 tests yielded artifacts. The shovel test assemblage totals 394 artifacts and includes eight biface fragments, two scrapers, 35 flake tools, four cobble tools, six cores, 332 pieces of debitage, and seven fcr weighing 521.0 grams (Table 1). A total of 327 artifacts were found in plowed soils, 11 artifacts were recovered from unplowed A soils and 56 artifacts were found B-horizon soils. Thirty-one shovel tests contained subplowzone artifacts.

3. Unit Excavations

Sixteen 1x1-meter units were excavated at the site (see Figure 5). The units were positioned according to shovel testing results and placed to examine different areas of the site. Prehistoric artifacts from the units total 870. Artifacts were found in all units, but totals varied considerably, ranging from 237 artifacts in Unit 2 to two artifacts in Unit 15 (see Table 1). Units 11 and 4 had the next highest artifact totals with 158 and 123, respectively. The remaining units all contained less than 100 artifacts with Units 2, 6 and 16 each having less than ten artifacts. One feature,

(Feature 2) was identified in the unit excavations. Subplowzone artifacts were found in all but three units (Units 9, 15 and 16).

Table 1
Gorge Creek Site 1 Phase II Artifact Assemblage

Artifact Class	STPs	Units																Feat. 2	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Biface/CST	8						1					1		1					11
Scraper	2																		2
Flake Tool	35	5	25	1	12	3	3	1	1	1	3	5	2	2	1		1		101
Core	6	2	2	3	2			1		1		1							18
Debitage																			
DF	5	1	1							1									8
ER	75	12	46	5	21	15	1	8	16	4	2	29	8	4	7		2	4	259
LR	160	34	96		57	1		11	42	11	12	106	11	8	18	2		1	570
RF	4	1	5		8				3	3		2	2						28
BK	43	8	35	1	15	5		4	5			7			3				126
SH	45	4	27		8	3	1	11	5		2	7	2	2	4				121
Cobble Tool	4			1															5
Fcr	7	1		2						1			1				1	2	15
TOTAL	394	68	237	13	123	27	6	36	72	22	19	158	26	17	33	2	4	7	1264

CST=Chipped stone tool; DF=Decortification flake; ER=Early Reduction flake; LR=Late Reduction flake; RF=Retouch Flake; BK=Broken; SH=Shatter

Units 2 through 4 and Unit 7 were positioned in the site area that shovel testing documented the existence of unplowed A soils under the Ap. Combined, these four units yielded a total of 409 artifacts (Table 2), accounting for almost half (47%) of all artifacts found in the 16 1x1-meter units. Artifacts recovered from the unplowed A soils in these four units total 163, and 14 artifacts were found in the upper B horizon in these units. While all four of these units had artifacts in the unplowed A soils, Units 2 and 4 had the most with a total of 163 artifacts. As noted, Unit 2 contained the most artifacts of the 16 unit excavations. This unit was positioned next to a Phase I

Table 2
Units 2-4 and 7: Artifact Assemblage by Context of Recovery

Artifact Class	Unit 2				Unit 3				Unit 4				Unit 7			
	Ap	A	B	Total	Ap	A	B	Total	Ap	A	B	Total	Ap	A	B	Total
Flake Tool	14	11		25	1			1	11	1		12		1		1
Core	1	1		2		2	1	3	2			2			1	1
Debitage																
DF	1			1				0				0				0
ER	16	30		46	1	2	2	5	18	3		21	5	2	1	8
LR	38	56	2	96				0	55	2		57	6	3	2	11
RF	4	1		5				0	8			8				0
BK	14	21		35		1		1	11	4		15	4			4
SH	6	18	3	27				0	8			8	8	1	2	11
Cobble Tool				0		1		1				0				0
Fcr				0		2		2				0				0
TOTALS	94	138	5	237	2	8	3	13	113	10	0	123	23	7	6	36

DF=Decortification flake; ER=Early Reduction flake; LR=Late Reduction flake; RF=Retouch Flake; BK=Broken; SH=Shatter shovel test (Tr. 11, STP 1) containing a relatively high number of artifacts (n=30), and at the time of Phase I fieldwork, this concentration of cultural material was interpreted to represent a feature (Gade et al. 2016:11). Despite the density of artifacts found in Unit 2, no feature was identified in the unit. Units 3 and 7 did not have high frequencies of artifacts. Thirteen artifacts, including eight recovered from the unplowed A soil, were found in Unit 3. Unit 7 contained 36 artifacts including seven from unplowed A soils.

Unit 1, located approximately ten meters east of Unit 4, is the only unit in which a feature was identified. Feature 2 is a pit feature that was first identified in a Phase II shovel test (Tr. 22, STP 2) and further exposed in Unit 1. It appeared at the base of the plowzone at a depth of 30 centimeters below the surface as a soil stain of reddened (thermally altered) earth with charcoal. The feature extended into the northern and eastern walls of the unit and was roughly rectangular in shape (Figure 7). It measured 70x55 centimeters with a burned earth concentration measuring 55x23 centimeters along the unit's eastern wall. The profile of the feature exhibited relatively straight walls and a flat bottom, and it extended 23 centimeters into the B horizon (see Figure 7). The feature matrix included mottled dark yellowish brown and strong brown (10YR 4/6, 7.5YR 4/6) silt loam. Artifacts recovered from the feature total seven and include five flakes and two fcr weighing 62.1 grams.

In addition to the artifacts from Feature 2, 68 artifacts were found in Unit 1. This unit did not have unplowed A-horizon soil; the plowzone was directly atop the B horizon (see Figure 7). Sixty-two artifacts were recovered from the plowzone of this unit and six artifacts were found in the B horizon.

Unit 11 had the second highest number of artifacts at the site with a total of 158: 131 artifacts from the plowzone and 27 artifacts from the B horizon. This unit was located in the northern site area near Gorge Creek and along higher elevation on the terrace. Unit 8, located approximately 30 meters upslope from Unit 11, contained 72 artifacts, which is the fourth highest number of artifacts from the unit excavations. In Unit 8, 65 artifacts were found in the plowzone and seven artifacts were recovered from the B horizon.

B. ARTIFACT ANALYSIS

Phase II excavations yielded 1264 artifacts (Table 3): nine bifaces, two scrapers, two other chipped stone implements, 101 flake tools, 18 cores, 1112 flakes, five cobble tools, and 15 fcr. Artifacts recovered from the plowzone total 943, or 74.6 percent of the assemblage. One hundred seventy-five artifacts (13.8%) were found in intact A soils encountered below the plowzone, and 139 artifacts (11.0%) were found in B soils. The remaining seven artifacts were found in Feature 2.

Table 3
Phase II Artifact Assemblage by Context of Recovery

Artifact Class	Ap	A	B	Feature 2	**Total**
Biface	6	2	1		9
Scraper	2				2
Other CST	1		1		2
Flake Tool	75	17	9		101
Core	10	3	5		18
Debitage					
DF	6		2		8

Artifact Class	Ap	A	B	Feature 2	**Total**
ER	186	39	30	4	259
LR	444	61	64	1	570
RF	25	1	2		28
BK	97	26	3		126
HS	80	20	21		121
Cobble Tool	3	1	1		5
Fcr	8 (480 g)	5 (436.2 g)	0	2 (62.1 g)	15 (978.3 g)
TOTAL	943	175	139	7	1264

CST=Chipped stone tool; DF=Decortification flake; ER=Early Reduction flake; LR=Late Reduction flake; RF=Retouch Flake; BK=Broken; SH=Shatter

The assemblage includes two projectile points and seven other biface fragments. The projectile points consist of one Lamoka point and an untyped point (Appendix A: Photograph 4). Lamoka points are associated with the Late Archaic Lamoka Phase (3500-2500 BC). The Lamoka point is broken along one side of the blade and the tip is absent. It was manufactured from Onondaga chert and measures 35.3 millimeters in length, 22.6 millimeters in width, and 6.3 millimeters in thickness. It was found in the plowzone in Unit 13. The untyped point was found in the plowzone of Unit 11. It also was manufactured from Onondaga chert. The tip and part of the base are absent, and it is broken along the blade on one side. The remaining intact morphology of the point indicates that it is a side-notched point with a markedly concave base. It measures 31.8 millimeters in length, 30.2 millimeters in width, and 8.8 millimeters in thickness. The remaining seven biface specimens are blade fragments or small unidentified forms with at least one bifacally-chipped edge. All seven were manufactured from Onondaga chert.

Other chipped stone artifacts found on the site include a chipped stone wedge, a chipped stone siltstone tool, and two scrapers. The wedge was found in the plowzone of Unit 6. It was manufactured from Onondaga chert. Percussion flaking formed the tapered edge of this implement. The wedge measures 49.0 millimeters in length. The chipped stone siltstone tool was found in the B horizon of Transect 25, STP 1. This tool is on a fragment of siltstone and has flaked notches forming a serrated edge. The scrapers consist of a side scraper and a small thumb scraper. Both scrapers were manufactured from Onondaga chert. The side scraper has step fractures along the pressure flaked scraping edge. The thumb scraper was made from a piece of chert shatter and is small weighing 4.5 grams. It has a steep pressure-flaked edge and step fractures along the utilized edge. The side scraper was found in the plowzone of Transect 28, STP 2, and the smaller thumb scraper was found in the plowzone of Transect 25, STP 2.

Five cobble tools are in the assemblage. These tools include a stone axe, a hammerstone, and three cobbles that are battered along one or more edges. The stone axe was found in the B horizon in Unit 3. This axe is a smooth stone with damage on the striking edge. The hammerstone was found in the plowzone of Transect 28, STP 1. The hammerstone is an angular blocky piece of Onondaga chert that has been battered along two edges. The remaining three cobble tools were found in shovel tests (Tr. 23, STPs 2 and 6; Tr. 27, STP 3) with two recovered from the plowzone and the third from B-horizon soils.

A large number of flake tools (n=101) were recovered on the site. Every unit except Unit 15 contained at least one flake tool and flake tools were recovered from 28 shovel tests. Use wear is evident on 96 flakes, four flakes have been retouched, and one specimen exhibits evidence of both use wear and retouch. Of the flake tools exhibiting use wear, 24 specimens have two or more utilized edges. The utilized flakes exhibit chipping or crushing wear indicative of scraping activities. Notable retouched flake tools include a flake with pressure flaking to create a perforator or graver tip, and another specimen that was pressure flaked to create a burin-like tool. Ninety-nine flake tools were of Onondaga chert and two were Esopus chert.

Eighteen cores were found on the site, ranging in weight from 10.3 to 138.4 grams. All are Onondaga chert.

Flaking debris accounts for 87.9 percent of the artifact assemblage. Flakes total 1112, and the assemblage is dominated by late reduction flakes (n=570) and early reduction flakes (n=259). Decortification flakes (n=8), retouch flakes (n=28), broken flakes (n=126), and chert shatter (n=121) are present in lower frequencies. Most flakes (n=1101) are Onondaga chert; however, Esopus chert (n=8), quartzite (n=1), and siltstone (n=1) are present in small quantities. One flake's chert type was not identified.

Fifteen fcr with a combined weight of 978.3 grams were recovered from the site. Eight were found in the plowzone, five were found in the A horizon in Unit 3 and in Transect 23, STPs 5 and 6, and two were found in Feature 2. The presence of fcr may be evidence of thermal features.

C. SITE INTERPRETATION

Based on the recovery of a Lamoka point, a Late Archaic Lamoka Phase (3500-2500 BC) cultural affiliation is assigned to Gorge Creek Site 1. A Late Archaic association is further supported by an artifact assemblage gathered by Tom Anderson, a local collector, who had collected the plowed surface of the site several times. The collection was shown to the Principal Investigators. Recognizable points in his collection included several Late Archaic Lamoka and Snook Kills points, and Orient Fishtail points of the Terminal Archaic/Transitional cultural period (Appendix A: Photograph 5). A small fragment of what appeared to be a Turkey Tail point base, a Terminal Archaic/Early Woodland cultural period style, also was in the collection along with several biface blade fragments. Additionally, the collector also had drawn a map showing artifact locations and the relative distribution of Lamoka and Orient Fishtail points on the terrace. According to the map, he found Lamoka and stemmed points in an area southeast and outside of the APE. Oriental Fishtail points were found by the collector in the northeastern portion of Gorge Creek Site 1 in the general location of the eastern portion of Phase I Transect 1 and Phase II Transect 20.

Phase II excavations yielded a relatively large assemblage of 1264 artifacts. Combined with the Phase I collection which included 183 artifacts, 1447 prehistoric artifacts have been collected from excavations at the site. No pottery or other artifacts solely associated with the Woodland or later prehistoric cultural periods were found at the site.

The density of artifacts and the range of tools types in the Phase I and II assemblage point to multiple and varied activities occurring at the site. The site is interpreted to represent a combination of short term camps and seasonal occupations revisited throughout the Late Archaic period where inhabitants procured and processed plant and animal resources. Expedient flake tools are profuse across the site and these tools exhibit single to multiple edges with damage. The dearth of projectile points at the site is attributed to these tool types being targeted by local collectors. Of note is the relative lack of fcr in the assemblage. Only 15 fcr were found in the Phase II excavations. There is little doubt that Gorge Creek Site 1 extends beyond the APE boundary and artifact types and tools poorly represented in the Phase I and II artifact assemblage could be present elsewhere on the terrace outside of the APE as well as on the other side of Gorge Creek.

The vertical distribution of artifacts indicates that repeated cultivation of the terrace has plowed most of the archaeological deposits at the site. However, several shovel tests and Units 2 through 4 and Unit 7 have documented that unplowed A-horizon soils with archaeological deposits are preserved on the terrace at least in one location. Based on Phase II data, this area measures approximately 761.5 square meters. Thirteen percent of all Phase II artifacts were recovered from the unplowed A soils in this area of the site. Artifacts were also recovered from the upper B horizon soils, usually within the first ten centimeters below the Ap or A horizon. Approximately 11 percent of the Phase II assemblage was found in the upper B-horizon soils.

5. RECOMMENDATIONS

Gorge Creek Site 1 is recommended as eligible to the NRHP under Criterion d. The site has yielded a diagnostic artifact of the Late Archaic cultural period and a large artifact assemblage with a variety of tools types. While most of the site has been impacted by cultivation, Phase II investigations of the site documented the presence of intact cultural deposits in unplowed A-horizon soils in at least one portion of the site. Artifacts are also found in the upper B-horizon soils across much of the site. One pit feature was exposed in a unit excavation. The presence of this feature as well as the density of artifacts at the site suggest other features are likely to exist at the site. Cultural deposits at the site have potential to yield additional information on the Late Archaic cultural period. Specifically, the site provides an opportunity to examine and expand our knowledge regarding settlement, subsistence and community patterning of Late Archaic period occupations along Gorge Creek, a small tributary in the Schoharie Creek valley. Therefore, the site meets Criterion d of the NRHP. Research topics which can be addressed by cultural deposits at the site include:

- Settlement System/Site Function
- Subsistence Patterns
- Community Pattern
- Cultural History

Avoidance of the site is recommended. Site avoidance should include an avoidance and preservation plan that outlines short term protective strategies to protect the site during construction, as well as long term plans to ensure future preservation of the site. The avoidance and preservation plan must be submitted to OPRHP for review.

For areas of the site that avoidance is not feasible, a Phase III archaeological data recovery is recommended to mitigate adverse effects of the proposed development activities. Phase III investigations should follow a Data Recovery Plan (DRP) which is developed in consultation with the OPRHP. The DRP must outline field and analytical methods to address research issues relevant to the site’s data potential.

6. SUMMARY

Phase II archaeological investigations of prehistoric Gorge Creek Site 1 (09542.000116) included the excavation of 102 shovel tests and 16 1x1-meter units. Gorge Creek Site 1 is located within the APE for the floodplain expansion and sedimentation basin area of the proposed Gorge Creek Culvert Repair and Storm Water Improvements project (OPRHP# 15PR06219) in the village and town of Middleburgh, Schoharie County, New York. The investigation was conducted by Landmark Archaeology, Inc. who was retained as a subconsultant by Tectonic Engineering & Surveying Consultants, P.C. of Mountainville, New York.

Gorge Creek Site 1 is recommended as eligible for listing in the NRHP under Criterion d. The site is associated with the Late Archaic cultural period base on a Lamoka projectile point found during Phase II fieldwork. Excavations generated a large and diverse artifact assemblage indicative of short term camps and seasonal settlements. Artifacts are found in the plowzone and upper B-horizon soils, and in some areas of the site, in unplowed A-horizon soils below the plowzone. The prehistoric cultural deposits at the site have potential to yield information on the Late Archaic cultural period and the prehistoric use and occupation of the area.

As planned, proposed project activities will impact Gorge Creek Site 1. Avoidance of the site is recommended. Site avoidance should include an avoidance and preservation plan that outlines short term protective strategies to protect the site during construction, as well as long term plans to ensure future preservation of the site. The avoidance and preservation plan must be submitted to the OPRHP for review.

If avoidance is not feasible, a Phase III archaeological data recovery is recommended to mitigate adverse effects of proposed development activities at the site. Phase III investigations should follow a DRP which is developed in consultation with the OPRHP. The DRP must outline field and analytical methods to address research issues relevant to the site's data potential.

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Figures

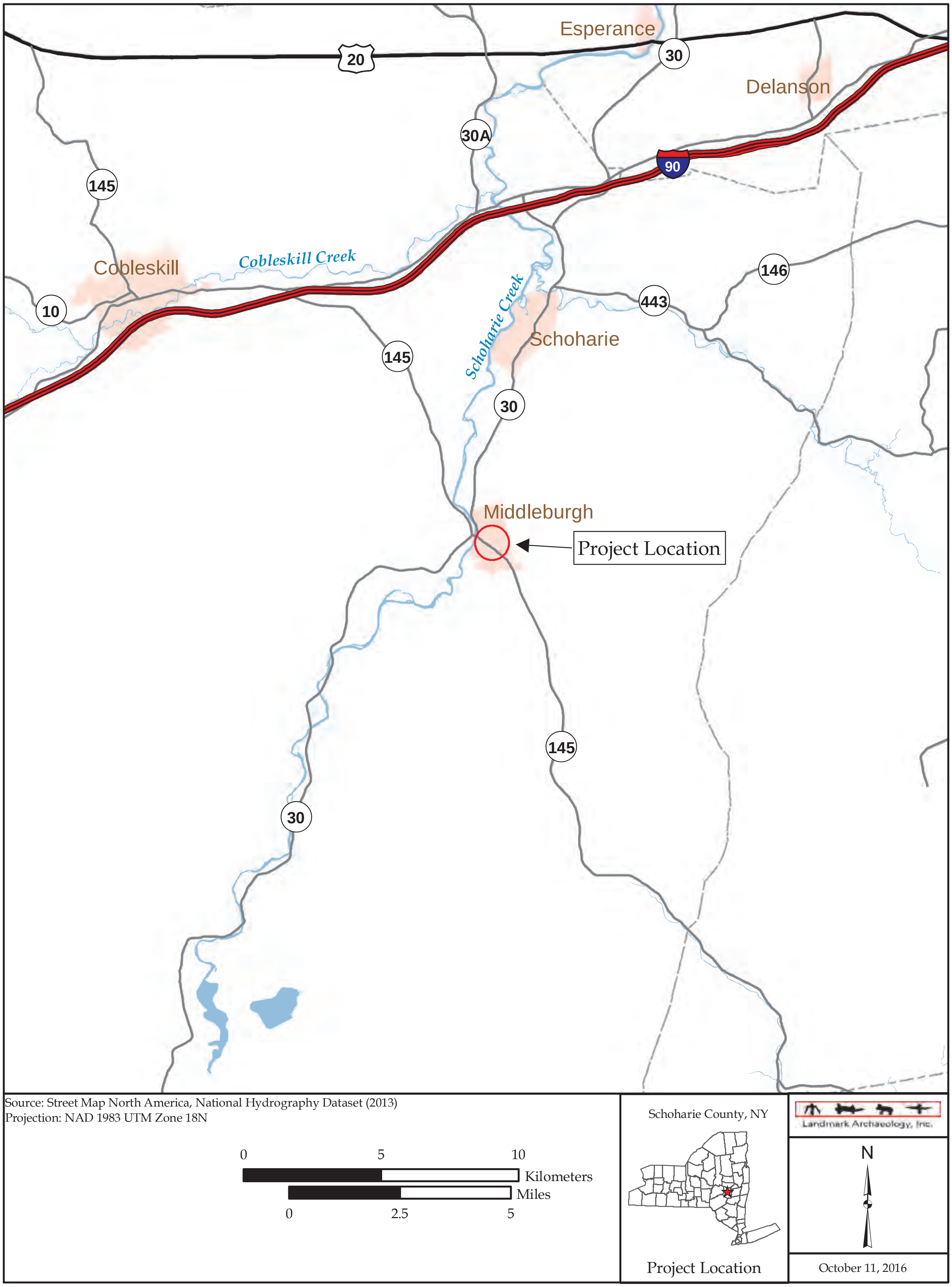


Figure 1: Project Location

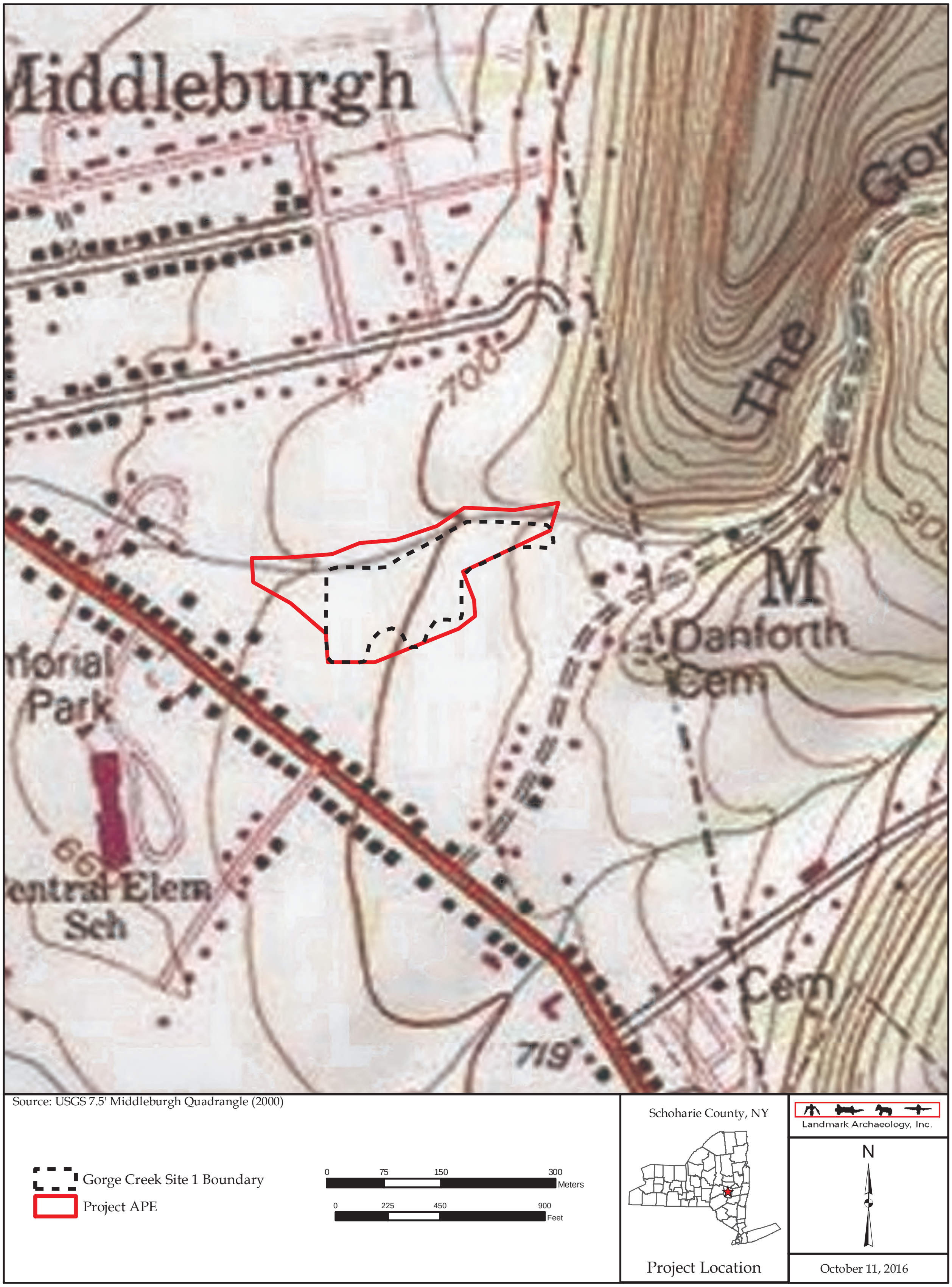
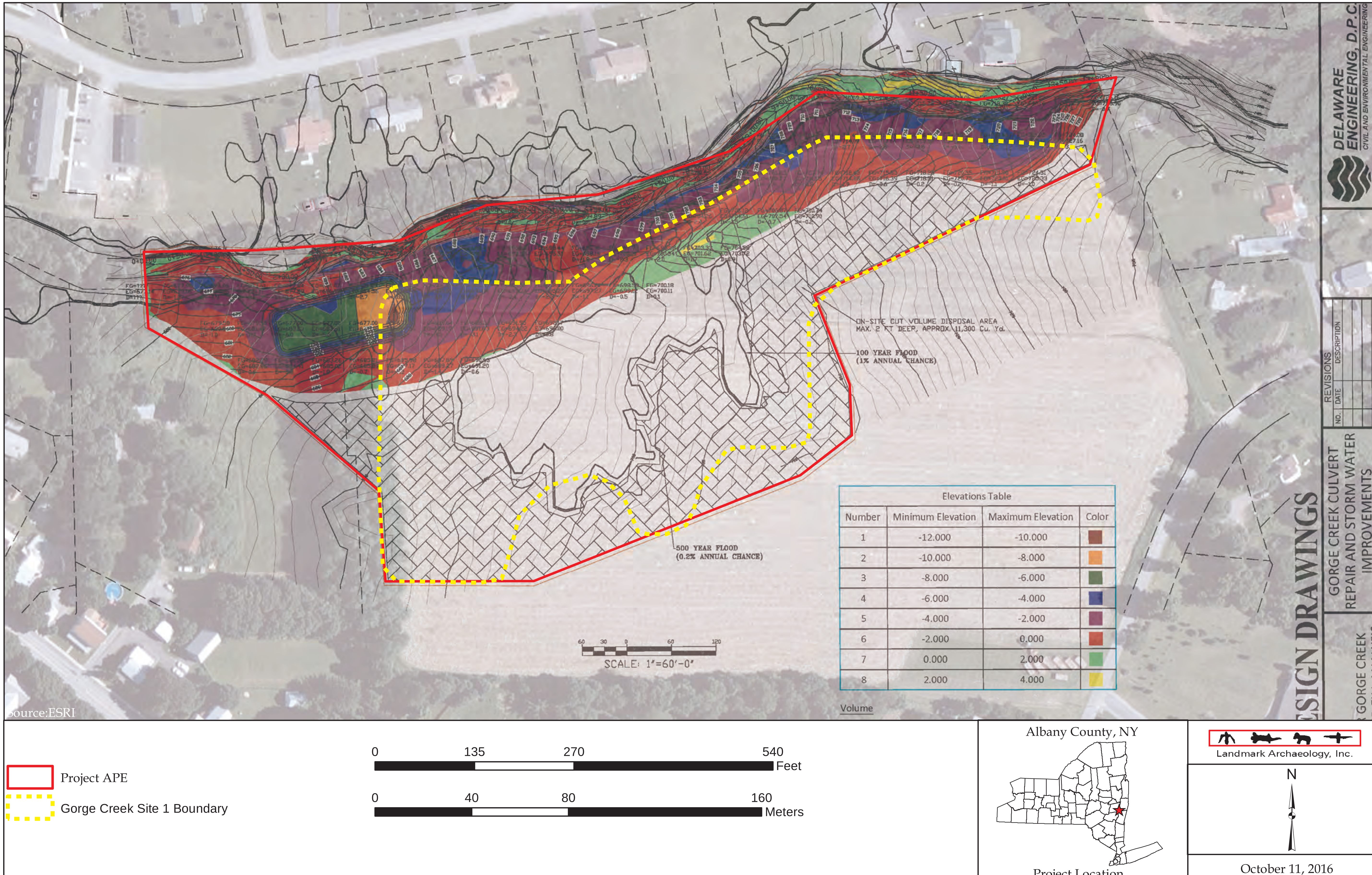


Figure 2: Gorge Creek Site 1 Location and Topographic Features



Number	Minimum Elevation	Maximum Elevation	Color
1	-12.000	-10.000	
2	-10.000	-8.000	
3	-8.000	-6.000	
4	-6.000	-4.000	
5	-4.000	-2.000	
6	-2.000	0.000	
7	0.000	2.000	
8	2.000	4.000	

Figure 3: Project Plans and Gorge Creek Site 1 Location

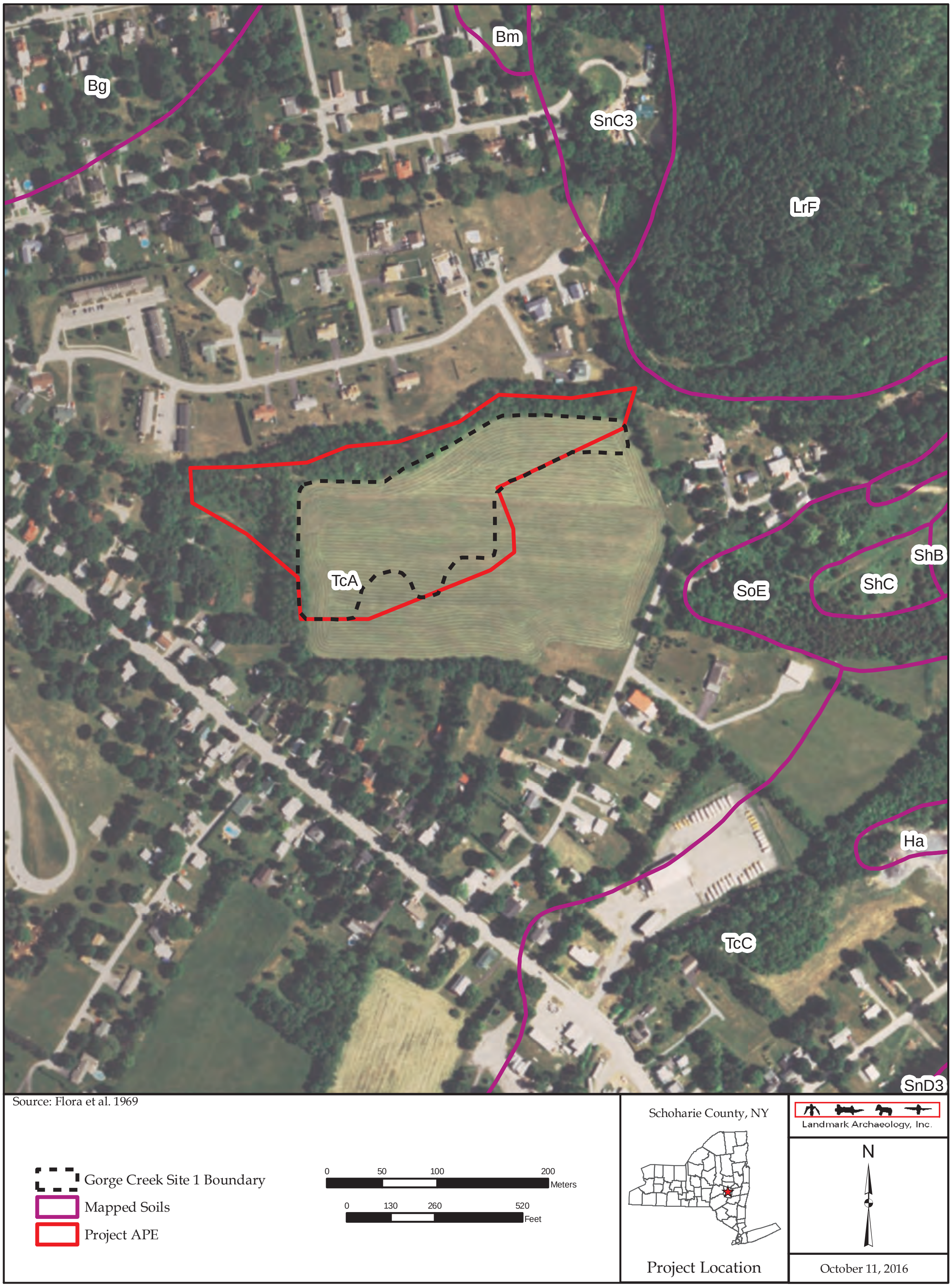


Figure 4: Mapped Soils

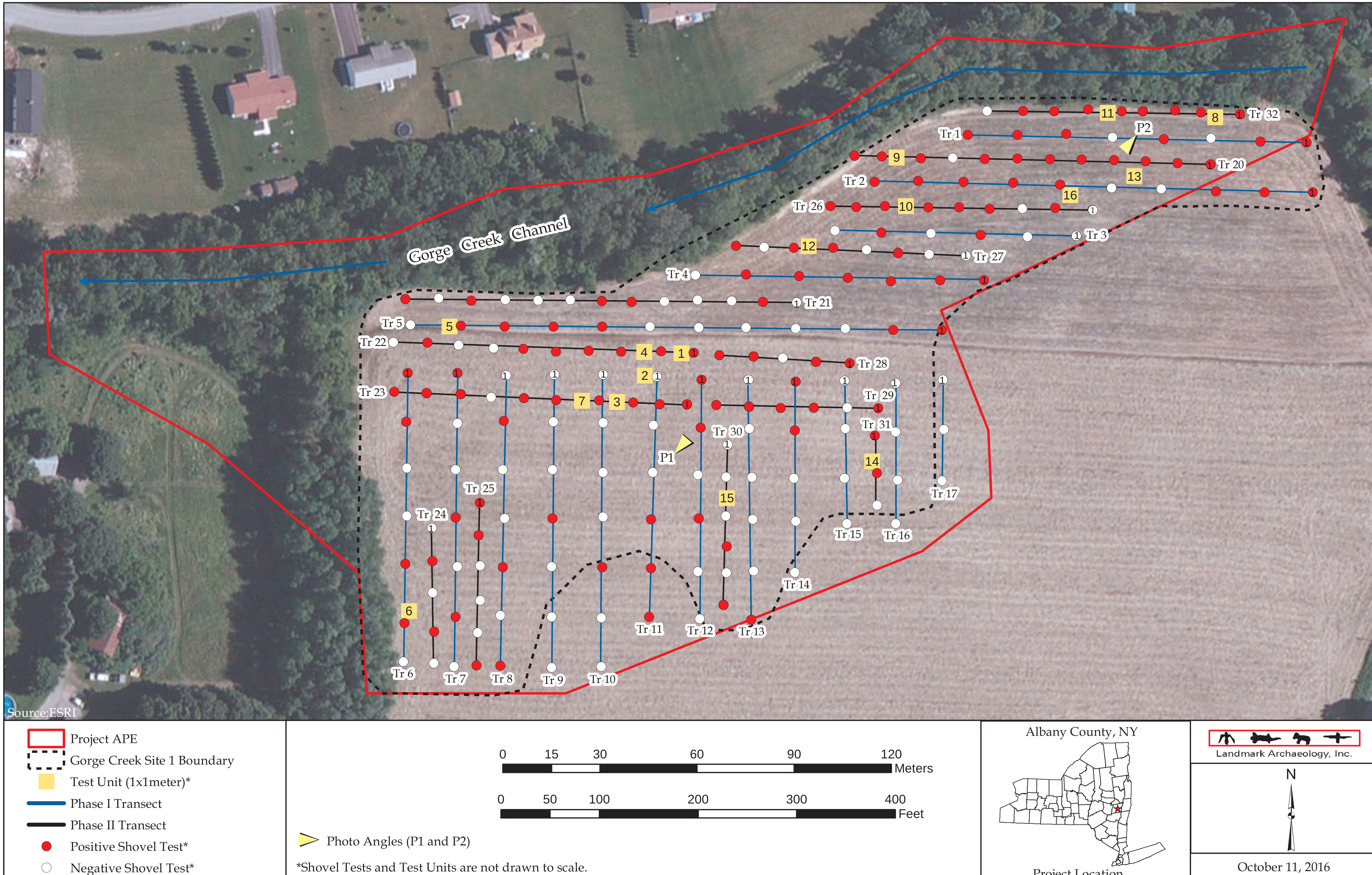


Figure 5: Gorge Creek Site 1 Phase I and II Test Locations

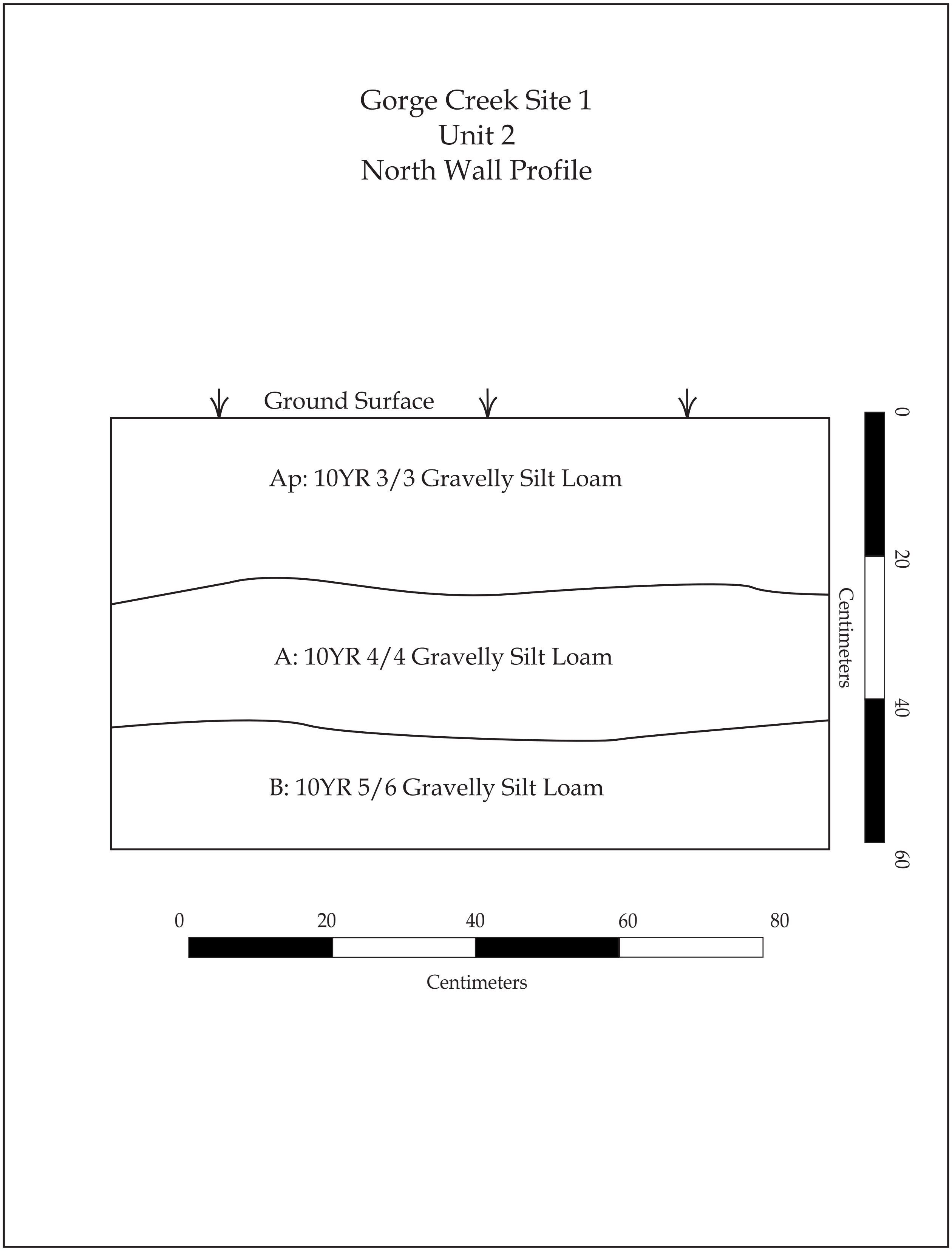


Figure 6: Gorge Creek Site 1 Unit 2 Profile

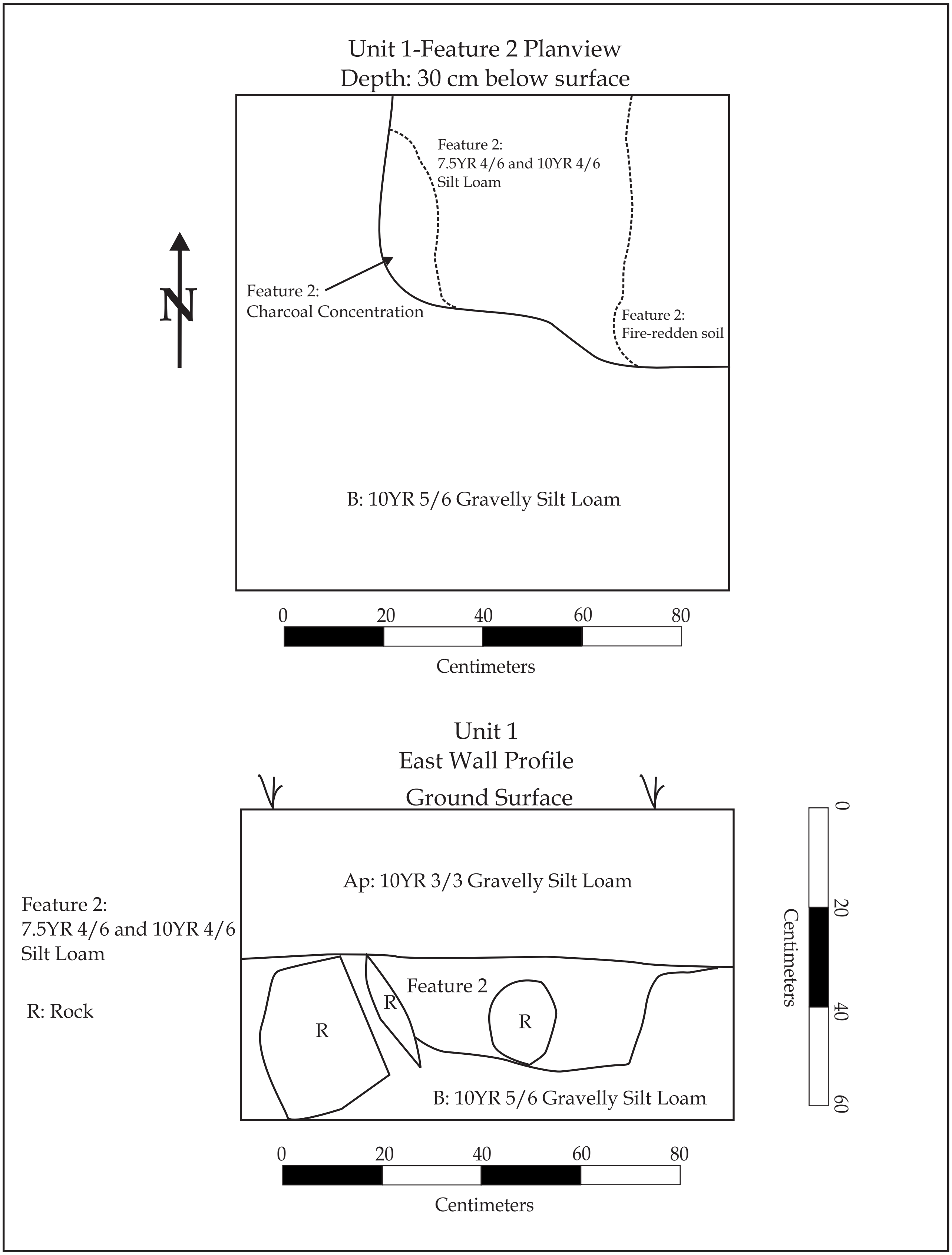


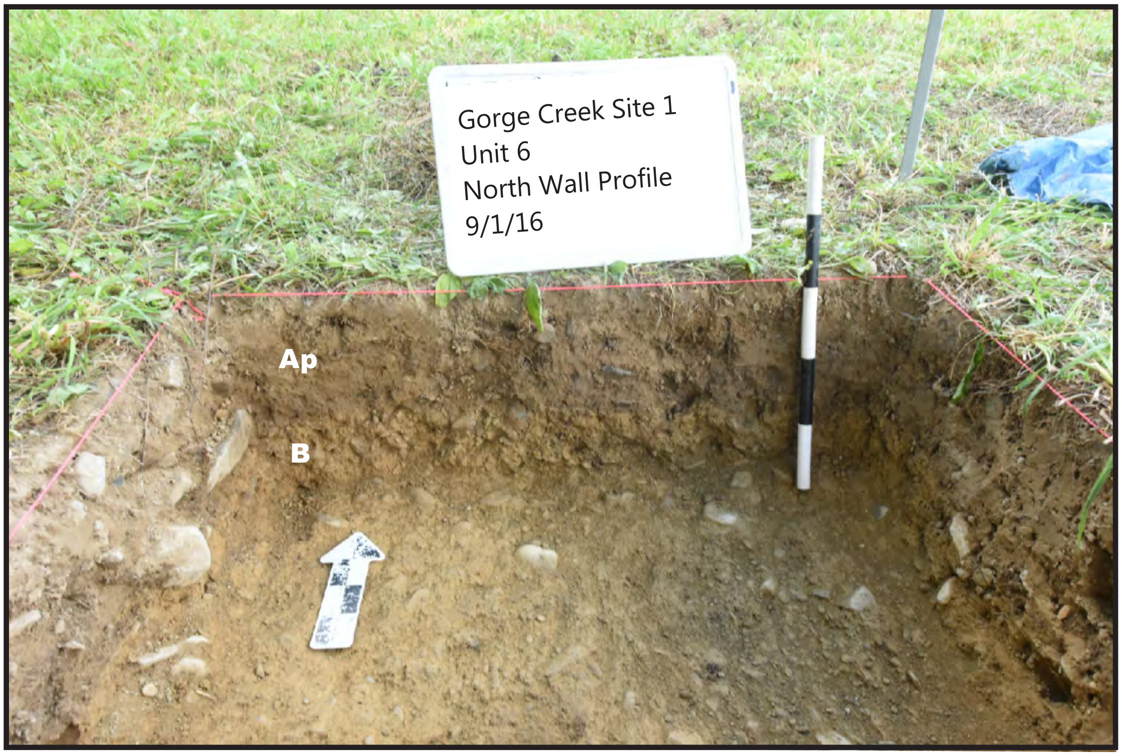
Figure 7: Gorge Creek Site 1 Feature 2 Planview and Unit 1 Profile

APPENDIX A

Photographs

Photograph 1: Northeastern Portion of Gorge Creek Site 1, View to Northeast

Photograph 2: Southwestern Portion of Gorge Creek Site 1
(note microtopography of terrace surface), View to Southwest



Photograph 3: Unit 6 North Wall Profile

Photograph 4: Gorge Creek Site 1 Selected Bifaces: a-Lamoka point, b-Untyped Side-notched point, c-Biface blade

Photograph 5: Tom Anderson's Artifact Assemblage Collected from the Plowed Surface of Gorge Creek Site 1.

APPENDIX B

Shovel Test Descriptions

Gorge Creek Culvert Repair and Storm Water Improvements
Phase II Gorge Creek Site 1 (09542.000116)
Schoharie County, New York
Landmark Archaeology, Inc. #369

Soil Description
1-Gravelly Silt Loam 3-Silt Loam
2-Gravelly Sand Loam/Loose Sand

Munsell		10YR 3/3	10YR 4/4-4/6	10YR 4/6-5/6	10YR 3/4	10YR 4/6	Artifacts Present	Comments
Soil Description Key		1	1	1	2	3		
STRAT		Ap	A	B	B/C	B		
	STP							
TRANSECT 20								
	1	0-27		27-48			x	
	2	0-23		23-48			x	
	3	0-26		26-48			x	
	4	0-24		24-41			x	
	5	0-35				35-56	x	Rock impasse
	6	0-33		33-73			x	
	7	0-25		25-47			x	
	8	0-23		23-39	39-52		x	
	9	0-21		21-41				Rock impasse
	10	0-21		21-42			x	
	11	0-31		31-41			x	Rock impasse
	12	0-23		23-38			x	
TRANSECT 21								
	1	0-32		32-55				
	2	0-30		30-50			x	
	3	0-40		40-70				
	4	0-24		24-46				
	5	0-30		30-55				
	6	0-34		34-60			x	
	7	0-30		30-58			x	
	8	0-35		35-55				
	9	0-24		24-44				
	10	0-18		18-38				
	11	0-25		25-53			x	
	12	0-23		23-47				
	13	0-19		19-46			x	
TRANSECT 22								
	1	0-32		32-54			x	Burned earth along SW wall of STP @ 35 cmbs
	2	0-32	32-44	44-65	65-77		x	
	3	0-33		33-44			x	
	4	0-32		32-45			x	
	5	0-23		23-42			x	
	6	0-18		18-48			x	
	7	0-32		32-49	49-52			
	8	0-33		33-53	53-57			
	9	0-29		29-49			x	
	10	0-30		30-51				
TRANSECT 23								
	1	0-26		26-46			x	
	2	0-32		32-54			x	
	3	0-30	30-51	51-70			x	
	4	0-32	32-52	52-72			x	
	5	0-32	32-60	60-80			x	
	6	0-28	28-50	50-67			x	
	7	0-30		30-55				Rock impasse
	8	0-28		28-54			x	
	9	0-23		23-58			x	
	10	0-23		23-53			x	
TRANSECT 24								
	1	0-28		28-49				
	2	0-19		19-44			x	
	3	0-29		29-48				
	4	0-29		29-49			x	
	5	0-23		23-38				
TRANSECT 25								
	1	0-28		28-50	50-60		x	
	2	0-28		28-48			x	
	3	0-29		29-51				
	4	0-30		30-52				
	5	0-33		33-44				
	6	0-33		33-58	58-66		x	
TRANSECT 26								
	1	0-33						Rock impasse at B horizon
	2	0-33		33-45			x	
	3	0-29						Rock impasse
	4	0-31		31-40			x	Rock impasse
	5	0-25		25-38			x	
	6	0-27					x	Rock impasse
	7	0-21		21-29			x	Rock impasse
	8	0-27		27-60			x	
	9	0-24		24-34			x	Rock impasse
TRANSECT 27								
	1	0-26		26-40				
	2	0-30		30-50				
	3	0-28		28-55			x	
	4	0-28		28-42				
	5	0-25		25-46			x	

Gorge Creek Culvert Repair and Storm Water Improvements
Phase II Gorge Creek Site 1 (09542.000116)
Schoharie County, New York
Landmark Archaeology, Inc. #369

Soil Description
1-Gravelly Silt Loam 3-Silt Loam
2-Gravelly Sand Loam/Loose Sand

Munsell		10YR 3/3	10YR 4/4-4/6	10YR 4/6-5/6	10YR 3/4	10YR 4/6	Artifacts Present	Comments
Soil Description Key		1	1	1	2	3		
STRAT		Ap	A	B	B/C	B		
	6	0-24		24-49			x	
	7	0-24		24-43				
	8	0-37		37-58			x	
TRANSECT 28								
	1	0-18		18-38			x	Rock impasse
	2	0-25		25-58	58-68		x	
	3	0-33		33-48				
	4	0-30		30-50			x	
	5	0-38		38-60			x	
TRANSECT 29								
	1	0-30			40-45	30-40	x	
	2	0-30			30-60			
	3	0-20			30-60	20-30	x	
	4	0-26		26-39			x	
	5	0-28		28-37			x	Rock impasse
	6	0-28		28-48	48-59		x	
TRANSECT 30								
	1	0-33		33-43				
	2	0-34		34-45				
	3	0-29		29-50				
	4	0-28		28-48	48-60		x	
	5	0-31		31-57				
	6	0-30		30-55			x	
TRANSECT 31								
	1	0-28		28-50			x	
	2	0-30		30-52			x	
	3	0-29		29-49			x	
TRANSECT 32								
	1	0-24		24-38			x	Rock impasse
	2	0-27		27-39			x	Rock impasse
	3	0-26		26-35	35-51		x	
	4	0-21		21-37			x	
	5	0-32		32-67			x	
	6	0-29		29-64			x	
	7	0-33		33-53			x	
	8	0-39		39-59			x	
	9	0-38						Rock impasse

APPENDIX C

Artifact Inventory

Gorge Creek Site 1 (09542.000116)
Chipped Stone Tool Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Tool Type	Biface Type	Morphology	Raw Material	Max Length	Max Width	Thickness	Weight (g)	Heat Treated	Comments
112	1	20	5		Ap	1	Biface	Unidentified		Onondaga	26.6	19.3	7.1			Broken
100	2	22	2		A	2	Biface	Unidentified		Onondaga	50.7	37.2				Broken
143	1	23	3		A	2	Biface	Unidentified		Onondaga	36.1	19	7.5		X	Biface fragment, fire-cracked and spalled, chert is swirled gray tones
137	1	23	4		Ap	1	Biface	Unidentified		Onondaga	19.5	20.8	7.5			Blade fragment
133	1	25	1		B	2	Notched tool			Siltstone	71.2	57.4	12.5			Multiple notches, processing tool, possible spokeshave use
216	1	32	1		B	2	Biface	Unidentified		Onondaga	41.6	14.6	15.1			Fragment
249	2	32	5		Ap	1	Biface	Unidentified		Onondaga	22.3	8.9	8.5			Fragment
249	1	32	5		Ap	1	Biface	Unidentified		Onondaga	28.6	23.4	6.6			Tip and blade, broken
212	4			6	Ap	1	Wedge			Onondaga	49	39.1	19.8	39.3		Battered edge damage
239	10			11	Ap	1	Biface		Side-Notched	Onondaga	31.8	30.2	8.8			Broken at base, along, blade, tip is absent, side-notched, appears to have had a concave base
256	7			13	Ap	1	Biface	Lamoka		Onondaga	35.3	22.6	6.3			Broken along blade, tip is absent

Gorge Creek Site 1 (09542.000116)
Flake Tool and Scraper Assemblage

Cat No.	Specimen	Transect	STP	Unit	Stratum	Level	Artifact Type	Raw Material	Technological Class	No. Edges Utilized	Heat Treated	Comments	Edge Number	Modification	Kind of Wear	Wear Shape	Length (mm)	Comments
112	4	20	5		Ap	1	Flake Tool	ON	LR	2			1	UW	CH	Convex	20.1	
													2	UW	CH	Straight	20.2	
112	3	20	5		Ap	1	Flake Tool	ON	SH	1			1	UW	CH	Concave	8.3	
112	2	20	5		Ap	1	Flake Tool	ON	DF	1	X		1	UW	CH	Straight	11.7	
103	1	20	6		Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Convex	12.8	
106	2	20	8		Ap	1	Flake Tool	ES	DF	2		Large Decortification flake that has notches (retouched), may have been used as a weight	1	RT	CH	Marked Concave	16.2	
													2	RT	CH	Marked Concave	15.6	
125	2	21	2		Ap	1	Flake Tool	ON	SH	3			1	UW	CH	Marked Concave	6.7	spokeshave use
													2	UW	CH	Marked Concave	7.6	spokeshave use
													3	UW	CH	Straight	16.2	
123	2	21	11		B	2	Flake Tool	ON	LR	1			1	UW	CH	Concave	8.3	
123	3	21	11		B	2	Flake Tool	ON	LR	3			1	UW	CH	Concave	9	
													2	UW	CH	Concave	5.9	
													3	UW	CH	Concave	4.1	
113	1	22	1		Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Concave	6.2	
109	7	22	1		B	2	Flake Tool	ON	ER	2			1	UW	CH	Straight	16.8	
													2	UW	CH	Straight	9.9	
109	1	22	1		B	2	Flake Tool	ON	ER	1		Pressure flaking to create perforator or graver		RT	CH			
100	1	22	2		A	2	Flake Tool	ON	ER	1			1	UW	CH	W-Wave	16.9	
129	1	22	2		Ap	1	Flake Tool	ON	ER	1			1	UW	CH	W-Wave	10.9	
150	1	22	4		Ap	1	Flake Tool	ON	LR	1			1	UW	CH	Straight	11.2	
140	2	22	5		Ap	1	Flake Tool	ON	SH	4			1	UW	CH	Marked Concave	12.5	

ON = Onondaga Chert
ES = Esopus Chert

DF=Decortification; ER=Early Reduction; LR=Late Reduction; BK=Broken; SH= Shatter
UW=Use Wear; RT= Retouched
CH=Chipping; CR=Crushing

Gorge Creek Site 1 (09542.000116)
Flake Tool and Scraper Assemblage

Cat No.	Specimen	Transect	STP	Unit	Stratum	Level	Artifact Type	Raw Material	Technological Class	No. Edges Utilized	Heat Treated	Comments	Edge Number	Modification	Kind of Wear	Wear Shape	Length (mm)	Comments
													2	UW	CH	Marked Concave	4.7	
													3	UW	CH	Marked Concave	5	
													4	UW	CH	Marked Concave	6.6	
140	3	22	5		Ap	1	Flake Tool	ON	ER	1			1	UW	CR	Straight	8.7	
132	2	22	9		Ap	1	Flake Tool	ON	ER	2			1	UW	CH	W-Wave	9.6	
													2	UW	CH	Concave	6.6	
143	2	23	3		A	2	Flake Tool	ON	DF	2			1	UW	CH	Convex	18.9	
													2	UW	CH	Concave	10.3	
143	3	23	3		A	2	Flake Tool	ON	ER	1			1	UW	CH	Concave	10.9	
148	1	23	4		A	2	Flake Tool	ON	SH	1		Weathered Shatter, utilized	1	UW	CH	Concave	9.3	
144	1	23	5		Ap	1	Flake Tool	ON	LR	2			1	UW	CH	Marked Concave	5.3	
													2	UW	CH	Marked Concave	6.3	
146	1	25	2		Ap	1	Thumb Scraper	ON		1		Thumb scraper made from shatter. Steep pressure flaked edge. Step fractures along utilized edge.						
134	1	25	2		B	2	Flake Tool	ON	SH	1			11	UW	CH	Concave	12	
188	1	26	7		Ap	1	Flake Tool	ON	ER	1	X		1	UW	CH	S-Wave	12.2	
176	6	27	5		Ap	1	Flake Tool	ON	ER	1		Retouched at utilized edge	1	UW	CR	Convex	9.8	
182	1	27	6		Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Concave	6.7	
194	2	28	2		Ap	1	Side Scraper	ON		1		Step fractures along utilized edge						
198	1	28	5		Ap	1	Flake Tool	ON	LR	1		Retouched flaking to produce graver tip	1	UW	CH	Concave	10.2	
168	1	28	5		B	2	Flake Tool	ON	ER	1			1	UW	CH	Straight	7.3	
178	1	29	4		Ap	1	Flake Tool	ON	ER	1		Retouched at utilized edge	1	UW	CR	Straight	28	

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Gorge Creek Site 1 (09542.000116)
Flake Tool and Scraper Assemblage

Cat No.	Specimen	Transect	STP	Unit	Stratum	Level	Artifact Type	Raw Material	Technological Class	No. Edges Utilized	Heat Treated	Comments	Edge Number	Modification	Kind of Wear	Wear Shape	Length (mm)	Comments
179	3	29	5		Ap	1	Flake Tool	ON	SH	1			1	UW	CR	Concave	8	
217	1	31	1		Ap	1	Flake Tool	ON	LR	1			1	UW	CH	Concave	4.8	
217	2	31	1		Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Straight	4	
248	1	32	3		Ap	1	Flake Tool	ON	LR	1			1	UW	CH	W-Wave	12.3	
249	3	32	5		Ap	1	Flake Tool	ON	LR	1			1	UW	CH	Marked Concave	12.3	
220	1	32	6		Ap	1	Flake Tool	ON	LR	2			1	UW	CH	Concave	4.6	
													2	UW	CH	Concave	4.9	
241	1	32	7		Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Convex	24.9	
199	10			1	Ap	1	Flake Tool	ON	LR	1			1	UW	CH	Straight	6.8	
199	11			1	Ap	1	Flake Tool	ON	LR					RT				
199	12			1	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Concave	14.4	
199	13			1	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Concave	7.5	
199	14			1	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Convex	10	
202	6			2	A	2	Flake Tool	ON	ER	3			1	UW	CH	Concave	15.2	
													2	UW	CH	Straight	10.1	
													3	UW	CH	Marked Concave	4.7	
202	7			2	A	2	Flake Tool	ON	ER	2			1	UW	CH	Straight	11.7	
													2	UW	CR	Concave	5.6	
202	8			2	A	2	Flake Tool	ON	ER	2			1	UW	CH	W-Wave	13.1	
													2	UW	CH	W-Wave	18.4	
202	9			2	A	2	Flake Tool	ON	ER	1			1	UW	CH	S-Wave	10.8	
202	10			2	A	2	Flake Tool	ON	ER	1			1	UW	CH	S-Wave	15.7	
202	11			2	A	2	Flake Tool	ON	ER	4			1	UW	CH	Convex	11.2	

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Gorge Creek Site 1 (09542.000116)
Flake Tool and Scraper Assemblage

Cat No.	Specimen	Transect	STP	Unit	Stratum	Level	Artifact Type	Raw Material	Technological Class	No. Edges Utilized	Heat Treated	Comments	Edge Number	Modification	Kind of Wear	Wear Shape	Length (mm)	Comments
													2	UW	CH	Straight	6.9	
													3	UW	CH	Concave	3.2	
													4	UW	CH	Concave	5.9	
202	12			2	A	2	Flake Tool	ON	ER	1			1	UW	CH	Marked Concave	4.4	
202	13			2	A	2	Flake Tool	ON	BK	1			1	UW	CH	Straight	5.9	
202	14			2	A	2	Flake Tool	ON	ER	1			1	UW	CH	Marked Concave	7.3	
202	15			2	A	2	Flake Tool	ON	ER	2			1	UW	CH	Concave	6.9	
													2	UW	CH	Concave	7.5	
202	16			2	A	2	Flake Tool	ON	ER	1			1	UW	CH	Convex	8.9	
201	9			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	S-Wave	15.9	
201	10			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Convex	13.9	
201	11			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Marked Concave	11.9	
201	12			2	Ap	1	Flake Tool	ON	ER	2			1	UW	CH	Marked Concave	8.6	
													2	UW	CH	W-Wave	10.9	
201	13			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Straight	15	
201	14			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Convex	16.2	
201	15			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Straight	12.8	
201	16			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Concave	10	
201	17			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Straight	19	
201	18			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Straight	8.1	
201	19			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Marked Concave	7.1	
201	20			2	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	S-Wave	5.3	
201	21			2	Ap	1	Flake Tool	ON	SH	1			1	UW	CH	Convex	34.6	

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Gorge Creek Site 1 (09542.000116)
Flake Tool and Scraper Assemblage

Cat No.	Specimen	Transect	STP	Unit	Stratum	Level	Artifact Type	Raw Material	Technological Class	No. Edges Utilized	Heat Treated	Comments	Edge Number	Modification	Kind of Wear	Wear Shape	Length (mm)	Comments
201	22			2	Ap	1	Flake Tool	ON	ER	1		Retouched flake, utilized	1	UW	CH	Straight	16	
204	2			3	Ap	1	Flake Tool	ES	DF	1			1	UW	CH	Convex	49.6	
209	1			4	A	2	Flake Tool	ON	ER	1			1	UW	CH	Straight	6.9	
208	7			4	Ap	1	Flake Tool	ON	DF			Retouched flake tool						
208	10			4	Ap	1	Flake Tool	ON	SH	2		Weathered	1	UW	CH	Straight	16	
													2	UW	CH	Concave	7.1	
208	11			4	Ap	1	Flake Tool	ON	DF	2			1	UW	CH	Convex	13.5	
													2	UW	CH	Straight	20.8	Retouched along this utilized edge
208	12			4	Ap	1	Flake Tool	ON	DF	1			1	UW	CH	Straight	13.4	
208	13			4	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Convex	20.1	
208	14			4	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	W-Wave	9.4	
208	15			4	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Marked Concave	6.3	
208	16			4	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Straight	5.1	
208	17			4	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Convex	14.1	
208	18			4	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	S-Wave	13.5	
208	19			4	Ap	1	Flake Tool	ON	LR	1			1	UW	CH	Straight	12.8	
210	5			5	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Concave	12.4	
210	6			5	Ap	1	Flake Tool	ON	SH	1			1	UW	CH	Convex	29.5	
211	1			5	B	2	Flake Tool	ON	ER	1			1	UW	CH	Marked Concave	6.9	
212	1			6	Ap	1	Flake Tool	ON	ER	1		Retouched flake tool, retouched to create burin, double spokeshave use wear adjacent to the burin	1	UW	CH	W-Wave	8.4	
212	3			6	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	W-Wave	9.7	

ON = Onondaga Chert
ES = Esopus Chert

DF=Decortification; ER=Early Reduction; LR=Late Reduction; BK=Broken; SH= Shatter
UW=Use Wear; RT= Retouched CH=Chipping; CR=Crushing

Gorge Creek Site 1 (09542.000116)
Flake Tool and Scraper Assemblage

Cat No.	Specimen	Transect	STP	Unit	Stratum	Level	Artifact Type	Raw Material	Technological Class	No. Edges Utilized	Heat Treated	Comments	Edge Number	Modification	Kind of Wear	Wear Shape	Length (mm)	Comments
213	1			6	B	2	Flake Tool	ON	ER	1			1	UW	CH	S-Wave	15.7	
230	1			7	A	2	Flake Tool	ON	SH	1			1	UW	CH	Straight	15.6	
233	1			8	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Straight	8	
235	1			9	Ap	1	Flake Tool	ON	ER			Retouched to create burin						
237	1			10	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Convex	40.7	
237	2			10	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	W-Wave	20.7	
237	3			10	Ap	1	Flake Tool	ON	LR	1			1	UW	CH	Concave	10.2	
239	6			11	Ap	1	Flake Tool	ON	ER	2			1	UW	CH	Straight	10.9	
													2	UW	CH	Concave	6.9	
239	7			11	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Marked Concave	11.2	
239	8			11	Ap	1	Flake Tool	ON	ER	2			1	UW	CH	Concave	6.7	
													2	UW	CH	W-Wave	18.6	
239	9			11	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Convex	17.5	
240	5			11	B	2	Flake Tool	ON	ER	1			1	UW	CH	Concave	5.9	
254	4			12	Ap	1	Flake Tool	ON	ER	2			1	UW	CH	W-Wave	20.9	
													2	UW	CH	Straight	9.5	
254	5			12	Ap	1	Flake Tool	ON	ER	2			1	UW	CH	Concave	6.5	
													2	UW	CH	Concave	5.8	
256	1			13	Ap	1	Flake Tool	ON	ER	2			1	UW	CH	Straight	12.5	
													2	UW	CH	W-Wave	17.3	
256	2			13	Ap	1	Flake Tool	ON	ER	1			1	UW	CH	Concave	11.2	
253	7			14	Ap	1	Flake Tool	ON	SH	1			1	UW	CH	Convex	12	
252	2			16	Ap	1	Flake Tool	ON	ER	2			1	UW	CH	Convex	21.1	
													2	UW	CH	Concave	8.4	

ON = Onondaga Chert
ES = Esopus Chert

DF=Decortification; ER=Early Reduction; LR=Late Reduction; BK=Broken; SH= Shatter
UW=Use Wear; RT= Retouched
CH=Chipping; CR=Crushing

Gorge Creek Site 1 (09542.000116)
Core Assemblage

Cat No.	Specimen	Transect	STP	Unit	Stratum	Level	Core Type	Raw Material	Broken	Weight (g)	Comments
176	1	27	5		Ap	1		Onondaga		138.4	
169	2	28	1		B	2	Utilized	Onondaga		30.8	Retouched and utilized
194	1	28	2		Ap	1		Onondaga		21.5	
221	5	32	1		Ap	1	Exhausted	Onondaga	X	15.8	Core fragment, exhausted, weathered
246	1	32	4		Ap	1	Exhausted	Onondaga		10.3	
245	1	32	5		B	3		Onondaga		83.3	
199	8			1	Ap	1		Onondaga		63.5	
199	9			1	Ap	1		Onondaga		112.2	
202	17			2	A	2		Onondaga		18.8	
201	8			2	Ap	1		Onondaga		21.8	
205	3			3	A	2		Onondaga		98.5	
206	1			3	A	3		Onondaga		41.3	Weathered
207	2			3	B	4		Onondaga		33.8	
208	8			4	Ap	1		Onondaga		82.3	
208	9			4	Ap	1	Exhausted	Onondaga		15.2	
231	3			7	B	3		Onondaga		93.9	
235	2			9	Ap	1		Onondaga		39.5	
240	4			11	B	2		Onondaga		54.8	

Gorge Creek Site 1 (09542.000116)
Debitage Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Feature	Raw Material	Technological Class	Heat Treated	Quantity	Comments
121	1	20	1		Ap	1		Onondaga	Late Reduction		1	
121	2	20	1		Ap	1		Onondaga	Shatter		1	
127	1	20	1		B	2		Onondaga	Early Reduction		2	
108	1	20	2		Ap	1		Onondaga	Late Reduction		8	
114	1	20	3		Ap	1		Onondaga	Late Reduction		3	
115	1	20	3		B	2		Onondaga	Late Reduction		2	
110	1	20	4		Ap	1		Onondaga	Early Reduction		2	
110	2	20	4		Ap	1		Onondaga	Late Reduction		2	
110	3	20	4		Ap	1		Onondaga	Broken		1	
112	7	20	5		Ap	1		Onondaga	Broken		7	
112	6	20	5		Ap	1		Onondaga	Late Reduction		20	
112	5	20	5		Ap	1		Onondaga	Early Reduction		7	
103	2	20	6		Ap	1		Onondaga	Early Reduction		3	
103	3	20	6		Ap	1		Onondaga	Late Reduction		2	
104	1	20	6		B	3		Onondaga	Early Reduction		1	
128	1	20	7		Ap	1		Onondaga	Late Reduction		1	
128	2	20	7		Ap	1		Onondaga	Broken	X	1	
106	1	20	8		Ap	1		Esopus	Early Reduction		1	
107	1	20	10		Ap	1		Quartzite	Early Reduction	X	1	
107	2	20	10		Ap	1		Onondaga	Early Reduction		2	
107	3	20	10		Ap	1		Onondaga	Broken		1	
101	1	20	11		Ap	1		Onondaga	Late Reduction		7	
101	2	20	11		Ap	1		Onondaga	Early Reduction		1	
101	3	20	11		Ap	1		Onondaga	Broken		2	
102	1	20	12		Ap	1		Onondaga	Early Reduction		3	
102	2	20	12		Ap	1		Onondaga	Late Reduction		1	
125	1	21	2		Ap	1		Onondaga	Late Reduction		4	
117	1	21	6		B	2		Onondaga	Late Reduction		1	
119	1	21	7		Ap	1		Onondaga	Late Reduction		1	
123	1	21	11		B	2		Onondaga	Shatter		1	
122	1	21	13		B	2		Onondaga	Shatter		1	
113	4	22	1		Ap	1		Onondaga	Shatter		1	
113	3	22	1		Ap	1		Onondaga	Broken		2	

Gorge Creek Site 1 (09542.000116)
Debitage Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Feature	Raw Material	Technological Class	Heat Treated	Quantity	Comments
113	2	22	1		Ap	1		Onondaga	Late Reduction	X	5	
109	2	22	1		B	2		Onondaga	Decortification		1	
109	3	22	1		B	2		Onondaga	Early Reduction		1	
109	4	22	1		B	2		Onondaga	Late Reduction		1	
109	5	22	1		B	2		Onondaga	Broken		1	
109	6	22	1		B	2		Onondaga	Shatter		1	
129	2	22	2		Ap	1		Onondaga	Early Reduction		4	
129	3	22	2		Ap	1		Onondaga	Late Reduction		11	
129	4	22	2		Ap	1		Onondaga	Broken		7	
129	5	22	2		Ap	1		Onondaga	Shatter		2	
130	1	22	2		B	2		Onondaga	Retouch		1	
153	1	22	3		Ap	1		Onondaga	Early Reduction		2	
153	2	22	3		Ap	1		Onondaga	Shatter		3	
140	1	22	5		Ap	1		Onondaga	Shatter		1	
138	1	22	6		Ap	1		Onondaga	Broken		1	
138	2	22	6		Ap	1		Onondaga	Shatter		1	
138	3	22	6		Ap	1		Onondaga	Late Reduction		1	
149	1	22	6		B	2		Onondaga	Decortification		1	
149	2	22	6		B	2		Onondaga	Shatter	X	1	
132	1	22	9		Ap	1		Onondaga	Early Reduction		1	
118	1	23	1		Ap	1		Onondaga	Shatter		1	
116	2	23	2		Ap	1		Onondaga	Broken		1	
143	4	23	3		A	2		Onondaga	Early Reduction		2	
139	1	23	3		Ap	1		Onondaga	Shatter		1	
137	2	23	4		Ap	1		Onondaga	Early Reduction		1	
142	1	23	5		A	2		Onondaga	Shatter	X	1	
144	2	23	5		Ap	1		Onondaga	Late Reduction		2	
189	1	23	8		B	2		Onondaga	Shatter		1	
193	1	23	9		Ap	1		Onondaga	Late Reduction		1	
177	1	23	9		B	2		Onondaga	Shatter		1	
136	1	23	10		Ap	1		Onondaga	Late Reduction		1	
136	2	23	10		Ap	1		Onondaga	Broken		3	
136	3	23	10		Ap	1		Onondaga	Shatter		5	

