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I. Introduction and Project Overview

Project Summary

Between July and August 2011, GAI Consultants, Inc. (GAI) conducted Third Supplemental Phase I Cultural Resources Investigations of new project localities within the proposed Bell Bend Nuclear Power Plant (BBNPP), in Luzerne County, Pennsylvania, for AREVA NP Inc. (AREVA) on behalf of UniStar Nuclear Energy, LLC (UniStar). The overall BBNPP project area is located adjacent to the existing PPL Corporation's Susquehanna Steam Electric Station (SSES), west of the North Branch Susquehanna River and northeast of the town of Berwick, Pennsylvania (Figure 1). PPL proposes the potential development of a nuclear power generation unit in this locality. As defined by AREVA, the Third Supplemental Phase I study area consists of approximately 25.7 acres (10.4 hectares) of new project localities bordering previously-surveyed portions of the BBNPP project area. These new project areas reflect 1) the addition of an on-site excess cut disposal area, associated with relocation of the proposed BBNPP power block, and 2) minor project boundary changes identified during a 2011 property survey. The purpose of GAI's study was to determine the presence of unrecorded archaeological sites within new portions of the project area and to assess the potential eligibility of identified sites for listing in the National Register of Historic Places (NRHP).

The Third Supplemental project area consists of five parcels including Area 1, Area 7 North, Area 12, Area 13 East (Excess Cut Disposal Area), and Area 14 (Photographs 1, 2, and 3). Area 12, Area 13 East, and Area 14 occupy upland settings near the south edge of the BBNPP project area. Area 13 East, situated between US Route 11 and the Susquehanna River, is a largely wooded parcel crossed by an existing transmission corridor and bordered by previously-surveyed Lots 93 D and 93 F. Area 14 includes a residential lot bordering the north edge of US Route 11, as well as a section of this roadway; it lies east of the transmission corridor, adjacent to previously-surveyed Lot 93D. Area 12 consists of a section of US Route 11, west of the transmission corridor. Area 1 and Area 7 North are both located on the low terrace/floodplain of the Susquehanna River in the northeast portion of the BBNPP project area. Area 1 consists of a portion of a paved access road adjacent to the south edge of previously-surveyed Area 7, while Area 7 North borders the northwest edge of this test area. Proposed construction activities will result in both temporary and permanent impacts (e.g., timbering, grading, fill, construction lay down, and roadway construction) within portions of the supplemental project area.



Photograph 1. Transmission Corridor in Area 13 East (Excess Cut Disposal Area), Facing Southwest

Photograph 2. Area 1 showing Paved Access Road and Adjacent Parking Lot at North Edge of PPL Riverlands Park, Facing West



Photograph 3. Area 14 showing Garage and Residential Lawns on North Side of US Route 11, Facing North



This Third Supplemental Phase I survey represents GAI's eighth cultural resources study of the proposed BBNPP project. GAI conducted Phase Ia cultural resources investigations (archaeological/geomorphological reconnaissance and architectural survey) of 1,271 acres (514 hectares) of potential project alternatives in two episodes—June 2007 and January 2008 (GAI 2007, Munford and Tuk 2008). Phase Ib survey of the initial 639-acre (259-hectare) project area (West Alternative, Areas 6, 7, and 8, and Confers Lane Parcel) was performed between May and August 2008 (Munford et al. 2008). Supplemental Phase Ib survey of approximately 263 acres (106 hectares) of new project localities (Lots 4, 64, 93F, 95, 96, 97/97C, and 100) bordering the initial project area was conducted between August and November 2008 (Munford 2008). Initial and Supplemental Phase Ib studies identified eleven archaeological sites, seven of which were determined to be potentially eligible for listing in the NRHP.

GAI conducted Phase II National Register Evaluations of these seven sites between July and November 2009, and based on the results of this study all seven sites were recommended as

Not Eligible to the NRHP. Architectural survey of the project area documented 52 architectural and historical resources within the project viewshed and recommended that seven resources were eligible or potentially-eligible for listing on the NRHP. The results of Phase I and II investigations were presented in the individual documents noted above and in a combined Draft Phase I/Phase II Technical Report (Munford et al. 2010). In an August 23, 2011 review letter (see Appendix B) PHMC-BHP concurred with eligibility recommendations for six of the seven Phase II sites and concluded that one site (36LU288) is NRHP eligible, requiring either site avoidance or Phase III Data Recovery investigations. They further concluded that three architectural resources are not NRHP-eligible and recommended a site visit to evaluate the NRHP eligibility of one historic district (155070).

