Chapter 5. Phase Ia Archaeological and Geomorphological Reconnaissance

Introduction

In 2007 and 2008, GAI conducted Phase Ia geomorphological and archaeological reconnaissance of BBNPP project localities in order to evaluate the project area's potential to contain unrecorded cultural resources and to delineate localities for subsequent Phase Ib survey. Phase Ia reconnaissance performed in June 2007, investigated approximately 761 acres (308 hectares) of potential project alternatives for green space/power plant development west and east of the river—the West Alternative (408-acres/165-hectares) and the Southeast Alternative (353-acres/143-hectares). In January 2008, following selection of the West Alternative as the preferred alternative, GAI conducted Phase Ia reconnaissance of an additional 511 acres (207 hectares) of new project localities between the SSES facility and the west bank of the river (Areas 6, 7, 8, and the Confers Lane Parcel). In total, approximately 1,272 acres (515 hectares) were investigated by these two Phase Ia field reconnaissance studies (Figure 5-1). The results of these studies have been provided in a Phase Ia letter report (GAI 2007) and in a Phase Ia technical report (Munford and Tuk 2008), which has been reviewed by the PHMC-BHP (June 5, 2008 review letter) (see Appendix A).

Goals and Methods

Specific goals of the geomorphological and archaeological reconnaissance were to 1) identify surface-visible cultural resources; 2) evaluate surface disturbances and landform age; 3) assess the potential for deeply-buried archaeological sites; and 4) refine preliminary estimates of archaeological sensitivity derived from background research.

During the geomorphological reconnaissance, GAI's Senior Staff Soil Scientist performed a walkover of the project area, and observed and recorded geomorphic conditions and the extent of surface disturbances. Judgmentally-placed auger probes were excavated, where possible, to evaluate soil profiles. As part of this study, a review of appropriate topographic maps and soil survey data was also conducted.

In conjunction with the geomorphological assessment, GAI project archaeologists conducted an archaeological reconnaissance to ground-truth preliminary assessments of archaeological potential based on background research. Local ground conditions and topographic settings were assessed to evaluate further the project area's archaeological potential. Surface artifacts, structural remains, and possible cultural features or sites were recorded and plotted on project maps.

Data collected from the geomorphological assessment and the archaeological reconnaissance was then combined with information from the background research to refine initial assessments of archaeological potential for the project. Areas of high to moderate archaeological potential, low archaeological potential, and disturbances were plotted on project maps and were used to guide Phase Ib investigations of the project area.

Results of Geomorphological Reconnaissance

Geomorphological reconnaissance confirmed that the upland portions of the project area, predominantly west of US Route 11, consist of glacial till and glacial outwash soils (Bush 1982). Glacial till soils are found on the highest elevation knobs within the project area as well as on the highest uplands immediately to the project's north (e.g., portions of the West Alternative and Switchyard 2). The large majority of Areas 6 and 8 west of the highway are mapped with glacial outwash soils. These outwash soils occur on broad, gently sloping areas

that represent the highest outwash terraces of the Susquehanna River. These terraces are Late Illinoian to Wisconsin in age. Wetlands that have developed on these terraces are also formed in glacial outwash. Upland portions of the project area include large cultivated fields, woodlands, orchards and fallow fields. Due to the residual nature of soils, cultural resources within the upland portions of the project area are expected to be associated with the modern ground surface. These areas have no potential for deeply buried cultural resources.

The portions of the project area east of US Route 11 consist of landforms formed in Holocene to recent alluvial sediments. The landforms represent the Late Holocene to recent low terraces and floodplain of the Susquehanna River. Two soil types are mapped in this portion of the project area: the well-drained Pope soils and the poorly-drained Holly soils (Bush 1981). Holly soils likely represent low and former channel locations on the floodplain while the Pope soils represent higher terrace and natural levee landforms. Areas mapped with Pope soils, including the poorly-drained channel-like swales observed within these localities (e.g., Area 7), have a high potential for cultural resources. Particularly, the margins of wetlands bordered by natural levee landforms represent a high potential setting for archaeological sites. Due to poor drainage capabilities, broader areas of Holly soils have a lower archaeological potential. Mapped wetlands, often associated with Holly soils in this area, are considered to have a low potential for archaeological sites.

Low terrace and floodplain settings within the project area (i.e., portions of Areas 6 and 8 and all of Area 7), particularly the well-drained low terraces and natural levee landforms, have a potential for both near-surface and deeply buried cultural resources. As described in the Phase Ia report (Munford and Tuk 2008) and noted in the background research discussion of the current document (see Chapter 4), Hayes et al. (1981) performed an archaeological investigation of the Susquehanna floodplain east of the SSES. This study documented a shallow (0.5 to 1.0 meter/1.6 to 3.2-foot deep) soil horizon producing prehistoric artifacts and features, as well as deeply-buried culture bearing soil horizons yielding artifacts from up to 2.15 meters (7.0 feet) below surface and cultural features at depths of 1.3 meters (4.3 feet) and 3.2 meters (10.5 feet) below surface (Hayes et al. 1981, p 178). This work confirmed the presence of deeply buried cultural deposits in the immediate project vicinity. Accordingly, depending on the proposed depth of project impacts, deep testing of low terrace/floodplain areas within the project area may be required to evaluate fully the potential for cultural resources.

Disturbances within the study area are largely associated with construction of the existing SSES facility—both on the uplands west of US Route 11 and in the area of the intake structure along the river, within Area 6. Additional ground surface disturbances have resulted from cultivation, quarrying, and roadway construction.

Results of Archaeological Reconnaissance

Based on the results of archaeological field reconnaissance and background research, GAI characterized the project APE in terms of its archaeological potential: high to moderate potential, low potential, and disturbed/no potential. Relatively undisturbed, well-drained, level to gently-sloping upland settings and floodplain/low terrace settings along the Susquehanna River were determined to have high to moderate archaeological potential. Steep slopes (slopes in excess of 15 percent), poorly-drained/wetland areas, and highly eroded fields were considered to have low archaeological potential. Areas disturbed by grading, landfill, and recent construction activities were determined to have no archaeological potential. Figure 5-2 illustrates archaeological potential within the project and Table 5-1 summarizes archaeological potential by test area.

Phase Ia reconnaissance of the total 1,272 acre (514.8 hectare) project APE identified 562 acres (227.4 hectares) (44.2 percent) of moderate to high archaeological potential, requiring subsequent systematic Phase Ib shovel testing or pedestrian ground survey. The remainder of the project area consisted of 446 acres (180.6 hectares) (35.1 percent) of low archaeological potential and 264 acres (106.5 hectares) (20.2 percent) of disturbed localities (no archaeological potential) (see Table 5-1). The low potential and disturbed areas were eliminated from Phase Ib shovel testing or pedestrian ground survey.

Table 5-1. Summary of Archaeological Potential and Identified Cultural Resources for Total Phase Ia APE

Area	Total Acres	High-Moderate Potential acres (% total)	Low Potential acres (% total)	Disturbed/ No Potential acres (% total)	Cultural Resources Documented by Phase Ia Reconnaissance	Previously-Recorded Cultural Resources in Project Footprint**
Southeast Alternative	353.0	102.0 (28.9%)	246.0 (69.7%)	5.0 (1.4%)	1 Possible archaeological component—Union Reformed Lutheran Church (Old River Church)	2 Union Reformed and Lutheran Church (Old River Church) (086562) Bridge (135679)
APE West of River						
West Alternative	407.5	224.0 (55%)	122.0 (30%)	61.5 (15%)	3 Site 36LU283 (Sink Site) * Site 36LU285 (Johnston/Folk Barn Site) * Site 36LU286 (Kisner Farmstead) *	0
Area 6	173.6	87.9 (37%)	37.4 (48%)	48.3 (25%)	1 Stone Walls * (GAI-02)	1 North Branch PA Canal * (141673/GAI-10)
Area 7	37.5	34.1 (14%)	0.2 (0.3%)	3.2 (2%)	1 Possible House Site *	2 Site 36LU0051 * North Branch PA Canal * (141673/GAI-10)
Area 8	272.4	103.1 (44%)	34.1 (44%)	135.2 (69%)	1 Beach Grove Cemetery (GAI-01)	6 Site 36LU0015 Site 36LU0016 Site 36LU0048 Site 36LU0049 Site 36LU0050 North Branch PA Canal (141673/GAI-10)
Confers Lane	27.4	10.9 (5%)	6.6 (8%)	9.9 (5%)	1 Site 36LU284 (Shortz Site) *	0
Subtotal	**918.4**	**460 (46%)**	**200.3 (15%)**	**258.1 (39%)**	**7**	**7**
Total	**1271.4**	**562 (44.2%)**	**446.3 (35.1%)**	**263.1 (20.2%)**	**4 sites, 2 possible sites, 2 architectural resources**	**6 sites, 3 architectural resources**

*Resource also mapped within subsequent Phase Ib APE;

**does not include resources surveyed by GAI during current Architectural Survey

As subsequently defined, the Phase Ib project APE (project preferred alternative) was located within portions of the Phase Ia study area west of the river. The approximately 918 acre (371.5 hectare) Phase Ia project area west of the river includes 460 acres (186.2 hectares) of moderate to high archaeological potential, 200 acres (80.9 hectares) of low potential and 258 acres (104.4 hectares) of disturbance/no potential. Nearly half of the moderate to high potential localities are located in the West Alternative (224 acres/90.6 hectares).

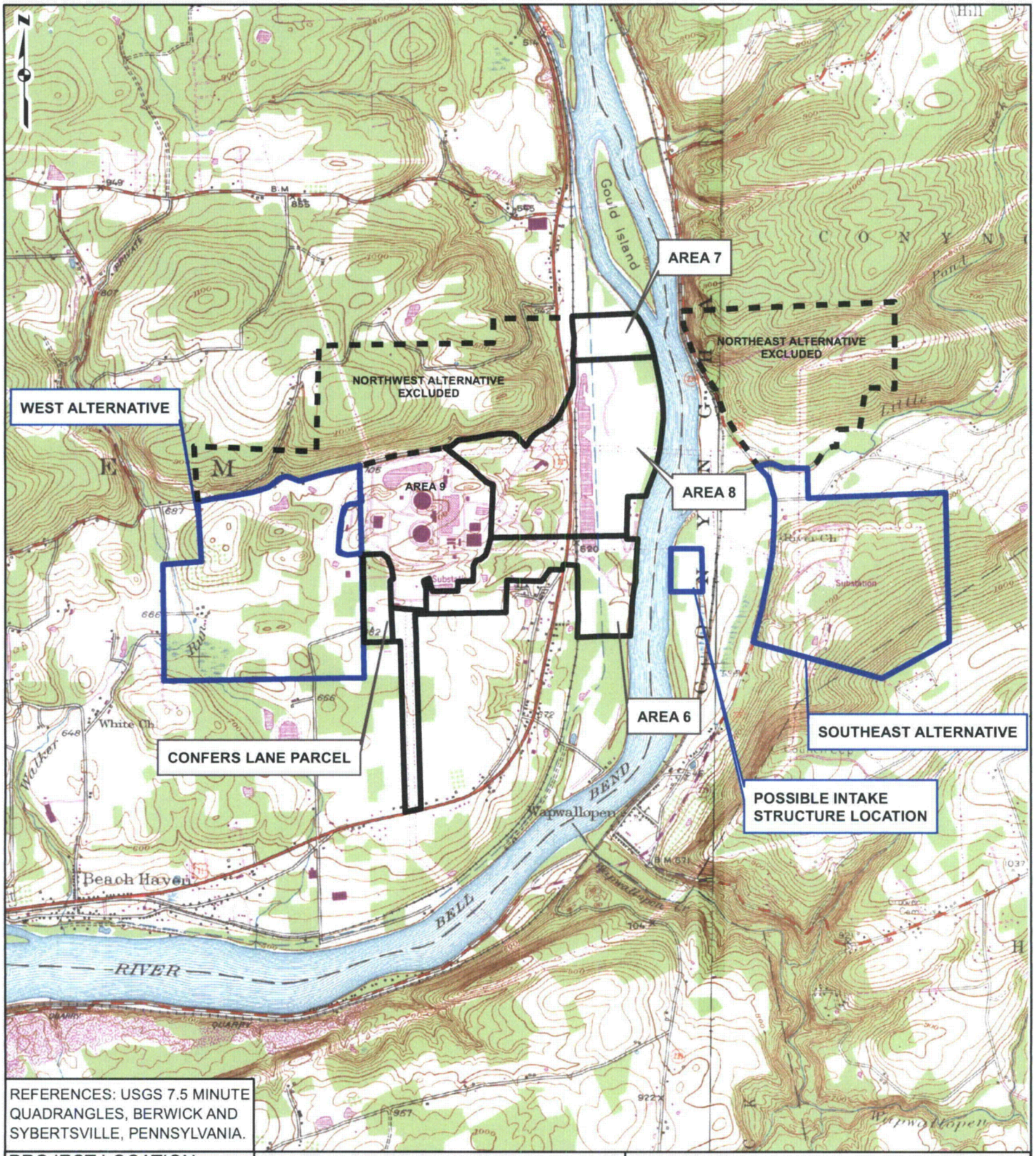
Based on observations of surface remains and on information provided by PPL staff, GAI's Phase Ia reconnaissance documented seven possible unrecorded cultural resources within the project APE west of the river; the single possible cultural resource in the Southeast Alternative was a potential archaeological component associated with the Union Reformed and Lutheran Church. Of the seven possible unrecorded cultural resources in the APE west of the river four resources represent historic archaeological sites, including three sites in the West Alternative (Sink Site/36LU283, Johnson-Folk Barn Site/36LU285, and the Kisner Farmstead/36LU286) and one site in the Confers Lane Parcel (Shortz Site/36LU284). All four sites were identified by PPL staff during the course of the field reconnaissance as representing the locations of former residences or farmsteads. Additionally, GAI documented the remains of a stone foundation at Site 36LU283 and recorded piles of gravel and rubble at Site 36LU286. No surface remains were observed at Sites 36LU284 or 36LU285 during Phase Ia reconnaissance. (These four sites were located within the subsequent Phase Ib project APE and were investigated during Phase Ib survey.)

Two of the observed cultural resources—the Beach Grove Cemetery (Area 8) and a fieldstone wall (Area 6)--represent architectural/historic properties. Both of these resources were recorded during GAI's architectural survey (Munford and Tuk 2008) and are described in Chapter 20. (Note that Beach Grove Cemetery lies with a portion of Area 8 that was eliminated from the Phase Ib project area.)

The possible house site noted in Area 7 consisted of a clearing with evergreen trees, which was considered to represent the location of a possible former residence. (This locality was located within the Phase Ib APE and was investigated by Phase Ib survey.)

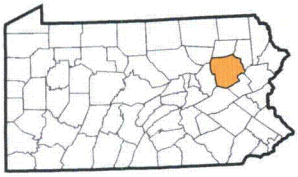
Summary of Phase Ia Results

The geomorphological and archaeological reconnaissance characterized the project area in terms of its archaeological potential (i.e., high/moderate, low or disturbed/no potential) and, based on surface observations and informant data, identified possible unrecorded cultural resources within the project APE. Based on this reconnaissance, upland portions of the project are expected to contain near-surface sites, while the low terrace/floodplain portion may yield both near-surface and deeply buried cultural deposits. In total, the 1,272-acre (514.8 hectare) Phase Ia project area includes 562 acres (227.4 hectares) (44.2 percent) of high to moderate archaeological potential, 446 acres (180.6 hectares) (35.1 percent) of low archaeological potential, and 263.1 acres (106.5 hectares) (20.2 percent) of disturbance/no archaeological potential. High to moderate potential localities are found in both upland and low terrace/floodplain settings.



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

PROJECT LOCATION



LUZERNE COUNTY, PENNSYLVANIA

LEGEND

- PROJECT AREA - 2008 PHASE Ia
- PROJECT AREA - 2007 PHASE Ia
- UNSURVEYED AREA

0 1,500 3,000 6,000 Feet

FIGURE 5-1
PHASE Ia PROJECT LOCATION

gai consultants

BELL BEND NUCLEAR POWER PLANT
UNISTAR NUCLEAR DEVELOPMENT, LLC.

DRAWN BY: AJW DATE: 05/26/2010
CHECKED: BAM APPROVED: BAM

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Figure 5-2. Phase Ia Project Area showing Archaeological Potential and Possible Cultural Locations

B Size

REDACTED Figure 5-2
Phase Ia Project Area showing
Archaeological Potential and
Possible Cultural Locations

(back of Figure 5-2)

Side 2 of REDACTED Figure 5-2.

Chapter 6. Phase Ib Archaeological Survey

Overview and Objectives

The goals of GAI's Phase Ib archaeological survey were to identify, delineate and evaluate the potential National Register eligibility of previously unrecorded historic and prehistoric sites in the project APE. GAI conducted two Phase Ib studies for the proposed BBNPP project. Initial Phase Ib survey of the approximately 639-acre (258.6-hectare) preferred alternative on the west side of the river was conducted between May and July 2008. Supplemental Phase Ib survey, performed between August and November, 2008, investigated an additional 263 acres (106 hectares) of new project areas abutting the southern and northwestern edges of the initial project area (see Figure 1-2).

The overall Phase Ib study area encompassed approximately 902 acres (365 hectares) of project area west of the river. Table 6-1 presents a summary of total Phase Ib results by test area for both Initial and Supplemental Phase Ib studies. In total, Phase Ib survey of the BBNPP project area included pedestrian ground survey, the excavation of 5,726 STPs, and a program of deep testing (11 trenches and 8 column sample units). This work resulted in the identification of 11 archaeological sites and 25 isolated finds (all located within the initial Phase Ib project area). Descriptions of Initial and Supplemental Phase Ib surveys are presented below and results are summarized at the end of this chapter.

Table 6-1. Summary of Initial and Supplemental Phase Ib Archaeological Survey Results

Area	Pedestrian Ground Survey	# STPs	Deep Testing	Sites	Isolated Finds
Initial Phase Ib (639 acres)					
West Alternative	Yes	2285	--	9	19
Confers Lane Parcel	No	265	--	1	0
Area 6	Yes	713	11 trenches, 8 units	0	1
Area 7	Yes	269	--	1	5
Area 8	No	0	--	0	0
Switchyard 2	No	257	--	0	0
Subtotal Initial Phase Ib		**3,789**	**11 trenches, 8 units**	**11**	**25**
Supplemental Phase Ib (263 acres)					
Lot 4	No	250	--	0	0
Lot 64	No	114	--	0	0
Lot 93F	No	79	--	0	0
Lot 95	No	668	--	0	0
Lot 96	No	19	--	0	0
Lot 97/97C	No	18	--	0	0
Lot 100	No	789	--	0	0
Subtotal Supplemental Phase Ib		**1937**	--	**0**	**0**
Total		**5,726**	**11 trenches, 8 units**	**11**	**25**

Initial Phase Ib Archaeological Survey

Description and Archaeological Potential

GAI's initial Phase Ib survey, conducted between May 19 and July 2, 2008, investigated an approximately 639-acre (259-hectare) preferred project alternative defined by UniStar west of the river. The APE for this study encompassed approximately 630 acres (255 hectares) included within the previous Phase Ia APE, plus the additional 39-acre (15.8-hectare) Switchyard 2 parcel, located to the north and added during the course of Phase Ib fieldwork (see Figure 1-2). Large portions of Phase Ia Areas 6 and 8 were excluded from the Phase Ib project APE. Based on the results of the Phase Ia field reconnaissance, GAI concluded that approximately 350 acres (142-hectares) of the project APE possessed a moderate to high archaeological potential and would require systematic Phase Ib survey. In their June 5, 2008, review letter, PHMC-BHP concurred with GAI's recommendations for a Phase Ib study.

The Initial BBNPP Phase Ib project area was divided into six test areas: the West Alternative, Area 6, Area 7, Area 8, Confers Lane Parcel, and Switchyard 2. The West Alternative, located in an upland setting west of the existing SSES facility and representing the location of the proposed new power generation unit, is the largest of these test areas. GAI defined numerous Phase Ib test sections within each of the five main project areas; no testing was conducted in Area 8, an existing, previously-disturbed railway corridor connecting Areas 6 and 7 and located largely within the SSES facility (see Figure 1-2). The individual test sections varied in size and generally represent separate landforms, changes in land use, or logical divisions reflecting the presence of field boundaries, roadways, or other cultural features (see Figure 1-2). Test sections were numbered sequentially within each area (i.e., West Alternative: Sections 1-24 and 27-31; Confers Lane Parcel: Sections 25 and 26; Area 6: Sections 1-5; Area 7: Sections 1-4; Switchyard 2: Section1). GAI conducted Phase Ib survey within each of these sections.

Figure 1-3 illustrates assessments of archeological potential within the Phase Ib project area and Table 6-2 presents a summary of this information. The project's 350 acres (142 hectares) of moderate to high archaeological potential were located predominantly (89 percent) in upland settings (311 acres/126 hectares); minor amounts occurred in low terrace/floodplain settings (39 acres/16 hectares). The remainder of the project area included approximately 174 (70.4 hectares) of low archaeological potential (e.g., slopes in excess of 15 percent, wetlands or recent deposits) and 115 acres (46.5 hectares) of prior disturbance (no archaeological potential). These areas were excluded from systematic Phase Ib survey. Due to refinements in assessments of archaeological sensitivity, resulting from detailed field observations made during the course of Phase Ib fieldwork, approximately 45.8 acres (18.5 hectares) of uplands assessed with low archaeological potential were also examined by pedestrian ground survey or shovel testing. These areas include 14.8 acres (6.0 hectares) of eroded fields in the West Alternative (Sections 10 and 11), and 31 acres (12.5 hectares) along the edges of wooded wetlands or slopes in the West Alternative (Sections 16, 18, 23 and 28—25.8 acres/10.4 hectares), and Area 6 (Section 5—5.2 acres/2.1 hectares).

Table 6-2. Summary of Archaeological Potential and Previously-Identified Cultural Resources in Phase Ib APE

Area	Total Acres	High-Moderate Potential acres (% total)	Low Potential acres (% total)	Disturbed/ No Potential acres (% total)	Phase Ia-Identified Cultural Resources in Phase Ib APE	Previously-Recorded NRHP-Eligible Cultural Resources in Phase Ib APE
Initial Phase Ib						
West Alternative	408.3	224.7	122.1	61.5	3 sites	0
Area 6	130.1	71.8	22.6	35.7	1 architectural resource (stone walls)	North Branch Canal (141673/GAI 10)
Area 7	27.8	25.9	0	1.9	1 poss house site	Site 36LU0051 North Branch Canal (141673/GAI-10)
Area 8	6.1	0	0	6.1	0	0
Confers Lane	27.4	10.9	6.6	9.9	1 site	0
Switchyard 2	39	16.7	22.4	0	0	0
Subtotal	**638.8**	**350**	**173.7**	**115.1**	**6** **(4 sites, 1 possible site, 1 architectural resource)**	**2** **(1 site, 1 architectural resource)**
Supplemental Phase Ib						
Lot 4	86.8	22.1	63.2	1.5	0	0 *
Lot 64	34.5	7.1	6.9	20.5	0	0
Lot 93F	15.7	7.5	8.2	0	0	0
Lot 95	61.8	39.72	22.1	0	0	0
Lot 96	1.2	1.2	0	0	0	0
Lot 97/97C	1.5	1.5	0	0	0	0
Lot 100	61.1	36.0	15.6	9.5	0	0
Subtotal	**262.5**	**115**	**116**	**31.5**	**0**	**1**
Total	**902**	**465**	**290**	**147**	**6** **(4 sites, 1 possible site, 1 architectural resource)**	**2** **(1 site, 1 architectural resource)***

*Stone Arch Bridge (155054/GAI-06), documented in Lot 4 during GAI's Architectural Survey for the current project, is recommended as NRHP eligible

Initial Phase Ib Field Methods

Phase Ib field methods varied based on project setting (upland versus lowland) and on ground conditions affecting ground surface visibility (poor or good visibility). Field investigations consisted of pedestrian ground survey and shovel testing, as well as a program of deep testing in one low terrace/floodplain locality. Figure 6-1 illustrates methods of Phase Ib survey within each test section.

Upland Settings

The majority of the initial Phase Ib project area occurs in upland settings. In upland portions of the project area with a moderate to high archaeological potential, Phase Ib survey

consisted of pedestrian ground survey or systematic shovel testing to identify near-surface archaeological sites. Pedestrian ground survey was conducted in approximately 96 acres (39 hectares) of previously cultivated fields that had been recently plowed and disked in advance of fieldwork in order to provide good ground surface visibility (Photograph 6-1, see Figure 6-1).

Photograph 6-1. View of Pedestrian Ground Survey in Area 6, Section 5, Facing East

Archaeologists systematically walked these fields along transects spaced at 5-meter intervals. Diagnostic artifacts and a representative sample of nondiagnostic artifacts observed on the surface were plotted on project maps, bagged, and provenienced (Photograph 6-2). Widely dispersed surface artifacts were individually point provenienced. Concentrations of surface artifacts were provenienced within 5-meter surface collection units. Judgmental STPs were excavated in select localities within these fields to document soil stratigraphy and assess the presence of subplowzone cultural deposits.