Gorge Creek Site 1 (09542.000116)
Debitage Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Feature	Raw Material	Technological Class	Heat Treated	Quantity	Comments
141	1	23	10		B	2		Onondaga	Shatter		2	
145	1	24	2		B	2		Onondaga	Late Reduction		1	
147	1	24	4		B	2		Onondaga	Late Reduction		1	
135	1	25	1		Ap	1		Onondaga	Broken		1	
134	1	25	2		B	2		Onondaga	Late Reduction		2	
151	1	25	6		Ap	1		Onondaga	Late Reduction		2	
163	1	26	2		Ap	1		Onondaga	Early Reduction		1	
161	1	26	4		Ap	1		Onondaga	Late Reduction		1	
155	1	26	5		Ap	1		Onondaga	Early Reduction		2	
158	1	26	6		Ap	1		Onondaga	Early Reduction		1	
188	5	26	7		Ap	1		Siltstone	Decortification		1	
188	4	26	7		Ap	1		Onondaga	Broken		1	
188	3	26	7		Ap	1		Onondaga	Late Reduction		4	
188	2	26	7		Ap	1		Onondaga	Early Reduction		3	
195	1	26	8		Ap	1		Onondaga	Decortification		1	
197	1	26	9		Ap	1		Onondaga	Early Reduction		1	
166	1	27	3		B	3		Onondaga	Late Reduction		1	
176	2	27	5		Ap	1		Onondaga	Early Reduction		1	
176	3	27	5		Ap	1		Onondaga	Late Reduction		5	
176	4	27	5		Ap	1		Onondaga	Broken		2	
176	5	27	5		Ap	1		Onondaga	Shatter		1	
182	3	27	6		Ap	1		Onondaga	Broken		2	
182	2	27	6		Ap	1		Onondaga	Late Reduction		5	
184	1	27	6		B	2		Onondaga	Late Reduction		2	
186	1	27	8		Ap	1		Onondaga	Late Reduction		3	
186	2	27	8		Ap	1		Onondaga	Retouch		1	
173	1	28	1		Ap	1		Onondaga	Late Reduction		1	
173	2	28	1		Ap	1		Onondaga	Shatter		2	
169	1	28	1		B	2		Onondaga	Early Reduction		1	
194	7	28	2		Ap	1		Onondaga	Shatter		4	
194	6	28	2		Ap	1		Onondaga	Broken		2	
194	5	28	2		Ap	1		Onondaga	Retouch		1	
194	4	28	2		Ap	1		Onondaga	Late Reduction		3	
194	3	28	2		Ap	1		Onondaga	Early Reduction		4	

Gorge Creek Site 1 (09542.000116)
Debitage Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Feature	Raw Material	Technological Class	Heat Treated	Quantity	Comments
160	1	28	4		Ap	1		Onondaga	Late Reduction		1	
164	1	29	1		Ap	1		Onondaga	Late Reduction		1	
164	2	29	1		Ap	1		Onondaga	Broken		1	
157	1	29	1		B	2		Onondaga	Shatter		1	
180	1	29	3		Ap	1		Onondaga	Shatter		2	
178	3	29	4		Ap	1		Onondaga	Shatter		5	
178	2	29	4		Ap	1		Onondaga	Late Reduction		4	
179	1	29	5		Ap	1		Onondaga	Late Reduction		1	
179	2	29	5		Ap	1		Onondaga	Shatter		1	
162	1	29	6		Ap	1		Onondaga	Decortification	X	1	fire-cracked and spalled
162	2	29	6		Ap	1		Onondaga	Early Reduction			
162	3	29	6		Ap	1		Onondaga	Late Reduction		3	
162	4	29	6		Ap	1		Onondaga	Shatter		1	
183	1	29	6		B	2		Onondaga	Late Reduction		1	
222	1	30	4		B	2		Onondaga	Early Reduction		1	
181	1	30	6		Ap	1		Onondaga	Early Reduction		1	
217	3	31	1		Ap	1		Onondaga	Late Reduction		1	
214	1	31	2		Ap	1		Onondaga	Late Reduction		1	
215	1	31	3		Ap	1		Onondaga	Early Reduction		1	
221	1	32	1		Ap	1		Onondaga	Early Reduction		2	
221	2	32	1		Ap	1		Onondaga	Late Reduction		8	
221	3	32	1		Ap	1		Onondaga	Broken		2	
221	4	32	1		Ap	1		Onondaga	Shatter		1	
216	2	32	1		B	2		Onondaga	Early Reduction		2	
242	1	32	2		Ap	1		Onondaga	Early Reduction		3	
242	2	32	2		Ap	1		Onondaga	Late Reduction		5	
242	3	32	2		Ap	1		Onondaga	Broken		1	
251	1	32	2		B	2		Onondaga	Early Reduction		1	
251	2	32	2		B	2		Onondaga	Late Reduction		1	
248	2	32	3		Ap	1		Onondaga	Early Reduction		1	
248	5	32	3		Ap	1		Onondaga	Late Reduction		5	
249	6	32	5		Ap	1		Onondaga	Broken		2	
249	5	32	5		Ap	1		Onondaga	Late Reduction		10	
249	4	32	5		Ap	1		Onondaga	Early Reduction		8	

Gorge Creek Site 1 (09542.000116)
Debitage Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Feature	Raw Material	Technological Class	Heat Treated	Quantity	Comments
250	1	32	5		B	2		Onondaga	Early Reduction		2	
250	2	32	5		B	2		Onondaga	Late Reduction		3	
220	2	32	6		Ap	1		Onondaga	Late Reduction		4	
220	3	32	6		Ap	1		Onondaga	Broken		2	
220	5	32	6		Ap	1		Onondaga	Retouch		1	
218	1	32	6		B	2		Onondaga	Early Reduction		1	
218	2	32	6		B	2		Onondaga	Late Reduction		2	
219	1	32	6		B	3		Esopus	Early Reduction		1	weathered
241	2	32	7		Ap	1		Onondaga	Early Reduction		2	
241	3	32	7		Ap	1		Onondaga	Late Reduction		2	
241	4	32	7		Ap	1		Onondaga	Shatter		2	
244	1	32	8		Ap	1		Onondaga	Late Reduction		1	
244	2	32	8		Ap	1		Onondaga	Early Reduction		1	
227	1			1	B	2		Onondaga	Early Reduction		1	
227	2			1	B	2		Onondaga	Late Reduction		2	
199	1			1	Ap	1		Onondaga	Broken		8	
199	2			1	Ap	1		Onondaga	Shatter		4	
199	3			1	Ap	1		Onondaga	Retouch		1	
199	4			1	Ap	1		Onondaga	Late Reduction		30	
199	5			1	Ap	1		Onondaga	Early Reduction		10	
199	6			1	Ap	1		Onondaga	Decortification		1	
226	1			1	B	2		Onondaga	Early Reduction		1	
226	2			1	B	2		Onondaga	Late Reduction		2	
200	1			1		2	2	Onondaga	Early Reduction		3	
200	2			1		2	2	Onondaga	Late Reduction		1	
224	1			1		2	2	Onondaga	Early Reduction		1	
202	1			2	A	2		Onondaga	Shatter	X	18	
202	2			2	A	2		Onondaga	Broken		21	
202	3			2	A	2		Onondaga	Retouch		1	
202	4			2	A	2		Onondaga	Late Reduction		56	
202	5			2	A	2		Onondaga	Early Reduction		30	
201	1			2	Ap	1		Onondaga	Early Reduction		15	
201	2			2	Ap	1		Onondaga	Late Reduction		38	
201	3			2	Ap	1		Onondaga	Retouch		4	

Gorge Creek Site 1 (09542.000116)
Debitage Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Feature	Raw Material	Technological Class	Heat Treated	Quantity	Comments
201	4			2	Ap	1		Onondaga	Broken		14	
201	5			2	Ap	1		Onondaga	Shatter		6	
201	6			2	Ap	1		Esopus	Early Reduction		1	
201	7			2	Ap	1		Onondaga	Decortification		1	
203	1			2	B	3		Onondaga	Shatter		3	
203	2			2	B	3		Onondaga	Late Reduction		2	
205	1			3	A	2		Onondaga	Early Reduction		2	
205	2			3	A	2		Onondaga	Broken		1	
204	1			3	Ap	1		Onondaga	Early Reduction		1	
207	1			3	B	4		Onondaga	Early Reduction		2	
209	2			4	A	2		Onondaga	Early Reduction		3	
209	3			4	A	2		Onondaga	Late Reduction		2	
209	4			4	A	2		Onondaga	Broken		4	
208	1			4	Ap	1		Onondaga	Early Reduction		16	
208	2			4	Ap	1		Onondaga	Late Reduction		55	
208	3			4	Ap	1		Esopus	Early Reduction		2	
208	4			4	Ap	1		Onondaga	Retouch		8	
208	6			4	Ap	1		Onondaga	Shatter		8	
208	5			4	Ap	1		Onondaga	Broken		11	
210	1			5	Ap	1		Onondaga	Early Reduction		15	
210	3			5	Ap	1		Onondaga	Broken		5	
210	4			5	Ap	1		Onondaga	Shatter		3	
211	2			5	B	2		Onondaga	Late Reduction		1	
212	2			6	Ap	1		Onondaga	Early Reduction		1	
213	2			6	B	2		Onondaga	Shatter		1	
230	2			7	A	2		Onondaga	Early Reduction		2	
230	3			7	A	2		Onondaga	Late Reduction		3	
230	4			7	A	2		Onondaga	Shatter		1	
229	1			7	Ap	1		Esopus	Early Reduction		1	
229	2			7	Ap	1		Onondaga	Early Reduction		4	
229	3			7	Ap	1		Onondaga	Late Reduction		6	
229	4			7	Ap	1		Onondaga	Broken		4	
229	5			7	Ap	1		Onondaga	Shatter		8	
231	1			7	B	3		Onondaga	Late Reduction		1	

Gorge Creek Site 1 (09542.000116)
Debitage Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Feature	Raw Material	Technological Class	Heat Treated	Quantity	Comments
231	2			7	B	3		Onondaga	Shatter		2	
232	1			7	B	4		Onondaga	Late Reduction		1	
232	2			7	B	4		Onondaga	Early Reduction		1	
233	2			8	Ap	1		Onondaga	Early Reduction		16	
233	3			8	Ap	1		Onondaga	Late Reduction		36	
233	4			8	Ap	1		Onondaga	Retouch		3	
233	5			8	Ap	1		Onondaga	Broken		5	
233	6			8	Ap	1		Onondaga	Shatter		4	
234	1			8	B	2		Onondaga	Late Reduction		6	
234	2			8	B	2		Onondaga	Shatter		1	
235	4			9	Ap	1		Onondaga	Decortification		1	
235	5			9	Ap	1		Onondaga	Early Reduction		4	
235	6			9	Ap	1		Onondaga	Late Reduction		11	
235	7			9	Ap	1		Onondaga	Retouch		3	
237	4			10	Ap	1		Onondaga	Early Reduction		1	
237	5			10	Ap	1		Onondaga	Late Reduction		8	
237	6			10	Ap	1		Onondaga	Shatter		2	
238	1			10	B	2		Onondaga	Early Reduction		1	
238	2			10	B	2		Onondaga	Late Reduction		4	
239	1			11	Ap	1		Onondaga	Early Reduction		24	
239	2			11	Ap	1		Onondaga	Late Reduction		89	
239	3			11	Ap	1		Onondaga	Retouch		2	
239	4			11	Ap	1		Onondaga	Broken		7	
239	5			11	Ap	1		Onondaga	Shatter		4	
240	1			11	B	2		Onondaga	Early Reduction		5	
240	2			11	B	2		Onondaga	Late Reduction		17	
240	3			11	B	2		Onondaga	Shatter		3	
254	1			12	Ap	1		Onondaga	Early Reduction		4	
254	2			12	Ap	1		Onondaga	Late Reduction		10	
254	3			12	Ap	1		Onondaga	Retouch		1	
255	1			12	B	2		Onondaga	Early Reduction		4	
255	2			12	B	2		Onondaga	Late Reduction		1	
255	3			12	B	2		Onondaga	Retouch		1	
255	4			12	B	2		Onondaga	Shatter		2	

Gorge Creek Site 1 (09542.000116)
Debitage Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Feature	Raw Material	Technological Class	Heat Treated	Quantity	Comments
256	3			13	Ap	1		Esopus	Early Reduction		1	
256	4			13	Ap	1		Onondaga	Early Reduction		3	
256	5			13	Ap	1		Onondaga	Late Reduction		7	
256	6			13	Ap	1		Onondaga	Shatter		2	
257	1			13	B	2		Onondaga	Late Reduction		1	
253	1			14	Ap	1		Esopus	Early Reduction		1	
253	2			14	Ap	1		Unidentified	Early Reduction		1	patinated
253	3			14	Ap	1		Onondaga	Early Reduction		3	
253	4			14	Ap	1		Onondaga	Late Reduction		10	
253	5			14	Ap	1		Onondaga	Broken		1	
253	6			14	Ap	1		Onondaga	Shatter		4	
258	1			14	B	2		Onondaga	Early Reduction		2	
258	2			14	B	2		Onondaga	Late Reduction		8	
258	3			14	B	2		Onondaga	Broken		2	
259	1			15	Ap	1		Onondaga	Late Reduction		2	
252	1			16	Ap	1		Onondaga	Early Reduction		2	

Gorge Creek Site 1 (09542.000116)
Cobble Tool Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Cobble Tool Type	Quantity	Weight (g)	Comments
116	1	23	2		Ap	1	Unknown	1	14.7	Natural chert pebble, battered along a convex edge
172	1	23	6		Ap	1	Unknown	1	48	Natural chert specimen with battering along several edges
156	1	27	3		B	2	Unknown	1	45	Battered along two edges
173	3	28	1		Ap	1	Hammer Stone	1	47.6	Angular chert, battered along two edges
205	2			3	A	2	Stone Axe	1	126.9	Battered on striking edge

Gorge Creek Site 1 (09542.000116)
FCR Assemblage

Cat. No.	Specimen	Transect	Shovel Test	Unit	Stratum	Level	Feature	Feature Level	Quantity	Weight (g)
112	8	20	5		Ap	1			1	17.1
142	2	23	5		A	2			2	79.1
144	3	23	5		Ap	1			1	67.2
175	1	23	6		A	2			1	254.4
182	4	27	6		Ap	1			1	53.9
220	4	32	6		Ap	1			1	49.3
199	7			1	Ap	1			1	55.1
200	3			1		2	2	1	1	47.9
225	1			1		3	2	2	1	14.2
206	2			3	A	3			2	102.7
235	3			9	Ap	1			1	34.9
254	6			12	Ap	1			1	128.4
252	3			16	Ap	1			1	74.1

APPENDIX D

New York State Archaeological Site Inventory Form

NEW YORK STATE PREHISTORIC ARCHAEOLOGICAL SITE INVENTORY FORM

NYS OFFICE OF PARKS, RECREATION & HISTORIC PRESERVATION
(518) 237-8643

OFFICE OF PARKS, RECREATION · HISTORIC PRESERVATION
NEW YORK STATE
Bernadette Castro
Commissioner

For Office Use Only--Site Identifier__09542.000116

Project Identifier__15PR06219______________________________ Date _9/12/2016

Your Name______Susan Gade_______________________ Phone (518) 861-8283
Address_________Landmark Archaeology, Inc.
_______________6242 Hawes Rd., Altamont, NY__________

Organization (if any)

1. SITE IDENTIFIER(S) Gorge Creek Site 1

2. COUNTY_________Schoharie____________One of the following: CITY:
TOWNSHIP: Middleburgh
INCORPORATED VILLAGE
UNINCORPORATED VILLAGE OR HAMLET

3. PRESENT OWNER: Walter Wissert
Middleburgh, NY 12122

4. SITE DESCRIPTION (check all appropriate categories):

Site

__Stray Find	___Cave/Rockshelter	___Workshop
__Pictograph	___Quarry	___Mound
__Burial	__ Shell Midden	_X_Village
_X_Surface Evidence	_X_Camp	_X_Material in plow zone
_X_Material below plow zone	__Buried evidence	___Intact Occupation floor
__Single component	_X_Evidence of features	___Stratified
	___Multicomponent	

Location

_X_Under cultivation	__Never cultivated	___Previously cultivated
___Pastureland	___Woodland	___Floodplain
__ Upland		___ Sustaining erosion

Soil Drainage: excellent ___ good _x_ fair ___ poor
Slope: flat _x_ gentle _x_ moderate ___ steep
Distance to nearest water from site (approx.) 5 meters
Elevation: 685-735 ft amsl

5. SITE INVESTIGATION (append additional sheets, if necessary):

Surface--date(s)
__Site map (Submit with form)
___Collection

Subsurface--date(s) August-September, 2016
Testing: shovel _X_ coring ___ other___________ unit size_30-50 cm
no. of units _102_________ (Submit plan of units with form)
Excavation: unit size 1x1-m___no. of units 16

Investigator: Derrick J. Marcucci, RPA and Susan Gade, RPA

Manuscript or published report(s) (reference fully):

Gade, Susan, Jessica Schreyer, Derrick Marcucci

2016 *Phase I Archaeological Investigations of the Gorge Creek Culvert Repair and Storm Water Improvements, Village of Middleburgh, Town of Middleburgh, Schoharie County, New York.* LA 364

Gade, Susan and Jessica Schreyer

2016 *Phase II Archaeological Investigations of the Gorge Creek Site 1 (09542.000116), Village of Middleburgh, Town of Middleburgh, Schoharie County, New York.* LA 369

Present repository of materials: <u>Temporarily curated at Landmark Archaeology, Inc., Altamont, NY</u>

6. COMPONENT(S) (cultural affiliation/dates):

Late Archaic

7. LIST OF MATERIAL REMAINS (be specific as possible in identifying object and material):

1 Lamoka point, 1 untyped point, 7 bifaces, 2 chipped-stone tool , 2 scrapers, 101 flake tools, 18 cores, 1112 flakes, 5 cobble tools, and 15 fcr

If historic materials are evident, check here and fill out historic site form

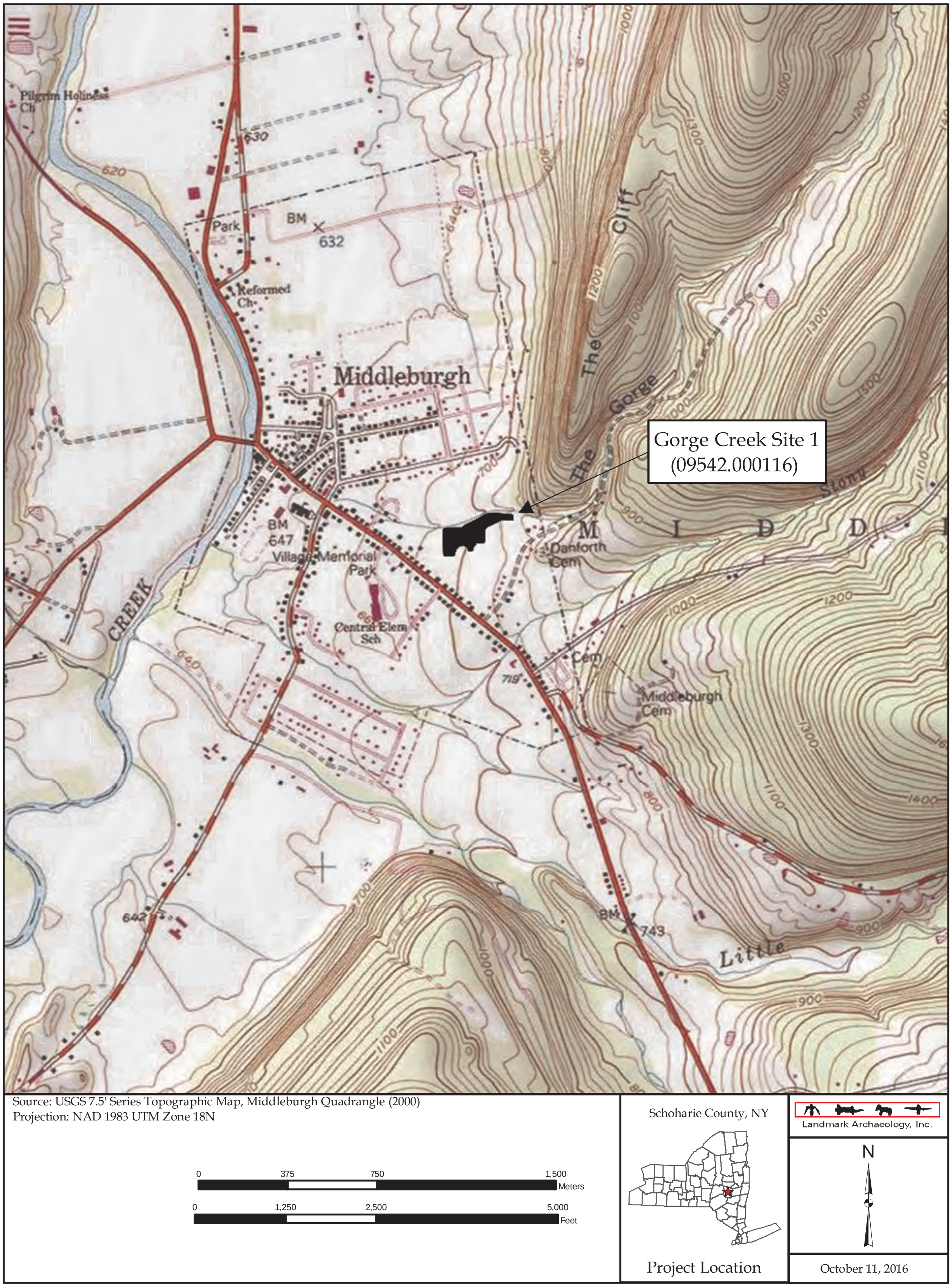
8. MAP REFERENCES

USGS 7.5 Minute Series Quad. Name: <u>Middleburgh, NY 2000</u>

UTM Coordinates <u>555443.69 East</u>
<u>4716202.64 North</u>

9. Photography

Photographs included in technical report.



Gorge Creek Site 1 (09542.000116) Location

June 15, 2016 **VIA NY-CRIS SUBMITTAL**

Mr. Larry Moss
Historic Preservation Technical Specialist
New York State Office of Parks, Recreation and Historic Preservation
Division of Historic Preservation
Peebles Island
P.O. Box 189
Waterford, New York 12188-0189

Re: Verification of APE and Comment on Potential Effect on Historic District
GOSR—Gorge Creek Culvert Improvements
Village and Town of Middleburgh, Schoharie County, New York
15PR06219

Dear Mr. Moss,

The Division of Historic Preservation's consolidated response of June 9, 2016 concerning the recently-submitted *Phase I Archaeological Investigations of the Gorge Creek Culvert Repair and Storm Water Improvements…* (Landmark Archaeology, Inc., May 2016) includes a request for clarification of the area of potential effects (APE) as depicted in the report and discussion of the project's potential effect on the Main Street-Railroad Avenue Historic District in Middleburgh, Schoharie County, New York:

> The APE shown on the Phase I archaeological Survey; Figures 2, 4, 5 indicate the project impacting parts of the historic district, which may impact above-ground cultural resources. Please verify the APE and clarify how the project will impact any above-ground structures.

We have contacted the engineering firm responsible for the design of the stormsewer system, Delaware Engineering, P.C., and learned that Figures 2, 4, and 5 of the Landmark Archaeology report are approximately correct with respect to the current planned footprint of the system. However, owing to a reduction in the scope of the project due to funding limitations, the project description cited on page 2, paragraph 5, of the report and the 5% Submittal plans for the stormsewer system included in the report's Appendix A (pp. 50-55 of the PDF version of the report document) are out of date. Updated information is provided below. It has also been determined that the stormsewer improvements will result in no adverse effects to buildings contributing to the historic district in Middleburgh.

As discussed on page 2 of the Landmark Archaeology report, the project involves three principal elements:

- New stormwater detention basin between Main Street (NYS 145) and M.T. Path;
- New box culvert below Main Street to improve flow of Gorge Creek beneath the roadway; and
- Improved stormsewer system from the intersection of Danforth and Wells avenues to an outfall west of Dexter Avenue.

Details of the improved stormsewer system have changed since the Landmark Archaeology report was prepared. According to Delaware Engineering, as currently planned, the system will originate at the intersection of Danforth Avenue, Railroad Avenue, and Wells Avenue and run southwest along Railroad Avenue and Grove Street to Main Street (NYS 145), where it will turn northwest for a short distance before turning southwest again at Baker Avenue. Approximately 340 feet south of Main Street, the line will turn west from Baker Avenue, cross empty lots and Dexter Avenue to terminate at the outfall in the bank of Schoharie Creek. This alignment is depicted in the attached plan of the proposed stormwater collection system, in a map of the Main Street-Railroad Avenue Historic District from NY-CRIS, and in a revised version of Figure 2 from Landmark Archaeology report. The revision to Figure 2 of the Landmark Archaeology report eliminates the L-shaped leg of the project running about 100 feet along Main Street and turning southwest into Dexter Avenue. Similar revisions could also be made to Figures 4 and 5 of the Landmark Archaeology report. The 5% Submittal plans for the stormsewer system included in Appendix A of the report are obsolete and should be ignored.

The proposed system of stormsewers will be constructed within the existing roadways at depths typically of no less than 2 feet using HDPE pipe. Sewers will range from 15 inches to 48 inches in diameter and will be installed in the streets, typically near the curb line except between Baker Avenue and Schoharie Creek. As shown in the attached figures, the stormsewer line between Baker Avenue and Dexter Avenue will cross a gravel parking lot and a small isolated grass area. From Dexter Avenue to Schoharie Creek, it will follow the current alignment of a 12 inch stormwater outlet to Schoharie Creek. Curbside catch basins will permit stormwater to drain into the sewers, with lateral pipes connecting any basins located on the sides of the streets opposite those above the sewer lines. Based on the revised storm sewer system, it is estimated that the main sewer lines will have a combined length of 1,800 feet, and there will be approximately 12 lateral branches connecting catch basins across streets from the main lines, with a combined length of approximately 250 feet. The entire system will be below grade, except for the at-grade curbside inlets to the catch basins and the stormwater outlet in the bank of Schoharie Creek. This outlet will be situated west of Dexter Avenue, approximately 400 feet south of Main Street.

According to the draft National Register of Historic Places nomination / OPRHP inventory form available from NY-CRIS, the Middleburgh Main Street-Railroad Avenue Historic District, through which portions of the sewer project pass, is “historically and architecturally significant as a substantially intact example of a village business district as it evolved from the early nineteenth to the early twentieth century.” The district illustrates “the design, materials, and decorative elements of the region’s vernacular architecture during the period of significance.” The district contains 44 contributing buildings. Street and sidewalk surfaces are not identified as contributing elements of the district. Recent photographs of streetscapes in the district (attached) show that the streets within which the storm sewer system will be installed are paved in non-historical bituminous asphalt concrete. The stormwater sewer system will be constructed in previously disturbed areas except for where the line crosses from Baker Avenue to Dexter Avenue where it will cross a gravel parking lot and an isolated grass area. From Dexter Avenue to the Schoharie Creek it will be located at the current location of the 12 inch stormwater outlet to Schoharie Creek.

It is concluded that the stormwater sewer system will not result in effects to above-ground historic properties. The system will be situated at and below grade. Construction of the system will affect only non-contributing elements of the streetscapes in the historic district, and following construction, streets will be restored to the existing grade using surfacing materials similar to those currently in place.

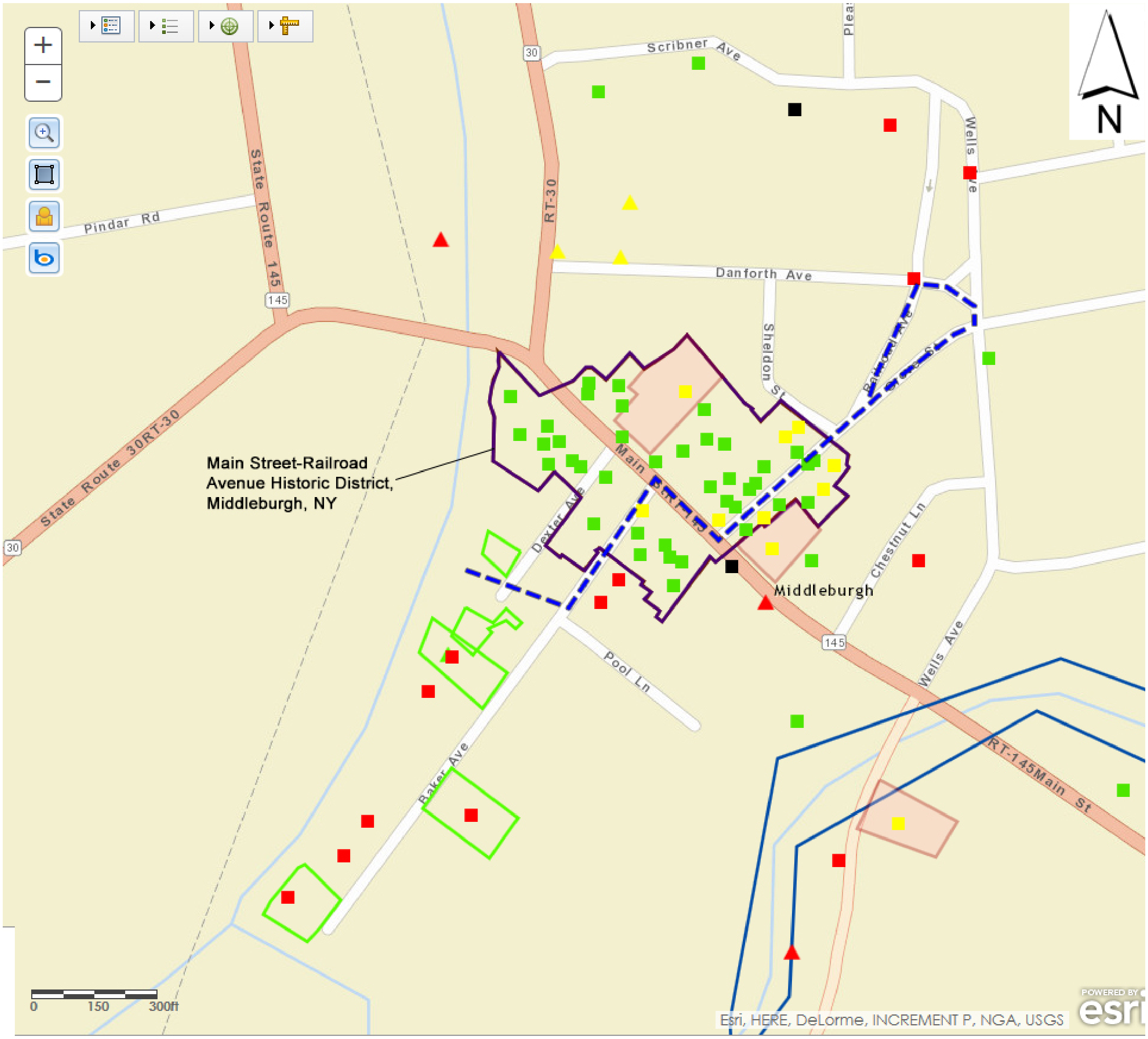
If you have any questions or require additional information, please feel free to contact me at (646) 417-4660 or via email at Thomas.King@stormrecovery.ny.gov. Thank you for your time and consideration.

Sincerely,

Thomas J. King
Assistant General Counsel and Certifying Officer
Governor's Office of Storm Recovery

Enclosures:
Revised Stormwater Collection System plan (oversize)
Stormwater Sewer Lines Plotted on NY-CRIS Mapping
Revised Figure 2 from Landmark Archaeology (2016) report
Views of Street Surfaces in Middleburgh Historic District (3 photos)


STORMWATER COLLECTION SYSTEM
N
S
E
W
DANFORTH AVE
RAILROAD A
ELLS AVE
SHELDON AVE
GROVE ST
RAILROAD AVE
DEXTER AVE
BAKER AVE
CHESTNUT ST
50 25 0 50 Feet
Village of Middleburgh
Schoharie County, New York
Legend
Proposed Stormwater Collection System
Prepared by: Delware Engineerin DPC, October 2015
Source: NYS Digital Ortho Imagery, Spring 2014
USGS Schoharie 2014 Lidar
Schoharie County RPS Digital Tax Parcels, 2011
Aerial TopographicSurvey, 2004



Base map: NY-CRIS, accessed 6/13/2016

USN Building Points (View)

- Eligible
- Listed
- Not Eligible
- Undetermined

USN Archaeology Points (View)

- Historic
- Prehistoric
- Both Prehistoric and Historic
- Historic with Human Remains
- Prehistoric with Human Remains
- Both with Human Remains
- Unknown Site Type
- Form Missing

National Register Archaeology Sites (View)

National Register Building Sites (View)

USN Building Districts (View)

USN Archaeology Districts (View)

Survey Building Areas (View)

Survey Archaeology Areas (View)

Consultation Projects (View)

Stormsewers

15PR06219
Gorge Ck. Culvert Improvement Project:
Planned Stormsewer System, June 2016

Village and Town of Middleburgh,
Schoharie County, NY

Tetra Tech (clb), 6/15/2016

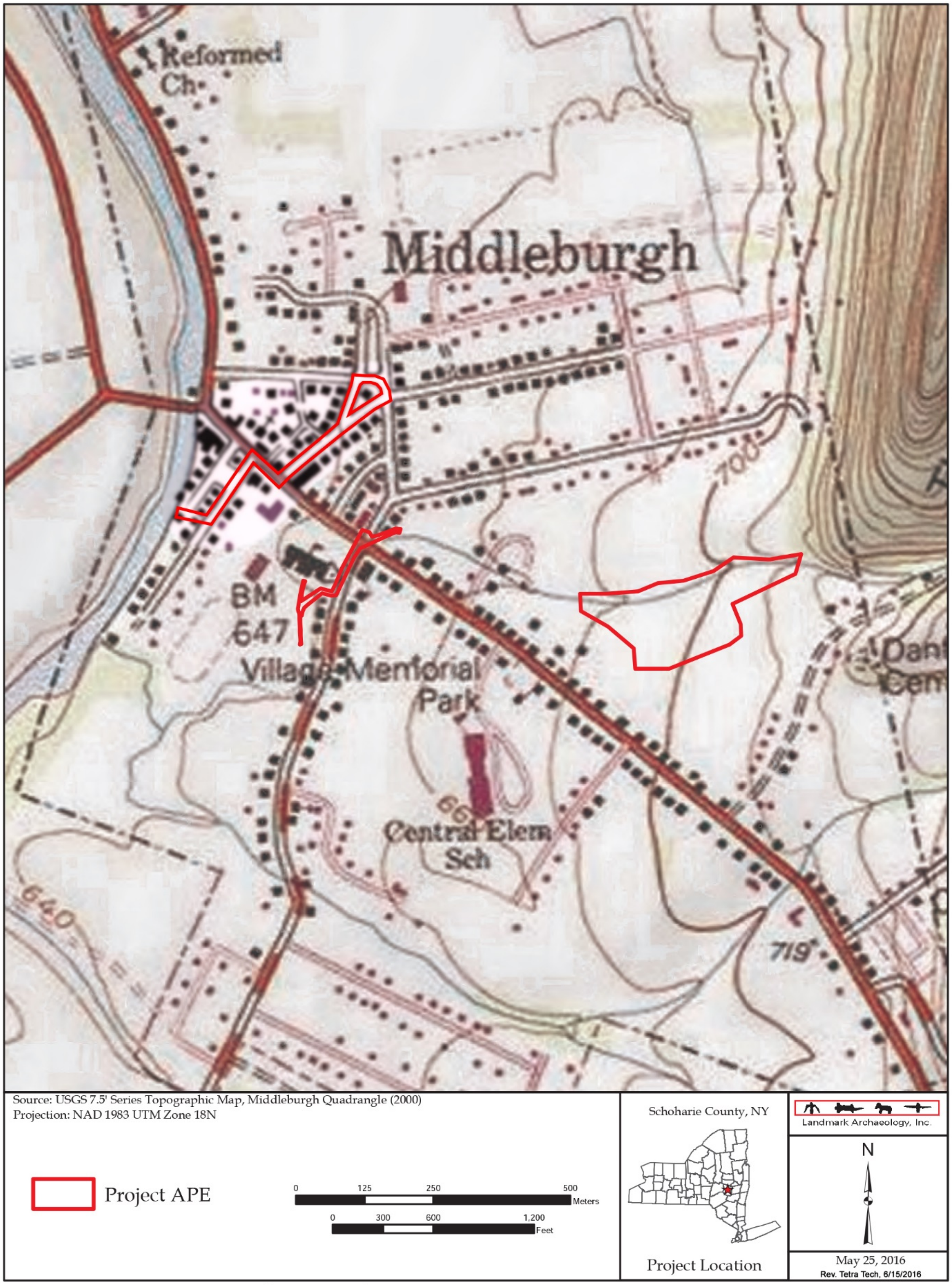


Figure 2: Project Location and Topographic Features

Photo 1: Surface of Main Street (NYS 145) from in front of the NRHP-listed US Post Office looking northwest toward Main Street-Railroad Avenue Historic District. Railroad Avenue intersects Main Street at right. Google Earth streetview image, September 2015.

Photo 2: Surface of Main Street (NYS 145) from vicinity of 333 Main Street looking southeast toward Main Street-Railroad Avenue Historic District. Dexter Avenue intersects Main Street at right, just beyond building with Greek Revival façade. Google Earth streetview image, September 2015.

Photo 3: Surface of Railroad Avenue from vicinity of its intersection with Railroad Court looking southwest toward Main Street-Railroad Avenue Historic District. Sheldon Street intersects Railroad Avenue at right. Google Earth streetview image, September 2015.

June 02, 2016

Ms. Alicia Shultz
HCR
38 State Street
Albany, NY 12207

Re: GOSR
Gorge Creek Culvert Improvements
Middleburgh, Schoharie County, NY
15PR06219

Dear Ms. Shultz:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project.

I have reviewed the report entitled, "Phase I Archaeological Investigations of the George Creek Culvert Repair and Storm Water Improvements, Village of Middleburgh, Town of Middleburgh, Schoharie County, New York" (May 2016). Two archaeological sites were identified as result of the archaeological survey: the Pre-Contact Native American George Creek 1 site (09542.000116) and the Historic Period George Creek 2 site (09542.000117). I concur with the report recommendation that the George Creek 2 site does not meeting eligibility criteria of the National Register of Historic Places (NRHP) and no additional archaeological work is necessary. I also concur with the report recommendation that there is insufficient information to determine the potential eligibility of the Gorge Creek 1 site for listing in the NRHP. Impacts to the George Creek 1 site (09542.000116) should be avoided. If impacts to the George Creek 1 site cannot be avoided, then a Phase II site evaluation should be conducted to assess the potential eligibility of the site for listing in the NRHP.

If further correspondence is required regarding this project, please refer to the SHPO Project Review (PR) number noted above. If you have any questions I can be reached at 518-268-2186.

Sincerely,

Tim Lloyd, Ph.D., RPA
Scientist - Archaeology
timothy.lloyd@parks.ny.gov

via e-mail only

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

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

ARCHAEOLOGY COMMENTS

Phase I Archaeological Survey Recommendation
(15PR06219 – George Creek Culvert Improvements)

Your project is located in an archaeologically sensitive area. Therefore, the Office of Parks, Recreation and Historic Preservation (OPRHP) recommends that a Phase I archaeological survey is warranted for all portions of the project that will involve ground disturbance, unless substantial prior ground disturbance can be documented. If you consider the entire project area to be disturbed, documentation of the disturbance will need to be reviewed by OPRHP. Examples of disturbance include mining activities and multiple episodes of building construction and demolition.

Documentation of ground disturbance should include a description of the disturbance with confirming evidence. Confirmation can include current photographs and/or older photographs of the project area which illustrate the disturbance (approximately keyed to a project area map), past maps or site plans that accurately record previous disturbances, or current soil borings that verify past disruptions to the land. Agricultural activity is not considered to be substantial ground disturbance.

Please note that in areas with alluvial soils or fill archaeological deposits may exist below the depth of superficial disturbances such as pavement or even deeper disturbances, depending on the thickness of the alluvium or fill. Evaluation of the possible impact of prior disturbance on archaeological sites must consider the depth of potentially culture-bearing deposits and the depth of planned disturbance by the proposed project.

A Phase I survey is designed to determine the presence or absence of archaeological sites or other cultural resources in the project's area of potential effect. The OPRHP can provide standards for conducting cultural resource investigations upon request. Cultural resource surveys and survey reports that meet these standards will be accepted and approved by the OPRHP.

Our office does not conduct archaeological surveys. A 36 CFR 61 qualified archaeologist should be retained to conduct the Phase I survey. Many archaeological consulting firms advertise their availability in the yellow pages. The services of qualified archaeologists can also be obtained by contacting local, regional, or statewide professional archaeological organizations. Phase I surveys can be expected to vary in cost per mile of right-of-way or by the number of acres impacted. We encourage you to contact a number of consulting firms and compare examples of each firm's work to obtain the best product.

Please also be aware that a Section 233 permit from the New York State Education Department (SED) may be necessary before archaeological fieldwork is conducted on State-owned land. If any portion of the project includes the lands of New York State you should contact the SED before initiating survey activities. The SED contact is Christina B. Rieth and she can be reached at (518) 402-5975. Section 233 permits are not required for projects on private land.

If you have any questions concerning archaeology, please contact Tim Lloyd at 518-268-2186 or Timothy.Lloyd@parks.ny.gov

October 26, 2015

John Bonafide
Director, Technical Preservation Bureau
Division for Historic Preservation
NYS Office of Parks, Recreation & Historic Preservation
P.O. Box 189 – Peebles Island State Park
Waterford, NY 12188-0189

Re: Section 106 Compliance for CDBG-DR Funding Application for Improvements to the Gorge Creek Culvert for the Village of Middleburgh, Town of Middleburgh, Schoharie County

Dear Mr. Bonafide:

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) is acting under the auspices 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"). GOSR is 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 request for consultation.

GOSR processes environmental reviews for projects funded with HUD CDBG-DR on a case-by-case basis. A consultation request for the project described herein will also be sent to the Delaware Nation, the Delaware Tribe of Indians, Mohawk Nation, Saint Regis Mohawk Tribe, and the Stockbridge-Munsee Community Band of Mohicans. 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.

Area of Potential Effect: GOSR proposes to fund the application to design and construct improvements to the Gorge Creek Culvert for the Village of Middleburgh, Town of Middleburgh, Schoharie County. The project would construct two culverts to accommodate potential storm water runoff from a 100 year storm. The culverts would also include panels at 150 foot intervals to allow for regular cleaning and flushing. Five new storm water systems would be installed at Main Street, River Street, Railroad Avenue, Shelton Street and Railroad Court, and Danforth Avenue. The project is anticipated to entail substantial earthwork. The enclosed **Site Location Aerial** shows the estimated Area of Potential Effect (the hatched area on the aerial photograph).

Proposed Project Description: To address the impacts of Hurricane Irene and Tropical Storm Lee, this project is designed to reduce the risk of localized flooding and increase access to emergency shelter when future storm events occur. These two storms caused significant flooding at the Middleburgh High School, due to the lack of drainage for Gorge Creek. Its channel runs under the school, where conveyances were overwhelmed by the volume of storm water and debris. Without mitigation, this channel will continue to flood in major storm events, potentially stranding the approximate 259 students that attend Middleburgh High School.

This project will be a part of a regional and municipal strategy of flood drainage improvements in the Village of Middleburgh. The first phase of the project includes the completion of a hydrology and hydraulics (H and H) and detailed drainage study. The project is not expected to result in a change in land use. Land acquisition is not anticipated; however, following the H and H stud, property easements may be needed for the construction of this project. The Village of Middleburgh will maintain the stormwater improvement portion of the project that is not located in the New York State Highway Right-of-Way. The New York State Department of Transportation (NYSDOT) will maintain the portion of the improvements in the New York State Highway right-of-way, as well as the Gorge Creek culvert repair portion of this project. The project would occur within currently developed or disturbed areas.

The purpose of this letter is to initiate consultation pursuant to Section 106 of the National Historic Preservation Act (NHPA) per the implementing regulations at 36 Code of Federal Regulations (CFR) Part 800. GOSR respectfully requests your review of the proposed project described herein. If the Area of Potential Effect encompasses historic properties of religious or cultural significance, please respond within 15 days or sooner. Please respond by email or in writing to the address listed below.

Mr. Thomas King, Certifying Officer
Governor's Office of Storm Recovery
99 Washington Avenue Suite 1224
Albany, New York 12260

If you have any questions or require additional information regarding this request, please feel free to contact me at (646) 417-4660 or via email at Thomas.King@stormrecovery.ny.gov. Thank you for your time and consideration.

Sincerely,

Thomas J. King

Thomas J. King
Certifying Officer

Enclosures:

Site Location Aerial

Site Location Aerial

APPENDIX F
TRIBAL CORRESPONDENCE

September 5, 2017

Ron LaFrance, Jr; Paul Thompson; and Beverly Cook, Chiefs
St. Regis Mohawk Tribe
412 State Route 37
Akwesasne, NY 13655

Re: Phase III Data Recovery Report for the Gorge Creek Culvert Repair and Storm Water Improvements, Village of Middleburgh, Schoharie County, New York

Dear Chiefs of the St. Regis Mohawk Tribe:

Please find enclosed the Phase III Data Recovery Report for the Gorge Creek Culvert Repair and Storm Water Improvements Project. The report has been submitted to SHPO and no comments have been received to date. Please review the attached report and respond within 30 days or sooner with any comments, questions, or concerns about the Report. 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.

Sincerely,

Lori A Shirley

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

Enclosure:
Phase III Data Recovery Report for Gorge Creek Site 1

Electronic letter sent to:
Arnold Printup
Saint Regis Mohawk Tribe, THPO
412 State Route 37
Akwesasne, NY 13655

Phase III Data Recovery
Gorge Creek Site 1 (09542.000116)

Village of Middleburgh, Schoharie County, New York

THIS REPORT CONTAINS CONFIDENTIAL INFORMATION
NOT FOR PUBLIC DISTRIBUTION

Prepared for:

Governor's Office of Storm Recovery
99 Washington Avenue, Suite 1224
Albany, New York 12260

Prepared by:

Louis Berger
20 Corporate Woods Blvd.
Albany, New York 12211

Final Report
September 5, 2017

Management Summary

Involved Agencies	Village of Middleburgh Schoharie County New York State Governor's Office of Storm Recovery (GOSR) New York State Homes and Community Renewal (HCR) New York State Office of Parks, Recreation and Historic Preservation (OPRHP)
Phase of Survey	Phase III Data Recovery
Location Information	Gorge Creek Site 1 (09542.000116), in agricultural field off Gorge Creek Road and along Gorge Creek
Village	Middleburgh
County	Schoharie
Site Size	2.47 hectares (6.1 acres)
USGS 7.5-Minute Quadrangle Map	*Middleburgh, NY*, 7.5-Minute Series Topographic Quadrangle, 2000
Data Recovery Overview	
Methods Used	Manual block excavation: 36 square meters (388 square feet) in 4 blocks, 9 square meters [97 square feet] each) Mechanical stripping (12 areas of various sizes totaling 3,691 square meters [39,730 square feet])
Artifacts Recovered/ Features Identified	3,076 lithic artifacts
Results of Data Recovery	
No./Name(s) of Prehistoric Sites Identified	Gorge Creek Site 1 (09542.000116)
No./Name(s) of Historic Sites Identified	None
Recommendations	Site deemed eligible for listing in the National Register of Historic Places. Impacts mitigated by data recovery excavations; no further work recommended.
Report Author	Stuart J. Fiedel, Ph.D., RPA, Christopher Morine, RPA, Delland Gould
Date of Report	September 5, 2017

Abstract

Louis Berger U.S., Inc. (Louis Berger) conducted Phase III archaeological data recovery excavations of the Gorge Creek Site 1 (09542.000116) April 26–June 15, 2017. This prehistoric site had been deemed eligible for the National Register of Historic Places as a result of Phase I and II investigations by Landmark Archaeology, Inc. in 2016. The site is located in the Area of Potential Effect (APE), or project area, for the proposed Gorge Creek Culvert Repair and Storm Water Improvements (OPRHP No. 15PR06219) in the Village of Middleburgh, Schoharie County, New York. Louis Berger performed the date recovery work on behalf of the Housing Trust Fund Corporation.

Louis Berger manually excavated 36 square meters (388 square feet) arrayed in four blocks of nine units each. The placement of these excavation blocks was determined primarily by the quantities of artifacts reported from the Phase I and Phase II shovel tests and units. Block 1 was located between Phase II Units 2 and 4. Block 2 was placed south of Phase II Unit 11. Block 3 was located just north of Shovel Test 28-2, and Block 4 was placed west of Shovel Test 20-5.

After block excavation, the plowzone was mechanically stripped from 12 areas for a total exposure of 3,691 square meters (39,730 square feet). The exposed subsoil was generally very rocky. Several patches of red-stained, oxidized soil were evident, generally with associated charcoal. These patches were amorphous and did not appear to be of cultural origin. Nevertheless, three patches, designated as Features 3, 4, and 5, were sectioned to reveal their profiles. None proved to be prehistoric cultural features.

The block excavations produced 3,076 lithic artifacts. In addition, a small number of chert chunks (n=44) were collected that, upon closer laboratory inspection, proved not to be artifacts. Only a very small percentage of the artifacts (n= 37; just over 1 percent) are whole or fragmentary formed tools, preforms, or utilized flakes. Almost all of this material came from the plowzone. By far the greatest percentage of the lithic material is dark gray Onondaga chert with brownish overtones. A minority is a lighter gray with a bluish tendency. The only temporally diagnostic artifact recovered is the basal portion of a Brewerton Corner-notched point found at the base of the plowzone in the northeast part of Block 3. This type indicates an occupation of the site ca. 6000 to 5000 cal BP.

Lithic debitage, including all types of flakes created in the lithic reduction sequence, was counted and measured. Raw material type, lithic reduction stage (blocky shatter, decortication, early stage, biface reduction, thinning) and presence/absence of cortex were also recorded. Whole and broken flakes (lacking the original striking platform or termination) were distinguished. Contrary to results of previous investigations, utilized flakes constitute only a small fraction of the assemblage.

A spatial analysis sought to determine horizontal variation in the distribution of lithic tool types and debitage, focusing on any perceptible differences between the northeast area of the site (Blocks 2 and 4), putatively dominated by Orient phase materials based on a surface collection, and the central area (Blocks 1 and 3), where the Brewerton point was found. The data for each block were also compared to data from other assemblages from the Schoharie Creek drainage, the mid-Hudson, and western New York. The results appear to indicate subtle differences in lithic reduction activities in the northeast area from those in the central area. Informative variables for this purpose proved to be the percentages of biface thinning flakes and flake fragments and the platform widths of biface reduction flakes. Gorge Creek appears distinctive from other Schoharie Creek sites for its very high proportion of biface thinning flakes (56 percent). Narrower platform widths distinguish flakes in Blocks 2 and 4 from those in Blocks 1 and 3. However, no distinctive attributes allow identification of the artifacts from the northeast sector as Orient-associated.

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I. Introduction

Louis Berger U.S., Inc. (Louis Berger) has completed Phase III archaeological data recovery excavations of the Gorge Creek Site 1 (09542.000116). This prehistoric site was deemed eligible for the National Register of Historic Places as a result of Phase I and II investigations by Landmark Archaeology, Inc. (Gade et al. 2016; Gade and Schreyer 2016). The site is located in the Area of Potential Effect (APE), or project area, for the proposed Gorge Creek Culvert Repair and Storm Water Improvements (OPRHP No. 15PR06219) in the Village of Middleburgh, Schoharie County, New York (Figure 1).

Louis Berger performed the work on behalf of the Housing Trust Fund Corporation. The Governor's Office of Storm Recovery (GOSR), operating under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation (HTFC), is the Responsible Entity for direct administration of U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant-Disaster Recovery (CDBG-DR) funds. The Schoharie County Soil and Water Conservation District (SWCD) is requesting funding under the New York Rising Community Reconstruction Program for Phase I and Phase II of the Gorge Creek Culvert Repair and Storm Water Improvements project. This storm water management improvement project involves culvert installation, expansion of the floodplain and sedimentation basin construction, and improvements to the storm water system under selected streets in the village. Development of the floodplain expansion and sedimentation basin portion of the project will affect the Gorge Creek Site 1.

This data recovery was conducted in accordance with guidelines established by the New York Office of Parks, Recreation and Historic Preservation (OPRHP) and the *Standards for Cultural Resource Investigations and Curation of Archaeological Collections in New York State* and the *Cultural Resource Standards Handbook*: *Guidance for Understanding and Applying the New York State Standards for Cultural Resource Investigations* published by the New York Archaeological Council (1994, 2000). This report conforms to all professional standards and requirements. The cultural resource specialists who performed this work meet or exceed the qualifications specified in 36 CFR 66.3(6)(2).

This report has been organized into eight chapters. The following chapter presents the project background, consisting of the project area description and environmental and cultural contexts for the project vicinity as well as regional comparative site research completed as part of the mitigation effort. Chapter III outlines the research design. Chapter IV describes the field methods and techniques applied to the Phase III data recovery excavations. Chapter V provides the Phase III archaeological testing results for Gorge Creek Site 1 (09542.000116), and Chapter VI contains the artifacts analysis and discussion. Chapter VII provides the summary and conclusions. Chapter VIII lists the references cited. Appendix A contains the methods for artifact cataloging and analysis, Appendix B contains the artifact inventory, and the data recovery plan is presented in Appendix C.

Louis Berger Archaeologist Lauren Hayden, RPA, ENV SP served as project manager. Stuart Fiedel, Ph.D. served as Principal Investigator. Louis Berger Principal Field Director Dell Gould and Archaeologist Christopher Morine served as field supervisors. The field crew consisted of Archaeological Technicians Amanda Burt, Brittany Faulkner, and Eric Ferraro. Stanley Jasinski of Blue Diamond Septic provided excavation services. Dr. Fiedel, Mr. Gould, and Mr. Morine wrote the report. Principal Editor Anne Moiseev edited and produced the report. The graphics were prepared by Principal Draftsperson/GIS Analyst Jacqueline L. Horsford.

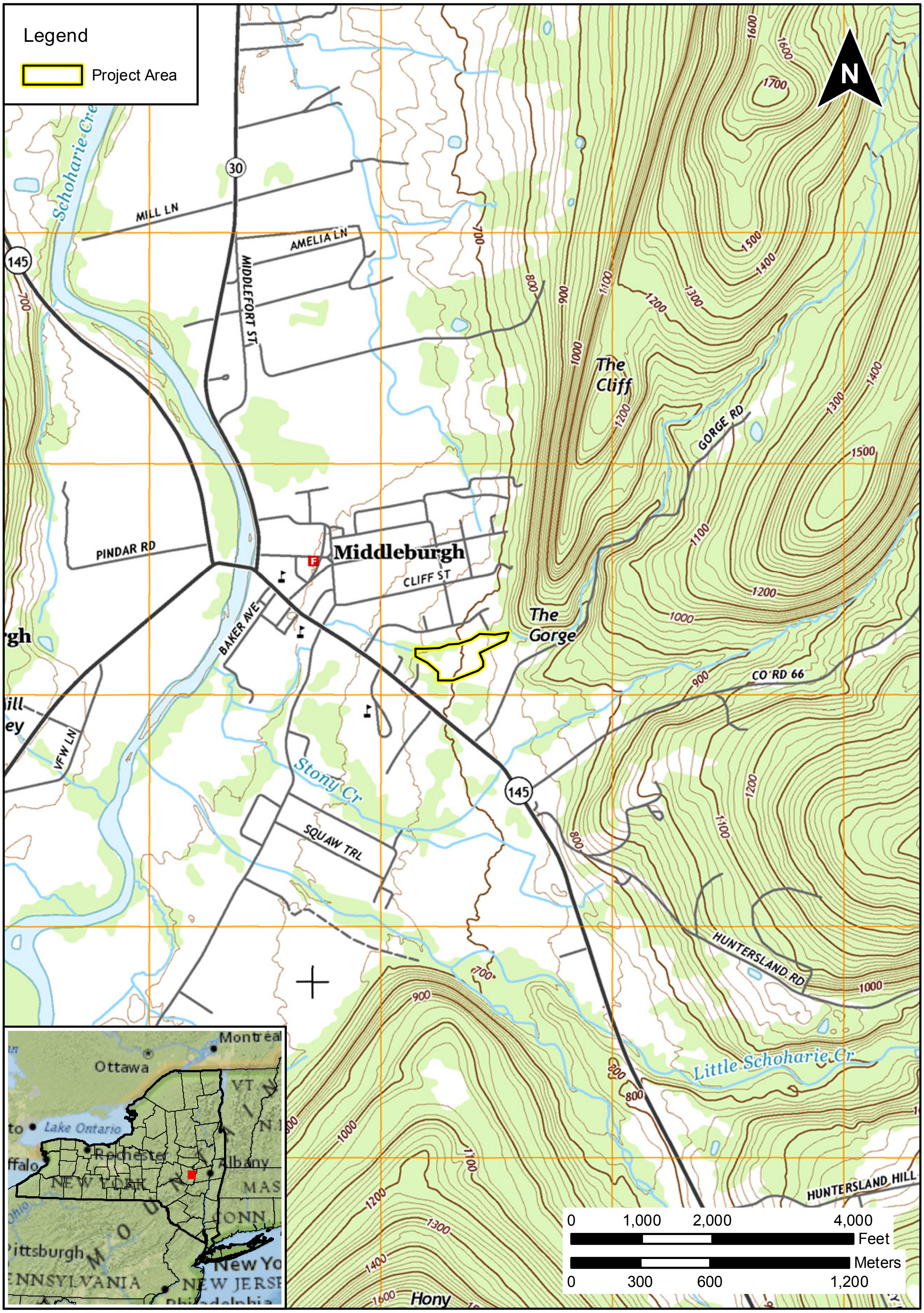

FIGURE 1: Location of Project Area (APE) (USGS Middleburgh 2016)

II. Project Background

A. Project Area Description

Southern Schoharie County is located in the glaciated portion of the Allegheny Plateaus physiographic province (Isachsen et al. 2000). The north part of the county lies within the Hudson-Mohawk Lowlands Section (a north extension of the Ridge and Valley Province). The Allegheny Plateaus province is a broad belt of flat-lying and relatively unfolded layers of sedimentary rock—sandstones, shales, limestones, and conglomerates. The bedrock of this region consists mainly of uplifted marine rocks of Devonian age (circa 365 to 405 million years ago). The modern topography encompasses flat-topped hills (indicative of erosion-resistant bedrock) and deeply dissected, broad to narrow valleys (formed in areas of eroded bedrock). The maturely dissected plateau was reshaped by Pleistocene ice sheets. The edges of the plateau, particularly in the east, form escarpments or dissected mountain fronts. The topography thus appears mountainous, for example, in the Catskill Mountains and the Poconos.

Gorge Creek is a small stream that flows west toward Schoharie Creek, which flows north to join the Mohawk River. The headwaters of Schoharie Creek rise in the Catskills, and the upper and middle reaches flow through the mountains. The largely arbitrary division between the upper and middle valley is at North Blenheim (east of Stamford). The middle valley was once occupied by the waters of post-glacial Lake Schoharie. Downstream from the lacustrine floodplain is the kilometer-long Schoharie Gorge, which leads into the lower valley that forms a corridor through the Mohawk Lowlands. Relatively few tributary streams drain these hills and rolling plains.

The Gorge Creek Site 1 (09542.000116) lies on a high Late Pleistocene glacial terrace, at the base of a prominent upland mountain nose/slope overlooking Middleburgh, in the central area of the county (see Figure 1). Gorge Creek, the site's north boundary, has incised into 2 to 3 meters of glacial till sediment. The terrace has undulating microtopography that may reflect the former presence of an ancient braided stream channel. Phase I testing revealed shallow (less than 0.5 meter [1.6 feet]) alluvium deposited by Gorge Creek on the surface in several areas of the site, and also pockets of deeper (1 meter [3.3 feet]) alluvium in swales (Gade et al. 2016:3). The only soil mapped within the site is Tuckhannock gravelly loam, fans (0 to 5 percent slope) (Flora et al. 1969). This is a well to somewhat excessively drained gravelly loam that formed in glacial outwash deposits. Currently the site is in a grass-covered, formerly cultivated field.

B. Environmental Context

The Pleistocene glaciers not only swept away the watershed's previous soils, they also spread a mantle of rock that has been subjected to erosion throughout the Holocene, either during or after soil formation. The glacial deposits are mostly unconsolidated till, heterogeneous in particle size, with inclusions of cobbles and boulders. This material is subject to gullying and mass movements, which have created some unstable cliffs along streams. Scattered glacial outwash beds, kames, and deltas supply gravels and sands to the streams; the lacustrine deposits left behind by Lake Schoharie in the middle valley are mainly silts and clays.

Schoharie Creek flows through a deeply entrenched valley cut into gently dipping Devonian bedrock. The village of Middleburgh is situated mostly on a large alluvial/fluvial fan complex at the confluence of Little Schoharie Creek and Schoharie Creek. Van Nest (2004) ran a transect of cores across the floodplain west of Middleburgh. She obtained two radiocarbon dates from the lowest strata that suggest that the Holocene alluvial deposits there are no older than ca. 2700 rcbp[1]. She suggests that the oldest floodplain sediments north of Middleburgh are also relatively young, dating to the late Holocene.

[1] "rcbp" or "rcybp" refers to uncalibrated radiocarbon years before present ("present" by accepted convention is AD 1950); "cal BP" refers to calibrated or calendrical years before 1950 (generally earlier than radiocarbon ages, by as much as 2000 years at 11,000 BP [=13,000 cal BP]); "cal AD" and "cal BC" denote calibrated calendar ages according to standard western usage.

During the Pleistocene this region was repeatedly covered by ice sheets, which left behind glacial tills and outwash as they receded. The Harbor Hill Moraine on Long Island represents the terminal moraine of the most recent glacial advance of the Wisconsin stage; the ice reached this final advanced position about 28,000 cal BP and started to retreat from it about 24,000 cal BP (Ridge 2003). Terminal moraine deposits also occur across northern Staten Island and extend westward across New Jersey into Pennsylvania. Most of the local soil types formed in the glacial till or outwash.

As the ice retreated, it left in its wake meltwater lakes in low-lying areas. One of these lakes ultimately filled, becoming the 55-square-mile "Black Dirt" bog, now drained farmland in the southwest part of Orange County, New York. It is noteworthy that at least 41 mastodont fossils have been discovered in the muck deposits of the Black Dirt and other swampy areas in Orange County (Dumont and Ehlers 1973). This area is about 90 miles south of the project vicinity.

When the retreating ice front halted temporarily between 18,200 and 17,400 cal BP (Ridge 2003), glacial meltwater began to flood the Schoharie Valley. In the middle reaches of the valley, a glacial lake formed, with a shoreline at an elevation of 213 meters (700 feet) above sea level (Dineen 1986). The ice pushed south again at 17,400 cal BP, stopping when it reached the Catskills. As the glacier again retreated, the new glacial Lake Schoharie rose to a shoreline elevation of 354 to 366 meters (1,160 to 1,200 feet) above sea level. When the Delmar ice margin stabilized around 16,200 cal BP (Ridge 2004), water from glacial Lake Schoharie drained to the northeast, through the Delanson spillway (LaFleur 1969). This spillway fed the Delanson River, which emptied into glacial Lake Albany (LaFleur 1976). The Stage 3 shoreline of glacial Lake Schoharie was established at 256 to 213 meters (840 to 700 feet) above sea level (Dineen and Hanson 1985; LaFleur 1969).

For some time during the glacial retreat, glacial Lake Iroquois—much larger than modern Lake Ontario—was connected to glacial Lake Albany, in the Hudson Valley, through the Mohawk Valley (Ridge 1997). This channel may have been occupied by a torrential river for a few centuries after 13,800 cal BP. Around 13,300 cal BP, glacial Lake Iroquois drained catastrophically through Lake Albany, and then through the Narrows, into the North Atlantic. The floodwaters flowing out of Lake Iroquois at that time seem to have been channeled, not through the Mohawk Valley, but rather north of the Adirondacks, where the water breached the Covey Hill Ice Dam into glacial Lake Vermont. This meltwater input may have caused a disruption of thermohaline circulation in the ocean, which triggered a cold episode known in Europe as the Intra-Allerod Cold Period (Donnelly et al. 2005). It is unclear from the geological literature whether Lake Schoharie had already drained or was involved somehow in this massive discharge event.

Deglacial warming accelerated at the onset of the Bølling-Allerød interstadial, 14,700 cal BP. Vegetation responded to the warming trend. Initially, treeless tundra prevailed in the wake of the ice sheets; in response to Bølling-Allerød warming, spruce trees colonized this region, accompanied by pine and fir in some areas, such as the lower Wallkill Valley (Connally and Sirkin 1970). Oak was also present, in small numbers, by 14,700 cal BP. At Tannersville Bog, near Stroudsburg in eastern Pennsylvania, the pollen sequence records successive colonization between 16,000 and 10,000 cal BP by spruce, fir, pine (*Pinus banksiana*), paper birch, tamarack, white pine (*Pinus strobus*), gray birch, and pitch pine (*Pinus rigida*) (Watts 1979).

Pollen cores from Lake Mohonk and Lake Minnewaska in the Shawangunk Mountains (Menking et al. 2012) indicate a cool and humid climate from ca. 14,000 to 12,900 cal BP. The mixed thermophilous deciduous-boreal forest included birch, spruce, and oak (which accounted for 15 to 20 percent of the pollen).

Post-glacial warming was abruptly interrupted at 12,850 cal BP by the Younger Dryas cold episode, which lasted 1,200 years. Pollen sequences from northern New Jersey show the effect of the nearly glacial Younger Dryas climate on the regional flora, which responded very rapidly (Peteet et al. 1990; Yu 2007). Spruce increased to a maximum during this period. Tree macrofossils dating from about 12,600 to 11,600 cal BP, the middle to the end of the Younger Dryas, were found recently in an organic deposit in Cohoes, on the southwest side of the Mohawk River, near its junction with the Hudson. The wood fragments and plant remains were associated with pollen. They indicate a local forest of white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), and tamarack (*Larix laricina*). The presence of white rather than black or red spruce was probably a result of the local riverbank environment. Beaver tooth marks were found on some of the wood fragments (Miller and Griggs 2012). In the Shawangunk Mountains the climate during the Younger Dryas is reconstructed as cold and wet based on the abundance of alder and birch pollen in the lake sediment cores (Menking et al. 2012). Hemlock (*Tsuga canadensis*) arrived here ca. 12,700 cal BP.

Within only a few decades, at 11,650 cal BP, temperatures soared in the Northern Hemisphere (about 4 degrees C in the northeastern U.S.), marking the onset of the present Holocene interglacial. The climate of the Holocene has not been as dramatically variable as that of the late Pleistocene, but oscillations have been substantial enough to affect biota and the human cultures that depended upon them. Vegetation changes through the Holocene, as represented by shifting pollen frequencies, were first recognized by Deevey (1939) in New England. Using radiocarbon dates, Wendland and Bryson (1974) discerned a succession of Holocene climate episodes: Pre-Boreal (10,800 to 9200 rcbp), Boreal (9200 to 8000 rcbp), Atlantic (8000 to 4200 rcbp), Sub-Boreal (4200 to 2500 rcbp), Sub-Atlantic (2500 to 1800 rcbp), Scandic (1800 to 1100 cal BP), Neo-Atlantic (1100 to 700 cal BP) and Pacific (700 cal BP to present).

More recently, analyses of North Atlantic sediments have demonstrated a roughly 1,500-year recurrence of ice-rafted debris (IRD) events, which are interpreted as markers of sudden cold episodes accompanied by major reorganizations of atmospheric circulation (Bond et al. 1997, 2001). A growing collection of data (from pollens, carbonates, midges, plant macrofossils) shows both pan-continental episodes (e.g., Hypsithermal warming) but also local variability and out-of-phase changes of climate. Some of the salient Holocene climate episodes for northeastern North America, after the 11,650 cal BP warming, include the following.

The sharpest of the Holocene cold oscillations occurred early on; these are the Pre-Boreal Oscillation at about 11,300 cal BP and the 8200 cal BP cold event. The latter has been attributed to the final massive draining of glacial Lake Agassiz into the North Atlantic, an event which would have disrupted thermohaline circulation. The flood event may also be related to accelerated wasting of the remnant Laurentide ice sheet between 9900 and 8400 cal BP (Shuman et al. 2002). The effects of the 8200 cal BP event may have lasted for about 400 years.

The Laurentian ice sheet shrank rapidly after 10,000 cal BP. A lowering of the ice mass may have caused significant environmental changes around 9000 cal BP. Between 9000 and 8000 cal BP, summer monsoon rains intensified in the southeastern U.S., causing a rise of lake levels and expansion of the range of moisture-tolerant southern pines. In the same period the mid-continent was arid; lake levels dropped and prairie expanded eastward. This was also a period of maximum aridity in the Northeast. After the collapse of the Hudson Bay ice dome about 8200 cal BP, a decreased albedo effect, along with increasing influence of the Bermuda subtropical high, resulted in more moisture in the Northeast; lake levels rose and pines were replaced by beech and hemlock.

There appears to have been a 200-year cooling event at 10,300 cal BP (9100 rcbp) (Björck et al. 2001). This event has been theoretically linked to reduced solar forcing, as inferred from a ^{10}Be flux peak (i.e., more intense cosmic radiation was affecting the atmosphere as insolation weakened).

Variations in solar output also seem to have been responsible for the “Bond events,” cooling episodes in the North Atlantic that occurred about every 1,500 years throughout the Holocene and probably also during the Pleistocene (Bond et al. 1997, 2001). The eight Holocene events are dated to about 11,100, 10,300, 9400, 8100, 5900, 4200, 2800 and 1400 cal BP. The modeled mechanism involves reduced solar irradiance, triggering changes in stratospheric ozone that cause cooling of the atmosphere in high north latitudes, a slight southward shift of the north subtropical jet stream, and decreased Northern Hadley circulation. These atmospheric changes would then lead to increased North Atlantic drift ice, cooling of the ocean surface and atmosphere above Greenland, and reduced precipitation in low latitudes (Bond et al. 2001).

Viau et al. (2002) examined radiocarbon dates obtained for more than 700 pollen diagrams from across North America. These dates tend to cluster at significant discontinuities in the climate record. The major transitions identified by Viau et al. within the past 14,000 calendar years occur at 13,800, 12,900, 10,190, 8100, 6700, 4030, 2800, 1600, and 600 cal BP. Their analysis did not attach a direction (cooling or warming) to the vegetation changes observed at each transition, but it is clear that those changes were pan-continental. Four of the vegetation events correspond rather closely to Bond events (10,190=10,300, 8100=8100, 4030=2200, 2850=2800 cal BP). More recently, Gajewski et al. (2007) have synthesized dates for North American and European pollen transitions, Bond events in the North Atlantic, and cold spikes in the Greenland ice cores, to identify trans-hemispheric “climate transitions” at 13,900, 12,800, 11,100, 10,300, 9000, 8100, 6800, 5900, 4200, 2800, 1600, 600, and 350 cal BP.

Pollen sequences from the beds of several lakes in the Catskills and Hudson Valley, relatively close to the Gorge Creek 1 Site, offer records of local Holocene vegetation changes and inferred regional climate shifts. These records come from Lake Mohonk and Lake Minnewaska in the Shawangunk Mountains (Menking et al. 2012); Balsam Lake in the west Catskill Mountains (Ibe 1982, 1985); Sutherland Pond in Orange County and Spruce Pond near Tuxedo Park in Rockland County (Maenza-Gmelch 1997); and Ballston Lake between Saratoga and Schenectady (Toney et al. 2003).

At the onset of the Holocene, the climate in the Shawangunk Mountains became warm and dry from 11,500 to 8700 cal BP. The forest was dominated by white pine while oak increased. At Balsam Lake fir and spruce had been dominant around 14,000 cal BP but were largely replaced by pine, which peaked ca. 10,200 cal BP. In the Shawangunk Mountains a wet interval from 8700 to 8000 cal BP is indicated by increased hemlock, beech, and birch pollen while oak declined. Maximum wetness there is dated to 8100 cal BP, possibly connected with the 8200 cal BP cold event. By 7800 cal BP the pines had been replaced by hemlock, birch, beech, and maple.

At Ballston Lake near Saratoga, about 135 kilometers north of the Shawangunk ridge, minimal loss-on-ignition values from about 10,000–7000 cal BP, with minor oscillations, also indicate aridity. At 11,000 cal BP, spruce declined abruptly; white pine and birch became the predominant trees for several centuries. Smaller quantities of pollen indicate the presence in the Early Holocene mixed forest of tamarack, hemlock, oak, elm, basswood, aspen, hornbeam, ash, walnut/butternut, hickory, maples (sugar, red, and mountain), willow, alder, and sedge. At 10,800 cal BP, pine declined as hemlock and oak became prevalent; hickory remained present at low percentages (Toney et al. 2003).

To the south, in Orange and Rockland counties (the Hudson Highlands), the oak-dominated forest was invaded by white pine (*Pinus strobus*) at the end of the Younger Dryas (ca. 11,700 cal BP). Hemlock arrived here at 11,000 cal BP, followed by beech at 9000 cal BP.

Farther east, the period from 10,100 to 7700 cal BP appears to have been very dry in southern New England. *Ambrosia* (ragweed) pollen indicates the existence of open savanna-like areas on ridgetops and knolls. These areas were probably created mainly by fire, although deer-browsing and anthropogenic ignition may have played a role in maintaining these open patches (Faison et al. 2006). It is interesting to note that, in the Hudson Highlands sequence, high percentages of oak pollen correlate with a continuous charcoal influx throughout the record, which suggests that fire was a factor in the expansion and maintenance of oaks in the forest. A temporary reduction in fire frequency around 11,000 cal BP seems to have encouraged expansion of hemlock (Maenza-Gmelch 1997).

The climate in this area was warm and dry from 7900 to 7300 cal BP. The landscape became unstable as soil erosion increased. There is an uptick in charcoal particles in the cores, indicating that drought led to frequent outbreaks of fire. In these conditions oak thrived while hemlock declined and beech was slightly less abundant than before.