GAI conducted a Second Supplemental Phase Ib survey of an additional 176 acres (71 hectares) of new project areas between April and May 2010 (Munford 2010). This study identified two archaeological sites, one of which (Site 36LU301) was recommended as potentially NRHP eligible. Based on PHMC-BHP's review and concurrence, GAI performed a Phase II National Register Evaluation of Site 36LU301 between June and July 2011. A technical report on this study is in progress.

Third Supplemental Phase I investigations were conducted in accordance with GAI's Scope of Work dated May 31, 2011. The initial scope of work was based on project mapping provided by AREVA (AREVA February 18, 2011, mark-up of Figure 1, Second Supplemental Phase Ib Project Location, GAI Consultants, Inc., June 30, 2010; Area to Characterize, PPL Bell Bend, LLC, Bell Bend Nuclear Power Plant, Salem Township, PA, Pennoni Associates, Inc. May 11, 2011). Slight changes in the Supplemental Phase I study area occurred due to review of additional project mapping and minor revisions in the project limit of disturbance (Limit of Disturbance, PPL Bell Bend, LLC, Bell Bend Nuclear Power Plant, Salem Township, PA, Pennoni Associates, Inc., August 25, 2011). This addendum report presents the methods and results of Supplemental Phase I survey and provides recommendations on the need for further work. A BHP Report Summary Form for the project is presented in Appendix A. Project Correspondence is located in Appendix B, while a PASS form and an artifact catalog are provided in Appendices C and D.

Area of Potential Effect

The Area of Potential Effect (APE) for the current Phase I study consists of approximately 25.7 acres (10.4 hectares) of new project localities within the BBNPP project area (see Figure 1). The project APE is defined as the footprints of the five test areas: Area 1 (0.75 acres/0.30 hectares), Area 7 North (0.63 acres/0.25 hectares), Area 12 (0.76 acres/0.31 hectares), Area 13 East (Excess Cut Disposal Area) (19.26 acres/7.79 hectares), and Area 14 (4.33 acres/1.75 hectares).

Summary of Results

Supplemental Phase I fieldwork was performed between July 11 and 15, 2011 and on August 25, 2011. This work included an archaeological reconnaissance of the project area and the excavation of 71 shovel test pits (STPs) in portions of the project area concluded to have a moderate to high archaeological potential to contain archaeological resources (Figure 2). Table 1 presents a summary of Third Supplemental Phase I survey results by testing area.

The Third Supplemental Phase I survey identified one archaeological site, Site 36LU307, yielding 22 modern/historic artifacts. This site represents a small, low density scatter of twentieth century artifacts and was recommended as Not Eligible to the NRHP.

GAI's previous architectural survey documented four architectural resources that are situated within the project footprint. One of these resources, the North Branch Pennsylvania Canal (141673/GAI-10), has been concluded by PHMC-BHP to be eligible for listing in the NRHP (March 17, 2010 review letter) (see Appendix B). The other three resources—the Bloomsburg Division of the Delaware, Lackawanna & Western Railway (155053/GAI-11), the Susquehanna and Tioga Turnpike (155056/GAI-12), and a residence (GAI-23)—have been concluded Not Eligible by PHMC-BHP (March 17, 2010 review letter) (see Appendix B). No additional investigations were conducted of these resources during the current study.

Based on the results of the Phase I survey GAI recommends no further archaeological investigations of the Third Supplemental project area.

As indicated in the earlier BBNPP Phase I/II Technical Report (Munford et al. 2010), GAI recommends that project impacts to the North Branch Pennsylvania Canal be assessed and included in a subsequent Criteria of Effects Evaluation Report for the BBNPP project.