Photograph 6-2. View of Surface Collection in West Alternative, Section 7, Facing North

Shovel testing was required in approximately 215 acres (87 hectares) of upland fields and woodlands with poor ground surface visibility (Photographs 6-3 and 6-4) (see Figure 6-1). Systematic STPs were excavated at 15-meter (50 foot) intervals within transects spaced 15 meters (50 feet) apart. Judgmental STPs were excavated in select areas to confirm the presence of cultural artifacts, disturbed soils or recent deposits. When a shovel test yielded artifacts, radial STPs were excavated at 5-meter (15-foot) intervals around the initial positive findspot in order to investigate the locality further. In areas of standing structures or archaeological sites, 5-meter (15-foot) interval shovel testing was conducted, where appropriate, to assist in evaluating the resource and to

define site boundaries. GAI excavated 3,491 STPs in upland settings within the Initial Phase Ib APE.

Photograph 6-3. View of Shovel Testing in West Alternative, Section 31 (Site 10), Facing Southeast

Photograph 6-4. View of Shovel Testing in Woodlands, West Alternative, Facing North

STPs measured 50 cm in diameter and were hand-excavated in natural strata to at least 10 cm into the subsoil and 10 cm below the deepest artifact recovery. Excavated soils were screened through 0.25-in (0.6-cm) wire mesh for systematic artifact recovery. Prehistoric and historic artifacts recovered during survey were bagged and labeled with appropriate provenience information. GAI archaeologists recorded results of individual STPs on standardized field forms, noting depths of soil horizons, soil texture and Munsell color, and the presence of artifacts. STP locations were recorded on project maps and were backfilled upon completion.

Identified archaeological resources were recorded on standardized forms, plotted on maps, documented with photographs, and their locations were recorded using mapping grade GPS equipment.

Lowland Settings

Based on the results of Phase Ia reconnaissance, moderate to high potential portions of the project APE in low terrace/floodplain settings (Area 7 and portions of Area 6) were determined to have a potential for both near-surface and deeply-buried archaeological sites. Phone consultation with Steve McDougal (PHMC-BHP) on April 8, 2008, resulted in PHMC-BHP's

concurrence on restricting deep testing to evaluate the potential for deeply-buried archaeological resources to those localities with proposed deep project impacts (i.e., Area 6 floodplain). Due to anticipated shallow impacts resulting from proposed use as a laydown area [personal communication, phone conference with Mark Hunter (UniStar), February 2, 2008; (Document 38-9090613-000)], deep testing was not required in portions of the low terrace/floodplain within Area 7.

In addition to this subsurface testing, GAI documented portions of the previously-recorded North Branch Pennsylvania Canal (141673/GAI-10) located within Areas 6 and 7. In portions of the canal that contain water (e.g., Area 6) GAI recorded the canal with digital photographs. In Area 7, where the canal bed was dry, documentation included both photography and a measured drawing of the canal in cross section. A description of the canal, along with this cross-section, is provided in the architectural survey section of this document (Chapter 20).

Near-Surface Testing

Low terrace/floodplain settings with proposed shallow project impacts were investigated by pedestrian ground survey or systematic shovel testing to evaluate the presence of near-surface archaeological resources. Approximately 18 acres (7 hectares) of recently plowed and disked low terrace/floodplain fields) with good ground surface visibility (Area 7, Sections 1 and 2) were subject to pedestrian ground survey (see Figure 6-1). Judgmental STPs were excavated in select locations within these fields. Systematic shovel testing was conducted in approximately 13 acres (5 hectares) of poor ground surface visibility within the shallow-impact, low terrace/floodplain settings (Area 7, Sections 3 and 4). STPs in these lowland settings were excavated to a depth of 80 cm below ground surface. GAI excavated 298 STPs in low terrace/floodplain portions of the project.

Deep Testing

Deep testing was proposed for portions of Area 6 (Sections 1 and 2), which are expected to be subject to deep impacts from proposed construction of a new intake structure and blow down lines [personal communication, phone conference with Mark Hunter (UniStar), February 2, 2008; (Document 38-9090613-000)]. Deep testing was monitored by Dr. David Cremeens, GAI's Senior Staff Soil Scientist, during site visits in May, June and July 2008. The objective of this testing was to evaluate the potential for deeply-buried cultural resources and determine the depth to Pleistocene deposits in these localities. In Section 1, deep testing was conducted by a combination of backhoe trenching (and soil coring with a drill rig in Section 1, followed by hand-screening of 1x1-meter test unit column samples (Photograph 6-5). In Section 2, initial hand-augering revealed a shallow depth to bedrock (ranging from 42 to 78 cm), unexpected based on topography and on the earlier reconnaissance. The documentation of shallow bedrock negated the need for deep testing in this section and, accordingly, Section 2 was investigated by shovel testing (see Figure 6-1).

Photograph 6-5. Overview of Area 6 (Section 1)* showing *Open Field on Low Terrace/Floodplain Subject to Deep Testing, Facing South

Results of Initial Phase Ib Fieldwork

Phase Ib survey of the Initial BBNPP project area consisted of pedestrian ground survey of 114 acres (46 hectares) of cultivated fields, the excavation of 3,789 STPs, and a program of deep testing (eleven trenches, soil corings, and eight test unit column samples) in a low terrace/floodplain field.

The survey resulted in the identification of eleven archaeological sites (three prehistoric and eight historic) and 25 prehistoric isolated finds, as well as dispersed historic/modern surface artifacts representing non-site field scatters. Table 6-3 presents a summary of Phase Ib survey results by testing location (for both Initial and Supplemental Phase Ib survey). The locations of the eleven identified archaeological sites (Sites 36LU278, 36LU279, 36LU280, 36LU281, 36LU282, 36LU283, 36LU284, 36LU285, 36LU286, 36LU287, and 36LU288) are illustrated on Figure 6-1. The sections below describe field investigations within each of the initial Phase Ib test areas.

Table 6-3. Summary of Phase Ib Archaeological Survey Results by Testing Location

Testing Location	Pedestrian Survey*	# STPs/ Other	# Pos. STPs	Sites	Isolated Finds
INITIAL Phase Ib					
West Alternative					
1	X	4	0	36LU278	IF 1 IF 24 IF 25 IF 27
2	X	4	0	--	--
3	X	4	0	36LU282	IF 6 IF 7 IF 8 IF 9
4	X	4	0	--	--
5	X	4	0	--	--
6	X	4	1	--	IF 2 IF 3 IF 4 IF 5 IF 10
7	X	3	1	36LU279	IF 11 IF 12 IF 14
8	X	3	0	--	--
9	X	4	0	--	--
10	X	4	1	--	--
11	X	4	0	--	--
12	X	3	0	--	IF 15
13	X	4	1	36LU280	--
14	X	4	1	36LU281	--
15	X	4	0	--	--
16	--	417	2	--	--
17	--	201	9	36LU285	IF 22
18	--	392	2	--	--
19	--	117	0	--	--
20	--	111	0	--	--
21	--	115	2	36LU287	--
22	--	140	2	--	--
23	--	229	0	--	--

Testing Location	Pedestrian Survey*	# STPs/ Other	# Pos. STPs	Sites	Isolated Finds
24	--	54	0	--	--
27	--	218	0	--	--
28	--	15	0	--	--
29	--	43	2	--	IF 25
30	--	117	40	36LU283	--
31	--	59	18	36LU286	
Subtotal	*15 sections*	*2285*	*53*	*9*	*19*
Confers Lane					
25	--	70	0	--	--
26	--	195	31	36LU284	--
Subtotal	--	*265*	*31*	*1*	*0*
Area 6					
1	--	Deep Testing (11 trenches/ 8 units)	0	--	--
2	--	29	0	--	--
3	X	3	0	--	IF 16
4	--	449	4	--	--
5	--	232	4	--	--
Subtotal	*1 section*	*713*	*8*	*0*	*1*
Area 7					
1	X	8	1	--	IF 17 IF 18 IF 19 IF 20 IF 21
2	X	134	13	36LU288	--
3	--	58	3	--	--
4	--	69	6	--	--
Subtotal	*2 sections*	*269*	*23*	*1*	*5*
Area 8	--	**0**	**0**	--	--
Switchyard 2	--	**257**	**0**	--	--
Total Initial Phase Ib	***18 sections/ 114 acres***	***3,789 STPs plus deep testing***	***115***	***11 sites***	***25 IFs***
SUPPLEMENTAL Phase Ib					
Lot 4					
1	--	81	0	--	--
2	--	12	0	--	--
3	--	157	0	--	--
Subtotal	--	*250*	*0*	--	--
Lot 64 1		**114**	**0**	---	--
Lot 93F 1		**79**	**0**	--	--
Lot 95					
1	--	424	0	--	--
2	--	226	2	--	--
3	--	18	0	--	--
Subtotal		*668*	*2*	--	--
Lot 96 1	--	**19**	**0**	--	--
Lot 97/97C 1	--	**18**	**0**	--	--

Testing Location	Pedestrian Survey*	# STPs/ Other	# Pos. STPs	Sites	Isolated Finds
Lot 100				--	--
1	--	492	2	--	--
2	--	297	0	--	--
Subtotal		*789*	*2*	--	--
Total Supplemental Phase Ib		***1,937***	*4*	*0 sites*	*0 IFs*
Total Phase Ib	**18 sections/ 114 acres**	**5,726**	**119**	**11 sites**	**25 IFs**

*X=systematic pedestrian ground survey was conducted in section

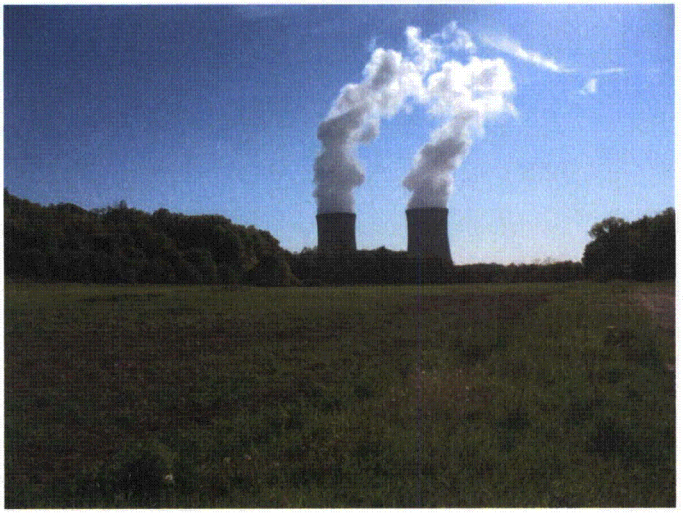
West Alternative

The West Alternative, the largest contiguous test area in the project APE, consists of a 408-acre upland parcel located at the western margin of the project (see Figures 1-2 and 1-3). It is bounded generally by Beach Grove Road to the south, North Market Street to the west, and Confers Lane to the east.

The West Alternative encompasses broad, relatively-level, upland flats, as well as low wetlands, and hilltops with gentle to moderately-steep side slopes and previously disturbed areas. Large cultivated fields occur on the relatively well drained upland flats (Photographs 6-6 and 6-7).

Photograph 6-6. Overview of Broad Upland Fields in West Alternative (Sections 9 and 10), Facing Northeast

Woodlands are located within areas of higher elevation bordering the fields and in wetland areas. An abandoned apple orchard is situated on the hilltop and side slopes in the west central portion of this test area. Walker Run flows through the western edge of this test area and wetlands associated with this stream have been mapped in a large area of fallow fields and woodlands in the southwest quadrant of the West Alternative; wooded wetlands also occur along tributaries extending through the central and northern portions of this parcel. The northeast corner of this test area (west of the intersection of Confers Lane and Beach Grove Road) has been extensively disturbed by former cut and fill activities associated with construction of the existing SSES facility; this disturbed area currently includes buildings, parking areas, and fallow fields. A transmission corridor extends in a northwest/southeast orientation through the northern portion of the West Alternative and connects with the SSES facility.



Photograph 6-7. Overview of Cultivated Fields in West Alternative (Sections 3-6), Facing West

GAI defined and surveyed 29 separate test sections (Sections 1-24 and 27-31) within the West Alternative (see Figure 1-3). These include 26 sections of moderate to high archaeological, as well as three sections (Sections 10, 11 and 28) that were assessed with low archaeological potential during the Phase Ia reconnaissance. Based on detailed field observations during the course of Phase Ib fieldwork, GAI concluded that Phase Ib survey could be conducted within Sections 10 and 11, comprising eroded fields, and within Section 28, a small, relatively well drained, wooded area between Confers Lane and a wetland. In addition, Phase Ib survey was expanded to include a band of low archaeological potential bordering Sections 16, 18 and 23, as it was concluded that areas of wetlands and steep slopes within in this band were discontinuous in nature (see Figure 6-1).

Of the 29 separate test sections, fifteen (Sections 1-15) represent recently cultivated fields and eleven (Sections 19-28 and 30) are wooded. Section 16 includes woodlands and a fallow field; Sections 17 and 29 encompass fallow fields; and Section 18 consists largely of an abandoned apple orchard. Section 31, situated in the western portion of the West Alternative, represents the location of a former farmstead (the Kisner Site/36LU286) located in an open area at the edge of a cultivated field.

During Phase Ib survey, GAI excavated 2,285 STPs and conducted pedestrian ground survey of 85 acres of recently cultivated fields (Sections 1-15) in the West Alternative (see Figure 6-1, see Table 6-3). This work resulted in the identification of nine archaeological sites and 19 Isolated Finds. These sites include seven historic period sites (36LU279, 36LU280, 36LU281, 36LU283/Sink Site, 36LU285/Johnson-Folk Barn Site, 36LU286/Kisner Site, and 36LU287) and two prehistoric lithic scatters (36LU278 and 36LU282) (see Figure 6-1, see Table 6-4). The historic period sites include six domestic sites or farmsteads and one historic artifact scatter. They are located in proximity to roadways (Confers Lane, North Market Street, Beach Grove Road or farm lanes) in the southeast, west and northern portions of the West Alternative. The two prehistoric lithic scatters represent low density surface artifact scatters identified during pedestrian ground survey of cultivated fields in the western portion of the West Alternative (Sections 1 and 3). These sites are summarized at the end of this chapter and are described in individual site chapters (Chapters 9-14 and 16-18).

Confers Lane Parcel

The Confers Lane Parcel is a 27.4-acre upland area flanking the east edge of Confers Lane, immediately opposite the West Alternative (see Figures 1-2 and 1-3). It is bordered by the existing SSES facility to the north and east, Confers Lane to the west, and a pond and wetland to the south. This parcel includes woodlands and areas of open, overgrown clearings. It is relatively level, with a steep wooded slope associated with the adjacent SSES facility in its extreme northeast corner. An area of construction disturbance is located in the center of the

parcel and a building and parking lot lie near its northern edge. Wooded wetlands occur in the northern portion as well as at the southern edge of this area (where a pond is also located). A narrow paved access land extends southeast from Confers Lane to a clearing near the south central portion of this test area (Photograph 6-8).

Photograph 6-8. Confers Lane Parcel* showing *Paved Access Road and Woodlands, Facing Southeast

GAI identified and conducted shovel testing in two areas of moderate to high archaeological potential in the Confers Lane Parcel (Sections 25 and 26) (see Figure 6-1). (Note that these sections were numbered and surveyed in conjunction with survey of the West Alternative.) A total of 265 STPs were excavated within this parcel, resulting in the identification of one historic period archaeological site (36LU284/Shortz Site) (see Table 6-3). This domestic site is located in the southern, wooded portion of the parcel (Section 26) and includes a brick well/cistern and a shallow surface depression, possibly representing the location of a former structure.

Area 6

Area 6 is a 103.1-acre parcel that encompasses both upland settings immediately south and east of the SSES facility and low terrace/floodplain settings along the river, east of US Route 11 (see Figures 1-2 and 1-3). The upland portion of Area 6 includes a transmission corridor extending southward from the SSES facility to US Route 11, as well as a cultivated field, a fallow field, and woodlands to the southeast and east of the plant (Photograph 6-9).

Photograph 6-9. Upland Portion of Area 6* showing *Pedestrian Ground Survey of Cultivated Field (Section 3) with Disturbance to the South and Transmission Line and Switchyard in Background, Facing West

The edge of Area 6 bordering the plant has been disturbed by prior construction. The low terrace/floodplain portion of Area 6 includes an open grassy field, adjacent to the river, woodlands, wetlands, and areas of disturbance resulting from construction of the existing SSES intake structure. This lowland area is cut by three north/south oriented linear

resources—US Route 11 (155056/GAI-12), the Delaware, Lackawanna & Western Railway (155053/GAI-11), and the North Branch Pennsylvania Canal (141673/GAI-10). All three of these architectural resources were documented during GAI's architectural survey of the project area; only one resource, the North Branch Pennsylvania Canal, has been recommended eligible for listing in the NRHP (see discussion in Chapter 20 of this document).

GAI defined five localities of moderate to high archaeological potential within Area 6 (Sections 1-5) (see Figure 1-3). Sections 1 (open, overgrown field) and 2 (woodland) are situated in the eastern, lowland portion of this test area. Sections 3-5 occur in upland settings and include one recently cultivated field (Section 3), one largely overgrown transmission line corridor (Section 4), and one fallow field and adjacent woodland (Section 5). Section 4, representing the transmission line corridor, included a 6.8 acre (2.7 hectare) portion of a cultivated field for which access had not been obtained at the time of initial Phase Ib fieldwork; this "stay-off" property was surveyed during the course of subsequent Supplemental Phase Ib investigations, following receipt of property access.

Phase Ib investigations consisted of the excavation of 713 STPs, pedestrian ground survey of one approximately 11-acre cultivated field (Section 3) and deep testing in Section 1, open field adjacent to the river and south of the existing intake structure (see Figure 6-1, see Table 6-3). These investigations identified one Isolated Find (IF 16) in Section 3.

The stone walls (GAI-02) observed in Area 6, Section 5 during Phase Ia reconnaissance were documented by GAI's architectural survey. Phase Ib shovel testing was also conducted in the vicinity of these walls and this work yielded no artifacts or further evidence of structural remains. No archaeological site was identified in this locality. These parallel stone walls likely represent a boundary marker and were determined by PHMC-BHP to be not eligible for listing in the NRHP (June 5, 2008 letter, see Appendix A). No further investigation of this resource is required.

Area 6, Section 1 consists of an approximately 8-acre (3.2-hectare) fallow field adjacent to the Susquehanna River. It has a mounded surface topography, with the highest elevation in its south-central portion. This field was vegetated in tall grass and brush and was bordered by a screen of trees to the east, along the riverbank, and by wooded wetlands to the north, south and west. The North Branch Pennsylvania Canal lies within the wetland area west of the field and an unnamed drainage marks its northern end. Eleven trenches (six with soil corings in their base) were mechanically excavated (using a trackhoe) to expose soil stratigraphy and permit an assessment of the locality's potential for deeply-buried cultural deposits (Figure 6-2). Soil profiles were recorded for each backhoe trench and are provided in Appendix G.

Deep testing began with the excavation of five initial trenches (BHTs 1-5), placed in a staggered north-south transect across the field, and extending to a maximum depth of a 4.2 meters (13.8 feet) or, in one trench, to bedrock (encountered at 1.2 meters/3.9 feet below surface) (Photographs 6-10 and 6-11). These trenches exposed an unanticipated 1.0 to 4.0-meter- (3.3 to 13.1-foot) thick surface fill deposit above natural soils.

Because of the depth necessary to expose natural soils and evaluate the depth of Pleistocene deposits, a second set of six trenches (Trenches 6-11) was excavated approximately 1.0 to 2.0 meters (3 to 7 feet) into the fill and a track-mounted drill rig was used to collect a continuous sample soil core in the base of each trench (see Figure 6-2, Photograph 6-12). Cores were collected to a maximum depth of 8.5 meters (27.9 feet) below ground surface. As documented in the soil borings, the natural soils underlying the surface fill deposit consisted of a single soil profile [Ab-(BE)-Bt(x)-BC] developed on an alluvial terrace. No buried soils were

observed below the surface of the terrace. Pleistocene deposits were not observed in any of the cores. The depth to bedrock, encountered at the base of the soil borings, ranged from 5.9 to 8.5 meters (19.4 to 27.9 feet).

Photograph 6-10. Deep Testing in Area 6, Section 1, showing Mechanical Excavation of Trench, Facing South

Photograph 6-11. Deep Testing in Area 6, Section 1, showing Upper Fill Deposit Exposed in Profile of Trench, Facing South

Photograph 6-12. Deep Testing in Area 6, Section 1, showing Drill Rig Excavating a Soil Coring in Base of Trench, Facing North

Based on the results of a June 19, 2008 phone consultation with Steve McDougal (PHMC-BHP), natural soils below the surface fill were sampled with eight mechanically-excavated 1x1-m test unit column samples (TUs 1-8). These eight test localities were situated along a proposed 30-meter (100-foot)-wide right-of-way corridor extending north-south through the central portion of the field, and then turning eastward to continue to the riverbank [personal communication, phone conference with Michael Cain (PPL), June 16, 2008 (Document 38-9090613-000)] (see Figure 6-2). In each location, a trackhoe was first used to excavate a trench through the fill and into the underlying natural soils. A unit was positioned along the side of the excavated trench. At each test location, the approximately 4.0-meter (13-foot)-thick surface fill deposit was mechanically removed as a single layer and the 1x1-meter (3x3-foot) column sample was then mechanically-excavated in 20-cm (8-inch) levels from the lower portion of the fill deposit to the BC horizon or bedrock (approximately 1 meter/3 feet of excavation). Soils from each 20-cm (8-inch) level were placed on plastic sheeting in separate, labeled piles, adjacent to the trench (see Photograph 6-13). Soils from each level were hand-screened and recovered artifacts were bagged by provenience. Standardized excavation forms were completed for each level. A profile was drawn of one wall of each unit. Soil profiles were recorded for each test unit column sample and are presented in Appendix G. Following the completion of hand-screening, each test location was mechanically backfilled. Due to the unconsolidated nature of the thick, surface fill layer, many of these units experience slumping prior to backfilling.

Photograph 6-13. Site 36LU288: Area 6, Section 1, Mechanically Excavated Piles of Soil from TU 7 Column Sample

The Phase Ib program of deep testing in Area 6, Section 1 identified no archaeological sites. Importantly, deep testing determined that this field is capped by up to 4.2 meters (13.8 feet) of fill material. Scattered historic/modern artifacts were recovered from fill deposits and the upper portion of the former ground surface (now buried by up to 4.2 meters/13.8 feet of fill) in trenches and column samples. Two prehistoric artifacts (one early stage biface fragment and one piece of debitage) were also found in a fill deposit immediately above shallow bedrock (Test Unit 3). Due to their disturbed context, these artifacts do not represent historic or prehistoric archaeological sites and were recorded as non-site materials (see Non-site Artifact Catalog in Appendix H). Additionally, deep testing documented no buried soils below the single ground surface lying between the surface fill deposit and the top of bedrock. Many of the soil corings exposed Cg horizons suggesting the presence of marshy or swampy conditions in the area, perhaps associated with an abandoned stream channel. These deposits do not represent a dry land surface that was stable for any period of time. The results of deep testing indicate that any cultural resources found in Area 6, Section 1 are expected to be associated with the natural soil (Ab-Bxb-BC) found immediately below the fill mantle. Based on the presence of a weakly-developed fragipan (Bx) subsoil, the age of the

low terrace landform in Area 6, Section 1 is estimated to date to the mid-Holocene (4000 to 6000 years old).

Area 7

Area 7 represents a low terrace/floodplain setting along the west bank of the river, in the northeastern corner of the project APE (see Figures 1-2 and 1-3). The North Branch Pennsylvania Canal (141673/GAI-10) extends through the western portion of this 27.8-acre (11.3-hectare) test area, separating a fallow field and woodland to the west from two large, adjacent cultivated fields to the east. A narrow paved access road for the Susquehanna Riverlands Environmental Preserve bounds the southern edge of Area 7, near its southwest corner. All of Area 7 was considered to have a moderate to high archaeological potential.

Four test sections (Sections 1-4) were identified and surveyed in Area 7 during Phase Ib investigations (see Figure 1-2). Sections 1and 2 represent cultivated fields (Photograph 6-14), while Sections 3 and 4 consist of a fallow field and a wooded lot, respectively. As noted above, although this lowland setting has a potential for both near-surface and deeply buried cultural materials, due to the shallow nature of proposed project impacts, no deep testing was required (see Figure 6-1).

Photograph 6-14. View of Area 7 (Section 1)* showing *Cultivated Field on Low Terrace/Floodplain, Facing Northeast

Phase Ib survey of Area 7 included excavation of 269 STPs and pedestrian ground survey of 18 acres of cultivated fields (Sections 1 and 2) (see Table 6-3). This work resulted in the identification of one prehistoric archaeological site (36LU288) in Section 1 and five prehistoric Isolated Finds (IFs 17-21) in Section 2. Based on Phase Ib results, Site 36LU288 represents a low density, multicomponent prehistoric lithic scatter. This site is summarized below and a site description is presented in Chapter 19.

A possible archaeological site (house site), suggested by a clearing with evergreen trees, was mapped in Area 7 (Section 4) during Phase Ia reconnaissance of the project. Phase Ib shovel testing in this locality produced no artifacts and uncovered no evidence of structural remains or features. Furthermore, historic map research indicates no structure in this locality. Accordingly, this locality does not represent an archaeological.

The majority of the North Branch Pennsylvania Canal (141673/GAI-10) located in Area 7 consists of a dry canal bed, overgrown with vegetation (Photograph 6-15). The canal prism at the southernmost edge of Area 7 retains shallow water, while directly south of the paved access road, the portion of the canal within the Susquehanna Riverlands Environmental Preserve is fully watered. During Phase Ib survey, GAI documented the canal with photographs and also recorded a cross section of the canal with a measured drawing. A

description of the canal, along with this cross section, is provided in the Architectural Survey section of this document (Chapter 20).

