3.0 METHODS

This section presents the methodology for the Phase II evaluations along the SR1 corridor, New Castle County, Delaware. Archival research was conducted at numerous repositories in the State of Delaware and the District of Columbia, supplementing findings of archaeological investigations on the historical sites identified within the SR1 Smyrna to Pine Tree Corners corridor. Appropriate site-specific field methods were developed through continual monitoring and onsite consultation with DelDOT and the Delaware SHPO. Field methods included excavation of shovel test pits and test units, large scale mechanical stripping of plowzone deposits, surface collection units, and real time preparation of artifact distribution maps based on preliminary field counts. A field laboratory was established at a DelDOT facility in Little Heaven, Delaware to aid in initial artifact processing, assessment, and development of preliminary databases. These preliminary databases were used to generate real time distribution maps using the SURFER® software program. Detailed artifact processing and analysis was conducted at the Parsons archaeological laboratory in Fairfax, Virginia. Spatial analyses were conducted and aided interpretation of site activities and settlement patterning.

3.1 ARCHIVAL RESEARCH

Phase II archival research consisted of a records search, review of historic maps, and regional and local historical background research. Land use planning documents, as well as deed, tax and census records at the New Castle County Building in Wilmington and the Delaware Public Archives in Dover, provided information concerning the historical development of individual site locales. Acts of the General Assembly, Clerk of the Peace Records, Orphan's Courts Records, and books, historic maps, photographs, and probate records were reviewed at the Delaware Public Archives, the Delaware Historical Society in Wilmington, and the Library of Congress in Washington, DC. Information on the Blackbird Historical District, which is situated within proximity of several of the historical sites investigated, was obtained from the National Register Nomination form on file with the Delaware SHPO.

Researchers prepared chains of title and site histories for the following Phase II sites that contained extensive historical components: 7NC-J-195A, 7NC-J-199/200, 7NC-J-207, and 7NC-J-224. The history of the Blackbird School and its corresponding district, School District 69, was researched because of the possible association with several of the historic sites identified in the corridor.

Comparisons of historical maps dating to 1849, 1868, 1881, and 1931 showed historical settlement patterns relative to transportation networks within one mile of the project area. These particular historical maps depicted building locations, owners' names, and showed the transportation networks before and after the introduction of the railroad (1849 versus 1868) and the automobile (1881 versus 1931) to the region.

3.2 FIELD METHODS

The Phase II archaeological field investigations along the Smyrna to Pine Tree Corners portion of the SR1 corridor were conducted in phases consistent with conventional Cultural Resource Management practices in the State of Delaware. Each phase of investigation had distinct goals and field methods varied according to these goals. Scopes of work were prepared for the initial stage of Phase II investigations at each site. Field counts of artifacts were tabulated and used to generate SURFER® distribution maps. Based on resulting distribution maps, a more refined understanding of artifact distribution within each site emerged. Formal field visits by DelDOT and the Delaware SHPO at the completion of the first stage were conducted and the preliminary distribution maps were examined to determine direction and focus of continued Phase II excavations. Conducting the Phase II archaeological investigations in this manner allowed field work to continue uninterrupted and allowed for timely input from DelDOT and the Delaware SHPO. The staged Phase II evaluation program allowed efficient and flexible use of available resources, focusing efforts on the areas within the sites that were likely to contain the most pertinent information.

Prior to any field investigations, a health and safety plan was prepared (Appendix A). Hazards identified included vehicular traffic, working around heavy equipment, severe weather, poison ivy/oak, and insects.

3.2.1 Excavation Techniques

Various field methodologies for the recovery of prehistoric and historical data were employed at the SR1 sites. For the Phase II evaluations, field methods were tailored to each site as agreed by the Delaware SHPO, DelDOT, and Parsons. These methods included controlled surface collection, shovel test pit (STP) excavation, 1 x 1 meter (m) test unit excavation, and mechanical removal of the plowzone in order to expose sub-surface features (Table 3-1).

Table 3-1. Phase II field methodology.

