6.91-MILE MILLTOWN "E" LOOP
OF THE LIBERTY PIPELINE UPSTREAM FACILITIES
TEMPORARY ROW EXPANSION AND
WORKSPACE AREAS
PHASE I HISTORICAL AND
ARCHAEOLOGICAL SURVEY

PRINCETON, FRANKLIN, AND BRUNSWICK TOWNSHIPS
MERCER, SOMERSET, AND MIDDLESEX COUNTIES
NEW JERSEY

Prepared for:
TRANSCONTINENTAL GAS PIPE LINE CORPORATION
Houston, Texas

Prepared by:
THE CULTURAL RESOURCE GROUP
LOUIS BERGER & ASSOCIATES, INC.
East Orange, New Jersey

MARCH 1992
November 2, 1992

Janet Feldstein
U.S. Environmental Protection Agency
26 Federal Plaza, Room 759
New York, New York 10278

Dear Ms. Feldstein:

Per our telephone conversation on November 2, 1992, attached is a copy of the report "6.91-Mile Milltown "E" Loop of the Liberty Pipeline Upstream Facilities Temporary ROW Expansion and Workspace Areas Phase I Historical and Archaeological Survey". This report was prepared by Louis Berger & Associates, Inc. for Transcontinental Gas Pipe Line Corporation (TGPL) to satisfy requirements of the Federal Energy Regulatory Commission (FERC) prior to construction of the 6.91-mile pipeline loop. Plans to construct this loop were shelved after completion of the survey, therefore, the report has not been submitted to the New Jersey SHPO or the FERC. Please note that TGPL was unable to survey several areas where access was denied by property owners and such areas included at least one property owned by Higgins.

I hope you will find the information provided by TGPL useful. Any questions should be addressed to J. D. Bloemker at 713-439-2656.

Very truly yours,

W. F. Chamberlain
Manager
Environmental Assessments

WFC/bjh

Attachment

cc: J. D. Bloemker
C. J. Murin
P. E. Newton
8830.3002
6.91-MILE MILLTOWN "E" LOOP
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This report presents the results of a Phase I historical and archaeological survey of the proposed route for the 6.91-mile Milltown 42-inch "E" Loop of the Liberty Pipeline Upstream Facilities in Princeton, Franklin, and Brunswick townships, Mercer, Somerset, and Middlesex counties, New Jersey. Phase I survey of the Milltown E Loop project included background research, project area reconnaissance and subsurface testing. Background research and reconnaissance indicated varying levels of historic and prehistoric archaeological potential in the project area. During the Phase I subsurface survey, LBA excavated 499 shovel tests over 3.33 miles of the project corridor.

At one location in the ROW expansion west of River Road, designated Area 6, shovel tests revealed the presence of an historic archaeological site. Artifacts indicate that the archaeological deposit documented here represents an occupation beginning in the late nineteenth or early twentieth centuries. All artifacts were recovered from plowzone deposits. This site may constitute a significant archaeological resource.

Lithic materials tentatively identified as prehistoric artifacts were recovered from five locations in the project area. Excavation of additional shovel tests in cruciform fashion around three of these findspots failed to produce additional artifacts. Based on the present findings, these do not represent significant archaeological resources. At two additional locations, the recovery of isolated prehistoric artifacts could not be evaluated because continued access to these locations by the property owners was denied.

Under present design plans, proposed construction will affect the historic site located west of River Road. LBA recommends that this site be evaluated in terms of its significance and National Register eligibility through a program of limited additional background research and Phase II archaeological testing.
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I. INTRODUCTION

This report presents the results of a Phase I historical and archaeological survey of the proposed route for the 6.91-mile Milltown "E" Loop of the Liberty Pipeline Upstream Facilities in Princeton, Woodbridge, and Brunswick townships, Mercer, Somerset, and Middlesex counties, New Jersey (Figures 1 and 2). The survey was conducted by the Cultural Resource Group of Louis Berger & Associates, Inc. (LBA) for the Transcontinental Gas Pipe Line Corporation (Transco).

Because the Milltown E Loop project will require a permit from the Federal Energy Regulatory Commission (FERC), Transco undertook this investigation to comply with federal cultural resource management regulations that require consideration of the effects of construction on significant historic or prehistoric resources. These regulations include Section 106 of the National Historic Preservation Act of 1966, Section 101 of the National Environmental Policy Act of 1969, "Protection and Enhancement of the Cultural Environment" (Executive Order 11593), and the Procedures for the Protection of Historic and Cultural Properties, as amended (36 CFR 800). This study was conducted in accordance with the aforementioned federal regulations as well as the "Guidelines for Archaeological Investigations" established by the Office of New Jersey Heritage (ONJH).

The purpose of a Phase I cultural resource survey is to determine the presence or absence of historical and archaeological resources in the project area, to derive preliminary indications of the age, horizontal extent, and integrity of any archaeological sites present, and where possible, to evaluate the significance of any sites in terms of National Register eligibility. Data collection tasks for this Phase I survey included background research, project area reconnaissance, and field survey.

The proposed project will involve construction of a 6.91-mile "loop" of Transco's existing 46-inch "A" and 30-inch "C" natural gas pipelines (Figure 2). This proposed loop involves construction of new 42-inch diameter gas pipeline adjacent and parallel to the existing Transco A and C pipelines. In contrast to construction of an entirely new pipeline, this proposed looping will allow Transco to use a portion of the existing right-of-way (ROW).

The 6.91-mile project corridor for the Milltown E Loop extends from pipeline Mile Point (MP) 1776.57 (Survey Station 585+20) to MP 1782.92 (Survey Station 921+67). Within this project corridor, the proposed pipeline loop segment begins at MP 1776.63 (Survey Station 594+96). Taking into account project alignment inflections, the total length for this pipeline loop segment is 6.28 miles. The overall axis of the project corridor trends from west-southwest to
FIGURE 1: Milltown E Loop Project Location in the Piedmont Region of New Jersey

SOURCE: Wolfe 1977
FIGURE 2: Milltown E Loop Project Area, Showing Sections Where LBA Conducted Phase I Subsurface Survey

Located between the village of Rocky Hill to the north and the towns of Princeton and Kingston to the south, the project corridor crosses three counties. The project begins at its southwestern terminus in Princeton Township, Mercer County, passing through Woodbridge Township in Somerset County, finally terminating in Brunswick Township in Middlesex County. Major landmarks traversed by the corridor include the south flank of Rocky Hill in the western part of the corridor and the Millstone River and Delaware and Raritan Canal, both of which are bisected near the center of the corridor. From west to east, roads bisected by the project corridor include Cherry Hill Road, Route 206, Redding Circle, Mount Lucas Road, Bunn Drive, Loop Road, Herrontown Road, Autumn Hill Road, River Road, Kingston/Rocky Hill Road, and Great Road.

Over most of the project corridor, the existing Transco A Line runs parallel to and approximately 40 feet north of the Transco C Line. As defined by Transco, the project area consists of the temporary ROW expansion areas north and south of these two existing lines and temporary work space areas defined for the project outside of these areas of ROW expansion. Transco specified areas of temporary ROW expansion on both sides of these existing pipelines. Over most of the project corridor, the temporary ROW expansion includes a 50-foot-wide ROW expansion to the north of the two existing lines and a 100-foot-wide ROW expansion to the south of these existing lines. Under present design plans, the centerline for the proposed Milltown E Loop will run through the wider ROW expansion, while the more narrow ROW expansion will be utilized for access and equipment storage during construction. It should be noted that the width of these temporary ROW expansion areas vary, in some cases ranging up to 150 feet wide. In addition to temporary ROW expansion areas, Transco has defined a total of four temporary work space areas.

For the purposes of this study, areas of potential impact from construction of the proposed pipeline include all areas of temporary ROW expansion as well as all temporary workspaces. During construction of the proposed pipeline, impacts to archaeological resources in the ROW can result from the specific steps involved in the construction process. Initial preparation of the ROW would involve clearance of trees and other large obstacles by heavy equipment. This would be followed by grading of the ROW to provide a level working surface for pipeline installation, during which any displaced topsoil would be conserved in a temporary pile or berm for replacement during final cleanup. Following this, a ditch would be excavated for the pipeline along the ROW centerline. Dimensions of the ditch will be approximately 66 inches wide and 78 inches deep. During actual laying of the pipeline, stringing (delivery of sections of pipe by truck to the work area), welding, and lowering of completed sections of pipeline into the ditch using side-boom tractors would be conducted inside the 50-foot wide "working side" of the ROW. Topsoil displaced during this operation
is normally stored on the opposite side of the pipeline trench within 25 feet of the proposed mainline. Once the pipeline has been laid in place, the ditch is backfilled with the previously excavated soil that was temporarily stored for this purpose. The ROW is then regraded to its approximate preconstruction contour, save for a slight crown of soil over the ditch to compensate for natural subsidence of the backfill.

In temporary work areas, possible impacts to cultural resources may also result from proposed use. In general, temporary work areas will be employed for the storage of equipment and materials or as staging areas during construction. Potential sources of disturbance include traffic from tracked and wheeled construction vehicles.

This Phase I historic and archaeological survey included background research, walkover reconnaissance, and subsurface shovel testing. Background research included study of (1) survey reports and historic and archaeological site files at the Office of New Jersey Heritage (ONJH); (2) prehistoric site files at the Archaeology Division, New Jersey State Museum; and (3) cartographic and historical data at the New Jersey State Library and Archives and the Alexander Library, Rutgers University.

Based on the background research, the proposed pipeline corridor was judged to contain areas of variable potential for prehistoric and historic archaeological resources. The walkover reconnaissance of the project area indicated limited areas of surface disturbance that were eliminated from subsurface archaeological survey. Subsurface survey identified a single historic site located near the center of the project corridor, immediately west of River Road. Artifacts recovered indicate a possible late nineteenth-century or early twentieth-century occupation at this location. This site may represent a significant archaeological resource that will likely be subject to impacts during proposed construction. LBA recommends that a program of Phase II archaeological evaluation be carried out at this location to determine the significance and National Register Eligibility of this site.

Dr. Jonathan Lothrop served as Principal Investigator for this project. Background research was conducted by Ingrid Wuebber. The field survey was supervised by Rob Jacoby and Bradford Botwick. The field crew included Janice Cross, Laura Elsinger, Ed Miller, and Earl Proper. This report was prepared by Lothrop and Botwick. The graphics for this report were prepared by Linda Lipka. This document was produced by Valerie Moore, under the direction of Lee Nicoletti.
II. ENVIRONMENTAL CONTEXT

The proposed alignment is situated at southwestern boundary of the Piedmont physiographic province of New Jersey. The Piedmont is a broad plateau of gently rolling terrain situated between the New Jersey Highlands to the northwest and the Coastal Plain to the southeast. The topography in this province is punctuated by ridges of resistant Lockatong argillites and igneous rock units (Wolfe 1977:244).

The project corridor crosses both floodplain and upland settings. The western and central portions of the project area run along the southern flank of Rocky Hill. This area consists of gently undulating topography with slight to moderate slopes. Further to the east, the alignment crosses the narrow floodplain and terraces of the Millstone River at Rocky Hill Gap before running across the eastern remnant of Rocky Hill east of the river. Elevations in the project corridor range from 60 feet at the Millstone River to 280 feet on the crest of Rocky Hill west of the Millstone River.