Photograph 6-15. View of North Branch Pennsylvania Canal in Area 7* showing *Dry Canal Prism, Facing Southwest

Area 8

Area 8 comprises a narrow rail spur corridor extending northeastward from the upland portion of the SSES facility to join the railway on the low terrace/floodplain, near the PPL Susquehanna Energy Information Center (see Figures 1-2 and 1-3). This entire 6.1 acre area has been subject to previous disturbance associated with railway construction and development of the existing power plant (see Figure 6-1). No Phase Ib investigations were conducted within this locality.

Switchyard 2

Switchyard 2 is a 39-acre upland parcel located north of Beach Grove, opposite the intersection of Confers Lane and Beach Grove Road, which marks the boundary between the project's West Alternative and the existing SSES facility (Figures 1-2 and 1-3). Switchyard 2 is bisected by a northwest/southeast oriented transmission corridor (Photograph 6-16). The southern portion of this test area occupies a steep wooded hillside, while its northern portion lies on a relatively level to gently sloping, wooded hilltop.

GAI conducted Phase Ib shovel testing within the largely wooded hilltop (Section 1) in the northern portion of Switchyard 2 (see Figure 6 -1). The 257 STPs excavated in this locality produced no artifacts and resulted in the identification of no archaeological sites (see Table 6-3).

Photograph 6-16. Switchyard 2* showing *Shovel Testing in Transmission Line Corridor, Facing Southwest

Supplemental Phase Ib Archaeological Survey

Description and Archaeological Potential

Supplemental Phase Ib survey was conducted of approximately 263 acres (106 hectares) of new project localities added subsequent to completion of the Initial Phase Ib survey in July 2008. The supplemental project area consisted of seven lots (Lots 4, 64, 93F, 95, 96, 97/97C, and 100) located in upland settings south and west of the initial project area (see Figure 1-2, Photographs 6-17 and 6-18). Six of seven lots in the Supplemental Phase Ib APE were situated south of Area 6 and the existing SSES facility, while one lot (Lot 4) occurred at the northwest corner of the project's West Alternative. These lots varied from large cultivated fields (e.g., Lot 100) to small residential parcels (e.g., Lots 96 and 97/97C). Supplemental Phase Ib field archaeological fieldwork of these new project localities was conducted primarily between August 5 and September 11, 2008, with a return field visit on November 13, 2008 to survey one initial stay-off property (Lot 97/97C).

Photograph 6-17. Overview of Project Area in Cornfield, Lot 100, Facing North

Photograph 6-18. Overview of Project Area in Fallow Field, Lot 4, Facing South

GAI evaluated archaeological potential within the Supplemental Phase Ib APE based on a review of project mapping, the results of previous background research, and observations and evaluations of adjacent parcels during Phase Ia and Phase Ib investigations of the initial BBNPP project area (see Figure 1-3). 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 a Phase Ib archaeological survey 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 testing during Phase Ib investigations. Disturbed localities were determined to have no archaeological potential and were excluded from further investigation. Due to the upland setting of the project APE, archaeological sites were anticipated to be near-surface in nature; the project area has no potential for deeply buried sites.

GAI's August 6, 2008, Supplemental Phase Ib Scope of Work (see Appendix B) was based on project mapping (BBNPP, Wetland Impact Plan, Current Design, Sargent & Lundy, 6/26/08) provided by Peter Gluckler (AREVA) on July 1, 2008 (AREVA Document 38-9079793-002, AREVA Document 38-9080315-001, and AREVA Document 38-9084011-001) and on instructions from Peter Vlad (UniStar) (July 16, 2008, email). The scope estimated that the Supplemental Phase Ib APE comprised 235 acres (95 hectares) consisting of approximately 197 acres (80 hectares) of moderate to high archaeological potential, 30 acres (12 hectares) of low potential, and 8 acres (3 hectares) of disturbance/no potential. Estimates of both project size and archaeological potential were revised during the course of Phase Ib fieldwork. As directed by representatives of AREVA and UniStar [Chuck Thompson (Kleinfelder), August 18, 2008, personal communication, and Peter Gluckler (AREVA), September 2, 2008, email—AREVA Document 38-9079793-002, AREVA Document 38-9080315-001, and AREVA Document 38-9084011-001], the project APE was expanded to include Lot 93F and the southern portion of Lot 95, resulting in a total Supplemental Phase Ib project APE of 262.6 acres (106.3 hectares).

Assessments of archaeological potential were refined based on detailed, on-the-ground field observations made during the course of Phase Ib fieldwork (i.e., recent quarrying and topsoil removal disturbances in Lots 64 and 100) as well as the results of a wetlands survey conducted by Normandeau Associates (AREVA Document 38-9092360-000), which delineated additional wetland localities (characterized by low archaeological potential) within the supplemental project APE (i.e., in Lots 64 and 100).

In total, GAI identified 115 acres (46.5 hectares) of moderate to high archaeological potential within the 263-acre (106-hectare) project APE (see Table 6-3) requiring systematic Phase Ib survey (see Table 6-2). Also investigated during the course of fieldwork was one 6.8-acre (2.75-hectare) stay-off property defined during Initial Phase Ib as part of Area 6, Section 4 (transmission corridor). This parcel was tested along with Lot 100, Section 1, but its acreage is included in the Initial Phase Ib APE.

GAI defined test sections within each lot, representing separate areas of moderate to high archaeological. Test sections were numbered sequentially within each lot (i.e., Lot 4: Sections 1-3; Lot 64: Section 1; Lot 93F: Section 1; Lot 95: Sections 1-3; Lot 96: Section 1; and Lot 100: Section 1-2) (see Figure 1-3). A summary of Supplemental Phase Ib survey results by test section is presented in Table 6-3.

Also included within the footprint of the Supplemental Phase Ib project area are seven architectural and historical resources mapped during GAI's architectural survey for the current project (Table 6-4). These seven resources include one resource (Stone Arch Bridge; 155054/GAI-06) recommended as eligible to the NRHP (see discussion in Chapter 20). Three of these seven GAI-surveyed architectural and historical resources are located in Lot 4. Lots 64, 93F/95, 96 and 100 each contain a single resource.

Table 6-4. GAI-Surveyed Architectural Resources within Supplemental Phase Ib APE

Resource Number	Name	Address	Resource Type	Date	NRHP Recommendation	Location within APE
155059 (GAI-05)	Hummel Farmstead	371 Beach Grove Rd, Salem Twp.	Farmstead	c1890	Not Eligible	Lot 4
155054 (GAI-06)	Stone Arch Bridge	Beach Grove Rd. at Stone Church Rd., Salem Twp.	Bridge	c1935	Potentially Eligible, Criterion C	Lot 4
155056 (GAI-12)	Susquehanna and Tioga Turnpike	US Rt. 11, Salem Twp.	Highway	1807-1810	Not Eligible*	Lot 93F Lot 95
155061 (GAI-14)	House	49 Bell Bend Rd., Salem Twp.	House	c1875	Not Eligible	Lot 64
GAI-15	House	65 Bell Bend Rd., Salem Twp.	House	c1880	Not Eligible	Lot 100
GAI-24	House	1069 Salem Blvd., Salem Twp.	House	c1925	Not Eligible	Lot 96
GAI-52 (135820)	Bridge	N. Market St., Salem Twp.	Bridge	1937	Not Eligible	Lot 4

*Initially recommended Eligible by GAI but determined Not Eligible by PHMC-BHP

Supplemental Phase Ib Field Methods

Due to poor ground surface visibility throughout localities of moderate to high archaeological potential in the Supplemental Phase Ib project APE, systematic shovel testing was required within all test sections (see Figure 6-1). Previously cultivated fields (whether fallow or planted in corn) could not be plowed and disked, accordingly, pedestrian ground survey of these areas could not be conducted.

At the time of fieldwork, the majority of cultivated fields in the project APE were planted in corn, which reached heights of 2.4 to 3.0 meters (8 to 10 feet). Due to the unanticipated density of these cornfields, it was necessary to first clear transects through the cornfields to permit access for subsequent shovel testing (Photograph 6-19). Beginning with Lot 100, GAI archaeologists initially attempted to hand-clear transects using machetes. When this process proved too time-consuming, and potentially dangerous, a bobcat with a brush hog attachment was employed to clear these transects mechanically (Photograph 6-20). Cleared transects were spaced at 15-meter (50-foot) intervals; they averaged 1.5 meters (5 feet) in width and extended for the length of the field. GAI archaeologists used a compass to help the machine operator maintain each transect's orientation during mechanical clearing. Following completion of clearing activities, shovel testing was conducted within these transects. Shovel test pits were excavated as described for initial Phase Ib survey above.

Photograph 6-19. Hand-Clearing of Densely-Planted Corn in Lot 100, Facing North

Photograph 6-20. Machine-Clearing of Transect through Cornfield in Lot 100, Facing North

Results of Supplemental Phase Ib Fieldwork

GAI's Phase Ib survey of the Supplemental BBNPP project area involved the excavation of 1,937 STPs (see Table 6-3). Only four of these STPs were positive, producing just four historic artifacts (3 fragments of glass and 1 ceramic sherd). These artifacts represent field scatters or roadway scatters. No archaeological sites or isolated finds were identified within the project APE. Table 6-3 presents a summary of Phase Ib survey results by testing location. A brief description of testing within each lot is provided below.

Lot 4

Lot 4 is located at the northwest corner of the project's West Alternative, at the intersection of Beach Grove Road and North Market Street (see Figures 1-2 and 1-3). It encompasses steep wooded hillsides to the north of Beach Grove Road and woodlands, open fallow fields, and wetlands to the south of Beach Grove Road (Photograph 6-21). Walker Run bisects the western half of this lot. As indicated in Table 6-4, Lot 4 contains three architectural resources [155059 (GAI-05), 155054 (GAI-06) and 135820 (GAI-52)] recorded during GAI's architectural

survey for the current project (Munford and Tuk 2008). The Hummell Farmstead (155059/GAI-05) is located north of the roadway intersection (Photograph 6-22). The farmstead's yard was disturbed by landscaping and not subject to shovel testing. The stone arch bridge (155054/GAI-06) (Photograph 6-23) and the concrete bridge (135820/GAI-52) both span Walker Run in this area. Of these three resources, only the stone arch bridge (155054/GAI-06) is recommended as potentially eligible for listing in the NRHP (see Table 6-4). A discussion of these resources is provided in Chapter 20 of this document and an Updated PHRS form for 155054 (GAI-06) is included in Appendix E.

Photograph 6-21. Lot 4, Section 1, showing Overgrown Fallow Field, Facing Northeast

Photograph 6-22. Lot 4, View of Hummel Farmstead (155059/GAI-05) from North Market Street, Facing North

Photograph 6-23. Lot 4, Stone Arch Bridge (155054/GAI-06), Facing Northeast

GAI conducted Phase Ib survey in three localities (Sections 1-3) within Lot 4 (see Figure 6-1). Section 1 consists of an overgrown fallow field located southeast of the intersection of Beach Grove Rd and North Market Street (see Photograph 6-21). A garage sits adjacent to the roadway intersection. Section 2 represents a small wooded hilltop in the southeast corner of Lot 4. Section 3, situated in the southwest corner of Lot 4, includes an overgrown fallow field (to the east) and woodland (to the west).

GAI excavated 250 STPs in Lot 4 (see Table 6-3). This work produced no artifacts and identified no archaeological sites.

Lot 64

Lot 64 is located in an upland setting along the southern edge of Area 6, east of the transmission corridor (see Figures 1-2 and 1-3). Supplemental Phase Ib shovel testing was conducted in a cornfield (Section 1) in the eastern half of this lot (Photograph 6-24). Disturbances in the western portion of this lot include an active rock quarry and an area of recent topsoil removal, which, according to the landowner, occurred within the past year (personal communication, Mr. Dotzul, August 2008) (Photograph 6-25). The eastern end of the lot consists of wetlands and steep slopes, as well as an area of residential disturbance (along Bell Bend Road). A house (155061/GAI-14) recorded during GAI's architectural survey and recommended as not eligible to the NRHP, lies within the eastern end of Lot 64 (see Table 6-4).

Photograph 6-24. Lot 64 showing Disturbed Area of Topsoil Removal in Foreground and Section 1 Cornfield in Distance, Facing East

Photograph 6-25. Lot 64 showing Disturbed Area of Recent Topsoil Removal and Rock Quarry in Distance, Facing West

GAI conducted Phase Ib survey in one large cornfield (Section 1) located in the central portion of Lot 64 (see Figure 6-1). The 114 STPs excavated in this area produced no artifacts and resulted in the identification of no archaeological sites (see Table 6-3).

Lot 93F

Lot 93F, added to the project area during the course of fieldwork, represents a portion of an existing transmission corridor extending southward from US Route 11 to the railroad tracks (see Figures 1-2 and 1-3). The northern half of this parcel consists of a fallow field vegetated in overgrown grass and brush (Photograph 6-26); the southern half is steeply sloping woodland. The installation of transmission towers, and the construction and use of gravel access roads and several ATV tracks have resulted in limited localized disturbances within this parcel. US Route 11 (also known as the Susquehanna and Tioga Turnpike) (155056/GAI-12), bounding the northern edge of Lot 93F, was recorded during GAI's architectural survey. This roadway was recommended as initially recommended NRHP-eligible, but based on further investigation and PHMC-BHP review comments it has been determined Not Eligible for listing in the NRHP (see Table 6-4, see discussion in Chapter 20).

GAI excavated 79 STPs in the relatively level northern portion of this lot (Section 1) (see Figure 6-1); no artifacts were recovered (see Table 6-3).

Photograph 6-26. Lot 93F, Section 1,* showing *Overgrown Fallow Field within Existing Transmission Corridor, Facing South

Lot 95

Lot 95 borders the western edge of the transmission corridor (Area 6) and extends both north and south of US Route 11 (see Figures 1-2 and 1-3). GAI conducted Phase Ib shovel testing in three areas of moderate to high archaeological potential (Sections 1-3) within this upland parcel (see Figure 6-1). The portion of Lot 95 north of U.S. Route 11 consists largely of cornfields (Section 1) (Photograph 6-27), with a wooded wetland along its northern and western edges. A small, relatively well-drained, wooded area (Section 3) lies in the northeast corner. South of the roadway, this parcel encompasses a cornfield and a fallow field (Section 2) (Photograph 6-28). South of these cultivated fields, a steep wooded slope descends to the railroad track. Disturbances within this lot consist of cultivation and field access roads.

US Route 11 (the Susquehanna and Tioga Turnpike) (155056/GAI-12), marks the northern edge of Section 2 (Photograph 6-29). As noted above, this resource was initially recommended as NRHP-eligible but has been determined Not Eligible for listing in the NRHP by PHMC-BHP (see Table 6-4, see discussion in Chapter 20.

Photograph 6-27. Lot 95, Section 1, showing Shovel Testing in Cleared Transect through Cornfield, Woodland in Distance, Facing West

Photograph 6-28. Lot 95, Section 2, showing Shovel Testing in Fallow Field, Facing South

Photograph 6-29. Lot 95 showing US Route 11 (Susquehanna and Tioga Turnpike) (155056/GAI-12) at Northern Edge of Section 2 Cornfield, Facing South

GAI excavated 668 shovel tests in Lot 95 (see Table 6-3). Two positive STPs in Section 2 (cornfield south of U.S. Route 11) each produced a single artifact (1 fragment of glass and 1 historic ceramic). Radial shovel testing in these localities yielded no additional artifacts. These artifacts are concluded to represent modern/historic field or roadway scatter. No archaeological sites were identified in Lot 95.

Lot 96

Lot 96 is a residential parcel, situated along the north edge of US Route 11, immediately west of the existing transmission corridor (Area 6) (see Figures 1-2 and 1-3, Photograph 6-30). This property contains GAI-24, an architectural resource consisting of three abandoned structures (a circa-1925 dwelling, a garage and a garage/shed) and recommended as not eligible for listing in the NRHP (see Table 6-4, see discussion in Chapter 20). A lawn and a border of pine trees surround the structures. Disturbances within Lot 96 include residential construction, landscaping, gravel driveways, and the installation and removal of a pool (behind the house). GAI excavated 19 STPs in this area (see Figure 6-1, see Table 6-3). No artifacts were recovered and no archaeological sites were identified in Lot 96.

Photograph 6-30. Lot 96, Section 1, showing GAI-24 (Abandoned Dwelling and Garage), Facing North

Lot 97/97C

Lot 97/97C consists of adjoining residential parcels situated north of Route 11, immediately west of Lot 96 (see Figures 1-2 and 1-3). A dwelling, less than 50 years of age, is located on this lot (Photograph 6-31). Due to lack of property access, Lot 97/97C was not investigated during the August through September fieldwork. Following notification that property access was granted (November 11, 2008, email from Rick Williamson, AREVA), GAI returned to the project area on November 13, 2008, to survey this parcel. Eighteen STPs were excavated in Lot 97/97C. Shovel testing produced no artifacts and revealed no archaeological sites in this lot (see Table 6-3).

Photograph 16-31. Lot 97/97C, showing Residence, Facing East

Lot 100

Lot 100 occupies a broad upland flat south of Lot 64 and the Confers Lane Parcel, and extending eastward from the West Alternative to Bell Bend Road (see Figures 1-2 and 1-3). An existing transmission line corridor (Area 6) bisects its western half. This parcel includes extensive cornfields (Photograph 6-32). Wetlands are located in its northwest corner and along a small drainage crossing its central portion. The eastern end of Lot 100 encompasses an active quarry (Photograph 6-33), steep wooded wetlands, and residential properties. Disturbances within this lot include cultivation, quarrying, installation of transmission towers, and limited residential-related construction. GAI-15, a residential property recorded during GAI's architectural survey, is located at the eastern end of Lot 100 along Bell Bend Road; this property has been determined Not Eligible for listing in the NRHP (see Table 6-4, see discussion in Chapter 20).

Photograph 6-32. Lot 100, Section 1, Shovel Test Transect in Cornfield, Facing North

Photograph 6-33. Lot 100, View of Quarry at Eastern Edge of Section 2, Facing Southwest

GAI identified and surveyed two areas of moderate to high archaeological potential (Sections 1-2) within Lot 100 (see Figure 6-1). Section 1 represents the cornfield covering the western two-thirds of the parcel and spanning the transmission corridor; Section 2 consists of the cornfield in the eastern one-third of the lot. Section 1 included a 6.8-acre (2.75-hectare) portion of the cornfield located within the existing transmission corridor right-of-way that had been defined as a "stay-off" property (within Area 6) during the initial Phase Ib survey, due to lack of property access. Access was obtained following the completion of Initial Phase Ib fieldwork and, therefore, GAI conducted survey of this area during Supplemental Phase Ib investigations of Lot 100, Section 1.

Supplemental Phase Ib survey in Lot 100 consisted of the excavation of 789 STP (see Table 6-3). Two positive STPs were found in Section 1, each yielding a single fragment of glass (see Table 6-3). Radial shovel testing at these two dispersed localities produced no additional artifacts. These artifacts are concluded to represent modern/historic field scatter; they do not constitute archaeological sites. No archaeological sites were identified in Lot 100.

Summary of Phase Ib Archaeological Survey

The overall BBNPP Phase Ib project APE comprised 902 acres (365 hectares), including the 639-acre (259-hectare) Initial Phase Ib study area and the 263-acre (106-hectare) Supplemental Phase Ib project area. The total Phase Ib project APE included approximately 465 acres (188 hectares) of moderate to high potential, 290 acres (117 hectares) of low archaeological potential and 147 acres (59 hectares) of disturbance. Phase Ib fieldwork was conducted within the 465 acres (188 hectares) of moderate to high potential as well as approximately 45.8 acres (18.5 hectares) of eroded fields and woodlands at the edges of wetlands or slopes that were initially characterized as low potential. GAI Phase Ib fieldwork included the excavation of 5,726 STP, pedestrian ground survey of 114 acres of cultivated fields and a program of deep testing in one low terrace/floodplain locality.

Phase Ib survey produced a total of 2,171 artifacts (2089 historic specimens and 82 prehistoric lithics) and resulted in the identification of eleven archaeological sites and 25 prehistoric Isolated Finds, as well as dispersed historic/modern artifacts representing field scatters. Of the eleven sites, eight are historic period sites and three are prehistoric.

Identified Archaeological Sites

The eleven archaeological sites identified during Phase Ib survey include Sites 36LU278, 36LU279, 36LU280, 36LU281, 36LU282, 36LU283, 36LU284, 36LU285, 36LU286, 36LU287, and 36LU288. Table 6-5 presents a summary of Phase Ib testing results and recommendations for each site. All eleven sites are situated within the Initial Phase Ib project APE. The eight historic period sites all occur in upland settings in the western portion of the project—seven sites in the West Alternative (36LU278, 36LU279, 36LU280, 36LU281, 36LU282, 36LU283, 36LU285, 36LU286, and 36LU287) and one site in the Confers Lane Parcel (36LU284). Based on the results of Phase survey the historic sites represent five domestic occupations, two farmsteads, and one artifact scatter.

The three prehistoric sites consist of two small low-density lithic scatters (36LU279 and 36LU282) and one large, low density lithic scatter or camp (36LU288). Both of the small lithic scatters are located in upland settings within the West Alternative, while Site 36LU288 occupies a low terrace/floodplain in Area 7, along the west bank of the river.

Based on the results of Phase Ib investigations, GAI recommended that seven of the eleven identified sites are potentially eligible for listing in the NRHP. These include six historic sites (Sites 36LU279, 36LU280, 36LU281, 36LU283, 36LU285, and 36LU286) and one prehistoric site (Site 36LU288). Site avoidance or Phase II National Register Evaluations were recommended for each of these seven localities. The remaining four sites (36LU278, 36LU282, 36LU284 and 36LU287) were recommended Not Eligible and no further work was recommended for these localities. PHMC-BHP reviewed preliminary Phase Ib results presented in GAI's Phase Ib Management Summary (Munford and Tuk 2008) and in a March 2, 2009 review letter (see Appendix A) concurred with GAI's recommendations on site eligibility and further work.

Table 6-5. Identified Archaeological Sites: Phase Ib Summary and Recommendations

Site #	GAI Site #	Site Name	Area	Section	Setting	Landform	Dimensions (m)	Artifacts (Prehist)	Artifacts (Hist)	Site Type	Age	Phase Ib NRHP Eligibility Recommendations	Recommenda-tions
36LU278	1	--	West Alt	1	Upland	Hillside	3x21	3	--	Lithic Scatter	Unknown Prehistoric	Not Eligible	No Further Work
36LU279	2	--	West Alt	7	Upland	Broad Flat	38x76	--	159	Domestic Site	Early to Mid 19th	Potentially Eligible	Avoid/Phase II
36LU280	3	--	West Alt	13	Upland	Broad Flat	20x20	--	107	Domestic Site	Early 19th to Mid 20th c	Potentially Eligible	Avoid/Phase II
36LU281	4	--	West Alt	14	Upland	Broad Flat	30x45	--	366	Domestic Site	Mid 19th to Early 20th c	Potentially Eligible	Avoid/Phase II
36LU282	6	--	West Alt	3	Upland	Broad Flat	5x5	2	--	Lithic Scatter	Unknown Prehistoric	Not Eligible	No Further Work
36LU283	7	Sink Site	West Alt	30	Upland	Broad Flat	52x145	--	386	Farmstead	Late 19th to Mid 20th c	Potentially Eligible	Avoid/Phase II
36LU284	8	Shortz	Confers Lane	26	Upland	Broad Flat	122x168	--	135	Domestic Site	Mid to Late 20th c	Not Eligible	No Further Work
36LU285	9	Johnson/Folk	West Alt	17	Upland	Broad Flat	25x115	2	76	Domestic Site	Mid to Late 19th c and 20th c	Potentially Eligible	Avoid/Phase II
36LU286	10	Kisner	West Alt	31	Upland	Broad Flat	128x137	--	228	Farmstead	Mid 19th to 20th c	Potentially Eligible	Avoid/Phase II
36LU287	11	--	West Alt	21	Upland	Broad Flat	10x20	--	23	Artifact Scatter	19th c	Not Eligible	No Further Work
36LU288	5	--	Area 7	2	Lowland	Low Terrace/ Floodplain	152x260	48	34	Lithic Scatter	Paleo, LA,TA/EW, LW	Potentially Eligible	Avoid/Phase II

*Paleo=Paleoindian, LA=Late Archaic, TA=Terminal Archaic, EW=Early Woodland, LW=Late Woodland

Phase II investigations of the seven potentially-eligible sites are discussed in the following chapters and site descriptions each of eleven identified sites are provided in Chapters 9-19. Artifacts catalogs for each site are presented in Appendix H.

Identified Isolated Finds

GAI's Phase Ib survey identified 25 prehistoric Isolated Finds within the BBNPP project area (IF 1-12, 14-25 and 27) (Table 6-6). As with the identified sites, all of these resources were found within the initial Phase Ib project APE.