A Middle Holocene wet interval in the Shawangunk Mountains, from 7100 to 5700 cal BP, saw a decline in oak, increased hemlock, and limited prevalence of pine; however, at Davis Pond in southwest Massachusetts, low water levels indicate a drought from 6600 to 6400 cal BP (Newby et al. 2011). There are also indications of aridity in central New York; the water level in White Lake dropped at ca. 6100 cal BP (Li et al. 2006) and Cayuga Lake fell to a lowstand at 6830 cal BP (Mullins et al. 2011). Hickory pollen increased slightly at 7000 cal BP in the Shawangunk Mountains cores, which suggests a warming trend. This corresponds to the first occurrence of hickory in the Hudson highlands records at 7100 cal BP.

Multiple changes in climate and environment coincided at ca. 5800 to 5400 cal BP, including Bond event 4, droughts in the Northeast and Middle Atlantic, and hemispheric climate changes. This is also the time of transition from the Middle to Late Holocene (Zhao et al. 2010). Hemlock populations collapsed abruptly throughout the Middle Atlantic and Northeast at ca. 5500 cal BP (4750±50 rcbp) (Bennett and Fuller 2002). The proximate cause was probably a pathogen or insect infestation (Bhiry and Filion 1996); but the trees may already have been weakened by drought. The collapse involved two successive events, around 5800 and 5200 cal BP; these correspond to two coeval lake-level drops in the Northeast, which indicate drought conditions (Haas and McAndrews 1999). The first drought event seems coeval with the 5900 to 5800 cal BP Bond event. Low water levels at Davis Pond indicate an extended drought from 5600 to 4900 cal BP (Newby et al. 2011). Winters seem to have become colder at the same time (Calcote 2003). Peteet et al. (2011) reported evidence of droughts in the lower and mid-Hudson Valley at 5745 and 5480 cal BP. These droughts and temperature changes in the Northeast could have weakened the trees so that they became susceptible to pathogen outbreaks (Foster et al. 2006; Haas and McAndrews 1999).

In the Shawangunk Mountains the onset of a Middle Holocene drought at 5700 cal BP appears to have caused the collapse of hemlock. During this drought pitch pine (*Pinus rigida*), a fire-adapted tree, colonized the ridge. This is the only period when it was present in this area. Oak pollen increased. The local collapse of hemlock occurred at ca. 5400 cal BP. Hemlock also collapsed at Ballston Lake at the same time (5300 cal BP) (Toney et al. 2003), but the hemlock decline is a little later at Balsam Lake (ca. 5100 cal BP) and seems anomalously late in the Hudson Highlands, ca. 4700 to 3800 cal BP (Maenza-Gmelch 1997). The very arid conditions in the Shawangunk Mountains continued until 4100 cal BP. The drought and the hemlock die-off may have facilitated an expansion of chestnut (*Castanea*), which became very abundant in this vicinity. Chestnut is drought-tolerant but shade-intolerant, and thrives in disturbed areas. When the hemlock collapsed, the forest canopy opened and allowed more sunlight to reach the floor; the reduced shade favored chestnut growth. Chestnut arrived a little later in the Hudson Highlands, ca. 3900 cal BP.

There is evidence of roughly contemporaneous aridity both in central New York and northern New Jersey. Cayuga Lake dropped to a lowstand at 4770 cal BP (Mullins et al. 2011) and White Lake dropped to a low level ca. 4400 cal BP (Li et al. 2006).

On the Shawangunk ridge, the climate seems to have been wetter between 4100 and 2300 cal BP. Hemlock recovered and beech flourished. At Balsam Lake a partial hemlock recovery is also evident in this period. Chestnut had appeared here by 2600 cal BP (Ibe 1982, 1985).

Pollen sampled from Ballston Lake shows a gradual increase of conifers, hardwoods, and boreal taxa starting at about 2680 cal BP (2520 rcbp). This is interpreted as marking a shift to a colder climate (Toney et al. 2003). At Davis Pond low water levels indicate droughts ca. 4100, 3500 to 3000, 3000 to 2800, 2700 to 2300, and 1600 cal BP. A drop of the water level of White Lake in northern New Jersey indicates aridity ca. 3000 cal BP (Li et al. 2006). Cayuga Lake fell at 3200 cal BP and reached its lowest level around 1950 cal BP, after which it rose until around 950 cal BP. An abrupt cold, dry episode may have started around 3000 cal BP and persisting to 2400 cal BP; Mullins et al. (2011) hypothesize that it may have been caused by reduced solar activity.

The last drought occurred on the Shawangunk ridge between 2300 and 1000 cal BP. This arid episode was less intense than the middle Holocene drought. In fact there are indications of a more humid climate starting ca. 1400 cal BP. The inferred aridity here appears out-of-phase with records from New England, where many lakes rose to maximal levels after 3000 cal BP. In central New York a lowstand of Cayuga Lake implies a drought around 1950 cal BP. At White Lake in northern New Jersey, a lowered water level indicates an arid episode about 1300 cal BP (Li et al. 2006).

A recent synthesis of environmental proxies across the Northeast finds a long-term cooling trend from 3000 cal BP to AD 1700. An abrupt transition from wet to dry conditions occurred around AD 550 to 750 (1400 to 1200 cal BP). It was warmer and drier than today during the Medieval Climate Anomaly (ca. AD 950 to 1250) (Marlon et al. 2016). Peteet et al. (2011) reported charcoal peaks and coincident pollen frequency changes in cores at Tivoli Bay and Piermont in the Hudson Valley. They interpret these as records of severe aridity from about AD 850 to 1350. Tree rings indicate another major precontact drought in the Catskills that lasted from AD 1555 to 1578 (Pederson et al. 2013), as well as other episodes in the sixteenth and seventeenth centuries.

At the time of European arrival, this region hosted a north prong of the Oak-Chestnut Forest Region (Braun 1950). However, there is some ambiguity about the native vegetation because of the pervasive impact of nineteenth-century logging. The Catskills contained the most abundant hemlock trees in New York in the early nineteenth century, but these trees were cut and stripped of their bark for tanneries (Fox 1902:61). Until around 1850, the lumbermen in the Catskills mostly felled white pine. The more numerous hardwoods were not removed as logs because they did not float well. This situation changed once the logs could be transported by the railroads after 1860 (Fox 1902:11, 51–52). In the late nineteenth century spruce trees of all sizes were cut down for wood pulp, before forestry conservation practices were instituted (Fox 1902:12, 77–78, 86). By 1920 the Allegheny Plateau had been almost completely cleared of trees by logging.

Except for a few isolated patches of remnant old growth, the extant forests began to grow back only after 1920. Although the component species are probably the same as in the pre-logging forest, their relative numbers and distribution may be significantly different. Logging favored hardwoods and left extensive coniferous slash in its wake. This debris fueled intense fires that nearly eliminated white pine and hemlock in the Allegheny forests. Frequent burning also reduced the proportion of sugar maple, beech, and other hardwoods while encouraging growth of aspen, pin cherry, sedges, grasses, and honeysuckles. Currently, the secondary forest in the Catskills is dominated by oaks, red maple, and pignut hickory. Pitch pine, white pine, and sassafras are also common (Sullivan County Park & Recreation Commission n.d. a,b).

Funk (1993a:47) notes that charred butternuts and walnuts are very common in contexts dating from the Late Archaic through Late Woodland periods on the Upper Susquehanna. Butternut trees are abundant today in the lowlands, although Braun (1950) did not mention them. Butternut shell fragments dominated the samples from Vosburg phase (ca. 5300 to 5000 cal BP) features at the Kingston Armory Site. Black walnut (*Juglans nigra*) and hickory (*Carya*) nutshells were recovered from the Vergennes phase occupation (ca. 6000 rcbp, 6800 cal BP) at the Kingston Armory Site (Gould et al. 2008).

According to Fenton (1978:297), "the sugar maple, the American elm, and the white pine were the climax forms important to Iroquois technology; they were venerated and appealed to in political metaphors. Elm bark was crucial for shelter, containers, and vessels; indeed, the culture could not function without it because birch of sufficient girth for covering canoes, shingling lodges, and making vessels does not grow south of a line encompassing the Adirondacks."

Eastern North America had been depleted of its largest native mammals—e.g., mastodont, mammoth, stag-moose, giant beaver—by the Terminal Pleistocene megafaunal extinction at 13,000 to 12,700 cal BP (11,000 to 10,700 cal BC). Elk, cougar, and wolf were probably locally extirpated by the mid-nineteenth century. Among the extant native mammals of the region are deer, raccoon, beaver, black bear, fox, bobcat, rabbit, opossum, woodchuck, and muskrat. Small numbers of passenger pigeon (extinct since 1914), grouse, goose, and turkey were recognized in the bone sample from the Late Woodland Nahrwold site (Ritchie and Funk 1973). Schoharie Creek is inhabited today by bullhead, sucker, chub, and small mouth bass.

C. Prehistoric Context

Archaeologists have divided the vast expanse of New York culture history into five general periods: Paleoindian (12,000 to 9500 years before present [BP]); Archaic (9500 to 3000 BP); Woodland (3000 to 500 BP); Contact (500 to 300 BP); and Historic (300 BP to present). The first three subdivisions (Paleoindian, Archaic, and Woodland) are thought to represent Native American cultural adaptation to changing climatic conditions since the arrival of humans in the New York region around 12,000 years ago—from Pleistocene (Ice Age) to Holocene (modern) norms. The region's natural environment and geomorphology have greatly influenced the nature of Native American settlement, land use, and cultural development. One important factor in the interpretation of New York prehistory is the impact of glaciation on the topographic and hydrologic conditions in the area since the end of the Pleistocene.

1. Paleoindian Period (12,000 to 9500 BP)

The first inhabitants of this region were Paleoindians, who arrived circa 11,000 rcbp (13,000 cal BP, 11,000 cal BC). The diagnostic artifacts of these terminal Pleistocene hunters were fluted spearpoints made of high-quality cryptocrystalline stone. Many of these distinctive points have been found with few or no associated artifacts on the surfaces of fields.

Ritchie (1965:5) depicted no fluted points in Schoharie County, but he mapped two find-spots in adjacent Delaware County, not far from the headwaters of Schoharie Creek. Wellman (1982) presented data on 290 fluted points in New York. She listed only one point from Schoharie County. When the county-specific data are corrected for biases (e.g., numerous points from a single site, as in Greene County) and controlled for area, point densities can be compared. Greene County still has the highest density, but it is notable that two counties on the Appalachian Plateau, Chenango and Otsego, are among the 10 counties with the highest fluted point densities (Lothrop and Bradley 2012).

Although classic Clovis fluted spearpoints resembling points from the Plains and Southwest have been found in Pennsylvania and eastern New York, they appear to be absent or very rare farther east. In New England the pioneering Paleoindians made fluted points that resemble the Gainey type of the northern Midwest. Few secure radiocarbon dates are associated with Gainey, but the minor stylistic differences from the ancestral Clovis form suggest a date of ca. 12,900 to 12,600 cal BP. Across a vast area, the stylistic trends among point-makers descended from Clovis are similar—the channels or flutes become longer, a discrete nipple at the base of the preform is isolated and used to detach the long fluting flake, and the base becomes more concave. In the northern Midwest this trend leads to the Barnes/Parkhill type that follows Gainey. In New England one suggested stylistic sequence (Lothrop and Bradley 2012) begins with King's Road/Whipple (Gainey-like), followed by the Vail/Debert points with very deep basal concavities (which lack obvious Great Lakes counterparts, except for the cache from the Lamb Site in Genesee County, New York). Next are Bull Brook/West Athens Hill points, followed by Michaud/Neponset (equivalent to Barnes). These are followed by the last fluted point type, Crowfield (ca. 12,200 to 11,600 cal BP). Small unfluted points called Cormier/Nicholas are the New England equivalent of the Holcombe type (ca. 11,600 cal BP). Long, unfluted points that resemble the Agate Basin type of the Plains are sparsely distributed in New England and New York; they also were found at the Plenge Site in northern New Jersey. These date to about 11,800 to 11,000 cal BP.

South of Albany, several Paleoindian sites in Greene County (Kings Road, Swale, West Athens Hill) show that the Normanskill chert sources of this area attracted early quarrying and camping (Funk 2004). Morrow (personal communication 2016) has recently examined artifacts from the Greene County sites and confirms that they include early Clovis-style bifaces.

The Greene County chert sources are located near small tributaries of Catskill Creek. Paleoindians could readily have followed Catskill Creek to the Schoharie Valley, some 40 miles distant. The absence of Paleoindian traces from the latter area is therefore somewhat surprising.

Notable Paleoindian sites in the region south of the Gorge Creek project area include Dutchess Quarry Cave, Shawnee-Minisink, Twin Fields, Plenge, and Port Mobil.

At Dutchess Quarry Cave 1, near the village of Florida in Orange County, New York, a Cumberland-like fluted point, with flutes extending along nearly the entire length of the point, was found in the same stratum as fragments of caribou bone. A radiocarbon date of 12,530±370 rcbp was obtained from the bones (Funk et al. 1970). For some time this date was thought probably to be applicable to the Paleoindian point, although it was markedly earlier than other dates for fluted point assemblages. In fact the Cumberland style appears to be rather late in the stylistic sequence that begins with Clovis points at 11,000 cal BC. It was shown subsequently that the early date is accurate but is associated only with the extirpated Pleistocene fauna, *not* with the subsequent human occupation of the cave (Steadman et al. 1996). Three additional fluted point fragments, again Cumberland-like, were found in disturbed contexts in Dutchess Quarry Cave 8 (Kopper et al. 1980), 12 meters north of Dutchess Quarry Cave 1. Lothrop and Bradley (2012) ascribe these points to the Michaud/Neponset style. Small corner-notched points recovered from this cave are probably examples of the Early Archaic Amos type, dating from circa 9500 to 8300 cal BC.

The Shawnee-Minisink Site is located in Monroe County, Pennsylvania, at the confluence of the Delaware River and Brodhead Creek. Don Kline discovered the site in 1972 by digging three test units reaching a depth of 10 feet. A hearth found at the lowest level, associated with Paleoindian artifacts, produced a radiocarbon date of 10,590±300 rcbp (W-2994). Additional excavation of this multi-component stratified site was conducted by American University students directed by Charles McNett (1985). One Clovis point was found, along with numerous endscrapers. A hearth contained evidence of a broad-spectrum diet: fish bones and seeds and pits of acalypha, blackberry, hackberry, hawthorn plum, and grape (Dent 1991:125). The Paleoindian camp's setting is reconstructed as a grassy open patch amid a pine and birch-dominated woodland. Another radiocarbon date was obtained for the Paleoindian level: 10,750±600 rcbp (W-3134). Seeds from the hearth were retained, and two samples were submitted years later by Dent (1999) for AMS (accelerator mass spectrometry) radiocarbon dating. This improved technique employs direct counting of carbon atoms and yields more precise dates for much smaller samples. The seeds dated to 10900±40 bp (Beta-127163) and 10940±90 bp (Beta-101935). Renewed recent excavation by Kline and his associates (Gingerich 2007, 2011, 2013) has produced a second fluted point, more scrapers, blades, and carbonized seeds (as well as hickory nuts) from another feature. Additional AMS dates have been obtained for these hawthorn plum seeds: 10,820±50, 10,915±25, and 11,020±30 rcbp. The averaged age is calculated as 10,935±15 rcbp; Shawnee-Minisink is currently the most precisely dated Paleoindian site in North America (Waters and Stafford 2007).

Twin Fields is located on a sandy bluff above the Dwaar Kill, near Wallkill in Ulster County. Two fragments of fluted points and numerous unifacial tools were recognized in a mixed assemblage from near-surface soils (Eisenberg 1978:79). The abundance of scrapers here suggests a specialized wood-working camp.

Numerous fluted points of both early and late styles, and a few unfluted Plano-like points, were collected from the surface of the Plenge Site in New Jersey (Gingerich 2013; Kraft 1973). Fluted points were found near the Arthur Kill on Staten Island at the Port Mobil Site (Kraft 1977).

Experiments with replica points, mounted on spears and thrown using an atlatl, have demonstrated that fluted points were well designed to penetrate elephant hide; their use in hunting of mammoths is amply evidenced at a dozen kill sites in the Plains and Southwest. A few Clovis points were found in loose association with mastodont (*Mammut americanum*) skeletons at the Kimmswick Site near St. Louis; however, no clear evidence of hunting or butchering of mastodons or other terminal Pleistocene megafauna has been found at any other site east of the Mississippi. Instead, the few tiny preserved bone fragments that have been recovered from Eastern Paleoindian sites represent still extant species that moved north during the Holocene, such as caribou and Arctic fox. Along with the evidence of fishing and fruit-harvesting at Shawnee-Minisink, the absence of kill sites has led many archeologists to conclude that megafauna had mostly vanished from the Middle Atlantic region by the time Paleoindians arrived (e.g., Boulanger and Lyman 2014; Dent 1991).

The question of human-mastodont temporal and behavioral association is particularly relevant because the greatest concentration of mastodont fossils in the Northeast is located in Orange County, about 90 miles (140 kilometers) south of the Gorge Creek project vicinity (Ritchie 1965:11). Ritchie (1965:9) speculated that evidence of Paleoindian predation on megafauna might be found in the Wallkill River valley or the Black Dirt, which is drained by the Wallkill. Dutchess Quarry Cave, it may be noted, looks out over the Black Dirt, which had already become a bog by the time of Paleoindian occupation. Several radiocarbon dates for Orange County mastodonts have placed them late enough to have encountered human predators, e.g., 9860±225 rcbp for the Sugar Loaf specimen and 10,000±160 rcbp for the Arborio mastodont, found in a bog south of Montgomery (Dumont and Ehlers 1973). A bone from another extinct species, the stag-moose *Cervalces scotti* found at the Dewey-Parr Site in Orange County, produced a Clovis-era date of 10,950±150 rcbp (I-4016) (Funk et al. 1970). Bone has been a notoriously difficult material for radiocarbon dating, however, and unrecognized contaminants often result in dates that are obviously too recent. These dates obtained in the 1970s may reflect such problems. New procedures for extraction of pure collagen from ancient bone seem to yield more credible dates, which are usually older than those previously obtained from the same samples. A new date for the Arborio specimen is 11,750±60 rcbp (Feranec and Kozlowski 2012). However, recent dates do place many mastodonts late enough to overlap with the earliest Paleoindians in the region. Another Orange County find, the Temple Hill mastodont, has been dated to 11,000±80 rcbp (Robinson et al. 2005) and 10,900±40 rcbp (Feranec and Kozlowski 2012). The Otisville mastodont yielded a date of 10,970±40 rcbp (Robinson et al. 2005), and a mastodont from Ellenville (Ulster County) has been dated to 10,850±45 rcbp (Feranec and Kozlowski 2012, 2016). The Cohoes mastodont dates to 11,070±60 rcbp. The Chittenango mammoth from Madison County has been dated to 11,250±65 rcbp, and a mammoth from Watkins Glen in Schuyler County dates to 10,890±50 rcbp. If a date on tooth-derived collagen is accurate, the Randolph mammoth from Cattaraugus County died ca. 10350±45 rcbp (Boulanger and Lyman 2014). Apparently reliable dates for mastodont bones from the Hiscock Site in western New York include 10,850±140, 10,790±70, 10,705±80, and 10,630±80 rcbp (Laub 2003). Six fluted points and other Paleoindian tools have been found at Hiscock but not in close association with the mastodon remains. Note that these dates are statistically indistinguishable from those obtained for the Paleoindian occupation of Shawnee-Minisink. Paul Martin has argued since the 1960s (Martin 2005) that human predation was primarily responsible for the simultaneous extinction of 32 genera of North American megamammals at 13,000 to 12,700 cal BP (11,000 to 10,700 cal BC). Paradoxically, the extinction was so rapid—only some 400 years of overlap of the last megafauna and the first Paleoindians—that one should not expect to find many preserved kill and butchery sites (Fiedel 2009; Fiedel and Haynes 2004).

2. Archaic Period (9500 to 3000 BP)

The Archaic period is characterized by climatic amelioration that eventually resulted in greater biodiversity in the resource base, and changes in technology, site size, and site locations that reflect use of a broader spectrum of resources.

a. Early Archaic Period

Although the megafauna seem to have been extinct by 12,600 cal BP (10,600 cal BC), the use of fluted points continued for another thousand years. Perhaps they had proven effective in the pursuit of caribou, which may have lingered in the cold conifer-dominated forests of the Younger Dryas period. The appearance of new notched projectile point types around 10,000 rcbp (11,500 cal BP, 9500 cal BC) is a convenient marker for the initiation of a new cultural period known as the Early Archaic. Despite this stylistic change, the similarity of Paleoindian and Early Archaic settlement patterns has been cited as evidence that the basic lifeway, entailing restricted wandering between seasonally available resources in patchy mosaic environments, did not change very much (Custer 1990; Eisenberg 1978:138–139).

The style change is evident at Shawnee-Minisink, where a single side-notched “Kline” point was recovered from the “Early Early Archaic” level, estimated to date to about 9500 cal BC. This point bears some resemblance to the Early Archaic St. Charles type of the Midwest. The only reported find of similar points in the Northeast is the discovery of four at a workshop site (Site 194-3-1) located near West Athens during a survey for the Iroquois Pipeline (Funk 1996:15).

Funk (1996) observed the dearth of both Early and Middle Archaic sites and surface-collected diagnostic artifacts in the Northeast. The “Ritchie-Fitting” hypothesis (Fitting 1970; Ritchie 1971a) attributed the near-absence of cultural remains of these periods to the regional prevalence of a closed boreal forest that offered few resources for human foragers. Subsequent paleoecological research has shown that oaks and other deciduous trees colonized the region earlier than had been thought, and several deeply buried Early Archaic sites have been discovered (e.g., Johnsen No. 3 and Russ on the Upper Susquehanna) (Funk 1993b). Nevertheless, the paucity of Early and Middle Archaic diagnostics and components has not changed substantially and must be explained, probably in terms of paleoclimate or vegetation.

Corner-notched points of the Kirk series, dated to circa 9500 to 8500 rcbp (11,100 to 9600 cal BP, 9100 to 7600 cal BC) in the South, are very rare from New Jersey northward. At the Rockelein Site on the Upper Delaware, near the Orange County border, a Kirk-like assemblage was radiocarbon-dated to 7520±120 rcbp (6400 cal BC) (Dumont and Dumont 1979). This date is anomalously late in comparison to dates for this type from the south. The same site also yielded points of the LeCroy bifurcate, Eva, and Stanly/Neville types, indicating subsequent occupations between 8500 and 7000 rcbp (7600 and 5900 cal BC).

b. Middle Archaic Period

In the Middle Atlantic region bifurcate points are currently interpreted as diagnostic of the inception of a new period, the Middle Archaic (8500 to 5500 rcbp, 9600 to 6300 cal BP, 7600 to 4300 cal BC). This period roughly corresponds to the Hypsithermal climatic period, a warm, dry period when the oak-chestnut-deer-turkey biome became established in much of the Northeast. The warmest temperatures of the entire Holocene actually occurred at the beginning of this period, around 10,000 to 9500 cal BP (8000 to 7500 cal BC) (Lecavalier et al. 2017). In Tennessee and Illinois, Middle Archaic sites contain evidence of nut-harvesting as well as hunting and fishing (Chapman 1975, 1977).

A rare occurrence of bifurcate points in the Mid-Hudson region was reported from the Haviland Site, located near Cobleskill, about 12 miles northwest of the Gorge Creek project area (Ferguson 1995). Charcoal loosely associated with the artifacts was dated to 8405±65 rcbp. Several points found here most closely resemble the Kanawha type; another point seems to be a miniature Neville. Numerous pointed, thin ovate preforms or knives were recovered. As utilized flakes seem to be very common at the Gorge Creek Site 1, it is pertinent to note that at the Haviland Site, “Almost all flakes larger than 2 cm [n=862] show utilization in a variety of ways (e.g., scrapers, spokeshaves, knives, gravers, or awl-perforators)” (Ferguson 1995:8). These artifacts were made of locally procured Esopus chert. It is noteworthy that a similar date of 8450±340 rcbp was obtained on charcoal from a small, deeply buried feature at Site 303 on Schoharie Creek. Only a few pieces of debitage were associated (Wellman 1996).

At the Rockelein Site on the Delaware, the Neville-Stanly component included pitted stones, anvils, milling stones, and netsinkers. On the middle Delaware nut-harvesting is attested at the Sandts Eddy Site (north of Easton), where burnt hazelnut shells in Level IX were radiocarbon-dated to circa 7330±60 rcbp (6250 cal BC) (Bergman et al. 1994). The underlying occupation level (XI) yielded a LeCroy bifurcate point and an anomalous radiocarbon date of 9420±90 rcbp (9100 cal BC), too early for this type.

A substantial Middle Archaic occupation is attested in the Mohonk Rockshelter, located on a ridge west of the Wallkill Valley in Ulster County, New York. A total of 73 Neville points were found at this site, as well as four very similar points ascribed to the Kanawha bifurcate type (Eisenberg 1991). The rockshelter deposits were entirely mixed, so no stratigraphic associations were observed. To the north, in Saratoga County, Neville points have been reported from testing at the Clifton Park-Halfmoon Public Library (Landmark Archaeology, Inc. 2015).

The latter part of the Middle Archaic, circa 7000 to 5500 rcbp (7900 to 6400 cal BP, 5900 to 4400 cal BC), is not well attested in this region. Diagnostic points of this age may include Stark, Poplar Island, and Otter Creek types. Hunterbrook or Beekman triangles, originally described in Westchester County and later discovered in deep strata at Area D of the Abbott Farm Site near Trenton, New Jersey, may also belong in this period (Stewart 1990). At the Sylvan Lake Rockshelter in Dutchess County, a few Beekman triangles were recovered from Stratum 3 and radiocarbon-dated to circa 6600 to 6000 rcbp (7600 to 6900 cal BP, 5600 to 4900 cal BC). Beekman triangles were intermixed with stemmed points and Brewerton and Vosburg points in Level 5 of the Friedman II Site, located in New Jersey near the Dingmans Ferry Bridge on the Upper Delaware (Kinsey 1972; Marchiando 1967). Beekman triangles were found in a stratified context, associated with Vosburg points and broad side-notched points, at the Ten Mile River Rockshelter, northeast of Tunsten on the Upper Delaware. An associated radiocarbon date on a composite sample of bone fragments from Stratum 3 was 4450±130 rcbp (I-4837) (Funk et al. 1971). This date seems too recent, although Funk (1989) accepted it as a valid date for the Vosburg component.

c. Late Archaic Period

In the Upper Susquehanna drainage Funk (1993a) defined the regional Late Archaic as beginning with the appearance of side-notched “Proto-Laurentian” Otter Creek points at about 6000 rcbp (7000 cal BP). At the McCulley No. 1 Site in Delaware County, charcoal from two hearths associated with an Otter Creek component was dated to 5730±110 rcbp (ca. 6500 cal BP) (Funk and Hoagland 1972a). Otter Creek points may ultimately be derived from the side-notched types of the mid-continent (e.g., Big Sandy, Raddatz). Otter Creek points also occur in the mid-Hudson Valley; this type and the affiliated Vergennes phase were originally defined on the basis of finds in western Vermont (Ritchie 1965:87). There the Otter Creek points are associated with ground slate knives and ulus. It is noteworthy that Ritchie also reported a copper gorge from the KI Site. One of the slate points he illustrates (plate 27:2) is clearly imitative of a typical point form of the Old Copper Culture of the Great Lakes. A copper point of this type and other copper artifacts were found at the Sandy Lake Dam Site (21AK11) in northeastern Minnesota. A loosely associated piece of calcined bone was dated to 5690±30 rcbp, or ca. 6500 cal BP (Bradford 2013). Organic materials adhering to Old Copper artifacts have been dated to 5940±90, 4630±60, 4590±50, and 4420±60 rcbp (6900 to 5000 cal BP) (Beukens et al. 1992). Chemical traces identified recently in Lake Superior sediments indicate that intensive copper mining occurred there between 6500 and 5400 cal BP (Pompeani et al. 2015).

This evident population expansion/migration from the Great Lakes to New England may have been linked to an environmental change. A widespread pollen transition is evident at 6800 cal BP (Gajewski et al. 2007). In New Jersey lake sediments a sharp excursion in oxygen isotope ratios occurred in at that time. In some Maine lakes the water level dropped to a stable minimum ca. 7200 to 5800 cal BP (Almquist et al. 2001), while an episode of severe storms is seen in lake sediments in New England at 6800 cal BP (Parris et al. 2009). Events are also observed in lake sediments in western New York at 7100 and 6600 cal BP (Ellis et al. 2004).

At the Kingston Armory Site in Ulster County, three components were identified: Vergennes (Otter Creek), Late Archaic (Vosburg), and Terminal Archaic (Snook Kill, River, Frost Island, and Orient phases). Radiocarbon dates for the Vergennes phase occupation are 6170±40 rcbp (5260 to 4940 cal BC) and 5820±40 rcbp (4780 to 4590 cal BC) (Gould et al. 2008).

Otter Creek points were found at Site 303 (also known as the Shafer Site) on the Schoharie Creek floodplain near Breakabeen; they were associated with a radiocarbon date of 6290±190 rcbp (ca. 7200 cal BP, 5200 cal BC), which was obtained by combining charcoal from three hearths (Wellman 1996). Funk (1988) assigned this component to a proto-Laurentian “South Hill” phase.

Otter Creek appears to have evolved into the Brewerton complex of side-notched, corner-notched, and eared points. Ritchie (1965) regarded the Brewerton complex as part of a “Laurentian” tradition; Snow (1980) termed it the “Lake

Forest Archaic." Triangular points, not easily distinguished from much later Woodland arrow points, sometimes occur in association with Brewerton notched forms.

Ritchie found no datable charcoal at the type sites of the Brewerton phase, Robinson and Oberlander No. 1. He was certain that this phase persisted as late as 4000 rcbp (4500 cal BP) in central New York, but he could not ascertain when it began. Subsequently, Funk (1993a:190) reported a radiocarbon date of 5010±30 rcbp (5770 cal BP) on scraps of bone from Burial 4 at the Oberlander No. 1 Site. Ritchie (1971a) supposed that Brewerton was coeval with the Vosburg phase of eastern New York. "The Brewerton culture, then, probably constituted the dominant, and probably the sole Late Archaic occupation of north and north-central New York at around 2500 B.C., when the Lamoka culture flourished in the same role in south-central New York." Charcoal from the Brewerton horizon at the base of the stratified O'Neil Site in Cayuga County produced radiocarbon dates of 4000±220 rcbp and 3960 ± 100 rcbp. A date of 3850± 5 rcbp was obtained on a sample of bone from Burial 78 on Frontenac Island, also in Cayuga County. The grave goods in this burial included a ground slate point and a chopper. The grave goods of the apparently contemporaneous adjacent Burial 79 included two stone plummets and a bird effigy comb made of bone. Ritchie (1971a) noted that a bird effigy comb had also been found in the Maritime Archaic cemetery at Port au Choix, Newfoundland, which dates to 4500 to 4000 cal BP. Hearth charcoal from Frontenac Island was dated to 3963±80 and 3673±250 rcbp. Ritchie believed a date of 4000 rcbp was appropriate for the Frontenac phase, which he saw as a fusion of the Lamoka and Brewerton phases. Notably, Genesee point also were present in the Frontenac phase (Ritchie 1965: plate 34), indicating some affiliation with Broadspear cultures that spread northward ca. 4000 cal BP.

Ritchie (1965: plates 32 and 33) illustrated copper tools of Old Copper type, including a gouge or "spud," a celt, and awls, from the Robinson site, and he noted that other copper tools had been found in the nearby plowed fields. Based on this it seems there must be some temporal overlap of the Brewerton phase with the peak production period of the Old Copper culture as inferred from the Lake Superior sediments (6500 to 5400 cal BP). This is consistent with the available radiocarbon dates.

Louis Berger (Wall et al. 2006) identified typical Brewerton projectile points as well as other untyped projectile forms in association with a large and diverse cobble tool assemblage (although without a groundstone component) from the Mansfield Bridge Site (36Ti116) on the Tioga River near the New York-Pennsylvania border. Dates for features associated with this component ranged from 6600 to 6020 rcbp (7500 to 6800 cal BP) (Wall et al. 2006).

Points resembling the Brewerton side and corner-notched types were found on Morrison's Island in the Ottawa River, between Ontario and Quebec. Twenty-four percent of these points were made of Onondaga chert. This site included both campsite remains and intermingled burials. Copper was used to make diverse tools: barbs, awls, gorges, fishhooks, and points. Two of the burials had pairs of copper bracelets. Radiocarbon dates for the burials are 4620±40, 4630±40 and 4860±50 rcbp on human bone, and 4700±150 rcbp on charcoal from a grave (Clermont and Chapdelaine 1998; Ellis et al. 2009). Taken together these indicate a span from ca. 5600 to 5300 cal BP.

In the Hudson Valley a distinctive variant of the Late Archaic notched type is the Vosburg corner-notched type. At the Sylvan Lake Rockshelter the Vosburg component dated to 4780±80 rcbp (5500 cal BP) (Funk 1966). At the Kingston Armory Site in Ulster County, a Vosburg phase occupation yielded radiocarbon dates of 4550±40 rcbp (5200 cal BP), 4520±40 rcbp (5200 cal BP), and 5130±40 rcbp (5800 cal BP) (Gould et al. 2008). At the Camelot #2 Site on the Upper Susquehanna, Feature 22 was closely associated with three Brewerton eared triangles. Funk (1993a:160, 1993b:216) reports a date of 4795±230 rcbp (ca. 5500 cal BP) for this feature, which also contained charred butternuts.

On the Upper Delaware the Faucett Site yielded radiocarbon dates for three stratified Late Archaic components (Kinsey 1972:398). A component lacking diagnostics dated to 6170±135 rcbp (I-5238). Above this, a Vosburg component dated to 5570±200 rcbp (I-5237). An overlying component contained a Brewerton eared-notched point, with a date of 5180±200 rcbp (Y-2479). The Lackawaxen component (with stemmed points) provided three dates: 4560±110, 4445±130, and 4130±180 rcbp.

During the Late Archaic, circa 6000 or 5500 to 3700 rcbp (6400 to 4000 cal BP, 4400 to 2000 cal BC), the regional population seems to have increased dramatically. Multiple changes in climate and environment coincided at ca. 5800 to 5400 cal BP: Bond event 4 (iceberg rafting of debris southward in the North Atlantic [Bond et al. 1997, 2001]); droughts in New England, New Jersey, and West Virginia; and hemispheric-scale climate changes. This is also the time of transition from the mid- to late Holocene (Zhao et al. 2010). Hemlock (*Tsuga canadensis*) populations collapsed abruptly throughout the Middle Atlantic and Northeast at ca. 5500 cal BP (4750±50 rcbp) (Bennett and Fuller 2002; Bhiry and Filion 1996; Calcote 2003; Foster et al. 2006; Haas and McAndrews 1999).

The hemlock demise provided an opportunity for the growth of a diverse understory and the florescence of northern hardwoods (Sanger et al. 2007). This new vegetation, combined with a possible reduction of snowfall, would have provided prime habitat for deer. Coeval with the hemlock decline there is a sudden, dramatic increase in radiocarbon dates associated with human occupation in New England and New York (Fiedel 2001; Hoffman 1988; Reeve and Forgacs 1999; Munoz et al. 2010). It is probably no coincidence that, around 5500 to 5000 cal BP, Lamoka and other narrow stemmed points replaced notched points of the Brewerton tradition in New England.

Late Archaic people hunted deer and other animals of the deciduous forest (dominated by oak and hickory, after the hemlock decline), collected nuts and seeds, and took fish and shellfish from the rivers. Corner-notched Vosburg and related Beekman Triangle and Brewerton points (circa 5000 to 4000 rcbp, 5800 to 4500 cal BP, 3800 to 2500 cal BC) are somewhat more common than Otter Creek points, but the predominant form in Late Archaic assemblages is the narrow stemmed point. This type, variously named in southeastern New York “Taconic” (Brennan 1968) or “Sylvan Stemmed” (Funk 1976), dates from circa 4500 to 3500 rcbp (5300 to 3800 cal BP, 3300 to 1800 BC). A side-notched type (Sylvan Side-Notched or Twombly Side-Notched) apparently co-occurred with these stemmed points. In central New York the narrow stemmed variant is known as Lamoka. At the Lamoka Lake Site in Schuyler County, dated to circa 4500 rcbp (5300 cal BP), hunting, fishing, and acorn-harvesting produced a sufficient resource base to support a semi-sedentary occupation by about 150 people; their prolonged occupation is indicated by a multitude of postmolds and numerous storage pits. On the Upper Delaware the equivalent, contemporary type is known as Lackawaxen (Leslie 1967), with three sub-types: straight stem, expanded stem, and converging stem. A distinctive trait of Lackawaxen points is their raw material, which is frequently shale, argillaceous shale, or argillite.

On the Upper Susquehanna, Lamoka components were dated to between 4185±120 and 3750±100 rcbp at the Fortin Site, between 4490±90 and 3920±95 rcbp at Mattice No. 2, and have similar associated ages at other sites (Funk 1993a:158–164). Vestal corner-notched and side-notched points, apparently contemporaneous with Lamoka, are very numerous in the area around Binghamton. Funk (1993a:193), however, rejected many dates and argued for the “true” age of Vestal assemblages as circa 3900 to 3800 rcbp, based on the stratigraphic superposition of Vestal above Lamoka components at several sites. Also partially contemporaneous or slightly later than Lamoka and Vestal (from about 3900 to 3700 rcbp [2400 to 2000 cal BC]) is the side-notched Normanskill point type, which was prevalent in the mid-Hudson, Susquehanna, and Mohawk valleys. Vestal points are very rarely found on the Upper Delaware, but Normanskill-like forms are present there.

At Site 303 on Schoharie Creek, a Lamoka component was stratified above the Otter Creek component. Radiocarbon dates of 4340±190 and 4110±140 rcbp were associated with the narrow stemmed points (Wellman 1996).

d. Terminal Archaic/Transitional Period

Broadspear makers from the Southeast seem to have spread northward along the coastal plain, circa 4000 to 3500 rcbp (4500 to 3800 cal BP, 2500 to 1800 cal BC) (Kinsey 1972:359). The prototypical broad-bladed form is the Savannah River point, which developed in the Mill Branch culture of Georgia around 2800 cal BC (Sassaman 2006). The earliest broad-bladed form in New York is Snook Kill, probably derived from the similar Lehigh/Koens-Crispin points of Pennsylvania and New Jersey. Lehigh/Koens-Crispin points have been dated by a few radiocarbon assays in the Delaware Valley to about 3700 rcbp. At the Savich Farm, east of Philadelphia, dates of 3640±60, 3530±70, and 3820±60 rcbp were obtained for graves containing Koens-Crispin points and bannerstones (atlatl weights) (Regensburg 1982). In the Upper Susquehanna drainage dates of 3830±80 and 3620±130 rcbp are associated with Snook Kill points (Funk 1993a:162). Both forms were ancestral to the later Susquehanna and Perkiomen broad-bladed points; these coeval types date to about 3600 to 3200 rcbp. Four precise AMS dates for a hearth associated with Susquehanna and Dry Brook fishtail points and steatite bowl fragments at the Little Wood Creek Site in Fort Edward are 3160±30, 3070±30, 2970±30, and 2980±30 rcbp, or 1450 to 1200 cal BC (Grossman et al. 2015)

A noteworthy change in lithic raw materials occurred in the Delaware Valley when the broadspears replaced the narrow stemmed Lackawaxen points. The latter are made of shale and argillite, but preferred materials for broadspears are rhyolite, chert, and jasper. There does not appear to be as radical a shift in the Upper Hudson Valley, where chert continued to be used for broadspears.

Broadspear occupations tend to be focused on river floodplains and levees. In the absence of organic remains, it is unclear if this tendency is indicates the importance of fish (and perhaps also seed-bearing plants and tubers) in the diet, or simply reflects the importance of rivers as transportation routes. An innovation associated with broadspears is the construction of large platform hearths or pavements, full of fire-cracked rock (FCR). Many of these were found in Level 3 of the Zimmermann Site on the Upper Delaware (Werner 1972). Despite an absence of actual fish remains, it is generally assumed that these features were devoted to some kind of fish-processing, such as drying or smoking. This use would imply occupation sometime between March and June, when five species of shad migrate up the Delaware. Moeller (2005) notes a lack of diversity in the toolkits typically associated with these hearths and interprets this as indicative of short-term occupations rather than extended base-camps. He also suggests that the frequent burning of wood to heat the rock platforms may have severely diminished the local population of deciduous trees, causing an ecological catastrophe that led to the Early and Middle Woodland abandonment of the area. Whether or not this is a plausible explanation of local population dynamics, trans-regional climatic oscillations, particularly at 800 cal BC, may have caused the apparent Early Woodland population collapse throughout much of the Northeast (Fiedel 2001).

Tub-shaped vessels carved from soapstone (steatite) occur for the first time in association with Perkiomen or Susquehanna broadspears, both in the Upper Susquehanna and Upper Delaware drainages. This technology, interpreted as a step toward ceramic manufacture, was formerly seen as demarcating a Transitional cultural stage prior to the ceramic-producing Early Woodland cultures. Today, *Terminal Archaic* is the term more often applied to the period characterized by soapstone and broadspears.

In the Delaware Valley there is good evidence of the stylistic evolution of Orient Fishtail points from broadspears, by way of the intermediate Dry Brook type. Orient Fishtail points (circa 3200 to 2700 rcbp, 1500 to 800 cal BC) were found in elaborate mortuary deposits at the northeast tip of Long Island, associated with carved soapstone bowls. Ceramics, imitative of soapstone (steatite) vessels in shape, are a minor part of Orient assemblages in the Delaware Valley and eastern Long Island (Ritchie 1965:172); their appearance marks the onset of the Early Woodland. Marcey Creek steatite-tempered pottery was found in the Orient assemblage at Miller Field, New Jersey (dated to 3170±120 rcbp). At the Faucett Site in the Upper Delaware Valley, Exterior Corded/Interior Smoothed pottery appeared to be associated with an Orient component (Kinsey 1972:360).

Orient components are found at sites along the Hudson as far north as Saratoga County (they were recovered from the Church Site near Stillwater). At the stratified Coffin Site near Schuylerville, the Orient component yielded dates of 2820±110 and 3040±95 rcbp (Funk 1976:264). Orient points do not seem to occur farther west; they may overlap temporally with the Meadowood points that are predominant in central and western New York. Coeval Meadowood and Orient groups may have alternated habitation of the Pethick Site in Schoharie County (Rafferty et al. 2014). Vinette 1 pottery, quartz-tempered, conical-shaped, and cordmarked on both exterior and interior surfaces, is frequently associated with Meadowood points and is the index trait for the beginning of the Early Woodland.

Rafferty et al. (2014) suggest that sites along Schoharie Creek were located at the boundary between contemporaneous, distinct cultural zones: Orient Fishtail to the east and Meadowood to the west. They do not address the obvious question of whether those zones, defined by sharply distinct projectile point styles, represent discrete ethnic, linguistic, or political entities. Nevertheless, "We argue that the Pethick site was occupied by populations exhibiting Early Woodland and Transitional tool kits not sequentially, but consecutively (i.e., two populations alternatively occupying the site over time) and perhaps simultaneously" (Rafferty et al. 2014:184).

Orient Fishtail, clearly derived from the preceding aceramic Terminal Archaic or Transitional Savannah River/Snook Kill/Susquehanna/Perkiomen tradition, is generally regarded as the final expression of this tradition. The temporal division between Terminal Archaic (without pottery) and Early Woodland (with pottery) has generally been set at 3000 rcbp (3200 cal BP). Most Orient-associated radiocarbon dates fall on the early side of the boundary, beginning about 3200 rcbp (3400 cal BP) (Fiedel 1988); however, a few dates are as late as ca. 2800 rcbp (2900 cal BP) (albeit with large standard errors). Orient points are associated with carved soapstone vessels but also, rarely, with soapstone-tempered clay pots. Meadowood points are often associated with Vinette I pottery and are therefore assigned unambiguously to the Early Woodland. Radiocarbon dates for Meadowood generally fall between ca. 2900 and 2400 rcbp (3000 and 2500 cal BP); an anomalously early outlier from the Fortin Site on the Upper Susquehanna is 3180±95 (ca.3300 to 3500 cal BP). Meadowood points seem to have developed from the small, notched points (e.g., of the Hind type) that are found in southern Ontario and the northern Midwest between ca. 3500 and 2800 rcbp.

No credible Orient-associated dates are later than ca. 2750 rcbp (2850 cal BP or 880 cal BC). The end of the Terminal Archaic tradition thus appears temporally and perhaps causally associated with an abrupt climate event. Numerous environmental records in Europe indicate a climatic downturn around 800 to 750 cal BC, which coincides with a radiocarbon "cliff" indicating weakened solar activity. Atmospheric ^{14}C increases and dates drop abruptly from 2750 to 2450 rcbp (Fiedel 2001; Martin-Puertas et al. 2012; Van Geel and Mauquoy 2010). The "cliff" is followed by a plateau; between 2750 and 2400 cal BP, radiocarbon dates are indistinguishable, always ca. 2450 rcbp. Martin-Puertas et al. (2012) have recently shown that a simultaneous sharp increase in windiness and increase in cosmogenic beryllium (^{10}Be) occurred at ca. 2760 cal BP in central Europe; they infer that "changes in atmospheric circulation amplified the solar signal and caused abrupt climate change about 2800 years ago, coincident with a grand solar minimum." This climate change is coincident with Bond event 2 in the North Atlantic, and a probably associated climate episode shows up very strongly in the strontium/calcium ratios from Buckeye Creek Cave in West Virginia (Springer et al. 2008: figure 1). Shuman et al. (2009) infer numerous prehistoric episodes of regional drought from the occurrence of sand layers attributed to lowered water levels in New Long Pond, Massachusetts. Among these is a drought dated to ca. 2980 to 2760 cal BP. Newby et al. (2011) report a similar drought record from Davis Pond in southwestern Massachusetts. Low water levels are inferred for most of the period from 3500 to 2300 cal BP. Pollen sampled from Ballston Lake, located between Saratoga and Schenectady, shows an increase of conifers, hardwoods, and boreal taxa at about 2680 cal BP (2520 rcbp); this is interpreted as marking a shift to a colder climate (Toney et al. 2003).

At the Kingston Armory Site Vinette I sherds were recovered in association with a hearth that was dated to 2980±40 rcbp (ca. 1320 to 1060 cal BC). Orient fishtail points also were found near this feature. Another date for this component is 2790±40 rcbp (ca. 950±50 cal BC) (Gould et al. 2008).

3. Woodland Period (3000 to 500 BP)

a. Early and Middle Woodland Periods

The period from about 2700 to 1700 rcbp (800 cal BC to cal AD 400), corresponding to the Early Woodland and early Middle Woodland, is not well known; as Funk (1993a:200) observed, "Next to the Early Archaic this is the most poorly understood substage in the Northeast" and overall, "The evidence for this phase in New York State remains meager" (Funk 1993a:200).

An *in situ* transition from Orient to succeeding cultures has not been established. A sharp stylistic break occurred, along with reduced numbers of recognizable Early Woodland components. Other than a real population collapse, the most plausible alternative explanation might be a period of severe riverine erosion (which, however, would not explain the comparably small numbers of Early Woodland components in upland settings) (Fiedel 2001).

In the Upper Delaware Valley there is sparse evidence of a fleeting presence of the Meadowood phase; at the Faucett Site side-notched Meadowood points were stratified above the Orient component, and an associated radiocarbon date was 2700±100 rcbp (Kinsey 1972:361). A similarly ephemeral manifestation of the Adena complex of the Ohio region was discovered at the Rosencrans Site in Sussex County, New Jersey. The 13 cremation graves there contained blocked-end tubular pipes, slate gorgets, pendants, cones, slate and copper boatstones, a copper celt, copper beads, conch shell beads, Cresap stemmed points, and side-notched points. Associated radiocarbon dates were 2560±120 rcbp (Ritchie 1965:203) and 2400±60 rcbp (Kraft 1976).

Small Meadowood habitation sites appear to be anomalously concentrated in a linear zone stretching from the Mohawk to the Upper Susquehanna (Taché 2011). This group includes Nahrwold 2 along Schoharie Creek (Ritchie 1969), where the small Meadowood component was dated to 2710±80 rcbp.

At the Pethick Site on Schoharie Creek, 27 of the 81 identified points are Meadowood, and three of the reported radiocarbon dates are appropriate for the Meadowood phase (2510±40, 2640±60, and 2670±110 rcbp). Only one

Meadowood point was recovered from the Schoharie Creek II Site, but a radiocarbon date of 2500±40 rcbp was obtained that is appropriate for this component. Another Early Woodland date of 2070±40 rcbp is also reported (Rieth 2012). At the Vroman 1 Site, near Fox Creek, a probable Meadowood component yielded a radiocarbon date of 2460±40 rcbp. A date of 3060±40 rcbp may indicate an earlier Orient occupation, although no diagnostic artifacts were recovered (Rieth 2016).

Abundant carbonized plant remains were recovered by test excavations by the New York State Museum in 1999 at the Parlsow Field Site on Schoharie Creek near Breakabeen. Hart et al. (2003) report a date of 2386±48 rcbp for a fragment of wild rice from this site.

Curtin (2015) recently reported a substantial Meadowood component at the Esmond 2 and 3 sites in Saratoga County. The occupants used mostly Onondaga chert, which Curtin believes was derived from Terrace Mountain in the Schoharie Valley or some other source south of the Mohawk River. Charcoal from a feature at Esmond 2 was dated to 2420±30 rcbp. Another feature was dated to 2060±30 rcbp, which presumably relates to a post-Meadowood occupation.

Kinsey (1972) designated the seemingly indigenous Early to early Middle Woodland occupations of the Upper Delaware Valley as the Bushkill complex, with an estimated date range of 2500 to 2100 rcbp. Contracting-stemmed Rossville points are the most common diagnostic form of this period in the Upper Delaware Valley; Lagoon points and small numbers of nondescript side-notched forms were contemporaneous. Kinsey noted that the resemblance of Lagoon points to Adena forms is only superficial, and observed some similarity to Fox Creek/Steubenville points. The lithic assemblage appears to have been associated with several ceramic types (Vinette 1, Fabric-Impressed, Wiped, and Dentate-Stamped); however, the dominant ceramic type was Brodhead Net-Marked, a quartz-tempered ware that appears similar to the Popes Creek pottery of Virginia and Maryland as well as the North Beach type of coastal New York. Kinsey (1972:369) cautioned that the Bushkill complex seemed to be a grab-bag of distinct incoherent traits: "…it is likely that too many projectile point and pottery types have been identified as traits for the complex to represent the original ethnological conditions. When additional information is derived from a satisfactory context, it may be possible to subdivide the present complex into several phases."

Only a few sites in the Upper Susquehanna drainage contain Bushkill-like assemblages or have been dated to the same period. At Kuhr No. 1 an Adena-like stemmed point and clusters of Vinette 1 and Point Peninsula Plain pottery were found in a level dated to 2330±85 rcbp.

At the Westheimer Site in the Schoharie Valley, Stratum 5 contained Adena-like and Turkey Tail-like stemmed points, small triangular points or knives, and a few net-marked sherds. A hearth in this stratum yielded a date of 2520±100 rcbp (ca. 2700 to 2400 cal BP) (Ritchie and Funk 1973). Upstream on Schoharie Creek, the Lopuch 3 Site yielded Point Peninsula sherds, a triangular biface resembling those from Westheimer, and 15 microdrills. These artifacts were associated with two hearths dated to 2405±145 and 2315±105 rcbp (Lindner 1991). Although Lindner had speculated that these tools had been used to create shell beads, use-wear analysis instead suggested their use on wood or antler (Lindner and Folb 1996).

Given the presence of a Turkey Tail-like point in Anderson's surface collection from Gorge Creek Site 1, recent evidence pertaining to the date of this type should be noted. Gramly (n.d.) reports dates for two Turkey Tail caches in northeastern Kentucky: 2700±70 and 2570±40 rcbp. The only other date previously reported for a Turkey Tail cache, from Ohio, is 2340±80 rcbp (Grandstaff and Davis 1985).

Dentate and rocker-stamped pots of Early Point Peninsula type are markers of the Canoe Point phase (circa 1800 to 1700 rcbp) in New York. It is possible that these Middle Woodland ceramics, distributed from Manitoba to the New England coast, mark the expansion of Proto-Algonquians outward from the eastern Great Lakes region (Fiedel 1991). The ceramics seem to be associated with crude, nondescript side-notched points. At the Cottage Site a midden located on the Susquehanna near Binghamton, an assemblage of this phase was dated to 1810±100 rcbp (Funk 1993a:204). A later stage of the same cultural tradition seems to be represented at the Davenport Creamery Site, near Oneonta (Funk and Hoagland 1972b). Dentate and rocker-stamped sherds were associated with well-made, thin, side-notched points, resembling Ritchie's (1971b) Long Bay type. A feature there was dated to 1625±95 rcbp. Apparently, Fox Creek points and Petalas "blades" (large bifaces) formed part of the same assemblage. Hart and Brumbach (2005) have recently reported dates from central New York, on organic residues adhering to sherds, that extend the temporal range of Point Peninsula rocker-stamped pottery: 2270±35, 2205±30, and 1620±35 rcbp.

Funk (1993a) recognized a small (1 to 1.5 inches long) stemmed point type of the Middle Woodland period in the Upper Susquehanna drainage; he referred to this type as "Sand Hill Stemmed." At Harry's Farm (Site 28Wa2) in the Upper Delaware, Kraft (1975a) excavated points of the Tocks Island type, in association with Abbott Horizontal Dentate, Brodhead Net-Marked, and Exterior Corded/Interior Smoothed pottery, and a radiocarbon date of 1660±95 rcbp. The corner- or side-notched Tocks Island points are restricted to that vicinity. A noteworthy feature at Harry's Farm was a 47x26-foot platform of FCR, which was surrounded by pits and hearths.

Elsewhere, Fox Creek points date to between circa cal AD 300 and 700. Many of these were made of argillite obtained near present-day Trenton, New Jersey. The wide distribution of this lithic material shows that the Middle Woodland people of southern New York participated in a trade network that extended along the coastal plain from Maryland to Massachusetts. Ceramic styles diffused throughout the same exchange sphere. At sites in coastal New York, Fox Creek points were associated with North Beach Net-Marked and Abbott Zoned Net-Impressed and Incised ceramics. At the Ford Site in Columbia County, a similar net-marked ware was associated with Fox Creek points (Funk 1976:131). The Ford Site also yielded several sherds of zoned-incised Abbott ware that resemble Middle Woodland sherds from New Jersey. A typical Fox Creek component on the Upper Susquehanna, dated to circa 1590 rcbp, was excavated at the Fredenburg Site near Otego (Hesse 1968).

Fox Creek points were named by Funk, based on examples he excavated from Stratum 3 of the Westheimer Site, at the confluence of Schoharie Creek and Fox Creek (Funk 1968). The points were associated with net-marked sherds, including part of an Abbott Zoned vessel. This component produced overlapping radiocarbon dates of 1500±80 and 1540±80 rcbp (ca. cal AD 500 to 530) (Ritchie and Funk 1973). A residue deposit on a Ford Netmarked sherd from Westheimer was recently dated to 1600±35 rcbp (ca. cal AD 470) (Hart and Brumbach 2005).

Jack's Reef pentagonal and corner-notched points demarcate a late Middle Woodland horizon, the Kipp Island phase, ca. cal AD 600 to 900. Unlike earlier points, which were used as spear or dart tips, these points may have been used as arrow tips. Associated ceramic types include Point Peninsula Plain, Corded, and Rocker-Stamped; Jack's Reef Corded and Corded Punctate; and Vinette Dentate. Recently obtained residue dates for Jack's Reef Corded pottery are 1430±40, 1428±41, and 1315±50 rcbp (Hart and Brumbach 2005).

A particularly noteworthy find of late Middle Woodland age is a cremated burial on Minisink Island in the Upper Delaware (Ritchie 1965:234). The grave goods included "the calcined remains of a large, decorated comb of classic Kipp Island style, two perforated shark teeth, and a fragmentary straight-based platform pipe, all index markers for this phase." These artifacts bespeak an obvious cultural relationship to the coeval Island Field cemetery in Delaware and the cremated burial discovered beside the Whitehurst Freeway in Washington, D.C. (Knepper et al. 2006).

At the Schoharie Creek II Site no Middle Woodland diagnostic artifacts were found in data recovery; however, a Fox Creek point was found in previous testing, and five grit-tempered sherds could be derived from Point Peninsula pottery. In any case two radiocarbon dates would be appropriate for a Middle Woodland occupation: 1370±40 and 1420±40 rcbp (Rieth 2012).

b. Late Woodland Period

Archaeologists once believed that a commitment to horticulture was one on the main innovations that distinguished the Woodland from the preceding Archaic era. In this respect the Archaic/Woodland distinction has become very blurry, however, as more data have accumulated that show, on the one hand, intensive plant-collecting and even cultivation at very early dates in the Archaic, and on the other, very limited reliance on cultigens of tropical origin until quite late in the Woodland era. Based upon his experience in the Hudson and Upper Susquehanna valleys, Robert Funk (1993a:139) suggested that the whole cultural sequence from Early Archaic through Middle Woodland ought to be collectively lumped as a "Forager" stage of cultural development; Funk saw the transition from Middle to Late Woodland as the shift from this stage to the "Village Farmer" stage.

In Connecticut there is evidence that hazelnuts and cattails were gathered at the Sandy Hill Site by 9500 cal BP. A fragment of "gourd" (*Cucurbita*) rind recovered from the Sharrow Site in Maine was directly dated to 5695±100 rcbp (about 6500 cal BP) (Hart 2008; Petersen and Asch-Sidell 1996). This plant has very bitter flesh, so it may have been grown and used for containers or fishing floats rather than consumed. Laurentian occupants of the Bliss-Howard Site in Connecticut were collecting goosefoot seeds (*Chenopodium*) around 5500 cal BP. Similar gathering of diverse plants by Archaic peoples of the mid-continent resulted in the coalescence by 3800 cal BP of an indigenous horticultural complex, recognized at the Riverton Site in Illinois. The cultivated plants of this complex included domesticated bottle gourd (*Lagenaria siceraria*), marshelder (*Iva annua* var. *macrocarpa*), sunflower (*Helianthus annuus* var. *macrocarpus*), and two cultivated varieties of chenopod (*Chenopodium berlandieri*), and possibly also *Cucurbita pepo* squash and little barley (*Hordeum pusillum*) (Smith and Yarnell 2009). But there is no evidence that millennia of plant-gathering in the Northeast resulted in cultivation and sedentism.

John Hart's project of radiocarbon-dating carbonized residues on sherds at the New York State Museum has produced a date of 2905±35 rcbp for a sherd from the Scaccia Site, in Livingston County, that contains squash phytoliths. A sherd from the Vinette Site contains maize phytoliths in residue dated to 2270±35 rcbp. Some researchers assert that maize was common in central New York by ca. cal AD 500, but it should be cautioned that freshwater reservoir effects can make such residue dates too old by centuries (Fischer and Heinemeier 2003; Roper 2013; but see Hart and Lovis 2014).

Surprisingly old maize, directly dated to 1210±40 rcbp (cal AD 770 to 890) has been reported from the Deposit Airport I Site in Delaware County, New York (Knapp 2009). Site 211-1-1, located on Roeliff Jansen Kill, a small tributary on the east side of the Hudson River, was excavated as part of the Iroquois Pipeline survey (Cassedy and Webb 1999). A date of 810±50 rcbp was reported for maize, but corrected for ^{13}C, this date should be 1050±50 rcbp, or ca. cal AD 985. Hart has emphasized that beans spread into the Northeast much later than maize, but the temporal gap in New England is not great; a bean has been directly dated to 765 rcbp (cal AD 1275) at the Skitchewaug Site in the Connecticut River drainage in Vermont (Petersen and Cowie 2002).

A squash *(Cucurbita*) seed fragment was recovered from a feature at Smithfield Beach on the Upper Delaware along with Clemson Island Punctate pottery; wood charcoal from this feature was dated to 890±60 rcbp. Maize was recovered from the Owasco component of the Medwin Knoll II Site (28Sx266), dated to 720±50 rcbp. Beans were reported from the Intermediate component of the Minisink Site, dated to later than cal AD 1250 (Fischler and French 1991).

About cal AD 900 cordmarked ceramics of the Owasco complex replaced the Point Peninsula types in New York, marking the beginning of the Late Woodland period. In central New York Owasco cultural development can be divided into three sequential phases, based mainly on ceramic style changes: Carpenter Brook (cal AD 1000 to 1200), Canandaigua (cal AD 1200 to 1275), and Castle Creek (cal AD 1275 to 1350) (Ritchie 1965:272; Snow 1980, 1995). Owasco vessels are less conical than Point Peninsula pots but not as globular as later Iroquoian vessels. They had defined necks and flaring rims, and most were decorated with cord impressions around the neck. Collars, sometimes decorated with appliqued human effigies or incised designs, began to appear on Castle Creek phase pots. Stone and clay elbow pipes are also characteristic of Owasco.

The abruptness of the Point Peninsula/Owasco transition is debatable. Ritchie (1965) recognized a brief Hunter's Home phase, transitional between Kipp Island and Owasco. Snow (1995) argued that an abrupt style change took place from Point Peninsula to Owasco, and that Hunter's Home is an artificial construct attributable to assemblage mixing. He hypothesized that Owasco represents the intrusion of Proto-Iroquoians, migrants from a homeland somewhere in the Appalachian uplands. The Owasco economy, unlike their predecessors', was committed to cultivation of maize and squash (beans were a later addition to the diet, after AD 1300) supplemented by fishing, hunting, and gathering. Snow's migration model was weakened by the discovery of maize in Princess Point complex sites in Ontario, dating to as early as AD 600 (Crawford and Smith 1996). As noted above, Hart et al. (2007) have reported even earlier dates for organic residues on ceramic sherds that contain maize phytoliths. Princess Point ceramics are quite distinct from those of the Point Peninsula tradition and resemble Clemson's Island pottery from Pennsylvania in some respects, such as the decoration of vessel necks with punctates. It may be that Princess Point and early Clemson's Island actually represent the Iroquoian intrusion (as Fiedel [1991] suggested).

Particularly on the Upper Susquehanna, the Owasco culture's close relationship to, and perhaps derivation from, the Clemson's Island culture of central Pennsylvania is evident. This can be seen in the near identity of Clemson's Island ceramics, dated to between AD 1000 and 1300, to types of the early Owasco Carpenter Brook phase (Stewart

1988:VIII-2). At the Deposit Airport Site located on the West Branch of the Delaware in Delaware County, New York, early Owasco and punctated Clemson's Island sherds were recovered from the same features, dated to ca. 930 rcbp (ca. cal AD 1100) (Knapp 2009). At Smithfield Beach on the Upper Delaware, a date of 890±60 rcbp (ca. cal AD 1130) was associated with Clemson's Island Punctate sherds (Fischler and French 1991). Notably, several sites that figured in the definition of Owasco phases are located in Broome County, New York (e.g., Castle Creek, Willow Point, Roundtop). Owasco ceramics are associated with triangular points of the Levanna and, after AD 1100, Madison types, which were certainly arrowheads. Owasco assemblages also include a wide variety of bone and antler tools.

Because the geographic extension of particular styles of pottery decoration requires frequent face-to-face interactions between potters (almost certainly women in the Middle and Late Woodland Northeast), archaeologists tend to assume that the distributional boundaries of recognized ceramic types roughly correspond to socio-linguistic entities. This assumption has led to a particularly thorny problem in the interpretation of Owasco. Ritchie (1965) had originally, in the 1940s, accepted Arthur C. Parker's identification of the Owasco culture as the material manifestation of Algonquian speakers, but as he later adopted the *in situ* theory of Iroquoian origins, he envisioned a gradual developmental continuum from Point Peninsula to Owasco to incipient Iroquois culture (e.g. Ritchie 1965:210). But this left the Munsee culture, which Ritchie investigated at the Bell-Philhower Site on Minisink Island, unexplained:

> The Munsee division of the Lenni Lenape or Delaware Nation, of known Algonkian linguistic affiliation, were participants in the Owasco culture in a late prehistoric phase of their development. There seems to be no equally logical alternative to the judgment that Munsee culture, as it first appeared at their Minisink Island capital, conformed with the Castle Creek phase of the Owasco; that it underwent, prior to European impingement, progressive acculturation from neighboring groups, and from developing cultures upriver to the north which can historically be related to Iroquoian-speaking people.… Owasco culture was produced and shared by various groups whose linguistic affiliation included both Algonkians and Iroquoians [Ritchie 1965:299].

It must be emphasized that Algonquian and Iroquoian languages are radically distinct in all respects (phonology, grammar, and vocabulary); if they share a common ancestor, it can only be at great time depth, i.e., Paleoindian or Early Archaic.

There is a similar lack of fit in the ethnolinguistic and archaeological evidence in the Hudson drainage. When the Dutch arrived in the early sixteenth century, the lower Hudson was occupied by the Munsee, who spoke a distinct regional dialect of the Delaware language (a member of the Algonquian family) (Goddard 1978:213). Munsee speakers were divided into numerous social and political units (bands), but these formed a loose network, connected by kinship and marriage ties, that permitted frequent movement of individuals between bands. The Middle and Upper Hudson Valley was occupied by the Mahican. They were not Delaware-speakers, but their Eastern Algonquian language was much more closely related to Delaware than to the Algonquian languages of the native peoples of New England. Nevertheless, as Funk (1976:311) observed, in the Hudson Valley "the fragmentary data for post-Owasco manifestations leave little doubt that there was an unbroken development into ceramic stages similar to the Oak Hill, Chance, and Garoga horizons of the Mohawk Iroquois."

Herbert Kraft (1975b), well aware of the linguistic problem, attempted to define a regionally specific variant of Owasco on the Upper Delaware, ancestral to the Munsee; he called it "Pahaquarra," and contended that it could be distinguished from New York Owasco on five criteria. However, a subsequent re-evaluation of the regional Late Woodland sequence (Williams et al. 1982) concluded that Pahaquarra was not really different from Owasco. Most recently, Hart and Brumbach (2003) have argued that Owasco is a miscellaneous hodgepodge of unrelated traits that should not have been regarded as a coherent, temporally and spatially bounded cultural entity in the first place.

The complete correspondence of presumably ancestral Munsee ceramics to Iroquoian, and specifically Mohawk, types continues through the post-Owasco period, when Upper Delaware types are variations on Chance Incised pottery. Kinsey (1972:393) remarked, "In brief, there is the ambiguity of Iroquoian-speaking and Algonquian-speaking Indians possessing an identical ceramic tradition. This is not what we would expect, and it is regarded as an important and unresolved Late Woodland problem."

The earliest Owasco pottery types in central New York are Wickham Corded Punctate, Carpenter Brook Cord-on-Cord, Levanna Cord-on-Cord, and Canandaigua Plain. The generally accepted ages of the successive Owasco phases are cal AD 1150 to 1200 for Carpenter Brook, cal AD 1200 to 1275 for Canandaigua, and cal AD 1275 to 1350 for Castle Creek. However, recently reported dates on residues suggest that some Owasco types may be substantially older than previously thought, although possible reservoir effects should be borne in mind. New dates for Wickham Corded Punctate are 1425±45, 1260±39, and 1228±42 rcbp. Carpenter Brook Cord-on-Cord sherds have been dated to 1470±43, 1247±48, and 1231±44 rcbp (Hart and Brumbach 2005). Sackett Corded is dated to 810±150 rcbp at the Sackett Site in central New York. Sackett Corded is the predominant middle and late Owasco type; it encompasses Owasco Corded Horizontal, Owasco Herringbone, Owasco Platted, and Owasco Corded Oblique variants (Kinsey 1972:380). Hart and Brumbach (2005) have reported residue dates of 1211±46 rcbp for Owasco Corded Horizontal and 781±42 rcbp for Owasco Corded Oblique. On Minisink Island Sackett Corded and Levanna Cord-on-Cord sherds were dated to 730±50 rcbp (Kraft 1978).

The transition from Owasco into a recognizable proto-Mohawk culture occurred during the Oak Hill phase (AD 1350 to 1400). During the following Chance phase (AD 1400 to 1525) ancestral Mohawk moved into nucleated, fortified villages. Their characteristic Chance Incised pottery was decorated with alternate triangular plats and oblique lines. Deowongo Incised, Durfee Underlined, and Garoga Incised are recognized on the basis of slight design elaborations on the Chance prototype. The culture of the protohistoric Mohawk is ascribed to the Garoga phase (AD 1525 to 1550).

At the Nahrwold No. 1 Site near Middleburgh, most of the pottery (80 percent of diagnostic rims) represents a late Castle Creek Owasco occupation. This occupation continued into the Oak Hill phase; however, the site was virtually abandoned after ca. AD 1400, as only six sherds of Chance Incised and Deowongo Incised were recovered. A feature containing Castle Creek sherds yielded a radiocarbon date of 640±95 rcbp (ca. cal AD 1330). Another feature was dated to 500±80 rcbp (ca. cal AD 1410). This Late Woodland village was not protected by a palisade, which is unusual. Subsistence remains, some recovered from storage pits, included maize and beans as well as acorns, walnuts, butternuts, hickory nuts, and wild plums. Game was hunted with bows and arrows tipped with Levanna triangular points. The meat sources included deer, beaver, woodchuck, bear, fox, elk, turkey, mussels, and fish. Burials of both dogs and humans were encountered at Nahrwold No. 1.

Although the Nahrwold Site was rarely visited after AD 1400, numerous Chance phase villages were located in the Schoharie Creek floodplain, to a point beyond the Fox Creek confluence (Lenig 2013:55). The inhabitants were presumably proto-Mohawk.

D. Contact (Protohistoric) and Historic Periods

It is often speculated that Basque and English fishermen may have been landing on the coast of Labrador or Newfoundland as early as 1480, well before Columbus's discovery of the West Indies; however, there is no concrete evidence of their presence, and the first documented exploration of the northeast shores is John Cabot's expedition of 1497, which resulted in his discovery of Newfoundland. The official record of subsequent sixteenth-century expeditions to North America is rather sparse, but there are two lines of evidence about the high frequency of undocumented interactions between Basque, French, and English fishermen and native inhabitants of the Northeast coast. One is the existence of a Basque-based trade pidgin, used by the Micmac Indians of the Gaspe Peninsula (Bakker 1988). The second is archeological evidence (complemented by a few contemporary observations) of European trade goods, such as glass beads and brass kettles, which began to appear sporadically after 1500 but were already fairly common at interior sites by the 1580s (Noble 2004). They occur particularly in Susquehannock graves of this period, in southeastern Pennsylvania. A Basque whalers' camp, dating to the mid-1500s, has been excavated at Red Bay in Labrador.

In 1524 Giovanni da Verrazzano, financed by a Lyonnaise silk merchants' syndicate and authorized by the king of France, sailed along the Atlantic coast from Florida to Newfoundland. On this voyage he sailed across Delaware Bay, which he named Vandoma, but he did not explore the river. Verrazzano spent less than a day in New York Bay; thinking it was a lake, he called it Santa Margarita and the surrounding lands Angouleme. In Narragansett Bay, Rhode Island, Verrazzano observed that the natives had "many sheets of worked copper which they prize more than gold" (Wroth 1970:137–140). Presumably this was European copper, already obtained from French or Basque traders by "down-the-line" exchange. Similarly, when Jacques Cartier encountered Micmac Indians in Chaleur Bay near the Gaspe Peninsula in 1534, these natives were prepared to trade their furs for hatchets, knives, and beads. Evidently, the Micmacs already knew, from previous encounters, what the Europeans craved.

The first English colonization efforts on the coast of North Carolina, from 1584 to 1587, failed. They made another effort at Jamestown, Virginia, in 1607. In 1608 John Smith set out from Jamestown to explore the shores of the Chesapeake Bay. When he visited the Tockwoghs on the Sassafras River, Smith was surprised to discover that they already had many trade goods, "hatchets, knives, peeces of iron and brasse," which they reportedly had obtained from the Susquehannocks.

In 1609 Henry Hudson, an Englishman financed by the Dutch East India Company, searched for the Northwest Passage to Asia. Instead, he found the Hudson River (first known as the Mauritius, then the North River). He sailed upriver as far as present-day Albany. Hudson also entered the Delaware Bay, on August 28, 1609. Robert Juet, the mate of Hudson's ship, the *Halve Maen* (*Half Moon*), kept a journal in which he remarked that the local Indians (a branch of the Munsees) along the Hudson possessed "red Copper Tobacco pipes, and other things of Copper [which] they did wear about their neckes" (Juet 1609 [1909]:18). These seem to have been trade goods, and the Indians' cautious behavior toward Hudson's crew suggests that they had already had hostile encounters with other Europeans.

Dutch merchants quickly dispatched trading ships to exploit Hudson's discovery by acquiring beaver pelts. The first venture of this sort was in 1611. Ten thousand pelts were reportedly acquired from the Hudson River Indians in the winter of 1613 to 1614 (Kraft 1989). A fortified trading post, Fort Nassau, was established in 1614 on Castle Island in present-day Albany to trade with the Mohawks and their Algonquian-speaking neighbors, the Mahicans. The Dutch agents induced these warring rivals to sign a peace treaty. At about the same time the Dutch built another small fort at Esopus, and in 1615 they built a small fort on Manhattan. Both the British and French attempted to oust the Dutch interlopers, but their attacks were rebuffed. In 1621 the new Dutch West India Company took control of the Hudson River fur trade. In 1624 the company ordered construction of a new fort, Fort Orange, to replace Fort Nassau, which had been destroyed by a flood. Fort Orange served to draw Iroquois hunters away from the French traders on the St. Lawrence; however, the Dutch had some political problems at Fort Orange as they became embroiled in the ongoing hostility between the Mohawks and the Mahicans..