Table 1. Summary of Third Supplemental Phase I Survey Results

Test Area	Acres	Moderate-High Potential Acres	# STPs	Identified Archaeological Sites	Previously-Surveyed Architectural Resources in Project Footprint
Area 1	0.75	0	0	0	2 141673 (GAI-10)* 155053 (GAI-11)*
Area 7 North	0.63	0.43	0	0	2 141673 (GAI-10)* 155053 (GAI-11)*
Area 12	0.76	0	0	0	1 155056 (GAI-12)**
Area 13 East (Excess Cut Disposal Area)	19.26	1.74*	22	0	0
Area 14	4.33	2.48	49	1 (36LU307)	2 155056 (GAI-12)** GAI-23
TOTAL	25.73	4.85	71	1	4

141673 (GAI-10)-determined NRHP Eligible; * 141673 (GAI-10) and 155053 (GAI-11) extend through Area 1 and Area 7 North;

**155056 (GAI-12) extends through Areas 12 and 14; *encompassed by GAI 2008 Phase Ib survey

Regulatory Guidelines

GAI's Cultural Resources Survey was conducted in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, guidelines developed by the Advisory Council on Historic Preservation, the amended *Procedures for the Protection of Historic and Cultural Properties* as set forth in 36 CFR 800, the Secretary of Interior's *Standards and Guidelines for Archaeology and Historic Preservation*, and *Cultural Resource*

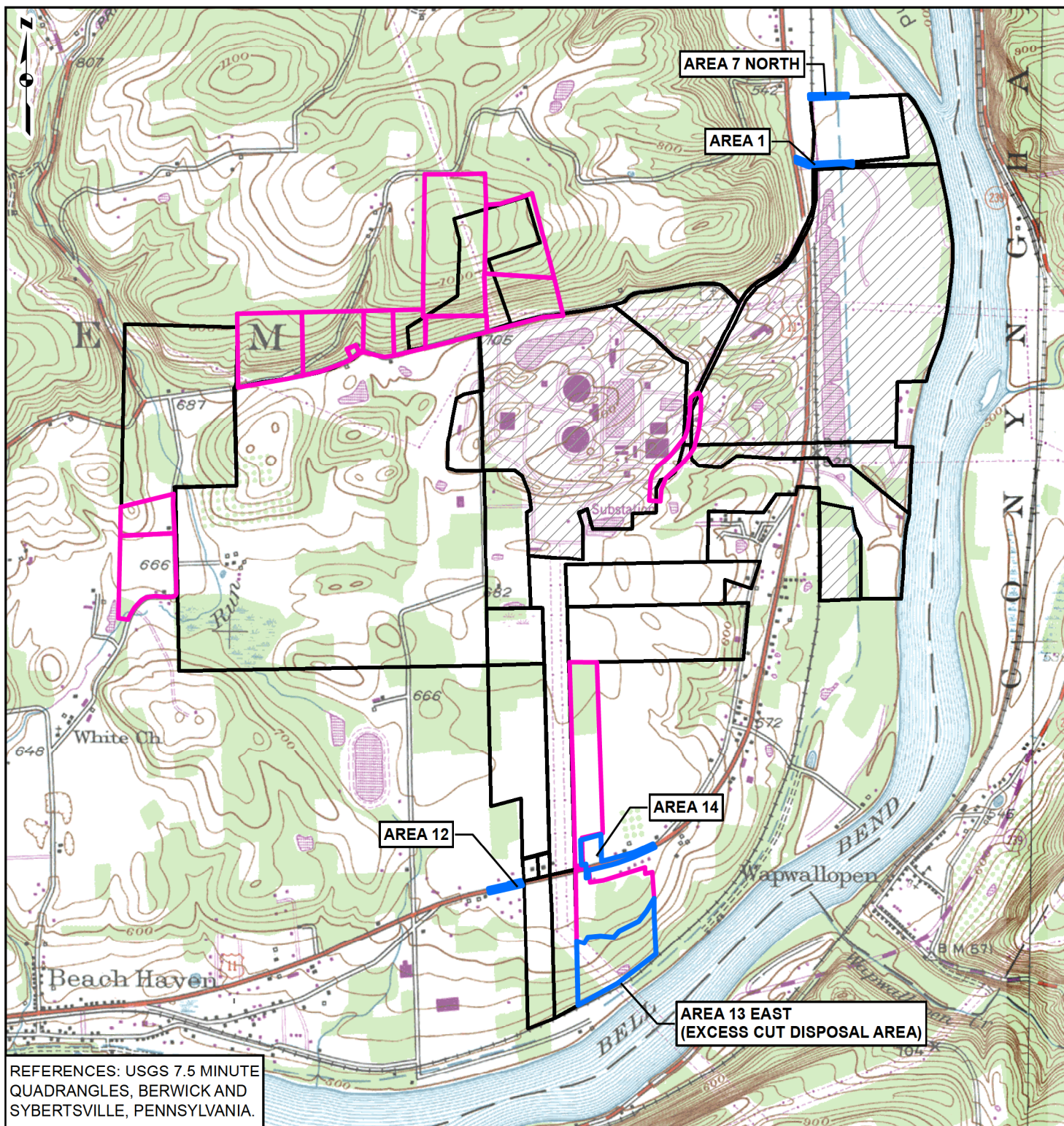
Management in Pennsylvania: Guidelines for Archaeological Investigations (PHMC-BHP 1991).