Table 6-6. Summary of Identified Isolated Finds

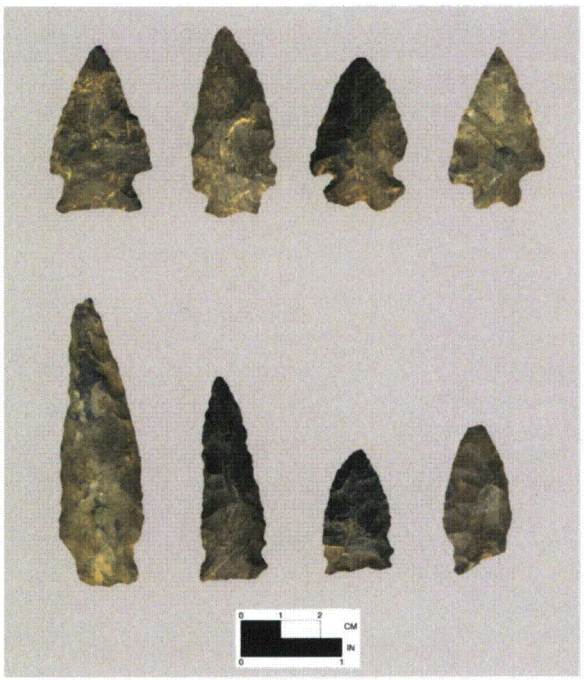
IF	Area	Section	Setting	Age	Description	Lithic Raw Material	Recommended NRHP Eligibility
IF 1	West Alt.	1	Upland	Unknown Prehistoric	Untyped projectile point	Gray chert	NE
IF 2	West Alt.	6	Upland	Early Archaic	Kirk corner-notched projectile point	Black chert	NE
IF 3	West Alt.	6	Upland	Early/Middle Archaic	MacCorkle-like projectile point	Black chert	NE
IF 4	West Alt.	6	Upland	Middle to Late Archaic	Piney Island projectile point	Black chert	NE
IF 5	West Alt.	6	Upland	Early/Middle Archaic	Kanawha projectile point	Gray chert	NE
IF 6	West Alt.	3	Upland	Unknown Prehistoric	Debitage	Indeterminate Chert	NE
IF 7	West Alt.	3	Upland	Unknown Prehistoric	Utilized flake	Black chert	NE
IF 8	West Alt.	3	Upland	Unknown Prehistoric	Debitage	Black translucent chert	NE
IF 9	West Alt.	3	Upland	Unknown Prehistoric	Retouched flake	Gray chert	NE
IF 10	West Alt.	6	Upland	Unknown Prehistoric	Untyped projectile point tip	Black chert	
IF 11	West Alt.	7	Upland	Late Archaic	Brewerton eared-notched projectile point	Dark gray chert	
IF 12	West Alt.	7	Upland	Unknown Prehistoric	Untyped projectile point	Black chert	NE
IF 13	DELETED						
IF 14	West Alt.	7	Upland	Unknown Prehistoric	Debitage	Black chert	NE
IF 15	West Alt.	12	Upland	Early Archaic	Palmer projectile point	Gray chert	NE
IF 16	Area 6	3	Upland	Unknown Prehistoric	Late stage biface	Black chert	NE
IF 17	Area 7	2	Low Terrace/ Floodplain	Unknown Prehistoric	Debitage	Rhyolite	NE
IF 18	Area 7	2	Low Terrace/ Floodplain	Unknown Prehistoric	Late stage biface	Dark gray chert	NE
IF 19	Area 7	2	Low Terrace/ Floodplain	Unknown Prehistoric	Debitage	Indeterminate chert	NE
IF 20	Area 7	2	Low Terrace/ Floodplain	Unknown Prehistoric	Mid stage biface	Gray chert	NE
IF 21	Area 7	2	Low Terrace/ Floodplain	Unknown Prehistoric	Debitage	Gray grainy chert	NE
IF 22	West Alt.	17	Upland	Unknown Prehistoric	Debitage	Dark gray chert	NE
IF 23	West Alt.	29	Upland	Unknown Prehistoric	Debitage	Gray chert	NE
IF 24	West Alt.	1	Upland	Unknown Prehistoric	Debitage	Jasper	NE
IF 25	West Alt.	1	Upland	Unknown Prehistoric	Debitage	Gray grainy chert	NE
IF 26	DELETED						
IF 27	West Alt.	1	Upland	Unknown Prehistoric	Untyped projectile point tip	Gray chert	NE

* NE=Not Eligible

In accordance with PHMC/BHP guidelines (PHMC/BHP 1991), these resources represent localities that produced fewer than three artifacts within a 15-meter (50-foot) radius. (Note that IFs 13 and 26 have been deleted; IF 13 was determined to be noncultural and IF 26 was incorporated into Site 1). Each of these isolated finds consists of a single lithic artifact. All but two of the isolated finds were found on the surface of cultivated fields during pedestrian ground

survey; IFs 22 and 23 were recovered from shovel tests. Twenty of the isolated finds (80 percent) were found on upland flats within the West Alternative; five were located on the low terrace/floodplain in Area 7, adjacent to the Susquehanna River. An artifact catalog for Isolated Finds is included in Appendix H.

The isolated finds consist of 10 projectile points, three bifaces, one utilized flake, one retouched flake, and ten pieces of debitage. The sample of projectile points includes six diagnostic points, all found in upland settings and ranging in age from the Early Archaic through Late Archaic periods. These diagnostic specimens include one Early Archaic Kirk Corner-notched point (IF 2), one Early Archaic Palmer point (IF 15), one Early/Middle Archaic MacCorkle-like point (IF 3), one Early/Middle Archaic Kanawha point (IF 5); one Middle to Late Archaic Piney Island point (IF 4), and one Late Archaic Brewerton Eared-notched points (Photograph 6-34).



Photograph 6-34. Isolated Finds—Diagnostic Projectile Points

Top—Early Archaic Kirk Corner-notched point (IF 2), Early Archaic Palmer point (IF 15), Early/Middle Archaic MacCorkle-like point (IF 3), Early/Middle Archaic Kanawha point (IF 5); Bottom—Middle to Late Archaic Piney Island point (IF 4), Late Archaic Brewerton Eared-notched point (IF 11), Untyped point (IF 12, Untyped point (IF 1)

The isolated finds represent brief, ephemeral prehistoric utilization of upland settings within the BBNPP project area during the Early through Late Archaic periods, as well as brief undated prehistoric use of the lowland portions of the project area. These artifacts do not represent significant archaeological resources. Accordingly, GAI recommends no further investigations of these localities. PHMC-BHP reviewed preliminary Phase Ib results presented in GAI's Phase Ib Management Summary (Munford and Tuk 2008) and in their March 2, 2009 review letter (see Appendix A) concurred with GAI's recommendations on NRHP eligibility and further work.

Non-Site Materials

A total of 577 artifacts (575 historic specimens and 2 prehistoric lithics) were recovered from non-site contexts during GAI's Phase Ib survey. These artifacts consist of isolated, widely dispersed specimens scattered across cultivated fields or in isolated shovel tests. Nearly three-quarters (72 percent, *n*=413) of the non-site specimens were located in upland portions of the project area, predominantly in the West Alternative (the largest of the BBNPP test areas); the remaining artifacts (*n*=164) were found in low terrace/floodplain settings (Table 6-7). Of the 575 historic non-site artifacts, 78 percent (*n*=449) were recovered during pedestrian ground survey (surface collection) of cultivated fields and 10.6 percent (*n*=61) were recovered from isolated positive STPs. The remaining 65 historic artifacts and the two prehistoric lithics were found in disturbed fill deposits during deep testing in Area 6 (backhoe trenches and 1x1-meter column samples).

The 575 historic non-site artifacts consist largely of ceramics (40.69 percent, *n*=234)—predominantly redware and whiteware sherds, as well as bottle/container glass (26.9 percent, *n*=155), and window glass (13.04 percent, *n*=75). Low frequencies of a variety of other materials including tin cans, flowerpot fragments, nails, brick, clay pigeons, and indeterminate metal fragments were also recovered. Temporally diagnostic artifacts identified in this assemblage indicate that the bulk of the artifacts are twentieth century in age. These artifacts represent historic and/or modern field scatter; they do not represent the remains of historic archaeological sites.

The prehistoric lithics (*n*=2) were found in a disturbed fill deposit directly above bedrock in Area 6, Section 1; these lithics have been displaced from unknown location and do not represent the remains of a prehistoric site in this locality. No further investigation of these non-site materials is recommended. An artifact catalog for non-site materials is provided in Appendix H.

Table 6-7. Summary of Non-Site Artifacts by Testing Location

Test Area/ Section	Prehistoric	Historic	Setting	Testing Method
WEST ALTERNATIVE				
1	--	7	Upland	PS
3	--	28	Upland	PS
4	--	34	Upland	PS
5	--	28	Upland	PS
6	--	57	Upland	PS
7	--	37	Upland	PS
8	--	3	Upland	PS
9	--	10	Upland	PS
10	--	50	Upland	PS
11	--	5	Upland	PS
12	--	54	Upland	PS
13	--	31	Upland	PS
14	--	18	Upland	PS
15	--	3	Upland	PS
16	--	2	Upland	STPs
17	--	2	Upland	STPs
18	--	2	Upland	STPs
22	--	4	Upland	STPs
29	--	1	Upland	STPs
SubTotal		**376**		
AREA 6				
1	2	65	Floodplain	Deep Testing
2	--	15	Floodplain	STPs
3	--	13	Upland	PS
4	--	4	Upland	STPs
5	--	16	Upland	STPs
Subtotal	**2**	**113**		
AREA 7				
1	--	67	Floodplain	PS
3	--	4	Floodplain	STPs
4	--	11	Floodplain	STPs
Subtotal		**82**		
Lot 95 (Section 1)	--	2	Upland	STPs
Lot 100 (Section 2)	--	2	Upland	STPs
TOTAL	**2**	**575**		

*PS=Pedestrian Ground Survey (Surface Collection); STPs=Shovel Test Pits

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Figure 6-1. Phase Ib Project Area showing Methods of Phase Ib Survey within Testing Locations
B Size

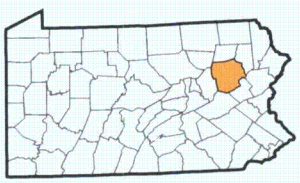
REDACTED Figure 6-1
Phase Ib Project Area showing
Methods of Phase Ib Survey
within Testing Locations

(back of Figure 6-1)

Side 2 of REDACTED Figure 6-1.

REFERENCE:
PAMAP 2005 AERIAL ORTHOPHOTOGRAPHY, PENNSYLVANIA DCNR.

PROJECT LOCATION



LUZERNE COUNTY, PENNSYLVANIA

LEGEND

- TEST UNIT
  1X1 METER SCREENED COLUMN SAMPLE
- PROPOSED CENTERLINE
- PROPOSED CONSTRUCTION LIMITS
- BACKHOE TRENCH #1-5
  TO A DEPTH OF ~4.0 METERS BELOW GROUND SURFACE
- BACKHOE TRENCH / CORE BORING #6-11
  TO A DEPTH OF ~ 1.2-8.5 METERS BELOW GROUND SURFACE
- AREA 6, SECTION 1 AREA
- PHASE Ib PROJECT AREA
- EXCLUDED AREA

0 75 150 300 Feet

FIGURE 6-2
AREA 6, SECTION 1
DEEP TESTING LOCATIONS

gai consultants

BELL BEND NUCLEAR POWER PLANT
UNISTAR NUCLEAR DEVELOPMENT, LLC.

DRAWN BY: AJW
CHECKED: BAM

DATE: 04/26/2010
APPROVED: BAM

Figure 6-3. Archaeological Site Locations

REDACTED Figure 6-3
Archaeological Site Locations

Chapter 7. Phase II National Register Evaluations: Research Design and Methods

Phase II Research Design

Because site avoidance through project design was not feasible, UniStar requested that GAI conduct Phase II National Register Site Evaluations of the seven potentially-eligible archaeological sites identified in the project area (Sites 36LU279, 36LU280, 36LU281, 36LU283, 36LU285, 36LU286, and 36LU288) to evaluate their eligibility to the NRHP. These seven sites include six historic period sites (36LU279, 36LU280, 36LU281, 36LU283, 36LU285, and 36LU286) and one prehistoric site (36LU288). For each site, specific objectives of the study included the following:

(1) Determine the horizontal and vertical limits of the site in the APE;

(2) Interpret the site's cultural affiliations, functions and significance;

(3) Evaluate site integrity;

(4) Conclusively determine the site's eligibility for listing on the NRHP;

(5) Define the need for further archaeological work.

The *National Register Bulletin No. 15-How to Apply the National Register of Criteria for Evaluation* (NPS 1991) provides standards that a site must meet to be considered eligible to the NRHP. The researcher must first be able to establish an historic context for the site, relating it to a specific cultural group or particular time period, and secondly, document that the site retains integrity.

To establish the historic context of a site, archaeologists must determine the period of occupation or cultural affiliation, typically accomplished via analysis of diagnostic artifacts (e.g., projectile points, bottle glass manufacturing method, ceramic type and decoration method), or by the identification of features which may provide a means to date the site occupation (e.g., large sample of diagnostic historic period artifacts or radiocarbon dating of charcoal from prehistoric hearths). For historic sites, context can be established by means of historic map research and chain-of-title and deed research. If the age of a site cannot be established, the site cannot be placed within a broad historic context and likely will not be eligible to the NRHP.

If the site provides data regarding its period of occupation, it must also be shown to be significant under one of the four National Register Criteria: A) association with historic events; B) association with historic individuals; C) distinctive design/construction; or D) information potential. Archaeological sites generally cannot be linked to historic events (Criterion A) or historic individuals (Criterion B), nor can they be evaluated based on their distinctive design/construction (Criterion C). Thus, most historic and prehistoric sites are evaluated for NRHP eligibility under Criterion D, the potential to contribute important information on the prehistory or history of the region. Sites in the BBNPP project area were evaluated for their NRHP eligibility under Criterion D.

An archaeological site must also retain integrity to qualify as NRHP-eligible. For archaeological sites, integrity is a quality that typically reflects whether or not the site's physical components have been disturbed since their original deposition. If the disturbance has been substantial, resulting in a significant loss of integrity, the site is likely to be not eligible to the NRHP. However, if a site was not disturbed, or only minimally disturbed to the extent that the

disturbance has not affected the qualities that render it NRHP-eligible, then the site can still be considered eligible to the National Register.

Phase II Methods

GAI conducted Phase II field investigations of the seven archaeological sites in the BBNPP project area between July 7 and November 2, 2009. Phase II tasks included site-specific archival research and field investigations. Detailed descriptions of Phase II methods for each Phase II site are presented in the appropriate site description chapters of this report (Chapters 10, 11, 12, 14, 16, 17, and 19). Updated Pennsylvania Archaeological Site Survey (PASS) Forms) for each of these sites are provided in Appendix D.

Site-Specific Archival Research

GAI conducted site-specific archival research for each of the six historic period sites (Sites 36LU279, 36LU280, 36LU281, 36LU283, 36LU285, and 36LU286) during the course of Phase II investigations in order to support NRHP evaluations. The goal of this documentary research was to identify important historical themes, events, or persons associated with the region, county, city, or town in which the site was located, and to determine the significance of the site relative to these themes, events, or persons. GAI's Architectural Historian and/or Cultural Resource Specialist conducted chain-of-title research, census research and historic map reviews at the Luzerne County Historical Society, Luzerne County Courthouse, and Osterhout Free Library (Wyoming Valley Historical and Genealogical Society) in Wilkes-Barre; the Luzerne County Community College Local History Reading Room in Nanticoke; the McBride Memorial Library Local History Reading Room in Berwick; the Columbia County Historical and Genealogical Society in Bloomsburg; and the Pennsylvania State Archives in Harrisburg. Sources such as tax records, rent rolls, appropriate published and unpublished histories, and on-line sources were also consulted. Additional resources included aerial photographic documentation of the property (circa 1939),

For the single prehistoric site (36LU288), GAI reviewed data from previous sites identified within the project vicinity, focusing on those sites located within the same watershed.

Results of Phase II documentary or background research for each Phase II site are included in the site description chapters (Chapters 10, 11, 12, 14, 16, 17 and 19).

Phase II Field Methods

Phase II field investigations at each site varied based on ground surface visibility as well as on the depth of proposed project impacts but generally consisted judgmental or close-interval shovel testing, followed by test unit excavation. Table 7-1 presents a summary of Phase II work effort and results for each site.

Prior to the start of Phase II field investigations sites were prepared either by plowing and disking or by brush clearing, as appropriate. Four of the seven Phase II sites (36LU279, 36LU280, 36LU281, and 36LU288) were located within previously cultivated fields that were plowed and disked to provide adequate visibility for subsequent surface collection. The three sites (36LU283, 36LU285 and 36LU286) situated in wooded or brush/grass-covered settings were cleared with a brush hog and/or by hand to expose surface features and structural remains. Mechanical removal of a surface gravel layer was also required in portions of Site 36LU286 to permit hand excavations.

Following site preparation, GAI surveyors used a total station to establish a grid at each site. Positive Phase Ib STPs were relocated, where possible, and were used to aid in the definition of site boundaries. A site datum was established and designated with arbitrary coordinates. Where

possible, the datum was tied into a permanent off-site marker. North/south and east/west baselines, marked by wooden stakes, were laid in across the site, as needed. GPS coordinates and ground surface elevations were recorded at these stakes. Phase II testing locations at each site were designated by their coordinates within this grid system.

Phase II fieldwork at the four sites situated in cultivated fields (36LU279, 36LU280, 36LU281 and 36LU288) began with a controlled surface collection (CSC) of the plowed and disked area. Each site was gridded into 15x15-foot (5x5-meter) collection blocks and artifacts observed on the surface were collected and provenienced by block. Based on the results of surface collection, judgmental STPs were excavated to sample artifact concentrations or locations of possible cultural features within the site area.

For the three sites located in wooded and/or brush covered settings (36LU283, 36LU285 and 36LU286), GAI conducted close-interval shovel testing to refine site boundaries within the project area and to delineate within-site artifact concentrations. STPs were generally excavated at 15-foot (5 meter) intervals throughout the site area. STPs measured approximately 1.5x1.5-feet (50x50 cm) in diameter and were hand-excavated by natural strata into the subsoil. Note that GAI's Phase II Scope of Work proposed a metal detector survey within portions of Sites 36LU283 and 36LU285 prior to the start of close interval shovel testing (see Appendix B). A metal detector survey was attempted at Site 36LU285, but due to the ubiquitous nature of identified metal (positive "hits") within the soils this methodology was unsuccessful in identifying subsurface remains and its use was terminated at these sites.

Based on the results of shovel testing or surface collection, GAI excavated test units in areas of higher artifact density, unusual stratigraphy or potential cultural features within each of the seven Phase II sites. Test unit excavations served to: (1) define site stratigraphy, (2) sample artifact concentrations and/or activity areas, (3) determine the potential for subsurface features, and (4) assess stratigraphic context and the integrity of archaeological remains. At each of the six historic period site (36LU279, 36LU280, 36LU281, 36LU283, 36LU285, and 36LU286) test units varied in size but generally measured 5x5 feet (1.5x1.5 meters) and 2.5x5 feet (0.76x1.5 meters). Test units at prehistoric Site 36LU288 measured 3x3-feet (1x1-meter). Test units were labeled sequentially within each site (i.e., TU 1, TU 2), as well as by their coordinates within the site grid. Results of initial test units guided the placement of subsequent test units. Test units were hand-excavated in 0.3-foot (10-cm) levels according to natural stratigraphy and extended into subsoil. At the completion of each test unit, measured profiles were drawn and photographs taken of at least one wall of each unit.

For both STPs and test units, excavated soils were screened through 0.25-inch (6-mm) hardware cloth for systematic artifact recovery. Recovered artifacts were bagged and labeled with appropriate provenience information. Select diagnostic artifacts found in situ were point provenienced and bagged separately. GAI archaeologists recorded results of individual STPs and test units on standardized field forms, including depths of soil horizons, soil texture and Munsell color, and artifact recovery. Testing locations were plotted on project maps and documented with photographs. STPs and test units were backfilled upon completion.

Due to the upland setting of the six historic period sites (36LU279, 36LU280, 36LU281, 36LU283, 36LU285, and 36LU286), cultural resources in these localities were expected to be near-surface in nature and excavations typically extended to a maximum depth of approximately 1.6 feet (50 cm) below ground surface. Site 36LU288, located on a low terrace/floodplain, has a potential for deeply buried cultural resources. However, proposed project impacts in this area are anticipated to be shallow [0.5-0.6 foot (15-18 cm)], resulting from its use as a temporary laydown area. Based on the proposed depth of impact, PHMC-BHP concurred that excavations

in this locality would extend to a maximum depth of 2.6 feet (80 cm) below ground surface [phone consultation with Steve McDougal (PHMC/BHP) on April 8, 2008; see Appendix A].

Following completion of test unit excavations at the four sites in cultivated fields (36LU279, 36LU280, 36LU281, and 36LU288), mechanical removal of the plowzone was conducted in portions of these sites to expose cultural features at the plowzone/subsoil interface. A backhoe with a flat blade was used to remove the plowzone within approximately 6.5-foot (2-meter) wide strips to the top of the B horizon. This activity was monitored by GAI archaeologists. The exposed subsoil surface within each strip was hand shovel-scraped in order to define and delineate features. Plowzone strips were plotted on project maps, documented with photographs and backfilled upon completion.

Potential cultural features exposed during test unit excavations were troweled clean to clearly determine boundaries. Feature locations were plotted on the appropriate level forms and on the site map. Digital photographs were taken of the feature in planview. A detailed plan map of the feature was drawn on a Standard GAI Feature Form and resulting field data, including soil descriptions, feature dimensions and provenience information, were recorded. The feature was then cross-sectioned for profiling. A portion (generally at least 3 liters) of the fill was collected as a flotation sample. The remainder of the feature fill was screened through 0.25-inch (6-mm) hardware cloth for systematic artifact recovery. A measured drawing of the feature profile was recorded on a Standard GAI Profile/Summary Form, noting feature shape, stratigraphy (if present), and soil descriptions. Photographs were taken of the feature profile. The remaining half of the feature was then excavated and its fill was screened. For large and/or linear features, only a portion of the feature was exposed and sampled during Phase II testing. Recovered artifacts and samples collected from the feature fill were placed in bags labeled with the appropriate provenience information. A GAI Feature Form was used to record provenience data, feature type, feature description, samples collected, and numbers and types of artifacts recovered. Features were numbered sequentially within each site.

Overview of Phase II Field Results

As presented in Table 7-1, Phase II field investigations of Sites (Sites 36LU279, 36LU280, 36LU281, 36LU283, 36LU285, 36LU286 and 36LU288) included the excavation of 1,169 STPs and 80 test units. This work produced 63,170 artifacts, ranging from 387 to 26,549 artifacts per site. Twenty-nine features were also documented and sampled during Phase II testing. Site 36LU285 yielded approximately 42 percent of the total recovered artifacts while Site 36LU283 produced approximately 23 percent; these two sites each produced approximately one-quarter of the features (23 to 26 percent each).

Table 7-1. Summary of Phase II Field Results by Site

Site	GAI Site #	Dimensions	# STPs	# TUs	Surface Collection	Plowzone Stripping	Features	Phase II Artifacts (Prehist)	Phase II Artifacts (Hist)	Total Phase II Artifacts P/H
36LU279	2	230x150 ft	53	8	Yes	4@6x105 ft (2,520 ft²)	0	2	1242	1244
36LU280	3	120x155 ft	59	4	Yes	3@6x105 ft (1,890 ft²)	5	1	1953	1954
36LU281	4	130x150 ft	81	8	Yes	3@6x105 ft (1,890 ft²)	2	0	9090	9090
36LU283	7	170x475 ft	310	12	No	--	8	1	14508	14509
36LU285	9	82x377 ft	108	12	No	--	7	4	26545	26,549
36LU286	10	420x350 ft	502	16	No	--	5	36	9401	9,437
36LU288	5	500x850 ft	56	20	Yes	11@6x197 to 344 ft (23,358 ft² / 2,170 m²)	2	284	103	387
TOTALS			1,169	80			29	328	62,842	63,170

*Site 36LU288 NRHP eligibility recommendation is for upper soil profiles only—deep deposits not tested.

Based on the results of Phase II investigations, all seven sites (36LU279, 36LU280, 36LU281, 36LU283, 36LU285, 36LU286 and 36LU288) are recommended as Not Eligible to the NRHP. Results of Phase Ib and Phase II investigations and recommendations of NRHP eligibility for these seven sites are presented in Chapters 10, 11, 12, 14, 16, 17 and 19. Artifact catalogs are presented in Appendix H.

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Chapter 8. Analytical Methods

Introduction

This chapter reviews the methods employed during analysis of historic and prehistoric artifacts recovered during GAI's Phase Ib and II investigations of the BBNPP project area. Brief overviews of analytical methods are presented for historic/modern artifacts, prehistoric lithics, and flotation/ethnobotanical remains. Detailed descriptions of historic artifact analysis and prehistoric lithic analysis are provided in Appendices I and J.

Laboratory Processing

Cultural materials collected during Phase Ib survey and Phase II testing were transported to GAI's Archaeological Laboratory in Homestead, Pennsylvania, for processing and analysis. These materials were processed in accordance with the *Curation Guidelines* of the Pennsylvania Historical and Museum Commission (2005). Following completion of this project and approval of technical reporting, project materials will be donated to the PHMC-BHP for permanent curation at the State Museum of Pennsylvania.

For each site, the initial processing stage consisted of checking artifact bags against the field-generated Field Specimen Log to confirm that all collected materials were present. Artifacts were temporarily placed in numerical order according to Field Specimen Number (FS#), providing a basis for processing, analysis, and curation. Artifacts were then cleaned, generally with water and a soft brush. Metal artifacts and perishable items were cleaned by dry-brushing. Non-cultural materials (i.e., pebbles) included in the artifact samples were recorded and discarded during this stage of processing or in later stages, as they were recognized. Cultural materials were placed on artifact-drying racks to air dry.

When dry, the artifacts within each provenience were sorted into basic artifact classes (i.e., glass, ceramics, metal) and were re-bagged accordingly in clean, perforated, 4-mil polyethylene bags. Bags were labeled with provenience information using a permanent ink marker. An acid-free paper tag with complete provenience information was also placed inside each artifact bag.