The bedrock of the Piedmont consists predominantly of sedimentary rocks of the Newark Basin, a rift valley formed during the Triassic Period (Van Houten 1969). Three rock units underlie the project area (New Jersey Geological Survey 1957). These include: (1) the Brunswick Formation, consisting primarily of interbedded reddish-brown shale and sandstone (Van Houten 1969; Wolfe 1977); (2) the Lockatong Formation, composed of black shale, argillite, and flagstone (Wolfe 1977:77); (3) and intrusive diabase which forms part of Rocky Hill. The Inner Coastal Plain, located five miles south of the project area, is composed of unconsolidated marine and fluvial deposits of clays, silts, sands, and gravels of Late Cretaceous and Tertiary Age (Stansfield 1983:32; Wolfe 1977:207). At the juncture of the Piedmont and Inner Coastal Plain, the unconsolidated deposits of the latter province overlie the rock units of the Piedmont.

The project area is located in the Millstone River drainage basin. The north-flowing Millstone is a high-order streamcourse that empties into the Raritan River near Bound Brook. Secondary drainages in the project area and vicinity include Stony, Harris, and Carters brooks, all tributaries of the Millstone River. Low-order tributaries of Stony and Harris brooks cross western portions of the project corridor, while Carters Brook flows through the eastern part of the project.

The soils within the project area are derived from four sources that include (1) weathered shale bedrock, which creates a loamy red soil; (2) weathered diabase and basalt rock, which generate yellowish brown silt; (3) Inner Coastal Plain sediments, which produce yellowish brown acidic sands and silts; and (4) alluvial
deposits, which result in reddish brown and brown silts. Additional deposits may be derived from glacial outwash in the area around the Rocky Hill Gap and along the banks of the Millstone River (Wolfe 1977:134).

The USDA soil conservation service has identified 15 soil series and complexes along the project corridor. These soils, as classified by the USDA, include Birdsboro silt loam; Doylestown silt loam; Elkton silt loam; Keyport sandy loam; Klinesville shaly loam; Lehigh silt loam; Lawrenceville-Mount Lucas silt loams; Mount Lucas very stony silt loam; Mount Lucas-Watchung very stony silt loams; Neshaminy silt loam; Neshaminy very stony silt loam; Neshaminy-Mount Lucas very stony silt loams; Penn shaly loam; Rowland silt loam; and Very stony land with Neshaminy material, Neshaminy-Mount Lucas material, and Watchung material (Jablonski 1972; Kirkham 1976; Powley 1987).

**Birdsboro silt loam**

Birdsboro silt loam consists of deep, well-drained soils found in the valleys of major streams. This soil type formed in old stream sediments derived from red sandstone, siltstone, and shale. A typical profile of this soil type consists of a surface layer of dark reddish gray silt loam about 8 inches thick. The subsurface layer is reddish brown silt loam four inches thick. The upper 7 inches of subsoil is reddish brown silt loam, and the lower 19 inches is dark reddish brown light silty clay loam that includes some pebbles. The substratum consists of dark reddish brown sandy loam between depths of 38 and 56 inches. The lower level of the substratum reaches 70 inches deep and is dark reddish brown stratified sand and gravel. In areas where slope exceeds 6%, higher frequencies of gravel may be present in the surface layer (Kirkam 1976:13-14).

**Doylestown silt loam**

Doylestown silt loam is described as deep and poorly drained soils that occur in upland settings. Soils of this unit formed in a mantle of silty material that weathered from red shale deposits of the Piedmont, or were wind-deposited. Typically, this soil series consists of a surface layer of very dark grayish brown to dark grayish brown silt loam with a depth of 11 inches. The subsoil is gray silt loam mottled with dark gray, light gray, strong brown, and yellowish brown silt loam. This stratum reaches a thickness of 28 inches. The substratum is mottled pale brown and yellowish brown silt loam (Jablonski 1972:18).

**Elkton silt loam**

Elkton silt loam formed in marine deposits. This soil type is described as deep and poorly drained, and is found in broad upland flats. The surface layer of this soil series is grayish brown loam
about 8 inches thick. The subsoil reaches 27 inches in thickness and consists of mottled gray clay loam. The substratum is mottled gray and yellowish-brown clay loam that extends to 60 inches deep (Kirkam 1976:23; Powley 1987:19).

**Keyport sandy loam**

Keyport sandy loam consists of deep, moderately well-drained soils that formed in moderately fine-textured Coastal Plain sediments. A typical profile of this soil includes a surface layer of brown sandy loam about 8 inches thick. The subsoil reaches 26 inches thick and is divided into three parts. The upper portion is yellowish brown sandy clay loam 7 inches thick. The middle part is a 12-inch layer of yellowish brown sandy clay loam. The lowest layer of the stratum is light brownish gray clay loam that reaches 7 inches in thickness. The substratum is mottled gray clay loam that extends to a depth of 60 or more inches (Powley 1987:31, 98).

**Klinesville shaley loam**

Klinesville shaley loam is characterized as shallow and well-drained, having formed in red shale, siltstone, or fine-grained sandstone. The upper 6-inch layer is dark reddish-brown shaly loam. The subsoil is 7-inches thick and consists of reddish-brown shaly loam. The substratum of yellowish-red very shaly loam reaches 18 inches deep. Bedrock is present at 18 inches or less (Kirkam 1976:25-26; Powley 1987:38, 99).

**Lehigh silt loam**

Lehigh silt loam is described as moderately deep, moderately well-drained and somewhat poorly-drained upland soils. This soil developed in sediments derived from gray or black metamorphosed shale and siltstone. A typical profile for this soil includes a very dark grayish-brown silt loam surface layer that reaches 11-inches thick. The subsoil is mottled very dark grayish-brown and dark grayish-brown silt loam and silty clay loam that reaches up to 29 inches deep. The substratum is a dark gray very shaly loam that lay atop weathered bedrock between 34 and 45 inches deep (Jablonski 1972:31; Kirkham 1976:29).

**Lawrenceville-Mount Lucas silt loams**

Lawrenceville and Mount Lucas silt loams tend to co-occur in varying proportions. Lawrenceville silt loam is characterized as deep and moderately well-drained. It is typically found in upland settings, having developed in a silty mantle over shale, sandstone, basalt, diabase, or metamorphosed shale. The 6-inch-thick surface layer consists of dark brown silt loam. The subsurface layer is 9-inches of brown silt loam. The subsoil, between 15 and 31 inches deep is mottled brown silt loam. The lower part, between 31 and
48-inches-deep, is a firm and brittle fragipan of brown heavy silt loam. Shale bedrock lay at a depth of 48 inches (Kirkham 1976:28).

Mount Lucas silt loam is characterized as a deep, moderately well-drained soil that developed in sediments derived from weathered diabase and basalt rocks of the Piedmont. A representative profile consists of a surface layer of dark grayish-brown and grayish-brown silt loam 8 inches thick. The subsoil between depths of 8 and 23 inches is mottled light yellowish-brown and yellowish-brown silt loam and heavy silt loam. Between 23 and 35 inches deep, the layer is mottled dark-brown light silty clay loam. The substratum reaches a depth of 56 inches and is mottled brown cobbly loam. Bedrock lies at 56 inches (Kirkam 1976:31). Also included in project area are Mount Lucas very stony silt loam. This soil conforms to the above description but includes diabase stones greater than 10 inches in diameter (Jablonski 1972:35).

Mount Lucas-Watchung very stony silt loams

Watchung soils are characterized as deep and poorly drained, having formed in material weathered from dark gray or black igneous rock. A typical profile consists of a 9-inch-thick surface layer of very dark brownish-gray silt loam. The subsoil is divided into three parts: 4 inches of light brownish-gray silt loam, 12 inches of light brownish-gray silty clay loam, and 11 inches of pinkish-gray silty clay loam. The substratum reaches to 60 inches deep or more and consists of mottled strong brown gravelly loam (Kirkham 1976:49).

Neshaminy silt loam

Neshaminy silt loam is a deep, well-drained soil found in the uplands of the Piedmont. This soil formed in materials weathered from diabase rock. A representative profile of this soil includes a 4-inch-thick dark brown silt loam. The subsoil is reddish-brown silty clay loam that is 37 inches thick. The substratum of dark yellowish-brown gritty loam is gravelly or cobbly. Bedrock generally lies between 5 and 10 feet deep (Jablonski 1972:35). Also located along the proposed alignment are Neshaminy very stony silt loams which include diabase boulders and rocks greater than 10 inches in diameter (Jablonski 1972:36; Kirkham 1976:33).

Penn shaly silt loam

Penn shaly silt loam is a moderately deep and well-drained soil found in upland settings. This soil formed in material weathered from shale, siltstone, and fine-grained sandstone. A typical profile includes a surface layer of dark reddish-brown silt loam 8 inches thick. The subsoil is divided into two layers. The upper portion is 4 inches thick and consists of reddish brown silt loam. The lower part is 13 inches of reddish brown shaly loam. The
substratum reaches is a dark reddish-brown very shaly loam that meets shale bedrock at 30 inches deep (Kirkham 1976:40).

Rowland silt

Rowland silt is characterized as deep, moderately well-drained or somewhat poorly-drained soil that formed in alluvium along major rivers and their tributaries. It is located on floodplains along streams and large drainages in the Piedmont. The 7-inch surface layer generally consists of brown silt loam. The subsoil is 33 inches thick and is dark brown and reddish brown silt loam. The substratum of gray silt loam and dark gray sandy loam reaches to depths greater than 60 inches (Powley 1987:57, 109).

Very stony land

Three types of Very stony land are found in the proposed alignment. These soil types consist of small mapped areas that include rounded boulders of rock. The three types included are Very stony land, Watchung material; Very stony land, Neshaminy material; Very stony land, Neshaminy-Mount Lucas material. The soils of each type conform to the above descriptions and include diabase boulders greater than 24 inches in diameter that cover 50 to 90% of the surface area (Jablonski 1972:48).

The natural vegetation in the region, where soil and drainage permit, is forest. The most common forest type present in the Piedmont is the mixed oak forest, dominated by red, white, and black oak and the less common chestnut oak and scarlet oak. In addition to these species, other trees present may include hickory, maple, white ash, tulip tree, beech, elm, black cherry, sweet birch, and black gum (Robichaud and Buell 1973:171-180). The most common tree types in wet areas are red maples, elm, pin oak, swamp white oak, and silver maple. Other flora in this environment consists of laurel, shadbush, spicebush, ferns, skunk cabbage, and mosses. Vines, such as poison ivy and wild grape, are also present in areas where trees have been felled by wind or disturbed by man (Robichaud and Buell 1973:151-154). These habitats support a variety of terrestrial, aquatic, and semi-aquatic wildlife. Mammalian species that are currently and/or formerly present include deer, raccoon, rabbit, squirrel, muskrat, beaver, bear, and mink. Avian species include quail, ducks, and geese (Leopold et al. 1981). Riverine environments would include fish, mollusks, and certain reptiles and amphibians.
III. PREHISTORIC BACKGROUND

This chapter presents an overview of the prehistoric occupation of New Jersey. Regional journals, cultural resource reports, and local archives were examined for information on regional prehistory.

The earliest recognized aboriginal occupation of New Jersey dates to the Paleoindian period (11,000 to 10,000 BP). Paleoindian occupation is characterized by the use of distinctive fluted lanceolate points. While over 200 such fluted points have been found throughout New Jersey, the largest number of these have been located in the Delaware River drainage, and almost all of these are surface finds (Marshall 1982).