Project Staff and Acknowledgements

Benjamin Resnick, M.A., RPA (Group Manager, Cultural Resources) served as project manager for GAI's study. Barbara A. Munford, M.A. (Lead Archaeologist) was project Principal Investigator and author of this addendum report. William Caramana (Archaeologist) supervised the archaeological fieldwork which was conducted along with Colleen Dugan (Archaeologist) and Matt Wilson. Amanda Wasielewski prepared figures for this document.

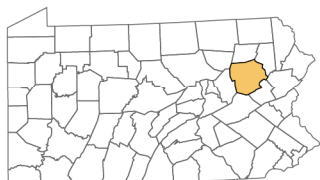
John Snooks was AREVA's technical manager for the project.

Larry Peterson (AREVA) and Mike Wysocki (UniStar) served as on-site field coordinators for supplemental Phase Ib fieldwork and facilitated the field crew's daily access within the project area. Michael Detamore (PPL) managed the field project for PPL Bell Bend.



REFERENCES: USGS 7.5 MINUTE
QUADRANGLES, BERWICK AND
SYBERTSVILLE, PENNSYLVANIA.

PROJECT LOCATION



LUZERNE COUNTY,
PENNSYLVANIA

LEGEND

- THIRD SUPPLEMENTAL PHASE Ib
PROJECT AREA
- SECOND SUPPLEMENTAL PHASE Ib
PROJECT AREA
- PREVIOUS PHASE Ib PROJECT AREA
- EXCLUDED AREA

0 1,000 2,000 4,000
Feet

FIGURE 1
THIRD SUPPLEMENTAL
PHASE Ib PROJECT LOCATION



BELL BEND NUCLEAR POWER PLANT
UNISTAR NUCLEAR ENERGY, LLC.

DRAWN BY: AJW
CHECKED: BAM

DATE: 09/02/2011
APPROVED: BAM

Figure 2. Third Supplemental Phase I Project Area showing Archaeological Potential and Testing Locations

*REDACTED Figure 2
Third Supplemental Phase I
Project Area showing
Archaeological Potential and
Testing Locations*

II. Background, Setting, and Archaeological Potential

Summary of Previous Studies

GAI conducted a Phase Ia archaeological and geomorphological reconnaissance of approximately 760 acres (307.5 hectares) of potential project alternatives for green space/power plant development in June 2007 (GAI 2007). In January 2008, following selection of the preferred alternative, GAI performed Phase Ia investigations (archaeological and geomorphological reconnaissance and architectural survey) of an additional 511 acres (206.8 hectares) (Munford and Tuk 2008). In total, 1,271 acres (514.3 hectares) were investigated by Phase Ia survey.