Specimens large enough in size were then labeled with the site number and the appropriate field specimen number (FS#). Labels were written in permanent ink and coated with PVA. After washing and labeling, artifacts were subject to the appropriate laboratory analysis.

Methods of Historic/Modern Artifact Analysis

Historic/modern artifacts recovered during Phase II investigations were subjected to identification and analysis using GAI's Historic Coding scheme (see Appendix I). This multivariate classification system codes for significant attributes of various artifact classes. Artifact analysis was focused on the creation of an inventory of artifact classes and types to examine issues of chronology and function for each site containing historic/modern components. A variety of analytical techniques was employed to synthesize artifact data including standard classification typologies developed by South (1977).

Once washed, artifacts were sorted into major material classes including ceramics, glass, and metal. The materials were then subjected to a preliminary analysis, which included a basic description of artifacts by material class, functional group, and relevant attributes. Included among the recorded attributes, as applicable, are type, beginning and end dates of production, form, motif/decoration, color, manufacturing technique, functional group, base, finish, embossment, maker's mark/manufacturer, material, bore diameter, and pattern class and subclass (South 1977:95-96). Artifact dating was based on the identification of maker's marks,

diagnostic-manufacturing methods, such as bottle mold seams, bottle pontil marks, ceramic bodies and glazes, and known dates of production.

Coded data, using unique codes for each artifact description, were entered into the Access database. This database was subsequently converted into the Excel computer program for purposes of data manipulation and table generation.

Historic ceramic analysis focused on identifying ware and type categories, decorative attributes, and maker's marks, in order to interpret site chronology. Whenever possible, each provenience was assigned dates based on a Mean Ceramic Dates (MCD) and Terminus Post Quem (TPQ) date. Attributes recorded during the ceramic analysis include count, ware, type, form, motif, colors, percent complete, and functional group for each artifact or group of artifacts. Maker's marks were described in detail and dated, when possible.

Glass artifacts, much like ceramics, were tabulated according to major groups (e.g., bottle glass, window glass, lamp glass, tableware, tumblers) and then separated into functional categories whenever possible. Dating information was based on the identification of diagnostic technological attributes (e.g., mold seams and evidence of snap-case manufacture) in addition to identifiable bottle embossments. Attributes recorded for glass artifacts include manufacturing technique, decoration, finish type, base type, color, and functional group. The beginning and end dates for datable attributes were determined. Maker's marks and embossments were described and dated, when possible.

Other historic/modern artifact classes include architectural debris (e.g., bricks, nails, window glass, etc.), clothing (type and materials identified when possible) and miscellaneous small finds. Where appropriate, attributes such as character, wear, decoration, and material were recorded for these artifacts.

A data base was created for each site to use with Surfer 8.0 program to create artifact distribution maps. Recorded data include coordinates, total number of artifacts, number of kitchen-group artifacts, and number of architecture-group artifacts. The artifact distribution maps produced using this program were examined to identify artifact clusters.

Methods of Prehistoric Lithic Analysis

The analytical approach for stone tools and debris employed here can be described as techno-morphological; that is, lithic artifact classes and types were based on key morphological attributes, which are linked to or indicative of particular stone tool production (reduction) strategies (see Appendix J).

Following initial artifact processing, GAI's Lithic Analyst divided lithic artifacts from each provenience into general classes (i.e., debitage, bifaces, unifaces, cores, cobble tools, groundstone, fire-cracked rock) and then subdivided them into specific artifact types (i.e., early-stage biface, late-stage biface, projectile point) for that particular class. Artifacts were then examined and appropriate attributes were recorded. The surfaces and edges of artifacts were examined with the unaided eye and with a 10x hand lens, where appropriate, to discern evidence of retouch and/or utilization.

Lithic raw material type was recorded for all artifacts. These lithic raw material types were defined on the basis of macroscopic characteristics, including color, texture, hardness, and inclusions (Luedtke 1992). Where possible using conservative standards and based on the above macroscopic criteria, nonlocal (i.e., excluding cobble quartz and quartzite) lithic raw material types were attributed to known geological sources based on published sources (e.g., Stewart 1984) and by reference to GAI's lithic reference collection.

All lithic tools were examined at a detailed analysis level that recorded temporal/stylistic, functional, and technological variables as well as lithic raw material type. These variables included artifact class, artifact type, condition of specimen, presence/type of cortex, weight, and metric dimensions (when complete). Further artifact-specific observations (e.g., heat damage, refit, unique characteristics) were noted where appropriate. Diagnostic projectile points, important in assessing the age of prehistoric components represented at the sites, were to be identified though a comparison with standard typologies established for Maryland and the eastern United States (Stevenson et al. 1963; Dent 1995; Justice 1995; Broyles 1971; Coe 1964; Ritchie 1961). Additional variables of point type and temporal affiliation were to be recorded for diagnostic points.

Lithic debitage was classified using a typology designed to detect differences in lithic reduction practices and early vs. late-stage reduction (e.g., decortication flake, bipolar reduction flake, early reduction flake, biface thinning flake). Other attributes recorded on debitage included raw material, presence and type of cortex (as indicators of primary or secondary geologic source), weight and size grade.

Information recorded during lithic analysis was entered on analysis sheets as a series of codes, unique to each variable. The codes were then entered into Access, a relational database. For the purposes of data analysis and manipulation, this database was subsequently converted to the Excel computer program for data manipulation and table generation.

Methods of Flotation Processing

Soil flotation samples were collected from feature fill during excavation in order to recover small specimens that would normally pass through 6-mm (0.25-inch) hardware cloth and to provide a constant volume sample of mortar, brick, shell, and coal, which may have been judgmentally-sampled during the screening process in the field.

Flotation samples of feature fill were processed at GAI's Archaeological Laboratory using an *R. J. Dausman Flot-Tech* flotation machine. The Dausman flotation machine is a self-contained, multi-modal system that uses a closed-loop water recirculation system. It allows the user to manually adjust water circulation and flow rates to assist in the separation of light and heavy fractions of flotation samples. This method produces clean, sediment-free, light and heavy fraction feature fill samples. Once floted, the materials were allowed to air dry before being re-bagged according to heavy or light fraction type into clean, 4-mil polyethylene bags. As with artifact processing, these bags were clearly labeled with provenience information using a permanent ink marker and an acid-free tag with complete provenience information placed inside each bag.

Following flotation processing, GAI technicians examined heavy fractions of each sample to collect cultural materials. To insure standardization during flotation sample "picking," each heavy fraction sample was examined for 20 minutes to separate out other cultural materials. Cultural materials identified in the samples were subjected to historic or prehistoric analysis as described above.

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Chapter 9. Site 36LU278 (GAI Site 1)

Phase Ib
Location: West Alternative, Section 1
Site Type: Indeterminate Prehistoric
Site Size: 3x21 meters (10x70 feet)
Recommendations: Not NRHP Eligible/No Further Work

Site 36LU278 (Site 1) is a small, undated prehistoric lithic scatter located in the West Alternative, Section 1, in the northwest portion of the project area (see Figure 1-3, Figure 9-1). It is situated in a cultivated field on a gently sloping upland hillside, approximately 49 meters (160 feet) south of Beach Grove Road (Figure 9-2, Photograph 9-1). Walker Run is located approximately 701 meters (2300 feet) to its west. The site lies at an elevation of approximately 730 feet above mean sea level (amsl); the hilltop located to its southwest rises to an elevation of 800 feet amsl. Identified during Phase Ib pedestrian ground survey, Site 36LU278 has dimensions of 3x21 meters (10x70 feet). Prehistoric Isolated Finds 24, 25, and 27, also recorded during pedestrian ground survey, are located between 27 and 85 meters (90 and 280 feet) south and west of Site 36LU278. These isolated artifacts consist of two pieces of debitage (IFs 24 and 25) and one distal fragment of a projectile point (IF 27). Proposed project impacts will result from cooling tower construction.

[*REDACTED Photograph 9-1.*]

Photograph 9-1. View of Site 36LU278 **showing** ***Pedestrian Ground Survey of Cultivated Field, Facing Southwest***

GAI's Phase Ib investigations in this locality consisted of pedestrian ground survey of the cultivated field and judgmental shovel testing. Initial pedestrian ground survey, conducted in transects spaced at 15-meter intervals, identified three prehistoric lithic artifacts in the northeast corner of the field. Observed surface artifacts were marked with pin flags. A grid was then established over this locality using a compass and tapes. Because of the low density and dispersed nature of the observed surface artifacts in this field, individual artifacts were point provenienced by coordinates within this grid system, rather than being collected by 5-meter blocks. Following collection of surface artifacts, GAI excavated one shovel test (STP 1) immediately east of these surface finds to document stratigraphy and the depth of cultural deposits in the site locality.

Shovel testing revealed an Ap-B soil horizon sequence within the field. As described for STP 1 the profile consists of a 28-cm-thick dark yellowish-brown silt loam plowzone above a brownish-yellow silty clay B horizon (Figure 9-3). Artifacts were recovered from the surface only. No cultural features were identified.

The three lithic artifacts recovered from Site 36LU278 consist of two untyped projectile point fragments and one piece of debitage. Both point fragments are manufactured from black chert, while the debitage (flake fragment) is made from grainy gray chert. One of the point fragments (FS 1) represents a small distal (tip) fragment while the other (FS 2) is an untyped stemmed point base. No diagnostic artifacts were recovered from this site.

Site 36LU278 Recommendations

Site36LU278 is a small, undated, prehistoric lithic scatter on an upland hillside east of Walker Run. The low artifact density and limited range of artifact types suggests that this site represents a small, brief prehistoric occupation. Due to the absence of diagnostic artifacts or dateable cultural features, the age of the site cannot be determined. The integrity of this site is good, with disturbances limited to cultivation. Based on the site's low artifact density and lack of diagnostic artifacts or features GAI concludes that the potential for Site 36LU278 to contribute important information on the prehistoric utilization of this area is low. GAI recommends that Site 36LU278 is Not Eligible for listing in the National Register under Criterion D. No further archaeological investigations are recommended for this site. The PHMC-BHP reviewed preliminary results of Phase Ib investigations of Site 36LU278 as presented in GAI's Phase Management Summary (Munford and Tuk 2008) and in a March 2, 2009 review letter (see Appendix A) concurred with GAI's recommendations for this site.

Figure 9-1. Site 36LU278 Location

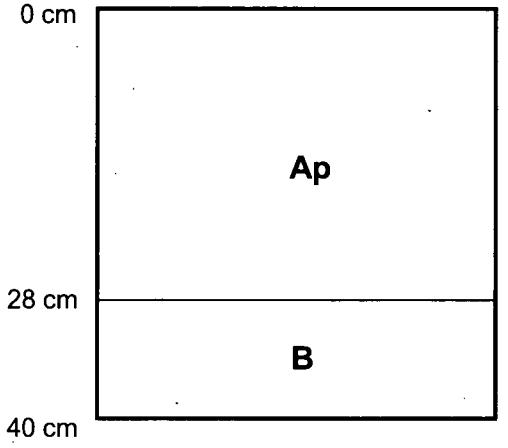
REDACTED Figure 9-1
Site 36Lu278 Location

Figure 9-2. Site 36LU278 showing Phase Ib Testing Locations

REDACTED Figure 9-2
Site 36Lu278 showing Phase Ib
Testing Locations

SITE 36LU278

STP 1



KEY:

Ap – DARK YELLOWISH BROWN (10YR 4/4) SILT LOAM

B – BROWNISH YELLOW (10YR 6/6) SILTY CLAY LOAM

SCALE

gai consultants

DWN	LMD	**CHKD**	TJN
APPD	BAM	**DATE**	09/04/08
SCALE	AS NOTED		
DRAWING NUMBER	C080204.10.002.C.A.Si 1		

FIGURE 9-3. SITE 36LU278: REPRESENTATIVE PHASE Ib SOIL PROFILE (STP 1)

BELL BEND NUCLEAR POWER PLANT

UNISTAR NUCLEAR DEVELOPMENT, LLC.

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Chapter 10. Site 36LU279 (GAI Site 2)

Phase Ib and Phase II
Location: West Alternative, Section 7
Site Type: Early to mid 19th Domestic Site; Prehistoric Lithic Scatter
Site Size: 230x150 feet (70x46 meters)
Recommendations: Not NRHP Eligible

Site Setting

GAI conducted a Phase Ib survey and a Phase II National Register site evaluation of Site 36LU279 (GAI Site 2). This historic period site (and minimal prehistoric lithic scatter) is situated in the West Alternative, Section 7, along the western margin of the project area (see Figure 1-3; Figure 10-1). It occupies the northern portion of a cultivated field flanked by North Market Street to the west and woodlands bordering Walker Run to the east (Photograph 10-1). A slight rise is located in the central portion of the site. This upland setting has an elevation of 660 feet amsl. Site 36LU279 was identified during the Phase Ib pedestrian ground survey and has dimensions of 230x150 feet (70x46 feet). Disturbances in the site area appear to be limited to cultivation. Proposed project impacts will result from use of this locality as a laydown area.

[*REDACTED Photograph 10-1*]

Photograph 10-1. Overview of Site 36LU279, Facing Southeast

Phase Ib Investigations

Phase Ib investigations of Site 36LU279 consisted of pedestrian ground survey, systematic surface collection and the excavation of judgmental shovel tests (Figure 10-2). Initial pedestrian ground survey, conducted in transects spaced at 15-meter intervals, identified an artifact scatter in the northern portion of the field. Artifacts observed on the surface were marked with pin flags. A grid was then established over this locality using a compass and tapes and the site was subject to a systematic surface collection. Observed artifacts were collected by 5-meter-blocks within the grid system. Artifacts were recovered from 56 5-meter blocks, with artifact density ranging from 1 to 10 per block. Three shovel tests were excavated in the north, east-central, and southern portion of the site to document stratigraphy and the depth of cultural deposits.

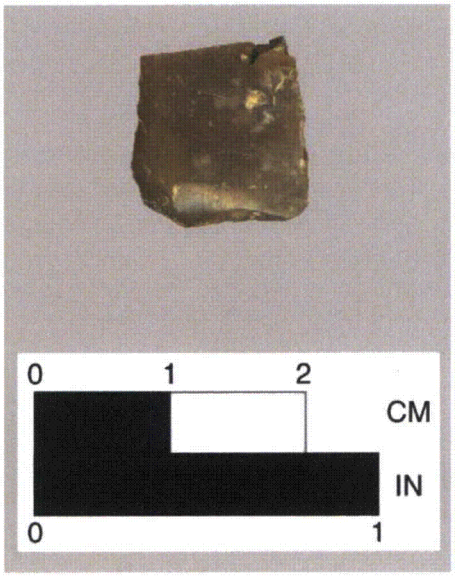
Shovel tests excavated at the site revealed an Ap-B soil horizon sequence. As described for STP 3, this profile consisted of a 30-cm-thick brown silt loam plowzone and a brown silty clay loam B horizon (Figure 10-3). Historic artifacts were recovered from the Ap horizon as well as from the surface. No cultural features were identified.

Phase Ib survey of Site 36LU279 generated 159 artifacts (Table 10-1). Approximately 90 percent of the artifact assemblage fell within the kitchen group and included bottles and ceramics. The vast majority of ceramics (*n*=104) were redware, which typically dates to the

eighteenth and nineteenth centuries. There were several other temporally diagnostic ceramics including plain pearlware (1780-1830), hand-painted blue pearlware (1780-1820), hand-painted polychrome pearlware (1795-1820), and hand-painted polychrome whiteware (1840-1860). Architecture-related remains include a brick, a nail, and window glass. The window glass was thin, which is typical for the early to mid-nineteenth century. A small quantity of other artifacts was recovered including a honey-colored (French) gunflint, an aluminum pull-tab (modern), glass insulator, and a bolt (Photograph 10-2). The paucity of architectural-related artifacts may indicate that there was once a log house at this site, most likely during the second and third quarters of the nineteenth century.

Table 10-1. Site 36LU279: Phase Ib Artifact Pattern Analysis

Class	Sub-Class	Total	Percent
Activities	Cans/Tins	1	0.63
	Machine Parts/ Hardware	1	0.63
	Activities Total	**2**	**1.26**
Architecture	Brick	1	0.63
	Electrical	1	0.63
	Nails	1	0.63
	Window Glass	9	5.66
	Architecture Total	**12**	**7.55**
Arms	**Gunflints**	**1**	**0.63**
Faunal	**Bone**	**1**	**0.63**
Kitchen	Bottles/Jars	4	2.52
	Ceramics	139	87.42
	Kitchen Total	**143**	**89.94**
TOTAL		**159**	**100.00**



Photograph 10-2. Site 37LU279: French Gun Flint Found during Phase Ib Surface Collecting Activities

Phase I investigations produced 25 temporally diagnostic artifacts (Table 10-2). Since no structure appears in the site location on an 1873 map and the artifact assemblage appears to date to the nineteenth century, an arbitrary date of 1900 was used as the end date for plain whiteware and ironstone sherds. These artifacts yielded a mean date of 1850 and a TPQ date of 1840 for the site.

Table 10-2. Site 36LU279: Phase Ib Artifact Dating Analysis

Artifact	Item Description	Count	Start Date	End Date	Reference
Pearlware	plain	3	1780	1830	South 1977
Pearlware	hand painted; polychrome	3	1780	1830	South 1977
Whiteware	plain	16	1830	1900	Price 1979; Noël Hume 1980
Whiteware	hand painted brown	2	1840	1860	Lofstrum et al. 1982; Majewski & O'Brien 1984
Ironstone	plain	1	1840	1900	Wetherbee 1980
	Total Count 25				
	Mean Date 1850				
	TPQ 1840				

Phase Ib Summary and Recommendations

Site 36LU279 possessed good integrity and was composed of an early to mid-nineteenth century surface artifact scatter consisting largely of kitchen-related specimens, with low quantities of architectural debris and other artifacts. This artifact sample was considered a likely early domestic occupation for this area. The low quantity of architectural-related artifacts was consistent with use of a log house.

Based on the Phase Ib results (good integrity, artifacts from a relatively short timeframe, and likely association with a former structure), GAI recommended that Site 36LU279 was potentially eligible for listing in the NRHP under Criterion D. The PHMC-BHP reviewed preliminary results presented in GAI's Phase Ib Management Summary (Munford and Tuk 2008) and concurred with this recommendation in a letter dated March 2, 2009 (see Appendix A). Because Site 36LU279 could not be avoided by the proposed project construction, a Phase II archaeological evaluation was undertaken at this site.

Phase II Methods

The Phase II study was designed to: (1) interpret the cultural affiliation and function of the site; (2) identify the horizontal and vertical site limits; (3) determine site integrity; (4) assess the site research potential; and (5) evaluate site significance as defined by eligibility for listing on the National Register of Historic Places. Phase II fieldwork was conducted in August 2009

Phase II investigations consisted of archival research, field excavations, and laboratory analysis. The archival research focused on the former landowners. Fieldwork included with a controlled surface collection of the plowed field within 15x15 ft (4.6x4.6 m) blocks, followed by excavation of 81 STPs on a 15-foot (4.6-meter) grid and eight judgmentally placed test units (4-5x5-ft [1.5x1.5 m] and 4-2.5x5-ft [0.76x1.5 m]). Upon completion of the test units, the plowzone was removed from four mechanically excavated trenches, each measuring 6x105 feet (1.83x32 m) to search for cultural features.

Phase II Archival Research

Map, deed, probate, and census documents were examined to develop a context and establish a chain-of-title for the property. Sites 36LU279 and 36LU286 are located within the same 142-acre parcel, which has remained undivided since it was originally granted to Jacob Smethers by the Commonwealth of Pennsylvania on April 5, 1814. While this chapter presents the results of

the deed and census research for the individuals who owned the land encompassing both sites, additional information specifically relating to Site 36LU286 will be presented in Chapter 17. Archival research revealed that the portion of the parcel occupied by 36LU279 is possibly associated with a log cabin dating to the early owners of the subject parcel. Table 10-3 summarizes chain-of-title data for Sites 36LU279 and 36LU286. A Warrantee Map drawn in 1848 shows how this area was divided and records the original landowners (Figure 10-4).

Table 10-3. Site 36LU279: Chain-of-Title

Date of Instrument	Grantee/Defendant	Grantor/Complainant	Conveyance Reference	Comments
July 1, 2000	PPL Susquehanna LLC	PPL Electric Utilities Corporation	Luzerne County Deed Book 2741:702	142 Acres
July 29, 1986	PPL Electric Utilities Corporation	William E. Kisner	Luzerne County Deed Book 2206:613	142 Acres
March 25, 1965	Emery R. Kisner Jr. and William E. Kisner	Emery R. Kisner Sr.	Luzerne County Deed Book 1563:690	142 Acres
July 3, 1944	Emery R. Kisner Sr. and Elsie Kisner	Mary J. Lutz	Luzerne County Deed Book 917:85	142 Acres
March 12, 1925	Mary J. Lutz	William J. Lutz	Luzerne County Deed Book 622:186	142 Acres
April 1, 1909	William J. Lutz	Elizabeth Hess, et ux.	Luzerne County Deed Book 495:266	142 Acres
November 5, 1865	Jacob Harter and John Hess	Jeremiah Hess	Luzerne County Deed Book 103:130	142 Acres
April 26, 1824	Jeremiah Hess	Christian Stout	Luzerne County Deed Book 20:330	142 Acres
November 28, 1819	Christian Stout	Frederick Nogle and Elizabeth Nogle	Luzerne County Deed Book 20:129	142 Acres
May 19, 1819	Frederick Nogel	Jacob Smethers and Rosena Smethers	Luzerne County Deed Book 19:573	142 Acres
April 5, 1814	Jacob Smethers	Commonwealth of Pennsylvania	Luzerne County Patent Book "H" Vol. 9:537	142 Acres

Further research, which included Federal Census data, tax assessment rolls, agricultural census data, and local history literature, was used in conjunction with deeds to develop the overall history of Site 36LU279.

Jacob Smethers was born in Northampton County, Pennsylvania, and was an early inhabitant of Luzerne County. It is unknown at what time he moved to Luzerne County, but a 1796 list of taxable inhabitants of Salem Township lists a Jacob Smuthers (Bradsby 1893:643). It is possible that this is the same Jacob Smethers, as his name is listed with variable spellings throughout the historical records. A review of the Federal Census records revealed that Jacob Smethers was living in Salem Township in 1800 as the head of a household of eight people: one male and three females under the age of 10, two males between the ages of 10 and 16, and one male and one female (presumably Jacob and his wife Rosena) between the ages of 26 and 45.

The 1810 Federal Census lists Jacob Smethers as still being the head of a household of eight; however, it appears that the structure of his family had changed. Jacob is listed as being older than 45, while Rosena is listed as still being between the age of 26 and 45. One male and two females are listed as being under the age of 10, and these would most likely represent new children in the family. Two males and one female are listed as being between the ages of 10 and 16. Considering that a decade earlier, Jacob and Rosena had one male and three females

listed as living in the household under the age of 10, it appears that two of their daughters no longer resided in the household. The 1810 census also listed Jacob as a farmer who owned one slave.

A review of tax assessment records for Jacob Smethers revealed that in 1812, prior to the granting of the subject parcel, Jacob owned 147 acres of land, with 45 acres improved and 102 acres unimproved, on two lots of ground containing a house and a barn. The 1813 tax assessment (also prior to the grant of the current parcel) states that Jacob owned 144 acres of land, 47 acres of which were improved, and 97 acres unimproved, on two lots of ground containing two houses and a barn. The 1815 tax assessment, one year after the Commonwealth of Pennsylvania granted Jacob the parcel containing Sites 36LU279 and 36LU286, states that Jacob again owned 147 acres of land, 45 acres being improved and 102 acres being unimproved, on two lots of ground containing one house and two barns. These assessments most likely refer to other land owned by Jacob Smethers, as the 142-acre parcel of land containing Sites 36LU279 and 36LU286 has remained an undivided 142-acre lot since the original 1814 grant. However, these tax assessments and census information illustrate that Jacob Smethers was farming in Salem Township both before and after he was granted the parcel of land on which Site 36LU279 and 36LU286 are located.

Between 1819 and 1824, the subject parcel traded hands numerous times. Frederick Nogle purchased the land from Jacob Smethers and his wife Rosena Smethers on May 19, 1819, for $3,500.00 (Luzerne County Deeds 20:330). Frederick Nogle sold the property to Christian Stout on November 28, 1819, for $3,500.00 (Luzerne County Deeds 20:129). The 1820 Federal Census listed Christian Stout as the head of a household of 13 people: three males and one female under the age of 10, one male and two females between the ages of 10 and 16, one male between the ages of 16 and 18, three females between the ages of 16 and 26, and one male and one female (presumably Christian Stout and his wife) were listed as being between the ages of 26 and 45. The census noted that three of the members of Mr. Stout's household were engaged in agriculture.

Christian Stout sold the property to Jeremiah Hess on April 26, 1824, for $4,500.00 (Luzerne County Deeds 20:330). Jeremiah Hess was born in Easton, Northampton County, Pennsylvania in 1795, and moved to Luzerne County with his family in 1803. Jeremiah was a miller by trade and built a mill in Wapwallopen, Luzerne County, which he operated until he traded it for a farm in Salem Township. In 1824, he purchased the farm located within the project area (Beers, ed. 1915:437). However, the Federal Censuses did not list Jeremiah as a Salem Township resident until 1860. The 1830 census stated that Jeremiah Hess resided and operated his mill in nearby Wapwallopen. Based on this evidence, it appears that during the years before he resided in Salem Township, Jeremiah may have used the property located within the project area solely for farming and/or grazing land. Jeremiah Hess and his wife had 11 children: John, Philip, Jeremiah, Nathan, Reuben, Aaron, Susan (Fenstermacher), Elizabeth (Hill), Catherine (Hill) and Amanda (who died before reaching adulthood).