A 1616 map discovered in the Royal Archives in the Hague in 1841 was probably based on a map drawn in 1614 by the explorer and fur trader Captain Adriaen Block (O'Callaghan 1856; Williamson 1959:8). This map shows the upper reaches of a major river west of the Hudson. The names of the Indian nations located along the west bank of this river persisted on Dutch maps as late as the 1680s. Proceeding downriver, these were Maquaas (Mohawk), Canomakers, Senecas (possibly referring to Oneida rather than Senecas), Gacheos, and Capitannasses. According to Weslager (1961:112–113), notations in Dutch in the west portion of this Figurative Map actually refer to the adventures of a Dutchman called Kleytjen and two companions from the crew of the *Fortune*. They left the newly constructed Fort Nassau (now Albany) in the spring of 1614 and wandered toward the southwest. They probably traveled along the Mohawk River before reaching the headwaters of the Susquehanna. They were reportedly ransomed from the Minquaas (Susquehannock) several months later by Captain Hendricksen in the yacht *Onrust* on the lower Delaware.

In the late seventeenth century the Mohawk lived in three "castles" or principal villages, plus several smaller villages. In 1634 and in the 1640s, Dutch and French visitors reported that these villages were located on the south side of the Mohawk River. In 1666 these villages were burned by the French, and afterward the Mohawk rebuilt them north of the river. The easternmost castle was also called the Lower or First Castle. Its name changes often in the oldest accounts, perhaps indicating that it was moved several times. In 1634 it was called Onekagoncka; in 1643 it was Ossernenon or Asserue. At that time the village was located 0.25 mile south of the river, southeast of modern Auriesville (and thus near the mouth of Schoharie Creek). In 1659 this village was called Kaghnuwage (a variant of Caughnawaga) from the Mohawk *kahnawa.ke*, meaning "at the rapids." After it was destroyed by a French expedition in 1666, the village was rebuilt on the north side of the river, west of present-day Fonda, New York (Fenton and Tooker 1978). Given its location west of Fort Nassau (Albany), it seems reasonable to identify the "Canomakers" village shown on the 1616 map as a faulty transcription of *kahnawa.ke* or Caughnawaga. If this equation is correct, this could have been the last Mohawk town Kleytjen and his companions visited before they turned south. The small stream shown on the map as running southeast could then be Schoharie Creek. This would have been a logical route for the Dutchmen to have traversed as they entered Mahican country. If so, they would have been the first European visitors to this area.

Dutch relations with the Indians deteriorated through the mid-seventeenth century, resulting in several wars. In 1664 Britain seized New Netherland, but the Hudson Valley retained a strong Dutch linguistic and cultural imprint for a century and a half after Dutch political sovereignty ended.

The precise chronology and severity of pandemics of European diseases that hit native populations during the Contact period remain matters of debate. On the one hand it would seem that the evident coastal trade contacts starting in the early 1500s provided the setting for transmission of contagious viruses. On the other hand archaeologists familiar with the record of village development in Iroquoia and Huronia (Snow 1995; Warrick 2003) see no evidence of population decline caused by disease prior to 1634. In 1634–1635 the Mohawks were hit by a smallpox epidemic. The cumulative effect of successive waves of European-introduced disease (17 epidemics are recorded in the Northeast between 1624 and 1783) reduced the native population of the Northeast to a small remnant by the mid-eighteenth century—to perhaps 10 percent of the pre-Contact population. While native numbers declined, Euro-American numbers were growing rapidly, from both intrinsic growth of the seventeenth-century settlements and a surge of new immigration after 1710, particularly from Scotland and Germany. Land-hungry settlers pressed on Indian lands.

The first European settlers in the Schoharie Valley arrived almost simultaneously, but they acquired their lands by different means. The Dutchman Adam Vrooman began operating a mill in Schenectady in 1683. In 1711 he purchased about 600 acres from the Mohawks. This tract, located southwest of present-day Middleburgh, became known as Vrooman's Land. Vrooman had two deeds drafted in Schenectady to record the purchase. The first deed, dated August 22, 1711, lists the Indian sellers as Pennonequieeson, Canquothoo, Hendrick the Indian, Kawnawahdeakeoe, Turthyowriss, Sagonadiet, Tucktahraessoo, Onnadahsea, Kahenterunkqua, Amos the Indian, Cornelius the Indian, Gonhe Wannah, Oneedyea, Leweas the Indian, Johanis the Indian, Tuquaw-in-hunt, and Esras the Indian. They represented "the three races or tribes of the Maquase, the Turtle, Wolf and Bear." The tract of 260 acres—200 flats, 60 woodland—was located near the hill "called Onitstagrawa." Vrooman's second deed, dated April 30, 1714, lists eight Mohawk sellers as Sinonneequerison, Tanuryso, Nisawgoreeatah, Turgourus, Honodaw, Kannakquawes, Tigreedontee, and Onnodeegondee. The transferred land was 340 acres of woodland, east of the 60 acres previously sold.

Impelled by their poverty, the effects of a French invasion, glowing reports of available land in the Carolinas, and an invitation from Queen Anne, thousands of Palatine Germans emigrated to England in 1709 (Otterness 1996). From there, 3,000 Germans shipped out to New York in April 1710. The new English governor, Robert Hunter, settled some 700 of them on the Hudson at two temporary camps about 90 miles north of New York City. The East Camp is present-day Germantown; the West Camp was opposite, on the west bank of the river. Hunter's plan was that the Germans would be settled in the pine forests and produce tar for the royal navy. This plan was abandoned and de-funded in September 1712. Some of the German colonists then set out for the Schoharie Valley, arriving in the winter. They had no patents for the land, so the British authorities regarded them as squatters. The Germans settled in seven clusters, or villages, called *dorfs*, each under a leader or headman for whom the dorf was usually named. Johann Conrad Weiser, Sr. (1662–1746) was the headman of Weiser's Dorf (or Wiserdorp), which would become Middleburgh.

The Germans harassed both Vrooman, who settled nearby in 1715, and governmental agents from Albany. The continuing disputes over their land rights led 60 families to emigrate with Weiser to Berks County, Pennsylvania. In 1726 Vrooman obtained another deed from the Mohawks affirming his ownership of Vrooman's Flats. The Indians reserved land for their "castle" at Wilder Hook. John M. Brown (1816), a longtime resident of the area (since 1757, when he was 12 years old), identified the inhabitants of the flats as the "Karigh Ondonte" tribe. He ascribed their origin to:

> a French Indian prisoner; married to a Mohawk Squaw. His name was Karigondonte, whose father-in-law sent him there, and gave him land, for fear that the Mohawk Indians would kill him when they got drunk, and gave him land, as the Mohawk bore a great enmity to the French.
>
> Other Indians, Mohawk, Mohegan, Discarora, Delaware, and Onidas, flocked to him, so that he increased to a nation to about three hundred strong, and established chiefs among them; who then pretended to be the owners of all that vast territory of land, and granted conveyances thereof….
>
> Their chiefs, that remained in my time, were Seth, 'Hansyerry, Joseph Hanelie and Aggy Awner, together with their squaws of the direct line of Karigh Ondonte, namely: Lisiquet, Wawly and Catoline, who always pretended to have the exclusive title of the soil, in the very best of this tract they settled….Here they gave names to three particular hills, namely; Onisto Graw, Conegena and Mohegan, by which they continue to be named this day [Brown 1816].

Brown also reports that the Karigh Ondonte people were devastated by an outbreak of yellow fever in 1775.

Starting in 1713, the German settlers of the valley grew wheat. After a century of cultivation by a growing population, the soil was giving out in the early nineteenth century. In 1819 a farmers' magazine called the soils of the famously fertile Schoharie Flats "totally inert" (Ellis 1946: 136). The 1819 county fair in the village of Schoharie promoted soil conservation (Ellis et al. 1967:171). The local farmers began using deeper-cutting plows to compensate for declining crop yields in the bottom lands (Ellis 1946:142), but this practice accelerated erosion. After ca. 1850, erosion was reduced by reforestation and selective planting. Wheat farming continued into the 1870s, but it was largely replaced by dairying in the middle and lower Schoharie valley (Thompson 1966:210–211).

E. Previous Investigations

Phase I testing of the project area was conducted in May 2016 (Gade et al. 2016). Ninety-eight shovel tests in the floodplain expansion and sedimentation basin area were located within the boundaries of the artifact concentration designated as the Gorge Creek Site 1. Based on the Phase I data, the extent of the Gorge Creek Site 1 was estimated at approximately 6.1 acres. Fifty-eight of the 98 tests contained prehistoric artifacts. In total, 183 artifacts were recovered from the shovel tests. A feature (Feature 1) was identified in Transect 11, Shovel Test 1.

Most of the artifacts (n=136; 74 percent) were found in the plowzone (Ap horizon), 28 artifacts (15 percent) were found in B soils, and 19 artifacts (10 percent) were found in Feature 1. The shovel tests revealed an Ap-B soil sequence within the site and across the entire area of the proposed floodplain expansion and sedimentation basin. The plowzone consisted of dark brown (10YR 3/3) gravelly silt loam that extended to a maximum depth of 40 centimeters below ground surface (bgs). The underlying B horizon soils were dark yellowish brown (10YR 4/4–4/6) gravelly silt loam or silt loam. In several shovel tests a B/C horizon, consisting of dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand, was encountered below the B soil.

The artifact assemblage recovered by Phase I testing consisted of 183 artifacts: four bifaces, one endscraper, four retouched flakes, 21 utilized flakes, 10 cores (845.3 grams), 129 flakes, two cobble tools (199.0 grams), and 12 pieces of FCR (489.6 grams). The assemblage did not include any culturally/temporally diagnostic artifacts.

Feature 1 was identified in Transect 11, Shovel Test 1. Charcoal flecking was encountered at depths of 40 and 60 centimeters bgs within soils similar to the plowzone. Feature 1 contained 19 artifacts, including one retouched flake, three utilized flakes, 13 flakes, one core (113.7 grams), and one piece of FCR (20.1 grams). Because of limited exposure, the feature's size, type, and function could not be determined. The overlying plowzone in this shovel test yielded 11 artifacts, the greatest number found in the plowzone of any of the shovel tests at the site.

The Phase II field investigation was conducted August 23–September 9, 2016 (Gade and Schreyer 2016). It entailed excavation of 102 shovel tests and 16 1x1-meter test units. The shovel tests were spaced 10 meters apart and were arrayed along transects that were located parallel to or on selected Phase I transects. This procedure created transects spaced 7.5 meters apart across the site area. The subsequent placement of units was based on shovel test results and the character of the landform.

Consistent with the Phase I shovel tests, Phase II excavations documented an Ap-B soil sequence across much of the site. The plowzone (Ap) consisted of dark brown (10YR 3/3) gravelly silt loam and typically extended between 20 and 30 centimeters below the surface. B horizon soils were dark yellowish brown to yellowish brown (10YR 4/6-5/6) gravelly silt loam or silt loam. In several shovel tests a B/C horizon was encountered below the B soil; it was a dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand with dense cobbles. In low-lying terrain in the west section of the site, an unplowed remnant of the A horizon was encountered in several shovel tests along Transects 22 and 23, and also in Units 2, 3, 4 and 7. These excavations were located along the lower elevations of the terrace, within a noticeable swale. In these tests, the unplowed A soil lay directly below the plowzone; it was a dark yellowish brown (10YR 4/4-4/6) gravelly silt loam ranging in thickness from 10 to 18 centimeters.

Phase II excavations yielded a total of 1,264 artifacts: nine bifaces, two scrapers, two other chipped stone implements, 101 flake tools, 18 cores, 1,112 flakes, five cobble tools, and 15 pieces of FCR. Of the total, 394 artifacts were recovered from 70 positive shovel tests. The great majority of these (327) came from the plowzone; 56 artifacts were found in the B horizon, and 11 came from the unplowed A horizon soil. Another 870 artifacts were recovered from the 16 units.

Artifacts were found in all units, but the totals varied widely, ranging from 237 artifacts in Unit 2 to two artifacts in Unit 15. After Unit 2, Units 11 and 4 had the next highest artifact totals with 158 and 123, respectively. The remaining units all contained fewer than 100 artifacts; Units 6, 15, and 16 each yielded fewer than 10 artifacts. Sub-plowzone artifacts were found in all but three units (Units 9, 15, and 16). Units 2, 3, 4, and 7 were placed in the portion of the site where shovel tests had encountered unplowed A horizon soils under the plowzone. Combined, these four units yielded a total of 409 artifacts, accounting for almost half (47 percent) of all artifacts found in the 16 1x1-meter units. A total of 163 [175?] artifacts were recovered from the unplowed A horizon soils in these four units (mostly from Units 2 and 4), and 14 artifacts were found in their upper B horizon.

A few of the Phase I and II shovel tests were exceptional for their density of lithic artifacts: Shovel Tests 32:5 (n=29), 20:5 (n=38), 22:2 (n=27), and 11:1 (n=27). These unusual concentrations triggered the placement of Phase II units in the vicinities of these productive shovel tests. Those units generally confirmed patchy artifact concentrations near the most artifact-rich shovel tests. Units 2 (n=237) and 4 (n=123) were placed west of Shovel Test 22:2 and 11:1. Unit 1 (n=63) was located east of Shovel Test 22:2 and west of Shovel Test 22:1 (n=16). Unit 11 (n=158) was placed just west of Shovel Test 32:5. The concentrated patches seemed to be small and isolated. No unit was placed immediately adjacent to Shovel Test 20:5. Unit 16, located about 15 meters southwest of this most productive shovel test, yielded only four artifacts; Unit 13, about 20 meters southeast of Shovel Test 20:5, produced only 17 artifacts. There appeared to be a sharp jump in artifact density represented by shovel tests with more than about 12 artifacts. Phase II units placed near shovel tests with 11 or fewer artifacts generally produced relatively few artifacts: Unit 13, Unit 9 (n=22), Unit 10 (n=19), and Unit 12 (n=26). Some units located near shovel tests with three or fewer artifacts predictably yielded very few artifacts, such as Unit 6 (n=6) and Unit 15 (n=2); however, Units 5 (n=27) and 14 (n=33), although not very productive, contained more artifacts than would be expected from the very low yields of the nearest shovel tests.

The only feature identified in Phase II was Feature 2. This pit feature was first identified in a Phase II shovel test (Shovel Test 22:2) and was further exposed by excavation of Unit 1. The feature became evident at the base of the plowzone, at a depth of 30 centimeters bgs, as a soil stain of reddened (thermally altered) earth with charcoal. It extended into the north and east walls of the unit. Roughly rectangular in shape, Feature 2 measured 70x55 centimeters. A concentration of burned earth measuring 55x23 centimeters was located along the unit's east wall. In profile the feature exhibited relatively straight walls and a flat bottom, and it extended 23 centimeters into the B horizon. The feature matrix consisted of mottled dark yellowish brown (10YR 4/6) and strong brown (7.5YR 4/6) silt loam. A total of seven artifacts were recovered from the feature, consisting of five flakes and two pieces of FCR weighing 62.1 grams.

Apart from the artifacts found in Feature 2, 68 additional artifacts were recovered from Unit 1. This unit did not have an unplowed A horizon soil; the plowzone lay directly atop the B horizon. Sixty-two artifacts were recovered from the plowzone and six artifacts were found in the B horizon.

Unit 11 had the second highest number of artifacts at the site with a total of 158: 131 artifacts from the plowzone and 27 artifacts from the B horizon. This unit was located in the northeast part of the site near Gorge Creek and on a relatively higher elevation of the terrace. Unit 8, located about 30 meters upslope from and east of Unit 11, contained 72 artifacts: 65 from the plowzone and seven from the B horizon.

In shovel tests and units together, 943 artifacts, or 74.6 percent of the total assemblage, were recovered from the plowzone. One hundred seventy-five artifacts (13.8 percent) came from intact A horizon soils below the plowzone, and 139 artifacts (11.0 percent) were found in B soils. The remaining seven artifacts were recovered from Feature 2.

The basal portion of a stemmed point typed as a Lamoka was recovered from the plowzone of Unit 13. An untypable basal fragment of another, side-notched point came from the plowzone of Unit 11. The Lamoka-like point suggests a Late Archaic presence at the site. A pre-Woodland date (older than 3000 rcbp) is also suggested by the apparent absence of pottery.

Gade and Schreyer examined artifacts found on the plowed surface of the site by Tom Anderson, a local collector. They recognized in his collection several Late Archaic Lamoka and Snook Kill points, as well as Orient Fishtail points. They also noted a basal fragment of what seemed to be a Turkey Tail point. Their photograph of the collection also seems to include two triangles, which could date to the Late Woodland or alternatively to the Middle or early Late Archaic. A side-notched point in the same photograph could be a Meadowood or Brewerton.

Anderson showed Gade and Schreyer a map he had drawn showing artifact locations and the relative distribution of Lamoka and Orient Fishtail points on the terrace. According to the map, he found Lamoka and stemmed points in an area southeast and outside the Gorge Creek project area. Anderson collected Oriental Fishtail points in the northeast portion of Gorge Creek Site 1 where the east portions of Phase I Transect 1 and Phase II Transect 20 were located.

If one combines the Phase I (n=183) and Phase II (n=1264) artifacts, the total assemblage from the Gorge Creek Site 1 numbers 1,447 prehistoric artifacts. All of these are lithics; no pottery has been recovered. The paucity of projectile points is clearly attributable to previous surface collection.

The variety of tool types recognized in the Phase I and II assemblages suggests that multiple and varied activities occurred at the site. Many expedient flake tools with flaking or wear on one or several edges were found across the site. Gade and Schreyer (2016) noted that only 15 pieces of FCR were found in the Phase II excavations. It is unlikely that collectors would have removed any FCR, so this rarity is probably representative of the actual low frequency of FCR on the site. Their near-absence may indicate that few long-term hearths were created during occupations. This could imply that cooking was rarely undertaken, or that the site was mainly inhabited in the summer, when the warmth of fires was not needed. Despite the absence of preserved bone or macrobotanical remains, Gade and Schreyer suggest that the inhabitants procured and processed plant and animal resources. They interpret the Gorge Creek Site 1 as a composite of short-term camps and seasonal occupations that occurred throughout the Late Archaic period. They also note the likelihood that the site extends beyond the APE boundary and that artifacts may be present elsewhere on the terrace outside the APE as well as on the other side of Gorge Creek.

Historic-era agriculture severely affected the integrity of the prehistoric cultural deposits at Gorge Creek Site 1. The great majority of the artifacts were recovered from the plowzone (74 percent in Phase I, 74.6 percent in Phase II). However, artifacts also were recovered from the upper B horizon soils, usually within the first 10 centimeters (about 11 percent of the Phase II assemblage). Additional analysis (e.g., of the relative sizes of flakes in the A vs. B horizons) would be necessary to determine if the artifacts in the lower zone are *in situ* or have been redeposited from the plowzone due to cryo- or bioturbation. In several shovel tests and Units 2, 3, 4, and 7, artifacts were found in a distinct stratum intervening between the plowzone and the B horizon. Gade and Schreyer designated this stratum as an unplowed A horizon that contained *in situ* archaeological deposits. They did not reconstruct the depositional processes that formed this horizon. Does it represent overbanking of the stream, or incorporation of organic detritus from the prehistoric campsites, or an old plowzone? Whatever its origin, on the basis of Phase II data, Gade and Schreyer estimated that this unplowed A horizon extends over an area of about 760 square meters of the terrace. Thirteen percent (n=175) of all Phase II artifacts came from the unplowed A horizon in this part of the site.

Gade and Schreyer (2016:12) recommended Gorge Creek Site 1 as eligible for the National Register of Historic Places under Criterion D (i.e., it has yielded, or may be likely to yield, information important in prehistory or history). They emphasized the presence of artifacts in the unplowed A horizon soils and in the upper B horizon soils as well as the recognition of a pit feature. The latter raised the possibility that other features may be present. “Specifically, the site provides an opportunity to examine and expand our knowledge regarding settlement, subsistence and community patterning of Late Archaic period occupations along Gorge Creek, a small tributary in the Schoharie Creek valley” (Gade and Schreyer 2016:12).

III. Research Design

A. Feasible Research Issues

Phase I and II investigations exposed only a small percentage of the Gorge Creek Site 1, but they were sufficient to perceive the general character of the site. An absence of pottery indicates that the occupations were Archaic. Lithic debitage was fairly abundant, but diagnostic projectile points were very rare. Formal tools were also rare, but flakes reportedly were used frequently as expedient tools. Almost all of the debitage came from the plowzone, making it impossible to distinguish successive occupation episodes by their vertical relationships. It was reported, however, that Orient fishtail points had been collected from the surface mainly in the northeast sector of the field. No calcined bones or carbonized botanical remains were recovered. Two “features” were encountered below the plowzone, but based on the brief descriptions and minimal analyses, it is unclear if the excavators determined these to be either anthropogenic or of prehistoric age. In one area of the site, a stratum was recognized below the plowzone that was reported as possibly a buried A horizon, although its process of formation was not explicated.

Gade and Schreyer (2016:12) suggested that these research topics could be addressed by additional recovery of cultural deposits from the Gorge Creek Site 1:

1. Settlement System/Site Function
2. Subsistence Patterns
3. Community Pattern
4. Cultural History

In view of the data available from the previous investigations, however, it appeared unlikely that subsistence patterns and community patterns could be addressed. Given the absence of any organic remains (apart from charcoal flecks), subsistence patterns could not be studied directly. Nevertheless, analysis of wear traces on utilized flakes could possibly indicate whether predominantly plants (e.g., grasses, wood) or animal materials (bone, meat, hides) were being processed on-site.

It would also be difficult to retrieve any information about “community pattern.” It was not impossible that Archaic postmold patterns might be revealed. Woodland-age postmolds have been exposed at other sites along Schoharie Creek (Rafferty et al. 2014; Ritchie and Funk 1973; Rieth 2008, 2012); however, such traces of older Archaic dwellings are very infrequently encountered. Nothing found in previous investigations of the Gorge Creek Site 1 suggested that postmolds would be present. Lacking clear evidence of the locations of residential households, little can be said about the community’s spatial organization.

Given the probability that Phase III excavations would recover mainly additional debitage, perhaps more temporally diagnostic projectile points, and possibly a few sub-plowzone features with datable charcoal, the Phase III research design focused on issues of (1) “cultural history” (chronology) and (2) site function as inferred from aspects of lithic technology.

B. Chronology

Basically, there are two ways to construct a chronology for this site. One is to assemble a substantial collection of projectile points. Based on their distinctive basal morphology and radiocarbon-dated associations at numerous sites, these artifacts can be assigned to temporal spans of approximately 500 to 1,500 years. The relative numbers of points of each type may be used as an index of the frequency/intensity of site use during each period.

A complementary or alternative strategy for establishing the site’s chronology is to recover organic material from hearths or pit features, which can be sampled for dating by radiocarbon assays. This was the primary rationale for targeting most of the data recovery effort at the portion of the site where features were most likely to be encountered. Features could also yield material such as charred nut shells, seeds, and calcined bones that would be useful for reconstruction of subsistence and environment. Additionally, charred nuts and seeds are the preferred samples for radiocarbon dating because the "old wood effect" is minimized. A piece of wood may be burned in a hearth many years after the tree's death, and radiocarbon dating establishes the time of death (after which atmospheric carbon dioxide was no longer absorbed), not the time of burning. In contrast, nuts and seeds are likely to have been burned very soon after they were harvested.

Recovery of datable charcoal from features in the central and northeast sectors of the site might provide samples for several accelerator mass spectroscopy) (AMS) radiocarbon assays. Many of the extant radiocarbon dates that underpin regional chronology predate introduction of the AMS technology in the late 1980s. AMS dates are much more precise and often more accurate than the older assays. An example of the improved chronological resolution provided by AMS is the recent re-dating of the Terminal Archaic and Late Woodland components at the Little Wood Creek Site in Fort Edward (Grossman et al. 2015).

In principle, the most frequent and intensive occupations of a site should leave behind both the greatest numbers of artifacts, including typologically diagnostic specimens, and also the greatest numbers of features and organic detritus suitable for radiocarbon dating. However, because site function changes over time, and preservation and sampling techniques are not exact, these kinds of evidence may not coincide precisely. An example of such incongruity can be seen at the Pethick Site. Of the 81 typable points, only two (2.5 per cent) (a Perkiomen and a Susquehanna Broad) can be attributed to the portion of the Terminal Archaic between ca. 4000 and 3600 cal BP. However, two (20 percent) of the 10 radiocarbon dates reported for the site fall within this period. On the other hand, 27 (33 percent) of the 81 identified points from Pethick are Meadowood, and similarly three (30 percent) of the 10 dates are appropriate for the Meadowood phase (2510±40, 2640±60, and 2670±110 rcbp). For comparison, it may be noted that Funk (1993a:299–307) reported a fairly close correspondence of the relative frequencies of projectile point types and components of each period, both in the Upper Susquehanna Valley and the Hudson Valley; however, in both regions Late Archaic points (Sylvan Stemmed in the Hudson Valley, Vestal in the Upper Susquehanna Valley) were over-represented relative to the numbers of components of these phases.

The only typable artifact recovered in previous investigations at the Gorge Creek Site 1 was the basal portion of a Lamoka-like point; however, the points collected in this vicinity by local amateur Tom Anderson include Lamoka-like points, Snook Kill, Dry Brook, Orient Fishtail, a possible Turkey Tail, and a few side-notched (Meadowood or Brewerton) points. This evidence suggests that the site was occupied intermittently between ca. 5500 and 2500 cal BP. A few triangles in Anderson's collection might indicate either a discrete Late Woodland presence or another Middle or early Late Archaic occupation. The preponderance of Orient and Dry Brook fishtail points in the collection suggested that the site was occupied most intensively around 3500 to 3200 cal BP.

The likely presence of an Orient Fishtail component at the Gorge Creek Site 1 offered an opportunity to address a research issue that has been raised by recent work at the Pethick Site. Rafferty et al. (2014) suggest that this site, and others along Schoharie Creek, were located at the boundary between contemporaneous, distinct cultural zones: Orient Fishtail to the east and Meadowood to the west. They do not explicitly address the obvious question of whether those zones, defined by sharply distinct projectile point styles, represent discrete ethnic, linguistic, or political entities. Nevertheless, "We argue that the Pethick site was occupied by populations exhibiting Early Woodland and Transitional tool kits not sequentially, but consecutively (i.e., two populations alternatively occupying the site over time) and perhaps simultaneously" (Rafferty et al. 2014:184).

Orient Fishtail, clearly derived from the preceding aceramic Terminal Archaic or Transitional Savannah River/Snook Kill/Susquehanna/Perkiomen tradition, is generally regarded as the final expression of this tradition. The temporal division between Terminal Archaic (without pottery) and Early Woodland (with pottery) has generally been set at 3000 rcbp (3200 cal BP). Most Orient-associated radiocarbon dates fall on the early side of the boundary, beginning about 3200 rcbp (3400 cal BP) (Fiedel 1988), although a few dates are as late as ca. 2800 rcbp (2900 cal BP) (albeit with large standard errors). Orient Fishtail points are associated with carved soapstone vessels but also, rarely, with soapstone-tempered clay pots. Meadowood points are often associated with Vinette I pottery and therefore are assigned unambiguously to the Early Woodland. Radiocarbon dates for Meadowood generally fall between ca. 2900 and 2400 rcbp (3000 and 2500 cal BP); an anomalously early outlier from the Fortin Site on the Upper Susquehanna is 3180±95 (ca. 3300 to 3500 cal BP). Meadowood points seem to have developed from the small, notched points (e.g., Hind) that are found in southern Ontario and the northern Midwest between ca. 3500 and 2800 rcbp.

No credible Orient-associated dates are later than ca. 2750 rcbp (2850 cal BP or 880 cal BC). The end of the Terminal Archaic tradition thus appears temporally and perhaps causally associated with an abrupt climate event.

Numerous environmental records in Europe indicate a climatic downturn around 800 to 750 cal BC, which coincides with a radiocarbon "cliff" indicating weakened solar activity. Atmospheric ^{14}C increases and dates drop abruptly from 2750 to 2450 rcbp (Fiedel 2001; Martin-Puertas et al. 2012; Van Geel and Mauquoy 2010). The "cliff" is followed by a plateau; between 2750 and 2400 cal BP, radiocarbon dates are indistinguishable, always ca. 2450 rcbp. Martin-Puertas et al. (2012) have recently shown that a simultaneous sharp increase in windiness and increase in cosmogenic beryllium (^{10}Be) occurred at ca. 2760 cal BP in central Europe; they infer that "changes in atmospheric circulation amplified the solar signal and caused abrupt climate change about 2800 years ago, coincident with a grand solar minimum." This climate change is coincident with Bond event 2 in the North Atlantic, and a probably associated climate episode shows up very strongly in the strontium/calcium ratios from Buckeye Creek Cave in West Virginia (Springer et al. 2008: figure 1).

Shuman et al. (2009) infer numerous prehistoric episodes of regional drought from the occurrence of sand layers attributed to lowered water levels in New Long Pond, Massachusetts. Among these is a drought dated to ca. 2980 to 2760 cal BP. Newby et al. (2011) report a similar drought record from Davis Pond. Low water levels are inferred for most of the period from 3500 to 2300 cal BP. Pollen sampled from Ballston Lake, located between Saratoga and Schenectady, shows an increase of conifers, hardwoods, and boreal taxa at about 2680 cal BP (2520 rcbp); this is interpreted as marking a shift to a colder climate (Toney et al. 2003). Very close to the Gorge Creek Site 1, Van Nest (2004) ran a transect of cores across the floodplain of Schoharie Creek west of Middleburgh, and two radiocarbon dates from the lowest strata show that the Holocene alluvial deposits there are no older than ca. 2700 rcbp (see Chapter II.B). This evidence suggests that a change in the creek's sediment load and overbanking behavior coincides with the ca. 800 cal BC climate event.

C. Site Function: Inferences from Lithic Technology

The uniformity of raw material, the lack of stratigraphic separation, and the ubiquity of utilized flake tools across the site combined to create a probably erroneous impression of the unchanging function of the Gorge Creek Site 1 through time, However, Anderson's collection suggested at least three discrete occupation episodes, each separated by centuries from the next: Lamoka (ca. 5500 to 5000 cal BP); Snook Kill (ca. 4200 to 3800 cal BP) and Dry Brook-Orient (ca. 3500 to 2900 cal BP). Both earlier (Brewerton or Middle Archaic) and later (Meadowood and Late Woodland) occupations might also be present. It would be surprising if the site were used in exactly the same way in each of these episodes, particularly as a cultural discontinuity probably occurred between the Lamoka and Snook Kill horizons. On the other hand, if the resources available in this location did not change significantly in the course of millennia, the basic processing tasks that entailed the use of many expedient flake tools may have varied little from one occupation episode to the next.

It is doubtful whether the entire site would have been occupied during any single occupation episode. The possibility of isolating a Terminal Archaic camp was raised by Anderson's observation that Orient Fishtail points were concentrated in the northeast sector of the site.

Previous investigations indicated the existence of several discrete clusters of high-density debitage across the site. Louis Berger investigators anticipated that wider exposure of these areas by manual excavation and mechanized stripping might clarify their character. Are they simply patches where historic-era plowing was less intense, so that artifacts were less dispersed than elsewhere? Alternatively, do they represent the remnants of discrete lithic reduction/processing areas? In that case do the separate clusters represent distinctive lithic reduction strategies? If so, can these strategies be tied to particular cultural phases? To do so, it would be helpful to tie any perceptible artifact concentrations to closely associated sub-plowzone features dated by radiocarbon and/or typological dating of their artifact contents.

The uniformity of the lithic materials used at the site (almost all locally available Onondaga chert, with just a few pieces of Esopus chert), indicated that any toolstones that may have been procured elsewhere during other seasonal phases of the settlement round were not transported here. Similarly, the apparent absence of exotic toolstones suggested that interactions with neighboring societies, or with more distant groups, were not manifested in the exchange of lithics. The uniformity of lithics at the Gorge Creek Site 1 also makes it more difficult to tease out assemblages attributable to distinct Archaic sub-periods because such culturally diagnostic exotic materials as jasper, rhyolite, Ramah chert, or Flint Ridge chert are not present. Curiously, the absence of exotic lithics at this site contrasts with the nearby (about 11 kilometers [7 miles] to the north) Schoharie Creek II Site, where, in addition to Eastern Onondaga chert, the Early Woodland component included debitage of chalcedony, Pennsylvania jasper, Kalkburg, and Normanskill chert (Rieth 2008, 2012).

Nevertheless, some insights into regional settlement patterns may be possible by comparing the Gorge Creek Site 1 assemblage with those recovered from Schoharie Creek II (Rieth 2012) and the nearby Pethick sites (Rafferty et al. 2014). A cursory comparison reveals that the Gorge Creek Site 1 chipped stone assemblage from Phase II (n=1,244) has a much lower proportion of shatter and broken flakes (n=247; 19 percent) than Schoharie Creek II, where these constitute about 64 percent of the lithics (22,772 out of a total of 35,837). At the Pethick Site an even greater percentage of the lithics is classified as shatter (177,889 of a total 188,406, or about 94 percent) (Rafferty et al. 2104:186). At the Gorge Creek Site 1, a much higher proportion of flakes were utilized (n=101; 8 percent of all lithics) than at Schoharie Creek II, where only 383 flakes had use wear (a little more than 1 percent of the lithic assemblage). Only 723 utilized flakes (less than 0.5 percent of total lithics) have been recognized at the Pethick Site.

At Schoharie Creek II, projectile points represented a remarkably small proportion of the total lithic assemblage; only nine points were found. Many more points have been recovered from the Pethick Site; the 180 points include 33 Levanna, 27 Meadowood, six Orient, five Adena, four Brewerton, two Madison, two Jack's Reef, one Perkiomen, one Susquehanna, and 99 unidentifiable points (Rafferty et al. 2014:186). Although only two points were found in the excavations at the Gorge Creek Site 1, many more were collected from the surface by Anderson. It is noteworthy that one of the few typable points from Schoharie Creek II is an Orient Fishtail, another appears to be a Dry Brook Fishtail, and a third is a Meadowood. The Terminal Archaic fishtail types are well represented in Anderson's surface collection from the Gorge Creek Site 1. Of course, the differing scales of the total assemblages may be affecting these comparisons. One of the rationales for additional excavation at the Gorge Creek Site 1 was to obtain a larger artifact sample, which might clarify whether these ostensible inter-site differences are real or only a statistical result of small sample size.

It is possible that the ostensible high frequency of utilized flakes at the Gorge Creek Site 1 may be a culturally diagnostic trait. Kraft (1970:9) reported his recovery of nearly three dozen utilized flakes from the Orient Fishtail component of the Miller Field Site in northern New Jersey. These were mainly of a specialized form with convex or concave edges. Kraft also reported utilized flakes from the slightly older Broadspear component of the site; such tools had not previously been recognized in Terminal Archaic assemblages. It would be necessary to closely examine utilized flakes from the Phase III excavations to determine if (1) the edge wear was really caused by prehistoric use or by plow damage or other post-depositional processes; and (2) if there is any morphological consistency that might indicate a cultural template similar to the specialized Orient forms from Miller Field.

IV. Archaeological Methods and Techniques

A. Fieldwork

In the data recovery plan (attached as Appendix B) Louis Berger proposed Phase III data recovery procedures that would address the research issues described in Chapter III by means of two complementary strategies: (1) manual excavations in the locations where previous research indicated the highest densities of artifacts and features, and (2) mechanical stripping of areas with lower artifact densities to identify features at the plowzone/B horizon interface.

The placement of individual test unit excavations addressed two specific archaeological objectives. First, the excavations were located to recover sufficient quantities of artifacts needed to address the research issues. Second, areas were exposed to identify additional features and discrete or clustered activity areas, such as those focused around prehistoric hearths or storage pits. If features were exposed, flotation samples would be taken for attempted recovery of the faunal and floral remains needed for radiocarbon dating and inference of prehistoric subsistence practices and seasonality.

Louis Berger manually excavated 36 square meters (388 square feet) arrayed in four blocks of nine units each. The placement of these excavation blocks was determined primarily by the quantities of artifacts reported from the Phase I and Phase II shovel tests and units. During manual excavation, all soil horizons were removed using shovels and trowels. The excavation of block units began with removal of the plowzone, about 20 to 30 centimeters deep. The buried A horizon and B horizon were then excavated by 10-centimeter intervals within natural/cultural horizons. All soils were screened through 0.25-inch hardware cloth. The locations of diagnostics identified *in situ* were recorded with three-dimensional coordinates.

The Phase III data recovery anticipated discovery of a few features. Any cultural features encountered would be numbered, photographed, and mapped; they would then be bisected and profiled. A sample for flotation from each feature would be taken, consisting of up to approximately half of the feature. This general sample size might be adjusted in cases where the features were larger. Charcoal or other carbonized materials present in feature fill would be sampled for radiocarbon assay. In fact, however, only a few non-cultural soil anomalies were encountered below the plowzone.

Field observations and excavation data were recorded on standardized forms developed by Louis Berger. Excavated soils were recorded and described in terms of both texture and color, using USDA soil classifications and Munsell charts. Digital photographs of the site area and excavations were taken as appropriate. All excavations were backfilled upon completion, and all safety regulations were strictly followed during the investigations.

Following manual excavations, a straight-bladed backhoe was used to mechanically strip off the 30-centimeter plowzone from selected portions of the site in an effort to identify features at the plowzone-subsoil interface. Louis Berger estimated that approximately 3,700 square meters (40,000 square feet) would be stripped. In actuality, 3,691 square meters (39,730 square feet) were stripped from 12 areas.

Louis Berger archaeologists monitored the mechanical stripping operations at all times, examining the stripped surface for soil anomalies and guiding the depth of excavations. Once the interface potentially containing cultural deposits and features had been exposed by the machine, archaeologists hand-skimmed the remnant overburden and examined the surface for prehistoric cultural features, rock and artifact clusters, and soil anomalies. All soil stains identified during this process were pin-flagged for further review to determine their cultural vs. natural status. A number designation was assigned to each potential cultural feature. All numbered potential features were mapped using global positioning system (GPS) technology, and where multiple features were identified, digital photographs were taken of the feature clusters.

B. Artifact Analysis

At the conclusion of the field investigations, all recovered materials were transported to Louis Berger's laboratory where artifact analysis was undertaken.

Specific laboratory tasks for preliminary treatment of cultural materials included the following.

- All recovered materials were cleaned and conserved to ensure their stability. Prehistoric bifaces, flake tools, utilized flakes, and other artifacts that might be examined for edge-wear traces were minimally processed pending appropriate analysis.

- All materials were fully provenienced and labeled. The artifacts were prepared for permanent curation.

- To the extent possible, all recovered lithic artifacts were identified as to cultural and temporal affiliation, raw material type, and formal and functional categories.

As discussed in Chapter III, the research orientation of the data recovery focused on the site's chronology, cultural affiliations, and definition of site function(s) in the regional settlement systems of several periods. Laboratory classification and analyses of artifacts were oriented toward these research issues.

As a first step in analysis of the lithic artifacts, they were sorted into tool and debitage classes. Following this, they were sorted and analyzed with respect to functional morphology, technological stages, and metrical and other attributes (e.g., color, texture and inferred source of the stone).

Projectile points were assigned to recognized regional types. This classification is crucial for establishing the chronology of the site as a whole, and possibly for distinguishing sectors occupied by distinct social groups, whether sequentially or simultaneously. Breakage patterns, edge and tip wear, and re-working were noted. Other formed tools were classified as end- or sidescrapers, knives, drills, or other functional classes based on a combination of morphology and any observed use wear or breakage.

A major goal of the analyses of debitage, cores, and incomplete bifaces was to determine the intensity, stages, and distinctive strategies of lithic reduction activities at the site. For the bifaces the presence/absence of cortical surfaces and width-to-thickness ratios indicated stage of reduction. For cores the size, shape, extent of cortex, and flaking patterns were recorded.

Lithic debitage, including all types of flakes created in the lithic reduction sequence, was counted and measured. Raw material type, lithic reduction stage (blocky shatter, decortication, early stage, biface reduction, thinning) and presence/absence of cortex were also recorded. Whole and broken flakes (lacking the original striking platform or termination) were distinguished.

Based on reported Phase I and II data, the Gorge Creek Site 1 lithic assemblage appeared to contain an unusually high percentage of utilized flakes. To confirm or refute this finding, which has important implications for the site's function and role in the regional settlement system, it was necessary to devote special attention to this artifact class. All debitage was visually inspected for patterned edge damage and/or retouching. A sample of those artifacts with ostensible edge alteration were examined using low-power microscopy to identify micro-flake scars, snap fractures, step fractures, and edge rounding.

The Phase I and II investigations found no ceramic sherds; nevertheless, given the presence of a likely Meadowood point and a few triangles in Anderson's surface collection, Woodland occupations appeared to be present, so finding potsherds was considered possible. Although the laboratory had procedures in place for ceramic analysis, the Phase III excavations recovered no sherds. The laboratory was also prepared to process samples of carbonized material from features; however, no cultural features were identified.

Following analyses of the lithic artifacts, a spatial analysis focused on horizontal variation in the distributions of lithic tool types and debitage. Of particular interest were any perceptible differences between the northeast sector of the site, putatively dominated by Orient phase materials based on a surface collection, and the central sector. The data for each block were also compared to data from other assemblages from the Schoharie Creek drainage, the mid-Hudson, and western New York.

V. Fieldwork Results

A. Block Excavations

Louis Berger began the data recovery excavations on April 26, 2017. The first stage was manual excavation of four blocks, each consisting of nine 1x1-meter units, for a total of 36 square meters (388 square feet) (Photograph 1). The placement of excavation blocks and units was determined primarily by the quantities of artifacts reported from the Phase I and Phase II shovel tests and units (Figure 2). Manual block excavation concluded on June 7, 2017.

Block 1 (Units 1-9) was located between Phase II units 2 and 4. Block 2 (Units 10–18) was placed south of Phase II Unit 11. Block 3 (Units 19–27) was located just north of Shovel Test 28-2, which had produced 16 lithic artifacts. Block 4 (Units 28–36) was placed to the west of Shovel Test 20-5, which had yielded 38 pieces of debitage.

1. Block 1

A total of 1,322 artifacts were recovered from Block 1. The greatest number (n=196) came from Unit 8; Unit 4 was the least productive (n=83) (Table 1).

TABLE 1

LITHIC ARTIFACTS RECOVERED FROM BLOCK 1, GORGE CREEK SITE 1 DATA RECOVERY

UNIT	UTILIZED FLAKE/ FLAKE TOOLS	FINISHING FLAKES	BIFACE REDUCTION FLAKES	FLAKE FRAGMENTS	DECORTICATION FLAKES	IRREGULAR/ SHATTER	CORES	TOTAL
1		4	61	38		16		119
2			55	68		19		142
3	1		85	74		20		180
4	2		39	28		14		83
5		1	91	17		18		127
6		1	88	32	1	58		180
7			89	15	1	16		121
8		1	80	70		45		196
9			75	77	2	19	1	174
All	3	7	663	419	4	225	1	1322

Thirty-six artifacts (a little less than 3 percent of the total) came from Stratum B. These undoubtedly represent downwards drift from the plowzone (Stratum A).

Stratum A was an Ap horizon that consisted of a dark brown (10YR 3/3) silt loam that terminated between 25 and 39 centimeters (0.82 and 1.28 feet) bgs. This overlaid a yellowish brown (10YR 5/6) sandy loam subsoil that was excavated at least 10 centimeters (0.33 foot) below the plowzone. Rock content was significantly greater in the subsoil compared to the plowzone (Figure 3; Photograph 2).

2. Block 2

A total of 525 artifacts were recovered from Block 2. The greatest number (n=82) came from Unit 12, and the lowest number (n=48) came from Unit 18 (Table 2). Fifteen chert chunks were collected during excavation but were discarded as non-cultural upon later examination in the laboratory.

PHOTOGRAPH 1: Block Excavation, View East

PHOTOGRAPH 2: Plan View of Block 1, View North

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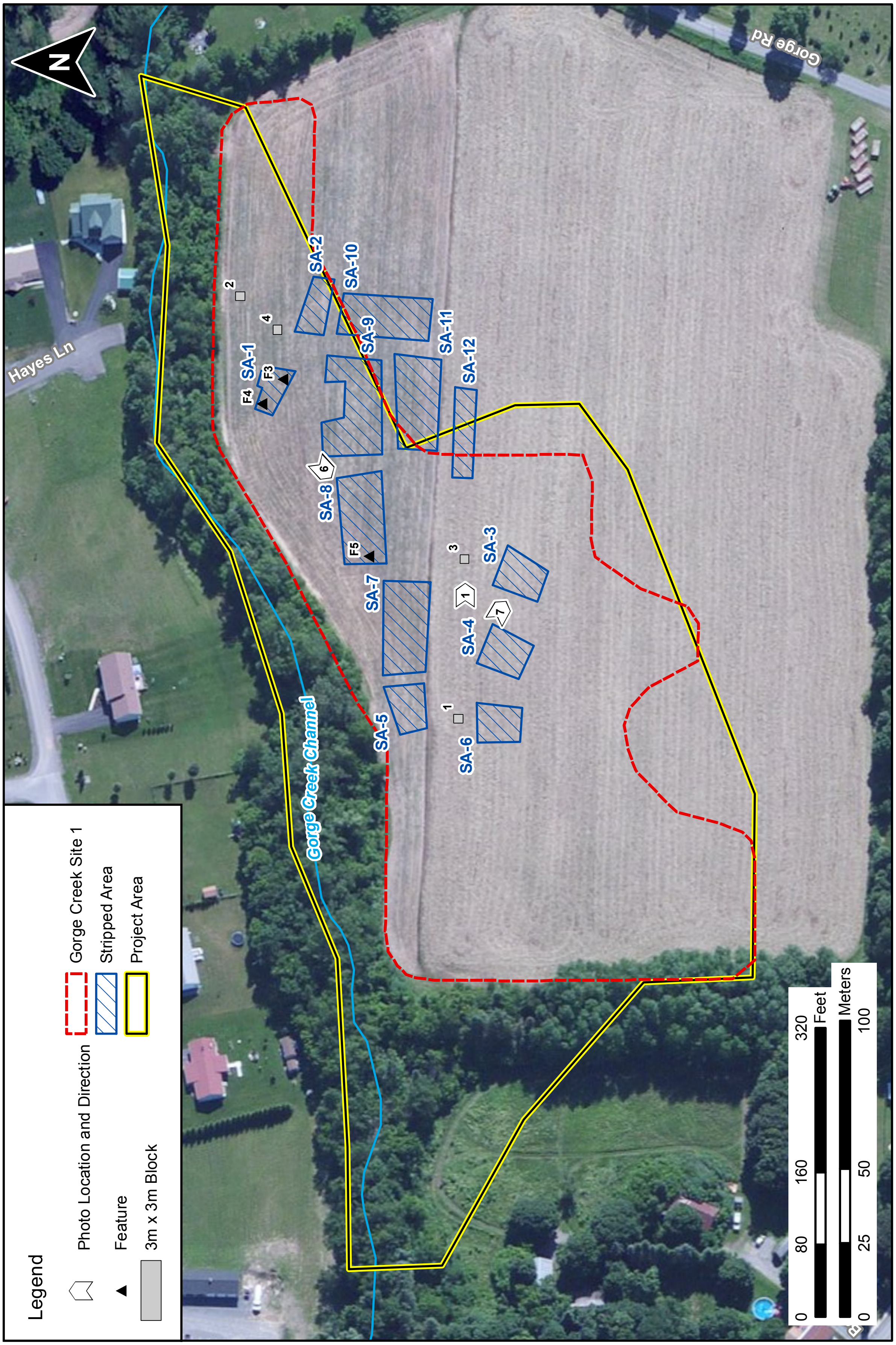


FIGURE 2: Locations of Phase III Block Excavations and Mechanically Stripped Areas (ESRI World Imagery 2015)

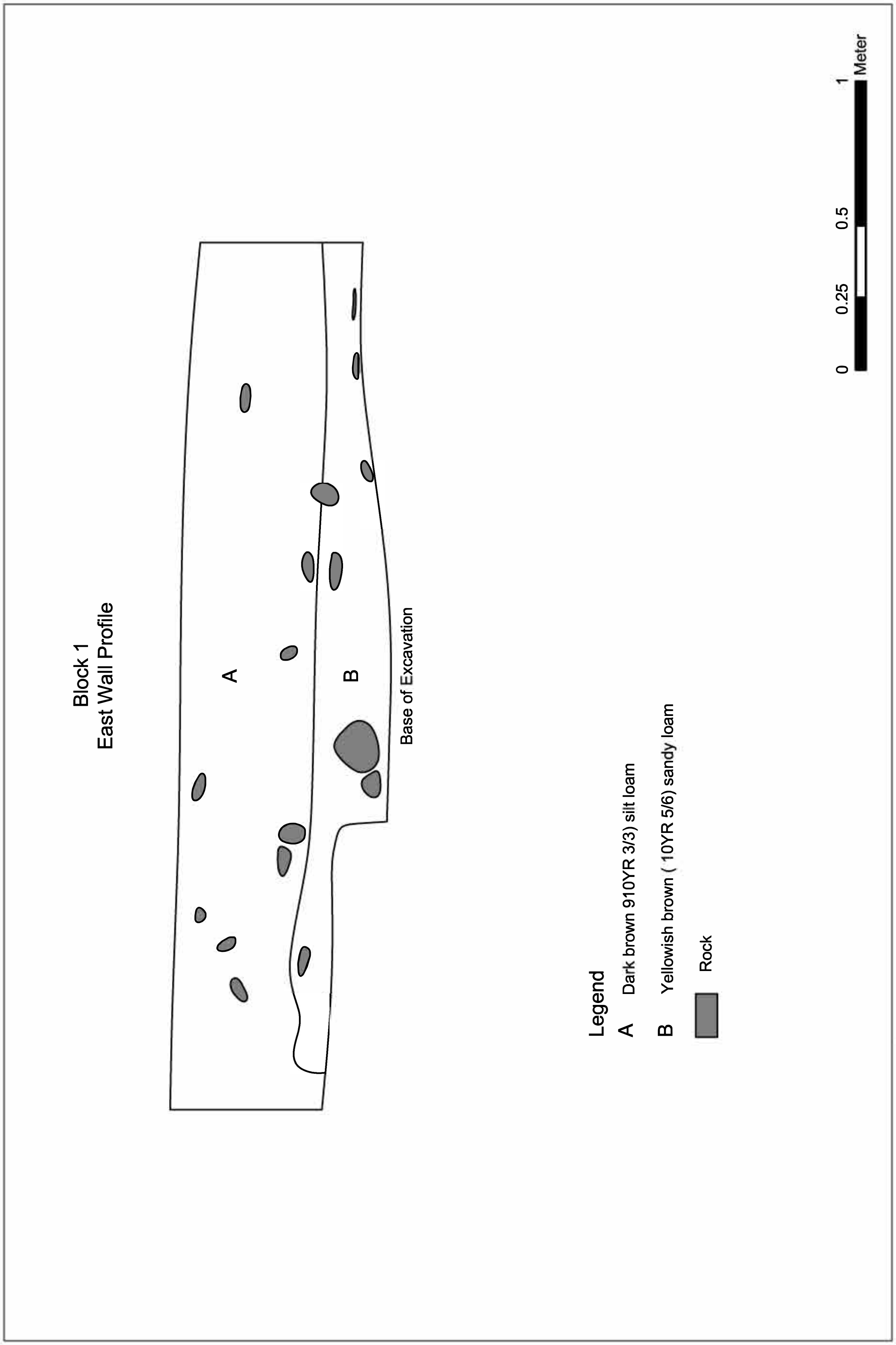


FIGURE 3: Stratigraphic Profile of East Wall, Block 1

TABLE 2

LITHIC ARTIFACTS RECOVERED FROM BLOCK 2, GORGE CREEK SITE 1 DATA RECOVERY

UNIT	BIFACES/ TOOLS	FINISHING FLAKES	BIFACE REDUCTION FLAKES	EARLY FLAKES	FLAKE FRAGMENTS	DE-CORT.	IRREGULAR /SHATTER	CORES	TOTAL
10			27		19		4		50
11	3		41		19				63
12	1	1	53	5	4		17	1	82
13			29			1	1		31[+11]
14			39	1	4		11		55
15	1		51		6		19		77[+4]
16			42		2		18		62
17			34				23		57
18			31		8		9		48
All	5	1	347	6	62	1	102	1	525[+15]

Fifty-nine artifacts (11 percent of the total) were recovered from uppermost Stratum B. These are interpreted as the result of downward drift from the plowzone and have not been distinguished in analyses.

Stratum A consisted of a dark brown (10YR 3/3) silt loam Ap horizon with 1 to 5 percent subrounded to subangular cobbles. The depth of the plowzone ranged from 25 to 41 centimeters (0.82 to 1.35 feet) bgs. Stratum B consisted of a fine-grained olive brown (2.5Y 4/4) sandy loam. This was primarily located along the north and east portions of the block. The west and south portions of the block contained a brown (10YR 4/3) gravel intrusion consisting of loose granules and pebbles (Figure 4; Photograph 3).

3. Block 3

A total of 412 artifacts were recovered from Block 3. The greatest number (n=64) came from Unit 21; nearly as many (n=63) were found in Unit 23. The lowest number (n=25) came from Unit 19 (Table 3). Twenty-eight chert chunks were collected during excavation but were discarded as non-cultural upon later examination in the laboratory. The basal portion of a Brewerton Corner-notched point was found at the base of the lower plowzone (Stratum B) of Unit 21 in the northeast part of the block.

The stratigraphy of Block 3 was more complex than that of the other blocks. The plowzone contained an upper and a lower division (Strata A and B). About half of the artifacts came from the lower plowzone (Stratum B) or from the underlying Stratum C. The stratigraphic distinction does not appear to be temporally meaningful and therefore the artifacts were not separated for analytical purposes.

Stratum A consisted of a brown (10YR 4/3) rocky silt loam, terminating between 31 and 39 centimeters (1.02 to 1.28 feet) bgs. This overlaid Stratum B, a dark brown (10YR 3/3) rocky silt loam. Stratum B extended for two levels in the north two thirds of the block and only one level in the south third. Beneath Stratum B was Stratum C, a yellowish brown (10YR 5/6) silt loam with 15 to 20 percent pebbles and cobbles also extending for two levels in thenorth two thirds of the block (Figure 5; Photograph 4).

4. Block 4

A total of 817 artifacts were recovered from Block 4. The greatest number (n=162) came from Unit 28; the lowest number (n=28) came from Unit 31 (Table 4). One chert chunk was collected during excavation but was discarded as non-cultural upon later examination in the laboratory.

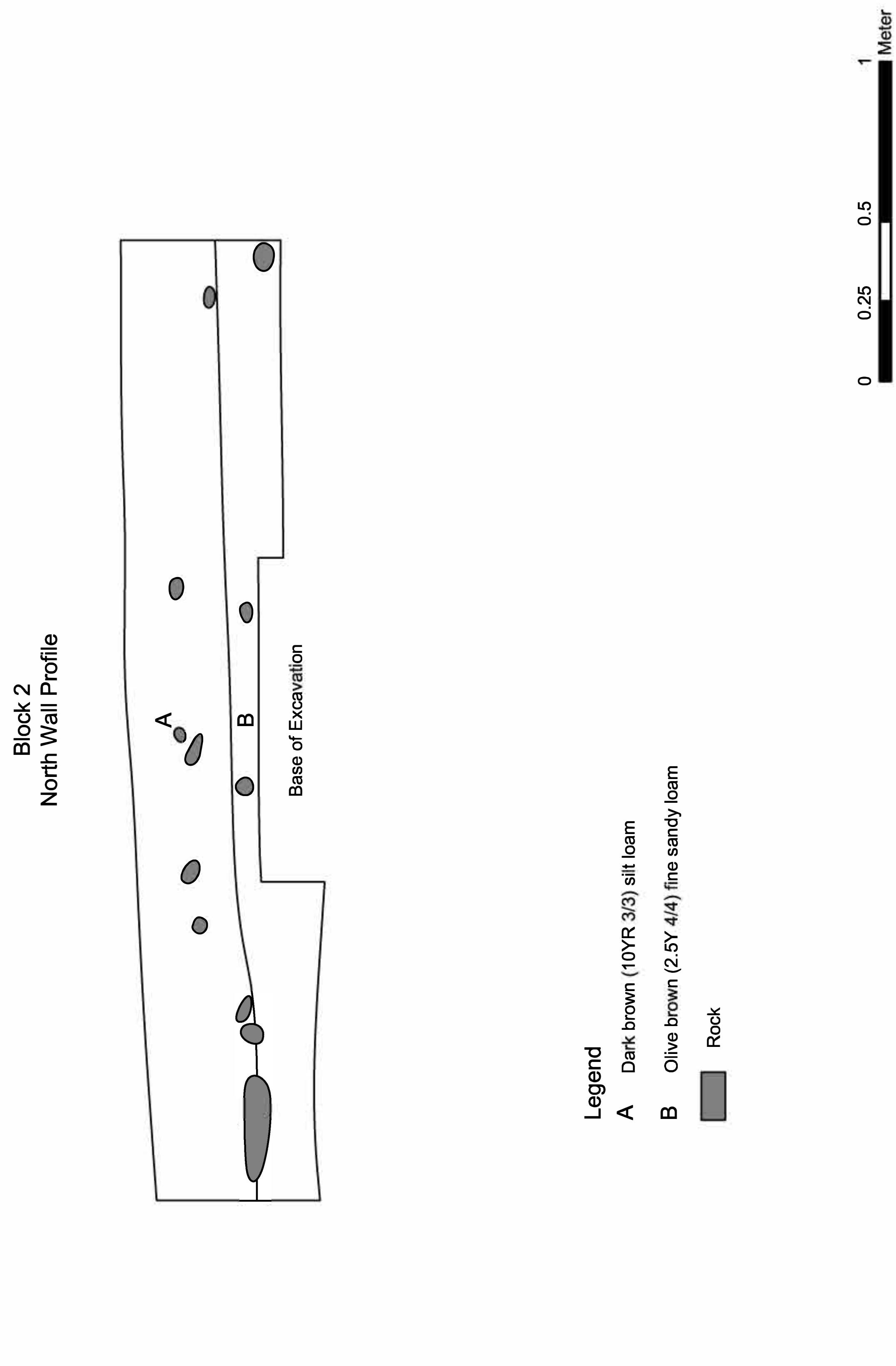


FIGURE 4: Stratigraphic Profile of North Wall, Block 2

PHOTOGRAPH 3: Plan View of Block 2, View North

PHOTOGRAPH 4: Plan View of Block 3, View North

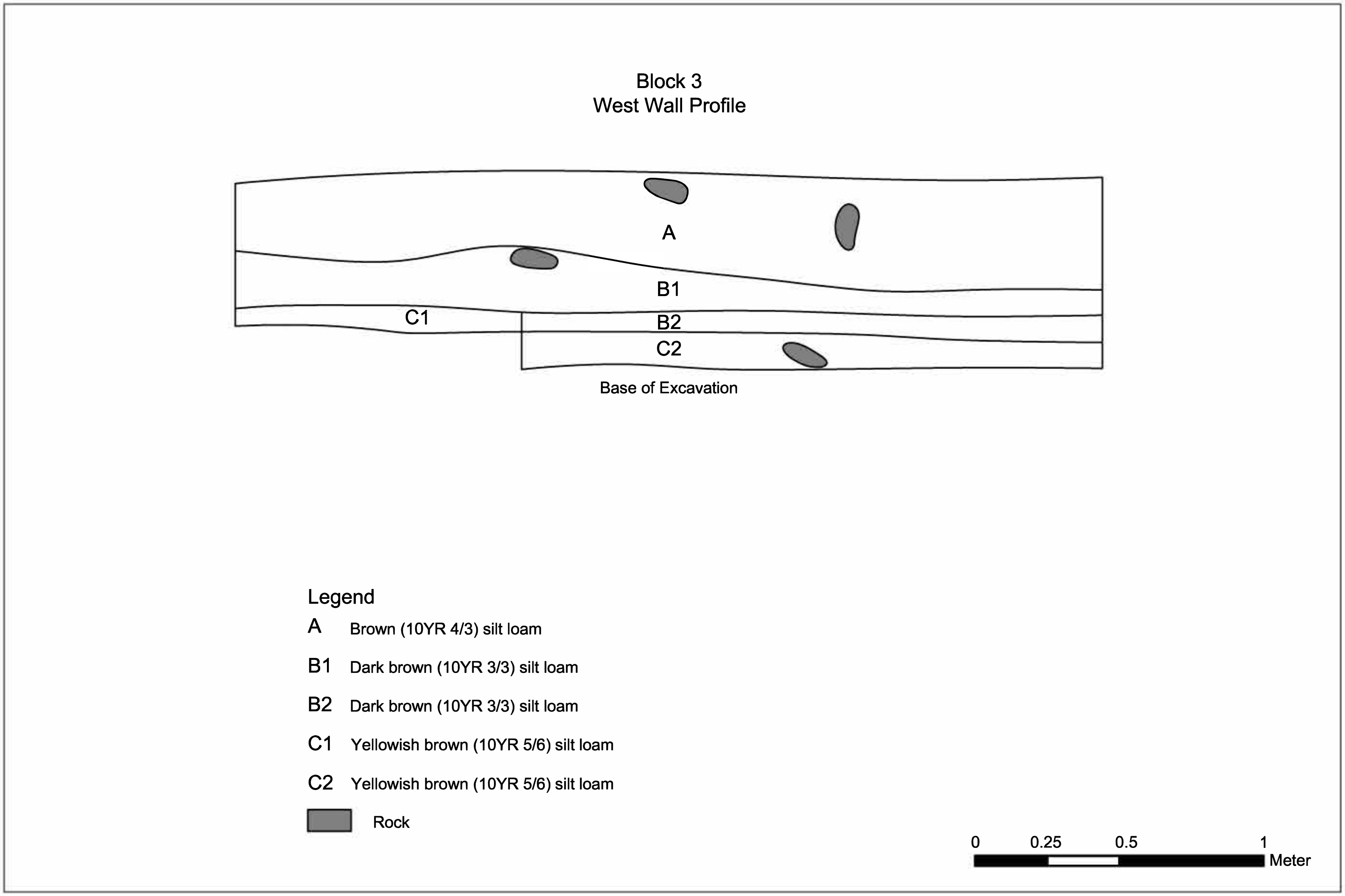


FIGURE 5: Stratigraphic Profile of West Wall, Block 3

TABLE 3

LITHIC ARTIFACTS RECOVERED FROM BLOCK 3, GORGE CREEK SITE 1 DATA RECOVERY

UNIT	BIFACES/ TOOLS	FINISH'G FLAKES	BIFACE REDUCTION FLAKES	EARLY FLAKE	FLAKE FRAGS	IRREG./ SHATTER	DECORT.	TESTED COBBLE	CORE	TOTAL
19		1	16		2	6				25
20			19	2	1	34				56
21	1 (point)		41	1		21				64
22	2		8			32				42
23	1		20		2	38	1	1		63[+5]
24	1		34			12				47[+5]
25	3		11		2	11				27
26			28	1		27				56[+14]
27			12	1		18			1	32[+4]
All	8	1	189	5	7	199	1	1	1	412[+28]

TABLE 4

LITHIC ARTIFACTS RECOVERED FROM BLOCK 4, GORGE CREEK SITE 1 DATA RECOVERY

UNIT	BIFACES/ TOOLS	FINISHING FLAKES	BIFACE REDUCTION FLAKES	EARLY FLAKE	FLAKE FRAGS	IRREG./ SHATTER	DECORT.	TOTAL
28	1		119		19	23		162[+1]
29		1	45		11	13	3	73
30	3	1	61	9	40	19	1	134
31			26			2		28
32	3		43	5	5	5		61
33	3		57		18	10		88
34	4		66		11	15	2	98
35		1	61	2	30	1		95
36	7		39	8	13	11		78
All	21	3	517	24	147	99	6	817[+1]

The plowzone yielded a small teardrop-shaped biface, probably a late-stage preform. Two biface preforms were recovered from the plowzone of Unit 36. One is relatively narrow. The other is relatively wide and thick. It has overshot flake scars that are superficially reminiscent of Paleoindian knapping techniques.

About 8 percent of the artifacts (n=69) were recovered from the uppermost part of Stratum B. These are interpreted as downward drift and were not separated from Stratum A material for analyses.

Stratum A was dark brown (10YR 3/3) gravelly silt loam Ap horizon that terminated between 40 and 46 centimeters (1.31 and 1.51 feet) bgs. This overlaid Stratum B, a yellowish brown (10YR 5/6) rocky silt. The west sixth of Stratum B was cut by a gravel deposit similar to the intrusion in Block 1 (Figure 6; Photograph 5).

B. Mechanized Stripping

After block excavation was completed, mechanized stripping of the plowzone was initiated on June 8 and continued through June 15, 2017 (Photographs 6 and 7). The plowzone was stripped from 12 areas for a total exposure of 3,691 square meters (39,730 square feet) (see Figure 2).

The east edge of Stripped Area 1 (SA-1) was about 10 meters west of Block 4. Putative Features 3 and 4 were exposed in this area. SA-2 was located south of Block 4. SA-3 was located south of Block 3, and SA-6 nearly abutted the south

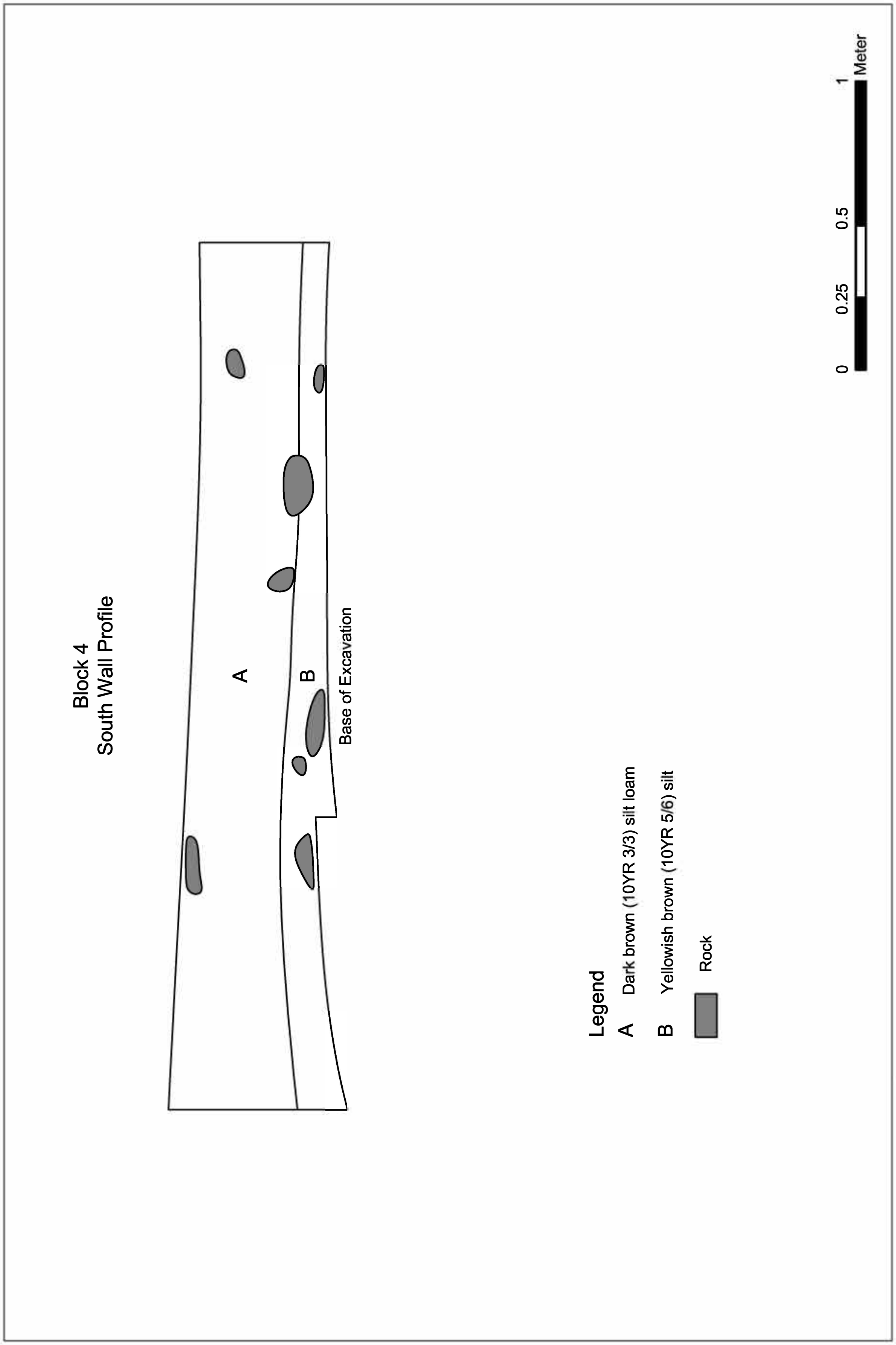


FIGURE 6: Stratigraphic Profile of South Wall, Block 4

PHOTOGRAPH 5: Plan View of Block 4, View South

PHOTOGRAPH 6: Mechanical Stripping, View Southwest

PHOTOGRAPH 7: Mechanical Stripping, View Southeast

side of Block 1. SA-4 was located between SA-3 and SA-6. SA-5 was placed north of Block 1, and SA-7 was located east of SA-5. SA-12 was a narrow strip located about 25 meters east of Block 3. Four large stripped areas were placed between Block 3 to the southwest and Block 4 to the northeast: SA-8, SA-9, SA-10, and SA-11.

The subsoil exposed immediately below the plowzone interface was generally very rocky, although patches with fewer clasts were observed. Three patches of red-stained, oxidized soil were evident, generally with associated charcoal. These patches were amorphous and did not appear to be of cultural origin; however, they were designated as potential features and numbered from 3 to 5 (as two putative features had been identified in previous investigations). These features were sectioned to reveal their profiles.

Feature 3 was elliptical and measured approximately 45 centimeters (1.48 feet) long by 18 centimeters (0.59 feet) wide (Figure 7; Photograph 8). It presented as a red stain as the excavator removed the plowzone. Louis Berger archaeologists bisected the feature, excavated the northwest section, and also photographed a profile (Photograph 9) and created a line drawing (see Figure 7) of the southeast wall. The feature consisted of a red (2.5YR 4/8) silt loam with fleck of charcoal surrounded by a yellowish brown (10YR 5/8) silt loam subsoil. From the stripped surface to the bottom of the feature was generally 7 centimeters (0.23 foot). A portion of the feature's end extended approximately 14 centimeters (0.46 foot) below the stripped surface. No artifacts were identified during the feature bisection.

Feature 4 was oblong, approximately 140 centimeters (4.59 feet), with widths varying from 10 to 30 centimeters (0.33 to 0.98 foot) (Figure 8; Photograph 10). This feature was identified through the presence of red-stained soils and abundant charcoal beneath the stripped plowzone. The north section contained a red (2.5YR 4/8) circular stain with large charcoal fragments. This was surrounded by a very dark grayish brown (10YR 3/2) silt loam with charcoal flecking. These feature soils were within a yellowish brown (10YR 5/8) subsoil. Louis Berger archaeologists bisected the feature and excavated the east portion. During excavation, archaeologists encountered a partially burned wood fragment, approximately 4 to 5 centimeters (0.13 to 0.16 foot) long between 5 and 10 centimeters (0.16 and 0.33 foot) bgs. At that point Louis Berger archaeologists abandoned the feature because the staining and related charcoal were likely the result of a burn, probably within the more recent past. No profile drawing was constructed.

Feature 5 was elliptical and measured approximately 60 centimeters (1.97 feet) long by 41 centimeters (1.35 feet) at its widest point (Figure 9; Photograph 11). Two large charcoal stains were identified in the west portion of a red (2.5YR 4/8) stain on the surrounding dark yellowish brown (10YR 4/4) subsoil. Louis Berger archaeologists bisected Feature 5 from west to east and excavated the north portion. From west to east the feature extended deeper into the subsoil until it reached a void, likely the result of a rodent borough (see Figure 9; Photograph 12). Charcoal flecks were noted through the bisection, but no artifacts were identified.