Phase Ia background research identified 24 previously-recorded archaeological sites and five previously-recorded architectural resources within the project vicinity. Six of these sites (36LU15, 36LU16, 36LU48, 36LU49, 36LU50 and 36LU51) and one architectural resource (the North Branch Pennsylvania Canal/141573) were mapped within the Phase Ia project footprint. GAI's architectural survey recorded 52 architectural and historical resources within the proposed project viewshed. Ten of these surveyed resources were initially recommended eligible for NRHP listing. Phase Ia geomorphological and archaeological field reconnaissance, along with background research, defined localities of moderate to high archaeological potential (e.g., undisturbed, relatively level, well-drained areas), low archaeological potential (e.g., wetlands or slopes in excess of 15 percent) and disturbed/no potential within the project area. Systematic Phase Ib survey was recommended for areas of moderate to high potential. In a June 5, 2008, review of these studies (GAI 2007; Munford and Tuk 2008), the PHMC-BHP concurred with GAI's recommendations for additional Phase Ib archaeological fieldwork and requested further survey information for 22 of the 52 recorded architectural and historical resources.

GAI conducted Phase Ib archaeological survey of a 639-acre (259-hectare) project (West Alternative, Area 6, Area 7, Area 8, the Confers Lane Parcel, and the proposed Switchyard 2 Transmission Line Corridor) between May and July 2008 (Munford et al. 2008). This work resulted in the identification of 11 archaeological sites (Sites 36LU278, 36LU279, 36LU280, 36LU281, 36LU282, 36LU283, 36LU284, 36LU285, 36LU286, 36LU287 and 36LU288) and 25 Isolated Finds. Seven of the sites (Sites 36LU279, 36LU280, 36LU281, 36LU283, 36LU285, 36LU286, and 36LU288) were recommended as potentially-eligible for listing in the NRHP and avoidance or Phase II testing was recommended for these localities. Supplemental architectural and historical survey collected additional information and provided completed PHRS forms for 22 of the 52 resources recorded during the initial survey.

Supplemental Phase Ib survey of 263 acres (106 hectares) acres of new project localities bordering the initial Phase Ib project area was conducted by GAI between August and November 2008 (Munford 2008). No archaeological sites were identified during this work and no further work was recommended.

Based on the Phase Ib results and SHPO concurrence (PHMC-BHP review letter dated March 23, 2009), and at the request of UniStar, GAI performed Phase II National Register Evaluations of the seven potentially-eligible archaeological sites (Sites 36LU279, 36LU280, 36LU281, 36LU283, 36LU285, 36LU286, and 36LU288). Fieldwork was conducted between July and November 2009. The results of Phase Ib and Phase II investigations were provided in a combined Phase I/II Technical Report (Munford et al. 2010) which was submitted to PHMC-BHP for review in December 2010. Based on the results of Phase II testing, all seven sites were recommended as Not Eligible to the NRHP and no further investigations were

recommended. Three architectural resources were concluded by the PHMC-BHP to be NRHP eligible (North Branch Pennsylvania Canal/141673, Union Reformed and Lutheran Church/155049, and Woodcrest/155052) and four additional architectural resources were recommended by GAI as potentially NRHP eligible (Stone Arch Bridge/155054, North Market Street Bridge/155055, Red Brick Studios/155064, and Wapwallopen Historic District/155070). In an August 23, 2011 review letter (see Appendix B) the PHMC-BHP concurred that six of the archaeological sites are Not Eligible; they concluded that one site (36LU288) is NRHP eligible and recommended avoidance or Phase III data recovery investigations for this site. Additionally, PHMC-BHP concluded that 155054, 155055 and 155064 are not NRHP eligible and requested a site visit to evaluate eligibility of the Wapwallopen Historic District (155070).

In 2010, GAI conducted Second Supplemental Phase Ib survey of 176 acres (71 hectares) of new project areas (13 upland lots) associated with the BBNPP Power Block Relocation (Munford 2010). This study identified two archaeological sites (36LU301 and 36LU302). Prehistoric Site 36LU301 was recommended as potentially eligible for listing in the NRHP, while historic period Site 36LU302 was recommended as Not Eligible. PHMC-BHP concurred with these recommendations in a May 20, 2011 review letter, requesting Phase II investigations of Site 36LU301 in the event that the site cannot be avoided by proposed project impacts (see Appendix B).

At the request of PPL, GAI performed a Phase II National Register Evaluation of Site 36LU301 between June and July 2011. Data analysis and preparation of a Phase II report are in progress.