Jeremiah Hess's 142 acres of property were recorded in an 1826 tax assessment. The assessment stated that Jeremiah owned one lot in Salem Township that included 60 acres of improved land and 82 acres of unimproved land. One house and one outbuilding were located on his property. A subsequent tax assessment in 1830 listed no houses or outbuildings on the property, but revealed an increase in improved land to 63 acres, with 79 acres unimproved. An 1835 tax assessment revealed a further increase in improved land to 85 acres, with 70 acres unimproved. No houses or outbuildings were identified on the property, but Jeremiah was assessed for 155 acres of land. An 1840 tax assessment revealed another increase in improved

land to 90 acres, with 45 acres unimproved. Again, no houses or outbuildings were assessed on the property, and Jeremiah was only assessed for 135 acres. In 1845, Jeremiah was again assessed for 135 acres, but 95 were improved, and 40 were unimproved. These assessments reveal a steady increase in tillable land on Jeremiah Hess' property between 1826 and 1845, suggesting an increase in farming activity during that time. Of particular interest in the 1845 tax assessment is the listing of two houses and two outbuildings on the property; previous tax assessments listed the property as being void of structures subsequent to the 1830 assessment (Table 10-4).

Table 10-4. Site 36LU279: Tax Assessment for Jeremiah and John Hess

Description	Jeremiah Hess Ownership					John Hess Ownership	
	1826	1830	1835	1840	1845	1866	1875
Improved Land	60 acres	63 acres	85 acres	90 acres	95 acres	100 acres	100 acres
Unimproved Land	82 Acres	79 acres	70 acres	45 acres	40 acres	40 acres	40 acres
Lots of land	1	1	1	1	1	1	1
Houses	1	0	0	0	2	1	1
Outbuildings	1	0	0	2	2	2	2
Mills	0	0	0	0	0	0	0
Horses	2	2	2	3	3	1	2
Oxen	0	1	1	0	0	0	0
Cows	3	3	3	4	4	2	2
Occupation	Farmer	Farmer	Farmer	Farmer	Farmer	Farmer	Farmer
Total Valuation	**$790.00**	**$1,059.00**	**$1,059.00**	**$997.00**	**$665.00**	**$1,804.00**	**$2,716.00**

The listing of structures on the 1845 assessment corresponds to the 1850 Federal Census, which listed two of Jeremiah Hess' children (Jeremiah M. and John) as heads of households residing in Salem Township. It is possible that Jeremiah's two sons constructed houses on their father's property around that time.

The 1850 Federal Census listed Jeremiah Hess' son Jeremiah as a 35-year-old head of a household that included his wife Maria, who was 34 years old, his sister Mary, 28 years old, his brother Aaron, 23 years old, his brother Reuben, 15 years old, and his sister Catherine, 15 years old. The census also listed that Sarah Fenstermacher, 11 years old, lived with the family. Sarah Fenstermacher may have been the daughter of Jeremiah Hess' daughter Susan. The Fenstermachers were also early settlers and farmers of the Salem Township area. The three males in the household were listed as farmers. Since the 1850 Federal Census did not list Jeremiah Hess, Sr. as a Salem Township resident, it is assumed he continued to operate his mill in Wapwallopen while his children lived and worked the farm on which Sites 36LU279 and 36LU286 are located.

This is further confirmed, as Jeremiah Hess' Salem Township farm was surveyed as part of the 1850 Federal Agricultural Census, although he was not listed as a Salem Township resident (Table 10-5). This agricultural schedule provides a detailed account of the activities of the farm at that time, and reveals that the Hess farm was involved in the raising of dairy cows for the production of butter, and that the Hesses kept bees for the production of beeswax and honey. They also raised cattle and hogs for slaughter and cultivated cereal grains and vegetable crops, including corn, wheat, oats, potatoes, rye, buckwheat, and hay. The census stated that the household sold $13.00 worth of home-manufactured goods. This diverse system of farming allowed families a wider range of commodities to barter and trade in the local economy, providing a strategy for obtaining goods not produced on the farm. Furthermore, the wide variety of farming techniques, including the tending of livestock and dairy production, as well as

the intensive farming of crops, suggests that the entire family, both males and females, were engaged in the production of the farm (McMurry 1988:91).

Table 10-5. Site 36LU279: Agricultural Census Data

Description	Jeremiah Hess	John Hess	
	1850	1870	1880
Improved Land (acres)	60	100	100
Unimproved land (acres)	14	40	40
Cash Value of farm	$3,000.00	$6,000.00	$6,000.00
Value of Farming Implements	$250.00	$279.00	$200.00
Wages Paid for Labor and Board	n/a	$400.00	$125.00
Horses	3	4	4
Asses and Mules	0	0	0
Milk Cows	4	7	7
Working Oxen	0	0	0
Other Cattle	4	0	0
Sheep	0	4	0
Swine	13	7	6
Value of Livestock	$394.00	$787.00	$300.00
Poultry (Barnyard/Other)	n/a	n/a	40/0
Eggs Produced (dozens)	n/a	n/a	250
Wheat (bushels)	150	185	200
Rye (bushels)	40	75	20
Indian Corn (bushels)	200	250	500
Oats (bushels)	100	300	200
Rice (lbs.)	0	0	0
Tobacco (lbs.)	0	0	0
Wool (lbs.)	0	200	0
Peas & Beans (bushels)	0	0	0
Irish Potatoes (bushels)	100	100	200
Sweet Potatoes (bushels)	0	0	0
Barley (bushels)	0	0	0
Buckwheat (bushels)	20	0	0
Apple Bearing Trees/Bushels	n/a	n/a	
Value of Orchard Products	$0.00	$10.00	$6.00
Wine (gallons)	0	0	0
Value of Produce of Market Gardens	$0.00	$0.00	$0.00
Butter (lbs.)	300	400	500
Cheese (lbs.)	0	0	0
Hay (tons)	12	20	15
Clover Seed (bushels)	2	0	0
Other Grass Seed (bushels)	0	0	0
Hops (lbs.)	0	0	0
Flax (lbs.)	0	0	0
Flaxseed (bushels)	0	0	0
Maple Sugar (lbs.)	0	0	0
Cane Sugar (lbs.)	0	0	0
Molasses (gallons)	0	0	0
Beeswax and Honey (lbs.)	50	50	0
Value of Home-made Manufactures	$13.00	$0.00	n/a
Value of Animals slaughtered	$75.00	$222.00	n/a
Estimated Value of Farm Production	n/a	$1,608.00	$1,000.00

John Hess, Jeremiah's other son living in Salem Township, was listed as the head of a household of six persons in the 1850 Federal Census. He lived with his 27-year-old wife Elizabeth, his four-year-old son Norman, two-year-old son Urias, and 11-month-old daughter

Rachel. Eliza Bittenbanden, 18 years old, was also listed as living with the family. It is possible that she worked as a servant. It is also possible that John and his family lived in one of the houses mentioned in Jeremiah Hess' 1845 tax assessment, as the property was later sold to him by his father.

The 1860 Federal Census listed Jeremiah Hess as a 67-year-old farmer who lived in Salem Township with his 61-year-old wife Catharine. This was the first Federal Census that listed Jeremiah Hess, Sr. as residing in Salem Township. According to *The History of Columbia and Montour Counties*, Jeremiah Hess retired to his farm in Salem Township sometime around 1860 where, although retired, he oversaw the operation of the farm (Beers 1915:437).

The dynamics of John Hess' family changed between the 1850 and 1860 Federal Census. At the time of the latter census, he was listed as the head of a household of seven persons. John was 41 years old, his wife Elizabeth, 37 years old, his son Norman W., 14 years old, and his son Urias was 12 years old. It appears that his daughter Rachel, who was 11 months old in 1850, had died, and John and his wife had three more daughters: Lydia C. was seven years old, Alice was five years old, and Lizza was two years old. There is no mention of Eliza Bittenbanden being in the household.

Jeremiah Hess owned the property until November 5, 1865, when he sold the land to his son John Hess and Jacob Harter for $5,000.00 (Luzerne County Deeds 103:130). It is unclear who Jacob Harter was in relation to John Hess, but considering John Hess' wife Elizabeth's maiden name was Harter, he was likely a relative by marriage. Regardless, by the time of John Hess' death in 1881, he was the sole owner of the property.

In 1866, shortly after John Hess' acquired the property from his father, he was assessed for taxes on a plot of land that consisted of 100 acres of improved land and 40 acres of unimproved land. The tax assessment also listed one house and two outbuildings on the property. This assessment reveals an increase of five acres of cleared land and one less house than recorded in 1845. It is probable that after John acquired the property from his father one of the houses on the property, which may have housed his brother Jeremiah M. and his other siblings, was demolished.

The 1870 Federal Census listed John Hess, 51 years old, as the head of a household of eight, including his wife Elizabeth, 47; his sons Norman W., 24, and Urias, 22; and his daughters Lydia C., 17, Alice, 15, and Lizza, 12. The census also recorded that a laborer named Winner, 66 years old, lived with the family.

Jacob Harter was listed in the 1870 Federal Census as a 41-year-old head of a household of six that resided in Salem Township. Others in his household included his wife Cordelia, 41 years old, son James W., 15 years old, son Asbury A., 13 years old, son William P., 9 years old, and a "baby", one month old. Although the census listed Jacob as a farmer, it is unclear if he lived on the property at that time.

In 1870, John's father Jeremiah still lived on the property with his wife Catharine, and according to the 1870 Federal Census, he was 78 years old, while his wife was 70. The census did not list any personal or real estate value for Jeremiah, likely because he had sold the property to John and only resided there. Jeremiah Hess, Sr. died in 1877 at the age of 86. He still resided on the farm at the time of his death (Beers 1915:437).

The Hess farm was again surveyed in the Federal Agricultural Census in 1870 (see Table 1--5). At that time the census listed the farm in the name of John Hess. The 1870 agriculture schedule illustrates that between 1850 and 1870 the Hess' began raising sheep for the production of wool and increased their number of dairy cows, resulting in the production of 100 additional pounds of

butter. Also important to note is that as the farm increased in size so too did the cultivation of crops; most notably the harvest of oats tripled, and the harvest of rye nearly doubled. It appears that orchards were planted between 1850 and 1870, as the census recorded $10.00 worth of products sold. However, no selling of manufactured goods was recorded, and no cattle other than dairy cows were present on the farm.

It was during the period of John Hess's ownership that an 1873 map of the area identified a structure labeled "J. Hess" in the immediate vicinity of Site 36LU286, and an absence of any other structures within the parcel (Figure 10-5).

The 1880 Federal Census listed John Hess as 61 years old and the head of a household of seven that included his wife Elizabeth, 56, son Urias, 31, daughter-in-law Fannie Hess, 29, and daughter Lydia C., 26, who at that time had the surname Smethers. The census also listed that two farm-hand servants, Elias Lawall, 17, and Stephan Halk, 50, lived in the household. The presence of servants and laborers in the 1870 and 1880 Federal Censuses, as well as the increased value of the property in the tax assessments between 1866 and 1875, illustrate the growing prosperity of the farm during this time.

As evidenced by the 1880 Federal Agricultural Census, between the years of 1850 and 1880, the Hess farm continued to increase the cultivation of wheat, corn, potatoes, and butter. The production of corn and potatoes doubled between 1870 and 1880. However, the farm witnessed a decrease in the cultivation of rye, oats, and hay between 1870 and 1880. Furthermore, the farm did not raise sheep and did not kept bees in 1880 (see Table 10-5). This suggests a more focused specialization in the production of wheat, corn, and butter during these years.

John Hess died in 1881 and willed the property to his heirs, who were listed on the deed as "Elizabeth widow of John Hess, Norman W. Hess and his wife Leah D. Hess from the borough of Benton, Lizzie Hess and William F. Hess of Wapwallopen, Urias Hess and his wife Fannie Hess from Salem Township, Lydia C. Harman and her husband Chester A. Harman of Salem Township, Alice Smethers and Jacob C. Smethers from Berwick" (Luzerne County Deed Book 495:266). Interestingly, two of John Hess' daughters, Lydia C. and Alice, married descendents of original landowner Jacob Smethers. Lydia C. first married Wesley Smethers and later Chester A. Harmon (Beers 1915:437).

William J. Lutz purchased the land from John Hess' heirs on April 1, 1909. William was born around 1874 and married his wife Mary around 1896. The 1910 Federal Census listed William J. Lutz as 36 years old, and the head of a household of four people. His wife Mary was listed as 34 years old, and his two daughters, May and Elsie were 13 and 3, respectively. The census also noted that Lutz owned his farm with a mortgage. The 1920 census listed William Lutz as 45 years old, and the head of a household of five, including his wife Mary, 42, daughter Elsie, 13, and son William A., seven. A 19-year-old boarder, Carl Gerts, was also listed as residing with the family. The census stated that he owned his farm free with no mortgage.

On March 12, 1925, William J. Lutz deeded the property to his wife Mary J. Lutz (Luzerne County Deed Book 622:186). The 1930 Federal Census listed William J. Lutz as 56 years old, and the head of a household of four, including his wife Mary, 55, daughter Elsie, a 23-year-old school teacher, and son William A, 18. William's real estate was valued at $10,000, and it is assumed that included the property he deeded to his wife.

During the period of Mary Lutz's ownership, a 1939 aerial photograph was taken that shows a farmstead complex consisting of numerous structures in the same vicinity as the John Hess structure depicted on the 1873 map (Site 36LU286), but no structures in the vicinity of Site 36LU279 (Figure 10-6).

On July 3, 1944, Mary J. Lutz sold the property to Emery R. Kisner Sr. and his wife Elsie (Luzerne County Deed Book 917:85). During Emery and Elsie Kisner's ownership of the property, a 1955 quadrangle map illustrates a cluster of structures in the vicinity of Site 36LU286, but again, no structures are depicted in the vicinity of Site 36LU279 (Figure 10-7). Furthermore, an aerial photograph taken in 1959 reveals an absence of buildings in the vicinity of Site 36LU279 (Figure 10-8).

After the death of his wife Elsie, Emery Kisner became the sole owner of the land on February 24, 1965. One month later, on March 25, 1965, William E. Kisner and his brother Emery R. Kisner Jr. inherited the property from their father (Luzerne County Deed Book 1563:690). An aerial photograph taken in 1969 shows a complex of buildings in the vicinity of Site 36LU286, but no buildings are present in the vicinity of Site 36LU279 (Figure 10-9). It is unknown when William E. Kisner became the sole owner of the property but on July 29, 1986, William E. Kisner granted and conveyed an undivided 90% interest to PPL Electric Utilities Corporation and an undivided 10% interest to Allegheny Electric Cooperative (Luzerne County Deed Book 2206:613). Subsequently, on July 1, 2000, PPL Susquehanna LLC, the present owner of the parcel of land containing Sites 36LU279 and 36LU286, acquired the property (along with an additional 85.882 acres) from PPL Electric Utilities Corporation (Luzerne County Deed Book 2741:702).

Tax assessment records indicate at least three different houses were constructed within this 142-acre parcel. The earliest dwellings, recorded in 1826, consisted of one house and one outbuilding. The 1830 tax assessment shows no structures to assess, indicating that they were demolished between 1826 and 1830. The property remains void of structures in the 1835 and 1840 tax assessments. It is not until the 1845 tax assessment that structures are again recorded on the property, and these consist of two houses and two outbuildings (see Table 10-4). Unless one of the houses was built over the location of the former structures, there would be three different house sites on this parcel. It is unknown whether the two houses and outbuildings listed on the 1845 tax assessment were constructed near the structure shown in the 1873 map (Site 36LU286), or if they represent different house locations. Given the paucity of architectural-related artifacts, and the early dates of the artifacts recovered, it is possible that the house and outbuilding listed in the 1826 tax assessment, and subsequently demolished prior to 1830, are represented by the artifact assemblage recovered from Site 36LU279. This early house and outbuilding are related to the early occupation of the parcel and date from the period of ownership of Jacob Smethers, Frederick Nogel, and Christian Stout. The dates of these occupations correspond to the artifacts recovered from Site 36LU279, and the lack of architectural-related artifacts found at that site may indicate that there was once a log house in the vicinity, which would also correspond to the early dates of occupation.

Phase II Fieldwork

Site 36LU279 was located in a cultivated agricultural field that was planted in corn at the time of the Phase II study (Figure 10-10). Prior to the start of fieldwork, the corn was mechanically cut and removed from the site area. Following site clearing, GAI surveyors established a grid across the site using a total station. The grid covered a 285x180 ft area (gridlines N120-405 and E210-390) and was oriented at an angle of N 10 degrees E. Hubs were placed at 15-foot (4.6-meter) intervals along gridlines at the edges of the site boundary and at select grid points throughout the site. The site datum (N300 E300) was located on a slight rise in the northern portion of the site.

Phase II Soils and Geomorphology

Phase II excavations exposed an Ap-B soil horizon sequence across the site. The Ap horizon (plowzone) varied from brown to dark yellowish-brown silt loam measuring from 0.8 to 1.1 ft thick. The B horizon (subsoil) was typically yellowish-brown silt loam. The subsoil in TU 5, located in a low-lying area with the water table encountered at the B horizon, was comprised of grayish-brown silty clay loam.

Artifact Distribution (Controlled Surface Collection and Shovel Tests)

The controlled surface collection (CSC) blocks and STP excavations were used to examine artifact distributions across the site and to refine the horizontal site limits. On domestic sites, higher frequencies of artifacts are generally found near the house and yard area and in refuse deposits, while lesser quantities are found on the fringe of the habitation area and lightly scattered across fields. CSC block artifact distributions and STP artifact distributions were plotted on site maps and the distribution of artifacts were used, in part, to guide the placement of subsequent test units.

Typically, concentrations of architectural remains reflect the general locations of former structures, burn piles, or refuse dumps. Concentrations of kitchen-related artifacts can be useful in identifying the former location of a structure, especially if these are associated with concentrations of architectural remains. Kitchen-related artifacts may also indicate activity areas around the house.

Phase II fieldwork began with a controlled surface collection of the site area within 217-15x15 ft (4.6x4.6 m) blocks. Surface collection activities yielded 369 historic and 3 prehistoric artifacts from 94 positive blocks (Figure 10-11). Surface collection activities were useful in identifying general artifact densities across the site. Four of the CSC blocks produced architecture remains (one to two specimens per block): N150 E300, N165 E240, N270 E285, and N330 E270. There were only six CSC blocks that produced 10 or more artifacts, all of which were kitchen-related items: N150 E285, N180 E315, N195 E255, N 195 E315, N210 E255, and N225 E255. The CSC block at N195 E255 is especially noteworthy, as it yielded 35 artifacts while the remaining blocks with high artifact counts produced only between 10 and 13 artifacts each.

Nearly all (98.6%) of the historic artifacts from CSC N195 E255 fell within the kitchen class (Table 10-6). Architecture-related artifacts were restricted to four brick and one window glass. The vast majority of artifacts were redware sherds, which were common utilitarian wares used in the first half of the nineteenth century. Pearlware and whiteware represented small components within the ceramic assemblage.

Table 10-6. Site 36LU279: Controlled Surface Collection, Historic Artifact Pattern Table

Class	Subclass	Object/Ware	Total	Percentage
Architecture	Brick, Block	Brick	4	1.1%
	Window Glass	Window glass	1	0.3%
		Architecture Total	**5**	**1.4%**
Kitchen	Bottles	Bottle glass	2	0.5%
	Ceramics	Earthenware, indeterminate decoration	2	0.5%
		Pearlware, plain	4	1.1%
		Pearlware, transfer printed, blue	4	1.1%
		Pearlware, transfer printed, brown	1	0.3%
		Redware, glazed	138	37.4%
		Redware, unglazed	203	55.0%

Class	Subclass	Object/Ware	Total	Percentage
		Whiteware, paste only	1	0.3%
		Whiteware, plain	9	2.5%
		Kitchen Total	**364**	**98.6%**
		TOTAL	**369**	**100.0%**

Subsurface testing began with the systematic excavation of 53 STPs at 15-ft (4.6-m) intervals (Figure 10-12). Shovel test pits measured approximately 50 cm in diameter and were excavated in natural layers. The goals of this close interval testing were to help identify site limits, provide information on soil stratigraphy and artifact distribution, and identify potential features and activity areas.

Of the 53 STPs excavated, only 15 STPs produced artifacts. STP excavations resulted in the recovery of 72 historic artifacts, including 67 kitchen-related artifacts and five architecture-related artifacts (Table 10-7). Most of the positive shovel tests yielded a very low artifact density (≤5 artifacts per shovel test). Five of the STPs produced more than five artifacts. STP N210 E270 produced 21 artifacts while the other four STPs (N180 E255, N180 E300, N180 E330, and N210 E255) yielded six to nine artifacts each.

Table 10-7. Site 36LU279: Phase II STP Excavations, Artifact Pattern Analysis

Class	Subclass	Object/Ware	Total	Percentage
Architecture	Brick, Block	Brick	1	1.4%
	Window Glass	Window glass	4	5.6%
		Architecture Total	**5**	**6.9%**
Kitchen	Ceramics	Pearlware, plain	2	2.8%
		Pearlware, underglaze handpainted	1	1.4%
		Redware, glazed	24	33.3%
		Redware, unglazed	28	38.9%
		Stoneware, gray bodied	1	1.4%
		Whiteware, hand painted	1	1.4%
		Whiteware, plain	6	8.3%
		Whiteware, shell edged	1	1.4%
		Whiteware, transfer printed, blue	2	2.8%
		Yellowware, plain	1	1.4%
		Kitchen Total	**67**	**93.1%**
		TOTAL	**72**	**100.0%**

Nearly all of the artifacts (93%) were ceramics that fell within the kitchen class. Like the CSC artifact assemblage, architectural remains included a small quantity of window glass and brick; there were also a few whiteware and pearlware sherds, but redware ceramic dominated the assemblage

Distributions of artifacts from all CSC blocks and STPs provide information on site limits and show general patterns of site usage. The site size of 230x150 feet (70x46 m) reflects the location of positive CSC blocks and STPs. No features were identified during these activities.

The total number of artifacts from the CSC blocks and STP excavations were plotted on two distribution maps (see Figures 10-10 and 10-11). Based on these maps one centrally located artifact concentration was identified.

High densities of artifacts can be useful indicators of feature and activity area locations. Only three STPs produced architecture artifacts, all of which fell in the artifact concentration (Figure 10-13). Three architectural related artifacts were recovered from the STP N210 E270, perhaps indicating that a structure was once located in this area. Sixteen STPs produced kitchen-related artifacts; all but three of these fell within the central artifact concentration (Figure 10-14). Five STPs produced more than five kitchen-related artifacts, including N180 E180, N210 E255, N210 E270, N180 E300 and N180 E330.

Test Units

GAI excavated eight test units of varying sizes, totaling 150 square feet (13.9 square meters), to further investigate the moderately high-density artifact cluster (see Figure 10-11). Test unit information is summarized in Table 10-8. Test unit excavations produced 801 artifacts. No features were identified. Test units are discussed below by three general locations: Test Units 2, 4, and 8 (possible house location), Test Units 3, 6, and 7 (possible activity area), and Test Units 1 and 5 (possible front yard area).

Table 10-8. Site 36LU279, Test Unit Summary Information

Test Unit #	Size (in ft)	Location	Soil Stratigraphy (Depth is feet below ground surface)	Artifact Ct.	Comments
1	5x5	N177 E306	Ap, 0-0.8' brown silt loam B, 0.8-1.2' brown (7.5YR5/4) silt loam	81	No features present. Plow scars visible at Ap/B interface.
2	5x5	N201 E270	Ap, 0-1.1' dark yellowish-brown silt loam B, 1.1-1.4' yellowish-brown silty clay loam	202	No features present.
3	2.5x5	N180 E262	Ap, 0-0.8' dark yellowish-brown silt loam B, 0.8-1.1'-13.5" yellowish-brown silty clay loam	.50	No features present. Plow scars visible at Ap/B interface.
4	2.5x5	N210 E260	Ap, 0-1.0' brown silt loam B, 1.0-1.3' yellowish-brown silt loam	123	No features present. Plow scars visible at Ap/B interface.
5	5x5	N155 E295	Ap1, 0-0.9 dark yellowish-brown silt loam Ap2, 0.9-1.0' dark-brown silt loam B, 1.0-1.3' grayish-brown silty clay loam (wet soils)	66	No features present. An older plowzone measuring one inch thick was evident at base of recent plowzone
6	5x5	N193 E262	Ap, 0-1.0' brown silt loam B, 1.0-1.3' yellowish-brown silt loam	161	No features present. Plow scars visible at Ap/B interface.
7	2.5x5	N178 E250	Ap, 0-0.8' brown silt loam B, 0.8-1.2' yellowish-brown silt loam	27	No features present.
8	2.5x5	N212 E272	Ap, 0-0.9' brown silt loam B, 0.9-1.25' yellowish-brown silt loam	88	No features present. Plow scars visible at Ap/B interface.

Test Units 2, 4, and 8 were excavated to investigate evidence of a structure in the vicinity of STP N210 E270, where three architecture-related artifacts were recovered. The soil stratigraphy exhibited an Ap-B soil horizon sequence (Figure 10-15). The Ap horizon or plowzone was 9.5-13 inches thick and varied from brown to dark yellowish-brown silt loam. Typically, plow scars were visible at the Ap/B interface. The sterile subsoil or B horizon was comprised of yellowish-brown silt loam to silty clay loam (Photograph 10-3). No features were identified in these three units.