Preserved pollen remains and associated radiocarbon dates suggest a gradual warming trend following the retreat of the Pleistocene glaciers that began about 17,000 BP. The general pattern of ecological succession suggests a predominantly herbaceous vegetation following glaciation (i.e., mosses, lichens, and sedges). This was succeeded by open parkland vegetation and then by mixed forest zones with pine and spruce predominating at about 13,000 BP. In New Jersey, pine had begun to predominate sometime after 12,000 BP, and roughly coincided with the beginning of the Paleoindian period. By 8500 BP, oak and hemlock predominated. During the Paleoindian period, sea level lay below its modern level. As a result, the Jersey shoreline lay some 50 miles east of its present position (Marshall 1982).

Paleoindian subsistence strategy may have centered on the hunting of game. Although other economic activities such as the gathering of plant foods may have been equally important, they have left little or no trace in the archaeological record. The location of known Paleoindian sites in New York and New Jersey suggests a preference for high, well-drained ground, near streams or wetlands, offering vantage points for observing game. Sites have also been located in rockshelters, near lithic source areas, and on lower river terraces. It is probable that many Paleoindian sites were situated on what is now the continental shelf (Marshall 1982).

The ecological changes brought about by the warmer Holocene climates subsequently encouraged population migrations and the development of new subsistence strategies which characterize the Archaic period dating from 10,000 to 3000 BP. Compared with the Paleoindian period, a wider variety of artifact types were used during the Archaic. This suggests that a greater diversity of subsistence and technological activities were pursued, although hunting still appears to have been the major focus.
The Early Archaic phase (10,000 to 8000 BP) is characterized by corner-notched, stemmed, and bifurcate stemmed projectile points (Coe 1964; Broyles 1971). Several Early Archaic components have been identified in the region, including the Old Place, Ward's Point, and Richmond Hill sites on Staten Island (Ritchie and Funk 1971, 1973:38-39). Although the transition from the Late Paleoindian to the Early Archaic period was marked by a change in projectile point morphology, recently it has been suggested that such a shift does not necessarily indicate a new way of life (Gardner 1974; Cavallo 1980). These researchers have argued that Late Paleoindian populations and Early Archaic peoples continued the same basic adaptation and that change in projectile point morphology merely implies a technological rather than an economic shift. Settlement patterns during this period appear to represent the same preferences for site location as in the preceding period (LBA 1986:III-19).

Middle Archaic remains, dated to 8000 to 6000 BP, are extremely rare in the region, possibly the result of unclear typological definitions for this period. So little is known about the Middle Archaic occupation of New Jersey that it is often linked with either the Early or Late Archaic (Kraft and Mounier 1982). The traces of this period that have come to light suggest the exploitation of a broader resource base than in earlier periods. In addition, a change in lithic material preferences also occurred, with a greater reliance on argillite. Models of settlement for the Middle Archaic suggest two types of sites. The first type reflects large group activities that are sited to maximize proximity to a variety of resources. Such sites would be located on floodplains and low terraces of major rivers and streams and in association with marsh, swamp, and estuarine environments. A second site type recognized for the Middle Archaic reflects small group activities such as forays from base camps or staging areas. These sites would be located in a wider variety of environmental settings (LBA 1984:III-21-22).

Sites associated with the Late Archaic period (6000-3000 BP) are more common, leading to the inference by some researchers of an increase in aboriginal populations at this time. In some instances, Late Archaic base camp sites appear to represent occupations of longer duration. A variety of narrow-bladed notched and stemmed projectile points, including Lackawaxen, Poplar Island, Lamoka, and Sylvan types, are diagnostic of the Late Archaic period. Tool assemblages from Late Archaic sites also include atlatl weights, ground and pecked-stone implements, heavy and light woodworking tools, netsinkers, and food-grinding implements (Kinsey et al. 1972; Kraft 1975). Milling stones and other food grinding implements attest to an increased reliance on gathered wild plants; netsinkers, stone-boiling features, and faunal remains indicate the importance of fishing and shellfishing.
Models for Late Archaic settlement suggest three alternatives. The first is a central-based wandering system wherein a fixed base camp is occupied on a semi-sedentary basis. Seasonal or constant forays to other camps would occur with the base camp periodically or seasonally abandoned and reoccupied during later parts of the annual cycle. A second settlement pattern involves a shifting base camp location. This alternative model suggests that base camp locations would shift when local resource bases become depleted or as seasonal resources become available in other areas. The third alternative model proposes restricted wandering within a given territory with periodic group consolidation at changing base camp locations as resource availability allowed (LBA 1986:III-27).

Regensburg (1971) has reported a major Late Archaic habitation and mortuary site at the Savich Farm in Marlton, New Jersey. The cremated remains of some 52 individuals have been identified, some accompanied by grave goods, suggesting incipient social ranking.

The Terminal Archaic or Transitional period (3000-2700 BP) is distinguished by broad-blade projectile points including Susquehanna, Perkiomen, and Orient Fishtail types. The appearance of soapstone or steatite vessels and artifacts on New Jersey Coastal Plain sites of this period provides evidence of interregional trade and also may suggest residential stability, since stone bowls are items not easily transportable from site to site.

The Woodland period (2700 BP/750 BC to AD 1600) is divided into three successive subperiods: Early, Middle, and Late Woodland. The Early Woodland (750 BC to 0 AD) is traditionally distinguished from the preceding Late Archaic period by the introduction of ceramic vessels. Trends toward greater sedentism and subsistence specialization began during the Terminal Archaic continued and were eventually accompanied by experimentation with cultigens. The earliest ceramics are termed the Marcey Creek and Ware Plain types and consist of flat-bottomed, straight-sided vessels with lugs or handles. These are thought to have been followed by the Vinette I conical-based, coarse-gritted, coil-constructed vessels, the interiors and exteriors of which are covered with the marks of cord-wrapped paddles (Williams and Thomas 1982; Kraft 1975). The Early Woodland Meadowood projectile point is also fairly widespread on sites of this period in New Jersey.

Settlement pattern models for the Early Woodland period generally conform to those presented for the Late Archaic. Present data from the Early Woodland support two possible models. The first alternative suggests the occupation of base camps in proximity to zones of maximum resource availability. Forays by small groups would leave these camps to exploit available resources, but would not extend outside the major environmental zone in which the base camp was situated. The alternative model suggests that seasonal fusion and fissioning of groups at specialized procurement and
processing sites occurred. Such consolidation might take place during runs of anadromous fish. Afterwards, groups would split and move into a variety of environments on forays. Later group fusion would follow in other areas to exploit other seasonal resources (LBA 1986:III-30).

During the Middle Woodland period (AD 0 - 700), coarse cord-marked pottery was replaced by net-impressed and, at least at the Abbott Farm site near Trenton, zoned ceramics. Rossville, Fox Creek, and Jack’s Reef are the predominant projectile point types. Pestles, hammerstones, and anvilstones are important processing implements recovered from sites of this period, while the presence of netsinkers attests to the continued exploitation of fish resources (Williams and Thomas 1982; Stewart 1985). Settlement patterns during this period appear to reflect a continuation of those postulated for the preceding Late Archaic and Early Woodland periods (LBA 1986:III-32).

The Late Woodland period (AD 700 - 1600), is well represented throughout New Jersey. The largest sites are usually located on major rivers and probably represent base camps which may have been occupied during most of the year. Smaller sites are abundant on tributaries as well as near natural springs. These sites probably functioned as temporary or seasonal camps. The practice of hoe-type horticulture was well established, although hunting, gathering, and fishing continued as major subsistence activities. Hickory nuts and acorns were important wild foods, as were butternut and blueberries. Freshwater mussels have been found in large quantities in many of the shell pits and middens on the terraces of the Upper Delaware River (Kraft and Mounier 1982; Kinsey 1972).

Except for stylistic changes, the Late Woodland stone toolkit remained similar to that of earlier periods and reflects the functional diversity associated with exploiting a broad resource base. The utilization of a wide range of lithic materials coincided with sedentary settlements and the exploitation of immediately available resources. Diagnostic artifacts of the Late Woodland period are triangular points; collared and collarless ceramic vessels bearing incised geometric motifs and cordmarking; and a variety of chipped, pecked, and groundstone tools (LBA 1989:III-8).

Present information indicates two possible alternatives for Late Woodland settlement patterns. These models are similar to those discussed for the Late Archaic period. The first alternative proposes base camps that were settled on a year-round basis with small-group forays leaving those camps seasonally or as needed. During the Late Woodland, these forays do not appear to be as frequent as during earlier periods. The second model suggests that base camps were broken up on a seasonal basis and groups moved to other camps for limited amounts of time as resources were
exploited. Differing degrees of group fusion and fissuring would occur away from the base camp (LBA 1986:III-39-40).

At the time of European contact, New Jersey was occupied by the Unami branch of the Lenape (renamed the "Delaware" by Europeans) (Goddard 1978; Kraft 1986). The Algonquian-speaking Lenape could not be described as a tribe because they existed in loosely structured, autonomous bands residing in small dispersed settlements (Kraft 1981). Increased contact with European traders and settlers resulted in the breakdown of traditions and increased reliance on European goods in exchange for land and furs. Warfare, disease, and alcoholism decimated the native population to such an extent that by 1759 it was estimated that only 300 Lenape remained in the Province of New Jersey. By 1801, few Lenape remained in the state; today their descendants reside primarily in Oklahoma and Canada (Kraft 1986).
IV. HISTORICAL BACKGROUND

This chapter presents a historical overview of the Lower Millstone River Valley. Particular attention is given to the settlement, transportation systems, and economic development in the region.

The project area is located in the Lower Millstone River Valley. Initial European settlement of this region began in the late seventeenth-century. Colonists included Dutch-descended settlers from Manhattan and Long Island and English immigrants. The earliest documented occupation of the area is associated with Greenland's Tavern near Kingston, established by 1685. Within the next 15 years, English Quakers founded a settlement along Stony Brook (Menzies 1969; Murphy et al. 1981:1; LBA 1984:IV-13, 1991:7-8).

Because the Millstone River was not navigable, settlers entered the Lower Millstone Valley via a network of roads. Between 1620 and 1660, the Dutch built the Upper Road (now State Route 27) to link their Hudson River and Delaware River settlements. This road incorporated portions of the Assunpink Path, an Indian trail that ran between New Brunswick and Kingston (LBA 1985:V-7) (Murphy et al. 1981:1).

Early settlers established dispersed farmsteads on irregularly-shaped lots that enabled individuals to maximize their possession of desirable land (LBA 1985:V-4). Nucleated settlements also focused on roads; generally at intersections or river crossings. Thus the ford of Stony Brook became a focus of settlement that later developed into the town of Princeton; the intersection of the Millstone River and Upper Road became the site of Kingston; and Mount Lucas Road, an important eighteenth-century route, was the location where the village of Rocky Hill was established (LBA 1985, 1991:8; Murphy et al. 1981:2). Nucleated settlements became sources of goods and services for surrounding rural areas. Villages encompassed mills (grist and saw), taverns, and stores as well as other services such as blacksmiths and wheelwrights (LBA 1984:IV-23; Murphy et al. 1981:6). This pattern of nucleated settlements surrounded by dispersed farmsteads characterized the area throughout the eighteenth and nineteenth centuries (LBA 1984, 1985).