Site Number	Site Type	Total STPs or SCUs*	Interval	Total Test Units	Mechanical Stripping (linear meters)
Herring Run (7NC-H-93B)	NA	20 STPs	5 m	3	0
Herring Run (7NC-H-95A)	NA	18 STPs	5 m	0	0
Herring Run (7NC-H-95B)	NA	58 STPs	5 m	19	0
Herring Run (7NC-H-95D)	NA	20 STPs	5 m	3	0
Herring Run (7NC-H-95FGH)	NA/H	229 STPs	5 m	19	0
Herring Run (7NC-H-95JKL)	NA	107 STPs	5 m	34	0
Herring Run (7NC-H-95M)	NA	32 STPs	5 m	19	0
7NC-J-192B	NA	33 STPs	5 m	0	0
7NC-J-195A	NA/H	25 STPs	5 m	5	0
7NC-J-199/200	H	29 STPs	10 m	0	0
Buckson Site (7NC-J-207)	NA/H	171 STPs	10 m	56	175 m
Reynolds Tenancy Site (7NC-J-224)	H	68 SCUs	10 m^2	11	0
TOTAL		**741 STPs 68 SCUs**		**168**	**175 m**

NA = Native American; H = Historical; P/H = Both Native American and historical components present
* SCUs = Surface Collection Units

Surface visibility of over 50 percent at 7NC-J-224 allowed visual location of artifact concentrations. A gird of systematic Surface Collection Units (SCU), each unit measuring 10 m x 10 m, was delineated across the site. SCU designations, determined by the coordinate of the southwest corner, dictated artifact provenience and provided horizontal distribution data.

STPs measured approximately 30-50 centimeters (cm) in diameter and extended at least 10 cm into culturally sterile subsoil, where possible; in accordance with Delaware state guidelines. Natural stratigraphic breaks (i.e. soil color/texture change) dictated STP excavation, with depths measured from ground surface. A stratigraphic profile of each STP was recorded on a standard form, listing soil color, texture, and inclusions. Standardization of soil color descriptions resulted from use of the Munsell® Soil Color Chart (1994 edition). Soil excavated from each STP was screened through ¼ inch (6 millimeter [mm]) hardware cloth to ensure uniform recovery of cultural materials. Systematic shovel testing and surface collection generated initial distributional data indicating artifact densities and areas of greatest archaeological potential. STPs were excavated only after the completion of the surface collection.

Test unit excavation established the degree of subsurface integrity, located subsurface features, and provided control with respect to the vertical distribution of artifacts. All test units measured 1 m x 1 m. Disturbed sediments, redeposited strata, and introduced fill were removed as individual stratigraphic units rather than excavated in arbitrary levels. Test units containing intact subsoil or B-horizon deposits were excavated in 10 cm arbitrary levels within the natural strata. All of the excavated material was screened through ¼ inch mesh hardware cloth. Excavation continued until pre-Holocene deposits exposed or to a depth of 1 m below surface, in accordance with regulations dictated by the Occupational Safety and Health Administration (OSHA) and enforced by the site safety officer. Standardized field notes documented unit placement, soils, artifacts, depth of excavation, reason for termination of excavation (i.e. natural stratigraphic break, arbitrary break, presence of features), excavators, date of excavation, and all observations. Scale drawings, 35 mm black and white prints, and color slides of a representative wall from each test unit documented individual stratigraphic sequences. Planview photographs and scale drawings, where appropriate, completed documentation. During fieldwork, site maps illustrating unit placement were created and maintained. Following documentation, all excavations were backfilled.

Artifacts were placed in resealable polyethylene bags labeled, in indelible marker, with complete horizontal and vertical provenience information. A bag inventory form recorded provenience information for each artifact bag.

Mechanical stripping of the plowzone in linear trenches exposed sub-plowzone features. Excavation consisted of controlled removal of the uppermost horizon with a backhoe, outfitted with a smooth (toothless) bucket attachment. Backhoe operations were monitored at all times. Smooth bucket excavation results in a smooth excavation surface allowing greater visibility of potential features. Upon excavation, crew members removed the glossy sheen created by the backhoe with flat-headed shovels and trowels to better expose soil manifestations for identification and mapping purposes.