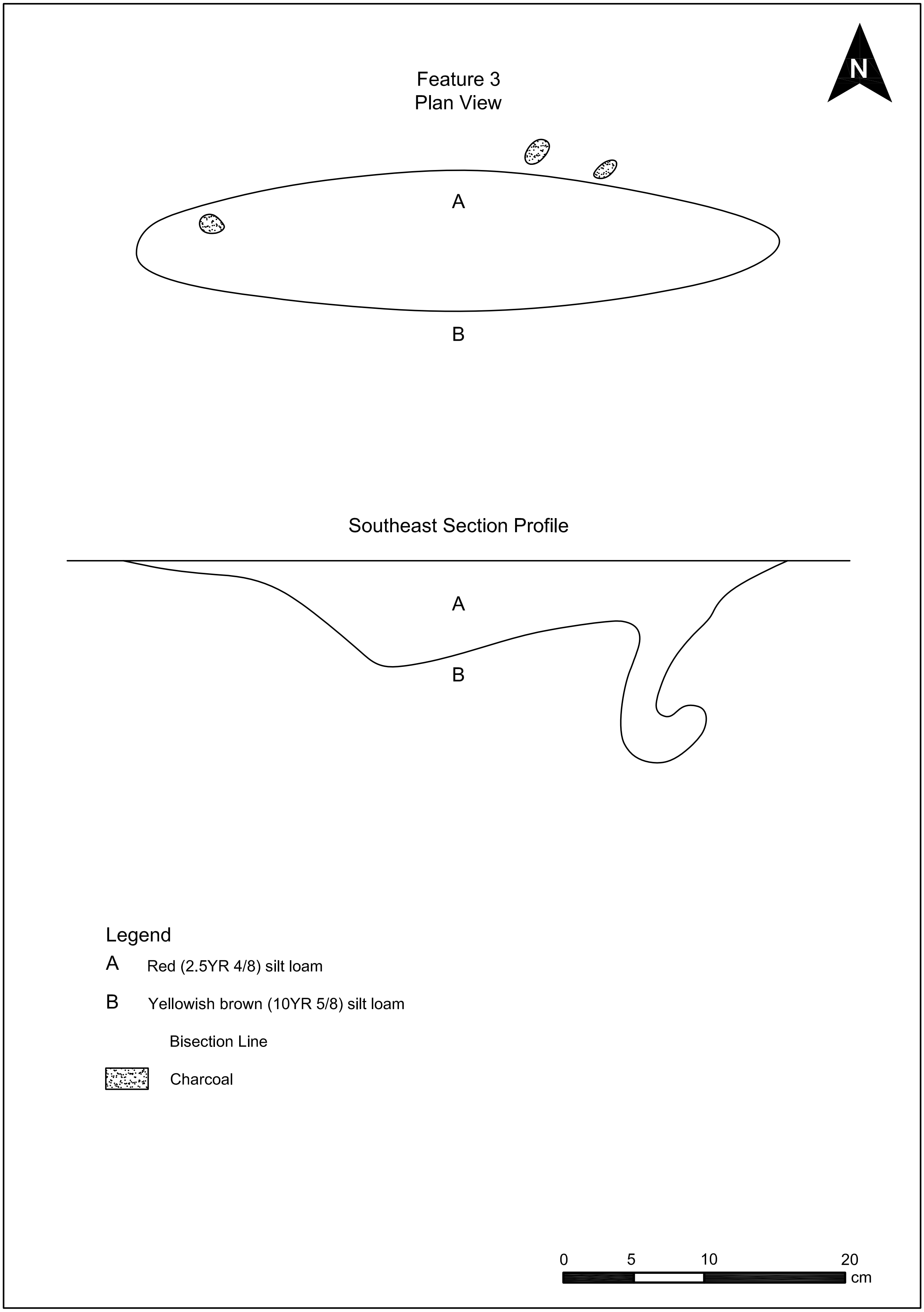


FIGURE 7: Feature 3 Plan View and Profile of Southeast Section

PHOTOGRAPH 8: Plan View of Feature 3, View North

PHOTOGRAPH 9: Profile of Feature 3, Southeast Section

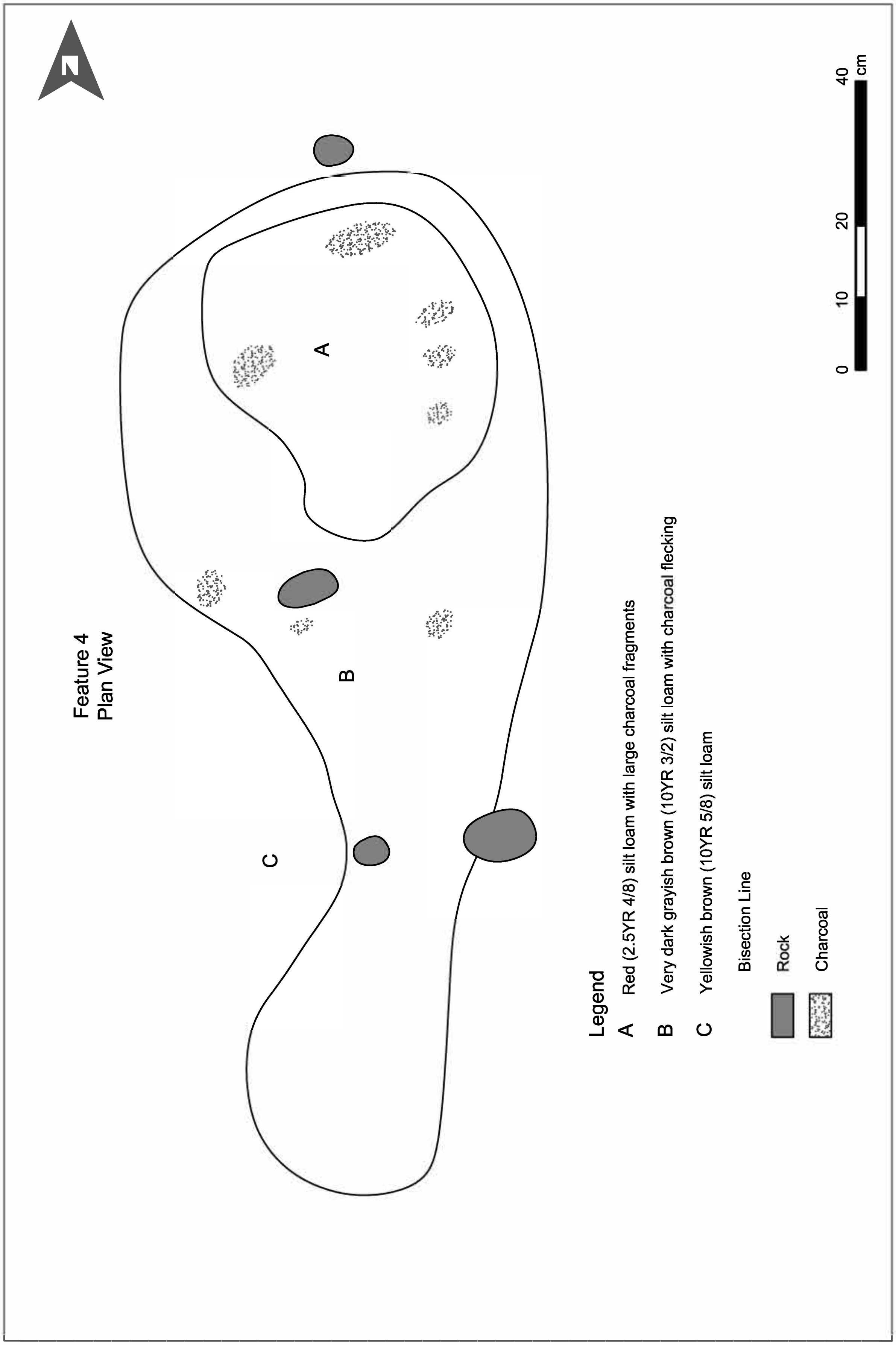


FIGURE 8: Feature 4 Plan View

PHOTOGRAPH 10: Plan View of Feature 4, View North

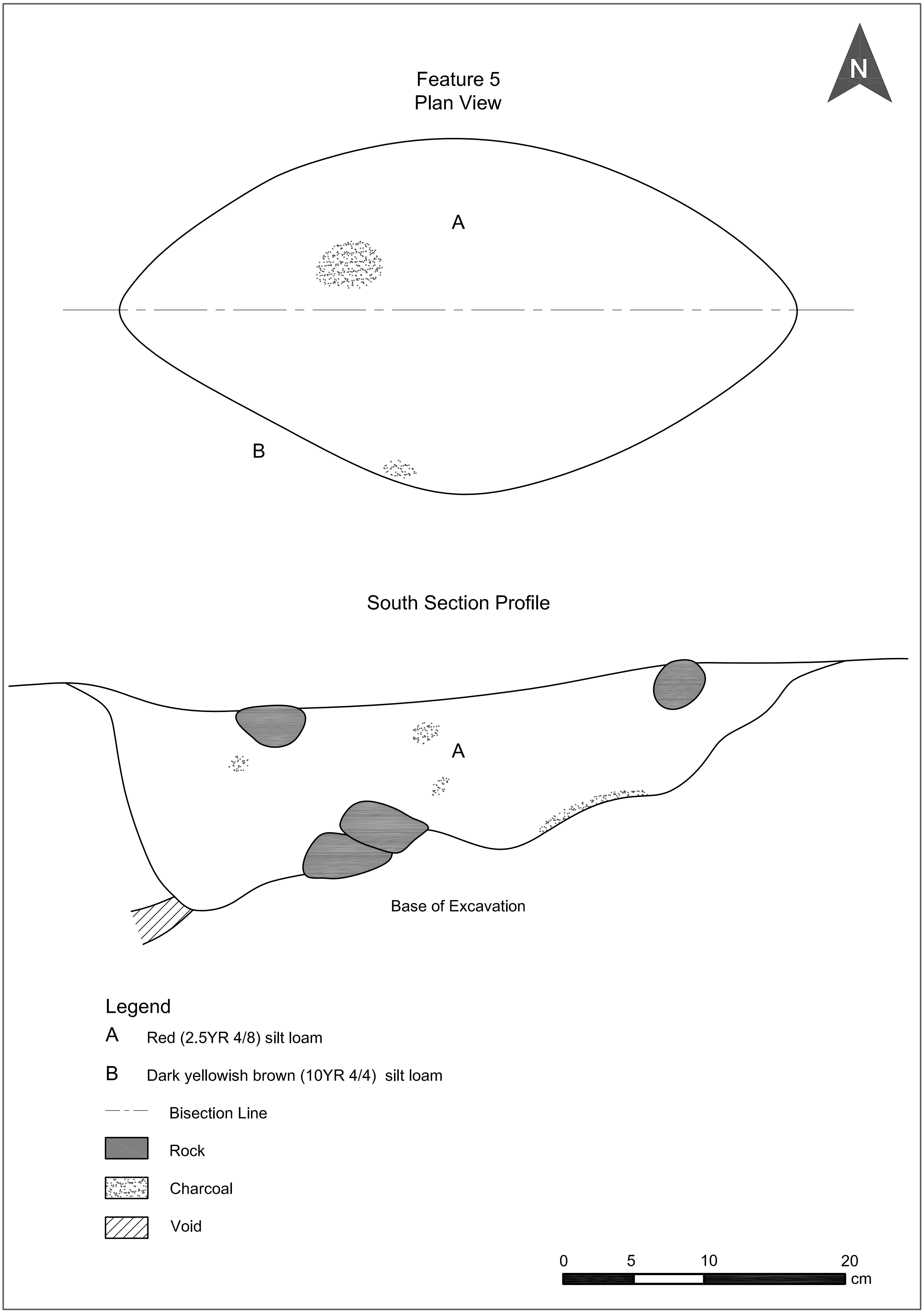


FIGURE 9: Feature 5 Plan View and Profile of South Section

PHOTOGRAPH 11: Plan View of Feature 5, View West

PHOTOGRAPH 12: Profile of Feature 5, South Section

VI. Artifact Analysis and Discussion

A. Individual Artifacts

The block excavations produced 3,076 lithic artifacts. In addition, a small number of chert chunks (n=44) were collected that, upon closer inspection in the lab, proved not to be artifacts. Only a very small percentage of the artifacts (n= 37, just over 1 percent) are whole or fragmentary formed tools, preforms, or utilized flakes.

Almost all of the artifacts came from the plowzone. That means that artifacts have been repeatedly exposed on the surface of the field since the arrival of Palatine farmers circa 1715 and local collectors have likely gathered a large number of them; certainly, local collector Tom Anderson has found points on the surface. A similar scarcity of finished bifaces was recorded in data recovery at Schoharie Creek II, where only nine projectile points (three of them typable) are among the 35,837 lithic artifacts (Rieth 2012). It seems likely that this low ratio also reflects collector activity.

The basal portion of a Brewerton Corner-notched point, made of dark gray Onondaga chert, was found at the base of the lower plowzone in Unit 21, in the northeast part of Block 3 (Photograph 13). This point is slightly unusual for the type in that the basal edge is not ground; Ritchie (1971b) noted that about two thirds of the points of this type have ground bases. However, it is not difficult to find published examples without basal grinding; for one such specimen see Funk (1993b:453, figure 159, no. 16), from the Russ Site near Wells Bridge. As discussed above, this type indicates an episode of occupation of the site at some time roughly between 6000 and 5000 cal BP. With benefit of hindsight, it seems likely that two points in Anderson’s collection, photographed for the Phase II report, are probably Brewerton side-notched points (Gade and Schreyer 2016: photograph 5).

Apart from the Brewerton Corner-notched point and the ubiquitous debitage, the following artifacts found in data recovery are particularly noteworthy.

- In Unit 3 a broad, flat flake was bifacially worked along two edges, with pronounced bulbs of percussion; one long edge is snapped or broken (Photograph 14).

- Two utilized flakes were recovered from Unit 4. They are broad and flat, probably retouched intentionally along the edges. They lack cortex, and there is no indication of heat treatment (see Photograph 14).

- A probable core fragment was found in Unit 9. It is made of dark gray chert and retains a small amount of cortex, a prominent platform, and flake scars.

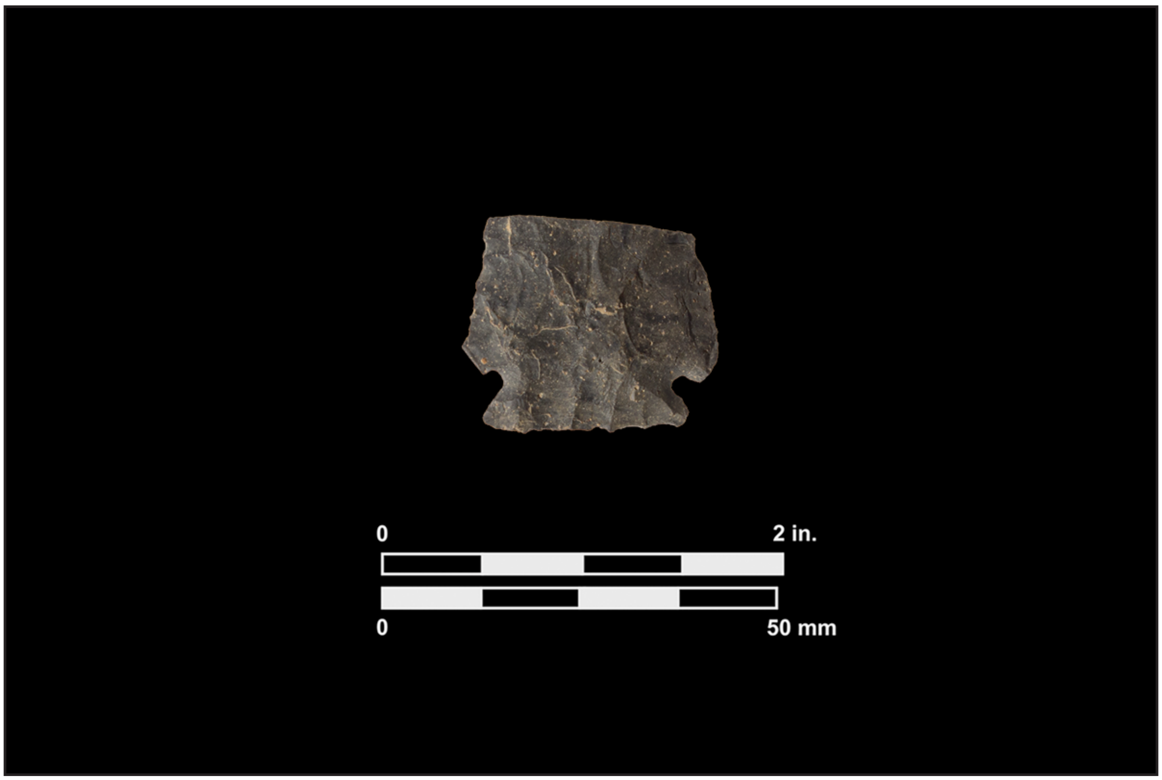
- A biface fragment including a partial lateral edge was found in Unit 11 (Photograph 15). Made of dark gray chert, it has no remnant cortex. Two flake tools with retouched or utilized edges also came from this unit. They are made of dark gray chert without cortex.

- Unit 12 produced a core and a tip fragment of an early-stage biface. The intact core, made of dark gray chert that retains some cortex, has multiple striking platforms. The biface tip, made of mottled chert, weighs 19 grams (see Photograph 15).

- A utilized chert flake was recovered from Unit 15. This is a large biface reduction flake, with no cortex, that has been pressure-flaked on one lateral edge.

- An early reduction flake found in Unit 22 may have been used as a scraper (see Photograph 14). Scars from pressure flake removal are present on the corticated dorsal surface. Another flake tool recovered from this unit is a utilized biface reduction flake bearing small flake scars caused by edge wear on the ventral surface near the bulb of percussion.

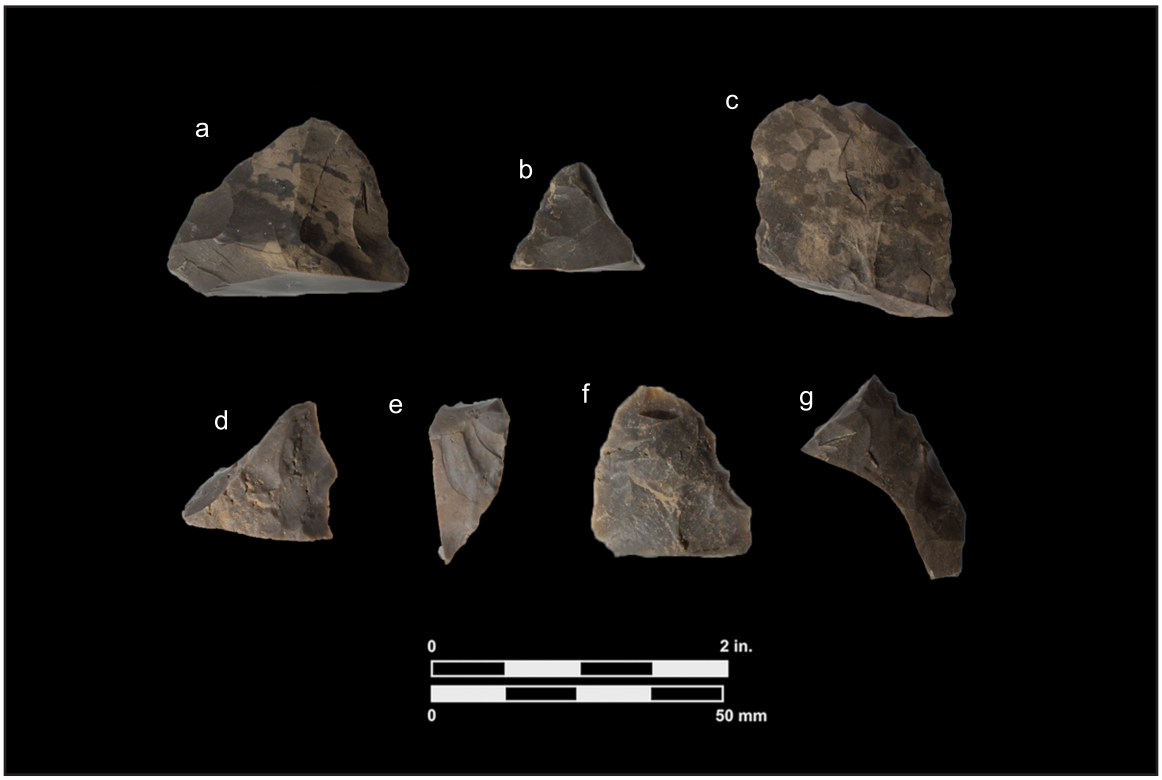
- Unit 23 yielded the only tested cobble recovered from the excavations. This is a large blocky fragment from which flakes have been removed, perhaps intentionally. It has no cortex but contains impurities.



PHOTOGRAPH 13: Basal Portion of Brewerton Corner-Notched Point (Field No. 144, Spec. No. 5)

PHOTOGRAPH 14: Scrapers and Utilized Flakes

(a) Flake tool (Field No. 148, Spec. No. 4)
(b) Flake tool (Field No. 104, Spec. No. 1)
(c) Utilized flake (Field No. 184, Spec. No. 12)
(d) Utilized flake (Field No. 105, Spec. No. 1)
(e) Endscraper (Field No. 148, Spec. No. 3)
(f) Sidescraper (Field No. 155, Spec. No. 4)



PHOTOGRAPH 15: Fragmentary Bifaces

(a) Early-stage biface fragment (Field No. 121, Spec. No. 13)
(b) Biface fragment (Field No. 119, Spec. No. 1)
(c) Biface fragment (Field No. 168, Spec. No. 11)
(d) Biface fragment (Field No. 172, Spec. No. 13)
(e) Biface fragment (Field No. 178, Spec. No. 11)
(f) Biface fragment (Field No. 178, Spec. No. 12)
(g) Biface fragment (Field No. 172, Spec. No. 12)

- A biface fragment was also found in this unit. Its surfaces are worn, with micro-flake scars present along the edge. The snapped fragment has a convex shape and may have been retouched for use as a scraper.

- An endscraper was recovered from Unit 24 (see Photograph 14). This is a small thumb scraper with a convex, retouched edge.

- Two scrapers and a flake tool were found in Unit 25. One scraper, with a chisel-like shape and worn edges, was made of light gray chert. The other scraper is on a snapped flake with an intentionally worked edge. It was made of light gray Onondaga chert with an unusually waxy texture. The flake tool, made of dark gray chert, has pressure flaking along the lateral edge, with remnant cortex on the dorsal surface.

- A possible core was recovered from Unit 27. It has multiple flake scars and worn edges. No cortex is present.

- A fragment of a snapped biface was recovered from Unit 28. It is made of mottled Onondaga chert (see Photograph 15).

- An unfinished late-stage biface (Photograph 16) and two medial biface fragments were found in Unit 30. One fragment has a pressure-flaked edge and was possibly utilized. The other midsection is a fragment of a thick, unfinished tool made of waxy light gray chert, probably Onondaga.

- The medial and distal portion of a snapped middle stage biface was found in Unit 32. Two other tools came from this unit. A piece of debitage had been worked into a crude bifacial tool with a retouched edge. A flake seems to have been utilized and possibly pressure-flaked.

- A large utilized flake and two biface fragments were found in Unit 33. One lateral edge of the dark gray flake has small flake scars produced by wear and/or intentional retouch. One biface fragment was made of light bluish gray chert with red mottling. The other, made of dark gray chert, consists of a midsection and tip.

- Three utilized flakes and a small biface were found in Unit 34. Two flakes are dark gray chert. The third is made of dark gray chert with red staining; it has flaking on the ventral surface. The biface was made on an early reduction flake, with dorsal cortex present, which was flaked on both surfaces. There is no evidence of use wear or edge retouch, so it appears to be an ovoid preform. The intended final product must have been some sort of miniature tool (Photograph 17).

- Two bifaces, a scraper, and a utilized flake were recovered from Unit 36. An early-stage biface was made of mottled chert. One edge was flaked, the other was unworked. This is a large, thick preform, weighing 57.7 grams (see Photograph 16). A middle-stage biface is made of mottled chert. This unbroken biface is long and narrow and weighs 8.2 grams. The scraper is a large flake of dark gray chert and weighing 37.6 grams. Its steep lateral edges are retouched and utilized. The utilized flake of dark gray chert weighs 10.6 grams. Its edges are retouched and possibly damaged by use.

B. Assemblage Characteristics

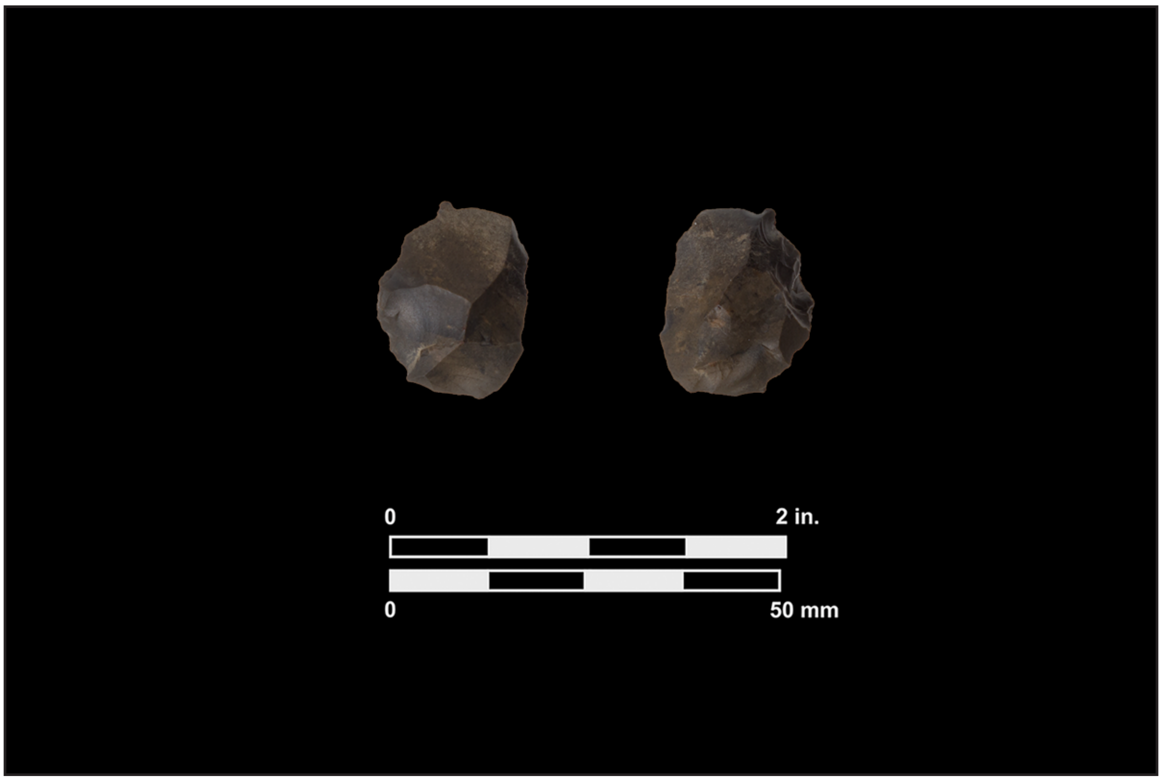
The Gorge Creek 1 assemblage includes many medium-sized, thin flakes indicative of biface reduction. A small number have platforms that include both sides of the edge of the biface preform ("biface edged flakes" [Rondeau and Rondeau 1993]). Twelve early through late-stage biface preforms, both whole and fragmentary, were recovered. These display variable shapes, including lanceolate, ovoid, narrow, and extremely narrow (see Photographs 16 and 17). Obviously, these preforms were not intended for production of points of a single type. The narrow bifaces could not have been made into broad Brewerton notched points like the one found in Block 3.

The ratio of bifaces to total debitage (12:3,076) is somewhat lower than that reported in the previous investigations. For the Phase I survey it was four out of 169; for the Phase II, nine out of 1,244.

The natural stony soil at the site includes chert clasts of varying size. Apart from biface reduction, there is some evidence that blocky chert chunks were occasionally collected at or near the site and tested for quality with a few

PHOTOGRAPH 16: Whole Bifaces

(a) Early-stage biface (Field No. 184.9)
(b) Middle-stage biface (Field No. 184.1)
(c) Late-stage biface (Field No. 172, Spec. No. 14)



PHOTOGRAPH 17: Small Biface (Field No. 180, Spec. No. 11)

blows. Some of these chunks were selected as cores and reduced further by removal of large, parallel, blade-like flakes. A tested cobble was recovered from Unit 23. Cores were found in Units 9, 12, and 27, and possible cores were found in Units 19 and 20. Notably, none of these cores come from Block 4.

Gade and Schreyer (2016) reported a relatively high percentage of flake tools and expediently utilized flakes among the artifacts from Phase I and II investigations. In the Phase I survey 25 of the total 169 chipped stone artifacts (14 percent) were classified as retouched or utilized flakes. During Phase II, 101 artifacts out of 1,244 flaked lithics (8 percent) were regarded as flake tools (apart from two scrapers and two "chipped stone implements").

The utilized and retouched flakes found at the Gorge Creek site 1 during data recovery represent a much smaller proportion of the total assemblage (less than 0.5 percent) than anticipated. Five artifacts were classified as flake tools, and nine were identified as utilized flakes. These were recovered from Units 3, 4, 11, 15, 22, 25, 32, 33, 34, and 36. In addition, five artifacts (from Units 22, 24, 25 and 36) were identified as scrapers, with steep intentional retouch either at the distal edge or on one or both lateral edges.

A few of the utilized flakes display crescentic or "half-moon" scars along the edge. Keeley (1980:25) observed that this kind of edge damage is caused "when low-angled edges are tightly held in the material being worked and the edge is moved laterally." Lewenstein (1987) observed that similar-shaped edges were caused by scraping manioc. Obviously, given the site's location in New York, manioc was not processed here, but processing of some other native tuber (e.g., ground nut) is possible. It is also possible that Gade and Schreyer interpreted the nibbling or irregular scars seen on flake edges as use wear; Louis Berger analysts regard most of this as post-depositional damage caused by plowing or trampling. The latter could reflect either prehistoric pedestrian traffic or the activities of farm animals.

C. Raw Materials

Several varieties of chert, presumably almost all from local cobble or bedrock sources, can be distinguished in the Gorge Creek assemblage, mainly by color (Table 5; Photograph 18). By far the greatest percentage of the material is dark gray Onondaga chert with brownish overtones. A minority is a lighter gray with a bluish tendency. A few flakes and a biface edge fragment are a very light bluish gray, and one small thinning flake is very light gray with darker flecks. In analysis the following color variants were recorded (excluding 43 non-cultural pieces that were mainly dark gray): dark gray (n=2,647), light gray (n=309), light gray/red (n=18), dark gray/red (n=28), bluish gray (n=8), bluish light gray (n=10), dark gray/purple mottled (n=2), dark/light gray mottled (n=2), light gray/brown mottled (n=3), light brown/red (n=1), and black (n=2). The two black flakes, from Unit 8 and Unit 30, are both biface reduction flakes less than 1.3 centimeters (0.5 inch) long. The Unit 8 flake weighs 0.7 gram (see Photograph 18), the Unit 30 flake, 0.2 gram. These small flakes are presumed to be Esopus chert; their size is consistent with their having been detached from a preform carried to the site from a chert source some distance away. The source may not have been very far from the site; Esopus chert is available both on the south side of the Mohawk Valley and the west side of the Hudson (Fisher 1980).

D. Comparisons

Block 1 is distinctive from the other blocks in that the proportion of flake fragments (defined as lacking the striking platform at the proximal end) to complete biface reduction flakes is much greater (419:663; the comparable ratios are 62:347 in Block 2, 7:189 in Block 3, and 147:517 in Block 4). Most of these fragments are small; in Block 1 only 24 of the 419 fragments are larger than 1.3 centimeters (0.5 inch). The distinction between the analytical categories of "flake fragment" and irregular, amorphous "general debitage" or shatter is admittedly somewhat vague. If we consider only the latter, it is Block 3 that appears anomalous, with 199 pieces of amorphous debitage, only seven flake fragments, and 189 biface reduction flakes. If we combine fragments and general debitage, the ratios to biface reduction flakes are 644:663 in Block 1, 164:347 in Block 2, 206:189 in Block 3, and 246:517 in Block 4.

At Schoharie Creek II Rieth (2012) recovered 35,307 flakes. Of this total, 22,772 (64.5 percent) are broken flakes and shatter. The remainder of the debitage consists of 982 primary/secondary flakes (2.8 percent), 2,542 tertiary flakes (7.2 percent), 5,701 bifacial thinning flakes (16.1 percent), 2,962 pressure flakes (8.4 percent), and 348 utilized flakes (1 percent).

TABLE 5

DISTRIBUTION OF CHERT ARTIFACTS BY COLOR PER UNIT

UNIT	TOTAL LITHICS	LIGHT GRAY	LT GRAY/ RED	DARK GRAY/RED	LT BROWN/ RED	DARK GRAY PURPLE	BLUISH GRAY	BLUE/ LIGHT GRAY	DARK/ LIGHT GRAY	LIGHT GRAY BROWN	BLACK
1	119	25	3					1			
2	142	11									
3	180	31		1							
4	83	18									
5	127	33	3			1					
6	180	44	1	2							
7	121	35	1				1				
8	196	49					1				1
9	174	16		1							
10	50	0									
11	63	0									
12	82	3							1		
13	31	0									
14	55	0									
15	77	0		2							
16	62	2	3								
17	57	1		2							
18	48	0									
19	25	3									
20	56	5									
21	64	5									
22	42	2									
23	63	1		1							
24	47	0		1			1		1		
25	27	3				1					
26	56	0		1							
27	32	3						1			
28	162	3	1	3							
29	73	2		4							
30	134	4	4	1			5	1			1
31	28	0									
32	61	1	2	1				4		3	
33	88	2		4	1			3			
34	98	1		3							
35	95	2									
36	78	4		1							

PHOTOGRAPH 18: Color Variants of Onondaga Chert

(a) Dark gray/red (Field No. 158, Spec. No. 1)
(b) Light gray/red (Field No. 107, Spec. No. 5)
(c) Black (Field No. 113, Spec. No. 5)
(d) Dark/light gray mottled (Field No. 155, Spec. No. 1)
(e) Dark gray (Field No. 133, Spec. No. 3)
(f) Dark gray (Field No. 148, Spec. No. 1)
(g) Light gray (Field No. 113, Spec. No. 4)
(h) Light bluish gray (Field No. 172, Spec. No. 9)

Rieth (2012: figure 24) compares the Schoharie Creek II lithic assemblage with those from the Winnie IV and Vroman I sites (Rieth 1999, 2016; Sopko 1999). Vroman I is a small campsite on a small alluvial terrace on the valley wall overlooking Fox Creek. Although no diagnostic artifacts were recovered, a partial point may be a Meadowood, and two radiocarbon dates indicate probable Orient and Meadowood components. Winnie IV is a small seasonal camp in the uplands overlooking Onesquethaw Creek, a tributary of Schoharie Creek, and is attributed to the Woodland period. At Vroman I a total of 959 lithic artifacts were recovered, 645 from non-fill contexts. Of these 645 artifacts, 13 percent are primary/secondary flakes, 16.9 percent are tertiary flakes, 22.8 percent are bifacial thinning flakes, 1.6 percent are pressure flakes, 37.7 percent are broken flakes, 14.3 percent are shatter, and 1.4 percent are utilized flakes. At Winnie IV about 24 percent are primary/secondary flakes, 16 percent are tertiary flakes, 12 percent are bifacial thinning flakes, 1 percent are pressure flakes, 46 percent are broken flakes and shatter, and 1 percent are utilized flakes.

Citing a model derived from Magne (1989) and utilized by Cesarski (1996) in a study of collections from the Hoosic River drainage, Rieth (2012) interprets these data as indicative of a logistic settlement pattern. Major base camps were located on the valley floor. Upland sites represent small task-specific camps for resource procurement. Lithics brought as rough cores to these small sites were reduced there to render them more transportable. Rieth interprets Schoharie Creek II as a “small repeated logistical camp.” Sites of this type, according to Magne’s model, should contain a high percentage of late-stage flakes and diverse bifacial tools, and these criteria fit the actual assemblage characteristics of Schoharie Creek II.

The debitage categories used by Louis Berger in sorting the lithics from Gorge Creek 1 are not precisely equivalent to Rieth’s, which complicates comparison of the data. Broken flakes plus general debitage can be equated unequivocally with Rieth’s broken flakes and shatter. We may provisionally equate early reduction and decortication flakes with her primary/secondary flakes, biface reduction flakes with tertiary flakes and bifacial thinning flakes, and finishing flakes with pressure flakes. If we combine material from all four blocks (a total of 3,058 after subtracting the 18 formed bifaces and scrapers), only 51 artifacts (1.7 percent) are primary/secondary (35 early reduction flakes, 12 decortication flakes, plus three cores and a tested cobble). Biface reduction flakes number 1,716 (56 percent). Fragments and amorphous debitage account for 1,260 pieces (41 percent). The 12 finishing (pressure) flakes constitute only 0.4 percent, and the 14 flake tools also account for just 0.4 percent. Comparing the percentages to Rieth’s sites, we see that early phase reduction is even less prevalent at Gorge Creek 1 than at Schoharie Creek II. Fragments and shatter are less common than at any of the three sites. Gorge Creek 1 appears distinctive for its very high proportion of biface thinning flakes (56 percent); combining the tertiary and bifacial thinning flakes at Schoharie Creek II, they account for only 23.3 percent of the lithic total. The same percentages are 28 percent at Winnie IV and 39.7 percent at Vroman I.

At Schoharie Creek II, 33 bifaces, 11 side- and endscrapers, one drill, and one uniface were recovered from features and living floors. Three of these tools are made of Normanskill chert; the rest are all are made of the gray Eastern Onondaga chert that outcrops at Terrace Mountain (Rieth 2012).

Rieth’s analysis of the biface fragments showed that 81 per cent of them could be assigned to the production Stages II, III, and IV defined by Callahan (1979:3). Based on the presence of these unfinished bifaces, along with large numbers of non-cortical flakes, she suggests that both initial edging and thinning of bifaces were performed at the Schoharie Creek II site. Stage I bifaces were relatively rare (under 10 percent), as were primary (cortical) flakes; their rarity suggests that initial reduction of cores probably occurred at or near the chert outcrop. A similar separation of initial and later reduction stages is evident in other Early Woodland assemblages in eastern New York, including Nahrwold 2 (Ritchie and Funk 1973), Dennis (Ritchie and Funk 1973:96–97), and Schoharie Creek I (Rieth 1998; Rieth and LoRusso 1996).

Seventeen percent of the bifaces at Schoharie Creek II site have hinge fractures indicating damage by impact or force applied to the tip of the tool. Such fractures may result from use of a hand-held tool for puncturing or prying. Edge damage consistent with “crushing usewear” (Pagoulatos 1992:92) was observed on six scrapers and four bifaces; this wear may have been caused by processing both hard and soft materials. Similar use wear also was seen on expedient flake tools.

Snyder (2016) has recently analyzed 12 sites in western New York containing Late Archaic and Early Woodland workshops and camps. These sites are located in a cluster just north of the chert-bearing Onondaga escarpment and consist mainly of Onondaga chert debitage, like the Gorge Creek Site 1. At all but one of these sites, flake fragments account for more than 40 percent of the assemblage; at six sites they constitute more than 50 percent of the assemblage (Snyder 2016:157–158). The greatest percentage of fragments is about 65 percent, at Site 32L3. Snyder (2016:160) interprets fragments and broken flakes as indicators of biface reduction, and whole flakes as indicating "non-intensive core reduction."

As already observed, the 14 flake tools at Gorge Creek 1 account for just 0.4 percent of the total lithic assemblage, and at Schoharie Creek II utilized flakes account for just under 1 percent of the lithic assemblage (Rieth 2012). Snyder (2016:164) found a comparably low percentage of utilized flakes in his Spaulding Green sites in western New York. Retouched flakes typically account for about 1 to 4 percent of the total debitage in these assemblages; one site has only .02 percent. It should also be pointed out, however, that Snyder reports much higher percentages (up to 33 percent) for several small assemblages with fewer than about 30 artifacts.

Recovery of a Brewerton point fragment at the Gorge Creek Site 1 was unexpected, based on previous finds at the site, and also highlights a curious hiatus in the local archaeological sequence. Otter Creek points were found at Site 303 (the Shafer Site) on Schoharie Creek near Breakabeen. They were associated with a radiocarbon date of 6290±190 rcbp (7165±210 cal BP, 5215 cal BC), which was obtained by combining charcoal from three hearths (Wellman 1996). Funk (1988) assigned this component to a proto-Laurentian "South Hill" phase. A Lamoka component was stratified above the Otter Creek component. Radiocarbon dates of 4340±190 and 4110±140 rcbp (ca. 4700 cal BP) were associated with the narrow stemmed points (Wellman 1996). A ca. 2,500-year hiatus intervened between these occupations—precisely the period when people of the Brewerton phase should have been present. Among the 180 points found at the Pethick Site, only four are typed as Brewerton (Rafferty et al. 2014:186). A deeply buried A horizon at that site yielded few artifacts but two features: one dated to 3490±60 rcbp, the other to 3510±40 rcbp. Although Rafferty et al. (2014:185) believe that these features are "probably associated with the Brewerton Phase," these dates are typical of the Terminal Archaic Broadspear complex, represented at the Pethick Site only by one Perkiomen and one Susquehanna Broad point.

In the nearby Cobleskill drainage a lithic assemblage recovered in the Phase II evaluation of the Overlook Precontact Site in the village of Cobleskill has been ascribed to the Laurentian phase based on the presence of a black siltstone gouge fragment (Curtin and Vidulich 2010). In data "retrieval" at the Birches precontact site in the Village of Schoharie, an Otter Creek point and two Lamoka points were found (Krievs and Kirk 2014), but most of the material found there was of Woodland age.

Ritchie and Funk (1973:340) noted that "Some Brewerton materials have been found at the Divers Lake flint quarries in Genesee County, New York. The western Onondaga flint which occurs in these and other related quarries was much utilized by Brewerton groups for chipped stone artifacts." Prisch (1976) counted 52 Brewerton side-notched and 27 corner-notched points among the artifacts surface-collected from the fields near the quarry.

Louis Berger's excavations at the Kingston Armory Site (Gould et al. 2008) revealed features and associated lithic artifacts of stratified Vergennes (Otter Creek) and Vosburg phase occupations. These assemblages illuminate the composition of Laurentian lithic assemblages in the mid-Hudson Valley; comparison with the Gorge Creek assemblage (Table 6) may indicate whether the latter (and Block 3 in particular, where the Brewerton point was found) has any attributes that are specifically Brewerton or, more broadly, Laurentian.

A few observations can be made based upon Table 6. The most striking difference is in the numbers of flake fragments; these account for 45.5 percent of the Kingston Vergennes assemblage, 48.7 percent of the Vosburg assemblage, but only 1.7 percent of the Block 3 debitage and 20.9 percent of the entire Gorge Creek assemblage. Both the assemblages from Block 3 and from the site as a whole have a much greater percentage of amorphous debitage and shatter (49.5 percent and 20.6 percent, respectively) than either the Vergennes (8.1 percent) or Vosburg (11.9 percent) phase assemblages from Kingston Armory. The proportion of decortication flakes is much greater at Gorge Creek (although the sample is quite small in absolute number), but there are only about half as many early reduction flakes as in the Kingston assemblages.

TABLE 6

COMPARISON OF DEBITAGE, GORGE CREEK 1 AND KINGSTON ARMORY SITES LAURENTIAN COMPONENTS

COMPONENT	DECORT. FLAKES	EARLY REDUCTION	BIFACE REDUCTION FLAKES	FINISHING FLAKES	FLAKE FRAGS.	IRREG./ SHATTER	OTHER	TOTAL
Gorge Creek 1 (All)	12 (0.4 %)	35 (1.1 %)	1716 (56.5 %)	12 (0.4 %)	635 (20.9 %)	625 (20.6 %)	0	3035
Gorge Creek 1 (Block 3)	1 (0.2 %)	5 (1.2 %)	189 (47 %)	1 (0.2 %)	7 (1.7 %)	199 (49.5 %)		402
Vergennes (Kingston)	3	188 (2.4 %)	2529 (32.6 %)	873 (11.3 %)	3526 (45.5 %)	630 (8.1 %)	1	7750
Vosburg (Kingston)	2	193 (2.9 %)	1742 (26.4 %)	661 (10 %)	3218 (48.7 %)	786 (11.9 %)	1	6603

On the presumption that the artifacts from the northeast portion of Gorge Creek 1 are mainly associated with an Orient phase occupation, one would expect the debitage to reflect a *chaine operatoire* resembling that observed in other Orient assemblages. Unfortunately, there are very few well-defined Orient assemblages to which this material can be compared. The Orient fishtail points at the Miller Field Site in northern New Jersey were made of chert, but few details about their manufacture were provided (Kraft 1970).

In contrast to Miller Field, the great majority of Orient fishtail points surface-collected from the Marshlands Conservancy in Rye, New York, were made of quartz, like most specimens from Long Island (Fiedel 1988). Because there was no stratigraphy, it is speculative to relate any of the preforms or debitage from the Marshlands to any of the points. Nevertheless, given the relative percentages of points of various types, it is likely that a comparably large proportion of the debitage relates to manufacture of fishtail-style projectile points. In any case many broken, incomplete preforms were recovered, which can be identified as fishtail-derived because of their shape and/or the presence of partially finished “tails” on the basal fragments. The quartz cobble was initially worked into a long ovoid, 8 to 10.5 centimeters long and 3 to 5.5 centimeters wide. The cortex was often left intact on one side, with unifacial flaking creating a central hump on the other face. Thickness of these first-stage blanks ranges from 2.5 to 3.5 centimeters. Early in the reduction process, the artisan began to shape the projecting ears of the fishtail base, presumably because the ears were the most delicate part of the point. If the preform tip snapped accidentally, the tip could be resharpened, although the resulting finished point would be shorter than planned; but if the basal ears broke, the preform would be irreparable. On one broken basal fragment the ears were already roughed out and the body was still 2.5 centimeters thick. On a few other preforms the delicate ears of the base were fully delineated but the blade and tip were only roughly chipped. Late-stage preforms seem to fall into two groups. Some were designed to produce a long point of about 6 to 7 centimeters, others to make shorter points, about 4.5 to 5.5 centimeters.

It is impossible to state whether this procedure was standard for point fishtail production regardless of the raw material or was specifically tailored to knapping quartz cobbles. Thousands of similar “turtleback” preforms were excavated at the Piney Branch quarry in Washington, D.C. (Holmes 1897), where they are presumed to date mainly from the Terminal Archaic. So, this may have been a culturally mandated manufacturing technique rooted deeply in the Savannah River complex from which the Orient culture was derived. On the other hand, it may simply have been an expedient way to reduce ovoid corticated cobbles.

Intermediate in time and stylistic evolution between Savannah River and Orient, Susquehanna and Perkiomen broadspears (ca. 3600 to 3200 rcbp) were almost never made of quartz or quartzite. The preferred materials for these points were rhyolite, chert, and jasper. From Virginia to northern New England, the production sequence for these broadspears was very uniform and entailed creation of a thin, flat, pentagonal late-stage preform (e.g., Fiedel and Galke 1996).

Two sites designated as 191-2-1 and 191-1-3 were identified near Hollister Lake in Athens during the Iroquois Pipeline survey in 1990 (Cassedy 1998; Cobb and Webb 1995). Site 191-1-3 was a quarry of Onondaga chert, and nearby Site

191-2-1 was interpreted as short-term encampment occupied during procurement trips to the quarry. A Normanskill point and the basal portion of an Orient fishtail were found at Sites 191-1-3. At Site 191-2-1 diagnostic artifacts indicated episodes of occupation in the Late Archaic, Terminal Archaic, early Woodland, and late Middle Woodland. In addition to 35 projectile points and 38 bifaces, 5,508 pieces of debitage were recovered and nine hearths were excavated. The diagnostic points included two Vosburg, 10 Sylvan Stemmed, one "Large Stemmed" (Snook Kill?), three Early Woodland points (Meadowood and Rossville), and four Levanna points. Lithic production at the Hollister Lake sites entailed both an expedient amorphous core technology and a formal biface core technology.

At another Iroquois Pipeline site in Athens, Site 193-2-2, the assemblage, made mostly of local Normanskill chert, was dominated by early- to middle-stage bifaces interpreted as preforms for Terminal Archaic Snook Kill and Perkiomen points. These preforms were 7 to 8 centimeters long and 3.5 to 4.5 centimeters wide (Cassedy 1998).
Returning to consideration of the Gorge Creek Site 1 assemblage, there was no evidence of either turtleback cores or incomplete fishtail-eared basal fragments in any of the excavation blocks. To completely reduce a turtleback core, decortication would have been necessary, but only 12 decortication flakes are present in the assemblage. Only one of these was found in Block 2, which was located in the northeast part of the site, where surface finds of Orient Fishtail points had been reported. The absence of turtlebacks and early-stage fishtail base fragments can be explained in various ways. They may all have been collected previously. The fishtail points may all have been made elsewhere, so that broken preforms were never produced here. Or, when working relatively tractable chert derived by flaking blocky cores, fishtail-makers may have used an entirely different procedure that did not entail making turtleback preforms.

Snyder (2016) was particularly interested in examining the stages of production of Meadowood cache blades in western New York. In addition to the surface scatters, he analyzed debitage from a few sealed features; one feature at the Renaissance House Site contained over 3,000 flakes, a fragment of a cache blade, and charcoal dated to 2840±30 rcbp. Another feature, from the Howard Ott 1 Site, could be assigned to a Meadowood occupation because it contained broken cache blades. Snyder measured 24 variable attributes of the debitage, although, based on knapping experiments (Williams and Andrefsky 2011) and archaeological analyses (Williams et al. 2013), he assumed that only six variables might be informative: maximum length, maximum width, platform width, platform thickness, maximum length/maximum width ratio, and platform width/platform thickness ratio. Snyder (2016:197) concluded that only platform width and, to a lesser extent, platform thickness were highly consistent between the two Meadowood feature assemblages and differentiated them from the undated but presumed Archaic assemblages from surface-collected sites. The mean platform width for the Meadowood flakes is about 5.9 millimeters. He was able tentatively to assign an otherwise undated debitage assemblage to the Meadowood phase because the graphed distribution of platform widths matched those of the known Meadowood sites.

For purposes of both intra-site (between blocks) and inter-site comparison, Louis Berger measured the platform widths of a randomly selected 10 percent sample of complete flakes from each of the four excavation blocks at Gorge Creek 1. The results are shown in Figures 10–21 and Table 7.

The data from Table 7 seem to indicate that the knappers responsible for the Block 4 assemblage were using narrower platforms for both large and small (less than 0.5 inch) flakes than those in the other three areas. The evident difference from the nearby Block 2 is surprising. In fact, as the histograms in Figures 10–21 illustrate, both the Block 2 and Block 4 assemblages are dominated by platforms in the range of 5 to 8 millimeters; they differ from Blocks 1 and 3 in that, in the latter flake assemblages, platform widths of 10 millimeters and more are common (Photograph 19). Only the patterns seen in Blocks 2 and 4 bear any resemblance to the Meadowood-specific platform width profiles presented by Snyder (2016), in which widths are typically 3 to 6 millimeters and rarely wider than 7 millimeters.

TABLE 7

PLATFORM WIDTHS (MILLIMETERS) OF WHOLE FLAKES SAMPLED FROM BLOCKS 1–4

BLOCK	ALL FLAKES, MEAN	ALL FLAKES, MEDIAN	FLAKES>0.5", MEAN	FLAKES >0.5", MEDIAN	FLAKES<0.5", MEAN	FLAKES<0.5", MEDIAN
1	9.72	9.18	10.64	9.2	8.87	8.09
2	8.02	6.47	10.22	9.81	6.55	6.29
3	8.67	8.4	10.42	9.5	7.76	8.1
4	6.91	6.43	7.88	7.34	6.38	5.63

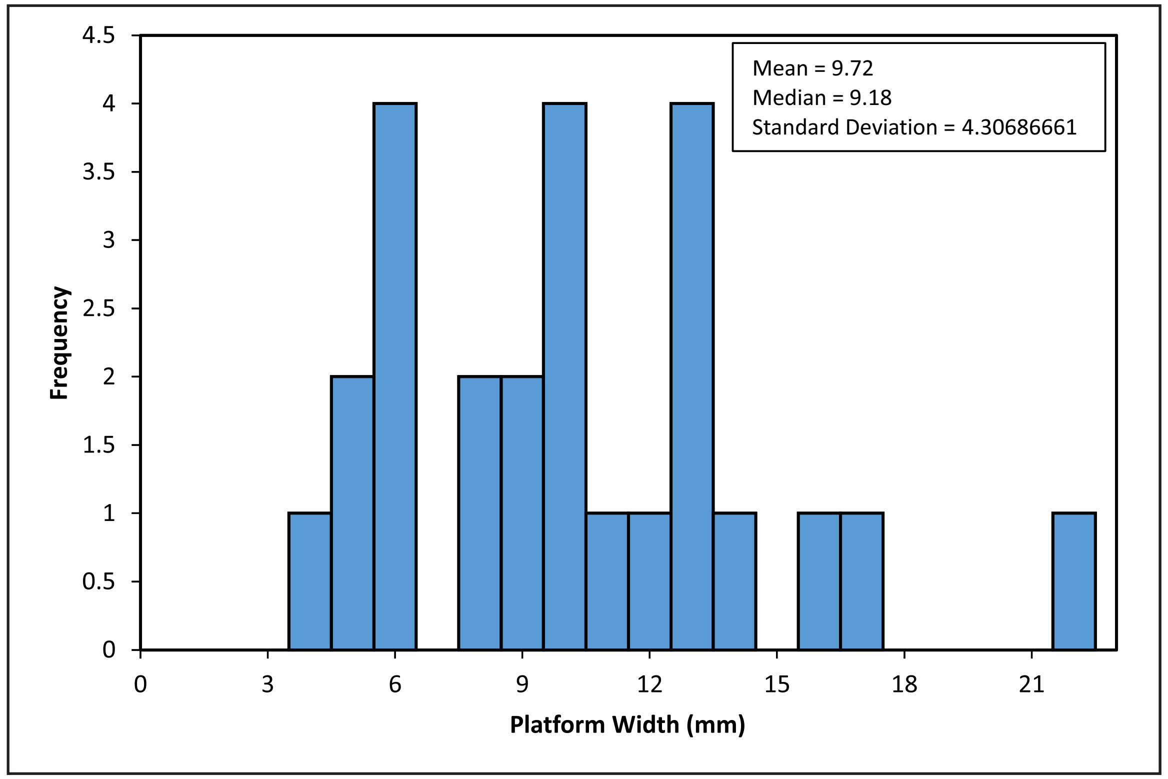


FIGURE 10: Block 1 Histogram, Biface Reduction Flake Platform Width (mm)

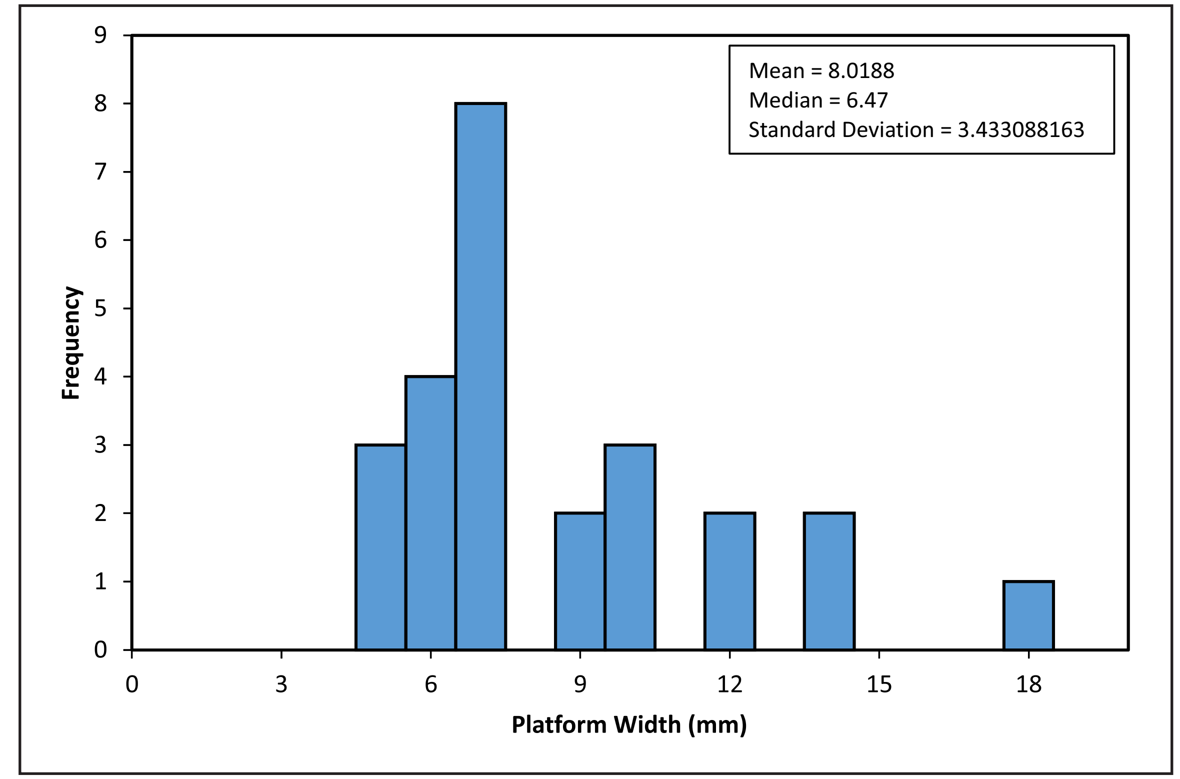


FIGURE 11: Block 2 Histogram, Biface Reduction Flake Platform Width (mm)

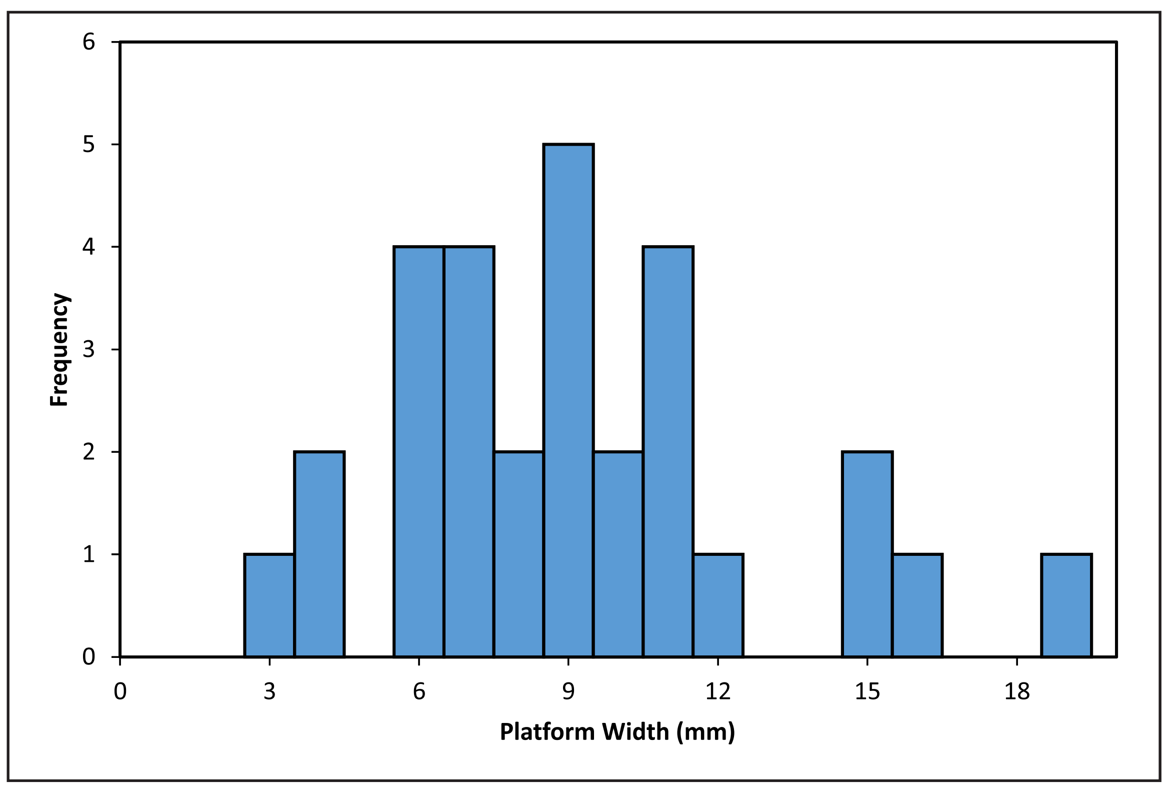


FIGURE 12: Block 3 Histogram, Biface Reduction Flake Platform Width (mm)

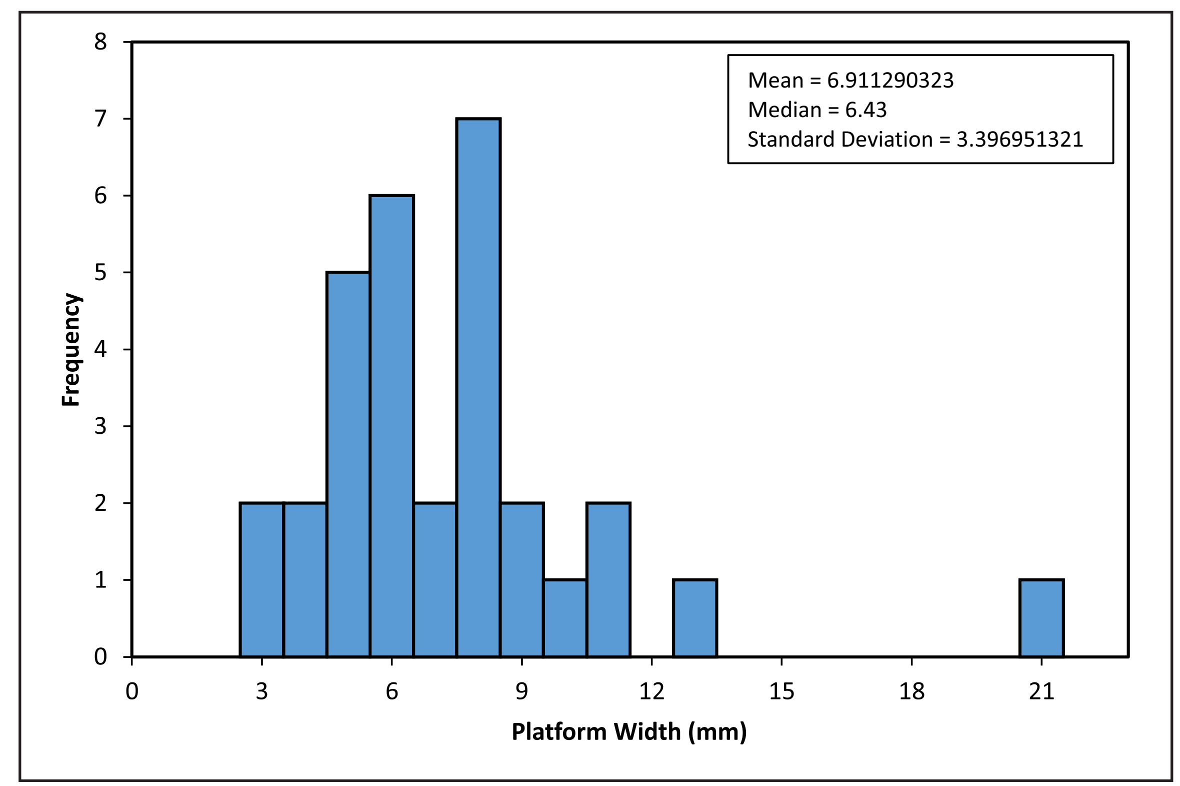


FIGURE 13: Block 4 Histogram, Biface Reduction Flake Platform Width (mm)

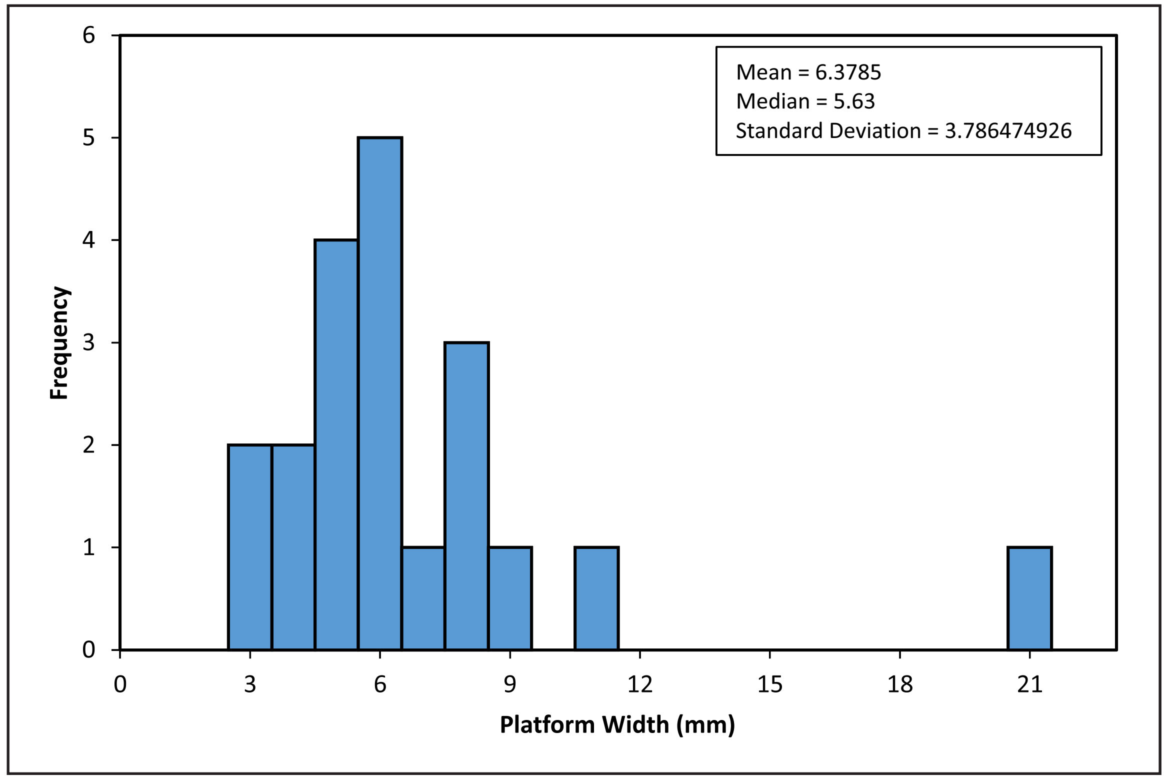


FIGURE 14: Block 1 Histogram, Biface Reduction Flake Platform Width (mm) Size <1/2"

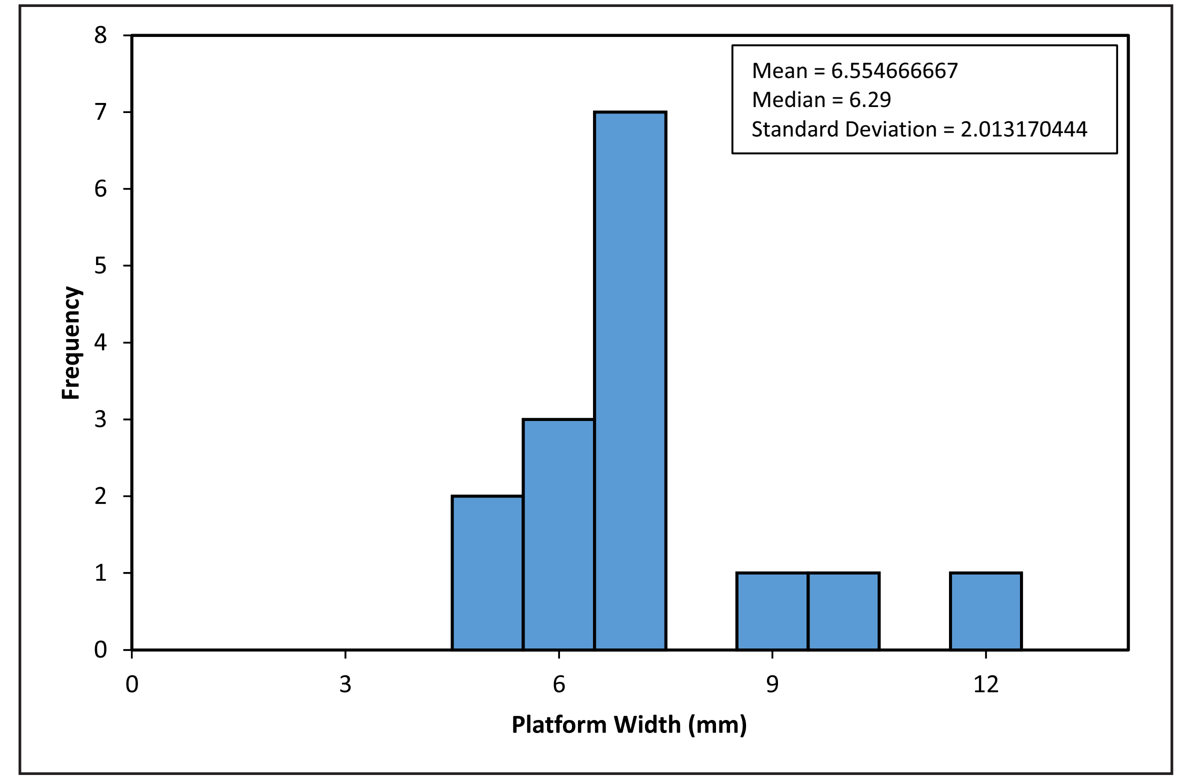


FIGURE 15: Block 2 Histogram, Biface Reduction Flake Platform Width (mm) Size <1/2"

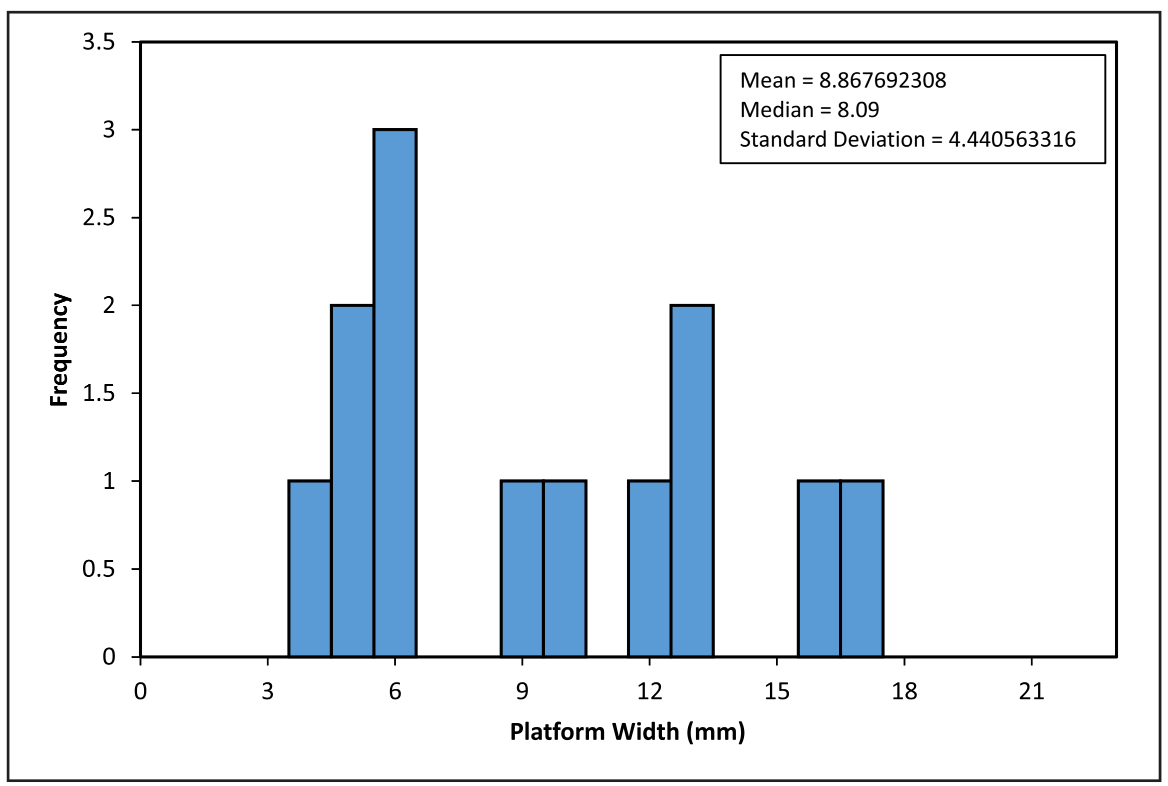


FIGURE 16: Block 3 Histogram, Biface Reduction Flake Platform Width (mm) Size <1/2"

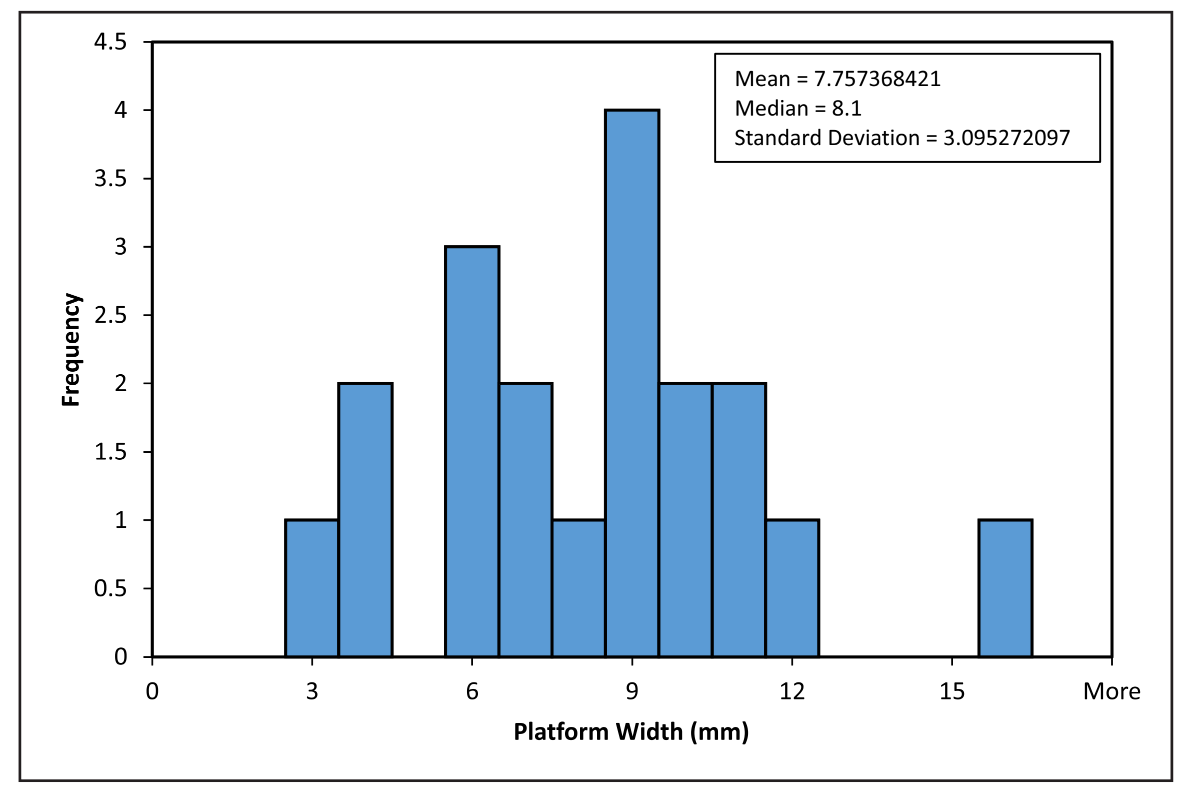


FIGURE 17: Block 4 Histogram, Biface Reduction Platform Width (mm) Size <1/2"