Economic patterns established by the first settlers in the region persisted through the eighteenth and nineteenth centuries. Agriculture formed the economic basis of central New Jersey. Wheat and corn were the primary cash crops followed by oats and hay. Farmers cultivated fruits and vegetables, and produced dairy products primarily for home consumption. Flax and sheep were raised for linen and wool (Schmidt 1973; LBA 1991:12). After 1810, increased competition and improved communication resulted in
innovation and reform in agricultural practices. By the second half of the nineteenth century, specialization in dairying was possible because of improved transportation to expanding urban markets. Perishable crops were also cultivated for quick sale in the cities. In the central portion of New Jersey, cereal crops were still grown in association with dairying (Schmidt 1973:105, 187-190) (LBA 1991:12).

Other economic pursuits developed in association with agriculture and the region's transportation systems. The principal activities were milling and tavern-keeping. By 1710, a mill was located on the east side of the Millstone River at Rocky Hill (Menzies 1969:49; Murphy et al. 1981:2). Grist mills became prevalent throughout the area to convert the agricultural produce of the region. Saw mills also increased in frequency as the rising population demanded building materials (LBA 1984:IV-23).

Taverns were also a prominent economic activity in the area. The developing transportation networks and the resulting flow of people and goods through the region supported this business. Princeton was a stopping point along the New York-Philadelphia stage coach route, while Rocky Hill served as a port on the D&R Canal (League of Women Voters 1963; Murphy et al. 1981:13). Additional industries in the region included quarrying, brick works, fulling and wool manufacturing (Murphy et al. 1981:13; LBA 1984:IV-46).

Until the nineteenth century, roads were the primary means of transportation and communication in the area. Nineteenth century developments in transportation included the construction of turnpikes, the opening of the Delaware and Raritan (D&R) Canal, and the installation of a branch of the Trenton-New Brunswick Railroad. Turnpike construction began in New Jersey during the early nineteenth century. In 1807, the Princeton-New Brunswick Turnpike was built. A boom in local road construction and improvements also occurred in this period (LBA 1985:V-16). The growing network of roads contributed to greater population growth by improving access to the area (Murphy et al. 1981:8).

The D&R Canal began operating in 1834. Its primary purpose was to ship coal from Pennsylvania to eastern markets, although other commodities such as iron, lumber, timber, grain, feed, and flour travelled along this route. The success of the canal prompted development in the Millstone Valley, particularly in the vicinity of Rocky Hill. By the late nineteenth century, improved transportation and convenient water power stimulated the town's growth as a small industrial center. Certain industries, such as quarrying and brick manufacturing, were made economically feasible by the canal (Murphy et al. 1981:7, 13). After successful competition with the railroad for 50 years, however, the canal began to decline in importance after 1880 (LBA 1984:IV-30).
Railroads began operating in the region by 1839. By this date the Trenton-New Brunswick Railroad operated a main route that ran just east of the Millstone River. By 1864, a branch line was extended through Princeton and Kingston, with a spur to Rocky Hill (LBA 1984:IV-30, 1985:V-17-18). Initially, passenger service was dominated by the railroad, with the canal handling a greater volume of freight. After 1880, the railroad dominated the canal (LBA 1984:IV-35-36). The railroad had varied impacts on the economy of the study area. While it allowed the industry around Rocky Hill to expand, it also ended the stagecoach traffic through Princeton (League of Women Voters 1963:4; Murphy et al. 1981:13).
V. RESULTS OF BACKGROUND RESEARCH: ARCHAEOLOGICAL RESOURCE POTENTIAL

To assess the potential for locating cultural resources inside the project area, LBA consulted studies and reports that contained information on prehistoric and historic period settlement. In addition, known prehistoric sites were plotted on USGS topographical maps in the four quadrangles (Princeton, Rocky Hill, Monmouth Junction, and Hightstown) surrounding the project area to characterize the locational attributes of prehistoric site distribution. Historic maps and documents were consulted to determine where historic period sites had been situated in relation to the project area.

Review of site files indicates that no recorded prehistoric sites are present in the project area. With regard to historic resources, the project corridor crosses the Delaware and Raritan (D&R) Canal, a National Register property. No impacts to this resource are anticipated from construction of the proposed pipeline because a directional bore beneath the canal will be conducted at this crossing location.

A second National Register property is located immediately south of the project area. The "Tusculum" property is situated southwest of the intersection of the project corridor with Cherry Hill Road. The property was first owned in the eighteenth century by John Witherspoon, sixth president of Princeton University and a signer of the Declaration of Independence. He constructed the stone residence in 1773. At the time, the property was used both as a residence and as an agricultural laboratory. After his death in 1794, the property passed through a succession of owners and was acquired by the Stockton family in 1815. In 1830, additional improvements were made to the property, including the construction of a Federal-style stone barn. Tusculum remained in the hands of the Stocktons into the mid-nineteenth century and was eventually purchased by Edward Jewell in 1857. The 20-acre property encompasses the residence, stone barn, and associated outbuildings. These structures are all located 800 to 1000 feet south of the project corridor. The northern boundary of the overall Register property lies approximately 100 feet south of the project ROW. Consequently, no impacts to this property are anticipated from construction of the proposed Milltown E Loop pipeline.

With regard to the possible occurrence of prehistoric sites in the project area, background research for cultural resource studies in the lower Raritan River Valley (LBA 1992) suggests that the prehistoric utilization of wetlands and riverine environments was common. Previous research in Middlesex County and other parts of New Jersey indicates that habitation sites of aboriginal populations were frequently located on elevated, well-drained
landforms in proximity to water sources (Skinner and Schrabisch 1913; Schrabisch 1915; Kalb and Kopleck 1979; Springstead et al. 1980; Fittipaldi 1981; Chesler 1982; Kardas and Larabee 1985; Research and Archaeological Management 1989). Recorded prehistoric sites display a correlation with particular environmental features; all are associated with a stream, river, or wetland.

To derive indications of site potential in the upper reaches of the Raritan River drainage where the project is located, state site files and cultural resource reports were consulted for locational data on prehistoric sites in the project vicinity. For this area, a pattern similar in some respects to that described above for the lower Raritan Valley seems to obtain. Review of cultural resource reports (Perazio and Baumgardt 1988, Cruse et al. 1990, and Hunter 1991) and state site files indicates that sites in the project vicinity tend to occur either in settings with well-drained soils or in proximity to year-round streamcourses. Of the seven recorded prehistoric sites located within three miles of the project area, five (28Me49, 28So38, 28So73, 28So75, 28So93, and 28Mi90) are associated with USDA soils characterized as well-drained. In addition, each of these five sites is found within 500 feet of an existing watercourse. The remaining two sites (28Mi112 and 28Mi113) are associated with Chalfont silt loams that are characterized as somewhat poorly drained. These two sites are located within 600 feet of low-order streams. Components represented in this sample of seven sites include Late Archaic, Early Woodland, and Late Woodland components.

Based on this review of locational attributes for recorded prehistoric sites, LBA designated all portions of the project corridor with well-drained soils (Birdsboro, Klinesville, Neshaminy, and Penn associations) located within 500 feet of a streamcourse as areas of high potential for prehistoric sites. Project area sections with well-drained soils located at distances of greater than 500 feet from existing watercourses were designated as having a moderate potential for prehistoric sites. (The distribution of well-drained soils in the project area is shown in Figure 3.) Finally, settings with less than optimal soil drainage characteristics but that were situated within 500 feet of a streamcourse were considered to be locations of moderate archaeological potential. For remaining portions of the project area where soil drainage is characterized as poor and streamcourses are absent, prehistoric archaeological potential was characterized as low. Using these criteria, slightly less than half of the project corridor constitutes settings of high or moderate prehistoric sensitivity.

Historic maps of the project area vicinity (Morgan and Hills 1766; Otley and Keily 1850; Beers 1873; Everts and Stewart 1875) provide data for calculating the historic archaeological potential of the project area (Figures 4-7). These data, presented in Table 1, indicate a total of six locations of historic occupation in the
FIGURE 3: Milltown E Loop Project Area, Showing Sections with USDA Soils Characterized as Well Drained

FIGURE 4: Milltown E Loop Project Area Superimposed on Morgan and Hills 1766 Map of Mercer County

SOURCE: Morgan and Hills 1984
FIGURE 5: Milltown E Loop Project Area Superimposed on Otley and Kelly 1850 Map of Somerset County

SOURCE: Otley and Kelly 1850
FIGURE 6: Milltown E Loop Project Area Superimposed on Beers 1873 Map of Somerset County

SOURCE: Beers 1873
FIGURE 7: Milltown E Loop Project Area Superimposed on Everts and Stewart 1875 Map of Mercer County

SOURCE: Everts and Stewart (1875)
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<td>Kingston/Rocky Hill Road Crossing</td>
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project corridor. These include areas immediately west of the Cherry Hill and Mount Lucas Road crossings, areas immediately east of the Herrontown and Kingston/Rocky Hill crossings, an area immediately north of a small stream that feeds the D&R Canal, and an area immediately west of the Great Road crossing. These locations were characterized as areas of high potential for historic archaeological resources, pending results of pedestrian reconnaissance. Survey station points delineating the linear extent of these high potential areas in the project area are provided in Table 1. The positions of these six locations in the project corridor are depicted in Figure 8. All remaining portions of the proposed ROW were characterized as having a low potential for such resources. During the subsequent pedestrian reconnaissance of the project area, these assessments were revised as a result of observations regarding disturbance in the project area.
FIGURE 8: Miltown E Loop Project Area, Showing Locations of Historic Archaeological Potential Listed in Table 1

VI. PHASE I FIELD INVESTIGATIONS

A. INTRODUCTION

Phase I field investigations of the project area included an initial surface reconnaissance of the entire project area, followed by subsurface testing in areas of high and moderate archaeological potential. LBA conducted the fieldwork for this project during the periods from December 6, 1991 through January 14, 1992, and February 25 through February 26, 1992.

B. PEDESTRIAN RECONNAISSANCE

Pedestrian reconnaissance of the project area was intended to refine assessments of archaeological potential in the project area based on observations of topographic setting and ground conditions. During reconnaissance, the character and condition of project area sections were recorded based on observations of surface conditions and limited soil augering. Areas with poor drainage indicated by saturated soils or standing water were excluded from subsurface survey. Areas that exhibited ground disturbance in the form of truncated soil profiles observed on exposed surfaces or by soil augering were also excluded from further consideration. With regard to areas of historic archaeological potential, LBA only excluded Location 6, on the west side of Great Road. During reconnaissance at this location, soil augering indicated a truncated soil profile.

C. PHASE I SUBSURFACE SURVEY METHODOLOGY

Based on the above assessments of archaeological potential, LBA defined 12 project corridor segments for subsurface survey, designated Areas 1 through 12 (see Figure 2, Table 2). Phase I subsurface survey consisted of shovel test excavation at prescribed intervals. In areas of ROW expansion, shovel testing was normally conducted as paired, single transects located on opposite sides of the existing A and C pipelines. In temporary workspace areas, Phase I shovel testing was conducted at the variable intervals depending upon sensitivity. In areas of high archaeological potential, LBA archaeologists excavated shovel tests at 50-foot (15-meter) intervals. Shovel testing in areas of moderate archaeological potential and high potential areas with limited disturbance was normally conducted at 100-foot (30-meter) or greater intervals.

During subsurface survey, all shovel tests in a single transect were assigned a number within a single sequence for that area. Shovel tests measured approximately 1.4 feet (40 centimeters) in diameter and were excavated to an average depth of 3.0 feet (90 centimeters). Excavations proceeded by natural or cultural soil horizons, and deposits from individual strata were screened through 0.25-inch (6-millimeter) mesh for systematic artifact recovery. In
TABLE 2. Locations of Survey Areas in the Project Corridor and Lengths of ROW Shovel Tested.