Project Setting

The BBNPP project area is located in Luzerne County, in the Susquehanna Lowland Section of the Ridge and Valley physiographic province (Sevon 2000). GAI's Phase I/II Technical Report (Munford et al. 2010) provides details regarding the overall project setting; the current document presents only a brief review.

The overall BBNPP project area is located on the inside edge of a large southwest curve in the North Branch Susquehanna River, referred to as Bell Bend (see Figure 1). US Route 11, which follows the curve of the river, crosses through the eastern and southern portions of the project area. The previously-surveyed 1,078-acre (436-hectare) Phase Ib project area comprised uplands surrounding the existing SSES facility, as well as more limited low terrace/floodplain settings along the west bank of the Susquehanna River. The Third Supplemental Phase I project area includes new project localities in both upland and low terrace/floodplain settings bordering previously-surveyed portions of the project.

Upland portions of the project area consist of Late Illinoian to Wisconsin-aged, high glacial outwash terraces of the Susquehanna River (Bush 1981). These upland settings have no potential for deeply buried cultural resources. Any cultural resources in these areas are expected to be associated with the modern ground surface. Portions of the project area east of US Route 11 occur on low terraces and floodplain of the Susquehanna River, formed in Late Holocene to recent-aged alluvial sediments (Bush 1981). These areas, particularly the well-drained low terraces and natural levee landforms, have a potential for deeply buried cultural resources (Munford et al. 2010; Hayes 1981).

Current land use within the Third Supplemental Phase I project area includes woodlands, residential and commercial development, and limited cultivation. Areas of disturbances are associated with construction of a transmission line corridor, road construction, residential use, commercial development, and ATV trails.

Background Research Review

Based on a review of previously-conducted background research and the results of GAI's 2008 architectural survey of the initial BBNPP project area (Munford and Tuk 2008, Munford et al. 2010) the Third Supplemental Phase I APE contains four previously-recorded architectural resources. These resources include one NRHP-eligible property [the North Branch Pennsylvania Canal (141673/GAI-10)] as well as three resources determined Not Eligible for listing in the NRHP—the Bloomsburg Division of the Delaware, Lackawanna & Western Railroad (155053/GAI-11); the Susquehanna and Tioga Turnpike (155056/GAI-12), and a residence (GAI-23). A description of these resources was provided in GAI's Phase Ia Technical Report (Munford and Tuk 2008) and Phase I/II Technical Report (Munford et al. 2010). PHMC-BHP determinations of eligibility for these resources were provided in June 5, 2008 and March 17, 2010 review letters (see Appendix B). Based on PHMC-BHP's review, no further investigations of the railroad (155053/GAI-11), the turnpike (155056/GAI-12) and the residence (GAI-23) are required. An assessment of proposed project impacts to the North Branch Pennsylvania Canal (141673/GAI-10) is to be included in a separate Criteria of Effects Report to be prepared for NRHP-eligible properties within the overall BBNPP project.

Table 2. Previously-Recorded Architectural Resources within Project APE

ID No.	Name	Address	Style and Type	Date	NRHP Eligibility	Location within APE
NRHP- Eligible						
141673/ GAI-10	North Branch Pennsylvania Canal	Along Susquehanna River, US Rt. 11 Vicinity, Salem Twp	Vernacular Canal	1828	Determined Eligible by PHMC-BHP, Criterion A	Area 1 Area 7 North
Not Eligible						
155053/ GAI-11	The Bloomsburg Division of the Delaware, Lackawanna & Western Railway	Along Susquehanna River, US Rt. 11 Vicinity, Salem Twp	Vernacular Railroad	1858	Determined Not Eligible by PHMC-BHP	Area 1 Area 7 North
155056/ GAI-12	Susquehanna and Tioga Turnpike	US Rt. 11, Salem Twp	Vernacular Highway	1807-1810	Determined Not Eligible by PHMC-BHP	Area 14 Area 12
GAI-23	Hower Property	1091 Salem Boulevard, Salem Twp	Frame Vernacular Residence	c.1910	Determined Not Eligible by PHMC-BHP	Area 14

A review of historic mapping indicates that by 1873 (Beers 1873) the major transportation routes in the project vicinity—the North Branch Pennsylvania Canal (141673/GAI-10), the adjacent rail line (155053/GAI-11), and the Susquehanna and Tioga Turnpike/US Route 11 (155056/GAI-12)—followed their present paths (Figure 3). In 1873, residential development is illustrated along US Route 11 in the general vicinity of Area 14 (see Figure 3).