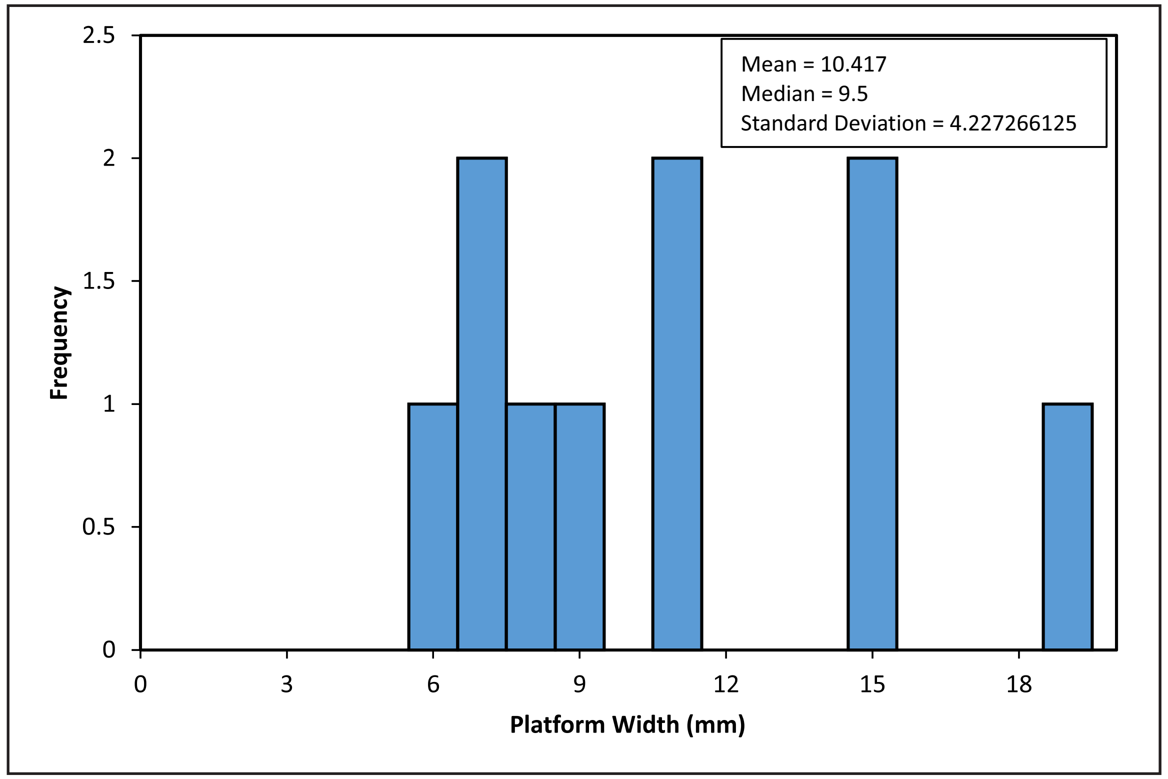


FIGURE 18: Block 1 Histogram, Biface Reduction Flake Platform Width (mm) Size >1/2"

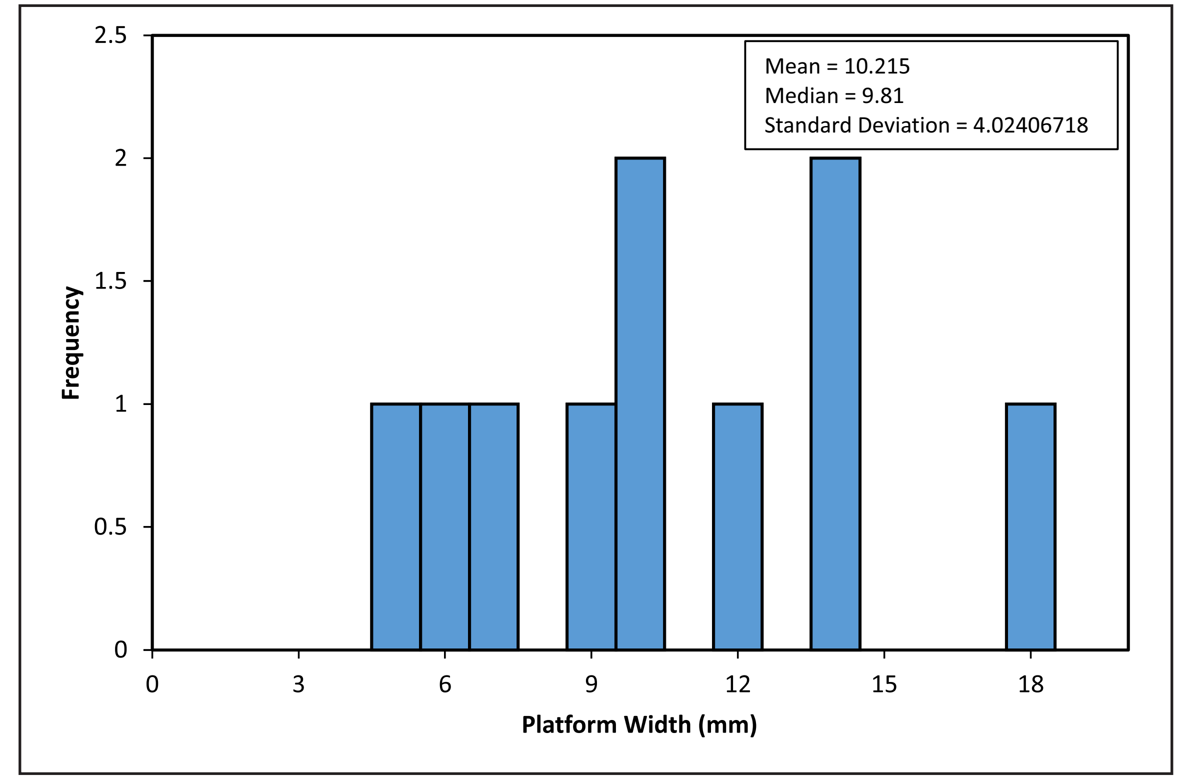


FIGURE 19: Block 2 Histogram, Biface Reduction Flake Platform Width (mm) Size >1/2"

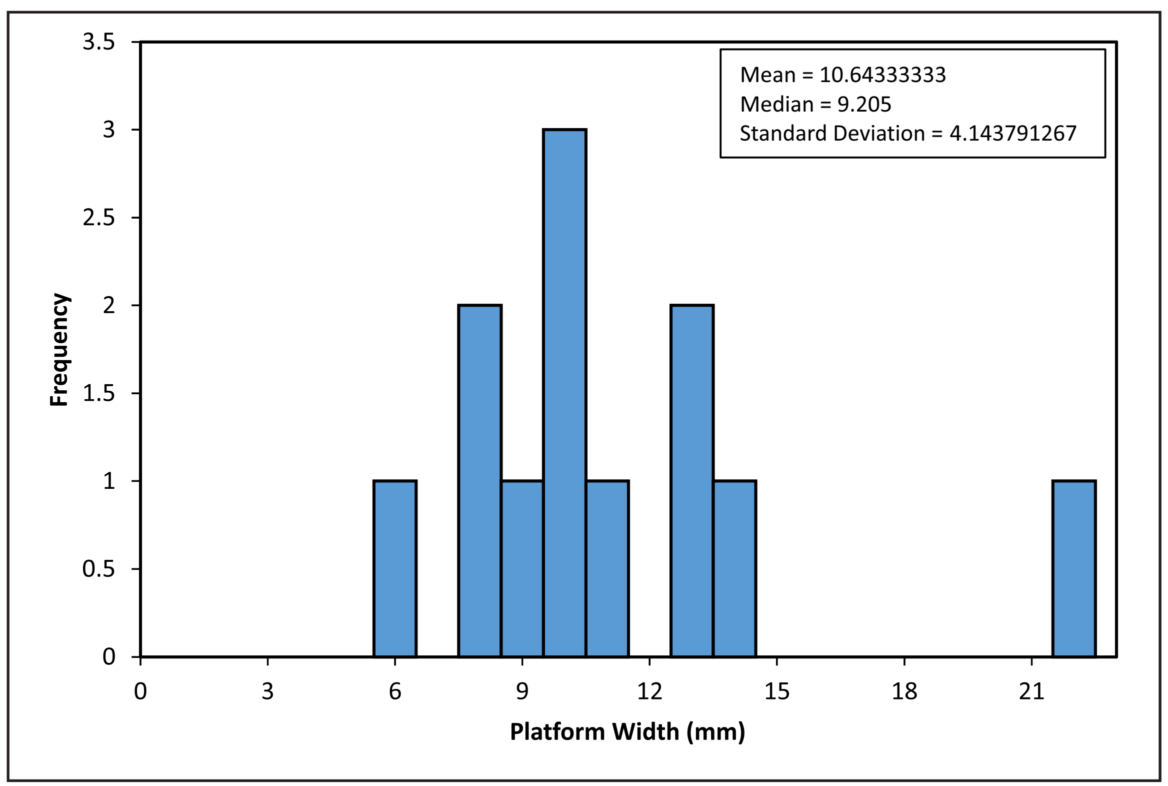


FIGURE 20: Block 3 Histogram, Biface Reduction Flake Platform Width (mm) Size >1/2"

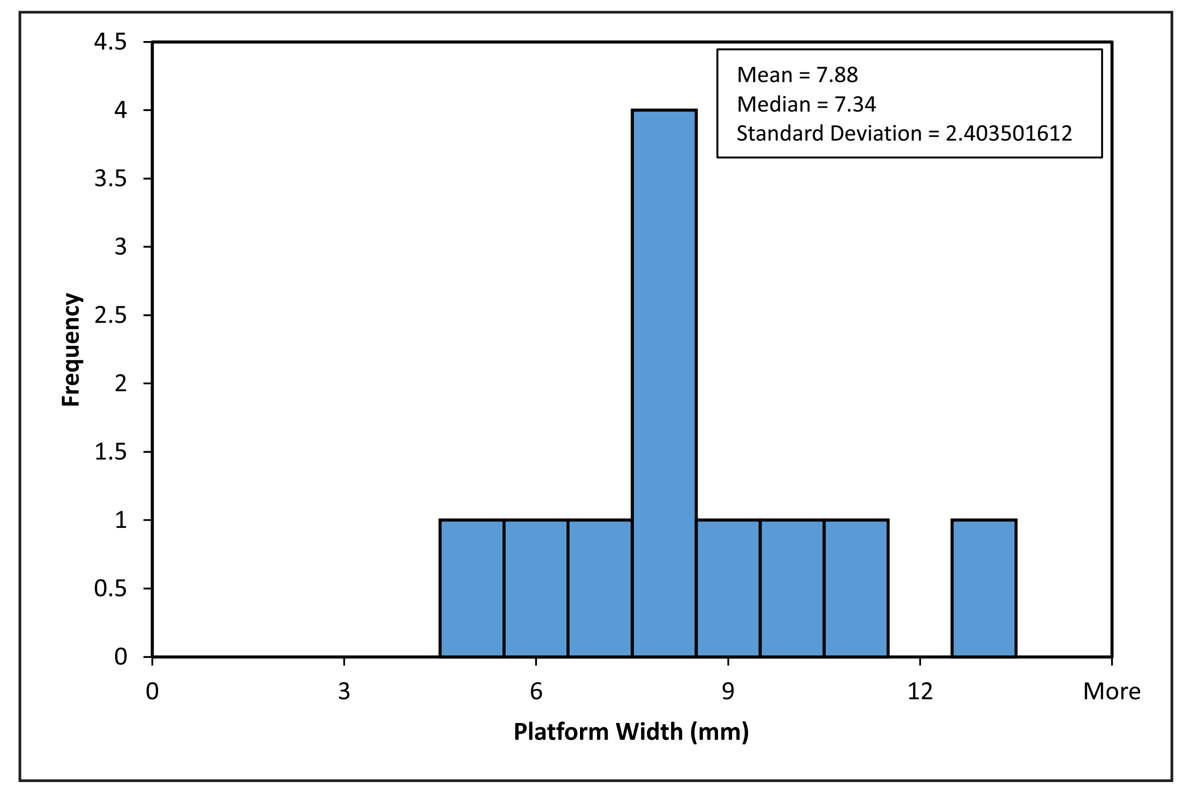
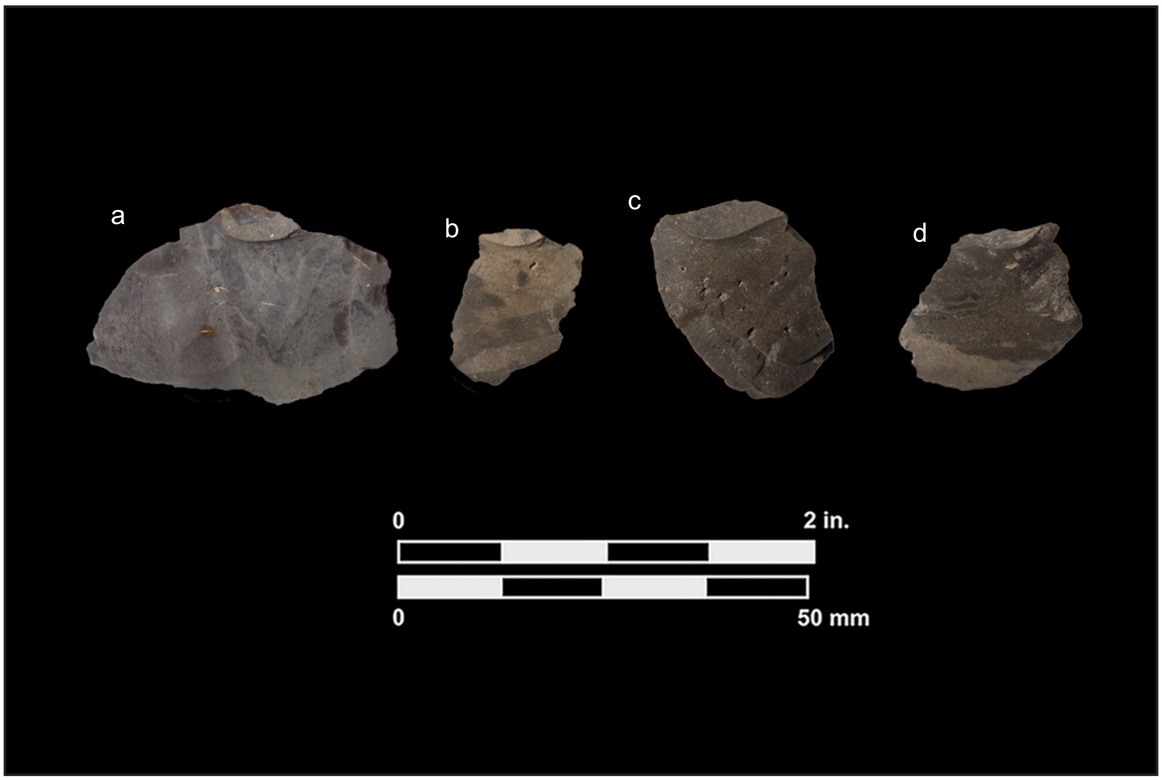


FIGURE 21: Block 4 Histogram, Biface Reduction Flake Platform Width (mm) Size >1/2"



PHOTOGRAPH 19: Platforms on Biface Reduction Flakes

(a) Block 1 (Field No. 109, Spec. No. 2)
(b) Block 2 (Field No. 123, Spec. No. 3)
(c) Block 3 (Field No. 166, Spec. No. 2)
(d) Block 4 (Field No. 178, Spec. No. 1)

VII. Summary and Conclusions

Louis Berger conducted Phase III archaeological data recovery excavations of the Gorge Creek Site 1 (09542.000116) April 26–June15, 2017. This prehistoric site had been deemed eligible for the National Register of Historic Places as a result of Phase I and II investigations by Landmark Archaeology, Inc. (Gade et al. 2016; Gade and Schreyer 2016). The site is located in the APE for the proposed Gorge Creek Culvert Repair and Storm Water Improvements (OPRHP No. 15PR06219) in the Village of Middleburgh, Schoharie County, New York. Louis Berger performed the work on behalf of the Housing Trust Fund Corporation.

Louis Berger manually excavated 36 square meters (388 square feet) arrayed in four blocks of nine units each. The placement of these excavation blocks was determined primarily by the quantities of artifacts reported from the Phase I and Phase II shovel tests and units. Block 1 was located between Phase II Units 2 and 4. Block 2 was placed south of Phase II Unit 11. Block 3 was located just north of Shovel Test 28-2, and Block 4 was placed west of Shovel Test 20-5.

After block excavation, the plowzone was mechanically stripped from 12 areas for a total exposure of 3,691 square meters (39,730 square feet). The exposed subsoil was generally very rocky. Several patches of red-stained, oxidized soil were evident, generally with associated charcoal. These patches were amorphous and did not appear to be of cultural origin. Nevertheless, three patches, designated as Features 3, 4, and 5, were sectioned to reveal their profiles. None proved to be prehistoric cultural features.

The block excavations produced 3,076 lithic artifacts. In addition, a small number of chert chunks (n=44) were collected that, upon closer laboratory inspection, proved not to be artifacts. Only a very small percentage of the artifacts (n= 37; just over 1 percent) are whole or fragmentary formed tools, preforms, or utilized flakes. Almost all of this material came from the plowzone. By far the greatest percentage of the lithic material is dark gray Onondaga chert with brownish overtones. A minority is a lighter gray with a bluish tendency. The only temporally diagnostic artifact recovered is the basal portion of a Brewerton Corner-notched point found at the base of the plowzone in the northeast part of Block 3. This type indicates an occupation of the site ca. 6000 to 5000 cal BP.

Lithic debitage, including all types of flakes created in the lithic reduction sequence, was counted and measured. Raw material type, lithic reduction stage (blocky shatter, decortication, early stage, biface reduction, thinning) and presence/absence of cortex were also recorded. Whole and broken flakes (lacking the original striking platform or termination) were distinguished. Contrary to results of previous investigations, utilized flakes constitute only a small fraction of the assemblage.

A spatial analysis sought to determine horizontal variation in the distribution of lithic tool types and debitage, focusing on any perceptible differences between the northeast area of the site (Blocks 2 and 4), putatively dominated by Orient phase materials based on a surface collection, and the central area (Blocks 1 and 3), where the Brewerton point was found. The data for each block were also compared to data from other assemblages from the Schoharie Creek drainage, the mid-Hudson, and western New York. The results appear to indicate subtle differences in lithic reduction activities in the northeast area from those in the central area. Informative variables for this purpose proved to be the percentages of biface thinning flakes and flake fragments and the platform widths of biface reduction flakes. Gorge Creek appears distinctive from other Schoharie Creek sites for its very high proportion of biface thinning flakes (56 percent). Narrower platform widths distinguish flakes in Blocks 2 and 4 from those in Blocks 1 and 3. However, no distinctive attributes allow identification of the artifacts from the northeast sector as Orient-associated.

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Appendix A

Methods of Artifact Cataloging and Analysis

METHODS OF ARTIFACT CATALOGING AND ANALYSIS

A. LABORATORY PROCESSING

All artifacts were transported from the field to the Louis Berger laboratory. In the field, artifacts were bagged in 4-mil, resealable polyethylene bags. Artifact cards bearing provenience information were included in the plastic bags. A Field Number was assigned to each unique provenience in the field. This number appears with all the provenience information and is used throughout processing and analysis to track artifacts.

Prehistoric lithics were washed in water with a soft toothbrush. Fragile artifacts were wet-brushed with a soft natural-bristle paintbrush or were simply dry-brushed. All artifacts were laid out to air-dry in preparation for analysis.

During analysis, individual Specimen Numbers were assigned to artifacts. After analysis, the artifacts were re-bagged into clean, perforated 4-mil resealable polyethylene bags. Artifacts are organized sequentially first by Site Number, then Field Number and finally by Specimen Number. Before submitting for curation, catalog numbers were assigned in accordance with curation facility guidelines. An acid-free artifact card listing full provenience information and analytical class was included in each bag. No conservation treatment on the artifacts was needed nor performed.

B. ANALYTICAL METHODS

All artifact analyses were conducted by the Laboratory Supervisor and/or Material Specialist(s). Louis Berger maintains an extensive comparative collection and laboratory research library to contribute to the completeness and accuracy of the analyses.

Louis Berger has developed a flexible analytical database system that fully integrates all artifacts in one database for use in data manipulation and interpretation. The computerized data management system is written using Microsoft Access, a relational database development package that runs on a Windows® platform. Each class of artifacts (lithics, historic ceramics, curved (vessel) glass, small finds/architectural, historic tobacco pipes, and faunal) has a series of attributes, sometimes unique to that class, that are recorded to describe each artifact under analysis. Artifact information (characteristics) was entered into the system during the process of analysis. The system was then used to enhance the artifact records with the addition of provenience information. Louis Berger maintains a complete type and attribute coding system maintained in the database.

The Notes field allows individual written comments applicable to a specific entry. In general notes are used to describe particulars of decorative motifs or unusual characteristics, or to record bibliographic references used for identification or dating.

C. LITHIC ARTIFACT ANALYSIS

The analytical approach to stone tool production and use that was used in this analysis can be described as technomorphological; that is, artifacts were grouped into general classes and then further divided into specific types based upon key morphological attributes, which are linked to or indicative of particular stone tool production (reduction) strategies. Function was inferred from morphology as well as from use wear. Data derived from experimental and ethnoarchaeological research were relied upon in the identification and interpretation of artifact types. The works of Callahan (1979), Clark (1986), Crabtree (1972), Flenniken (1981), Justice (1987), and Parry (1987) were drawn upon most heavily. All types were quantified by both count and weight (in grams). Each artifact type was separated by material first (Onondaga chert, Esopus chert, etc.), and then further grouped by size (< 0.5 inch or > 0.5 inch) and color (dark gray, 2.5Y 4/1 to 3/1; light gray, 2.5Y 5/1 or 6/1).

a. Debitage

Debitage is the byproduct of lithic reduction and includes all types of chipped-stone refuse that bear no obvious traces of having been utilized or intentionally modified. There are two basic forms of debitage: flakes and shatter. Observations on raw material and cortex were recorded. The following descriptions are for the debitage types identified, but not the full range of types described in Taylor et al. (1996).

Decortication Flakes are intact or nearly intact flakes with 50 percent or more cortex covering their dorsal surface. These are the first series of flakes detached during lithic reduction.

Early Reduction Flakes are intact or nearly intact flakes with less than 50 percent dorsal cortex, fewer than four dorsal flake scars, on the average, and irregularly shaped platforms with minimal faceting and lipping. Platform grinding is not always present. These flakes could have been detached from early-stage bifaces or cores of the freehand and bipolar types.

Biface Reduction Flakes are intact or nearly intact flakes with multiple overlapping dorsal flake scars and small elliptically shaped platforms with multiple facets. Evidence of platform grinding is usually present. Platforms are distinctive because they represent tiny slivers of what once was the edge of a biface. Biface reduction flakes are generated during the middle and late stages of biface reduction and also during biface maintenance (resharpening).

Pressure Flakes are made using a flaker. Because the force is applied by pressing and not striking, there are some morphological differences as compared with hard and soft hammer flakes. The platform is not a flat surface, but a slightly crushed edge. The edge grinding appears as the result of the edge preparation procedure.

Bipolar Reduction Flakes are intact or nearly intact flakes that have been struck from a bipolar core. They typically exhibit sheared cones, diffuse bulbs, closely spaced ripples, and crushed and splintered platforms. Crushing can also occur on the termination of flakes (distal end).

Finishing Flakes are small flakes, usually detached through pressure flaking, and are used to create the final cutting edge of the blade.

Resharpening Flakes are small, often rounded flakes that are usually detached through pressure flaking and exhibit evidence of prior use on the dorsal surface. These flakes are the byproduct of resharpening the blade edge for further use.

Uniface Resharpening Flakes are small J-shaped flakes that have been removed from the margins of a uniface. Their platforms often bear traces of use damage or polish.

Flake Fragments are sections of flakes that are too fragmentary to be assigned to a particular flake type.

Block Shatter refers to angular or blocky fragments that do not possess platforms or bulbs. Generally the result of uncontrolled fracturing along inclusions or internal fracture planes, block shatter is most frequently produced during the early reduction of cores and bifaces. Block shatter is also common in bipolar reduction, and it is equivalent to Binford and Quimby's (1963) “primary shatter.” Thermal fracturing can also produce block shatter.

Flake Shatter refers to small, flat fragments or splinters that lack platforms, bulbs, and other obvious flake attributes. Flake shatter is generated throughout a reduction sequence but is most common in later stages. It is a common by-product of bipolar reduction, and it is equivalent to "secondary shatter" (Binford and Quimby 1963). Trampling of debitage on living surfaces also generates flake shatter, whereas thermal fracturing produces both flake and block shatter.

Other Flake Types are those types for which there is no Lithica (Taylor et al. 1996) designation. Their characteristics are described in the Notes field, as needed.

Indeterminate Flakes are flakes that cannot be assigned to a specific type because their surface has been damaged (e.g., pot lidding) or severely eroded (e.g., argillite debitage).

b. Cores

Cores are cobbles or blocks of raw material that have had one or more flakes detached and that have not been shaped into tools or used extensively for tasks other than as a nucleus from which flakes have been struck. The types of cores identified are listed below, but this does not represent the full range of types possible as discussed in Taylor et al. (1996).

Freehand Cores are blocks or cobbles that have had flakes detached in multiple directions by holding the core in one hand and striking it with a hammerstone held in the other (Crabtree 1972). This procedure generates flakes that can be used as expedient tools or can be worked into formalized tools. Freehand percussion cores come in various shapes and sizes, depending upon the raw material form and degree of reduction.

Bipolar Cores are blocks or cobbles that have had flakes detached by direct hard-hammer percussion on an anvil: the core is placed on the anvil and struck vertically with a hammerstone (Crabtree 1972; Hayden 1980). Cores typically take on a tabular shape, exhibit heavy crushing and battering, and flake scars tend to run between areas of crushing and battering. Bipolar cores are normally smaller than freehand cores because bipolar reduction is a technique for maximizing available raw materials. Most flakes that are detached are only suitable for expedient flake tools.

Bifacial cores are specific types of freehand, amorphous cores flaked on both sides, i.e., reduced along one or more bifacially prepared edges for the purpose of flake production. Flaking occurs on both sides of a nodule to fully exploit the material.

Flake cores are made from tubular large flakes usually flaked on one side, often with a defined flaking pattern. Some large early reduction flakes could have been used as flake cores to produce flake-based scrapers or perhaps burins.

Tested Cobbles are unmodified cobbles, blocks, or nodules that have had a few flakes detached to examine raw-material quality.

Other Core Types are cores that do not easily fit into existing types as for example, formalized blade cores. The Notes field is used to record important attributes.

c. Bifaces

A biface is a flake or cobble that has had multiple flakes removed from the dorsal and ventral surfaces. Bilateral symmetry and a lenticular cross section are common attributes; however, these attributes vary with the stages of production, as do thickness and uniformity of edges (see Callahan 1979). Included in this artifact class are all hafted and unhafted bifaces that functioned as projectile points and/or knives, as well as bifacially worked drill bits and unfinished bifaces. Specific types of bifaces represented in the collection are described below.

Projectile Points are finished bifaces that were usually hafted and functioned primarily as projectiles. Projectile points are usually triangular in overall form, with various types of hafting elements.

Knives are finished bifaces that were usually hafted and functioned primarily as cutting implements. Knives are characterized by one or more elongate cutting edges.

Finished Bifaces are finished bifaces that were probably hafted, but are too fragmentary or ambiguous to assign to a functional category (e.g., projectile point or knife).

Late-Stage Bifaces are basically finished bifaces; they are well thinned, symmetrical in outline and cross section, and edges are centered. Small areas of cortex may still exist on one or both faces. These bifacial preforms are analogous to Callahan’s Stage 4 bifaces (1979).

Middle-Stage Bifaces look more like bifaces; they have been initially thinned and shaped. A lenticular cross section is developing, but edges are sinuous, and patches of cortex may still remain on one or both faces. These bifaces are roughly equivalent to Callahan’s Stage 3 bifaces (1979). Biface reduction is a continuum; therefore, middle-stage bifaces are often difficult to distinguish from early- and late-stage bifaces, depending upon the point at which their reduction was halted. Rejected bifaces may have also been used for other tasks (recycled).

Early-Stage Bifaces are cobbles, blocks, or large flakes that have had their edges bifacially trimmed and a few large reduction flakes detached. These bifacial blanks are equivalent to Callahan’s Stage 2 bifaces (1979). Because of their crude condition, these bifaces can be confused with freehand percussion cores and choppers.

Choppers or cleavers are sizable bifaces that may have been employed in tasks that required heavy-duty cutting, chopping, or severing. These implements are often crudely formed and can be mistaken for cores or early-stage bifaces.

Drills are slender bifaces that could have been used to perforate or pierce various materials.

Adzes or gouges are bifaces that were hafted and used as heavy duty woodworking tools.

Other Bifaces are bifaces that do not easily fit into the above types. The Notes field is used to record distinctive attributes.

Indeterminate Bifaces are sections of bifaces that are too badly damaged to be assigned to a specific type.

d. Unifaces

A uniface is a formalized tool fashioned from a flake by uniformly retouching its edges to create a specific working edge and a standardized shape. There are two basic types of formal unifaces: endscrapers and sidescrapers. In the former, the working edge is transverse to the long axis of the tool; in the latter, the working edge (or edges) parallels the long axis of the tool.

Endscrapers are formalized unifaces that have uniformly retouched edges, which creates a working edge and a standardized shape. The working edge is transverse to the long axis of the tool, and retouching often erases obvious indications that the tool is made on a flake.

Sidescrapers are formalized unifaces that have uniformly retouched edges, which creates a working edge and a standardized shape. The working edge parallels the long axis of the tool, and retouching often erases obvious indications that the tool is made on a flake.

Other Uniface Types are unifaces that do not fit easily into existing types. The Notes field is used to record distinctive attributes.

Indeterminate Uniface Fragments are unifaces that are too fragmentary to be assigned to a specific type.

e. Flake Tools

Utilized and edge-retouched flakes are informal expedient tools. They are flakes that were struck from a core or a biface and used to perform one or more tasks, with little or no prior modification. In some cases, it is difficult to distinguish intentional retouch from use damage.

Utilized Flakes are expedient tools that exhibit traces of use damage and/or polish on one or more edges. These flakes could have been detached from cores or bifaces.

Retouched Flakes are expedient tools that have had one or more edges retouched, either to resharpen the working edge, to create a dulled edge for grasping, or to form a specific edge angle or shape. The flake itself could have been detached from a core or a biface.

Notched Flakes or spokeshaves are a special type of retouched flake. The retouching of one or more flake edges into a concavity distinguishes this morphological type.

Graver Flakes are a special type of retouched flake. The retouching of one or more edges into acute projections distinguishes this type.

Denticulated Flakes are a special type of retouched flake. They are distinctive because appropriately spaced flakes have been detached from one or more edges to form a toothed or serrated edge.

f. Cobble Tools

Alluvial cobbles or slabs of bedrock were used for various tasks, with little or no prior modification. These simple tools were used as hammers, anvils, grinding stones, abraders, or for a combination of functions. Battered, crushed, pitted, and/or smooth surfaces identify these stones as tools.

Netsinkers are notched cobbles. Direct hard hammer percussion was used to remove a few flakes from both ends of a cobble to facilitate the cobble's attachment to a net. Some specimens could have functioned as bolas stones.

Hammerstones are cobbles that show evidence of battering and crushing along their margins, indicating that they were intentionally used as percussors either for flaking siliceous materials or working other resistant materials.

Manos or grinding stones are hand-sized cobbles with one or more flat surfaces that were used to crush and grind various materials, as is evidenced by smoothed and polished surfaces.

Metates or grinding slabs are large cobbles or blocks of bedrock with one or two flat or concave surfaces, which exhibit evidence of grinding and crushing.

Pestles are linear (oblong) cobbles that exhibit crushing and smoothing on one or both ends or poles. Pestles can also be formalized tools that were shaped by pecking and grinding.

Mortars are large cobbles or blocks of bedrock with at least one deeply concave surface, which was used to hold various materials to be crushed and ground.

Pitted Cobbles or "nutting stones" are cobbles or blocks of bedrock with at least one smooth depression smaller than 4 centimeters in diameter. Unlike anvil depressions, these are smooth and tend to be circular or oval. These depressions may be the result of processing nuts, differing from anvil depressions created by bipolar lithic reduction.

Abraders are chunks of sandstone or related materials that were used to shape and sharpen tools made of various materials. Slotted abraders are believed to have been used in the manufacture and maintenance of bone and wood tools (e.g., needles, awls, shafts), and flat abraders are believed to have been used in the manufacture and maintenance of stone tools in addition to bone and wood tools.

Anvil Stones are cobbles or blocks of bedrock that were used as a base on which to rest materials while they were struck with a hammer. Anvil surfaces tend to possess shallow, coarse-textured depressions with amorphous outlines.

Other Cobble Tools are cobble tools that do not have pre-existing Lithica codes. A description of the specimen appears in the Notes field.

g. Groundstone Tools

Groundstone tools are formal stone tools and ornaments that were manufactured by pecking, grinding, and sometimes flaking. Typical artifact types are grooved axes, pipes, pendants, etc.

Stone Bowls are stone cooking vessels that were manufactured by carving, grinding, and polishing.

Grooved Axes are formal tools that were designed to be hafted, and their primary function was heavy duty woodworking.

Celts are ungrooved axes; they were hafted by a different method than grooved axes.

Adzes or gouges manufactured from granitic materials by pecking and grinding were hafted and functioned as heavy duty woodworking tools, much like their chipped stone tool counterparts.

Mauls are large, heavy-duty, round implements with a blunt bit and are most commonly associated with quarrying activities. Mauls are usually grooved and have defined polls. Mauls are often made from granite, diorite, basalt, or other hard stone. Ungrooved mauls are generally defined as hammerstones.

Other Groundstone Tools are those tools and ornaments that are not covered by the above types, for example, bannerstones, pipes, and pendants.

Indeterminate Groundstone Fragments are sections of groundstone tools or ornaments that are too badly damaged to be assigned to a specific type.

D. FLORAL ANALYSIS

The floral analysis identifies species, element, and any modifications to the specimen (e.g., Burning). Identifications were made with the aid of a comparative floral type collection and the use of reference materials, including Martin and Barkely (1961).

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Appendix B

Artifact Inventory

2004232.031_Gorge Creek Phase III Artifact Catalog

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	1	A	1	101	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	9	39.1	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	1	A	1	101	2	Lithics	Biface Reduction Flake	Light grey	> 1/2"	6	14.4	Light grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	1	A	1	101	3	Lithics	Biface Reduction Flake	Light grey/red	> 1/2"	1	5	Light grey with red mineral staining present Onondaga chert; cortex absent; platform and bulb of percussion present.
09542.0001	Block 1	1	A	1	101	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	30	19.3	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	1	A	1	101	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	7	5.4	Light gray Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	1	A	1	101	6	Lithics	Biface Reduction Flake	Bluish light grey	< 1/2"	1	0.7	Light bluish-gray chert with slight red mineral staining; cortex absent; platform and bulb of percussion present.
09542.0001	Block 1	1	A	1	101	7	Lithics	Finishing Flake	Dark grey	< 1/2"	4	0.3	Dark grey Onondaga chert; cortex absent; small, mostly complete flakes with platforms and/or bulbs of percussion present.
09542.0001	Block 1	1	A	1	101	8	Lithics	Flake Fragment	Dark grey	> 1/2"	1	2.1	Dark grey Onondaga chert; cortex absent; snapped/broken edges and ends.
09542.0001	Block 1	1	A	1	101	9	Lithics	Flake Fragment	Light grey	> 1/2"	3	3.5	Light grey Onondaga chert; cortex absent; broken/snapped ends and edges.
09542.0001	Block 1	1	A	1	101	10	Lithics	Flake Fragment	Dark grey	< 1/2"	26	14.3	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	1	A	1	101	11	Lithics	Flake Fragment	Light grey	< 1/2"	6	3.5	Light grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	1	A	1	101	12	Lithics	Flake Fragment	Light grey/red	< 1/2"	1	1	Light gray with red mineral staining Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	1	A	1	101	13	Lithics	Debitage / General	Dark grey	> 1/2"	3	30.2	Dark grey Onondaga chert; cortex absent; irregular forms.
09542.0001	Block 1	1	A	1	101	14	Lithics	Debitage / General	Dark grey	> 1/2"	2	75.3	Dark grey Onondaga chert; cortex present; one fragment with microfossils; irregular forms.
09542.0001	Block 1	1	B	2	102	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	6	2.4	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	1	B	2	102	2	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	1	1.4	Light grey with red mineral staining Onondaga chert; cortex absent; partial platform present.
09542.0001	Block 1	1	B	2	102	3	Lithics	Flake Fragment	Dark grey	< 1/2"	1	0.3	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	1	B	2	102	4	Lithics	Debitage / General	Dark grey	> 1/2"	2	11.1	Dark grey Onondaga chert; cortex absent; irregular/blocky forms.
09542.0001	Block 1	1	B	2	102	5	Lithics	Debitage / General	Dark grey	< 1/2"	5	4.2	Dark grey Onondaga chert; cortex absent; irregular forms.
09542.0001	Block 1	1	B	2	102	6	Lithics	Debitage / General	Dark grey	< 1/2"	4	3.3	Dark grey Onondaga chert; cortex present; irregular forms.
09542.0001	Block 1	2	A	1	103	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	16	69.4	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	2	A	1	103	2	Lithics	Biface Reduction Flake	Light grey	> 1/2"	5	14.7	Light grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	2	A	1	103	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	30	15.1	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	2	A	1	103	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	4	2.4	Light grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	2	A	1	103	5	Lithics	Flake Fragment	Dark grey	> 1/2"	7	12.6	Dark grey Onondaga cher; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	2	A	1	103	6	Lithics	Flake Fragment	Dark grey	< 1/2"	59	31	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	2	A	1	103	7	Lithics	Flake Fragment	Light grey	< 1/2"	2	1.8	Light grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	2	A	1	103	8	Lithics	Debitage / General	Dark grey	> 1/2"	4	19.9	Dark grey Onondaga chert; cortex absent; irregular forms.
09542.0001	Block 1	2	A	1	103	9	Lithics	Debitage / General	Dark grey	< 1/2"	10	11.9	Dark grey Onondaga chert; cortex absent; irregular forms.
09542.0001	Block 1	2	A	1	103	10	Lithics	Debitage / General	Dark grey	> 1/2"	5	56.1	Dark grey Onondaga chert; cortex present; irregular and blocky forms.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	3	A	1	104	1	Lithics	Flake Tool / General	Dark grey	> 1/2"	1	7.7	Onondaga chert, broad, flat flake bifacially worked along two edges, with pronounced bulbs of percussion, one long edge snapped/broken.
09542.0001	Block 1	3	A	1	104	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	20	50	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	3	A	1	104	3	Lithics	Biface Reduction Flake	Light grey	> 1/2"	7	26.4	Light gray Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	3	A	1	104	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	53	23.1	Dark gray Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	3	A	1	104	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	5	4.5	Light gray Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	3	A	1	104	6	Lithics	Flake Fragment	Light grey	> 1/2"	3	4	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	3	A	1	104	7	Lithics	Flake Fragment	Dark grey	< 1/2"	55	26.5	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	3	A	1	104	8	Lithics	Flake Fragment	light grey	< 1/2"	16	7.5	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	3	A	1	104	9	Lithics	Debitage / General	Dark grey	< 1/2"	12	14	Dark grey Onondaga chert, cortex absent; irregular forms.
09542.0001	Block 1	3	A	1	104	10	Lithics	Debitage / General	Dark grey	< 1/2"	7	7.6	Onondaga chert; cortex present, heating absent; irregular forms.
09542.0001	Block 1	3	A	1	104	11	Lithics	Debitage / General	Dark grey/red	< 1/2"	1	4.7	Onondaga chert, dark grey with red staining; cortex absent; one possible platform present; blocky, irregular form.
09542.0001	Block 1	4	A	1	105	1	Lithics	Utilized Flake	Dark grey	> 1/2"	2	17.1	Onondaga chert; cortex absent, heating absent; broad, flat flakes with probable retouching along edges.
09542.0001	Block 1	4	A	1	105	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	6	20.4	Onondaga chert; cortex absent, heating absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	4	A	1	105	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	18	9.1	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	4	A	1	105	4	Lithics	Biface Reduction Flake	Light grey	> 1/2"	6	24.3	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	4	A	1	105	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	7	3.9	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	4	A	1	105	6	Lithics	Flake Fragment	Dark grey	> 1/2"	2	4.2	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	4	A	1	105	7	Lithics	Flake Fragment	Dark grey	< 1/2"	22	9.1	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	4	A	1	105	8	Lithics	Flake Fragment	Light grey	< 1/2"	4	2.3	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion absent; snapped/broken ends and edges.
09542.0001	Block 1	4	A	1	105	9	Lithics	Debitage / General	Dark grey	< 1/2"	3	12.1	Onondaga chert; cortex absent, heating absent; irregular forms.
09542.0001	Block 1	4	A	1	105	10	Lithics	Debitage / General	Dark grey	< 1/2"	1	3.6	Onondaga chert; cortex present, heating absent; irregular form.
09542.0001	Block 1	4	B	2	106	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	0.3	Onondaga chert, grey; no heating, no cortex; flaking scars on dorsal surface
09542.0001	Block 1	4	B	2	106	2	Lithics	Debitage / General	Dark grey	> 1/2"	1	6.8	Onondaga chert, mottled dark grey; no heating, no cortex; blocky
09542.0001	Block 1	4	B	2	106	3	Lithics	Debitage / General	Light grey	< 1/2"	1	0.5	Grey/brown Onondaga chert; cortex on platform
09542.0001	Block 1	4	B	2	106	4	Lithics	Debitage / General	Dark grey	< 1/2"	8	4.4	Grey Onondaga chert; impurities present; blocky fragments
09542.0001	Block 1	5	A	1	107	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	13	49.2	Dark grey Onondaga chert; cortex absent; bulb present with platform
09542.0001	Block 1	5	A	1	107	2	Lithics	Biface Reduction Flake	Light grey	> 1/2"	12	25.9	Light grey Onondaga chert; contex absent; bulb present
09542.0001	Block 1	5	A	1	107	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	44	25.5	Dark grey mottled; Onondaga chert, no cortex, bulb present
09542.0001	Block 1	5	A	1	107	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	17	10.1	Onondaga chert; cortex absent; bulb present; mottled
09542.0001	Block 1	5	A	1	107	5	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	3	2.8	Light grey Onondaga chert, mottled with red; no cortex, bulb present

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	5	A	1	107	6	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.1	Very small whole reduction flake; bulb present; Onondaga chert
09542.0001	Block 1	5	A	1	107	7	Lithics	Flake Fragment	Dark grey	< 1/2"	13	8.7	Small Onondaga fragments; bulb absent
09542.0001	Block 1	5	A	1	107	8	Lithics	Flake Fragment	Light grey	< 1/2"	4	0.7	Very small Onondaga fragments; mottled; bulb absent
09542.0001	Block 1	5	A	1	107	9	Lithics	Debitage / General	Dark grey/purpl	> 1/2"	1	27.4	Large, block fragment; impurities present; mottled dark grey and purple; heating indeterminate
09542.0001	Block 1	5	A	1	107	10	Lithics	Debitage / General	Dark grey	> 1/2"	4	14	Blocky fragments; no cortex
09542.0001	Block 1	5	A	1	107	11	Lithics	Debitage / General	Dark grey	< 1/2"	10	3.9	Small blocky fragment; possible shatter; dark grey mottling
09542.0001	Block 1	5	B	2	108	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	0.4	Onondaga grey chert; bulb present; no heating; no cortex
09542.0001	Block 1	5	B	2	108	2	Lithics	Debitage / General	Dark grey	< 1/2"	3	2.4	Onondaga grey chert; blocky fragments; no heating, no cortex
09542.0001	Block 1	6	A	1	109	1	Lithics	Decortication Flake	Dark grey	> 1/2"	1	6.3	Cortex on dorsal surface; no heating, grey Onondaga chert
09542.0001	Block 1	6	A	1	109	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	16	72.5	Onondaga chert; no heating present, no cortex; large reduction fragments with bulb of percussion
09542.0001	Block 1	6	A	1	109	3	Lithics	Biface Reduction Flake	Light grey	> 1/2"	16	79.5	Onondaga chert; no heating present, no cortex; large reduction fragments with bulb of percussion
09542.0001	Block 1	6	A	1	109	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	36	17.7	Onondaga chert; no heating, cortex absent; bulb present
09542.0001	Block 1	6	A	1	109	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	16	10.4	Onondaga chert; no heating, no cortex; bulb present
09542.0001	Block 1	6	A	1	109	6	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	2	3.8	Onondaga chert, dark grey, red mottling; no cortext; bulb present
09542.0001	Block 1	6	A	1	109	7	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.2	Onondaga chert; dark grey, whole flake with bulb and dorsal scars
09542.0001	Block 1	6	A	1	109	8	Lithics	Flake Fragment	Dark grey	< 1/2"	18	8	Onondaga chert; no heating, no cortex; snapped fragments

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	6	A	1	109	9	Lithics	Flake Fragment	Light grey	< 1/2"	11	5.4	Onondaga chert; no heating, no cortex; snapped fragments
09542.0001	Block 1	6	A	1	109	10	Lithics	Debitage / General	Dark grey	> 1/2"	3	13.8	Mottled chert fragments; cortex present; blocky
09542.0001	Block 1	6	A	1	109	11	Lithics	Debitage / General	Dark grey	> 1/2"	6	27.7	Blocky chert fragments; cortex absent; fragments
09542.0001	Block 1	6	A	1	109	12	Lithics	Debitage / General	Dark grey	< 1/2"	43	23.8	Small fragments; cortex absent
09542.0001	Block 1	6	B	2	110	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	0.9	Dark grey Onondaga chert; no cortex; bulb peresent
09542.0001	Block 1	6	B	2	110	2	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.6	Dark grey Onondaga chert; snapped; no cortex; no bulb present
09542.0001	Block 1	6	B	2	110	3	Lithics	Flake Fragment	Light grey	< 1/2"	1	1	Light grey Onondaga chert; snapped proximal, no bulb; flaking scars on dorsal surface
09542.0001	Block 1	6	B	2	110	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	1.4	Blocky Onondaga chert; no cortex; small fragments; possibly natural (non-cultural)
09542.0001	Block 1	6	B	2	110	5	Lithics	Debitage / General	Light grey/red	> 1/2"	1	1.6	Spalled Onondaga chert fragment; interior reddish, exterior light grey
09542.0001	Block 1	7	A	1	111	1	Lithics	Decortication Flake	Dark grey	> 1/2"	1	2.8	Cortex present on dorsal surface; bulb present; Onondaga chert mottled
09542.0001	Block 1	7	A	1	111	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	15	59.5	Mottled Onondaga chert no cortex present; bulb present; large fragments
09542.0001	Block 1	7	A	1	111	3	Lithics	Biface Reduction Flake	Light grey	> 1/2"	12	32.8	Light grey Onondaga chert; no cortex, bulb present
09542.0001	Block 1	7	A	1	111	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	42	31.5	Dark grey Onondaga; no cortex, bulb present; mottled
09542.0001	Block 1	7	A	1	111	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	19	10.2	Light grey chert fragments; no cortex, bulb present
09542.0001	Block 1	7	A	1	111	6	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	1	1.1	Light grey with red mottling; no cortex, bulb present; snapped distal
09542.0001	Block 1	7	A	1	111	7	Lithics	Flake Fragment	Dark grey	< 1/2"	11	2.9	Snapped fragments; no bulb present; no cortex; Onondaga chert

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	7	A	1	111	8	Lithics	Flake Fragment	Light grey	< 1/2"	3	1.6	Mottled Onondaga chert; no bulb present; snapped fragments
09542.0001	Block 1	7	A	1	111	9	Lithics	Debitage / General	Dark grey	< 1/2"	15	14.6	Mottled debitage fragments; blocky, no cortex
09542.0001	Block 1	7	B	2	112	1	Lithics	Flake Fragment	Light grey	< 1/2"	1	0.5	Unmottled Onondaga chert; flake scars present; snapped end
09542.0001	Block 1	7	B	2	112	2	Lithics	Debitage / General	Bluish grey	< 1/2"	1	0.5	Blocky fragments; Chert; no cortex present; waxy texture
09542.0001	Block 1	8	A	1	113	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	18	49	Large Onondaga chert flakes; bulb present; no cortex; mottled
09542.0001	Block 1	8	A	1	113	2	Lithics	Biface Reduction Flake	Light grey	> 1/2"	11	24.3	Light grey Onondaga flakes; no cortex, bulb present
09542.0001	Block 1	8	A	1	113	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	27	21.2	Dark grey mottled Onondaga, no cortex; bulb present
09542.0001	Block 1	8	A	1	113	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	23	12.7	Light grey Onondaga; no cortex present; bulb present
09542.0001	Block 1	8	A	1	113	5	Lithics	Biface Reduction Flake	Black	< 1/2"	1	0.7	Esposus chert; no cortex, impurity present; bulb present
09542.0001	Block 1	8	A	1	113	6	Lithics	Flake Fragment	Dark grey	< 1/2"	54	15.5	Fragments; no cortex; no bulb, snapped; small; Onondaga
09542.0001	Block 1	8	A	1	113	7	Lithics	Flake Fragment	Light grey	< 1/2"	15	6.3	Small fragments; no cortex; no bulb, snapped; Onondaga chert
09542.0001	Block 1	8	A	1	113	8	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.1	Small; no cortex, whole with bulb; Dark grey and brown Onondaga chert
09542.0001	Block 1	8	A	1	113	9	Lithics	Debitage / General	Dark grey	> 1/2'	8	77.5	Onondaga chert; cortex present; large blocky fragments with impurites
09542.0001	Block 1	8	A	1	113	10	Lithics	Debitage / General	Dark grey	< 1/2"	34	28.4	Onondaga mottled chert, mostly dark grey; blocky fragments; no cortex
09542.0001	Block 1	8	A	1	113	11	Lithics	Debitage / General	Bluish grey	< 1/2"	1	0.4	Chert blocky fragment; waxy texture; no cortex present
09542.0001	Block 1	8	B	2	114	1	Lithics	Flake Fragment	Dark grey	< 1/2"	1	0.3	Onondaga chert; cortex absent, heating absent; snapped ends.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	8	B	2	114	2	Lithics	Debitage / General	Dark grey	< 1/2"	2	0.7	Onondaga chert; cortex absent, heating absent; irregular forms.
09542.0001	Block 1	9	A	1	115	1	Lithics	Core / General	Dark grey	> 1/2"	1	21	Dark grey Onondaga chert with small amount of cortex present; prominent platform and flaking scars; probable core fragment.
09542.0001	Block 1	9	A	1	115	2	Lithics	Decortication Flake	Dark grey	> 1/2"	1	4.6	Dark grey Onondaga chert with cortex present; platform and bulb of percussion present.
09542.0001	Block 1	9	A	1	115	3	Lithics	Decortication Flake	Dark grey	< 1/2"	1	0.6	Dark grey Onondaga chert with cortex present; platform and bulb of percussion present.
09542.0001	Block 1	9	A	1	115	4	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	20	56.8	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	9	A	1	115	5	Lithics	Biface Reduction Flake	Light grey	> 1/2"	4	10.8	Light grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	9	A	1	115	6	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	8.8	Dark grey and dark olive-grey mottled with possible microfossils, Onondaga variant; cortex absent; partial bulb of percussion present.
09542.0001	Block 1	9	A	1	115	7	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	39	22.4	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	9	A	1	115	8	Lithics	Biface Reduction Flake	Light grey	< 1/2"	8	7.8	Light grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	9	A	1	115	9	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	1	1.3	Reddish dark grey Onondaga chert with cortex absent; platform present.
09542.0001	Block 1	9	A	1	115	10	Lithics	Flake Fragment	Dark grey	> 1/2"	8	16	Dark grey Onondaga chert; cortex absent; snapped and/or broken ends.
09542.0001	Block 1	9	A	1	115	11	Lithics	Flake Fragment	Dark grey	< 1/2"	64	29.4	Dark grey Onondaga chert, cortex missing; snapped/broken ends and edges.
09542.0001	Block 1	9	A	1	115	12	Lithics	Flake Fragment	Light grey	< 1/2"	4	3.6	Light grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 1	9	A	1	115	13	Lithics	Debitage / General	Dark grey	> 1/2"	3	15.3	Dark grey Onondaga chert; cortex absent; fragmentary, irregular forms.
09542.0001	Block 1	9	A	1	115	14	Lithics	Debitage / General	Dark grey	< 1/2"	13	35.2	Grey Onondaga chert; cortex absent; irregular forms.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 1	9	B	2	116	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	0.6	Dark grey to grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 1	9	B	2	116	2	Lithics	Flake Fragment	Dark grey	< 1/2"	1	0.8	Dark grey Onondaga chert; cortex absent; snapped/broken ends.
09542.0001	Block 1	9	B	2	116	3	Lithics	Debitage / General	Dark grey	< 1/2"	2	4	Dark grey Onondaga chert, cortex absent, irregular forms.
09542.0001	Block 1	9	B	2	116	4	Lithics	Debitage / General	Dark grey	< 1/2"	1	1.9	Light grey, possible Onondaga chert; heating absent, small amount of cortex present; irregular form.
09542.0001	Block 2	10	A	1	117	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	6	24.1	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 2	10	A	1	117	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	17	11.5	Dark grey Onondaga chert, cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 2	10	A	1	117	3	Lithics	Flake Fragment	Dark grey	< 1/2"	15	6.3	Dark grey Onondaga chert; cortex absent; broken ends/snapped edges.
09542.0001	Block 2	10	A	1	117	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	4.3	Dark grey to grey chert, possible Onondaga; corte absent; irregular forms.
09542.0001	Block 2	10	A	1	117	5	Lithics	Debitage / General	Dark grey	> 1/2"	2	32.1	Dark grey Onondaga chert; small amount of cortex on both fragments; irregular forms.
09542.0001	Block 2	10	B	2	118	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	1.5	Dark grey Onondaga chert; cortex absent; platform and bulb of percussion present.
09542.0001	Block 2	10	B	2	118	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	3	0.7	Dark grey Onondaga chert; cortex absent; platform and bulb of percussion present.
09542.0001	Block 2	10	B	2	118	3	Lithics	Flake Fragment	Dark grey	< 1/2"	4	1.7	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 2	11	A	1	119	1	Lithics	Biface / General	Dark grey	> 1/2"	1	2.9	Dark grey Onondaga chert; cortex absent; fragment includes partial edge.
09542.0001	Block 2	11	A	1	119	2	Lithics	Flake Tool / General	Dark grey	> 1/2"	2	7.7	Dark grey Onondaga chert; cortex absent; possible working of edge present on both; possible utlized flakes/non-specific flake tools.
09542.0001	Block 2	11	A	1	119	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	6	20.4	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 2	11	A	1	119	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	23	9.7	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 2	11	A	1	119	5	Lithics	Flake Fragment	Dark grey	> 1/2"	1	1.8	Dark grey Onondaga chert; cortex absent; borken/snapped ends.
09542.0001	Block 2	11	A	1	119	6	Lithics	Flake Fragment	Dark grey	< 1/2"	18	8.3	Dark grey Onondagaa chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 2	11	B	2	120	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	12	5.9	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 2	12	A	1	121	1	Lithics	Early Reduction Flake	Dark grey	> 1/2'	1	7.2	Onondaga chert; cortex present; bulb present; early reduction fragment
09542.0001	Block 2	12	A	1	121	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	6	20.8	Dark grey Onondaga chert; cortex absent; flake scars on dorsal surface; large fragments
09542.0001	Block 2	12	A	1	121	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	1	3.3	Rough texture chert; not Onondaga; flake scars on dorsal surface
09542.0001	Block 2	12	A	1	121	4	Lithics	Biface Reduction Flake	Light grey	> 1/2'	1	1.9	Light grey Onondaga chert; bulb present; no cortex
09542.0001	Block 2	12	A	1	121	5	Lithics	Early Reduction Flake	Dark grey	< 1/2"	4	6.7	Dark grey early reduction flakes; cortex present on platform
09542.0001	Block 2	12	A	1	121	6	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	35	18.1	Dark grey Onondaga chert; bulb present; no cortex
09542.0001	Block 2	12	A	1	121	7	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	1.4	Light grey with bluish tint; Onondaga chert; no cortex; fragment
09542.0001	Block 2	12	A	1	121	8	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	0.1	Onondaga fragment; translucent waxy texture; no cortex present
09542.0001	Block 2	12	A	1	121	9	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.2	Onondaga chert; whole; no cortex; bulb present
09542.0001	Block 2	12	A	1	121	10	Lithics	Flake Fragment	Dark grey	< 1/2"	4	0.4	Onondaga chert, small fragments; snapped ends; no cortex present
09542.0001	Block 2	12	A	1	121	11	Lithics	Debitage / General	Dark grey	< 1/2"	10	7.8	Onondaga chert; blocky fragments; no cortex present
09542.0001	Block 2	12	A	1	121	12	Lithics	Shatter	Dark grey	> 1/2'	2	104.7	Onondaga chert; no cortex present; possibly unmodified

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 2	12	A	1	121	13	Lithics	Early-Stage Biface	Dark grey/Light	> 1/2'	1	19.2	Onondaga chert, mottled; biface fragment, tip only; snapped mid-shaft
09542.0001	Block 2	12	B	2	122	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	8	2	Dark grey Onondaga chert; no cortex, bulb present; small fragments
09542.0001	Block 2	12	B	2	122	2	Lithics	Debitage / General	Dark grey	< 1/2"	5	2.5	Dark grey Onondaga chert; blocky fragments; small; no cortex
09542.0001	Block 2	12	B	2	122	3	Lithics	Core / General	Dark grey	> 1/2'	1	14.4	Dark grey Onondaga chert; cortex present; multiple striking platforms present; whole
09542.0001	Block 2	13	A	1	123	1	Lithics	Decortication Flake	Dark grey	> 1/2'	1	4.6	Dark grey Onondaga chert; cortex fragment; rough texture
09542.0001	Block 2	13	A	1	123	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	7	29.6	Dark grey Onondaga chert with brown mottling; no cortex; large fragments, bulb present
09542.0001	Block 2	13	A	1	123	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	20	11.4	Dark grey Onondaga chert with brown mottlings; no cortex; bulb present
09542.0001	Block 2	13	A	1	123	4	Lithics	Non-Cultural	Dark grey		11	32.4	Dark grey chert; Onondaga; blocky fragments with worn smooth edges
09542.0001	Block 2	13	B	2	124	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	1.1	Dark grey Onondaga chert; bulb present; no cortex
09542.0001	Block 2	13	B	2	124	2	Lithics	Shatter	Dark grey	< 1/2"	1	0.8	Blocky shatter fragment; no cortex present; small
09542.0001	Block 2	14	A	1	125	1	Lithics	Early Reduction Flake	Dark grey	< 1/2"	1	0.5	Small fragment; cortex present on dorsal surface; Onondaga chert
09542.0001	Block 2	14	A	1	125	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	8	30	Onondaga chert; no cortex present; bulb present; mottled
09542.0001	Block 2	14	A	1	125	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	30	10.5	Onondaga chert; no cortex, small fragment; bulb present
09542.0001	Block 2	14	A	1	125	4	Lithics	Flake Fragment	Dark grey	< 1/2"	4	1.5	Onondaga chert; fragments; snapped; no bulb present; no cortex
09542.0001	Block 2	14	A	1	125	5	Lithics	Debitage / General	Dark grey	< 1/2"	8	12	Onondaga chert; blocky fragments; no cortex present
09542.0001	Block 2	14	B	2	126	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	0.3	Onondaga chert; small fragment; no cortex

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 2	14	B	2	126	2	Lithics	Debitage / General	Dark grey	< 1/2"	3	3.8	Onondaga chert; small fragment; no cortex; blocky fragments
09542.0001	Block 2	15	A	1	127	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	1	2.2	Onondaga chert; no cortex present; bulb present
09542.0001	Block 2	15	A	1	127	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	43	14.3	Onondaga chert; no cortex, bulb presence; small
09542.0001	Block 2	15	A	1	127	3	Lithics	Flake Fragment	Dark grey	< 1/2"	6	1.5	Onondaga chert; no cortex, no bulb presence; small fragments
09542.0001	Block 2	15	A	1	127	4	Lithics	Debitage / General	Dark grey	> 1/2'	1	24.1	Onondaga chert; cortex present; large fragment
09542.0001	Block 2	15	A	1	127	5	Lithics	Debitage / General	Dark grey	< 1/2"	16	9.3	Onondaga chert; no cortex, small debitage fragments; blocky
09542.0001	Block 2	15	A	1	127	6	Lithics	Debitage / General	Dark grey/red	< 1/2"	2	0.4	Onondaga chert with red tint; no cortex; small fragments
09542.0001	Block 2	15	A	1	127	7	Lithics	Utilized Flake	Dark grey	> 1/2'	1	4	Onondaga chert flake tool; large biface reduction flake with edge micro pressure flaking present; no cortex
09542.0001	Block 2	15	A	1	127	8	Lithics	Non-Cultural	Dark grey		4	14	Chert fragments; smoothed edges
09542.0001	Block 2	15	B	2	128	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	7	2.2	Onondaga fragments; no cortex present; small fragments
09542.0001	Block 2	16	A	1	129	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2'	6	20	Onondaga chert fragments; no cortex, bulb present; large flake fragments
09542.0001	Block 2	16	A	1	129	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	35	12	Onondaga chert fragments; no cortex, bulb presence; small
09542.0001	Block 2	16	A	1	129	3	Lithics	Debitage / General	Dark grey	> 1/2'	2	12.8	Onondaga chert debitage; blocky fragments; no cortex present
09542.0001	Block 2	16	A	1	129	4	Lithics	Debitage / General	Dark grey	< 1/2"	12	10.5	Onondaga chert fragments; no cortex; blocky; small
09542.0001	Block 2	16	A	1	129	5	Lithics	Debitage / General	Light grey/red	< 1/2"	3	1.8	Chert fragments; block; no cortex present; light grey to pinkish, waxy texture
09542.0001	Block 2	16	B	2	130	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	0.4	Onondaga chert fragments; bulb present, snapped distal end; no cortex

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 2	16	B	2	130	2	Lithics	Flake Fragment	Dark grey	< 1/2"	1	0.7	Onondaga chert fragment; no bulb, contex absent
09542.0001	Block 2	16	B	2	130	3	Lithics	Flake Fragment	Light grey	< 1/2"	1	0.5	Onondaga chert fragment; no bulb, contex absent
09542.0001	Block 2	16	B	2	130	4	Lithics	Debitage / General	Light grey	< 1/2"	1	0.3	Small fragments; cortex absent
09542.0001	Block 2	17	A	1	131	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	2	3.3	Onondaga chert fragments; no cortex present, bulb present
09542.0001	Block 2	17	A	1	131	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	26	11.4	Onondaga chert fragments; no cortex present, bulb present
09542.0001	Block 2	17	A	1	131	3	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	2	1.5	Onondaga chert; no cortex present, bulb present; reddish mottling
09542.0001	Block 2	17	A	1	131	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	1	Waxy chert flake; whole; no cortex, bulb present
09542.0001	Block 2	17	A	1	131	5	Lithics	Debitage / General	Dark grey	> 1/2"	4	46.6	Onondaga chert, no cortex, large debitage fragments
09542.0001	Block 2	17	A	1	131	6	Lithics	Debitage / General	Dark grey	< 1/2"	12	11.6	Onondaga chert, no cortex, small blocky fragments
09542.0001	Block 2	17	B	2	132	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	3	1.8	Onondaga chert; snapped fragments, bulb present; no cortex
09542.0001	Block 2	17	B	2	132	2	Lithics	Debitage / General	Dark grey	> 1/2"	2	21	Onondaga chert; large blocky fragments; no cortex present
09542.0001	Block 2	17	B	2	132	3	Lithics	Debitage / General	Dark grey	< 1/2"	5	6.7	Onondaga chert; small blocky fragments; no cortex present
09542.0001	Block 2	18	A	1	133	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	25	8.4	Onondaga chert flake; no cortex, bulb present; small
09542.0001	Block 2	18	A	1	133	2	Lithics	Flake Fragment	Dark grey	> 1/2"	1	3.1	2.5Y 3/1 Onondaga chert flake; rough texture, no cortex, no bulb
09542.0001	Block 2	18	A	1	133	3	Lithics	Flake Fragment	Dark grey	> 1/2"	2	3.7	2.5Y 4/1 Onondaga chert flake; snapped both ends; no cortex present
09542.0001	Block 2	18	A	1	133	4	Lithics	Flake Fragment	Dark grey	< 1/2"	5	0.7	Onondaga chert fragments; snapped ends; no bulb present; no cortex

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 2	18	A	1	133	5	Lithics	Debitage / General	Dark grey	> 1/2"	4	65.5	Onondaga chert fragments; large, blocky; cortex present
09542.0001	Block 2	18	A	1	133	6	Lithics	Debitage / General	Dark grey	< 1/2"	5	5.1	Small Onondaga chert fragments; blocky; cortex present
09542.0001	Block 2	18	B	2	134	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	6	1.7	Small Onondaga chert flakes; bulb present; no cortex
09542.0001	Block 3	19	A	1	135	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	5.4	Onondaga chert; no cortex, bulb present; mottled
09542.0001	Block 3	19	A	1	135	2	Lithics	Flake Fragment	Light grey	< 1/2"	1	0.7	Onondaga chert; no cortex, snapped ends
09542.0001	Block 3	19	A	1	135	3	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.1	Small Onondaga chert flake; bulb present, no cortex, whole
09542.0001	Block 3	19	A	1	135	4	Lithics	Debitage / General	Dark grey	> 1/2"	1	98.2	Large blocky Onondaga chert fragment; cortex present; possible core?
09542.0001	Block 3	19	A	1	135	5	Lithics	Debitage / General	Dark grey	< 1/2"	4	13.6	Blocky Onondaga chert fragments; no cortex
09542.0001	Block 3	19	B	2	136	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	3	2.3	Onondaga chert fragments; no cortex, bulb present
09542.0001	Block 3	19	B	2	136	2	Lithics	Biface Reduction Flake	Light grey	< 1/2"	2	2.4	Onondaga chert fragments; no cortex, bulb present
09542.0001	Block 3	19	B	3	137	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	2	Onondaga chert fragments; no cortex, bulb present; small
09542.0001	Block 3	19	B	3	137	2	Lithics	Debitage / General	Dark grey	< 1/2"	1	0.4	Onondaga chert fragment; no cortex, blocky fragment
09542.0001	Block 3	19	C	4	138	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	0.5	Onondaga chert fragment; cortex present, bulb present
09542.0001	Block 3	19	C	4	138	2	Lithics	Flake Fragment	Dark grey	< 1/2"	1	1.5	Onondaga chert fragment, snapped; no cortex, no bulb present; flaking scars on dorsal surface
09542.0001	Block 3	20	A	1	139	1	Lithics	Early Reduction Flake	Dark grey	< 1/2"	2	2.4	Onondaga chert fragment; cortex present; bulb present
09542.0001	Block 3	20	A	1	139	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	8.1	Onondaga chert, large flake; cortex absent; bulb present

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	20	A	1	139	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	9	6.5	Onondaga chert, cortex absent; bulb present
09542.0001	Block 3	20	A	1	139	4	Lithics	Biface Reduction Flake	Light grey	> 1/2"	2	5.4	Onondaga chert; no cortex, bulb present
09542.0001	Block 3	20	A	1	139	5	Lithics	Flake Fragment	Light grey	< 1/2"	1	0.5	Green Siltstone fragment; small
09542.0001	Block 3	20	A	1	139	6	Lithics	Debitage / General	Dark grey	< 1/2"	10	7	Onondaga chert fragments; blocky; no cortex present
09542.0001	Block 3	20	B	2	140	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	7.1	Onondaga chert; large flake; cortex absent; bulb present
09542.0001	Block 3	20	B	2	140	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	4	4.1	Onondaga chert fragments; cortex absent; bulb present
09542.0001	Block 3	20	B	2	140	3	Lithics	Debitage / General	Dark grey	< 1/2"	3	3.1	Onondaga chert fragments; blocky, cortex absent
09542.0001	Block 3	20	B	2	140	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	3.4	Onondaga chert fragments; blocky, cortex present
09542.0001	Block 3	20	B	2	140	5	Lithics	Debitage / General	Dark grey	> 1/2"	1	5.5	Onondaga chert fragment; blocky shatter; cortex absent
09542.0001	Block 3	20	B	2	140	6	Lithics	Debitage / General	Dark grey	> 1/2"	1	42.1	Onondaga chert blocky fragment; cortex present; possible multiple striking platforms present, core?
09542.0001	Block 3	20	B	3	141	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	9.7	Onondaga chert flake; large; cortex absent; bulb present; mottled; flake scars on dorsal surface
09542.0001	Block 3	20	B	3	141	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	0.3	Onondaga chert; small flake; cortex absent; bulb present
09542.0001	Block 3	20	B	3	141	3	Lithics	Debitage / General	Dark grey	> 1/2"	4	54.2	Onondaga chert, blocky fragments; cortex absent
09542.0001	Block 3	20	B	3	141	4	Lithics	Debitage / General	Dark grey	< 1/2"	8	9.6	Onondaga chert, small blocky fragments; cortex absent
09542.0001	Block 3	20	B	3	141	5	Lithics	Debitage / General	Light grey	> 1/2"	2	8.2	Unknown cortex fragments; rough texture
09542.0001	Block 3	20	B	3	141	6	Floral	Charcoal			1	0.2	Small charcoal sample

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	20	C	4	142	7	Lithics	Debitage / General	Dark grey	< 1/2"	3	6.7	Onondaga chert, blocky fragments; bulb and cortex absent
09542.0001	Block 3	21	A	1	143	1	Lithics	Early Reduction Flake	Dark grey	< 1/2"	1	4.4	Onondaga chert, flake with bulb of percussion, cortex present
09542.0001	Block 3	21	A	1	143	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	4	10.9	Onondaga chert; cortex absent, bulb present
09542.0001	Block 3	21	A	1	143	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	13	9.2	Onondaga chert; cortex absent, bulb present; small fragments
09542.0001	Block 3	21	A	1	143	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	4	3.5	Onondaga chert; contex absent, bulb present; light grey rough texture
09542.0001	Block 3	21	A	1	143	5	Lithics	Debitage / General	Dark grey	< 1/2"	6	5.8	Small Onondaga chert fragments; blocky
09542.0001	Block 3	21	B	2	144	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	17	11.3	Small Onondaga chert fragments; cortex absent; bulb presence
09542.0001	Block 3	21	B	2	144	2	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	1.1	Onondaga chert fragment, 2.5Y 5/1; almost no mottling, light grey rough material; cortex absent, bulb present
09542.0001	Block 3	21	B	2	144	3	Lithics	Debitage / General	Dark grey	< 1/2"	3	3	Onondaga fragments; no cortex present
09542.0001	Block 3	21	B	2	144	4	Lithics	Debitage / General	Dark grey	> 1/2"	3	30.5	Onondaga chert, cortex present; blocky fragments
09542.0001	Block 3	21	B	2	144	5	Lithics	Projectile Point	Dark grey		1	6.2	Onondaga chert, base and body portion; straight base, corner-notched, straight sides; thin
09542.0001	Block 3	21	B	3	145	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	0.6	Onondaga chert fragments; small; no cortex, bulb present
09542.0001	Block 3	21	B	3	145	2	Lithics	Debitage / General	Dark grey	< 1/2"	7	7.2	Blocky Onondaga chert fragments; no cortex present
09542.0001	Block 3	21	C	4	146	1	Lithics	Debitage / General	Dark grey	< 1/2"	2	3.1	Possible debitage; rounded, blocky fragments; cortex absent; Onondaga chert
09542.0001	Block 3	22	A	1	147	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	1.5	Onondaga chert, small fragments; bulb present, cortex absent
09542.0001	Block 3	22	A	1	147	2	Lithics	Biface Reduction Flake	Light grey	> 1/2"	1	3.4	Onondaga chert, mottled; bulb present, cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	22	A	1	147	3	Lithics	Debitage / General	Light grey	> 1/2"	1	6.6	Onondaga chert; blocky shatter fragment; cortex absent
09542.0001	Block 3	22	A	1	147	4	Lithics	Debitage / General	Dark grey	< 1/2"	12	13.2	Blocky debitage fragments; cortex absent; Onondaga chert
09542.0001	Block 3	22	B	2	148	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	2.6	Onondaga chert, 2.5Y 3/1; Bulb present, distal portion snapped; cortex absent
09542.0001	Block 3	22	B	2	148	2	Lithics	Debitage / General	Dark grey	< 1/2"	1	1.4	Onondaga chert; blocky fragment; cortex absent
09542.0001	Block 3	22	B	2	148	3	Lithics	Endscraper	Dark grey	> 1/2"	1	3.6	Onondaga chert; large amount of cortex present; early reduction flake utilized on dorsal surface; pressure flaking present; possible scrapper
09542.0001	Block 3	22	B	2	148	4	Lithics	Flake Tool / General	Dark grey	> 1/2"	1	6.2	Onondaga chert; cortex absent; biface reduction flake, utilized microflaking edge on ventral surface near the bulb of percussion
09542.0001	Block 3	22	B	3	149	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	2.9	Onondaga chert fragment; bulb present, cortex absent
09542.0001	Block 3	22	B	3	149	2	Lithics	Debitage / General	Dark grey	> 1/2"	1	5.3	Onondaga chert fragment; blocky, cortex absent
09542.0001	Block 3	22	B	3	149	3	Lithics	Debitage / General	Dark grey	< 1/2"	7	4	Onondaga chert fragments; small, blocky; cortex absent
09542.0001	Block 3	22	C	4	150	1	Lithics	Debitage / General	Dark grey	> 1/2"	2	16.4	Onondaga chert, blocky; cortex absent
09542.0001	Block 3	22	C	4	150	2	Lithics	Debitage / General	Dark grey	< 1/2"	2	2.8	Onondaga chert fragments; small; blocky with cortex present
09542.0001	Block 3	22	C	4	150	3	Lithics	Debitage / General	Dark grey	< 1/2"	6	7.5	Onondaga chert fragments; small, blocky with cortex absent
09542.0001	Block 3	23	A	1	151	1	Lithics	Decortication Flake	Dark grey	> 1/2"	1	2.1	Chert cortex fragment
09542.0001	Block 3	23	A	1	151	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	3	Onondaga chert fragment; snapped distal portion; bulb present, cortex absent
09542.0001	Block 3	23	A	1	151	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	9	9.9	Onondaga chert fragments; cortex absent; bulb present; small fragments