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<td>774.14</td>
<td>K, L</td>
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<tr>
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<td>781.38</td>
<td>M, N</td>
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<td>600</td>
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<tr>
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<tr>
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<td>815.00</td>
<td>Q, U, R</td>
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<td>10</td>
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<tr>
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<td>850.53</td>
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<td>888.06</td>
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<td>300</td>
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</tbody>
</table>
each shovel test, soil strata were designated with letters from an alphabetic sequence reflecting their positions from top to bottom in the test profile. Thus, four strata encountered in a single shovel test would be designated Strata A through D, with Stratum A being located at the top of the profile.

During Phase I subsurface survey, recovered artifacts were bagged according to soil stratum and shovel test provenience. Modern cultural materials recovered from disturbed deposits were inventoried and discarded in the field. Diagnostic historic and any possible prehistoric artifacts were retained for laboratory analysis. Standardized LBA field forms were used to describe shovel test soil profiles. All shovel test locations were recorded on project maps.

During Phase I survey, LBA archaeologists excavated a total of 499 shovel tests in ROW expansion and workspace areas along the project corridor. A total of 17,600 linear feet (3.33 miles) or 48 percent of the 6.91-mile project corridor was investigated by subsurface survey (see Table 2). Results of investigations are described in detail below. Discussion of results of fieldwork begins with Area 1 at the southwestern terminus of the project area and proceeds northeastward. Artifacts recovered during Phase I survey are listed in catalog fashion in an appendix to this report.

D. FIELD INVESTIGATIONS

1. Area 1

Survey Area 1 consists of a 3,700-foot-long section of the project corridor extending from the southwestern terminus of the project to Cherry Hill Road (see Figure 2, Figures 9 and 10). This section of the project corridor traverses largely undeveloped lands consisting of fallow fields and wooded areas. The Area 1 segment crosses four south-flowing, low-order stream tributaries of Stony Brook. Approximately the western two-thirds of this segment encompasses well-drained soils. The eastern portion of the segment encompasses an area of historic archaeological potential, illustrated as the "Jos. Grier" property on Everts and Stewart (1875) (Table 1). Shovel test Transects A and B were excavated north and south respectively of existing Transco pipelines. In addition, Temporary Work Spaces 1 and 2 were also surveyed. Temporary Work Space 1 encompasses the southwestern terminus of Milltown E Loop pipeline (see Figure 9). Temporary Work Space 2 is located further to the east, adjacent to the north side of the ROW expansion (see Figure 10).

Over most of the ROW expansion, shovel tests were excavated at 50-foot intervals. In portions of the ROW expansion, and in both temporary work spaces, the poorly drained nature of soils encountered during shovel testing and their high clay content, resulted in an increased shovel testing interval of 100 feet. In
LEGEND

- EXISTING PIPELINES
- PROPOSED PIPELINE
- ROW EXPANSION
- NEGATIVE SHOVEL TEST, PREHISTORIC
- POSITIVE SHOVEL TEST, PREHISTORIC

FIGURE 9: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 1, Transects A and B, Private Road to Survey Station 614 + 78
FIGURE 10: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 1, Transects A and B, Survey Station 614+78 to Cherry Hill Road
both transects, soils typically consisted of an A-horizon of brown or dark brown silt or clayey silt underlain by subsoils of clayey silt (Figure 11). Artifacts recovered during shovel testing along Transect A included two fragments of unidentified bottle glass from Shovel Test 1 and a single sherd of whiteware from Shovel Test 37. In Transect B, cultural materials were only recovered from Shovel Test 55. Items included single fragments each of whiteware, broad glass, and bottle glass and two fragments of brick. These five items were recovered from Stratum A, a plowzone deposit. The small number of historic artifacts recovered from this one shovel test and the absence of additional artifacts in surrounding shovel tests indicates that these items likely reflect casual discard and not actual historic occupation at this location.

Survey in Temporary Workspace #1 consisted of four shovel tests excavated within the boundaries of this 200x150-foot area (see Figure 9). Profiles in these tests were comparable to those encountered in Transects A and B. No artifacts were recovered.

Temporary Workspace #2 is larger, measuring 500x150 feet (see Figure 10). Subsurface survey here consisted of 10 shovel tests excavated at 100-foot intervals. Shovel Tests 1, 3, and 7 produced a total of five historic artifacts including two whiteware sherds, a machine cut nail, one fragment of broad glass, and one piece of unidentified glass. These items, all recovered from the A-horizon, likely represent casual discard rather than historic occupation at this location.

2. Area 2

Area 2 consists of a 3,700-foot-long segment of the project corridor located between Cherry Hill Road to the west and Mount Lucas Road to the east (see Figure 2, Figures 12 and 13). Western portions of Area 2 traverse undeveloped wooded sections immediately north of a housing development. Further to the east, this housing development encroaches on the project corridor, particularly in the vicinities of the Route 206 and Mount Lucas Road crossings. Limited survey in the western portion of Area 2 (Transect D, Shovel Tests 1-5) confirmed that soils in this area were not well drained. Remaining portions of Area 2 where soil drainage was poor, particularly in its midsection, were not shovel tested.

The eastern portion of Area 2, between Route 206 and Mount Lucas Road contains USDA soils characterized as well-drained. In the ROW expansion to the north, shovel testing documented the presence of a fill deposit measuring up to 62 centimeters thick above intact soils (Figure 14). This fill deposit consisted of yellowish brown clay silt mottled with strong brown clayey silt and brownish yellow clay. In Shovel Test 2 in Transect C, modest numbers of historic artifacts including broad glass, brick, and redware, pearlware, and whiteware ceramic fragments, and nails were recovered from this fill deposit. Intact soils beneath this fill deposit were sterile.
FIGURE 11: Representative Shovel TestProfiles, Area 1, Transects A and B
EXISTING PIPELINES
—— PROPOSED PIPELINE
—— MOW EXPANSION
NEGATIVE SHOVEL TEST.
POSITIVE SHOVEL TEST.
PREHISTORIC
100.
to
FEET

FIGURE 12: MIltown E Loop Project Corridor, Locations of Shovel Tests in Area 2, Transects C and D, Cherry Hill Road to Survey Station 661+39
FIGURE 13: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 2, Transects C and D, Survey Station 661+39 to Mount Lucas Road
FIGURE 14: Representative Shovel Test Profiles, Area 2, Transects C and D
These historic artifacts may relate to an actual historic occupation in the vicinity. They derive from a relatively thick fill deposit, however, that likely has its origin in the recent residential development in this area. As a consequence, these artifacts occur in a disturbed context and do not represent significant archaeological resources. In the ROW expansion to the south, no shovel testing was conducted because development had completely disturbed the deposits here.

The portion of Area 2 between U.S. Route 206 and Mount Lucas Road was designated as an area of high potential for historic archaeological resources (Table 1). Immediately east of Route 206, the project area has been heavily disturbed by development of an apartment complex. Consequently, Phase I shovel testing was only conducted between Redding Circle and Mount Lucas Road (see Figure 13). Shovel testing of this wooded section encountered an A-horizon plowzone of dark brown silty clay above subsoils of strong brown clay grading down to silty clay (see Figure 14). The only artifact recovered during survey here consisted of one whiteware fragment recovered from Stratum A of Shovel Test 8 in Transect D. Results of Phase I shovel testing in this eastern portion of Area 2 indicate that the historic occupations identified by map research either lie outside of the project corridor or have been completely disturbed by twentieth-century development.

3. Area 3

Area 3 extends from Mount Lucas Road to Bunn Drive, measuring a total of 2,050 feet in length (see Figure 2, Figure 15). Of this total, 1,800 feet were examined with shovel test transects E and F. The majority of this survey area encompasses well drained soils. Reconnaissance revealed areas of recent residential development in the western portion of Area 3. Here, shovel tests excavated at 100-foot intervals documented a fairly consistent pattern of fill deposits above truncated soil profiles, as exemplified by the profile for Shovel Test 2 in Transect E (Figure 16). Over most of the eastern portion of Area 3 where well-drained soils are mapped, shovel testing was conducted at 50-foot-intervals. Typically shovel tests here displayed profiles consisting of an A-horizon plowzone of yellowish brown silt loam or dark brown clayey silt underlain by subsoils of clayey silt and clay (see Figure 16). Shovel Test 23 in Transect E yielded the only artifacts recovered, consisting of one whiteware fragment, one piece of lamp chimney glass, a ceramic bowl fragment, and a clay pigeon fragment.

4. Area 4

Area 4 consists of a 3,000-foot-long section of the project corridor between Loop Road and Herrontown Road (see Figure 2, Figure 17). Well drained soils are present in the western and eastern thirds of Area 4. The central portion of Area 4 contains poorly drained soils; it encompasses a first-order stream tributary...
FIGURE 15: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 3, Transects E and F, Mount Lucas Road to Bunn Drive
FIGURE 16: Representative Shovel Test Profiles, Area 3, Transects E and F

LEGEND

A 7.5YR 4/4 BROWN/DARK BROWN CLAY LOAM MOTTLED WITH 7.5YR 5/6 STRONG BROWN SILTY CLAY (FILL)
B 10YR 4/2 DARK GRAYISH BROWN SILTY CLAY
C 7.5YR 4/6 STRONG BROWN CLAY
D 7.5YR 5/8 STRONG BROWN SILT MOTTLED WITH 10YR 6/6 BROWNISH YELLOW SILT

LEGEND

A 10YR 4/4 DARK YELLOWISH BROWN SILT LOAM
B 7.5YR 5/8 STRONG BROWN SILTY CLAY
C 10YR 5/8 YELLOWISH BROWN CLAY

LEGEND

A 10YR 3/3 DARK BROWN CLAYEY SILT
B 10YR 5/6 YELLOWISH BROWN CLAYEY SILT
FIGURE 17: MIltown E Loop Project Corridor, Locations of Shovel Tests in Areas 4, Transects G and H, Loop Road to Herrontown Road
of Harrys Brook. The latter watercourse is itself a tributary of the Millstone River to the southeast. Phase I survey of Area 2 involved excavation of Shovel Test Transects G and H to the north and south respectively. Phase I survey was conducted across all of Area 4, save for a 400-foot-long section at its western end where recent construction of a residential development had resulted in extensive surface disturbance. During Phase I survey, portions of Area 4 bracketing the unnamed stream were shovel tested at 50-foot intervals. Over the remaining portions of Area 4 to the east and west where subsurface survey was conducted, shovel tests were excavated at 100-foot intervals.

Subsurface survey revealed a consistent profile of plowzone above intact subsoils (Figure 18). At shovel tests such as Number 20 in Transect H, excavated in the vicinity of the stream, plowzone typically consisted of a brown or dark brown silty loam. Further to the east and west, as in Shovel Tests 5 in Transect G and 31 in Transect H, this stratum consisted of a brown clayey silt. At all locations, subsoils were composed of brownish yellow or yellowish brown or brown clayey silt or clayey loam. No artifacts were recovered during shovel testing of Area 4.