A series of twentieth-century aerial photographs (1939, 1959 and 1969) and the 1955 Shickshinny Quadrangle indicate a residence in the location of GAI-23, in Area 14, while development in the remainder of the project APE was limited to cultivation (Figures 4, 5, 6, and 7). In the 1939 aerial photograph a farm lane cuts diagonally through the side lawn east of the house while a lines of trees borders the north edge of this lawn (see Figure 4). The

1959 aerial photograph depicts the current garage as well as a possible outbuilding to its north (see Figure 6). By 1969, the possible outbuilding was no longer extant. All three aerial photographs depict large cultivated fields to the north and west of this residential property (see Figures 4, 6, and 7).

The 1939 aerial photograph shows that the northern portion of Area 13 East (Excess Cut Disposal Area) was cultivated while the southern portion was wooded. The 1959 and 1969 aerial photographs depict this entire area as vegetated in sparse woods and/or brush.

Twentieth-century aerial photographs and mapping illustrate large cultivated fields in the vicinity of Area 1 and Area 7 North on the low terrace/floodplains along the North Branch Susquehanna River (see Figure 5). Trees border the North Branch Pennsylvania Canal (141673/GAI 10) and rail lines (155053GAI-11), which lie near the west edge of the floodplain, parallel to US Route 11 (155056/GAI-12). No additional development is illustrated in this area.

Archaeological Potential

GAI conducted a preliminary assessment of archaeological potential within the Third Supplemental Phase I APE based on a review of project mapping, the results of previous background research, and observations and evaluations of adjacent parcels during previous field studies of the BBNPP project area (see Figure 2). Based on these data, undisturbed, relatively level, well-drained portions of the project area were considered to have a moderate to high potential for prehistoric and historic archaeological resources, requiring subsurface Phase Ib archaeological testing to identify sites. Portions of the project area characterized by wetlands or slopes in excess of 15 percent were considered to have a low archaeological potential. These areas would not require systematic subsurface testing during Phase I investigations. Disturbed localities were determined to have no archaeological potential and were excluded from further investigation. Archaeological sites in upland portions of the study area were anticipated to be near-surface in nature. Low terrace/floodplain localities were considered to have potential for both near-surface and deeply buried archaeological resources.

GAI's May 31, 2011 scope of work estimated that the Third Supplemental Phase I project area comprised approximately 22.0 acres (8.9 hectares), consisting of approximately 4.0 acres (1.6 hectares) of moderate to high archaeological potential and 18.0 acres (7.3 hectares) of low potential or disturbance/no potential.

Assessments of archaeological sensitivity were refined during the course of Phase I fieldwork based on detailed, on-the-ground field observations. Additionally, the project area was slightly increased due to final calculations of parcel sizes and the inclusion of one additional test area.

Based on these revisions GAI's Third Supplemental Phase I APE comprised an approximately 25.7-acre (10.4-hectare) area including 4.6 acres (1.8 hectares) of moderate to high potential (see Figure 2, see Table 1). The remainder of the project APE consisted of approximately 17.5 acres (7.1 hectares) of low potential and 3.6 acres (1.4 hectares) of disturbance/no potential.

Figure 3. Project Area and Vicinity in 1873

*REDACTED Figure 3
Project Area and Vicinity in 1873*

Figure 4. Upland Project Areas and Vicinity in 1939 (Areas 13 East and 14)

*REDACTED Figure 4
Upland Project Areas and
Vicinity in 1939 (Areas 13 East
and 14)*

Figure 5. Project Area and Vicinity in 1955

*REDACTED Figure 5
Project Area and Vicinity in 1955*

Figure 6. Upland Project Areas and Vicinity in 1959 (Areas 13 East and 14)

*REDACTED Figure 6
Upland Project Areas and
Vicinity in 1959 (Areas 13 East
and 14)*