Test Unit 2 (5x5 ft) produced 202 artifacts from the Ap horizon (Table 10-9). Architecture-related artifacts included three brick fragments, one indeterminate nail, and four window glass. Four lamp chimney-glass fragments fell within the furnishing group. The remaining 191 artifacts consisted of ceramics.

Photograph 10-3. Site 36LU279: Test Unit 4, South Profile. Note Plow Scars at Ap/B Interface.

Table 10-9. Site 36LU279: TUs 2, 4, and 8 Artifact Pattern Analysis

Class	Subclass	Object/Ware	TU 2 Count	TU 4 Count	TU 8 Count	TOTAL	Percentage
Architecture	Brick, Block	Brick	3	8	1	12	2.9%
	Nails, Spikes, Etc.	Nail, indeterminate	1		1	2	0.5%
	Window Glass	Window glass	4	4	3	11	2.7%
		Architecture Total	**8**	**12**	**5**	**25**	**6.1%**
Furnishings	**Lighting**	**Lamp chimney glass**	**3**			**3**	**0.7%**
Kitchen	Ceramics	Earthenware, indeterminate decoration	3			3	0.7%
		Pearlware, indeterminate decoration	1			1	0.2%
		Pearlware, plain	13	3	12	28	6.8%
		Pearlware, shell edged	3		2	5	1.2%
		Pearlware, simple bands	1		1	2	0.5%
		Pearlware, transfer printed, blue	1	1		2	0.5%
		Pearlware, handpainted	2			2	0.5%
		Redware, glazed	55	28	26	109	26.4%
		Redware, slipware, trailed			1	1	0.2%
		Redware, unglazed	49	53	28	130	31.5%
		Whiteware, hand painted	1			1	0.2%
		Whiteware, indeterminate decoration	1			1	0.2%
		Whiteware, plain	52	24	8	84	20.3%
		Whiteware, shell edged	1			1	0.2%
		Whiteware, simple bands	4		1	5	1.2%
		Whiteware, transfer printed, black	2			2	0.5%
		Whiteware, transfer printed, blue	1		3	4	1.0%
		Whiteware, stamped		2		2	0.5%
		Yellowware, plain	1		1	2	0.5%
		Kitchen Total	**191**	**111**	**83**	**385**	**93.2%**
		TOTAL	**202**	**123**	**88**	**413**	**100.0%**

In *Test Unit 4* (2.5x5 ft), 123 artifacts were recovered from the plowzone horizon (see Table 10-9). The artifacts consisted of eight brick fragments, four window glass pieces, and 111 ceramic sherds. The ceramics were comprised of redware, pearlware, and whiteware types.

Test Unit 8 (2.5x5 ft) excavations generated 88 artifacts from the plowzone horizon (see Table 10-9). The artifacts include one brick, one nail, three window glass, and 83 ceramics (redware, yellowware, pearlware, and whiteware).

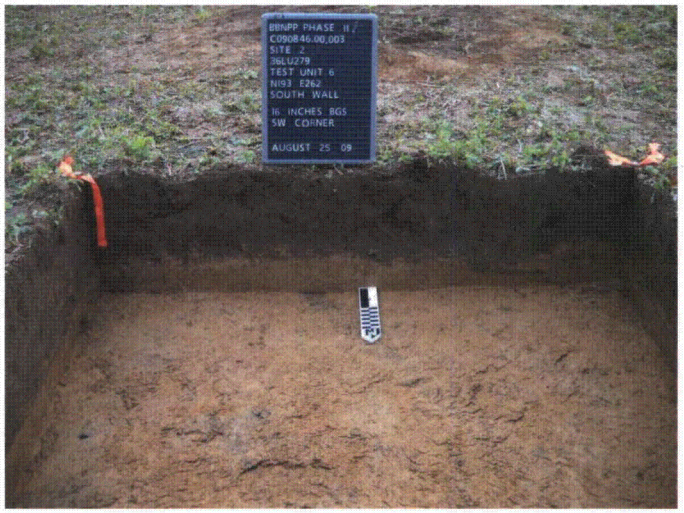
For all three units, the ceramic assemblage was dominated by redware sherds, which comprised approximately 58% of the entire assemblage. Redware is low-fired, porous clay that was usually glazed on the interior surface, although some vessel forms, such as jars, bowls, and pitchers, were glazed on both surfaces to make the vessel waterproof (Baugher-Perlin 1978: 201-202). Redware, a nineteenth century utilitarian ware, was made into other vessel forms, such as mugs, milk pans, crocks, chamber pots, and wash sets. Redware with trailed slip was commonly found on pie plates. Yellowware, which accounted for less than 1% of all artifacts, is also a utilitarian ware.

Pearlware and whiteware were refined earthenwares generally used for food and tea service. Pearlware was generally produced in the last quarter of the eighteenth century and the first quarter of the nineteenth century. The sample of pearlware, which comprised 9.7% of the assemblage, consisted of five different varieties including plain, shell-edged, banded, hand-painted, and blue transfer print. Plain pearlware was the least expensive variety, followed by minimally-decorated wares such as shell-edged and banded. Hand-painted and transfer printed wares were more expensive, with transfer printed designs representing the most expensive type of ceramic decoration at that time. Because the production of pearlware ended before this area was settled, it is likely that the pearlware sherds reflect dishes the family possessed prior to moving to this site.

Whiteware sherds represented 24.1% of the assemblage. This new ware type began to supplant pearlware around 1820. Therefore, the whiteware ceramics could have been in the family's possession when they moved to this site, or purchased after the family settled on the property. The decoration types displayed on the whiteware assemblage were very similar to the pearlware types and included plain, edge decorated, banded, hand-painted, and transfer printed varieties; in addition, there were two sponge-stamped sherds which were also relatively inexpensive compared to hand-painted and transfer printed designs.

Other types of artifacts recovered from these units include a small quantity of brick, window glass, nails, and lamp chimney glass. The paucity of construction materials (along with the lack of features) suggest s that the house was located elsewhere on the site or the house was constructed of logs. The low density of artifacts indicates that the site was occupied for a very brief period or that the main occupation and activity area was located elsewhere within the site limits.

Test Units 3, 6, and 7 were excavated within an area identified as having moderate quantities of artifact during the CSC and STP excavation. The soil stratigraphy exhibited an Ap-B soil horizon sequence (Figure 10-16). The Ap horizon or plowzone was 9.5-12 inches thick and varied from dark yellowish-brown to brown silt loam (Photograph 10-4). Typically, plow scars were visible at the Ap/B interface. The sterile subsoil or B horizon was comprised of yellowish-brown silt loam to silty clay loam. No features were identified in these units.



Photograph 10-4. Site 36LU279: Test Unit 6, South Profile. ***Note Plow Scars at Ap/B Interface.***

Test Unit 3 (2.5x5 ft) excavations produced 50 artifacts from the plowzone horizon (Table 10-10). The majority of the artifacts consisted of ceramics (redware and whiteware types). Other types of artifacts produced from this unit include bottle glass, window glass, and safety glass.

Table 10-10. Site 36LU279: Test Units 3, 6 and 7, Artifact Pattern Analysis

Class	Subclass	Object/Ware	TU 3 Count	TU 6 Count	TU 7 Count	Total	Percentage
Architecture	Brick, Block	Brick		1	7	8	3.3%
	Nails	Nail, indeterminate		2		2	0.8%
	Window Glass	Window glass	2	2	1	5	2.1%
		Safety Glass	1			1	0.4%
		Architecture Total	**3**	**5**	**8**	**16**	**6.6%**
Kitchen	Bottles	Bottle glass	2	5		7	2.9%
	Ceramics	Pearlware, plain		12	5	17	7.1%
		Pearlware, shell edged		2		2	0.8%
		Redware, glazed	19	45	4	68	28.2%
		Redware, unglazed	15	35	7	57	23.7%
		Whiteware, hand painted		1		1	0.4%
		Whiteware, plain	13	45	3	61	25.3%
		Whiteware, simple bands		1		1	0.4%
		Whiteware, sponge stamped		2		2	0.8%
		Whiteware, transfer printed, black		2		2	0.8%
		Whiteware, transfer printed, blue	1	1		2	0.8%
		Whiteware, underglaze handpainted		1		1	0.4%
		Whiteware, underglaze stenciled		1		1	0.4%
		Yellowware, plain		2		2	0.8%
		Yellowware, Rockingham		1		1	0.4%
		Kitchen Total	**50**	**156**	**19**	**225**	**93.4%**
		TOTAL	**53**	**161**	**27**	**241**	**100.0%**

Test Unit 6 (5x5 ft) excavations produced 161 artifacts from the plowzone horizon (see Table 10-10). The artifact assemblage included brick fragments, indeterminate nail pieces, window glass, bottle glass fragments, and ceramics. The ceramics included redware, yellowware, pearlware, and whiteware types.

Excavation of *Test Unit 7* (2.5x5 ft) recovered only 27 artifacts--all from the plowzone horizon (see Table 10-10). The artifact assemblage included seven brick fragments, one window glass fragment, and 19 ceramic (redware, pearlware, and whiteware) sherds.

The artifact assemblage for Test Units 3, 6, and 7, although smaller in number, was very similar to that recovered from Test Units 2, 4, and 8. The assemblage was dominated by utilitarian wares, especially redware sherds (*n*=125), which comprised nearly 52% of the artifacts, and to a lesser extent, yellowware, which comprised 1.2% of the assemblage. Tablewares, such as pearlware and whiteware, were present in smaller quantities, with whiteware (*n*=71 or 29.3%) more common than pearlware (*n*=19 or 7.9%).

Other types of artifacts recovered from these units include a small quantity of brick, window glass, safety glass, nails, and bottle glass. The bottle glass includes olive, aqua, light blue and clear glass; some of these bottles appear to represent bottles discarded after the site was no longer occupied. The paucity of construction materials and lack of features suggest that the house was located elsewhere. The low density of artifacts indicates that the site was occupied for a very brief period or the main occupation and activity area was located elsewhere.

Test Units 1 and 5. CSC and STP excavation produced a moderate quantity of artifacts in the vicinity of Test Units 1 and 5, which were excavated to search for possible features. The water table in this area is relatively high, which resulted in some water seepage at the bottom of these two units (Photograph 10-5). The soil stratigraphy exhibited an Ap-B soil horizon sequence (Figure 10-17). The Ap horizon or plowzone was 10-12 inches thick and varied from dark yellowish-brown to dark-brown silt loam. Test Unit 5 evidenced remains of an earlier plowzone at the base of the current Ap horizon; the deeper plowzone was designated an Apb horizon. Plow scars were visible at the Apb/B interface. The sterile subsoil or B horizon of TU1 was comprised of brown silt loam. However, the subsoil in TU 5 consisted of grayish-brown silty clay loam. No features were identified in these units.

Photograph 10-5. Site 36LU279: Test Unit 1, South Profile. Note Water along South Wall of Unit.

Test Unit 1 (5x5 ft) excavations produced a total of 81 artifacts from the Ap or plowzone horizon (Table 10-11). The artifacts consisted of two bottle glass fragments and 79 ceramic sherds. The ceramics were comprised of redware and whiteware varieties.

Table 10-11. Site 36LU279, Test Units 1 and 5, Pattern Table

Class	Subclass	Object/Ware	TU 1 Count	TU 5 Count	Total	Percentage
Kitchen	Bottles	Bottle glass	2	1	3	2.0%
	Ceramics	Pearlware, shell edged		1	1	0.7%
		Redware, glazed	25	26	51	34.7%
		Redware, unglazed	33	23	56	38.1%
		Whiteware, hand painted	2		2	1.4%
		Whiteware, plain	18	10	28	19.0%
		Whiteware, shell edged		1	1	0.7%
		Whiteware, transfer printed, blue	1		1	0.7%
		Whiteware, underglaze handpainted		1	1	0.7%
		Yellowware, plain		2	2	1.4%
		Kitchen Total	**81**	**65**	**146**	**99.3%**
Unidentified	**Indeterminate**	**Rubber seal**		**1**	**1**	**0.7%**
		TOTAL	**81**	**66**	**147**	**100.0%**

Test Unit 5 (5x5 ft) excavation produced 66 artifacts from the plowzone horizons (see Table 10-11). The artifacts consisted of one bottle glass fragments, one piece of tire rubber, and 64 redware, one whiteware, and one yellowware ceramic sherds.

Test Units 1 and 5 measured a total of 50 square feet, which is the same as the combined surface areas of TUs 2, 4, and 8 and of TUs 3, 6, and 7. In TUs 1 and 5, utilitarian wares (redware and yellowware) comprised over 74% of the assemblage. Tablewares, such as pearlware and whiteware, comprised 22.5% of the artifacts. Other types of artifacts recovered from these units included two clear and one olive bottle glass. The lack of architectural remains suggests that these units were located away from any structures.

Machine Excavated Trenches

Prior to the start of archaeological fieldwork a backhoe trench measuring 20x132 ft. and located at the southern margin of the site (approximately N90-112 E237-369) was excavated by another consultant, in association with wetland mitigation studies in the project area. A GAI archaeologist monitored this trench excavation. No artifacts or features were observed.

During the course of the Phase II archaeological study the plowzone was mechanically stripped from four 105x6 foot (1.83x32 m) trench blocks to search for cultural features (Photograph 10-6). Trench 1 was excavated from N165-270 and E 264-270. Trench 2 ran from N 165-270 and E 294-300.

Photograph 10-6. Site 36LU279: Trench Excavation in Progress.

Trench 3 was located at N 165-270 and E 318-324. Trench 4 was located at N 165-270 and E 234-240. Phase II testing, including machine excavated trenches (and the wetland backhoe mitigation trench), test units, and STPs, examined approximately 15.9% of the site area for features. No cultural features were identified.

Phase I/II Artifact Analysis

Phase I/II investigations produced 1,403 artifacts. These artifacts included 159 from Phase I investigations, and 1,244 artifacts (1,242 historic and 2 prehistoric) from Phase II investigations. The historic artifacts fell within six analytical classes, which included arms, activity, architecture, kitchen, furnishings, and unidentified.

Pattern Analysis

Approximately 4.5 percent fell within the architecture class including window and safety glass (*n*=31), electric insulator, (*n*=1), brick (*n*=26), and indeterminate nails (*n*=5) (see Table 10-12). Furnishing remains were restricted to three pieces of lamp glass. A honey-colored (French) gunflint fell in the arms group. Activities-related artifacts included a bolt and an aluminum pull tab. One piece of rubber (possibly from a car tire) was placed in the unidentified group.

Table 10-12. Site 36LU279: Artifact Pattern Analysis

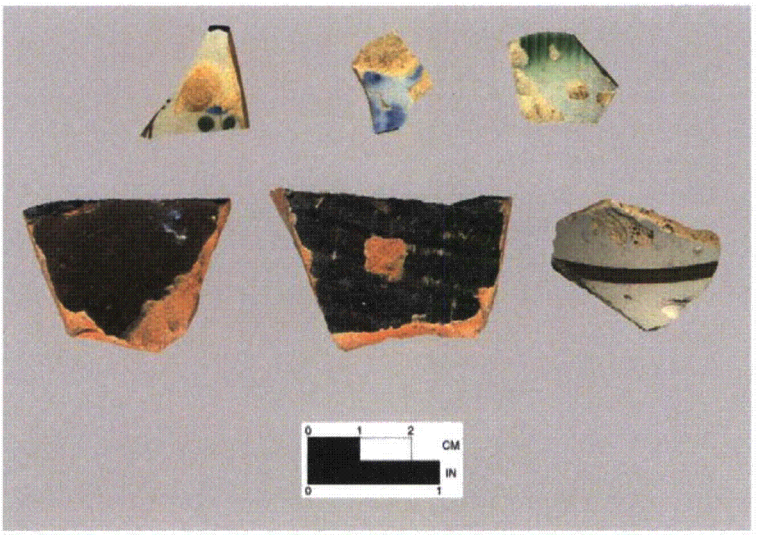
Class	Subclass	Object/Ware	Count	Percentage
Activities	Cans/Tins	pull tab	1	0.07%
	Misc. Hardware	Bolt	1	0.07%
		Activities Total	**2**	**0.14%**
Architecture	Brick, Block	Brick	26	1.85%
	Nails, Spikes, Etc.	Nail, indeterminate	5	0.36%
	Electrical	Insulator	1	0.07%
	Window Glass	Window glass	30	2.14%
		Safety Glass	1	0.07%
		Architecture Total	**63**	**4.49%**
Arms	**Gunflints**	**Honey-colored French gun flint**	**1**	**0.07%**
Faunal	**Bone**	**bone**	**1**	**0.07%**
Furnishings	**Lighting**	**Lamp chimney glass**	**3**	**0.21%**
Kitchen	Bottles	Bottle glass	16	1.14%
	Ceramics	Refined earthenware	6	0.43%
		Pearlware, indeterminate decoration	1	0.07%
		Pearlware, plain	54	3.85%
		Pearlware, shell edged	8	0.57%
		Pearlware, simple bands	2	0.14%
		Pearlware, transfer printed, blue	6	0.43%
		Pearlware, transfer printed, brown	1	0.07%
		Pearlware, handpainted	6	0.43%
		Redware, glazed	463	32.98%
		Redware, slipware, trailed	1	0.07%
		Redware, unglazed	514	36.61%
		Stoneware, gray bodied	1	0.07%
		Ironstone, plain	1	0.07%
		Whiteware, indeterminate decoration	1	0.07%
		Whiteware, plain	206	14.67%

Class	Subclass	Object/Ware	Count	Percentage
		Whiteware, shell edged	3	0.21%
		Whiteware, simple bands	6	0.43%
		Whiteware, sponge	2	0.14%
		Whiteware, transfer printed, black	4	0.28%
		Whiteware, transfer printed, blue	9	0.64%
		Whiteware, handpainted	8	0.57%
		Whiteware, stamped	2	0.14%
		Whiteware, stenciled	1	0.07%
		Yellowware, plain	7	0.50%
		Yellowware, Rockingham	1	0.07%
		Kitchen Total	**1330**	**94.73%**
Unidentified	**Indeterminate**	**Rubber seal**	**1**	**0.07%**
Prehistoric	**Lithic**	**Debitage**	**3**	**0.21%**
		TOTAL	**1404**	**100.00%**

The artifact assemblage was dominated by kitchen-related artifacts (*n*=1330) (see Table 10-12). These artifacts included bottle glass, whiteware, redware, pearlware, stoneware, and yellowware (Photograph 10-7). The bottle glass consisted of three aqua, one blue, two olive, two amber, one cobalt, and seven clear glass fragments. Olive bottle glass was common on mid-eighteenth to mid-nineteenth century sites.

The ceramic assemblage was composed predominately of redware (*n*=978) (Photograph 10-7). Pearlware sherds included 54 undecorated, eight edge decorated, two banded, seven transfer printed, and six hand painted specimens. Edge decorations included both green and blue shell edge decorations. Transfer printed decorations included one brown and six blue decorations. The hand-painted sherds included both polychrome and blue designs.

Whiteware sherds included 206 undecorated, 13 transfer-prints, eight hand-painted, two stamped, one stenciled, two sponged, six banded, and three edge decorated specimens (see Photograph 10-7). Additional sherds in the sample consisted of one pearlware, one whiteware, six refined earthenware indeterminate, one Rockingham, seven plain yellowware, one ironstone, and one gray stoneware sherd.



Photograph 10-7. Site 36LU279: Representative Ceramic Sample.

Row 1 (L-R) – hand-painted whiteware (FS 191); blue transfer-printed pearlware (FS 63); green shell-edge whiteware (FS 167). Row 2 (L-R) – redware (FS 82); redware (FS 82); banded whiteware (FS 192).

Dating Analysis

Artifacts, especially bottle glass and ceramics, provide useful information that helps to date the occupation or period of use for historic archaeological sites. The mean date of temporally diagnostic artifacts provides a general date for the occupation while the Terminus Post Quem (TPQ) date indicates the earliest possible manufacture date of the most recently manufactured artifact, indicating that occupation continued until at least the TPQ date. Modern artifacts, such as aluminum pull tabs found on sites near roads, could be modern intrusions and as a consequence are generally not used to calculate either of these dates.

There were 330 temporally diagnostic artifacts recovered from Site 36LU279 (Table 10-13). Because this site was likely abandoned prior to 1873, an arbitrary end date of 1900 was used for artifacts with production dates that continued into the twentieth century. These temporally diagnostic artifacts produced a mean date of ca. 1849 for this site. The site had a TPQ date of 1845.

Archival research revealed that Jacob Smethers obtained the original land grant for this parcel in 1814, which is the earliest likely date for occupation or use of this site. The tax assessments list two houses on the parcel in 1845 and only one house on the property in 1866. Site 36LU279 was likely used as a residential site within the period between 1814 and 1866. However, the lack of features and low density of architecture-related artifacts may also indicate that this was used as a refuse disposal area instead of a domestic site during this time period.

Table 10-13. Site 36LU279: Historic Artifact Dating Analysis

Object/Ware	Reference	Start Date	End Date	Count
Pearlware, plain	South 1977	1780	1830	54
Pearlware, shell edged	South 1977	1780	1830	8
Pearlware, transfer printed, blue	South 1977	1795	1840	6
Pearlware, transfer printed, brown	South 1977	1795	1840	1
Pearlware, underglaze handpainted	South 1977	1780	1830	6
Ironstone, plain	Wetherbee 1980	1840	1900	1
Yellowware, Rockingham glaze	South 1977	1845	1900	1
Whiteware, sponge stamped	Robacker and Robacker 1978	1830	1871	2
Whiteware, stamped	Robacker and Robacker 1978	1830	1871	2
Whiteware, plain	Price 1979, Noel Hume 1980	1830	1900	206
Whiteware, transfer printed, black	Majewski and O'Brien 1984, Mullins 1988	1828	1850	4
Whiteware, transfer printed, blue	Majewski and O'Brien 1984, Mullins 1988	1828	1860	9
Whiteware, hand painted	Majewski and O'Brien 1984; Lofstrum et al.1982	1830	1860	8
Whiteware, banded	Majewski and O'Brien 1984	1830	1860	6
Whiteware, stenciled	Lofstrum et al. 1982, Majewski and O'Brien 1984	1840	1860	1
Whiteware, shell edged	Lofstrum et al. 1982, Miller and Hunter 1990	1830	1891	3
Yellowware, plain	Ketchum, 1987	1830	1900	7
Bottle glass, olive	IMAC, 1984	1730	1870	2
Bottle glass, mold blown	Deiss 1981	1800	1870	1
			TOTAL	**330**
			Mean	**1849**
			TPQ	**1845**

Summary and Evaluation

Site 36LU279 is situated in the northern portion of a cultivated field flanked by North Market Street to the west and woodlands bordering Walker Run to the east. The Phase Ib field investigations resulted in the recovery of 159 artifacts but no features were identified. The background research indicated that the 142-acre property was occupied by the 1840s but the house location was not identified. Based on the artifact assemblage, Site 36LU279 was anticipated to be the original settlement location on this 142-acre parcel.

Phase II investigations used a three pronged approach including background research, archaeological testing, and laboratory analysis. Phase II archaeological testing included a controlled surface collection of 217-15x15 ft (4.6x4.6 m) blocks, excavation of 53 STPs on a 15-foot (4.6-meter) grid, eight judgmentally placed test units (150 sq ft or 13.9 sq m) and plowzone removal from three mechanically excavated 6x105 feet (1.83x32 m) trenches. In addition, excavation of an approximately 8x130 ft wetland mitigation exploratory trench (excavated by another contractor at the southern limits of Site 36LU279) was monitored by GAI. Phase II testing yielded 1,245 artifacts. The CSC activities produced 372 artifacts from 94 positive collection blocks. Fifteen positive STPs generated another 72 artifacts. No artifacts were collected from trench excavations. The remaining 801 artifacts came from test unit excavations.

The Phase I/II archaeological investigations at Site 36LU279 produced 1,403 artifacts. The vast majority of artifacts (69.7%) consisted of redware ceramics. There were few architectural-related materials recovered. This lack of architectural-related artifacts may be due either to log house construction or to secondary deposition of the artifacts (field scatter). The temporally diagnostic artifacts suggest the site dates to ca. 1815-1860. This agrees with the archival research, which indicated a house on the property in the 1840s. However, the lack of subsurface features makes it difficult to determine site function.

Phase II excavations examined nearly 16 percent of the site area. The archaeological remains are located entirely within the plowzone. No cultural features were identified. Based on the location of the artifacts and the lack of features, this site lacks integrity and does not meet the minimum criteria for listing in the National Register of Historic Places (NRHP). Accordingly, GAI recommends no further investigations of this site.

Site 36LU279 Recommendations

Site 36LU279 consists of an early to mid 19th century domestic site or secondary refuse disposal area located in a field between North Market Street and Walker Run. All of the artifacts were recovered from a plowzone context. There were no cultural features identified. Since all of the archaeological remains were located within a plow disturbed context, this site lacks integrity. GAI concludes that Site 36LU279 is not Eligible for listing to the National Register under Criterion D. Accordingly, GAI recommends that no additional work is required.