5. Area 5

Area 5 extends from Herrontown Road to Autumn Hill Lane, comprising a 1,200-foot-long segment of the project corridor (see Figure 2, Figure 19). This portion of the project area consists of largely undeveloped, wooded terrain that is drained by a second low-order tributary of Harrys Brook. Excluding activities associated with construction of the existing pipelines, disturbance in Area 5 is restricted to the immediate vicinity of a modern residence on the north side of the ROW expansion just west of Autumn Hill Lane. During shovel testing, a plowzone stratum was typically observed at the top of the profile, composed of either yellowish brown silty loam or brown clayey silt. As shown in Figure 20, this plowzone stratum was underlain by subsoils consisting of clayey or silty loams and silty clays. The single artifact recovered during shovel testing of this project segment was an 1833 dime recovered from the top of Stratum A in shovel Test 11 of Transect J.

6. Area 6

Area 6 constitutes a 3,200-foot section of the project corridor between Autumn Hill Lane and River Road (see Figure 2, Figure 21). This portion of the project corridor is presently undeveloped and almost entirely wooded. Soils here are classified as well drained. In terms of topography, the Area 5 runs from the top of the east end of Rocky Hill down to River Road, terminating just west of the Millstone River. The east-trending slope here generally ranges between two and eight degrees.
FIGURE 18: Representative Shovel Test Profiles, Area 4, Transects G and H
FIGURE 19: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 5, Transects I and J, Herrontown Road to Autumn Hill Lane
FIGURE 20: Representative Shovel Test Profiles, Area 5, Transects I and J
FIGURE 21: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 6, Transects K and L, Autumn Hill Lane to River Road
Over the majority of Area 6, shovel testing was conducted north and south of the existing pipeline (Transects K and L) at intervals of 100 feet. At the east end of Area 6, the last 500 feet, located near the Millstone River, were shovel tested at an interval of 50 feet. Soil profiles observed during shovel testing all displayed a plowzone above intact subsoils (Figure 22). Plowzone deposits consisted variously of clayey silt, silt or silt loam; in some shovel tests, the shallow nature of the plowzone suggested past erosion as a result of slope. Subsoils varied in texture between clayey silt and clayey loam and silty loam. Shovel tests at the east end of Area 6 in some instances encountered the water table at depths of approximately 80 centimeters.

Shovel Test 10 in Transect K produced a single flake of quartz from the interface of the A and B strata (see Figure 21). Recovery of this artifact, identified as an early reduction flake, prompted excavation of four additional shovel tests in cruciform pattern around this findspot. These shovel tests were each located at a distance of 2 meters from the original shovel test. This additional shovel testing failed to produce any prehistoric artifacts.

During shovel testing, only one artifact was recovered from Transect L, this being a single piece of broad glass found in Stratum A of Shovel Test 6 in the western portion of this transect. On the north side of the ROW expansion, six shovel tests (numbers 31, 35, 38, 39, 41, and 43) in the eastern portion of Transect K produced a total of 104 historic artifacts (Figure 23). These items were found in shovel tests located within 200 feet of a possible nineteenth-century residential structure situated immediately north of the ROW expansion (Figure 24). All items were recovered from plowzone soils consisting of dark brown silty loam above a B-horizon of yellowish brown silty loam. Items recovered include 19 ceramic, 34 glass, and 47 small finds artifacts as well as four faunal specimens. Ceramics include stoneware, ironstone, and whiteware. Glass artifacts include broad glass and assorted bottle glass fragments. Small finds include wire nails and a machine cut spike. Faunal remains include single specimens of clamshell and cow, and two oyster shell fragments.

Considering again the horizontal distribution of this material, it seems significant that the most productive shovel test, Shovel Test 39, was located closest to the structure at the north end of the ROW expansion (see Figure 24). This fact, combined with the range of materials recovered from this and the remaining five positive shovel tests in the vicinity, suggests that the material recovered represents domestic refuse from historic occupation of this house. Date ranges for the recovered artifacts are broad, beginning in the nineteenth century and extending nearly to the present. The recovery of certain items such as broad glass and a stoneware bottle fragment indicate a potential historic occupation here dating to either the nineteenth or early twentieth century. The present structure at this location is not shown on any of the
FIGURE 22: Representative Shovel Test Profiles, Area 6, Transects K and L
FIGURE 23: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 6 at Eastern Terminus of Transects K and L
FIGURE 24: Milltown E Loop Project Corridor, Total Historic Artifact Counts, Excluding Faunal Remains, in Shovel Tests in Area 6 at Eastern Terminus of Transects K and L
historic maps reviewed as part of the background research for this project. Coupled with the artifact assemblage, this suggests that the structure itself and the beginning of the historic occupation here may date to the late nineteenth or early twentieth century.

7. Area 7

Area 7 consists of a 700-foot-long section of the project corridor between River Road to the west and the D&R Canal to the east (see Figure 2, Figure 25). This survey area encompasses the Millstone River. Portions of the project corridor here are partially wooded. An additional temporary workspace measuring 150x150 feet adjoins the northern ROW expansion. This workspace presently consists of a gravel parking lot. A twentieth-century residence is present in the southern ROW expansion.

During Phase I subsurface survey, shovel tests in Transect M were excavated in the northern ROW expansion and shovel tests in Transect N excavated in the southern ROW expansion. No shovel tests were excavated in the temporary workspace because the presence of a gravel pad there precluded the possibility of impacts to any archaeological resources that might survive beneath this parking lot.

In Transect M, shovel tests further to the west displayed deep fill deposits relating to the construction of the parking lot immediately to the west. Shovel tests further to the east displayed what appeared to be relatively undisturbed profiles, as exemplified by Shovel Test 5 in Transect M. Shovel tests here revealed a relatively thick plowzone consisting of dark brown silt loam above a subsoil of yellowish brown clay loam. To the south, Shovel Tests 1-4 in Transect M encountered a series of fill deposits that likely relate to construction of the present bed of River Road and perhaps construction of the modern residence immediately east of River Road here. A minimum of three fill strata were observed in these shovel tests, as illustrated in Shovel Test 4 (Figure 26). In this shovel test, the uppermost two strata yielded plastic fragments indicating a recent age for these deposits. None of these four shovel tests encountered intact soils despite excavations to depths as much as 75 centimeters. To the east, two shovel tests (M-16 and N-5) were excavated between the Millstone River and the D&R Canal. These shovel tests encountered homogeneous deposits of silt and silt loam that likely represent recent flood sediments.

8. Area 8

Area 8 extends from Survey Station 787+00 to Kingston/Rocky Hill Road, measuring 1,600 feet in length (see Figure 2, see Figure 25). This survey area begins approximately 400 feet east of the Penn Central Railroad; this intervening ground was not included in this survey area because of extensive disturbance indicated by soil augering. Evidence of disturbance in this area east of the Penn
EXISTING PIPELINES
——— PROPOSED PIPELINE
——— ROW EXPANSION

FIGURE 25: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 7, Transects M and N, River Road to D&R Canal, and Area 6, Transects O and P, Station 787 + 00 to Kingston/Rocky Hill Road
FIGURE 26: Representative Shovel Test Profiles, Area 7, Transects M and N

LEGEND

A 10YR 3/3 DARK BROWN SILTY LOAM
B 10YR 4/4 DARK YELLOWISH BROWN CLAYEY LOAM

LEGEND

A 10YR 3/3 DARK BROWN SILTY LOAM GRAVEL (FILL)
B 7.5YR 5/6 STRONG BROWN COMPACT SILTY LOAM GRAVEL (FILL)
C 7.5YR 7/4 PALE YELLOW SILTY LOAM MOTTLED WITH 10YR 6/6 BROWNISH YELLOW SILTY LOAM WITH ANGULAR GRAVEL (FILL)
Central Railroad included truncated soil horizons and redeposited soils. Such disturbance is likely a product of railroad construction and past activities related to operation of the Trap Rock Industries, Inc., quarry facility which owns much of the land in this area. All of Survey Area 8 is also owned by Trap Rock Industries, Inc.

The project corridor in Area 8 runs parallel to and immediately south of Dirty Brook, a first-order stream that discharged into the Millstone River prior to construction of the D&R Canal. Examination of the northern ROW expansion at the onset of fieldwork revealed extensive disturbance in western portions of Area 8 consisting of either fill deposits emplaced on top of intact soils or severely truncated soil profiles. As a result, only four shovel tests were excavated in Transect O in the western portion of the northern ROW expansion here. These shovel tests exhibited truncated profiles and, in one case (Shovel Test 0-6), an intact profile overlain by fill. This disturbance likely relates to either construction of the existing A and C pipelines at this location and/or modern channelization of Dirty Brook. The latter possibility is suggested by the artificially straight path of the channel for most of its length. Further east in the northern ROW expansion, no subsurface survey was conducted because the channel of Muddy Brook occupies virtually the entire ROW expansion north of the existing pipelines.

Phase I survey of the southern ROW expansion for Area 8 involved excavation of shovel tests in Transect P. USDA soils in this area are classified as well drained. This fact, combined with proximity to an existing, albeit channelized, streamcourse resulted in shovel test excavation at 50-foot intervals.

In contrast to the northern ROW expansion, shovel tests revealed generally undisturbed deposits. Soils consisted of silty plowzone above subsoils of silty clay and silty or clayey loam (Figure 27). During shovel testing, possible prehistoric artifacts were recovered from Shovel Tests 6 and 18 in Transect P. Shovel Test 6 produced what appeared to be a freehand core of chert and a quartzite cobbie exhibiting localized battering that was tentatively classed as a hammerstone. Both of these items were recovered from the plowzone deposit in this shovel test. Shovel Test 18 produced a possible block shatter specimen of jasper; this item was found in the B-horizon soil of this shovel test.

At each of these artifact find locations, LBA subsequently excavated four additional shovel tests in cruciform pattern to evaluate the original finds. In each case, the four additional shovel tests excavated around the original findspot failed to produce any additional prehistoric artifacts.
FIGURE 27: Representative Shovel Test Profiles, Area 8, Transect P
9. Area 9

Area 9 extends from Kingston/Rocky Hill Road to Survey Station 815+00 (see Figure 2, Figure 28). Here, the project corridor encompasses a major inflection in the centerline for the proposed Milltown E Loop, changing from a northeast-southwest axis to a north-south axis. In part because of this inflection, the ROW expansion reaches its greatest width for the project at this location, measuring as much as 800 feet wide. To the north and east, a private access road for Trap Rock Industries, Inc., coincides with the northern and eastern limits of the ROW expansion. Three ponds have been constructed recently in this area, the northernmost of which feeds Dirty Brook. USDA soils in this area are characterized as well drained.

Previous reconnaissance indicated that the northern portion of Area 9 was heavily disturbed as a result of a combination of channelization of Dirty Brook, pond construction and private access road construction.

Subsurface survey of this remaining portion of Area 9 involved the excavation of shovel tests in Transects Q, R, and U. Shovel tests in Transect Q were located west of the existing A and C pipelines on private property presently used as a horse farm. The ponds present here are of recent construction. Most shovel tests in Transect Q exhibited disturbed profiles consisting of fill deposits of clayey or silty loam containing angular crushed gravel and occasional modern materials such as clear and brown bottle glass, coal, and occasional brick fragments. Fill deposits extended to depths of as much as 50 centimeters under which truncated subsoils of sterile clayey silt were observed. This pattern is illustrated in the profile for Shovel Test 17 (Figure 29). In rare cases, such as Shovel Test 23 (see Figure 29), apparently intact soil profiles were encountered consisting of a silty loam plowzone above sandy clay subsoils. The extensive disturbance noted in most shovel tests in Transect Q likely represents activities such as the construction of the artificial pond located in this area. Further to the west, limited shovel testing was conducted along Transect U. Survey here revealed the same situation, with fill deposits containing crushed gravel and modern artifacts such as brown bottle glass superimposed on truncated subsoils.