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	23	A	1	151	4	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	0.8	Onondaga chert; cortex absent; bulb present
09542.0001	Block 3	23	A	1	151	5	Lithics	Debitage / General	Dark grey	< 1/2"	12	11.4	Small Onondaga chert fragments; possilbe debitage; cortex absent
09542.0001	Block 3	23	B	2	152	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	1.8	Onondaga chert fragment; cortex absent, bulb present
09542.0001	Block 3	23	B	2	152	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	0.4	Onondaga chert fragment; small; cortex absent, bulb present
09542.0001	Block 3	23	B	2	152	3	Lithics	Debitage / General	Dark grey	< 1/2"	3	4.9	Onondaga chert fragments; blocky; cortex absent
09542.0001	Block 3	23	B	3	153	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	6	6.7	Onondaga chert fragments; bulb present, cortex absent
09542.0001	Block 3	23	B	3	153	2	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.3	Onondaga chert flake fragments; cortex absent, snapped ends
09542.0001	Block 3	23	B	3	153	3	Lithics	Debitage / General	Dark grey	> 1/2"	3	17	Onondaga chert flake; blocky fragments; cortex absent
09542.0001	Block 3	23	B	3	153	4	Lithics	Debitage / General	Dark grey	< 1/2"	19	25.4	Debitage fragments; Onondaga chert; cortex absent
09542.0001	Block 3	23	B	3	153	5	Lithics	Debitage / General	Dark grey/red	> 1/2"	1	13.4	Onondaga chert fragment; blocky; grey/red color with grey mottling; cortex absent
09542.0001	Block 3	23	B	3	153	6	Lithics	Tested Cobble	Dark grey	> 1/2"	1	203	Large Onondaga chert blocky debitage fragment; possible flakes removed; cortex absent, impurities present
09542.0001	Block 3	23	B	3	153	7	Lithics	Indeterminate Biface	Dark Grey	< 1/2"	1	0.9	Possible tool fragment; worn surfaces; microflaking present along edge; snapped with convex shape; possible retouched scraper
09542.0001	Block 3	23	B	3	153	8	Lithics	Non-Cultural	Dark grey		5	20.1	Onondaga chert fragments; small rounded; cortex absent
09542.0001	Block 3	23	C	4	154	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	1.4	Onondaga chert fragment; cortex absent; bulb present; snapped ends
09542.0001	Block 3	24	A	1	155	1	Lithics	Biface Reduction Flake	Dark grey/light	> 1/2"	1	8.3	Half dark grey, half light grey Onondaga chert; bulb present, cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	24	A	1	155	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	13	8.4	Onondaga chert, small fragments; cortex absent, bulb presence
09542.0001	Block 3	24	A	1	155	3	Lithics	Debitage / General	Dark grey	< 1/2"	4	1.8	Small debitage fragments; cortex present
09542.0001	Block 3	24	A	1	155	4	Lithics	Endscraper	Bluish grey	< 1/2"	1	1.1	Small thumb scraper; convex shape; retouching present
09542.0001	Block 3	24	A	1	155	5	Lithics	Non-Cultural	Dark grey		5	11.3	Small, rounded Onondaga fragments; worn
09542.0001	Block 3	24	B	2	156	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	3	15.4	Onondaga chert flakes; large; cortex absent, bulb present
09542.0001	Block 3	24	B	2	156	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	9	7.2	Onondaga chert flakes; small fragments; bulb presence, cortex absent
09542.0001	Block 3	24	B	2	156	3	Lithics	Debitage / General	Dark grey	> 1/2"	1	36.4	Onondaga chert, large debitage fragment; cortex present
09542.0001	Block 3	24	B	2	156	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	5.1	Onondaga chert fragments; blocky; cortex present
09542.0001	Block 3	24	B	3	157	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	4	3	Onondaga chert fragments; bulb present, cortex absent; small fragments
09542.0001	Block 3	24	B	3	157	2	Lithics	Debitage / General	Dark grey	> 1/2"	1	19.8	Large, blocky Onondaga chert fragment; cortex present
09542.0001	Block 3	24	B	3	157	3	Lithics	Debitage / General	Dark grey	> 1/2"	2	10.7	Large, blocky Onondaga chert fragment; cortex absent
09542.0001	Block 3	24	B	3	157	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	1.5	Small fragments Onondaga chert; cortex absent
09542.0001	Block 3	24	C	4	158	1	Lithics	Biface Reduction Flake	Dark grey/red	> 1/2"	1	7.2	Onondaga chert flake, bulb of percussion present; cortex absent; Dark red with grey mottling
09542.0001	Block 3	24	C	4	158	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	3	0.5	Onondaga chert fragments; small; bulb presence, cortex absent
09542.0001	Block 3	25	A	1	159	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	2	4.7	Onondaga chert flakes; bulb present, cortex absent; flaking scars on dorsal surface
09542.0001	Block 3	25	A	1	159	2	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.5	Onondaga chert fragments; small; cortex absent; snapped ends

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	25	A	1	159	3	Lithics	Debitage / General	Dark grey	< 1/2"	5	4.7	Onondaga chert, blocky fragments; cortex absent
09542.0001	Block 3	25	A	1	159	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	3.3	Onondaga chert, blocky fragments; cortex present
09542.0001	Block 3	25	A	1	159	5	Lithics	Endscraper	Light grey	< 1/2"	1	4	Light grey, unmottled Onondaga chert; chisel-like shape; worn tool
09542.0001	Block 3	25	A	1	159	6	Lithics	Endscraper	Light grey	> 1/2"	1	9.3	Light grey, waxy texture Onondaga chert; endscraper fragment, snapped; worked edge
09542.0001	Block 3	25	A	1	159	7	Lithics	Flake Tool / General	Dark grey	> 1/2"	1	43.3	Dark grey Onondaga chert; cortex present on dorsal surface of flake with pressure flaking along edge; bulb
09542.0001	Block 3	25	B	2	160	1	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	1.1	Onondaga chert flake; cortex absent; mottling absent; bulb present
09542.0001	Block 3	25	B	2	160	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	2	1.3	Onondaga chert; cortex absent; small fragments; bulb present
09542.0001	Block 3	25	C	3	161	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	10	Onondaga chert flake; bulb present, cortex absent; impurities present; flaking scars on dorsal surface
09542.0001	Block 3	25	C	3	161	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	4	3.3	Onondaga chert, small; bulb present, cortex absent
09542.0001	Block 3	25	C	3	161	3	Lithics	Biface Reduction Flake	Dark grey/purpl	< 1/2"	1	0.6	Chert flake fragment; bulb present, snapped; cortex absent
09542.0001	Block 3	25	C	3	161	4	Lithics	Debitage / General	Dark grey	> 1/2"	1	66.8	Onondaga chert, large blocky fragment; cortex absent, possible flaking scars present
09542.0001	Block 3	25	C	3	161	5	Lithics	Debitage / General	Dark grey	< 1/2"	3	3.1	Onondaga chert; fragments; cortex absent
09542.0001	Block 3	26	A	1	162	1	Lithics	Early Reduction Flake	Dark grey	> 1/2"	1	5.6	Onondaga chert with cortex present; bulb present
09542.0001	Block 3	26	A	1	162	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	2	6.2	Onondaga chert flakes, cortex absent; bulb present
09542.0001	Block 3	26	A	1	162	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	9	5.3	Onondaga chert flakes, small; cortex absent, bulb present
09542.0001	Block 3	26	A	1	162	4	Lithics	Debitage / General	Dark grey	< 1/2"	11	15.9	Blocky Onondaga chert fragment; cortex absent, small fragments

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	26	B	2	163	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	3.2	Onondaga chert fragments; cortex absent, bulb present; snapped ends
09542.0001	Block 3	26	B	2	163	2	Lithics	Debitage / General	Dark grey	> 1/2"	1	14.5	Onondaga blocky fragment; cortex present, shatter fragment
09542.0001	Block 3	26	B	2	163	3	Lithics	Debitage / General	Dark grey	> 1/2"	1	13.1	Onondaga chert, cortex absent; multiple flaking scars present, irregular form
09542.0001	Block 3	26	B	2	163	4	Lithics	Debitage / General	Dark grey	< 1/2"	3	2.6	Onondaga chert fragments; cortex absent; small irregular forms
09542.0001	Block 3	26	C	3	164	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	2	22.6	Onondaga chert, cortex absent; flaking scars on dorsal surface, bulb of percussion present
09542.0001	Block 3	26	C	3	164	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	9	8.9	Onondaga chert fragment; cortex absent; small flakes with bulb present
09542.0001	Block 3	26	C	3	164	3	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	1	0.9	Possible chert flake fragment; flaking scars present; cortex absent; deep red material color
09542.0001	Block 3	26	C	3	164	4	Lithics	Debitage / General	Dark grey	> 1/2"	7	221.3	Large blocky debitage/shatter fragments; Onondaga chert; reduction marks visible; minimal modifications present; cortex absent
09542.0001	Block 3	26	C	3	164	5	Lithics	Debitage / General	Dark grey	< 1/2"	4	3.3	Possible debitage/shatter fragments; small with reduction evidence; cortex absent
09542.0001	Block 3	26	C	3	164	6	Lithics	Non-Cultural	Dark grey	> 1/2"	7	225.2	Large blocky Onondaga chert fragments; no reduction marks visible or no cultural modifications present; cortex absent
09542.0001	Block 3	26	C	3	164	7	Lithics	Non-Cultural	Dark grey	< 1/2"	7	8.2	Small Onondaga chert fragments; no reduction marks visible or no cultural modifications present; cortex absent
09542.0001	Block 3	27	A	1	165	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	7	6.8	Onondaga chert fragments; cortex absent; bulb present
09542.0001	Block 3	27	A	1	165	2	Lithics	Core / General	Dark grey	> 1/2"	1	35	Worn Onondaga chert, possible core; multiple reduction scars present, worn edges; cortex absent
09542.0001	Block 3	27	A	1	165	3	Lithics	Debitage / General	Dark grey	> 1/2"	4	27.8	Worn Onondaga chert fragment; cortex absent
09542.0001	Block 3	27	A	1	165	4	Lithics	Debitage / General	Dark grey	< 1/2"	2	2.1	Onondaga chert debitage/shatter fragments; small fragments, cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 3	27	A	1	165	5	Lithics	Debitage / General	Bluish light grey	< 1/2"	1	2.9	Possible Onondaga chert debitage; cortex absent; irregular form
09542.0001	Block 3	27	A	1	165	6	Lithics	Non-Cultural	Dark grey/Light	< 1/2"	4	3.6	Small worn fragments; Onondaga chert
09542.0001	Block 3	27	B	2	166	1	Lithics	Early Reduction Flake	Light grey	> 1/2"	1	3.4	Onondaga chert reduction fragment; cortex present, no bulb of persussion present
09542.0001	Block 3	27	B	2	166	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	2	19.8	Large Onondaga chert flakes, cortex absent; bulb of percussion present
09542.0001	Block 3	27	B	2	166	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	3	2.1	Onondaga chert flakes, small; cortex absent; bulb present
09542.0001	Block 3	27	B	2	166	4	Lithics	Debitage / General	Light grey	< 1/2"	2	4.7	Onondaga chert debitabe/shatter fragments; cortex absent; blocky, irregular forms
09542.0001	Block 3	27	C	3	167	1	Lithics	Debitage / General	Dark grey	> 1/2"	4	24.9	Onondaga chert fragments; blocky debitage shatter, irregular forms
09542.0001	Block 3	27	C	3	167	2	Lithics	Debitage / General	Dark grey	< 1/2"	5	7.9	Onondaga chert fragments; small, irregular blocky forms
09542.0001	Block 4	28	A	1	168	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	4	17.2	Onondaga chert flakes, cortex present; bulb present
09542.0001	Block 4	28	A	1	168	2	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	13	33.9	Onondaga chert flakes, cortex absent; bulb present; mottled fragments
09542.0001	Block 4	28	A	1	168	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	87	38.9	Onondaga chert flakes, cortex absent; bulb present; mottled fragments
09542.0001	Block 4	28	A	1	168	4	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	1	0.3	Onondaga chert, cortex absent, bulb present; snapped fragment; red mottling
09542.0001	Block 4	28	A	1	168	5	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	3	1.4	Onondaga chert with red tint; cortex absent, bulb present
09542.0001	Block 4	28	A	1	168	6	Lithics	Flake Fragment	Dark grey	< 1/2"	19	4.5	Onondaga chert fragments; snapped ends; cortex absent
09542.0001	Block 4	28	A	1	168	7	Lithics	Debitage / General	Dark grey	> 1/2"	2	35	Large Onondaga chert blocky fragments; cortex present
09542.0001	Block 4	28	A	1	168	8	Lithics	Debitage / General	Dark grey	< 1/2"	18	14.1	Small, irregular fragments; Onondaga chert; cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	28	A	1	168	9	Lithics	Debitage / General	Light grey	< 1/2"	2	1.9	Small fragments; cortex present; waxy texture; Onondaga chert
09542.0001	Block 4	28	A	1	168	10	Lithics	Debitage / General	Light grey	< 1/2"	1	0.7	Small fragment Onondaga chert; rough texture; cortex absent
09542.0001	Block 4	28	A	1	168	11	Lithics	Biface / General	Dark grey/Light	> 1/2"	1	12.6	Mottled Onondaga fragment; snapped end; cortex absent
09542.0001	Block 4	28	A	1	168	12	Lithics	Non-Cultural	Dark grey	> 1/2"	1	2.8	Unidentified material, rough texture; smoothed/worn surfaces; no cultural moditications present
09542.0001	Block 4	28	B	2	169	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	11	4.8	Small Onondaga chert fragments; bulb presence; cortex absent
09542.0001	Block 4	29	A	1	170	1	Lithics	Decortication Flake		> 1/2"	3	13.9	Cortex fragments; Possible Onondaga chert reduction material
09542.0001	Block 4	29	A	1	170	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	16	72.3	Onondaga chert fragments; small; cortex absent, bulb presence, some with snapped ends
09542.0001	Block 4	29	A	1	170	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	23	56.9	Onondaga chert fragments; cortex absent; bulb present; reduction flakes
09542.0001	Block 4	29	A	1	170	4	Lithics	Biface Reduction Flake	Light grey	> 1/2"	1	3.2	Onondaga chert; cortex absent; bulb present; light, mottled grey color
09542.0001	Block 4	29	A	1	170	5	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	4	3.3	Onondaga chert, dark grey with red tint; red interior, dark grey exterior; cortex absent
09542.0001	Block 4	29	A	1	170	6	Lithics	Flake Fragment	Dark grey	< 1/2"	9	1.5	Small fragments; onondaga chert; cortex absent; snapped fragments
09542.0001	Block 4	29	A	1	170	7	Lithics	Debitage / General	Dark grey	> 1/2"	1	24.4	Large, blocky Onondaga chert fragment; cortex absent
09542.0001	Block 4	29	A	1	170	8	Lithics	Debitage / General	Dark grey	< 1/2"	12	7.4	Onondaga chert, cortex absent; small irregular fragments
09542.0001	Block 4	29	A	1	170	9	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	0.1	Small flake, snapped ends, bulb present; light grey Onondaga chert
09542.0001	Block 4	29	A	1	170	10	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.1	Possible Onondaga finishing flake; small, bulb present
09542.0001	Block 4	29	B	2	171	1	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.3	Onondaga chert fragments; cortex absent; bulb of percussion absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	30	A	1	172	1	Lithics	Decortication Flake		> 1/2"	1	2.5	Cortex fragment; possible Onondaga chert; early reduction
09542.0001	Block 4	30	A	1	172	2	Lithics	Early Reduction Flake	Dark grey	> 1/2"	5	19.8	Onondaga chert fragments; cortex present; bulb present; mottled fragments
09542.0001	Block 4	30	A	1	172	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	17	54.4	Onondaga chert fragments; cortex absent, bulb present; large fragments
09542.0001	Block 4	30	A	1	172	4	Lithics	Biface Reduction Flake	Light grey	> 1/2"	1	8.1	Onondaga chert, light grey mottled; cortex absent; bulb present; flake scars on dorsal surface prominent
09542.0001	Block 4	30	A	1	172	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	2	1.1	Onondaga chert, light grey unmottled; cortex absent; bulb present; small fragments
09542.0001	Block 4	30	A	1	172	6	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	15	74.5	Onondaga chert; cortex absent, bulb presence; small fragments
09542.0001	Block 4	30	A	1	172	7	Lithics	Biface Reduction Flake	Black	< 1/2"	1	0.2	Possible Espoesus chert; small fragment; cortex absent; black color homogenous
09542.0001	Block 4	30	A	1	172	8	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	4	1.3	Onondaga chert, light grey color with red tint; cortex absent
09542.0001	Block 4	30	A	1	172	9	Lithics	Biface Reduction Flake	Bluish grey	< 1/2"	5	1.6	Light bluish grey flake fragments; cortex absent; small fragments, bulb present
09542.0001	Block 4	30	A	1	172	10	Lithics	Flake Fragment	Dark grey	< 1/2"	40	5.9	Onondaga chert, small fragments; snapped portions, no bulb present; cortex absent
09542.0001	Block 4	30	A	1	172	11	Lithics	Debitage / General	Dark grey	< 1/2"	17	7.5	Small debitage/shatter fragments; Onondaga chert; cortex absent, irregular forms
09542.0001	Block 4	30	A	1	172	12	Lithics	Biface / General	Dark grey	> 1/2"	1	4.1	Onondaga chert biface/tool midshaft fragment; pressure flaking present
09542.0001	Block 4	30	A	1	172	13	Lithics	Biface / General	Light grey	> 1/2"	1	6.4	Waxy light grey chert, possibly Onondaga; midsection portion; thick and unfinished tool fragment
09542.0001	Block 4	30	A	1	172	14	Lithics	Late-Stage Biface	Dark grey	> 1/2"	1	10	Onondaga chert biface; unfinished
09542.0001	Block 4	30	A	1	172	15	Lithics	Early Reduction Flake	Dark grey	< 1/2"	4	3.5	Onondaga chert flake fragments, cortex present; bulb present
09542.0001	Block 4	30	A	1	172	16	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.2	Possible finishing flake; whole; cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	30	B	2	173	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	4.9	Onondaga chert flake; cortex absent, bulb present
09542.0001	Block 4	30	B	2	173	2	Lithics	Biface Reduction Flake	Bluish light grey	> 1/2"	1	3.1	Onondaga chert flake; mottled Gley 2 5/5B bluish grey; cortex absent, bulb present;
09542.0001	Block 4	30	B	2	173	3	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	13	5.1	Small Onondaga chert flakes; cortex absent, bulb present; snapped ends
09542.0001	Block 4	30	B	2	173	4	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	1	0.8	Small Onondaga chert flake with red tint; 5YR 4/1; Cortex absent, bulb present
09542.0001	Block 4	30	B	2	173	5	Lithics	Debitage / General	Dark grey	> 1/2"	2	8.2	Onondaga chert, blocky fragments; cortex absent
09542.0001	Block 4	31	A	1	174	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	10	28.4	Mottled Onondaga chert fragments; cortex absent, bulb present; large
09542.0001	Block 4	31	A	1	174	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	10	51	Onondaga chert fragments; cortex absent, bulb presence; small fragments
09542.0001	Block 4	31	A	1	174	3	Lithics	Debitage / General	Dark grey	< 1/2"	1	2.6	Blocky Onondaga chert fragment; irregular form; cortex present
09542.0001	Block 4	31	B	2	175	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	6	2.4	Onondaga chert, flake fragments; cortex absent, bulb presence
09542.0001	Block 4	31	B	2	175	2	Lithics	Debitage / General	Dark grey	< 1/2"	1	2.6	Blocky, irregular Onondaga chert fragment; cortex absent
09542.0001	Block 4	32	A	1	176	1	Lithics	Early Reduction Flake	Dark grey	< 1/2"	3	4.9	Early reduction flakes, cortex present; Onondaga chert fragments
09542.0001	Block 4	32	A	1	176	2	Lithics	Early Reduction Flake	Dark grey	> 1/2"	2	12.4	Onondaga chert fragments, cortex present
09542.0001	Block 4	32	A	1	176	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	19	52.4	Onondaga chert flakes; cortex absent; bulb present; large reduction
09542.0001	Block 4	32	A	1	176	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	14	60	Small Onondaga chert flakes; dark grey, mottled, the 2.5Y 3/1 are generally glossier than the 4/1 variety; cortex absent
09542.0001	Block 4	32	A	1	176	5	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	1	0.3	Small fragment; Onondaga chert; cortex absent, bulb present

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	32	A	1	176	6	Lithics	Biface Reduction Flake	Bluish light grey	> 1/2"	1	4.6	Large flake, chert; glossy texture, light blue grey; cortex absent, bulb present
09542.0001	Block 4	32	A	1	176	7	Lithics	Flake Fragment	Bluish light grey	< 1/2"	3	0.4	Small chert flake fragments, light bluish grey; cortex absent; snapped ends
09542.0001	Block 4	32	A	1	176	8	Lithics	Debitage / General	Dark grey	> 1/2"	3	24.2	Debitage/shatter fragments; Onondaga chert; cortex absent
09542.0001	Block 4	32	A	1	176	9	Lithics	Debitage / General	Dark grey	< 1/2"	1	2	Small fragment, Onondaga chert; cortex present
09542.0001	Block 4	32	A	1	176	10	Lithics	Debitage / General	Light grey	< 1/2"	1	0.4	Small shatter/debitage fragment; Onondaga chert, cortex present
09542.0001	Block 4	32	A	1	176	11	Lithics	Middle-Stage Biface	Dark grey	> 1/2"	1	7.8	Biface midshaft and tip fragment; looks to be almost completed, thinning process not started
09542.0001	Block 4	32	A	1	176	12	Lithics	Biface / General	Dark grey	> 1/2"	1	19.1	Debitage fragment worked into crude biface tool; retouched edge present
09542.0001	Block 4	32	A	1	176	13	Lithics	Utilized Flake	Dark grey	> 1/2"	1	2.5	Possible utilized flake, possible pressure flaking present? Cortex absent
09542.0001	Block 4	32	A	1	176	14	Lithics	Flake Fragment	Light grey/red	< 1/2"	2	0.5	Small fragments; translusent chert with red tint; cortex absent
09542.0001	Block 4	32	A	1	176	15	Lithics	Biface Reduction Flake	Light grey/brow	< 1/2"	3	2.3	Small fragments, glassy; mottled grey and brown; cortex absent
09542.0001	Block 4	32	B	2	177	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	4.1	Onondaga chert fragments, mottled; cortex absent, bulb presence
09542.0001	Block 4	33	A	1	178	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	22	58.8	Onondaga chert fragments; cortex absent, bulb present
09542.0001	Block 4	33	A	1	178	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	15	61.7	Onondaga chert fragments; cortex absent, bulb present; small fragments
09542.0001	Block 4	33	A	1	178	3	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	4	2.5	Onondaga chert fragments, red tint; cortex absent; bulb present
09542.0001	Block 4	33	A	1	178	4	Lithics	Biface Reduction Flake	Light Brown/red	< 1/2"	1	0.3	Chert fragment, cortex absent, bulb present; red tint, waxy texture
09542.0001	Block 4	33	A	1	178	5	Lithics	Biface Reduction Flake	Bluish light grey	< 1/2"	2	0.7	Small Chert fragment, cortex absent, bulb present; red tint

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	33	A	1	178	6	Lithics	Biface Reduction Flake	Light grey	< 1/2"	2	0.6	Light grey, Onondaga chert fragments; cortex absent, bulb present
09542.0001	Block 4	33	A	1	178	7	Lithics	Flake Fragment	Dark grey	< 1/2"	18	3.9	Onondaga chert fragments; snapped portions, bulb absent, cortex absent
09542.0001	Block 4	33	A	1	178	8	Lithics	Debitage / General	Dark grey/red	> 1/2"	1	22.8	Onondaga chert fragment; blocky structure, red mottling; cortex absent
09542.0001	Block 4	33	A	1	178	9	Lithics	Debitage / General	Dark grey	< 1/2"	9	7.5	Onondaga chert fragments; small; cortex absent
09542.0001	Block 4	33	A	1	178	10	Lithics	Utilized Flake	Dark grey	> 1/2"	1	6.1	Onondaga chert, large flake; Cortex absent, bulb present; utilized edge with microflaking/retouching present
09542.0001	Block 4	33	A	1	178	11	Lithics	Biface / General	Bluish light grey	< 1/2"	1	2.8	Light bluish grey chert with red mottling; cortex indeterminate; reduction on both surfaces; fragment
09542.0001	Block 4	33	A	1	178	12	Lithics	Biface / General	Dark grey	> 1/2"	1	7.1	Onondaga chert, biface midsection and tip portion; snapped base
09542.0001	Block 4	33	A	1	178	13	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	1	1	Onondaga chert, large platform; cortex absent
09542.0001	Block 4	33	B	2	179	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	10	4.3	Dark grey Onondaga chert; cortex absent; small fragments
09542.0001	Block 4	34	A	1	180	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	7	17.4	Onondaga chert fragments; cortex absent, bulb presence; large flakes
09542.0001	Block 4	34	A	1	180	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	53	24	Onondaga chert fragments, cortex absent; bulb present; small fragments
09542.0001	Block 4	34	A	1	180	3	Lithics	Biface Reduction Flake	Light grey	< 1/2"	1	0.1	Small light grey chert (7.5YR 6/1), cortex absent; bulb present; small fragment
09542.0001	Block 4	34	A	1	180	4	Lithics	Flake Fragment	Dark grey	< 1/2"	6	1.1	Small fragments, Onondaga chert; cortex absent, snapped ends
09542.0001	Block 4	34	A	1	180	5	Lithics	Flake Fragment	Dark grey/red	< 1/2"	2	2.1	Small fragments; dark grey with red exterior; cortex indeterminate, possible Onondaga chert
09542.0001	Block 4	34	A	1	180	6	Lithics	Debitage / General	Dark grey	> 1/2"	1	9.4	Onondaga chert, blocky fragment; cortex present
09542.0001	Block 4	34	A	1	180	7	Lithics	Debitage / General	Dark grey	< 1/2"	9	7.9	Onondaga chert fragments; small, irregular shaped; cortex absent

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	34	A	1	180	8	Lithics	Utilized Flake	Dark grey	> 1/2"	2	5.4	Onondaga chert, possible utilized flakes; cortex absent
09542.0001	Block 4	34	A	1	180	9	Lithics	Utilized Flake	Dark grey/red	> 1/2"	1	3.2	Possible utilized flake; dark grey Onondaga chert with red staining; flaking evident on ventral surface
09542.0001	Block 4	34	A	1	180	10	Lithics	Debitage / General	Dark grey	> 1/2"	1	12.4	Possible worked debitage fragment; irregular, blocky form; Onondaga chert, cortex absent
09542.0001	Block 4	34	A	1	180	11	Lithics	Biface / General	Dark grey	> 1/2"	1	4.3	Early reduction flake, worked both surfaces; cortex present; possible tool; whole
09542.0001	Block 4	34	B	2	181	1	Lithics	Decortication Flake	Dark grey	< 1/2"	2	1.9	Dark gery Onondaga chert; cortex present; platforms and/or bulbs of percussion present.
09542.0001	Block 4	34	B	2	181	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	4.3	Dark grey Onondaga chert; cortex absent; platforms and bulbs of percussion present.
09542.0001	Block 4	34	B	2	181	3	Lithics	Flake Fragment	Dark grey	< 1/2"	3	0.9	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.
09542.0001	Block 4	34	B	2	181	4	Lithics	Debitage / General	Dark grey	> 1/2"	2	33	Dark grey Onondaga chert; cortex present; irregular forms.
09542.0001	Block 4	34	B	2	181	5	Lithics	Debitage / General	Dark grey	< 1/2"	2	2.8	Dark grey Onondaga chert; cortex absent; irregular forms.
09542.0001	Block 4	35	A	1	182	1	Lithics	Early Reduction Flake	Dark grey	> 1/2"	1	2.9	Dark grey Onondaga chert; small amount of cortex present; platform and bulb of percussion present.
09542.0001	Block 4	35	A	1	182	2	Lithics	Early Reduction Flake	Dark grey	< 1/2"	1	0.9	Dark grey Onondaga chert; cortex present; platform and bulb of percussion present.
09542.0001	Block 4	35	A	1	182	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	10	44.1	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 4	35	A	1	182	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	41	25.7	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 4	35	A	1	182	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	2	2.1	Light grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 4	35	A	1	182	6	Lithics	Biface Reduction Flake	Light grey/red	< 1/2"	3	5.3	Light grey with red staining Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 4	35	A	1	182	7	Lithics	Flake Fragment	Dark grey	< 1/2"	28	12.3	Dark grey Onondaga chert; cortex absent; snapped/broken ends and edges.

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	35	A	1	182	8	Lithics	Debitage / General	Dark grey	> 1/2"	1	24.1	Dark grey Onondaga chert; cortex present; blocky form.
09542.0001	Block 4	35	B	2	183	1	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	5	3	Dark grey Onondaga chert; cortex absent; platforms and/or bulbs of percussion present.
09542.0001	Block 4	35	B	2	183	2	Lithics	Finishing Flake	Dark grey	< 1/2"	1	0.1	Dark grey Onondaga chert; cortex absent; platform and bulb of percussion present.
09542.0001	Block 4	35	B	2	183	3	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.8	Dark grey Onondaga chert; cortex absent; broken/snapped ends and edges.
09542.0001	Block 4	36	A	1	184	1	Lithics	Early Reduction Flake	Dark grey	> 1/2"	2	5	Onondaga chert fragments; cortex present, bulb present
09542.0001	Block 4	36	A	1	184	2	Lithics	Early Reduction Flake	Dark grey	< 1/2"	6	5.5	Onondaga chert fragments, cortex present, bulb present, small
09542.0001	Block 4	36	A	1	184	3	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	16	32	Onondaga chert fragments; large; cortex absent, bulb present
09542.0001	Block 4	36	A	1	184	4	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	10	50.6	Small Onondaga chert fragments; cortex absent, bulb presence
09542.0001	Block 4	36	A	1	184	5	Lithics	Biface Reduction Flake	Light grey	< 1/2"	4	1.2	Small Onondaga chert fragments, cortex absent, bulb present; slight bluish grey tint
09542.0001	Block 4	36	A	1	184	6	Lithics	Biface Reduction Flake	Dark grey/red	< 1/2"	1	0.1	Onondaga chert fragment, small; slight red tint; cortex absent
09542.0001	Block 4	36	A	1	184	7	Lithics	Flake Fragment	Dark grey	< 1/2"	11	2.2	Onondaga chert fragments; small with snapped ends; cortex absent
09542.0001	Block 4	36	A	1	184	8	Lithics	Debitage / General	Dark grey	< 1/2"	10	9.6	Onondaga chert fragments; irregular forms, debitage/shatter; cortex absent
09542.0001	Block 4	36	A	1	184	9	Lithics	Early-Stage Biface	Dark grey	> 1/2"	1	57.7	Mottled onondaga chert, early biface, whole; reduced on one edge, unworked on the other
09542.0001	Block 4	36	A	1	184	10	Lithics	Middle-Stage Biface	Dark grey	> 1/2"	1	8.2	Mottled Onondaga chert, whole; long and thin, cortex absent
09542.0001	Block 4	36	A	1	184	11	Lithics	Endscraper	Dark grey	> 1/2"	1	37.6	Dark grey Onondaga chert, whole; large flake, retouched edges and utilized
09542.0001	Block 4	36	A	1	184	12	Lithics	Utilized Flake	Dark grey	> 1/2"	1	10.6	Dark grey Onondaga chert, retouched edges; possibly utilized

Site No.	Area	Unit	Stratum	Level	Field #	Spec #	Class	Artifact Description:	Color	Size	Count	Weight (g)	Comments
09542.0001	Block 4	36	A	1	184	13	Lithics	Biface / General	Dark grey	> 1/2"	2	59.7	Dark grey Onondaga chert, cortex present; possible tools?
09542.0001	Block 4	36	B	2	185	1	Lithics	Biface Reduction Flake	Dark grey	> 1/2"	1	6.6	Onondaga chert flake; cortex absent, bulb present
09542.0001	Block 4	36	B	2	185	2	Lithics	Biface Reduction Flake	Dark grey	< 1/2"	7	3.5	Onondaga chert fragments; small; cortex absent, bulb present
09542.0001	Block 4	36	B	2	185	3	Lithics	Flake Fragment	Dark grey	< 1/2"	2	0.4	Onondaga chert fragments; small; cortex absent, snapped ends
09542.0001	Block 4	36	B	2	185	4	Lithics	Debitage / General	Dark grey	< 1/2"	1	0.4	Onondaga chert fragment; small, blocky and irregular shaped
09542.0001	Block 4	36	B	2	185	5	Lithics	Biface / General	Dark grey	< 1/2"	1	1.8	Onondaga chert biface body fragment; worked both surfaces; midsection fragment; cortex absent

Appendix C

Data Recovery Plan

Data Recovery Plan
Gorge Creek Site 1(09542.000116)

Village of Middleburgh, Town of Middleburgh,
Schoharie County, New York

Prepared for:

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Revised Draft
March 9, 2017

Data Recovery Plan – Gorge Creek Site 1(09542.000116)

Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Table of Contents

A. Introduction

Louis Berger U.S., Inc. (Louis Berger), is pleased to submit this Data Recovery Plan (DRP) to the Governor's Office of Storm Recovery (GOSR) for a Phase III archaeological investigation of Gorge Creek Site 1 (09542.000116). This prehistoric site was deemed to be eligible for the National Register of Historic Places (NRHP) as a result of Phase I and II investigations by Landmark Archaeology, Inc. (Gade et al. 2016; Gade and Schreyer 2016). The site is located in the Area of Potential Effect (APE) for the proposed Gorge Creek Culvert Repair and Storm Water Improvements (OPRHP No. 15PR06219) in the Village of Middleburgh, Schoharie County, New York (Figure 1).

GOSR, operating under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation (HTFC), is the Responsible Entity for direct administration of the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant–Disaster Recovery (CDBG-DR) funds. The Schoharie County Soil and Water Conservation District (SWCD) is requesting funding under the New York Rising Community Reconstruction Program for Phase I and Phase II of the Gorge Creek Culvert Repair and Storm Water Improvements project. This is a stormwater management improvement project involving culvert installation, expansion of the floodplain and sedimentation basin construction, and improvements to the stormwater system under selected streets in the village. Development of the floodplain expansion and sedimentation basin portion of the project will affect Gorge Creek Site 1.

This DRP has been developed in accordance with guidelines established by the New York Office of Parks, Recreation and Historic Preservation (OPRHP) and the *Standards for Cultural Resource Investigations and Curation of Archaeological Collections in New York State* and the *Cultural Resource Standards Handbook*: *Guidance for Understanding and Applying the New York State Standards for Cultural Resource Investigations* published by the New York Archaeological Council (1994, 2000). Reporting will conform to all professional standards and requirements. The cultural resource specialists who will perform this work meet or exceed the qualifications specified in 36 CFR 66.3(6)(2).

B. Previous Investigations

1. Phase I

Phase I testing of the project area was conducted in May 2016 (Gade et al. 2016). Ninety-eight shovel tests in the floodplain expansion and sedimentation basin area were located within the boundaries of the artifact concentration designated as Gorge Creek Site 1. Based on the Phase I data, the extent of the Gorge Creek Site 1 was estimated at approximately 6.1 acres. Fifty-eight of the 98 tests contained prehistoric artifacts. In total, 183 artifacts were recovered from the shovel tests. A feature (Feature 1) was identified in Transect 11, Shovel Test 1.

Most of the artifacts (n=136; 74 percent) were found in the plowzone (Ap horizon); 28 artifacts (15 percent) were found in B horizon soils, and 19 artifacts (10 percent) were found in Feature 1. The shovel tests revealed an Ap-B soil sequence within the site and across the entire area of the proposed floodplain expansion and sedimentation basin. The plowzone consisted of dark brown (10YR 3/3) gravelly silt loam that extended to a maximum depth of 40 centimeters below ground surface (bgs). The underlying B horizon soils were dark yellowish brown (10YR 4/4–4/6) gravelly silt loam or silt loam. In several shovel tests a B/C horizon, consisting of dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand, was encountered below the B horizon soil.

The artifact assemblage recovered by Phase I testing consisted of four bifaces, one endscraper, four retouched flakes, 21 utilized flakes, 10 cores (845.3 grams), 129 flakes, two cobble tools (199.0 grams), and 12 pieces of fire-cracked rock (FCR) (489.6 grams). The assemblage did not include any culturally/temporally diagnostic artifacts.

Feature 1 was identified in Transect 11, Shovel Test 1. Charcoal flecking was encountered at depths of 40 and 60 centimeters bgs within soils similar to the plowzone. Feature 1 contained 19 artifacts: one retouched flake, three utilized flakes, 13 flakes, one core (113.7 grams), and one piece of FCR (20.1 grams). The feature's size, type, and function could not be determined from the limited exposure. The overlying plowzone in this shovel test yielded 11 artifacts, the greatest number found in the plowzone of any of the shovel tests at the site.

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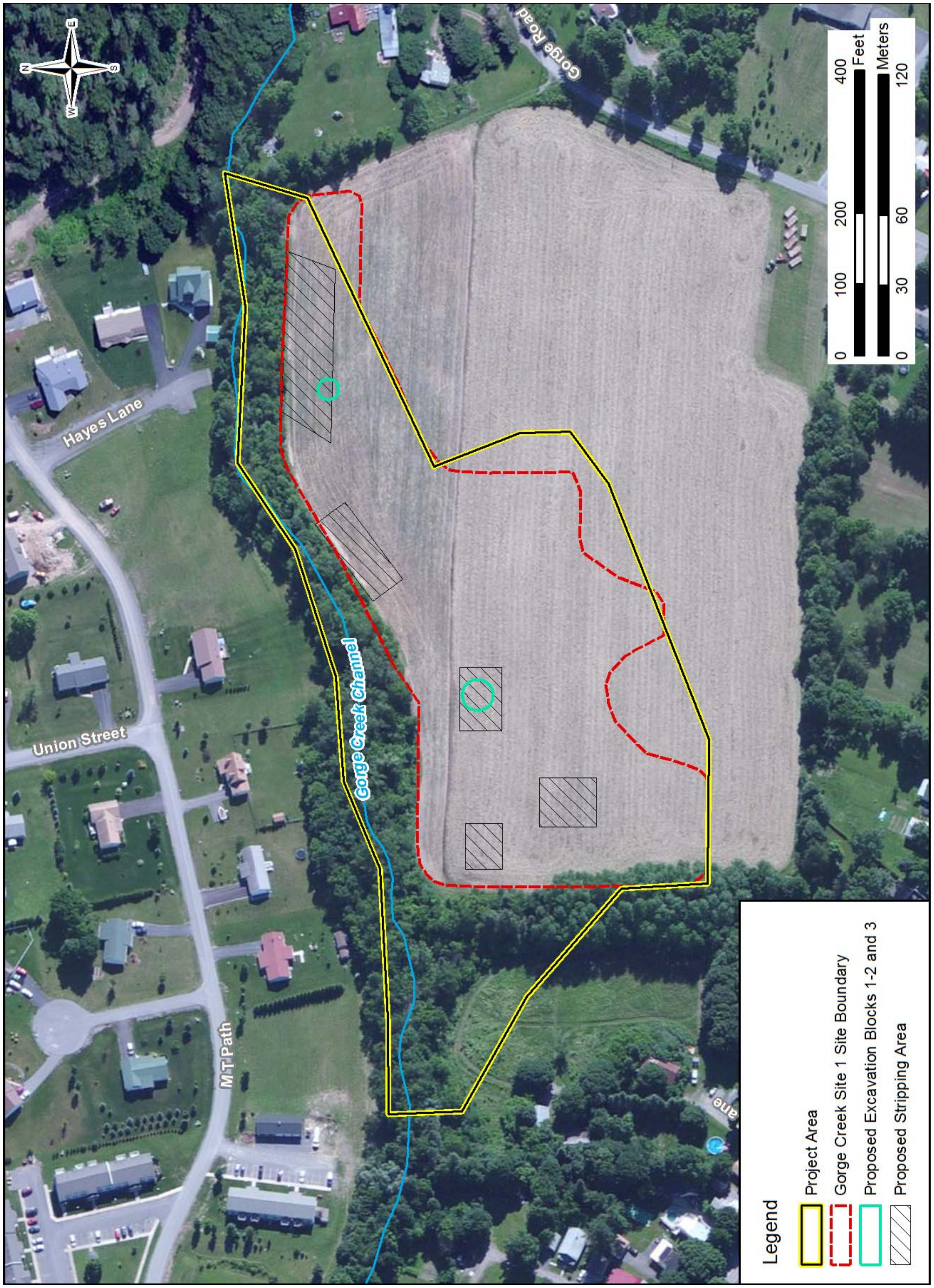

FIGURE 1: Site Map with Provisional Work Locations (ESRI World Imagery 2015)

2. Phase II

The Phase II field investigation was conducted from August 23 to September 9, 2016 (Gade and Schreyer 2016). It entailed excavation of 102 shovel tests and 16 1x1-meter test units. The shovel tests were spaced 10 meters apart and were arrayed along transects that were located parallel to or on selected Phase I transects. This procedure created transects spaced 7.5 meters apart across the site area. The subsequent placement of units was based on shovel test results and the character of the landform.

Consistent with the Phase I shovel tests, Phase II excavations documented an Ap-B soil sequence across much of the site. The plowzone (Ap) consisted of dark brown (10YR 3/3) gravelly silt loam and typically extended between 20 and 30 centimeters bgs. B horizon soils were dark yellowish brown to yellowish brown (10YR 4/6–5/6) gravelly silt loam or silt loam. In several shovel tests a B/C horizon was encountered below the B horizon soil; it was a dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand with dense cobbles. In low-lying terrain in the western section of the site, an unplowed remnant of the A horizon was encountered in several shovel tests along Transects 22 and 23, and also in Units 2, 3, 4, and 7. These excavations were located along the lower elevations of the terrace, within a noticeable swale. In these tests the unplowed A horizon soil lay directly below the plowzone; it was a dark yellowish brown (10YR 4/4–4/6) gravelly silt loam ranging in thickness from 10 to 18 centimeters.

Phase II excavations yielded a total of 1,264 artifacts: nine bifaces, two scrapers, two other chipped stone implements, 101 flake tools, 18 cores, 1112 flakes, five cobble tools, and 15 pieces of FCR. Of the total, 394 artifacts were recovered from 70 positive shovel tests. The great majority of these (n=327) came from the plowzone, 56 artifacts were found in the B horizon, and 11 came from the unplowed A horizon soil. A total of 870 artifacts were recovered from the 16 test units.

Artifacts were found in all units, but the totals varied widely, ranging from 237 artifacts in Unit 2 to two artifacts in Unit 15. After Unit 2, Units 11 and 4 had the next highest artifact totals with 158 and 123, respectively. The remaining units all contained fewer than 100 artifacts; Units 6, 15, and 16 each yielded fewer than 10 artifacts. Sub-plowzone artifacts were found in all but three units (Units 9, 15, and 16). Units 2, 3, 4, and 7 were placed in the portion of the site where shovel tests had encountered unplowed A horizon soils under the plowzone. Combined, these four units yielded a total of 409 artifacts, accounting for almost half (47 percent) of all artifacts found in the 16 1x1-meter units. A total of 163 artifacts were recovered from the unplowed A soils in these four units (mostly from Units 2 and 4), and 14 artifacts were found in their upper B horizon.

A few of the Phase I and II shovel tests are exceptional for their density of lithic artifacts: Shovel Tests 32:5 (n=29), 20:5 (n=38), 22:2 (n=27), and 11:1 (n=27). These unusual concentrations triggered the placement of Phase II units in the vicinities of these productive shovel tests. Those units confirmed that patchy artifact concentrations generally existed near the most artifact-rich shovel tests. Units 2 (n=237) and 4 (n=123) were placed west of Shovel Test 22:2 and 11:1. Unit 1 (n=63) was located east of Shovel Test 22:2 and west of Shovel Test 22:1 (n=16). Unit 11 (n=158) was placed just west of Shovel Test Tr. 32:5. The concentrated patches seemed to be small and isolated. No unit was placed immediately adjacent to Shovel Test 20:5. Unit 16, located about 15 meters southwest of this most productive shovel test, yielded only four artifacts; Unit 13, about 20 meters southeast of Shovel Test 20:5, produced only 17 artifacts. The shovel tests with more than about 12 artifacts appeared to represent a sharp jump in artifact density. Phase II units placed near shovel tests with 11 or fewer artifacts generally produced relatively few artifacts: Unit 13, Unit 9 (n=22), Unit 10 (n=19), Unit 12 (n=26). Some units located near shovel tests with three or fewer artifacts predictably yielded very few artifacts, such as Unit 6 (n=6) and Unit 15 (n=2); however, Units 5 (n=27) and 14 (n=33), although not very productive, contained more artifacts than would be expected from the very low yields of the nearest shovel tests.

The only feature identified during Phase II was Feature 2. This pit feature was first identified in a Phase II shovel test (Shovel Test 22:2) and was further exposed by excavation of Unit 1. The feature became evident at the base of the plowzone, at a depth of 30 centimeters bgs, as a soil stain of reddened (thermally altered) earth with charcoal. It extended into the north and east walls of the unit. Roughly rectangular in shape, Feature 2 measured 70x55 centimeters. A concentration of burned earth measuring 55x23 centimeters was located along the unit's east wall. In profile the feature exhibited relatively straight walls and a flat bottom, and it extended 23 centimeters into the B horizon. The feature matrix consisted of mottled dark yellowish brown (10YR 4/6) and strong brown (7.5YR 4/6) silt loam. A total of seven artifacts were recovered from the feature: of five flakes and two pieces of FCR weighing 62.1 grams.

Apart from the artifacts found in Feature 2, 68 additional artifacts were recovered from Unit 1. This unit did not have an unplowed A horizon soil; the plowzone lay directly atop the B horizon. Sixty-two artifacts were recovered from the plowzone and six artifacts were found in the B horizon.

Unit 11 had the second highest number of artifacts at the site with a total of 158; a total of 131 artifacts came from the plowzone and 27 artifacts from the B horizon. This unit was located in the northeast part of the site near Gorge Creek and on a relatively higher elevation of the terrace. Unit 8, located about 30 meters upslope from and east of Unit 11, contained 72 artifacts: 65 from the plowzone and seven from the B horizon.

In shovel tests and units together, 943 artifacts, or 74.6 percent of the total assemblage, were recovered from the plowzone. One hundred seventy-five artifacts (13.8 percent) came from intact A horizon soils below the plowzone, and 139 artifacts (11.0 percent) were found in B horizon soils. The remaining seven artifacts came from Feature 2.

The basal portion of a stemmed point typed as a Lamoka was recovered from the plowzone of Unit 13. An untypable basal fragment of another, side-notched point came from the plowzone of Unit 11. The Lamoka-like point suggests a Late Archaic presence at the site. A pre-Woodland date (older than 3000 radiocarbon years before present [rcbp]) is also suggested by the apparent absence of pottery.

Gade and Schreyer examined artifacts found on the plowed surface of the site by Tom Anderson, a local collector. They recognized in his collection several Late Archaic Lamoka and Snook Kill points, as well as Orient Fishtail points. They also noted a basal fragment of what seemed to be a Turkey Tail point. Their photograph of the collection also seems to include two triangles, which could be Late Woodland or Middle or early Late Archaic in age. A side-notched point in the same photograph could be a Meadowood or Brewerton.

Anderson showed Gade and Schreyer a map he had drawn showing artifact locations and the relative distribution of Lamoka and Orient Fishtail points on the terrace. According to the map, he found Lamoka and stemmed points in an area southeast of and outside the project area. Anderson collected Oriental Fishtail points in the northeast portion of Gorge Creek Site 1 where the east portions of the Phase I Transect 1 and Phase II Transect 20 were located.

3. Phase I and II Interpretations and Conclusions

If one combines the Phase I (n=183) and Phase II (n=1,264) artifacts, the total assemblage from Gorge Creek Site 1 numbers 1,447 prehistoric artifacts. All of these are lithics; no pottery was recovered. The paucity of projectile points is clearly attributable to previous surface collection.

The variety of tool types recognized in the Phase I and II assemblages suggests that multiple and varied activities occurred at the site. Many expedient flake tools with flaking or wear on one or several edges were found across the site. Gade and Schreyer (2016) noted that only 15 pieces of FCR were found in the Phase II excavations. It is unlikely that collectors would have removed any FCR, so this rarity is probably representative of the actual low frequency of FCR on the site. Their near absence may indicate that few long-term hearths were created during occupations. This could imply that cooking was rarely undertaken, or that the site was mainly inhabited in the summer, when the warmth of fires was not needed. Despite the absence of preserved bone or macrobotanical remains, Gade and Schreyer suggest that the inhabitants procured and processed plant and animal resources. They interpret Gorge Creek Site 1 as a composite of short-term camps and seasonal occupations that occurred throughout the Late Archaic period. They also note the likelihood that the site extends beyond the APE boundary and that artifacts may be present elsewhere on the terrace outside the APE as well as on the other side of Gorge Creek.

Historic-era agriculture has severely affected the integrity of the prehistoric cultural deposits at Gorge Creek Site 1. The great majority of the artifacts were recovered from the plowzone (74 percent in Phase I, 74.6 percent in Phase II). However, artifacts were also recovered from the upper B horizon soils, usually within the first 10 centimeters (about 11 percent of the Phase II assemblage). Additional analysis (e.g., of the relative sizes of flakes in the A vs B horizons) would be necessary to determine if the artifacts in the lower zone are *in situ* or have been redeposited from the plowzone due to cryo- or bioturbation. In several shovel tests and Units 2, 3, 4, and 7, artifacts were found in a distinct stratum intervening between the plowzone and the B horizon. Gade and Schreyer designated this stratum as an unplowed A horizon that contained *in situ* archaeological deposits. They did not reconstruct the depositional processes that formed this horizon. Does it represent overbanking of the stream, or incorporation of organic detritus from the prehistoric campsites, or an old plowzone? Whatever its origin, on the basis of Phase II data, Gade and Schreyer

estimate that this unplowed A horizon extends over an area of about 760 square meters of the terrace. Thirteen percent (n=175) of all Phase II artifacts came from the unplowed A horizon in this part of the site.

Gade and Schreyer (2016:12) recommended Gorge Creek Site 1 as eligible for the NRHP under Criterion D (it has yielded, or may be likely to yield, information important in prehistory or history). They emphasized the presence of artifacts in the unplowed A horizon soils and in the upper B horizon soils, as well as the recognition of a pit feature. The latter raised the possibility that other features may be present. “Specifically, the site provides an opportunity to examine and expand our knowledge regarding settlement, subsistence and community patterning of Late Archaic period occupations along Gorge Creek, a small tributary in the Schoharie Creek valley” (Gade and Schreyer 2016:12).

C. Problem Orientation

Gade and Schreyer (2016:12) suggested that the following research topics could be addressed by additional recovery of cultural deposits from Gorge Creek Site 1.

- Subsistence Patterns
- Community Pattern
- Settlement System/Site Function
- Cultural History

1. Subsistence Patterns

Given the absence of any organic remains (apart from charcoal flecks) from previous investigations and the improbability that they will be recovered in substantial quantities from the proposed excavations, it is unlikely that data will be generated with which to address subsistence patterns directly. It is possible, nevertheless, that analysis of wear traces on utilized flakes, which are common on the site, could indicate whether predominantly plants or animal materials were being processed there.

2. Community Patterns

It will also be difficult to retrieve any information about “community pattern.” It is not impossible that Archaic postmold patterns may be revealed. Woodland-age postmolds have been exposed at other sites along Schoharie Creek (Ritchie and Funk 1973; Rieth 2008, 2012; Rafferty et al. 2014). However, such traces of older Archaic dwellings are very infrequently encountered. Nothing found in previous investigations of Gorge Creek Site 1 suggests that postmolds will be present. Lacking clear evidence of the locations of residential households, little can be said about the community’s spatial organization.

3. Settlement System/Site Function

The uniformity of the lithic materials used at the site (almost all locally available Onondaga chert, with just a few pieces of Esopus chert), indicates that any toolstones that may have been procured elsewhere during other seasonal phases of the settlement round were not transported here. Similarly, the apparent absence of exotic toolstones suggests that interactions with neighboring societies, or with more distant groups, were not manifested in the exchange of lithics. The uniformity of lithics at Gorge Creek Site 1 will also make it more difficult to tease out assemblages attributable to distinct Archaic sub-periods, because such culturally diagnostic exotic materials as jasper, rhyolite, Ramah chert, or Flint Ridge chert are not present. Curiously, the absence of exotic lithics here contrasts with the nearby Schoharie Creek II site, where, in addition to Eastern Onondaga chert, the Early Woodland component included debitage of chalcedony, Pennsylvania jasper, Kalkburg, and Normanskill chert (Rieth 2008, 2012). Perhaps such materials will turn up at Gorge Creek Site 1 when data recovery expands the sample size.

Nevertheless, some insights into regional settlement patterns may be gleaned from comparison of the Gorge Creek Site 1 assemblage with those recovered from other sites located along Schoharie Creek, e.g., Schoharie Creek II (Rieth 2012) and Pethick (Rafferty et al. 2014), both of which are located about 8 kilometers (5 miles) north of Gorge Creek Site 1. A cursory comparison reveals that the Gorge Creek Site 1 chipped stone assemblage from Phase II (n=1,244) has a much lower proportion of shatter and broken flakes (n=247, 19 percent) than Schoharie Creek II, where these

constitute about 64 percent of the lithics (22,772 out of a total of 35,837). At the Pethick Site an even greater percentage of the lithics is classified as shatter (177,889 of a total 188,406, or about 94 percent) (Rafferty et al. 2104:186). At Gorge Creek Site 1 a much higher proportion of flakes was utilized (n=101, 8 percent of all lithics) than at Schoharie Creek II, where only 383 flakes showed use-wear (a little more than 1 percent of the lithic assemblage). Only 723 utilized flakes (less than 0.5 percent of total lithics) have been recognized at the Pethick Site.

At Schoharie Creek II projectile points represented a remarkably small proportion of the total lithic assemblage; only nine points were found. Many more points have been recovered from the Pethick Site; the 180 points include 33 Levanna, 27 Meadowood, six Orient, five Adena, four Brewerton, two Madison, two Jack's Reef, one Perkiomen, one Susquehanna, and 99 unidentifiable points (Rafferty et al. 2014:186). Although only two points were found in the excavations at Gorge Creek Site 1, Anderson collected many more from the surface. It is noteworthy that one of the few typable points from Schoharie Creek II is an Orient Fishtail, another appears to be a Dry Brook Fishtail, and a third is a Meadowood. The Terminal Archaic fishtail types are well represented in Anderson's surface collection from Gorge Creek Site 1. Of course, the differing scales of the total assemblages may be affecting these comparisons. One of the rationales for additional excavation at Gorge Creek Site 1 is to obtain a larger artifact sample, which may clarify whether these ostensible inter-site differences are real or only a statistical artifact of small sample size.

It is possible that the ostensible high frequency of utilized flakes at Gorge Creek Site 1 may be a culturally diagnostic trait. Kraft (1970:9) reported his recovery of nearly three dozen utilized flakes from the Orient Fishtail component of the Miller Field Site in northern New Jersey. These were mainly of a specialized form with convex or concave edges. Kraft also reported utilized flakes from the slightly older Broadspear component of the site; such tools had not previously been recognized in Terminal Archaic assemblage. It will be necessary to closely examine utilized flakes from the Phase III excavations to determine if (1) the edge wear is really caused by prehistoric use or by plow damage or other post-depositional processes, and (2) if there is any morphological consistency that might indicate a cultural template similar to the specialized Orient forms from Miller Field.

4. Cultural History/Chronology

Gade and Schreyer's (2016:12) suggested research focus on "cultural history" of the Gorge Creek Site 1 can be rephrased as a focus on chronology. Basically, there are two ways to construct a chronology for the site. One is to assemble a substantial collection of projectile points. Based on their distinctive basal morphology and radiocarbon-dated associations at numerous sites, these artifacts can be assigned to temporal spans of ca. 500 to 1500 years. The relative numbers of points of each type may be used as an index of the frequency/intensity of site use during each period.

The only typable artifact recovered in previous investigations was the basal portion of a Lamoka-like point. However, the points collected in this vicinity by a local amateur include Lamoka-like points, Snook Kill, Dry Brook, Orient Fishtail, a possible Turkey Tail, and a few side-notched (Meadowood or Brewerton) points. This evidence suggests that the site was occupied intermittently between ca. 5500 and 2500 calibrated years before present (cal BP). A few triangles in Anderson's collection might indicate either a discrete Late Woodland presence or another Middle or early Late Archaic occupation. The preponderance of Orient and Dry Brook fishtail points in the collection suggests that the site was occupied most intensively around 1500 to 1200 cal BP.

A complementary or alternative strategy for establishing the site's chronology is to recover organic material from hearths or pit features, which can be sampled for dating by radiocarbon assays. This is the primary rationale for targeting most of the data recovery effort at the portion of the site where features are most likely to be encountered. Features also may also yield material such as charred nut shells and seeds and calcined bones that would be useful for reconstruction of subsistence and environment. Additionally, charred nuts and seeds are the preferred samples for radiocarbon dating because the "old wood effect" is minimized. A piece of wood may be burned in a hearth many years after the tree's death; radiocarbon dates the time of death (after which atmospheric carbon dioxide was no longer absorbed), not the time of burning. In contrast, nuts and seeds are likely to have been burned very soon after they were harvested.

In principle, the most frequent and intensive occupations of a site should leave behind both the greatest numbers of artifacts, including typologically diagnostic specimens, and also the greatest numbers of features and organic detritus suitable for radiocarbon dating. However, because of differences in site function over time, and the vagaries of

preservation and sampling, these kinds of evidence may not coincide precisely. An example of such incongruity can be seen at the Pethick Site. Of the 81 typable points, only two (2.5 per cent) (a Perkiomen and a Susquehanna Broad) can be attributed to the portion of the Terminal Archaic between ca. 4000 and 3600 cal BP. However, two (20 percent) of the 10 radiocarbon dates reported for the site fall within this period. On the other hand, 27 (33 percent) of the 81 identified points from Pethick are Meadowood, and similarly three (30 percent) of the 10 dates are appropriate for the Meadowood phase (2510±40, 2640±60, and 2670±110 rcbp). For comparison, it may be noted that Funk (1993:299–307) reported a fairly close correspondence of the relative frequencies of projectile point types and components of each period, both in the Upper Susquehanna Valley and the Hudson Valley. However, in both regions Late Archaic points (Sylvan Stemmed in the Hudson Valley, Vestal in the Upper Susquehanna Valley) were over-represented relative to the number of components of these phases.

The uniformity of raw material, the lack of stratigraphic separation, and the ubiquity of utilized flake tools across Gorge Creek Site 1 combine to create a probably erroneous impression of the unchanging function of Gorge Creek Site 1 through time. It should be emphasized, however, that Anderson's collection suggests at least three discrete occupation episodes, each separated by centuries from the next: Lamoka (ca. 5500 to 5000 cal BP); Snook Kill (ca. 4200 to 3800 cal BP) and Dry Brook-Orient (ca. 3500 to 2900 cal BP). Both earlier (Brewerton or Middle Archaic) and later (Meadowood and Late Woodland) occupations may also be present. It would be surprising if the site were used in exactly the same way in each of these episodes, particularly as a cultural discontinuity probably occurred between the Lamoka and Snook Kill horizons. On the other hand, if the resources available in this location did not change significantly in the course of millennia, the basic processing tasks that entailed the use of many expedient flake tools may have varied little from one occupation episode to the next.

It is doubtful whether the entire site would have been occupied during any single occupation episode. The possibility of isolating a Terminal Archaic camp is raised by Anderson's observation that Orient Fishtail points were concentrated in the northeast sector of the site.

The likely presence of an Orient Fishtail component at Gorge Creek Site 1 offers an opportunity to address a research issue that has been raised by recent work at the Pethick Site. Rafferty et al. (2014) suggest that this site, and others along Schoharie Creek, were located at the boundary between contemporaneous, distinct cultural zones: Orient Fishtail to the east and Meadowood to the west. They do not address the obvious question whether those zones, defined by sharply distinct projectile point styles, represent discrete ethnic, linguistic, or political entities. Nevertheless, "We argue that the Pethick site was occupied by populations exhibiting Early Woodland and Transitional tool kits not sequentially, but consecutively (i.e., two populations alternatively occupying the site over time) and perhaps simultaneously" (Rafferty et al. 2014:184).

Orient Fishtail, clearly derived from the preceding aceramic Terminal Archaic or Transitional Savannah River/Snook Kill/Susquehanna/Perkiomen tradition, is generally regarded as the final expression of this tradition. The temporal division between Terminal Archaic (without pottery) and Early Woodland (with pottery) has generally been set at 3000 rcbp (3200 cal BP). Most Orient-associated radiocarbon dates fall on the early side of the boundary, beginning about 3200 rcbp (3400 cal BP). However, a few dates are as late as ca. 2800 rcbp (2900 cal BP) (albeit with large standard errors). Orient points are associated with carved soapstone vessels, but also, rarely, with soapstone-tempered clay pots. Meadowood points are often associated with Vinette I pottery and therefore are assigned unambiguously to the Early Woodland. Radiocarbon dates for Meadowood generally fall between ca. 2900 and 2400 rcbp (3000 and 2500 cal BP); an anomalously early outlier from the Fortin Site on the Upper Susquehanna is 3180±95 (ca. 3300 to 3500 cal BP). Meadowood points seem to have developed from the small, notched points (e.g., Hind) that are found in southern Ontario and the northern Midwest between ca. 3500 and 2800 rcbp.

No credible Orient-associated dates are later than ca. 2750 rcbp (2850 cal BP or 880 cal BC). The end of the Terminal Archaic tradition thus appears temporally and perhaps causally associated with an abrupt climate event. Numerous environmental records in Europe indicate a climatic downturn around 800 to 750 cal BC, which coincides with a radiocarbon "cliff" indicating weakened solar activity. Atmospheric ^{14}C increases and dates drop abruptly from 2750 to 2450 rcbp (Fiedel 2001; Martin-Puertas et al. 2012; Van Geel and Mauquoy 2010). The "cliff" is followed by a plateau; between 2750 and 2400 cal BP, radiocarbon dates are indistinguishable, always ca. 2450 rcbp. Martin-Puertas et al. (2012) have recently shown that a simultaneous sharp increase in windiness and increase in cosmogenic beryllium (^{10}Be) occurred at ca. 2760 cal BP in central Europe; they infer that "changes in atmospheric circulation amplified the solar signal and caused abrupt climate change about 2800 years ago, coincident with a grand solar

minimum." This climate change is coincident with Bond event 2 in the North Atlantic, and a probably associated climate episode shows up very strongly in the strontium/calcium ratios from Buckeye Creek Cave in West Virginia (Springer et al. 2008: figure 1). Shuman et al. (2009) infer numerous prehistoric episodes of regional drought from the occurrence of sand layers attributed to lowered water levels in New Long Pond, Massachusetts. Among these is a drought dated to ca. 2980 to 2760 cal BP. Newby et al. (2011) report a similar drought record from Davis Pond in southwestern Massachusetts. Low water levels are inferred for most of the period from 3500 to 2300 cal BP. At Cayuga Lake in central New York, Mullins et al. (2011) infer an abrupt cold, dry episode starting around 3000 cal BP and persisting to 2400 cal BP; they hypothesize that it may have been caused by reduced solar activity. Pollen sampled from Ballston Lake, located between Saratoga and Schenectady, shows an increase of conifers, hardwoods, and boreal taxa at about 2680 cal BP (2520 rcbp); this is interpreted as marking a shift to a colder climate (Toney et al. 2003).

Recovery of datable charcoal from features in the central and northeast sectors of Gorge Creek Site 1 may provide samples for several AMS (accelerator mass spectroscopy) radiocarbon assays. Many of the extant radiocarbon dates that underpin regional chronology predate introduction of the AMS technology in the late 1980s. AMS dates are much more precise and often more accurate than the older assays. An example of the improved chronological resolution provided by AMS is the recent re-dating of the Terminal Archaic and Late Woodland components at the Little Wood Creek Site in Fort Edward (Grossman et al. 2015).

5. Lithic Technology

Almost all of the cultural material recovered in previous investigations of Gorge Creek Site 1 is chipped stone. The assemblage includes bifaces, scrapers, chipped stone tools, expedient flake tools, cores, debitage, utilized cobbles, and thermally altered rocks. We anticipate that additional material excavated in the data recovery will augment this assemblage. Proportionally, very few projectile points were found in the Phase I and II testing; however, an avocational surface collection contained many projectile points; it is possible that excavation and stripping below the plowzone may produce more temporally diagnostic points.

Previous investigations indicated the existence of several discrete clusters of high-density debitage across the site. Wider exposure of these areas by manual excavation and mechanized stripping may clarify their character. Are they simply patches where historic-era plowing was less intense, so that artifacts were less dispersed than elsewhere? Alternatively, do they represent the remnants of discrete lithic reduction/processing areas? In that case do the separate clusters represent distinctive lithic reduction strategies? If so, can these strategies be tied to particular cultural phases? This would be facilitated by radiocarbon and/or typological dating of closely associated features.

D. Proposed Fieldwork

1. Excavations

Louis Berger's proposed Phase III data recovery procedures will address the research issues discussed in Section C by means of two complementary strategies: (1) manual excavations in the locations where previous research indicated the highest densities of artifacts and features, and (2) mechanical stripping of areas with lower artifact densities to identify features at the plowzone/B horizon interface.

The placement of individual test unit excavations will address two specific archaeological objectives. First, the excavations will be located to recover sufficient quantities of cultural material to address research issues. Second, areas will be exposed to identify additional features and discrete or clustered activity areas, for example, those focused around prehistoric hearths or storage pits. If features are exposed, flotation samples will be taken for attempted recovery of the faunal and floral remains needed for radiocarbon dating and inference of prehistoric subsistence practices and seasonality.

The proposed units will be 3x3-meter block excavations; individual test units will be excavated within these larger blocks as 1x1-meter units. Individual 1x1-meter units may also be employed to test and sample selected areas prior to mechanical stripping. The use of large 3x3-meter blocks consisting of contiguous test units will facilitate recognition of activity areas manifest as lithic artifact concentrations, FCR clusters, and pit and postmold patterns.

a. Manual Excavations

Louis Berger proposes to manually excavate a maximum of 36 square meters (387 square feet). The placement of excavation blocks and units will be determined primarily by the quantities of artifacts reported from Phase I and Phase II shovel tests and units; however, the disposition of units may be altered in the field in response to contingent circumstances (e.g., discovery in the initial units of large, dense artifact or feature concentrations). As of now, Louis Berger proposes to place two block excavations in the vicinity of Phase II Units 2 and 4 and the recorded buried A horizon, and one block near Phase II Shovel Test 20:5 (see Figure 1). One block will be held in reserve to deploy to one of these areas or elsewhere, as the initial results may dictate.

In manual excavation, all soil horizons will be removed using shovels and trowels. The excavation of block units will begin with removal of the approximately 20 to 30 centimeters of plowzone; the buried A horizon and B horizon will then be excavated by 10-centimeter intervals within natural/cultural horizons. All soils will be screened through 0.25-inch hardware cloth. The locations of diagnostics identified *in situ* will be recorded with three-dimensional coordinates. Any features encountered will be numbered, photographed, and mapped; they will then be bisected and profiled. A sample for flotation from each feature will be taken, consisting of up to approximately half of the feature. This general sample size may be adjusted in cases where the features are larger. Charcoal or other carbonized materials present in feature fill will be sampled for radiocarbon assay.

Field observations and excavation data will be recorded on standardized forms developed by Louis Berger. Excavated soils will be recorded and described in terms of both texture and color, using USDA soil classifications and Munsell charts. Digital photographs of the site area and excavations will be taken as appropriate. All excavations will be backfilled upon completion and all safety regulations will be strictly followed during the investigations.

b. Mechanical Excavations

Following manual excavations, a straight-bladed backhoe will be used to mechanically strip off the approximately 30-centimeter plowzone from selected portions of the site in an effort to identify features at the plowzone-subsoil interface. Louis Berger proposes to mechanically strip 3,700 square meters (40,000 square feet) of the site, comprising approximately 16 percent of the total site area (see Figure 1).

Louis Berger archaeologists will monitor the mechanical stripping operations at all times, examining the stripped surface for soil anomalies and guiding the depth of excavations. Once the interface potentially containing cultural deposits and features has been exposed by the machine, Louis Berger archaeologists will hand-skim the remnant overburden and examine the surface for prehistoric cultural features, rock and artifact clusters, and soil anomalies. All soil stains identified during this process will be pin-flagged for further review to determine their cultural vs. natural status. A number designation will be assigned to each potential cultural feature, including soil anomalies and rock clusters. All numbered potential features will be mapped using sub-foot GPS or total station. Wherever multiple features are identified, digital photographs will be taken of the feature clusters.

2. Health and Safety

Health and safety will be addressed in a site-specific health and safety plan (HASP). The Occupational Safety and Health Administration (OSHA) mandates preparation of this plan. The HASP identifies and evaluates health and safety hazards that may exist in a project area and provides procedures and equipment to be employed to minimize workers' exposure to the potential hazards.

E. Data Processing and Analysis

At the conclusion of the field investigations, all recovered materials will be transported to Louis Berger's laboratory where artifact analysis and flotation processing tasks will proceed. Louis Berger's budget for this task assumes that a maximum of 1,000 artifacts will be recovered.

Specific laboratory tasks for preliminary treatment of cultural materials will include the following.

All recovered materials, including floral and faunal remains, will be cleaned and conserved to ensure their stability. Prehistoric bifaces, flake tools, utilized flakes, and other artifacts that may be examined for edge wear traces will be minimally processed pending appropriate analysis.

All materials will be fully provenienced and labeled. The artifacts will be prepared for permanent curation and transferred to a facility that meets the curation standards published by NYAC (1994) at the conclusion of the project.

To the extent possible, all recovered lithic artifacts will be identified as to cultural and temporal affiliation, raw material type, and formal and functional categories.

As discussed above, the research orientation of the proposed investigation focuses on the site's chronology, cultural affiliations, and definition of its function(s) in the regional settlement systems of several periods. Laboratory classification and analyses of artifacts will thus be oriented toward these research issues. The following section outlines these laboratory procedures.

As a first step in analysis of the lithic artifacts, they will be sorted into tool and debitage classes. Following this, they will be sorted and analyzed with respect to functional morphology, technological stages, metrical, and other attributes (e.g. color, texture and inferred source of the stone).

Projectile points will be assigned to recognized regional types. This classification is crucial for establishing the chronology of the site as a whole, and possibly for distinguishing sectors occupied by distinct social groups, whether sequentially or simultaneously. Breakage patterns, edge and tip wear, and re-working will be noted. Other formed tools may be classified as end- or sidescrapers, knives, drills, or other functional classes based on a combination of morphology and any observed use-wear or breakage.

A major goal of the analyses of debitage, cores, and incomplete bifaces will be to determine the intensity, stages, and distinctive strategies of lithic reduction activities at the site. For the bifaces, presence/absence of cortical surfaces and width-to-thickness ratios will indicate stage of reduction. Size, shape, extent of cortex, and flaking patterns will be recorded for cores.

Lithic debitage, including all types of flakes created in the lithic reduction sequence, will be counted and measured. Raw material type, lithic reduction stage (blocky shatter, decortication, early reduction, biface reduction, thinning) and presence/absence of cortex will also be recorded. Whole and broken flakes (lacking the original striking platform or termination) will be distinguished.

Based on reported Phase I and II data, the Gorge Creek Site 1 lithic assemblage appears to contain an unusually high percentage of utilized flakes. To confirm or refute this finding, which has important implications for the site's function and role in the regional settlement system, it will be necessary to devote special attention to this artifact class. All debitage will be visually inspected for patterned edge damage and/or retouching. A sample of those artifacts with ostensible edge alteration will be examined using low-power microscopy to identify micro-flake scars, snap fractures, step fractures, and edge rounding.

No ceramic sherds were recovered in Phase I and II investigations. Nevertheless, given the presence of a likely Meadowood point and a few triangles in Anderson's surface collection, Woodland occupations appear to be present, so potsherds might be encountered. If ceramic sherds are recovered, they will be sorted into rim, neck, and body categories and will be refitted to the extent possible. The resulting vessel lots will be characterized in terms of temper, paste, and decorative treatment. If recovered ceramics are of sufficient size, measurements of sherd thickness and curvature may be used to infer vessel shape and size.

If prehistoric FCR features are exposed, the FCR will be counted and weighed in the field. Samples from features will be prepared for flotation. Carbonized pieces of wood and nutshell, whether collected during feature excavation or recovered later by flotation, will be examined by a paleobotany specialist to determine their taxa. Selected credible samples (from known prehistoric taxa such as oak, butternut, and hickory) from secure contexts will be submitted to a laboratory (e.g., Direct-AMS, Beta-Analytic) for radiocarbon assay.