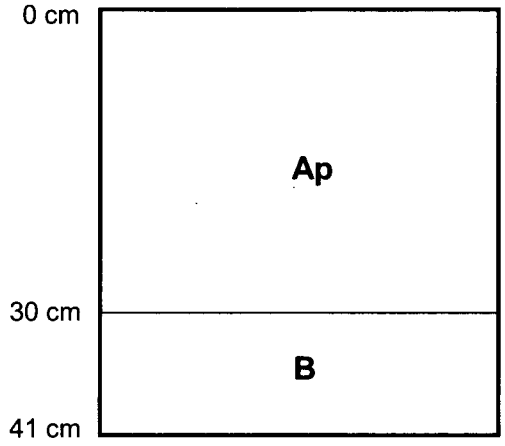
Figure 10-1. Site 36LU279 Location

REDACTED Figure 10-1
Site 36Lu279 Location

Figure 10-2. Site 36LU279 showing Phase Ib Testing Locations

REDACTED Figure 10-2
Site 36Lu279 showing Phase Ib
Testing Locations

STP 3



KEY:

Ap – BROWN (10YR 4/3) SILT LOAM

B – BROWN (7.5YR 4/4) SILTY CLAY

SCALE

0 m 0.2 m 0.4 m

gai consultants

DWN	LMD	CHKD	TJN
APPD	BAM	DATE	09/04/08
SCALE	AS NOTED		
DRAWING NUMBER	C080204.10.002.C.A.Si 2		

FIGURE 10-3. SITE 36LU279: REPRESENTATIVE SOIL PROFILE (STP 3)

BELL BEND NUCLEAR POWER PLANT

UNISTAR NUCLEAR DEVELOPMENT, LLC.

Figure 10-4. Site 36LU279 on Warrantee Map showing Original Parcels

REDACTED Figure 10-4
Site 36Lu279 on Warrantee Map showing Original Parcels

Figure 10-5. Site 36LU279 Vicinity in 1873

REDACTED Figure 10-5
Site 36Lu279 Vicinity in 1873

Figure 10-6. Site 36LU279 Vicinity in 1939

REDACTED Figure 10-6
Site 36Lu279 Vicinity in 1939

Figure 10-7. Site 36LU279 Vicinity in 1955

REDACTED Figure 10-7
Site 36Lu279 Vicinity in 1955

Figure 10-8. Site 36LU279 Vicinity in 1959

REDACTED Figure 10-8
Site 36Lu279 Vicinity in 1959

Figure 10-9. Site 36LU279 Vicinity in 1969

REDACTED Figure 10-9
Site 36Lu279 Vicinity in 1969

(Intentionally blank)

Figure 10-10. Site 36LU279 Phase II Testing Locations

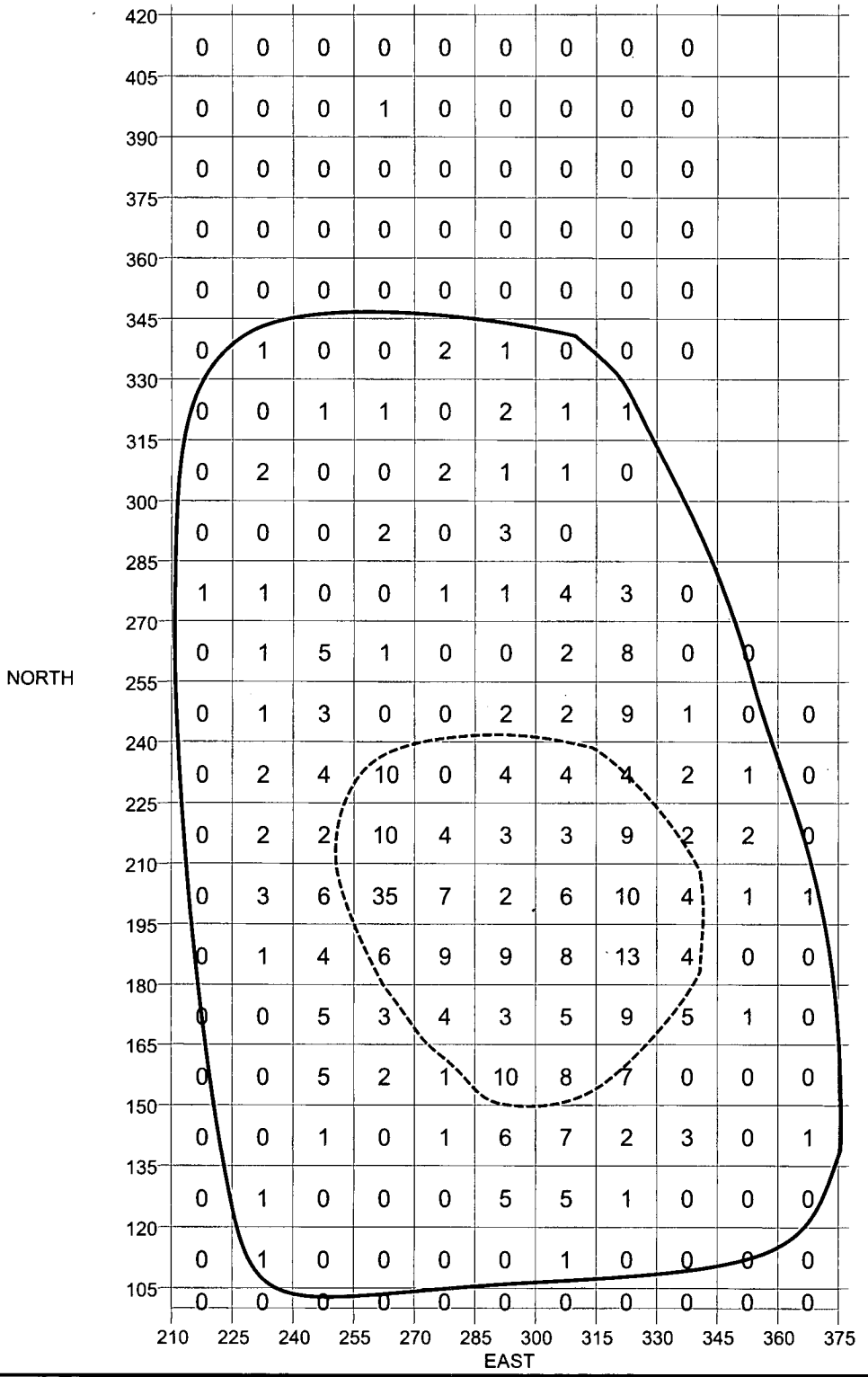
11x17

REDACTED Figure 10-10
Site 36Lu279 Phase II Testing Locations

(Back of Figure 10-10)

Side two of REDACTED Figure 10-10

SITE 36LU279
CONTROLLED SURFACE COLLECTION ARTIFACT DISTRIBUTION



LEGEND

——— : SITE BOUNDARY

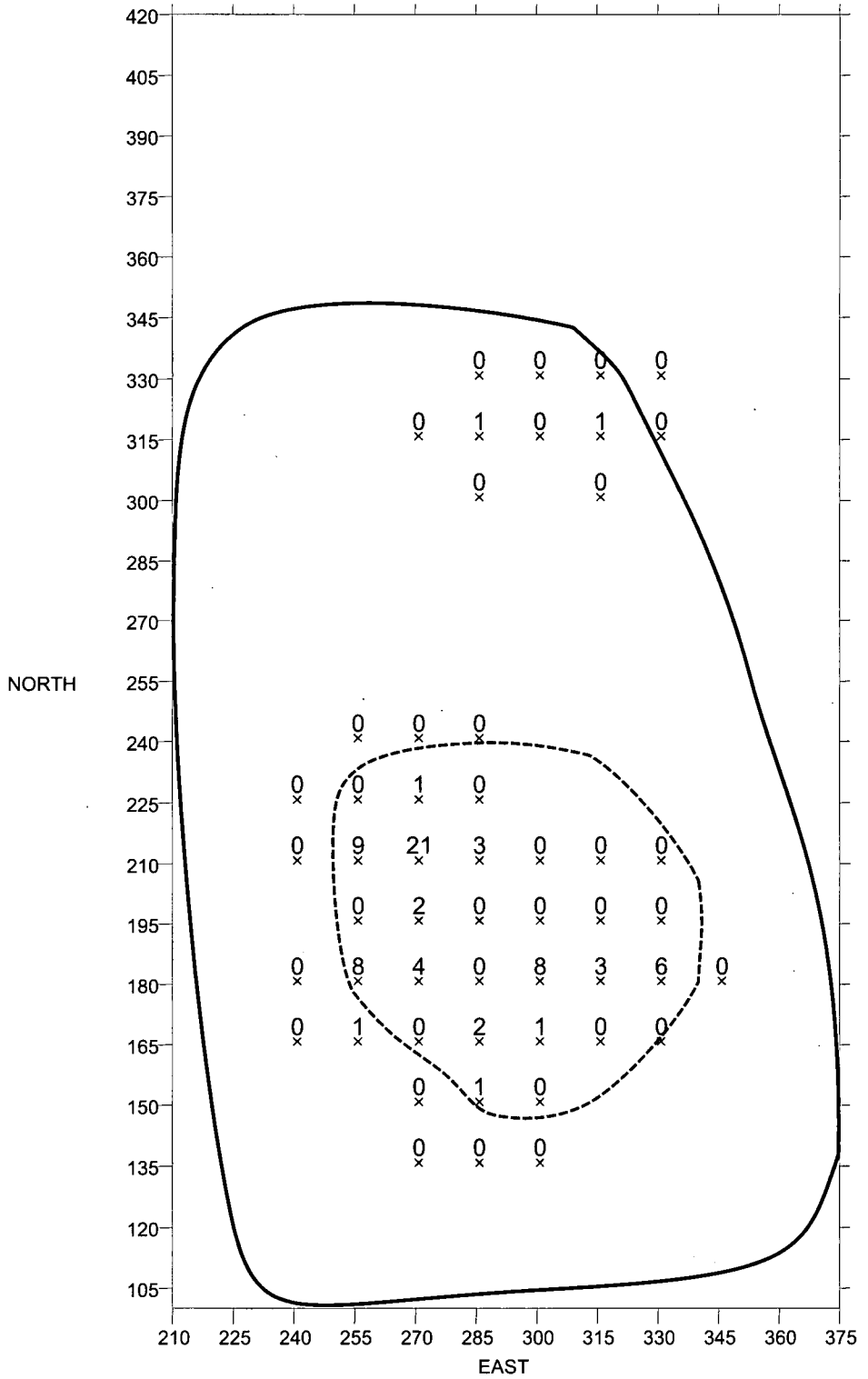
---------- : ARTIFACT CONCENTRATION

FIGURE 10-11
36LU279 CSC ARTIFACT DISTRIBUTION

BELL BEND NUCLEAR POWER PLANT
UNISTAR NUCLEAR DEVELOPMENT, LLC.
gai consultants

DRAWN: SJS DATE: 05/06/10
CHECKED: AKT APPROVED: LAF

SITE 36LU279
STP HISTORIC ARTIFACT DISTRIBUTION



LEGEND

———— : SITE BOUNDARY

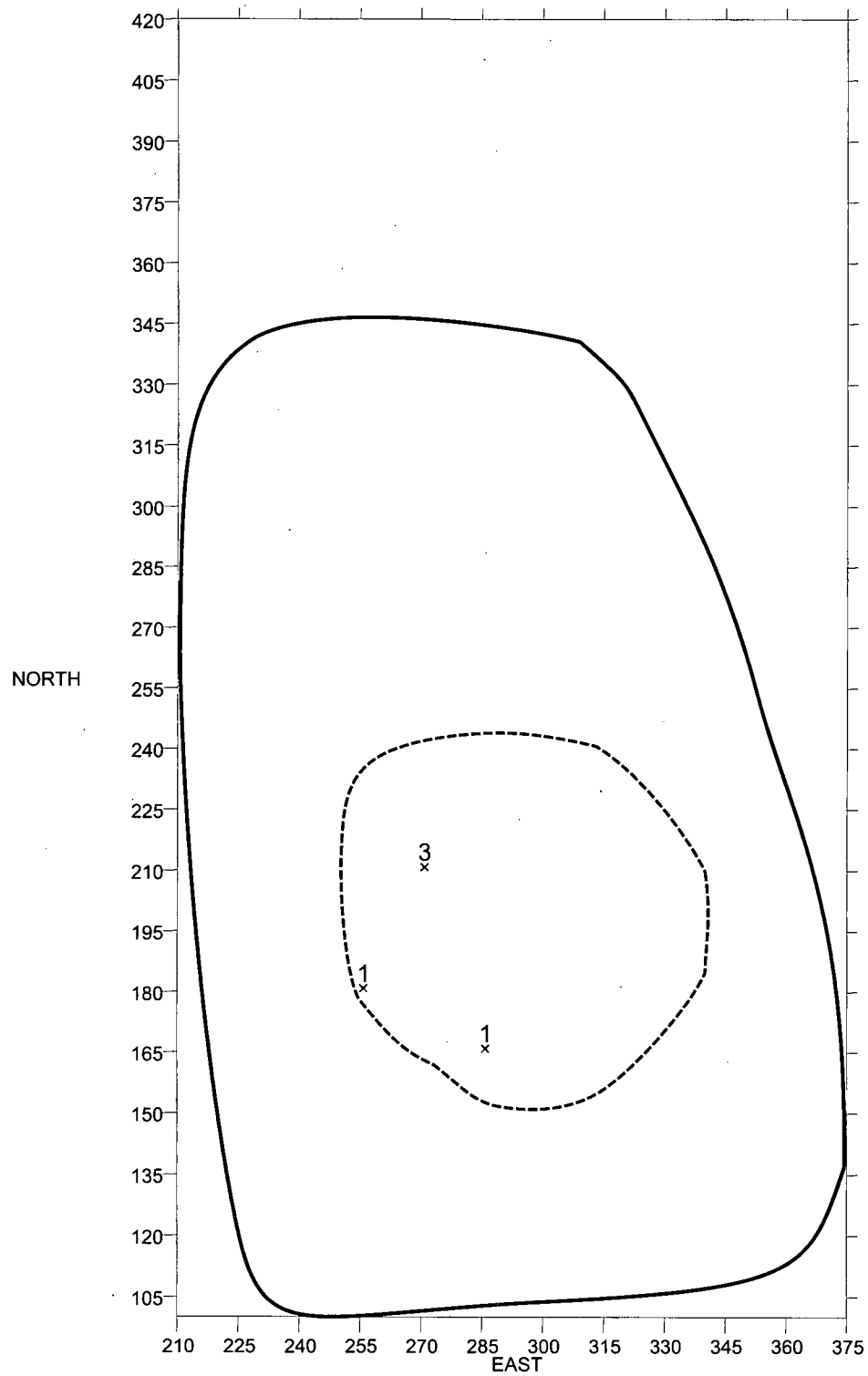
---------- : ARTIFACT CONCENTRATION

FIGURE 10-12
SITE 36LU279: STP ARTIFACT DISTRIBUTION

BELL BEND NUCLEAR POWER PLANT
UNISTAR NUCLEAR DEVELOPMENT, LLC.
gai consultants

DRAWN: SJS DATE: 05/06/10
CHECKED: AKT APPROVED:

SITE 36LU279
ARCHITECTURAL ARTIFACT DISTRIBUTION



LEGEND

: SITE BOUNDARY

: ARTIFACT CONCENTRATION

FIGURE 10-13
SITE 36LU279 :ARCHITECTURAL ARTIFACT DISTRIBUTION

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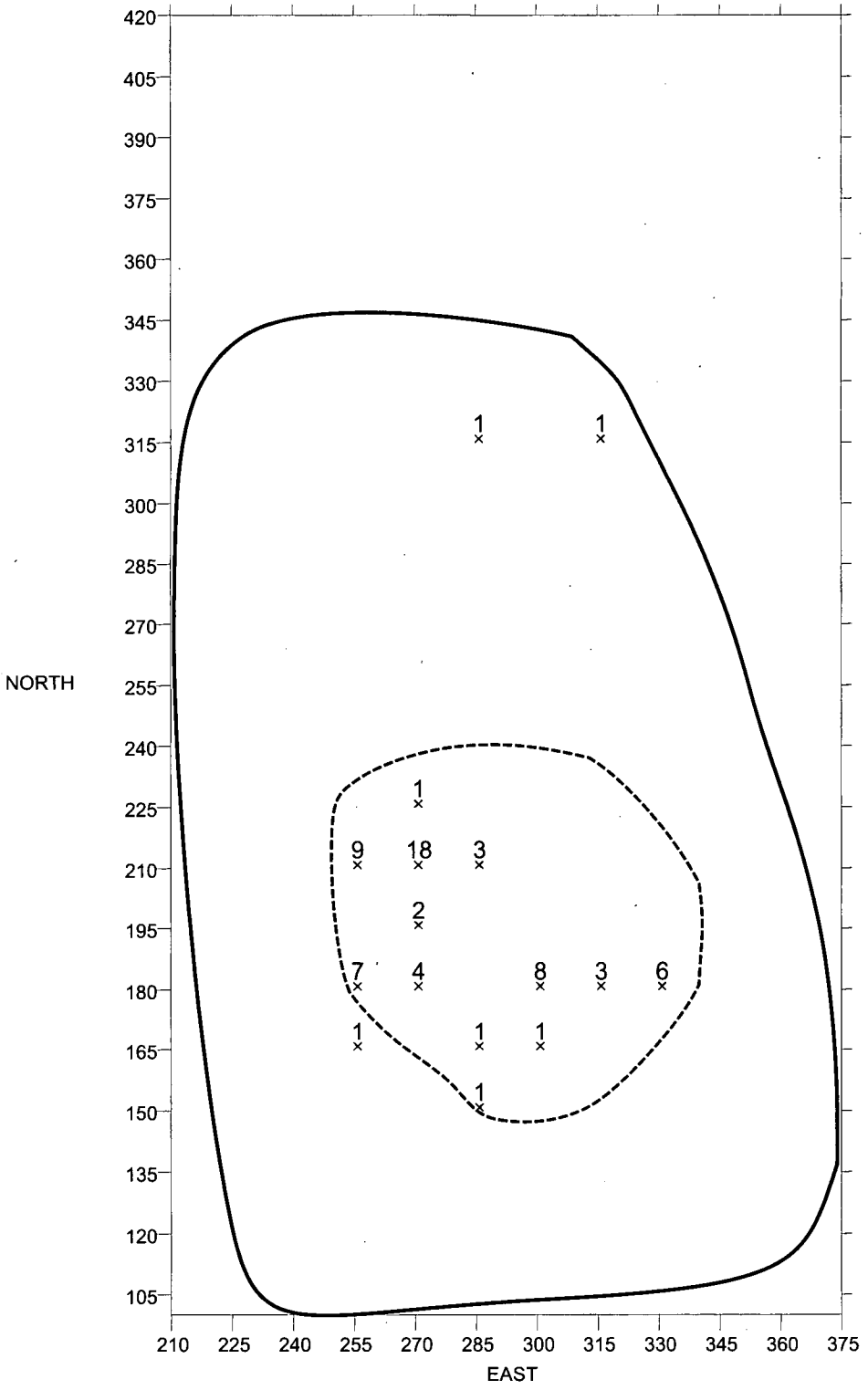
SITE 36LU279
KITCHEN ARTIFACT DISTRIBUTION



LEGEND

———— : SITE BOUNDARY

---------- : ARTIFACT CONCENTRATION

FIGURE 10-14
SITE 36LU279: KITCHEN ARTIFACT DISTRIBUTION

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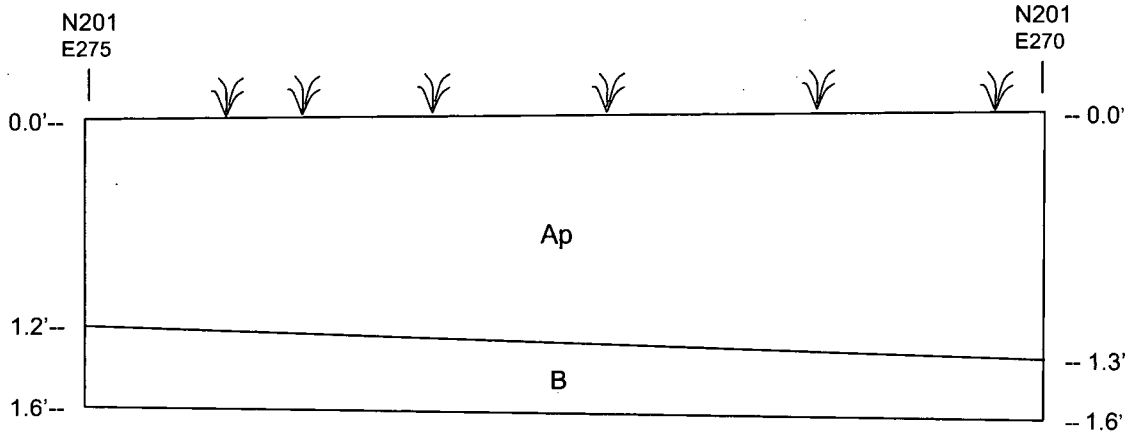
SITE 36LU279
TEST UNIT 2
SOUTH WALL PROFILE



Ap – DARK YELLOWISH BROWN (10YR 4/4) SILT LOAM
B – YELLOWISH BROWN (10YR 5/6) SILT CLAY LOAM

LEGEND

GROUND SURFACE

SCALE

0 FT 1 FT 2 FT

FIGURE 10-15
SITE 36LU279: TEST UNIT 2
SOUTH WALL PROFILE

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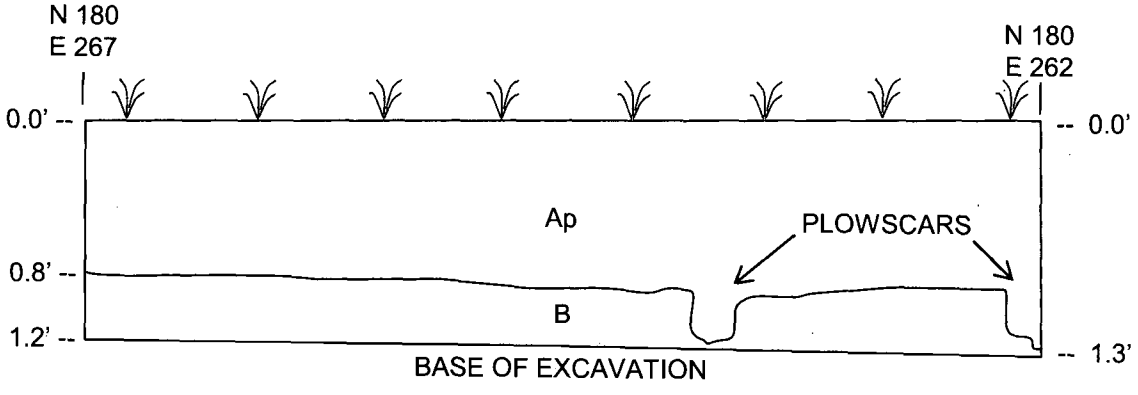
SITE 36LU279
TEST UNIT 3
SOUTH WALL PROFILE



Ap – DARK YELLOWISH BROWN (10YR 4/4) SILT LOAM
B – YELLOWISH BROWN (10YR 5/6) SILTY CLAY LOAM

LEGEND

GROUND SURFACE

SCALE

0 FT 1 FT 2 FT

FIGURE 10-16
SITE 36LU279: TEST UNIT 3
SOUTH WALL PROFILE

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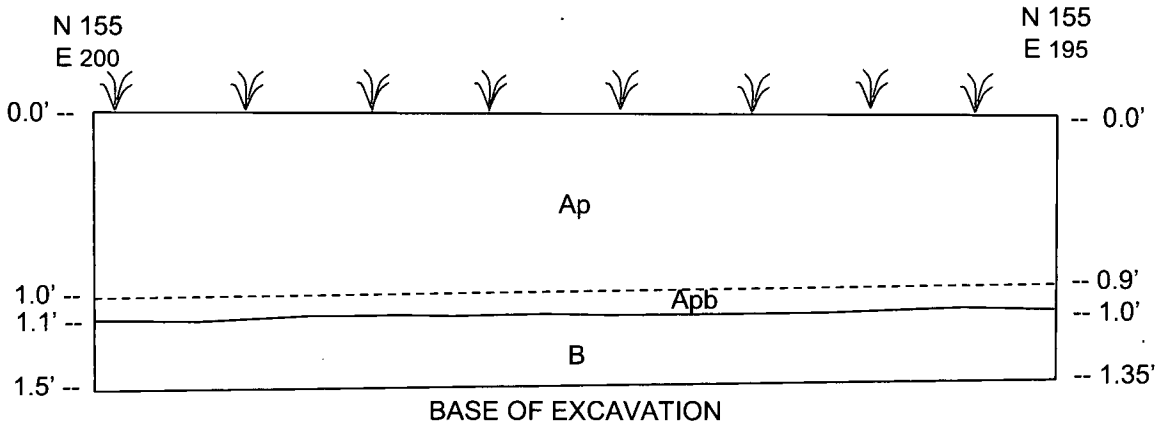
CHECKED: AKT APPROVED:

SITE 36LU279
TEST UNIT 5
SOUTH WALL PROFILE



Ap – DARK YELLOWISH BROWN (10YR 4/4) SILT LOAM
Apb – DARK BROWN (10YR 3/3) SILT LOAM
B – GREYISH BROWN(10YR 5/2) SILT CLAY LOAM

LEGEND

GROUND SURFACE

SCALE

0 FT 1 FT 2 FT

FIGURE 10-17
SITE 36LU279: TEST UNIT 5
SOUTH WALL PROFILE

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BELL BEND NUCLEAR POWER PLANT
UNISTAR NUCLEAR DEVELOPMENT, LLC.

DRWN: AJW DATE: 09/15/09
CHECKED: LMD APPROVED: BAM

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