That portion of the ROW expansion east of the existing Transco A and C pipelines was investigated with shovel tests in Transect R. Shovel tests in the northern portion of this transect (Numbers 1-4) exhibited what appeared to be relatively undisturbed profiles as illustrated in Shovel Test 4 (Figure 30). Beginning with Shovel Test 6, however, subsurface survey further to the south revealed disturbed profiles consisting of silty loam fill deposits containing modern crushed gravel above truncated subsoils.
FIGURE 28: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 9, Transects Q, R, and U, Kingston/Rocky Hill Road to Station 815+00
FIGURE 29: Representative Shovel Test Profiles, Area 9, Transect Q
FIGURE 30: Representative Shovel Test Profiles, Area 9, Transect R, and Area 10, Transect S
Area 10 extends from Station 815+00 to the second major inflection in the proposed Milltown Loop at Station 831+50 (see Figure 2, Figure 31). Essentially a continuation of the previous project area segment, Area 10 exhibits the same north-south axis. Here as well, the western ROW extension is owned by the private horse farm operation, while the eastern ROW extension is included in the Trap Rock Industries, Inc., property. Reconnaissance of the eastern ROW extension indicated the likelihood of extensively disturbed soils as a result of past landscaping and access road construction activities. Only two shovel tests, assigned to Transect T, were excavated here. As expected, both encountered fill deposits consisting of silty and clayey loams containing crushed angular gravels that extended to depths of 45 centimeters. Below this, gray clays were encountered.

In the ROW expansion to the west, Phase I survey could not be completed because access to this part of the project area was denied by the property owner partway through fieldwork. Consequently, LBA only conducted Phase I survey of the western ROW expansion in the southern portion of Area 10 (see Figure 31). Shovel testing here revealed a situation of discontinuous disturbance. Some shovel tests exhibited a plowzone of dark brown silty loam above subsoils of yellowish brown clayey loam and sandy clay. Others, such as Shovel Test 5 in this transect (see Figure 30) exhibited a fill deposit of silty loam with crushed gravel to a depth of 30 centimeters. This was underlain in turn by clayey loam or clayey silt. In some of the shovel tests where these fill deposits were observed, modern brown bottle glass as well as occasional fragments of brick and coal were recovered.

A single possible prehistoric artifact was recovered in Shovel Test 2 in Transect S. In this test, the upper stratum consisted of a yellowish brown silty loam with crushed gravel that likely represents a fill deposit. At a depth of 30 centimeters, a second stratum was encountered consisting of a brownish yellow clay mottled with dark gray clay that extended to a depth of 75 centimeters. This lower stratum produced a single specimen tentatively identified as a piece of quartz flake shatter. Following the excavation of shovel tests in Transect S, permission was denied by the property owner to continue investigations at this location. As a consequence, further exploration of the find spot at Shovel Test 2 to evaluate the validity of this find could not be conducted.

Finally, an additional temporary workspace for the project is located adjacent to Area 10. This temporary workspace lies within the property of Trap Rock Industries, Inc. Measuring 600x400 feet in length and width, this workspace is situated approximately 50 feet west of the ROW expansion in the vicinity of Station 831+50.
FIGURE 31: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 10, Transects S and T, Station 816 + 00 to Station 831 + 60, and Area 11, Transect V, Station 831 + 50 to Station 850 + 53
Reconnaissance of this temporary work space indicated that substantial disturbance of soil profiles here was likely. This was indicated by what appeared to be exposed subsoils extending across the entire work space and cutbanks measuring between 30 and 40 centimeters in height around the periphery of the proposed work space. LBA archaeologists excavated a total of three shovel tests at this location. Shovel tests revealed only disturbed subsoils consisting of yellowish brown or brown silty loam mottled with olive brown silty loam or reddish clay. No artifacts were recovered.

11. **Area 11**

Area 11 consists of a 1,900-foot-long segment of the project corridor extending from the centerline inflection at Station 831+50 to Station 850+53 (see Figure 2, see Figure 31). East of this inflection, the centerline for the Milltown E Loop trends in a northeasterly direction for the length of Area 11.

The ROW expansion here encompasses open ground bordering wooded sections to the south. USDA soils in the western and eastern thirds of Area 11 are classified as well drained. According to background research (Table 1, see Figure 8), an historic occupation was present during the nineteenth century immediately north of the small stream that flows west through this area. Reconnaissance and limited soil augering indicated that extensive portions of Area 11 had been subject to disturbance from construction of access roads for the Trap Rock Industries, Inc., facility to the north. Consequently, Phase I subsurface survey was only conducted in the northern ROW expansion along the eastern 600 feet of Area 11. Shovel tests excavated here in Transect V encountered relatively undisturbed soils consisting of plowzones of brown or grayish brown clayey loam or silty loam underlain by subsoils of yellowish brown or grayish brown clayey loam (Figure 32). No artifacts were recovered.

12. **Area 12**

Area 12 extends from Station 877+36 to Station 888+06 (see Figure 2, Figure 33). This 1,150-foot segment of the project corridor intersects the headwaters of Carters Brook, a low-order tributary of the Millstone River. USDA soils mapped at this location are characterized as poorly drained. However, limited subsurface survey was conducted in one portion of Area 12 because the topographic setting here suggested a potential for prehistoric occupation. Specifically, the area immediately west of Carters Brook in the project corridor consists of a low bench overlooking this small drainage. Such elevated ground is not present to the east of this stream.
FIGURE 32: Representative Shovel Test Profiles, Area 11, Transect V

LEGEND

A  10YR 4/2 DARK GRAYISH BROWN CLAYEY LOAM
B  10YR 5/2 GRAYISH BROWN CLAYEY LOAM MOTTLED WITH 10YR 5/6 YELLOWISH BROWN CLAYEY LOAM

LEGEND

A  10YR 3/3 DARK BROWN SILTY LOAM
B  10YR 5/4 YELLOWISH BROWN CLAYEY LOAM
FIGURE 33: Milltown E Loop Project Corridor, Locations of Shovel Tests in Area 12, Transects W and X, Station 877 + 36 to Station 888 + 06
LBA conducted shovel testing across this low bench for a distance of 300 feet in the project corridor. Shovel tests generally revealed largely intact profiles. Shovel Test 2 in Transect W in the northern ROW expansion represents one exception (Figure 34). Here, a possibly disturbed deposit consisting of a dark yellowish brown (10YR 4/4) clayey loam mottled with dark yellowish brown (10YR 4/6) clayey loam extended to a depth of 26 centimeters. Below this, a 5-centimeter-thick stratum of dark brown silty loam was observed that likely represents a truncated plowzone. This was underlain in turn by a brown loamy clay subsoil. Most other shovel tests in Transect W and in Transect X exhibited a more conventional profile (see Figure 34). At the top, a plowzone of brown silt loam was observed that was underlain in turn by a B-horizon of strong brown silt and a C-horizon of dark brown sandy silt. No artifacts were recovered from shovel tests in either of these transects.
FIGURE 34: Representative Shovel Test Profiles, Area 12, Transects W and X
VII. EVALUATIONS AND RECOMMENDATIONS

Phase I survey of the Milltown E Loop 6.91-mile project included background research, project area reconnaissance and subsurface testing. During the Phase I subsurface survey, LBA conducted shovel testing along 12 separate segments of the project corridor, designated Areas 1 through 12.

At one location in Area 6, shovel tests in Transect K revealed the presence of an historic site immediately west of River Road in the northern ROW expansion. Shovel testing recovered a total of 104 historic artifacts from an area south of a standing structure adjoining the ROW. Artifacts indicate that the archaeological deposit represents an occupation beginning in the late nineteenth or early twentieth centuries. Materials recovered likely represent discard of domestic refuse during the historic occupation. All artifacts were recovered from plowzone deposits. Fieldwork to date, however, does not preclude the possibility that features such as refuse pits or privies may survive below the plowzone. If present, such deposits could contribute data relevant to understanding the historic occupation of this property and the region. This site may therefore constitute a significant archaeological resource. Under present design plans, construction of the E Loop north of the existing A and C lines will impact portions of this archaeological deposit (see Figure 24).

Elsewhere in the project corridor, isolated historic artifacts were recovered, primarily from recent fill deposits. These finds appear to represent instances of casual discard and not actual historic occupations. Where they occur in fill, these deposits appear to be of recent age. These finds do not represent significant archaeological resources.

Lithic materials tentatively identified as prehistoric artifacts were recovered from five locations in the project area: Shovel Test L-24 in Area 6, Shovel Tests P-6 and P-18 in Area 8, Shovel Test Q-10 in Area 9, and Shovel Test S-2 in Area 10. Excavation of additional shovel tests in cruciform fashion around the findspots L-24, P-6, and P-18 failed to produce additional artifacts. This suggests that either the identification of the original finds was erroneous or alternatively, that these represent archaeological deposits with horizontal dimensions smaller than the 4x4-meter area investigated by the cruciform shovel tests. If the latter situation obtains, the information potential of these finds has likely been exhausted. Based on the present findings, these do not represent significant archaeological resources.

With regard to the findspots in Areas 9 and 10, permission to excavate additional shovel tests to evaluate these finds was denied by the property owner. Without further shovel testing, the
significance of these finds remains indeterminate. In addition, because of this denial of access, Phase I survey could not be completed in the northern part of the western ROW expansion in Area 10.

Under present design plans, proposed construction will impact the historic site located west of River Road. LBA recommends that the portion of this site in the ROW be evaluated in terms of its significance and National Register eligibility through a program of limited additional background research and Phase II archaeological testing. This work should be designed to clarify the horizontal distribution of archaeological classes at the site, determine the dates of occupation for the historic component, and determine whether undisturbed deposits such as features are present at the site.