Following analyses of the artifacts, a spatial analysis of the distributions of archaeological classes and features will be performed. This analysis will focus on horizontal variation in the presence/absence and densities of lithic tool types and debitage relative to FCR concentrations and other features identified on the site. Of particular interest will be any differences observed between the northeast sector of the site, putatively dominated by Orient phase materials, and the central sector, of unknown cultural/temporal affiliation.

F. Coordination/Human Remains Policy

Louis Berger will advise GOSR of any problems or significant developments during the data recovery, and will assist GOSR as needed with any notifications required at the onset of fieldwork. In addition, GOSR will be notified immediately if any human remains are encountered during performance of this work. If human remains are encountered, they will be treated at all times with appropriate respect and according to all prescribed procedures. In accordance with the *Human Remains Discovery Protocol* (New York State OPRHP 2015), the discovery of human remains will result in a cessation of work in the vicinity of the remains, and no skeletal or artifactual material will be removed or disturbed. Louis Berger will inform the appropriate local civil or law enforcement authority, OPRHP, the St. Regis Mohawk Tribe, and other involved parties of the finding. The local civil or law enforcement authority shall make an official determination of the nature of the remains. If the remains are identified as a Native American burial, GOSR will consult with OPRHP, the St. Regis Mohawk Tribe, and other appropriate parties regarding the course of treatment of the remains. Efforts will be made to avoid disturbance of any additional burials. Any investigation of skeletal remains will be conducted according to the NPS *Guidelines for the Disposition of Archeological and Historical Human Remains*. Any work or services provided by Louis Berger in association with the investigation of human remains will be coordinated and negotiated with GOSR.

G. Schedule and Reporting

Louis Berger understands that scheduling of the work is a primary concern and is prepared to mobilize a field crew to the project area upon approval of the DRP. Louis Berger has sufficient staff available to complete the work in a timely fashion and is prepared to commit staff resources so that the fieldwork, laboratory processing, and end-of-field letter can be completed within a proposed project schedule. It is anticipated that the fieldwork will begin on or around March 15, 2017, and will be completed in a period of approximately three weeks, weather permitting. Within 15 days of clearing the field, an end-of-field letter will be submitted to OPRHP for review and concurrence that the proposed data recovery fieldwork has been completed. The end-of-field letter is intended to facilitate OPRHP review to comply with the proposed construction scheduling. Following submission of the end-of-field letter and after data analyses are complete, a technical report will be prepared. The technical report will be submitted within one year of the submission of the end-of-field letter. The technical report will consist of the results of fieldwork and analyses of data and will include but not be limited to the following: abstract, introduction, description of the project, environmental setting, chronological and cultural context (including a review of regional archaeological data pertinent to the site), field expectations, field methodology, results of fieldwork, analytical methods, results of analyses, and bibliography. The report will include all appropriate maps, figures, and plates. An inventory of all observed and collected artifacts will be included as an appendix. The report will be submitted in PDF format (one draft and one final).

H. Additional Tasks *(Scheduling/Cost TBD)*

Louis Berger anticipates that, after analyses and report submission, the artifact assemblage recovered from the site will be transferred to a faciltiy that meets the standards speciifed by NYAC (1994) for permanent curation. All the artifacts will be prepared for long-term curation. In addition, all other collections resulting from the data recovery, including ecofacts, analytical samples, field notes, laboratory forms, and photographic documentation, will be packed in archival containers in preparation for curation.

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State Historic Preservation Office/
New York State Office of Parks, Recreation and Historic Preservation
Human Remains Discovery Protocol
(June 2015)

In the event that human remains are encountered during construction or archaeological investigations, the New York State Historic Preservation Office (SHPO) recommends that the following protocol is implemented:

- At all times human remains must be treated with the utmost dignity and respect. Should human remains or suspected human remains be encountered, work in the general area of the discovery will stop immediately and the location will be immediately secured and protected from damage and disturbance.

- Human remains or associated artifacts will be left in place and not disturbed. No skeletal remains or materials associated with the remains will be collected or removed until appropriate consultation has taken place and a plan of action has been developed.

- The SHPO, the appropriate Indian Nations, the involved state and federal agencies, the coroner, and local law enforcement will be notified immediately. Requirements of the corner and local law enforcement will be met. A qualified forensic anthropologist, bioarchaeologist or physical anthropologist will assess the remains *in situ* to help determine if the remains are Native American or non-Native American.

- If human remains are determined to be Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO and the Indian Nations. The involved agency will consult SHPO and appropriate Indian Nations to develop a plan of action that is consistent with the Native American Graves Protection and Repatriation Act (NAGPRA) guidance. Photographs of Native American human remains and associated funerary objects should not be taken without consulting with the involved Indian Nations.

- If human remains are determined to be non-Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO. Consultation with the SHPO and other appropriate parties will be required to determine a plan of action.

Louis Berger

Affidavit of Mailing

STATE OF NEW YORK)

: SS. :

COUNTY OF ALBANY)

MARY BARTHELME, being duly sworn, deposes and says:

1. I am over the age of eighteen years.
2. On March 9, 2017, I mailed true and correct copies of the annexed Draft Data Recovery Plan for Review to St. Regis Mohawk Tribe dated March 9, 2017 by placing the same in first class post-paid envelopes addressed: SEE ATTACHED LIST.
3. On said day, I deposited said envelopes in a mailbox at 99 Washington Avenue, Albany, New York 12210.

Mary Barthelme

Sworn to before me this
13th day of March, 2017

Notary Public

Casey R. Dwyer
Notary Public, State of New York
Qualified in Rensselaer County
No. 01DW6346468
Commission Expires August 15, 2020

Governor's Office of
Storm Recovery

ANDREW M. CUOMO
Governor

LISA BOVA-HIATT
Executive Director

March 9, 2017

Ron LaFrance, Jr; Paul Thompson; and Beverly Cook, Chiefs
St. Regis Mohawk Tribe
412 State Route 37
Akwesasne, NY 13655

Re: Draft Data Recovery Plan for the Gorge Creek Culvert Repair and Storm Water Improvements, Village of Middleburgh, Schoharie County, New York

Dear Chiefs of the St. Regis Mohawk Tribe:

Please find enclosed the Draft Data Recovery Plan for the Gorge Creek Culvert Repair and Storm Water Improvements Project. The report has been submitted to SHPO and SHPO has concurred with the scope of work and offered two minor edits (see attached comment leter.) Please respond within 30 days or sooner with any comments, questions, or concerns about the Draft Plan. 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.

Sincerely,

Lori A Shirley

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

Enclosure:
Draft Data Recovery Plan for Gorge Creek Site 1
SHPO Response Letter

Electronic letter sent to:
Arnold Printup
Saint Regis Mohawk Tribe, THPO
412 State Route 37
Akwesasne, NY 13655

DATA RECOVERY PLAN
GORGE CREEK SITE 1(09542.000116)

Village of Middleburgh, Town of Middleburgh,
Schoharie County, New York

Prepared for:

Governor's Office of Storm Recovery
99 Washington Avenue, Suite 1224
Albany, New York 12260

Prepared by:

Louis Berger
20 Corporate Woods Boulevard
Albany, New York 12211

Draft
March 6, 2017

Data Recovery Plan – Gorge Creek Site 1(09542.000116)

Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Table of Contents

A. Introduction

Louis Berger U.S., Inc. (Louis Berger), is pleased to submit this Data Recovery Plan (DRP) to the Governor's Office of Storm Recovery (GOSR) for a Phase III archaeological investigation of Gorge Creek Site 1 (09542.000116). This prehistoric site was deemed to be eligible for the National Register of Historic Places (NRHP) as a result of Phase I and II investigations by Landmark Archaeology, Inc. (Gade et al. 2016; Gade and Schreyer 2016). The site is located in the Area of Potential Effect (APE) for the proposed Gorge Creek Culvert Repair and Storm Water Improvements (OPRHP No. 15PR06219) in the Village of Middleburgh, Schoharie County, New York (Figure 1).

GOSR, operating under the auspices of New York State Homes and Community Renewal's Housing Trust Fund Corporation (HTFC), is the Responsible Entity for direct administration of the U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant–Disaster Recovery (CDBG-DR) funds. The Schoharie County Soil and Water Conservation District (SWCD) is requesting funding under the New York Rising Community Reconstruction Program for Phase I and Phase II of the Gorge Creek Culvert Repair and Storm Water Improvements project. This is a stormwater management improvement project involving culvert installation, expansion of the floodplain and sedimentation basin construction, and improvements to the stormwater system under selected streets in the village. Development of the floodplain expansion and sedimentation basin portion of the project will affect Gorge Creek Site 1.

This DRP has been developed in accordance with guidelines established by the New York Office of Parks, Recreation and Historic Preservation (OPRHP) and the *Standards for Cultural Resource Investigations and Curation of Archaeological Collections in New York State* and the *Cultural Resource Standards Handbook*: *Guidance for Understanding and Applying the New York State Standards for Cultural Resource Investigations* published by the New York Archaeological Council (1994, 2000). Reporting will conform to all professional standards and requirements. The cultural resource specialists who will perform this work meet or exceed the qualifications specified in 36 CFR 66.3(6)(2).

B. Previous Investigations

1. Phase I

Phase I testing of the project area was conducted in May 2016 (Gade et al. 2016). Ninety-eight shovel tests in the floodplain expansion and sedimentation basin area were located within the boundaries of the artifact concentration designated as Gorge Creek Site 1. Based on the Phase I data, the extent of the Gorge Creek Site 1 was estimated at approximately 6.1 acres. Fifty-eight of the 98 tests contained prehistoric artifacts. In total, 183 artifacts were recovered from the shovel tests. A feature (Feature 1) was identified in Transect 11, Shovel Test 1.

Most of the artifacts (n=136; 74 percent) were found in the plowzone (Ap horizon); 28 artifacts (15 percent) were found in B horizon soils, and 19 artifacts (10 percent) were found in Feature 1. The shovel tests revealed an Ap-B soil sequence within the site and across the entire area of the proposed floodplain expansion and sedimentation basin. The plowzone consisted of dark brown (10YR 3/3) gravelly silt loam that extended to a maximum depth of 40 centimeters below ground surface (bgs). The underlying B horizon soils were dark yellowish brown (10YR 4/4–4/6) gravelly silt loam or silt loam. In several shovel tests a B/C horizon, consisting of dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand, was encountered below the B horizon soil.

The artifact assemblage recovered by Phase I testing consisted of four bifaces, one endscraper, four retouched flakes, 21 utilized flakes, 10 cores (845.3 grams), 129 flakes, two cobble tools (199.0 grams), and 12 pieces of fire-cracked rock (FCR) (489.6 grams). The assemblage did not include any culturally/temporally diagnostic artifacts.

Feature 1 was identified in Transect 11, Shovel Test 1. Charcoal flecking was encountered at depths of 40 and 60 centimeters bgs within soils similar to the plowzone. Feature 1 contained 19 artifacts: one retouched flake, three utilized flakes, 13 flakes, one core (113.7 grams), and one piece of FCR (20.1 grams). The feature's size, type, and function could not be determined from the limited exposure. The overlying plowzone in this shovel test yielded 11 artifacts, the greatest number found in the plowzone of any of the shovel tests at the site.

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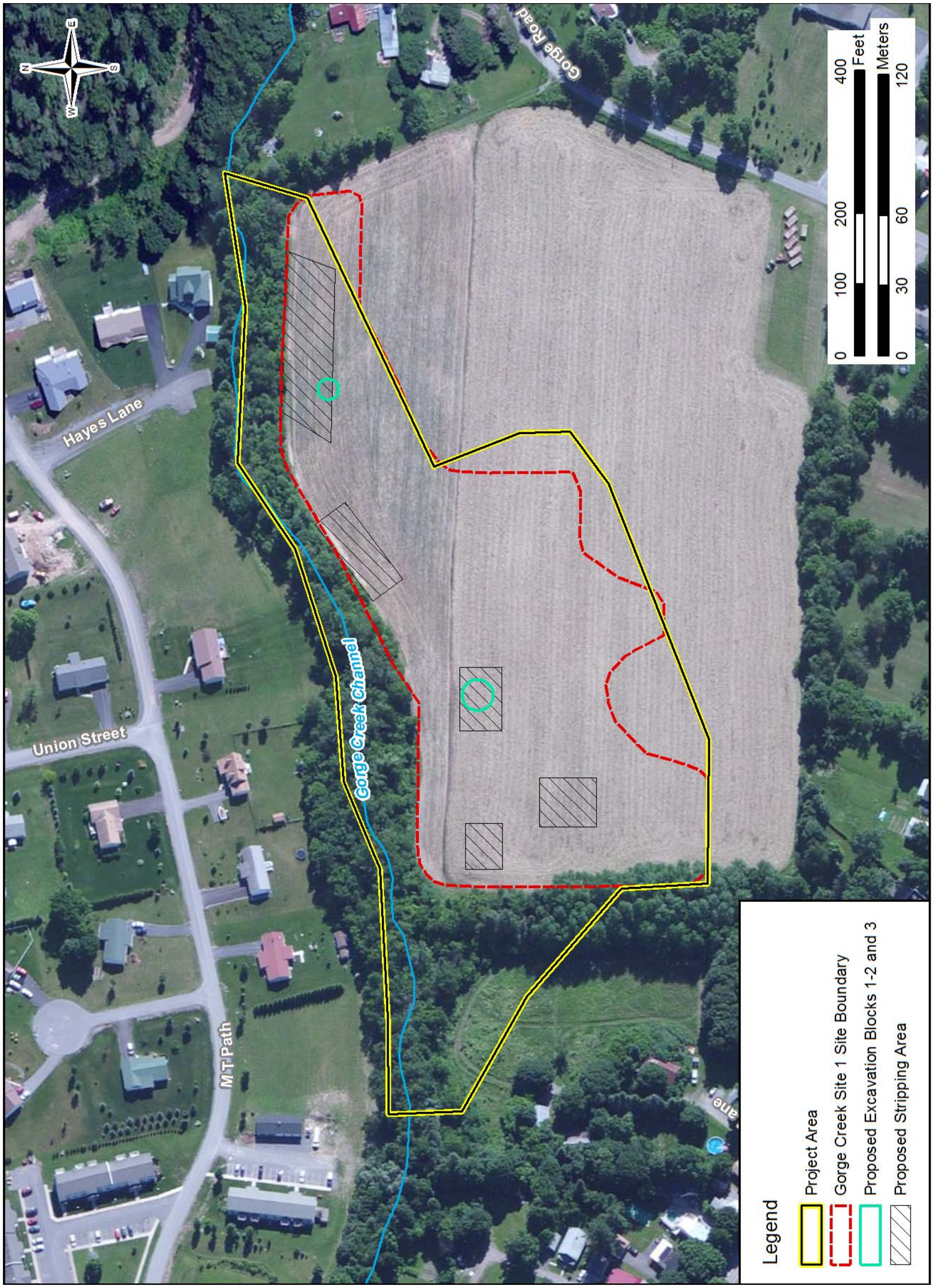

FIGURE 1: Site Map with Provisional Work Locations (ESRI World Imagery 2015)

2. Phase II

The Phase II field investigation was conducted from August 23 to September 9, 2016 (Gade and Schreyer 2016). It entailed excavation of 102 shovel tests and 16 1x1-meter test units. The shovel tests were spaced 10 meters apart and were arrayed along transects that were located parallel to or on selected Phase I transects. This procedure created transects spaced 7.5 meters apart across the site area. The subsequent placement of units was based on shovel test results and the character of the landform.

Consistent with the Phase I shovel tests, Phase II excavations documented an Ap-B soil sequence across much of the site. The plowzone (Ap) consisted of dark brown (10YR 3/3) gravelly silt loam and typically extended between 20 and 30 centimeters bgs. B horizon soils were dark yellowish brown to yellowish brown (10YR 4/6–5/6) gravelly silt loam or silt loam. In several shovel tests a B/C horizon was encountered below the B horizon soil; it was a dark yellowish brown (10YR 3/4) gravelly sandy loam/loose sand with dense cobbles. In low-lying terrain in the western section of the site, an unplowed remnant of the A horizon was encountered in several shovel tests along Transects 22 and 23, and also in Units 2, 3, 4, and 7. These excavations were located along the lower elevations of the terrace, within a noticeable swale. In these tests the unplowed A horizon soil lay directly below the plowzone; it was a dark yellowish brown (10YR 4/4–4/6) gravelly silt loam ranging in thickness from 10 to 18 centimeters.

Phase II excavations yielded a total of 1,264 artifacts: nine bifaces, two scrapers, two other chipped stone implements, 101 flake tools, 18 cores, 1112 flakes, five cobble tools, and 15 pieces of FCR. Of the total, 394 artifacts were recovered from 70 positive shovel tests. The great majority of these (n=327) came from the plowzone, 56 artifacts were found in the B horizon, and 11 came from the unplowed A horizon soil. A total of 870 artifacts were recovered from the 16 test units.

Artifacts were found in all units, but the totals varied widely, ranging from 237 artifacts in Unit 2 to two artifacts in Unit 15. After Unit 2, Units 11 and 4 had the next highest artifact totals with 158 and 123, respectively. The remaining units all contained fewer than 100 artifacts; Units 6, 15, and 16 each yielded fewer than 10 artifacts. Sub-plowzone artifacts were found in all but three units (Units 9, 15, and 16). Units 2, 3, 4, and 7 were placed in the portion of the site where shovel tests had encountered unplowed A horizon soils under the plowzone. Combined, these four units yielded a total of 409 artifacts, accounting for almost half (47 percent) of all artifacts found in the 16 1x1-meter units. A total of 163 artifacts were recovered from the unplowed A soils in these four units (mostly from Units 2 and 4), and 14 artifacts were found in their upper B horizon.

A few of the Phase I and II shovel tests are exceptional for their density of lithic artifacts: Shovel Tests 32:5 (n=29), 20:5 (n=38), 22:2 (n=27), and 11:1 (n=27). These unusual concentrations triggered the placement of Phase II units in the vicinities of these productive shovel tests. Those units confirmed that patchy artifact concentrations generally existed near the most artifact-rich shovel tests. Units 2 (n=237) and 4 (n=123) were placed west of Shovel Test 22:2 and 11:1. Unit 1 (n=63) was located east of Shovel Test 22:2 and west of Shovel Test 22:1 (n=16). Unit 11 (n=158) was placed just west of Shovel Test Tr. 32:5. The concentrated patches seemed to be small and isolated. No unit was placed immediately adjacent to Shovel Test 20:5. Unit 16, located about 15 meters southwest of this most productive shovel test, yielded only four artifacts; Unit 13, about 20 meters southeast of Shovel Test 20:5, produced only 17 artifacts. The shovel tests with more than about 12 artifacts appeared to represent a sharp jump in artifact density. Phase II units placed near shovel tests with 11 or fewer artifacts generally produced relatively few artifacts: Unit 13, Unit 9 (n=22), Unit 10 (n=19), Unit 12 (n=26). Some units located near shovel tests with three or fewer artifacts predictably yielded very few artifacts, such as Unit 6 (n=6) and Unit 15 (n=2); however, Units 5 (n=27) and 14 (n=33), although not very productive, contained more artifacts than would be expected from the very low yields of the nearest shovel tests.

The only feature identified during Phase II was Feature 2. This pit feature was first identified in a Phase II shovel test (Shovel Test 22:2) and was further exposed by excavation of Unit 1. The feature became evident at the base of the plowzone, at a depth of 30 centimeters bgs, as a soil stain of reddened (thermally altered) earth with charcoal. It extended into the north and east walls of the unit. Roughly rectangular in shape, Feature 2 measured 70x55 centimeters. A concentration of burned earth measuring 55x23 centimeters was located along the unit's east wall. In profile the feature exhibited relatively straight walls and a flat bottom, and it extended 23 centimeters into the B horizon. The feature matrix consisted of mottled dark yellowish brown (10YR 4/6) and strong brown (7.5YR 4/6) silt loam. A total of seven artifacts were recovered from the feature: of five flakes and two pieces of FCR weighing 62.1 grams.

Apart from the artifacts found in Feature 2, 68 additional artifacts were recovered from Unit 1. This unit did not have an unplowed A horizon soil; the plowzone lay directly atop the B horizon. Sixty-two artifacts were recovered from the plowzone and six artifacts were found in the B horizon.

Unit 11 had the second highest number of artifacts at the site with a total of 158; a total of 131 artifacts came from the plowzone and 27 artifacts from the B horizon. This unit was located in the northeast part of the site near Gorge Creek and on a relatively higher elevation of the terrace. Unit 8, located about 30 meters upslope from and east of Unit 11, contained 72 artifacts: 65 from the plowzone and seven from the B horizon.

In shovel tests and units together, 943 artifacts, or 74.6 percent of the total assemblage, were recovered from the plowzone. One hundred seventy-five artifacts (13.8 percent) came from intact A horizon soils below the plowzone, and 139 artifacts (11.0 percent) were found in B horizon soils. The remaining seven artifacts came from Feature 2.

The basal portion of a stemmed point typed as a Lamoka was recovered from the plowzone of Unit 13. An untypable basal fragment of another, side-notched point came from the plowzone of Unit 11. The Lamoka-like point suggests a Late Archaic presence at the site. A pre-Woodland date (older than 3000 radiocarbon years before present [rcbp]) is also suggested by the apparent absence of pottery.

Gade and Schreyer examined artifacts found on the plowed surface of the site by Tom Anderson, a local collector. They recognized in his collection several Late Archaic Lamoka and Snook Kill points, as well as Orient Fishtail points. They also noted a basal fragment of what seemed to be a Turkey Tail point. Their photograph of the collection also seems to include two triangles, which could be Late Woodland or Middle or early Late Archaic in age. A side-notched point in the same photograph could be a Meadowood or Brewerton.

Anderson showed Gade and Schreyer a map he had drawn showing artifact locations and the relative distribution of Lamoka and Orient Fishtail points on the terrace. According to the map, he found Lamoka and stemmed points in an area southeast of and outside the project area. Anderson collected Oriental Fishtail points in the northeast portion of Gorge Creek Site 1 where the east portions of the Phase I Transect 1 and Phase II Transect 20 were located.

3. Phase I and II Interpretations and Conclusions

If one combines the Phase I (n=183) and Phase II (n=1,264) artifacts, the total assemblage from Gorge Creek Site 1 numbers 1,447 prehistoric artifacts. All of these are lithics; no pottery was recovered. The paucity of projectile points is clearly attributable to previous surface collection.

The variety of tool types recognized in the Phase I and II assemblages suggests that multiple and varied activities occurred at the site. Many expedient flake tools with flaking or wear on one or several edges were found across the site. Gade and Schreyer (2016) noted that only 15 pieces of FCR were found in the Phase II excavations. It is unlikely that collectors would have removed any FCR, so this rarity is probably representative of the actual low frequency of FCR on the site. Their near absence may indicate that few long-term hearths were created during occupations. This could imply that cooking was rarely undertaken, or that the site was mainly inhabited in the summer, when the warmth of fires was not needed. Despite the absence of preserved bone or macrobotanical remains, Gade and Schreyer suggest that the inhabitants procured and processed plant and animal resources. They interpret Gorge Creek Site 1 as a composite of short-term camps and seasonal occupations that occurred throughout the Late Archaic period. They also note the likelihood that the site extends beyond the APE boundary and that artifacts may be present elsewhere on the terrace outside the APE as well as on the other side of Gorge Creek.

Historic-era agriculture has severely affected the integrity of the prehistoric cultural deposits at Gorge Creek Site 1. The great majority of the artifacts were recovered from the plowzone (74 percent in Phase I, 74.6 percent in Phase II). However, artifacts were also recovered from the upper B horizon soils, usually within the first 10 centimeters (about 11 percent of the Phase II assemblage). Additional analysis (e.g., of the relative sizes of flakes in the A vs B horizons) would be necessary to determine if the artifacts in the lower zone are *in situ* or have been redeposited from the plowzone due to cryo- or bioturbation. In several shovel tests and Units 2, 3, 4, and 7, artifacts were found in a distinct stratum intervening between the plowzone and the B horizon. Gade and Schreyer designated this stratum as an unplowed A horizon that contained *in situ* archaeological deposits. They did not reconstruct the depositional processes that formed this horizon. Does it represent overbanking of the stream, or incorporation of organic detritus from the prehistoric campsites, or an old plowzone? Whatever its origin, on the basis of Phase II data, Gade and Schreyer

estimate that this unplowed A horizon extends over an area of about 760 square meters of the terrace. Thirteen percent (n=175) of all Phase II artifacts came from the unplowed A horizon in this part of the site.

Gade and Schreyer (2016:12) recommended Gorge Creek Site 1 as eligible for the NRHP under Criterion D (it has yielded, or may be likely to yield, information important in prehistory or history). They emphasized the presence of artifacts in the unplowed A horizon soils and in the upper B horizon soils, as well as the recognition of a pit feature. The latter raised the possibility that other features may be present. "Specifically, the site provides an opportunity to examine and expand our knowledge regarding settlement, subsistence and community patterning of Late Archaic period occupations along Gorge Creek, a small tributary in the Schoharie Creek valley" (Gade and Schreyer 2016:12).

C. Problem Orientation

Gade and Schreyer (2016:12) suggested that the following research topics could be addressed by additional recovery of cultural deposits from Gorge Creek Site 1.

- Subsistence Patterns
- Community Pattern
- Settlement System/Site Function
- Cultural History

1. Subsistence Patterns

Given the absence of any organic remains (apart from charcoal flecks) from previous investigations and the improbability that they will be recovered in substantial quantities from the proposed excavations, it is unlikely that data will be generated with which to address subsistence patterns directly. It is possible, nevertheless, that analysis of wear traces on utilized flakes, which are common on the site, could indicate whether predominantly plants or animal materials were being processed there.

2. Community Patterns

It will also be difficult to retrieve any information about "community pattern." It is not impossible that Archaic postmold patterns may be revealed. Woodland-age postmolds have been exposed at other sites along Schoharie Creek (Ritchie and Funk 1973; Rieth 2008, 2012; Rafferty et al. 2014). However, such traces of older Archaic dwellings are very infrequently encountered. Nothing found in previous investigations of Gorge Creek Site 1 suggests that postmolds will be present. Lacking clear evidence of the locations of residential households, little can be said about the community's spatial organization.

3. Settlement System/Site Function

The uniformity of the lithic materials used at the site (almost all locally available Onondaga chert, with just a few pieces of Esopus chert), indicates that any toolstones that may have been procured elsewhere during other seasonal phases of the settlement round were not transported here. Similarly, the apparent absence of exotic toolstones suggests that interactions with neighboring societies, or with more distant groups, were not manifested in the exchange of lithics. The uniformity of lithics at Gorge Creek Site 1 will also make it more difficult to tease out assemblages attributable to distinct Archaic sub-periods, because such culturally diagnostic exotic materials as jasper, rhyolite, Ramah chert, or Flint Ridge chert are not present. Curiously, the absence of exotic lithics here contrasts with the nearby Schoharie Creek II site, where, in addition to Eastern Onondaga chert, the Early Woodland component included debitage of chalcedony, Pennsylvania jasper, Kalkburg, and Normanskill chert (Rieth 2008, 2012). Perhaps such materials will turn up at Gorge Creek Site 1 when data recovery expands the sample size.

Nevertheless, some insights into regional settlement patterns may be gleaned from comparison of the Gorge Creek Site 1 assemblage with those recovered from other sites located along Schoharie Creek, e.g., Schoharie Creek II (Rieth 2012) and Pethick (Rafferty et al. 2014), both of which are located about 8 kilometers (5 miles) north of Gorge Creek Site 1. A cursory comparison reveals that the Gorge Creek Site 1 chipped stone assemblage from Phase II (n=1,244) has a much lower proportion of shatter and broken flakes (n=247, 19 percent) than Schoharie Creek II, where these

constitute about 64 percent of the lithics (22,772 out of a total of 35,837). At the Pethick Site an even greater percentage of the lithics is classified as shatter (177,889 of a total 188,406, or about 94 percent) (Rafferty et al. 2104:186). At Gorge Creek Site 1 a much higher proportion of flakes was utilized (n=101, 8 percent of all lithics) than at Schoharie Creek II, where only 383 flakes showed use-wear (a little more than 1 percent of the lithic assemblage). Only 723 utilized flakes (less than 0.5 percent of total lithics) have been recognized at the Pethick Site.

At Schoharie Creek II projectile points represented a remarkably small proportion of the total lithic assemblage; only nine points were found. Many more points have been recovered from the Pethick Site; the 180 points include 33 Levanna, 27 Meadowood, six Orient, five Adena, four Brewerton, two Madison, two Jack's Reef, one Perkiomen, one Susquehanna, and 99 unidentifiable points (Rafferty et al. 2014:186). Although only two points were found in the excavations at Gorge Creek Site 1, Anderson collected many more from the surface. It is noteworthy that one of the few typable points from Schoharie Creek II is an Orient Fishtail, another appears to be a Dry Brook Fishtail, and a third is a Meadowood. The Terminal Archaic fishtail types are well represented in Anderson's surface collection from Gorge Creek Site 1. Of course, the differing scales of the total assemblages may be affecting these comparisons. One of the rationales for additional excavation at Gorge Creek Site 1 is to obtain a larger artifact sample, which may clarify whether these ostensible inter-site differences are real or only a statistical artifact of small sample size.

It is possible that the ostensible high frequency of utilized flakes at Gorge Creek Site 1 may be a culturally diagnostic trait. Kraft (1970:9) reported his recovery of nearly three dozen utilized flakes from the Orient Fishtail component of the Miller Field Site in northern New Jersey. These were mainly of a specialized form with convex or concave edges. Kraft also reported utilized flakes from the slightly older Broadspear component of the site; such tools had not previously been recognized in Terminal Archaic assemblage. It will be necessary to closely examine utilized flakes from the Phase III excavations to determine if (1) the edge wear is really caused by prehistoric use or by plow damage or other post-depositional processes, and (2) if there is any morphological consistency that might indicate a cultural template similar to the specialized Orient forms from Miller Field.

4. Cultural History/Chronology

Gade and Schreyer's (2016:12) suggested research focus on "cultural history" of the Gorge Creek Site 1 can be rephrased as a focus on chronology. Basically, there are two ways to construct a chronology for the site. One is to assemble a substantial collection of projectile points. Based on their distinctive basal morphology and radiocarbon-dated associations at numerous sites, these artifacts can be assigned to temporal spans of ca. 500 to 1500 years. The relative numbers of points of each type may be used as an index of the frequency/intensity of site use during each period.

The only typable artifact recovered in previous investigations was the basal portion of a Lamoka-like point. However, the points collected in this vicinity by a local amateur include Lamoka-like points, Snook Kill, Dry Brook, Orient Fishtail, a possible Turkey Tail, and a few side-notched (Meadowood or Brewerton) points. This evidence suggests that the site was occupied intermittently between ca. 5500 and 2500 calibrated years before present (cal BP). A few triangles in Anderson's collection might indicate either a discrete Late Woodland presence or another Middle or early Late Archaic occupation. The preponderance of Orient and Dry Brook fishtail points in the collection suggests that the site was occupied most intensively around 1500 to 1200 cal BP.

A complementary or alternative strategy for establishing the site's chronology is to recover organic material from hearths or pit features, which can be sampled for dating by radiocarbon assays. This is the primary rationale for targeting most of the data recovery effort at the portion of the site where features are most likely to be encountered. Features also may also yield material such as charred nut shells and seeds and calcined bones that would be useful for reconstruction of subsistence and environment. Additionally, charred nuts and seeds are the preferred samples for radiocarbon dating because the "old wood effect" is minimized. A piece of wood may be burned in a hearth many years after the tree's death; radiocarbon dates the time of death (after which atmospheric carbon dioxide was no longer absorbed), not the time of burning. In contrast, nuts and seeds are likely to have been burned very soon after they were harvested.

In principle, the most frequent and intensive occupations of a site should leave behind both the greatest numbers of artifacts, including typologically diagnostic specimens, and also the greatest numbers of features and organic detritus suitable for radiocarbon dating. However, because of differences in site function over time, and the vagaries of

preservation and sampling, these kinds of evidence may not coincide precisely. An example of such incongruity can be seen at the Pethick Site. Of the 81 typable points, only two (2.5 per cent) (a Perkiomen and a Susquehanna Broad) can be attributed to the portion of the Terminal Archaic between ca. 4000 and 3600 cal BP. However, two (20 percent) of the 10 radiocarbon dates reported for the site fall within this period. On the other hand, 27 (33 percent) of the 81 identified points from Pethick are Meadowood, and similarly three (30 percent) of the 10 dates are appropriate for the Meadowood phase (2510±40, 2640±60, and 2670±110 rcbp). For comparison, it may be noted that Funk (1993:299–307) reported a fairly close correspondence of the relative frequencies of projectile point types and components of each period, both in the Upper Susquehanna Valley and the Hudson Valley. However, in both regions Late Archaic points (Sylvan Stemmed in the Hudson Valley, Vestal in the Upper Susquehanna Valley) were over-represented relative to the number of components of these phases.

The uniformity of raw material, the lack of stratigraphic separation, and the ubiquity of utilized flake tools across Gorge Creek Site 1 combine to create a probably erroneous impression of the unchanging function of Gorge Creek Site 1 through time. It should be emphasized, however, that Anderson's collection suggests at least three discrete occupation episodes, each separated by centuries from the next: Lamoka (ca. 5500 to 5000 cal BP); Snook Kill (ca. 4200 to 3800 cal BP) and Dry Brook-Orient (ca. 3500 to 2900 cal BP). Both earlier (Brewerton or Middle Archaic) and later (Meadowood and Late Woodland) occupations may also be present. It would be surprising if the site were used in exactly the same way in each of these episodes, particularly as a cultural discontinuity probably occurred between the Lamoka and Snook Kill horizons. On the other hand, if the resources available in this location did not change significantly in the course of millennia, the basic processing tasks that entailed the use of many expedient flake tools may have varied little from one occupation episode to the next.

It is doubtful whether the entire site would have been occupied during any single occupation episode. The possibility of isolating a Terminal Archaic camp is raised by Anderson's observation that Orient Fishtail points were concentrated in the northeast sector of the site.

The likely presence of an Orient Fishtail component at Gorge Creek Site 1 offers an opportunity to address a research issue that has been raised by recent work at the Pethick Site. Rafferty et al. (2014) suggest that this site, and others along Schoharie Creek, were located at the boundary between contemporaneous, distinct cultural zones: Orient Fishtail to the east and Meadowood to the west. They do not address the obvious question whether those zones, defined by sharply distinct projectile point styles, represent discrete ethnic, linguistic, or political entities. Nevertheless, "We argue that the Pethick site was occupied by populations exhibiting Early Woodland and Transitional tool kits not sequentially, but consecutively (i.e., two populations alternatively occupying the site over time) and perhaps simultaneously" (Rafferty et al. 2014:184).

Orient Fishtail, clearly derived from the preceding aceramic Terminal Archaic or Transitional Savannah River/Snook Kill/Susquehanna/Perkiomen tradition, is generally regarded as the final expression of this tradition. The temporal division between Terminal Archaic (without pottery) and Early Woodland (with pottery) has generally been set at 3000 rcbp (3200 cal BP). Most Orient-associated radiocarbon dates fall on the early side of the boundary, beginning about 3200 rcbp (3400 cal BP). However, a few dates are as late as ca. 2800 rcbp (2900 cal BP) (albeit with large standard errors). Orient points are associated with carved soapstone vessels, but also, rarely, with soapstone-tempered clay pots. Meadowood points are often associated with Vinette I pottery and therefore are assigned unambiguously to the Early Woodland. Radiocarbon dates for Meadowood generally fall between ca. 2900 and 2400 rcbp (3000 and 2500 cal BP); an anomalously early outlier from the Fortin Site on the Upper Susquehanna is 3180±95 (ca. 3300 to 3500 cal BP). Meadowood points seem to have developed from the small, notched points (e.g., Hind) that are found in southern Ontario and the northern Midwest between ca. 3500 and 2800 rcbp.

No credible Orient-associated dates are later than ca. 2750 rcbp (2850 cal BP or 880 cal BC). The end of the Terminal Archaic tradition thus appears temporally and perhaps causally associated with an abrupt climate event. Numerous environmental records in Europe indicate a climatic downturn around 800 to 750 cal BC, which coincides with a radiocarbon "cliff" indicating weakened solar activity. Atmospheric ^{14}C increases and dates drop abruptly from 2750 to 2450 rcbp (Fiedel 2001; Martin-Puertas et al. 2012; Van Geel and Mauquoy 2010). The "cliff" is followed by a plateau; between 2750 and 2400 cal BP, radiocarbon dates are indistinguishable, always ca. 2450 rcbp. Martin-Puertas et al. (2012) have recently shown that a simultaneous sharp increase in windiness and increase in cosmogenic beryllium (^{10}Be) occurred at ca. 2760 cal BP in central Europe; they infer that "changes in atmospheric circulation amplified the solar signal and caused abrupt climate change about 2800 years ago, coincident with a grand solar

minimum." This climate change is coincident with Bond event 2 in the North Atlantic, and a probably associated climate episode shows up very strongly in the strontium/calcium ratios from Buckeye Creek Cave in West Virginia (Springer et al. 2008: figure 1). Shuman et al. (2009) infer numerous prehistoric episodes of regional drought from the occurrence of sand layers attributed to lowered water levels in New Long Pond, Massachusetts. Among these is a drought dated to ca. 2980 to 2760 cal BP. Newby et al. (2011) report a similar drought record from Davis Pond in southwestern Massachusetts. Low water levels are inferred for most of the period from 3500 to 2300 cal BP. At Cayuga Lake in central New York, Mullins et al. (2011) infer an abrupt cold, dry episode starting around 3000 cal BP and persisting to 2400 cal BP; they hypothesize that it may have been caused by reduced solar activity. Pollen sampled from Ballston Lake, located between Saratoga and Schenectady, shows an increase of conifers, hardwoods, and boreal taxa at about 2680 cal BP (2520 rcbp); this is interpreted as marking a shift to a colder climate (Toney et al. 2003).

Recovery of datable charcoal from features in the central and northeast sectors of Gorge Creek Site 1 may provide samples for several AMS (accelerator mass spectroscopy) radiocarbon assays. Many of the extant radiocarbon dates that underpin regional chronology predate introduction of the AMS technology in the late 1980s. AMS dates are much more precise and often more accurate than the older assays. An example of the improved chronological resolution provided by AMS is the recent re-dating of the Terminal Archaic and Late Woodland components at the Little Wood Creek Site in Fort Edward (Grossman et al. 2015).

5. Lithic Technology

Almost all of the cultural material recovered in previous investigations of Gorge Creek Site 1 is chipped stone. The assemblage includes bifaces, scrapers, chipped stone tools, expedient flake tools, cores, debitage, utilized cobbles, and thermally altered rocks. We anticipate that additional material excavated in the data recovery will augment this assemblage. Proportionally, very few projectile points were found in the Phase I and II testing; however, an avocational surface collection contained many projectile points; it is possible that excavation and stripping below the plowzone may produce more temporally diagnostic points.

Previous investigations indicated the existence of several discrete clusters of high-density debitage across the site. Wider exposure of these areas by manual excavation and mechanized stripping may clarify their character. Are they simply patches where historic-era plowing was less intense, so that artifacts were less dispersed than elsewhere? Alternatively, do they represent the remnants of discrete lithic reduction/processing areas? In that case do the separate clusters represent distinctive lithic reduction strategies? If so, can these strategies be tied to particular cultural phases? This would be facilitated by radiocarbon and/or typological dating of closely associated features.

D. Proposed Fieldwork

1. Excavations

Louis Berger's proposed Phase III data recovery procedures will address the research issues discussed in Section C by means of two complementary strategies: (1) manual excavations in the locations where previous research indicated the highest densities of artifacts and features, and (2) mechanical stripping of areas with lower artifact densities to identify features at the plowzone/B horizon interface.

The placement of individual test unit excavations will address two specific archaeological objectives. First, the excavations will be located to recover sufficient quantities of cultural material to address research issues. Second, areas will be exposed to identify additional features and discrete or clustered activity areas, for example, those focused around prehistoric hearths or storage pits. If features are exposed, flotation samples will be taken for attempted recovery of the faunal and floral remains needed for radiocarbon dating and inference of prehistoric subsistence practices and seasonality.

The proposed units will be 3x3-meter block excavations; individual test units will be excavated within these larger blocks as 1x1-meter units. Individual 1x1-meter units may also be employed to test and sample selected areas prior to mechanical stripping. The use of large 3x3-meter blocks consisting of contiguous test units will facilitate recognition of activity areas manifest as lithic artifact concentrations, FCR clusters, and pit and postmold patterns.

a. Manual Excavations

Louis Berger proposes to manually excavate a maximum of 36 square meters (387 square feet). The placement of excavation blocks and units will be determined primarily by the quantities of artifacts reported from Phase I and Phase II shovel tests and units; however, the disposition of units may be altered in the field in response to contingent circumstances (e.g., discovery in the initial units of large, dense artifact or feature concentrations). As of now, Louis Berger proposes to place two block excavations in the vicinity of Phase II Units 2 and 4 and the recorded buried A horizon, and one block near Phase II Shovel Test 20:5 (see Figure 1). One block will be held in reserve to deploy to one of these areas or elsewhere, as the initial results may dictate.

In manual excavation, all soil horizons will be removed using shovels and trowels. The excavation of block units will begin with removal of the approximately 20 to 30 centimeters of plowzone; the buried A horizon and B horizon will then be excavated by 10-centimeter intervals within natural/cultural horizons. All soils will be screened through 0.25-inch hardware cloth. The locations of diagnostics identified *in situ* will be recorded with three-dimensional coordinates. Any features encountered will be numbered, photographed, and mapped; they will then be bisected and profiled. A sample for flotation from each feature will be taken, consisting of up to approximately half of the feature. This general sample size may be adjusted in cases where the features are larger. Charcoal or other carbonized materials present in feature fill will be sampled for radiocarbon assay.

Field observations and excavation data will be recorded on standardized forms developed by Louis Berger. Excavated soils will be recorded and described in terms of both texture and color, using USDA soil classifications and Munsell charts. Digital photographs of the site area and excavations will be taken as appropriate. All excavations will be backfilled upon completion and all safety regulations will be strictly followed during the investigations.

b. Mechanical Excavations

Following manual excavations, a straight-bladed backhoe will be used to mechanically strip off the approximately 30-centimeter plowzone from selected portions of the site in an effort to identify features at the plowzone-subsoil interface. Louis Berger proposes to mechanically strip 3,700 square meters (40,000 square feet) of the site, comprising approximately 16 percent of the total site area (see Figure 1).

Louis Berger archaeologists will monitor the mechanical stripping operations at all times, examining the stripped surface for soil anomalies and guiding the depth of excavations. Once the interface potentially containing cultural deposits and features has been exposed by the machine, Louis Berger archaeologists will hand-skim the remnant overburden and examine the surface for prehistoric cultural features, rock and artifact clusters, and soil anomalies. All soil stains identified during this process will be pin-flagged for further review to determine their cultural vs. natural status. A number designation will be assigned to each potential cultural feature, including soil anomalies and rock clusters. All numbered potential features will be mapped using sub-foot GPS or total station. Wherever multiple features are identified, digital photographs will be taken of the feature clusters.

2. Health and Safety

Health and safety will be addressed in a site-specific health and safety plan (HASP). The Occupational Safety and Health Administration (OSHA) mandates preparation of this plan. The HASP identifies and evaluates health and safety hazards that may exist in a project area and provides procedures and equipment to be employed to minimize workers' exposure to the potential hazards.

E. Data Processing and Analysis

At the conclusion of the field investigations, all recovered materials will be transported to Louis Berger's laboratory where artifact analysis and flotation processing tasks will proceed. Louis Berger's budget for this task assumes that a maximum of 1,000 artifacts will be recovered.

Specific laboratory tasks for preliminary treatment of cultural materials will include the following.

All recovered materials, including floral and faunal remains, will be cleaned and conserved to ensure their stability. Prehistoric bifaces, flake tools, utilized flakes, and other artifacts that may be examined for edge wear traces will be minimally processed pending appropriate analysis.

All materials will be fully provenienced and labeled. The artifacts will be prepared for permanent curation and transferred to the St. Regis Mohawk Tribe at the conclusion of the project.

To the extent possible, all recovered lithic artifacts will be identified as to cultural and temporal affiliation, raw material type, and formal and functional categories.

As discussed above, the research orientation of the proposed investigation focuses on the site's chronology, cultural affiliations, and definition of its function(s) in the regional settlement systems of several periods. Laboratory classification and analyses of artifacts will thus be oriented toward these research issues. The following section outlines these laboratory procedures.

As a first step in analysis of the lithic artifacts, they will be sorted into tool and debitage classes. Following this, they will be sorted and analyzed with respect to functional morphology, technological stages, metrical, and other attributes (e.g. color, texture and inferred source of the stone).

Projectile points will be assigned to recognized regional types. This classification is crucial for establishing the chronology of the site as a whole, and possibly for distinguishing sectors occupied by distinct social groups, whether sequentially or simultaneously. Breakage patterns, edge and tip wear, and re-working will be noted. Other formed tools may be classified as end- or sidescrapers, knives, drills, or other functional classes based on a combination of morphology and any observed use-wear or breakage.

A major goal of the analyses of debitage, cores, and incomplete bifaces will be to determine the intensity, stages, and distinctive strategies of lithic reduction activities at the site. For the bifaces, presence/absence of cortical surfaces and width-to-thickness ratios will indicate stage of reduction. Size, shape, extent of cortex, and flaking patterns will be recorded for cores.

Lithic debitage, including all types of flakes created in the lithic reduction sequence, will be counted and measured. Raw material type, lithic reduction stage (blocky shatter, decortication, early reduction, biface reduction, thinning) and presence/absence of cortex will also be recorded. Whole and broken flakes (lacking the original striking platform or termination) will be distinguished.

Based on reported Phase I and II data, the Gorge Creek Site 1 lithic assemblage appears to contain an unusually high percentage of utilized flakes. To confirm or refute this finding, which has important implications for the site's function and role in the regional settlement system, it will be necessary to devote special attention to this artifact class. All debitage will be visually inspected for patterned edge damage and/or retouching. A sample of those artifacts with ostensible edge alteration will be examined using low-power microscopy to identify micro-flake scars, snap fractures, step fractures, and edge rounding.

No ceramic sherds were recovered in Phase I and II investigations. Nevertheless, given the presence of a likely Meadowood point and a few triangles in Anderson's surface collection, Woodland occupations appear to be present, so potsherds might be encountered. If ceramic sherds are recovered, they will be sorted into rim, neck, and body categories and will be refitted to the extent possible. The resulting vessel lots will be characterized in terms of temper, paste, and decorative treatment. If recovered ceramics are of sufficient size, measurements of sherd thickness and curvature may be used to infer vessel shape and size.

If prehistoric FCR features are exposed, the FCR will be counted and weighed in the field. Samples from features will be prepared for flotation. Carbonized pieces of wood and nutshell, whether collected during feature excavation or recovered later by flotation, will be examined by a paleobotany specialist to determine their taxa. Selected credible samples (from known prehistoric taxa such as oak, butternut, and hickory) from secure contexts will be submitted to a laboratory (e.g., Direct-AMS, Beta-Analytic) for radiocarbon assay.

Following analyses of the artifacts, a spatial analysis of the distributions of archaeological classes and features will be performed. This analysis will focus on horizontal variation in the presence/absence and densities of lithic tool types and debitage relative to FCR concentrations and other features identified on the site. Of particular interest will be any differences observed between the northeast sector of the site, putatively dominated by Orient phase materials, and the central sector, of unknown cultural/temporal affiliation.

F. Coordination/Human Remains Policy

Louis Berger will advise GOSR of any problems or significant developments during the data recovery, and will assist GOSR as needed with any notifications required at the onset of fieldwork. In addition, GOSR will be notified immediately if any human remains are encountered during performance of this work. If human remains are encountered, they will be treated at all times with appropriate respect and according to all prescribed procedures. In accordance with the *Human Remains Discovery Protocol* (New York State OPRHP 2008), the discovery of human remains will result in a cessation of work in the vicinity of the remains, and no skeletal or artifactual material will be removed or disturbed. Louis Berger will inform the appropriate local civil or law enforcement authority, OPRHP, the St. Regis Mohawk Tribe, and other involved parties of the finding. The local civil or law enforcement authority shall make an official determination of the nature of the remains. If the remains are identified as a Native American burial, GOSR will consult with OPRHP, the St. Regis Mohawk Tribe, and other appropriate parties regarding the course of treatment of the remains. Efforts will be made to avoid disturbance of any additional burials. Any investigation of skeletal remains will be conducted according to the NPS *Guidelines for the Disposition of Archeological and Historical Human Remains*. Any work or services provided by Louis Berger in association with the investigation of human remains will be coordinated and negotiated with GOSR.

G. Schedule and Reporting

Louis Berger understands that scheduling of the work is a primary concern and is prepared to mobilize a field crew to the project area upon approval of the DRP. Louis Berger has sufficient staff available to complete the work in a timely fashion and is prepared to commit staff resources so that the fieldwork, laboratory processing, and end-of-field letter can be completed within a proposed project schedule. It is anticipated that the fieldwork will begin on or around March 15, 2017, and will be completed in a period of approximately three weeks, weather permitting. Within 15 days of clearing the field, an end-of-field letter will be submitted to OPRHP for review and concurrence that the proposed data recovery fieldwork has been completed. The end-of-field letter is intended to facilitate OPRHP review to comply with the proposed construction scheduling. Following submission of the end-of-field letter and after data analyses are complete, a technical report will be prepared. The technical report will be submitted within one year of the submission of the end-of-field letter. The technical report will consist of the results of fieldwork and analyses of data and will include but not be limited to the following: abstract, introduction, description of the project, environmental setting, chronological and cultural context (including a review of regional archaeological data pertinent to the site), field expectations, field methodology, results of fieldwork, analytical methods, results of analyses, and bibliography. The report will include all appropriate maps, figures, and plates. An inventory of all observed and collected artifacts will be included as an appendix. The report will be submitted in PDF format (one draft and one final).

H. Additional Tasks *(Scheduling/Cost TBD)*

Louis Berger anticipates that, after analyses and report submission, the artifact assemblage recovered from the site will be transferred to the St. Regis Mohawk Tribe for permanent curation. All the artifacts will be prepared for long-term curation. In addition, all other collections resulting from the data recovery, including ecofacts, analytical samples, field notes, laboratory forms, and photographic documentation, will be packed in archival containers in preparation for curation.

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ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

March 07, 2017

Ms. Alicia Shultz
HCR
38 State Street
Albany, NY 12207

Re: GOSR
Gorge Creek Culvert Improvements
Middleburgh, Schoharie County, NY
15PR06219

Dear Ms. Shultz:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the submitted materials in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. 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 State Environmental Conservation Law Article 8).

We have reviewed the document entitled “Data recovery Plan, Gorge Creek Site 1 (09542.000116), Village of Middleburgh, Town of Middleburgh, Schoharie County, New York” (March 6, 2017). SHPO concurs with the proposed scope of work for the data recovery. SHPO recommends two changes to the document.

First, in Section E (Data Processing and Analysis), the document states that, “The artifacts will be prepared for permanent curation and transferred to the St. Regis Mohawk” (Page 10, Paragraph 2). This is reiterated in Section H (Additional Tasks). SHPO recommends that this be changed to state that the materials will be turned over to a curation facility that meets the New York Archaeological Council’s “Standards for Cultural Resource Investigation and the Curation of Archaeological Collections in New York State” (1994).

Second, in Section F (Coordination/Human Remains Policy), the document references the 2008 SHPO “Human Remains Discovery Protocol.” The protocol was updated in 2015 (see attached). SHPO recommends that the document reference the 2015 version of the protocol, and the protocol should be attached to the document.

If further correspondence is required regarding this project, please refer to the SHPO Project Review (PR) number noted above. If you have any questions I can be reached at 518-268-2186.

Sincerely,

Tim Lloyd, Ph.D., RPA
Scientist - Archaeology
timothy.lloyd@parks.ny.gov via e-mail only

Enc. (1)

Cc: Andrew Dangler (USACE)
Mary Barthelme (GOSR)
Ed Fahrenkopt (Delaware Engineering)
Genevieve Kaiser (Tetra Tech)

State Historic Preservation Office/
New York State Office of Parks, Recreation and Historic Preservation
Human Remains Discovery Protocol
(June 2015)

In the event that human remains are encountered during construction or archaeological investigations, the New York State Historic Preservation Office (SHPO) recommends that the following protocol is implemented:

- At all times human remains must be treated with the utmost dignity and respect. Should human remains or suspected human remains be encountered, work in the general area of the discovery will stop immediately and the location will be immediately secured and protected from damage and disturbance.

- Human remains or associated artifacts will be left in place and not disturbed. No skeletal remains or materials associated with the remains will be collected or removed until appropriate consultation has taken place and a plan of action has been developed.

- The SHPO, the appropriate Indian Nations, the involved state and federal agencies, the coroner, and local law enforcement will be notified immediately. Requirements of the corner and local law enforcement will be met. A qualified forensic anthropologist, bioarchaeologist or physical anthropologist will assess the remains *in situ* to help determine if the remains are Native American or non-Native American.

- If human remains are determined to be Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO and the Indian Nations. The involved agency will consult SHPO and appropriate Indian Nations to develop a plan of action that is consistent with the Native American Graves Protection and Repatriation Act (NAGPRA) guidance. Photographs of Native American human remains and associated funerary objects should not be taken without consulting with the involved Indian Nations.

- If human remains are determined to be non-Native American, the remains will be left in place and protected from further disturbance until a plan for their avoidance or removal can be generated. Please note that avoidance is the preferred choice of the SHPO. Consultation with the SHPO and other appropriate parties will be required to determine a plan of action.

<u>Affidavit of Mailing</u>

STATE OF NEW YORK)
: SS. :
COUNTY OF ALBANY)

MARY BARTHELME, being duly sworn, deposes and says:

1. I am over the age of eighteen years.
2. On November 14, 2016, I mailed true and correct copies of the annexed Gorge Creek Update to St. Regis about Phase II Archeology dated November 14, 2016 by placing the same in first class post-paid envelopes addressed: SEE ATTACHED LIST.
3. On said day, I deposited said envelopes in a mailbox at 99 Washington Avenue, Albany, New York 12210.

Mary Barthelme

Sworn to before me this
14th day of November 2016

Casey R. Dwyer
Notary Public

Casey R. Dwyer
Notary Public, State of New York
Qualified in Rensselaer County
No. 01DW6346468
Commission Expires August 15, 2020

November 14, 2016

Ron LaFrance, Jr; Paul Thompson; and Beverly Cook, Chiefs
St. Regis Mohawk Tribe
412 State Route 37
Akwesasne, NY 13655

Re: Phase II Archeological Site Evaluation for the Gorge Creek Culvert Repair and Storm Water Improvements, Village of Middleburgh, Schoharie County, New York

Dear Chiefs of the St. Regis Mohawk Tribe:

Please find enclosed the Phase II Archeological Evaluation for the Gorge Creek Culvert Repair and Storm Water Improvements Project. The report has been submitted to SHPO and no comments have been received to date. If the Area of Potential Effect encompasses historic properties of religious or cultural significance to your Tribe, please respond within 30 days or sooner. If you have any questions or require additional information regarding this request, please feel free to contact me at (646) 417-4660 or via email at Thomas.King@stormrecovery.ny.gov.

Thank you for your time and consideration.

Sincerely,

Thomas J. King
Assistant General Counsel and Certifying Officer
Governor's Office of Storm Recovery

Enclosure:
Phase II Archaeological Evaluation Gorge Creek Culvert Repair and Storm Water Improvements

Electronic letter sent to:
Arnold Printup
Saint Regis Mohawk Tribe, THPO
412 State Route 37
Akwesasne, NY 13655

Kaiser, Genevieve

From: King, Thomas J (STORMRECOVERY)
Sent: Tuesday, April 12, 2016 12:44 PM
To: Shultz, Alicia (NYSHCR)
Subject: FW: CDBG-DR, NYCR Gorge Creek Culvert Repair and Stormwater and Drainage Improvement Project, Village and Town of Middleburgh, Schoharie County NY

From: Arnold Printup [mailto:arnold.printup@srmt-nsn.gov]
Sent: Tuesday, April 12, 2016 2:31 PM
To: King, Thomas J (STORMRECOVERY) <Thomas.King@stormrecovery.ny.gov>
Subject: CDBG-DR, NYCR Gorge Creek Culvert Repair and Stormwater and Drainage Improvement Project, Village and Town of Middleburgh, Schoharie County NY

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She:kon Thomas,

The Saint Regis Mohawk Tribe would like to participate in the project referenced in the subject of this email. The project is an area considered culturally sensitive to the tribe. We will provide further comments upon the receipt of the Phase I survey. Please let me know if anything further is required of this office.

Nia:wen,

Arnold L Printup
Saint Regis Mohawk Tribe
Tribal Historic Preservation
1(518)358-2272 Ext. 2163

Barthelme, Mary (STORMRECOVERY)

From: Bonney Hartley <Bonney.Hartley@mohican-nsn.gov>
Sent: Monday, April 25, 2016 9:58 AM
To: Barthelme, Mary (STORMRECOVERY)
Subject: RE: Section 106 Discussion for Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvement Project, Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Follow Up Flag: Follow up
Flag Status: Completed

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Dear Mary:

The Gorge Creek Culvert Repair project in Middleburgh, Schoharie County NY is out of Stockbridge Munsee Mohican Tribe's cultural area of interest, therefore we do not have comment on the project.

Thank you,
Bonney

Bonney Hartley
Tribal Historic Preservation Officer
Stockbridge-Munsee Mohican Tribal Historic Preservation
New York Office
65 1st Street
Troy, NY 12180

(518) 244-3164
Bonney.Hartley@mohican-nsn.gov
www.mohican-nsn.gov
Physical Address: 37 1st Street

From: Barthelme, Mary (STORMRECOVERY) [mailto:Mary.Barthelme@stormrecovery.ny.gov]
Sent: Friday, April 22, 2016 2:20 PM
To: Bonney Hartley
Subject: Section 106 Discussion for Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvement Project, Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Dear Bonney,

Please see the attached consultation for the above-mentioned project.

A hard copy is being sent today by mail. Please let me know if you have any questions.

Thank you,

Mary Barthelme

Mary Barthelme
Environmental and Historic Preservation Specialist
Bureau of Environmental Review and Assessment
Governor's Office of Storm Recovery
99 Washington Avenue Suite 1224
Albany, New York 12260
Office: (518) 473-0154
Cell: (646) 706-6748
Mary.Barthelme@stormrecovery.ny.gov

April 22, 2016

Shannon Holsey, President
Stockbridge-Munsee Community, Band of the Mohicans
N8476 Moh He Con Nuck Road
Bowler, WI 54416

Re: Section 106 Discussion for CDBG-DR, NYRCR Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvement Project, Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Dear Shannon Holsey:

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) is acting under the auspices 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"). GOSR is 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 Community to respond with any concerns or comments.

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Mr. Thomas King
Certifying Environmental Officer
Governor's Office of Storm Recovery
99 Washington Avenue
Suite 1224
Albany, New York 12260

I am available to answer any questions that you may have regarding this action. If you have any questions, please feel free to contact me at (518) 473-0015 or via email at Thomas.King@stormrecovery.ny.gov.

Sincerely,

Thomas J. King, Esq.
Assistant General Counsel and Certifying Officer
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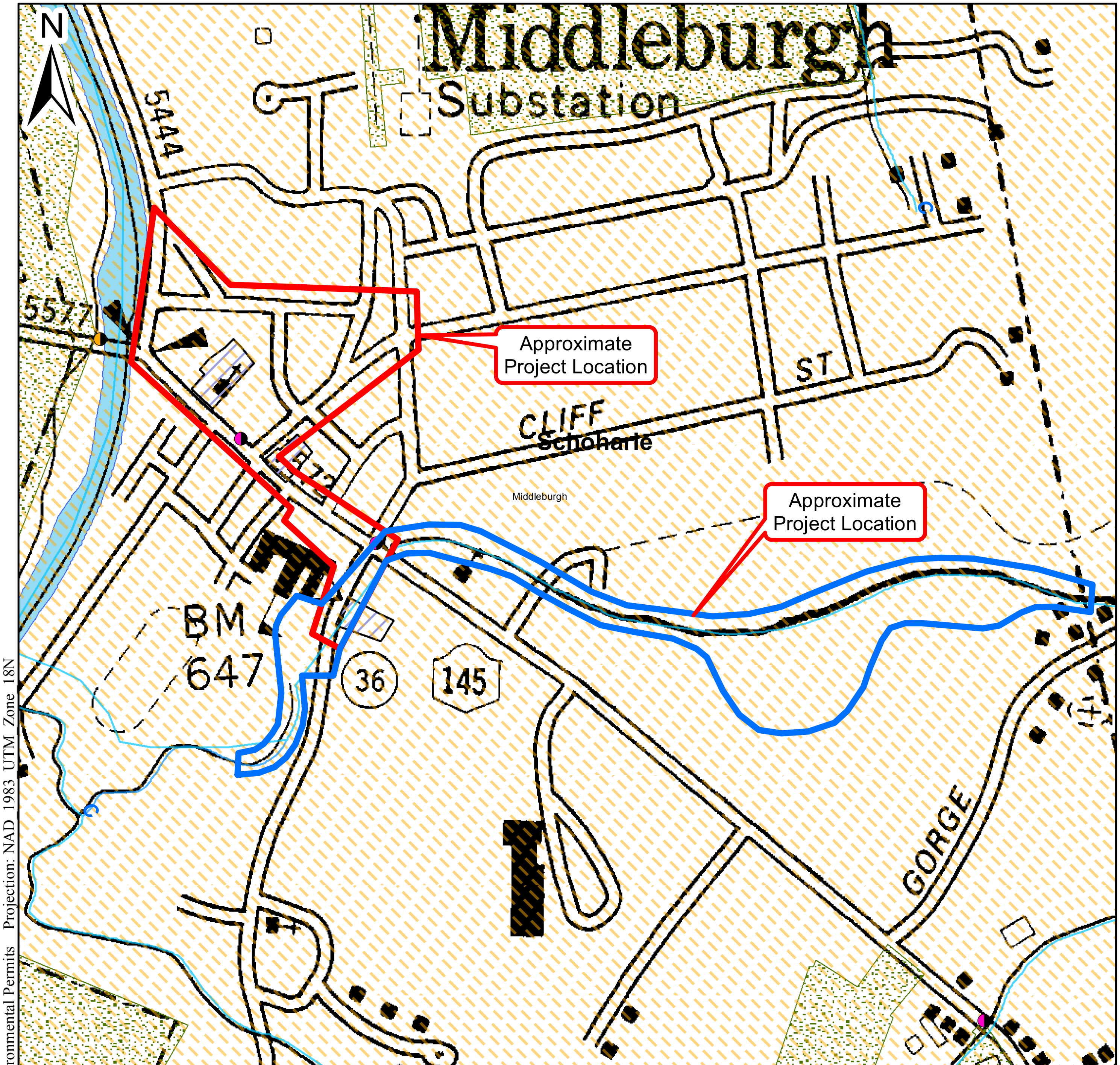
Enclosures:
Project Area Map
SHPO Finding for Archeology

Electronic letter sent to:
Bonney Hartley
THPO, New York Office
Stockbridge-Munsee Community, Band of the Mohicans
65 1st Street
Troy, NY 12180



NYS RESOURCES MAP

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February 4, 2016

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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

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Division of Environmental Permits Projection: NAD 1983 UTM Zone 18N

ARCHAEOLOGY COMMENTS

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Affidavit of Mailing

STATE OF NEW YORK)
: SS. :
COUNTY OF ALBANY)

MARY BARTHELME, being duly sworn, deposes and says:

1. I am over the age of eighteen years.
2. On March 22, 2016, I mailed true and correct copies of the annexed Schoharie Gorge Creek Tribal Consultations dated March 22, 2016, by placing the same in first class post-paid envelopes addressed: SEE ATTACHED LIST.
3. On said day, I deposited said envelopes in a mailbox at 99 Washington Avenue, Albany, New York 12210.

Mary Barthelme

Sworn to before me this
22 day of March, 2016

Bridget M. Van Zutphen
Notary Public

Bridget M. Van Zutphen
Notary Public, State of New York
Qualified in Albany County
No. 01VA6295970
Commission Expires Jan. 21, 2018

March 22, 2016

Mohawk Nation Council of Chiefs
of Haudenosaunee Six Nations Confederacy
Akwesasane Territory Box 336
Via Rooseveltown, NY 13683-0366

Re: Section 106 Discussion for CDBG-DR, NYRCR Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvement Project, Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

Dear Chiefs of the Mohawk Nation:

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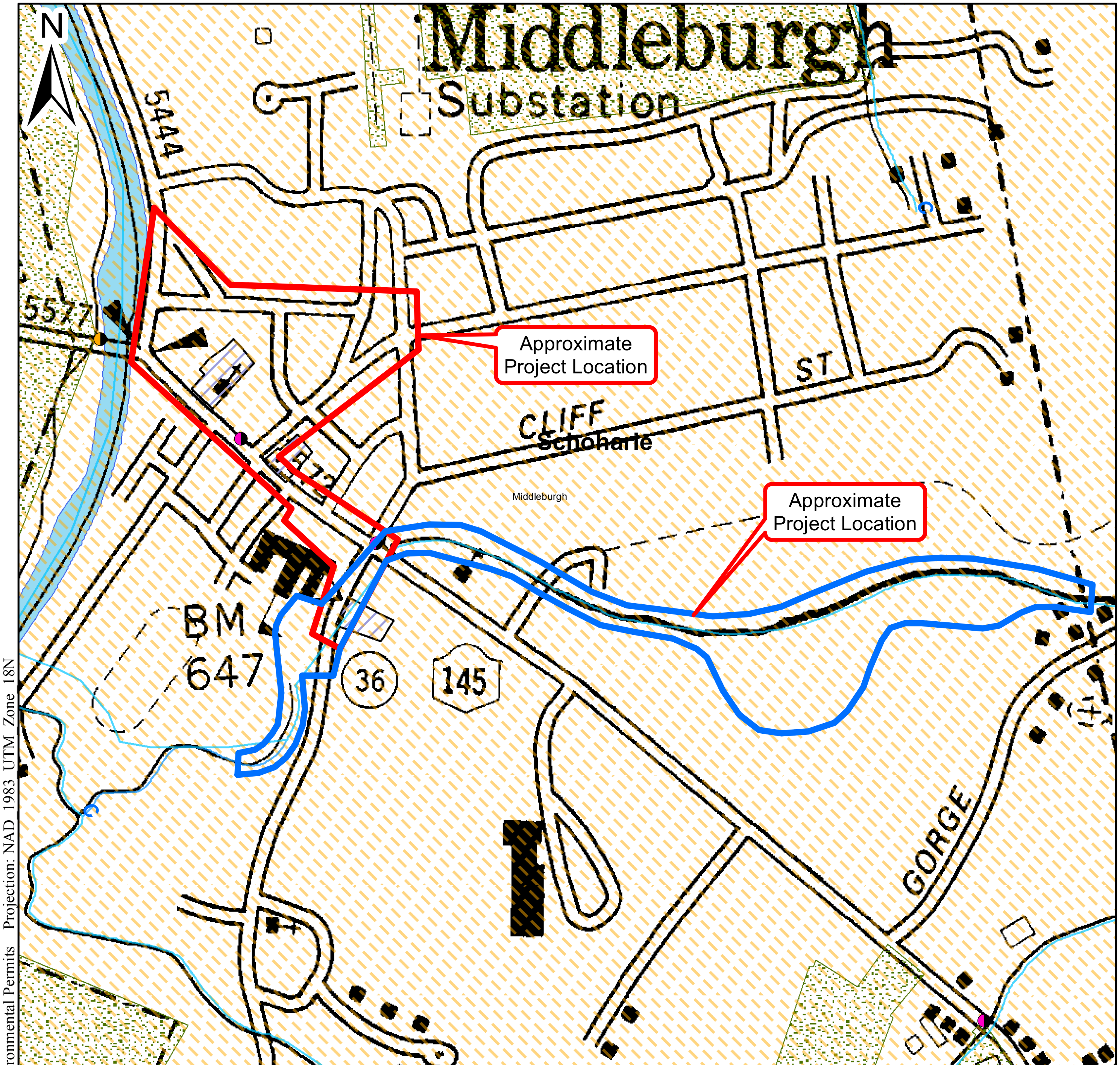

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March 22, 2016

Ron LaFrance, Jr; Paul Thompson; and Beverly Cook, Chiefs
St. Regis Mohawk Tribe
412 State Route 37
Akwesasne, NY 13655

Re: Section 106 Discussion for CDBG-DR, NYRCR Gorge Creek Culvert Repair and Stormwater and Drainage Infrastructure Improvement Project, Village of Middleburgh, Town of Middleburgh, Schoharie County, New York

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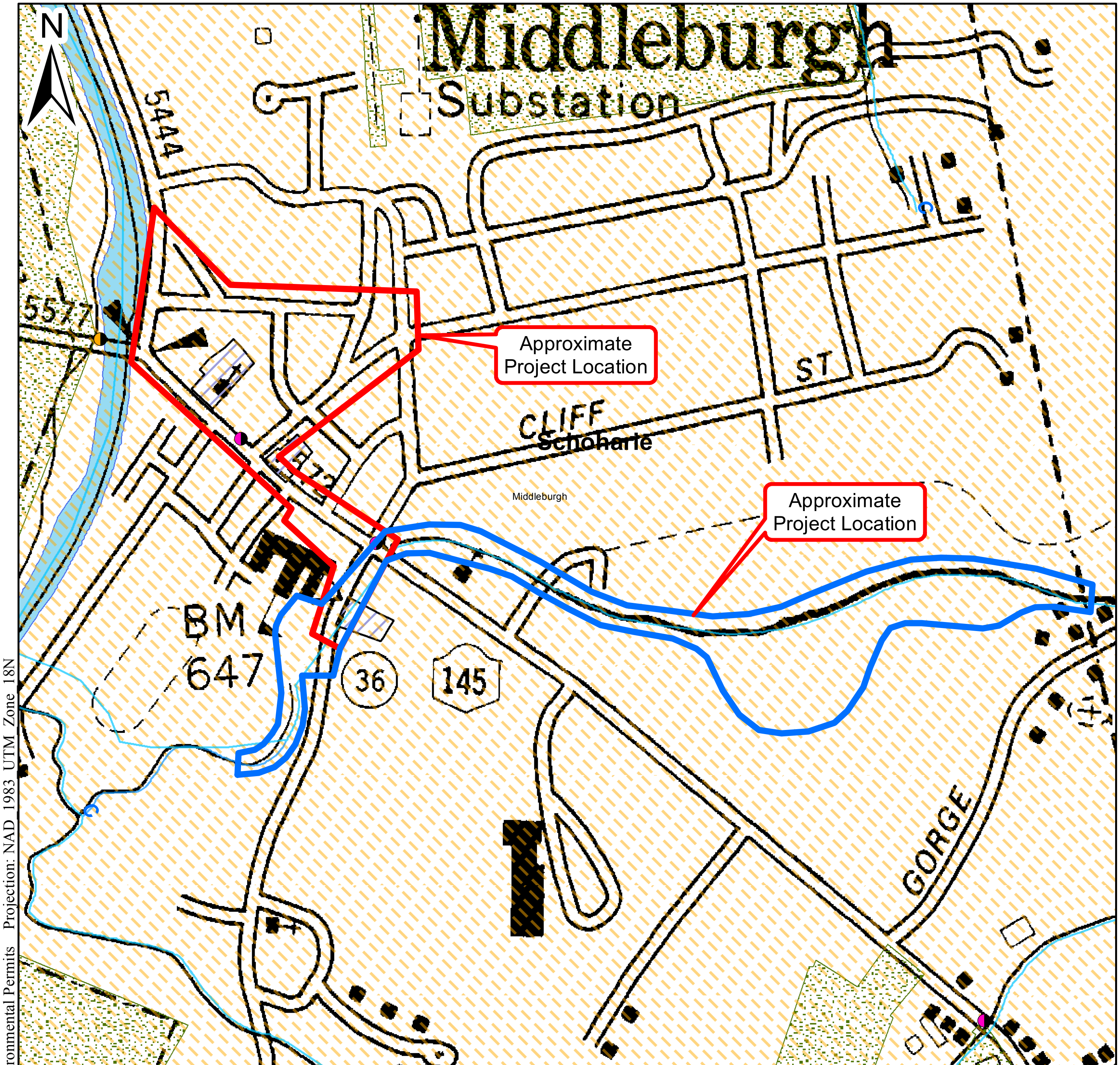

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NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

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A Phase I survey is designed to determine the presence or absence of archaeological sites or other cultural resources in the project's area of potential effect. The OPRHP can provide standards for conducting cultural resource investigations upon request. Cultural resource surveys and survey reports that meet these standards will be accepted and approved by the OPRHP.

Our office does not conduct archaeological surveys. A 36 CFR 61 qualified archaeologist should be retained to conduct the Phase I survey. Many archaeological consulting firms advertise their availability in the yellow pages. The services of qualified archaeologists can also be obtained by contacting local, regional, or statewide professional archaeological organizations. Phase I surveys can be expected to vary in cost per mile of right-of-way or by the number of acres impacted. We encourage you to contact a number of consulting firms and compare examples of each firm's work to obtain the best product.

Please also be aware that a Section 233 permit from the New York State Education Department (SED) may be necessary before archaeological fieldwork is conducted on State-owned land. If any portion of the project includes the lands of New York State you should contact the SED before initiating survey activities. The SED contact is Christina B. Rieth and she can be reached at (518) 402-5975. Section 233 permits are not required for projects on private land.

If you have any questions concerning archaeology, please contact Tim Lloyd at 518-268-2186 or Timothy.Lloyd@parks.ny.gov