With regard to remaining portions of the project, prehistoric findspots in Areas 9 and 10 require additional Phase I shovel testing and Phase I survey of the northern portion of Area 10 west of the existing pipelines must be completed. In all other portions of the project corridor, proposed construction will not affect any significant archaeological resources.
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APPENDIX A:
PHASE I HISTORIC ARTIFACT INVENTORY
6.91-MILE MILLTOWN "E" LOOP
OF THE LIBERTY PIPELINE UPSTREAM FACILITIES
TEMPORARY ROW EXPANSION AND WORKSPACE AREAS
PRINCETON, FRANKLIN, AND BRUNSWICK TOWNSHIPS
MERCER, SOMERSET, AND MIDDLESEX COUNTIES
NEW JERSEY
**CERAMICS TYPOLOGY**

### EARTHENWARES

**Red Bodied**
- **CER04** Dark Brown to Black Glaze  
  - Undated

**Pearlware**
- **CRP02** Plain  
  - 1780-1840

**Whiteware**
- **CRW02** Plain  
  - 1820-Present
- **CRW30** Overglaze Handpainted  
  - 1820-Present
- **CRW36** Polychrome Underglaze Handpainted Early Style  
  - 1820-1860
- **CRW50** Transfer Printed-Blue - General  
  - 1820-1915
- **CRW55** Transfer Printed - Other Colors  
  - 1825-1915

**Ironstone**
- **CRI02** Plain  
  - 1840-Present
- **CRI25** Embossed Body  
  - 1840-Present
- **CRI62** Simple Bands  
  - 1840-Present

### STONEWARES

**Brown Stonewares**
- **CFB70** 19th Century Style Bottles - Brown  
  - 1820-1910

**CERAMICS MODIFIERS**

**MAKERS MARK'S - VARIABLE 1**
- **19** See Written Comments
- **115** Maddock Potter Co., Lamberton Works 1893-1923  
  - (Barber:49, Lehner:100)
MOTIF/PATTERN - VARIABLE 4

019  See Written Comments
043  Mulberry
100  General Floral
200  Chinoiserie - General
751  Glazed Interior, Drips on Exterior
999  Insufficient Evidence to Determine Pattern

FORM - VARIABLE 5

General
014  Body-General
015  Rim-General
016  Base-General
019  See Written Comments

Teawares

099  Teacup-General

Other

126  Bottle

Serving Pieces

207  Butter Dish

COMMENTS

69  Mendable
### GLASS TYPOLOGY

**GLASS-BOTTLE**

**ALCOHOLS-BOTTLE**

GBA 03 WINE/LIQUOR BOTTLE

**UNIDENTIFIED**

GBU 01 UNIDENTIFIED BOTTLE GLASS/GENERAL

**GLASS-LIGHTING**

**LAMP-GENERAL**

GLL 23 LAMP CHIMNEY

**UNIDENTIFIED-OTHER**

GOU 01 TOTAL UNIDENTIFIED GLASS/GENERAL

### GLASS MODIFIERS

**MOTIF/PATTERN - VARIABLE 4**

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**MOLD TYPE/MANUFACTURING TECHNIQUE - VARIABLE 5**

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**COLOR - VARIABLE 6**

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BASE - VARIABLE 7

99 UNIDENTIFIED

FINISHES - VARIABLE 8

ONE-PART: LIP ONLY (VARIED DIAMETERS)

133 SCALLOPED (OR VARIATION), FIRE POLISHED

LETTERED EMBOSSEMENTS - VARIABLE 11

9999 UNIDENTIFIED PARTIAL

COMMENTS

34 STRAIGHT-SIDED
35 POSSIBLY LAMP-RELATED
PIPPES TYPOLOGY

BOWLS
PTE98 Unidentified Shape Undated

PIPPES MODIFIERS

USE - VARIABLE 7
1 Light

BORE DIAMETER - VARIABLE 9
1 unmeasurable or not present (on bowls)
SMALL FINDS/ARCHITECTURAL TYPOLOGY

ARCHITECTURAL

Building Materials

SAB01  Brick

Fasteners

SAF03  Machine Cut Nail  1830 -
SAF06  Wire Nail        1850 -
SAF07  Unidentified Nail
SAF16  Machine Cut Spike  1830 -
SAF18  Unidentified Spike

Glass

SAG11  Broad Glass  1820 - 1926

Hardware

SAH28  Wire Strands

UNIDENTIFIED

Other

SOS02  Unidentified Glass

PERSONAL

Coins

SPC08  U.S. Dime

ACTIVITIES

Hardware / Non-Architectural

SXH06  Washer

Recreation And Toys

SXR14  Skeet
SMALL FINDS/ARCHITECTURAL MODIFIERS

MATERIALS - VARIABLE 3

001 Ceramic
002 Glass
041 Silver Alloy
042 Ferrous Metal
046 Brass
400 Hard Rubber (Goodyear Patent Date)

CHARACTERISTICS - VARIABLE 5

001 Whole
002 Portion/Fragment
417 Head (nail)
511 Bust of Liberty Wearing Cap

COLOR - VARIABLE 6

11 Aqua

Beg D. - End D.
1851 -
FAUNAL TYPOLOGY

CLASS - MAMMALS

DOMESTIC SPECIES
ZMD 70  Cow

UNIDENTIFIED MAMMAL
ZMZ 04  Medium Mammal

CLASS PELECYPODA

ZXP 10  Oyster
ZXP 26  Hard Shell Clam

LATIN TRANSLATION

Bos

Crassostrea virginica
Mercenaria mercenaria

FAUNAL MODIFIERS

BUTCHERING - VARIABLE 3
01  Sawed

ELEMENTS - VARIABLE 5
038  Rib
700  Shell

BONE PART PRESENT - VARIABLE 6
02  Fragment
08  Proximal Section

BURNING - VARIABLE 7
04  Calcined
TRANSCO PRINCETON

TRANSCO PRINCETON - HISTORIC ARTIFACT DATA

REPORT DATE: 03/18/92

PAGE NUMBER: 1
<p>| CAT | OTHER TR STP | STR LEV | TYPE | COUNT | WEIGHT | BEGDATE | ENDDATE | VARS | VAR3 | VAR4 | VAR5 | VAR6 | VAR7 | VAR8 | VAR9 | VAR11 | PATRN | FUNCT | CONTNTS | TRANSLATION | NOTE |
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| 16  | K30 A       |         | SAF 6| 7     |       | 1058    |         | 42   | 1    |      |      |      |      |      |      |      |       | 212    | Wire Nail |       |
| 10  | K39 A       |         | CFO 2| 2     |       | 1059    |         | 99   | 19   |      |      |      |      |      |      |      |       | 101    | Ironstone - Single Bands |       |
| 10  | K39 A       |         | CRW 2| 2     |       | 1058    |         | 14   |      |      |      |      |      |      |      |      |       | 101    | Whiteware - Plain |       |
| 10  | K39 A       |         | CRW 2| 2     |       | 1058    |         | 15   |      |      |      |      |      |      |      |      |       | 101    | Whiteware - Plain |       |
| 10  | K39 A       |         | GBU 1| 1     |       |         |         | 1    | 1    |      |      |      |      |      |      |      |       | 102    | UNIDENTIFIED BOTTLE/GENERAL |       |
| 10  | K39 A       |         | GBU 1| 1     |       |         |         | 1    | 9    |      |      |      |      |      |      |      |       | 9999   | UNIDENTIFIED BOTTLE/GENERAL | ILLEGIBLE EMBOSMENT. |
| 10  | K39 A       |         | GBU 1| 1     |       |         |         | 99   | 1    |      |      |      |      |      |      |      |       | 110    | TOTAL UNIDENTIFIED GLASS/GENERAL |       |
| 10  | K39 A       |         | SAF 6| 19    |       | 1058    |         | 42   | 117  |      |      |      |      |      |      |      |       | 212    | Wire Nail |       |
| 10  | K39 A       |         | SAF 6| 5     |       | 1058    |         | 42   |      |      |      |      |      |      |      |      |       | 212    | Wire Nail |       |
| 10  | K39 A       |         | SAF 11| 9 | 0.816 | 1020   | 1020   | 2    | 11   |      |      |      |      |      |      |      |       | 211    | Broad Glass |       |
| 10  | K39 A       |         | SAS 2| 1     |       |         |         | 2    |      |      |      |      |      |      |      |      |       | 1199   | Medium Maenal |       |
| 10  | K39 A       |         | KBU 4| 1     |       |         |         | 30   | 2    |      |      |      |      |      |      |      |       | 1197   | Oyster |       |
| 10  | K39 A       |         | ZIP 10| 0.801 |       |         |         | 700  | 2    |      |      |      |      |      |      |      |       | 1197   | Hard Shell Clam |       |
| 19  | K41 A       |         | CRW 2| 1     |       | 1020   | 1020   | 14   |      |      |      |      |      |      |      |      |       | 101    | Whiteware - Plain |       |
| 19  | K41 A       |         | GSA 3| 1     |       |         |         | 99   | 5    |      |      |      |      |      |      |      |       | 102    | WINE/ LIQUOR BOTTLE |       |
| 19  | K41 A       |         | SAF 6| 1     |       | 1058    |         | 42   | 1    |      |      |      |      |      |      |      |       | 212    | Wire Nail |       |
| 19  | K41 A       |         | SAF 10| 1    |       |         |         | 42   |      |      |      |      |      |      |      |      |       | 212    | Unidentified Spike |       |
| 19  | K41 A       |         | SAF 3| 1     |       |         |         | 46   |      |      |      |      |      |      |      |      |       | 1197   | Washer |       |
| 19  | K41 A       |         | SAF 6| 1     |       |         |         | 46   |      |      |      |      |      |      |      |      |       | 1197   | Cow |       |
| 20  | K43 A       |         | CRW 2| 1     |       | 1040   | 1040   | 15   |      |      |      |      |      |      |      |      |       | 101    | Ironstone - Plain |       |
| 20  | K43 A       |         | CRW 2| 1     |       | 1020   | 1020   | 14   |      |      |      |      |      |      |      |      |       | 101    | Whiteware - Plain |       |
| 20  | K43 A       |         | GBU 1| 1     |       |         |         | 99   | 1    |      |      |      |      |      |      |      |       | 110    | TOTAL UNIDENTIFIED GLASS/GENERAL | EITHER TUMBLER OR BOTTLE BASE. |
| 20  | K43 A       |         | GBU 1| 1     |       |         |         | 99   | 1    |      |      |      |      |      |      |      |       | 110    | TOTAL UNIDENTIFIED GLASS/GENERAL | EITHER TUMBLER OR BOTTLE BASE. |
| 20  | K43 A       |         | SAF 6| 1     |       | 1058    |         | 42   | 1    |      |      |      |      |      |      |      |       | 212    | Wire Nail |       |
| 20  | K43 A       |         | SAF 6| 1     |       | 1058    |         | 1    | 11   |      |      |      |      |      |      |      |       | 110    | TOTAL UNIDENTIFIED GLASS/GENERAL | EITHER TUMBLER OR BOTTLE BASE. |
| 20  | K43 A       |         | SAF 6| 3     |       | 1030    |         | 42   |      |      |      |      |      |      |      |      |       | 212    | Machine Cut Nail |       |
| 20  | K43 A       |         | SAF 6| 1     |       | 1058    |         | 42   |      |      |      |      |      |      |      |      |       | 1197   | Oyster |       |
| 22  | L06 A       |         | SAF 11| 1 | 0.804 | 1020   | 1020   | 2    | 11   |      |      |      |      |      |      |      |       | 211    | Broad Glass |       |
| 27  | P05 AB      |         | SAF 20| 1   |       |         |         | 42   |      |      |      |      |      |      |      |      |       | 228    | Wire Strands |       |
| 39  | TWS-1-01 A  |         | CRW 34| 1   |       | 1020   | 1020   | 14   | 100  |      |      |      |      |      |      |      |       | 101    | Unidentified Glass | Handpainted Early Style, Handpainted |       |
| 43  | K39 A       |         | CRW 55| 1   |       | 1025   | 1915   | 16   | 999  |      |      |      |      |      |      |      |       | 101    | Whiteware - Polychrome Underglaze |       |
| 48  | TWS-1-03 A  |         | GBU 11| 1 | 0.801 | 1020   | 1020   | 2    | 11   |      |      |      |      |      |      |      |       | 110    | TOTAL UNIDENTIFIED GLASS/GENERAL |       |
| 41  | TWS-1-07 A  |         | CRW 2| 1     |       | 1020   | 1020   | 14   |      |      |      |      |      |      |      |      |       | 101    | Whiteware - Plain |       |</p>
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APPENDIX B:
PHASE I PREHISTORIC ARTIFACT INVENTORY
6.91-MILE MILLTOWN "E" LOOP
OF THE LIBERTY PIPELINE UPSTREAM FACILITIES
TEMPORARY ROW EXPANSION AND WORKSPACE AREAS
PRINCETON, FRANKLIN, AND BRUNSWICK TOWNSHIPS
MERCER, SOMERSET, AND MIDDLESEX COUNTIES
NEW JERSEY
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