3.2.2 Artifact Field Inventory

Artifacts recovered from the Phase II investigations were delivered to the Parsons field laboratory in Little Heaven, Delaware, for preliminary inventorying. Artifacts were classified by general category (i.e. prehistoric or historical) and specific type (thermally altered stone, debitage, nails, brick, etc.), and tallied by horizontal and vertical distribution. Since the chronology of occupation for a historical site considers far shorter periods of time than that of a prehistoric site, historical temporal indicators received an additional level of classification. For example, nails were divided into wrought/machine vs. wire nails; historical ceramics were divided into three groups by approximate manufacturing dates: 1770-1830, 1830-1880, and post-1880; and automatic machine-made glass, post-dating 1903, was separated from all other glass.

3.2.3 Field Distribution Maps

In order to evaluate the site components investigated along the proposed SR1 corridor, locations of artifacts, divided functionally and temporally, were plotted for each site. Distributions provided temporal and functional indications of cultural activity. The placement of artifacts relative to natural topographic features illustrated the natural and human processes involved within specific site development. The distribution maps provided feedback that aided in the direction of test unit and excavation block placement throughout the Phase II evaluation investigations. Distribution maps were generated using the SURFER® 8 program, designed by Golden Software, Inc. (2002).

3.3 COMPLIANCE DOCUMENT PREPARATION

At completion of Phase II field investigations, management summaries which provided field methodology, results, and recommendations for National Register of Historic Places (NRHP) eligibility were prepared for each site evaluated (Table 3-2). All compliance documents were submitted to DelDOT and the Delaware SHPO for review and comment.

As a result of the Phase II fieldwork, the following sites and site complexes were recommended as eligible for the (NRHP): the Frederick Lodge Site Complex (7NC-J-97/98/99), the Blackbird Creek Site (7NC-J-195D), the Jones Site (7NC-J-204), the Black Diamond Site (7NC-J-225), and the Sandom Branch Site Complex (7NC-J-227/7NC-J-228). Phase II management summaries, NRHP nomination forms constituting the determination of eligibility (DOE), and data recovery plans were prepared for these five sites. The Delaware SHPO concurred with these recommendations. The results of the Phase II fieldwork of these NRHP-eligible sites are presented in separate technical reports that also detail the data recovery investigations.

The management summary for the remainder of the sites evaluated during Phase II investigations was completed and submitted in January 2000 (Auman and Bupp 2000). Eleven of the remaining sites were recommended as not eligible for the NRHP. Because the Reynolds Tenancy site (7NC-J-224) was primarily located on private land beyond the SR1 project boundaries, that site remains unevaluated. Written concurrence was received from the Delaware SHPO on March 13, 2000 (Appendix B).

3.4 LABORATORY METHODS

Comprehensive artifact processing, cataloging, and analysis were performed in the Parsons Laboratory located in Fairfax, Virginia. Artifacts were processed to the standards of the October 1993 Delaware State Museums Sampling and Curation Policy (Delaware SHPO 1993). Artifacts

Table 3-2. Compliance Documents Prepared for Sites in the Smyrna to Pine Tree Corners Portion of SR1

Site Number	Document	Date	Author (s)
Herring Run (7NC-H-93B)	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
Herring Run (7NC-H-95A)	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
Herring Run (7NC-H-95B)	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
Herring Run (7NC-H-95D)	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
Herring Run (7NC-H-95FGH)	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
Herring Run (7NC-H-95JKL)	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
Herring Run (7NC-H-95M)	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
Frederick Lodge Site Complex (7NC-J-976/98/99)	Management Summary: Phase II Evaluation of the Frederick Lodge Site, 7NC-J-97/98/99/224, New Castle County, Delaware	1999	Bupp and Auman
	Determination of Eligibility for the National Register of Historic Places: Frederick Lodge Site Complex, 7NC-J-97/98/99, SR1 Smyrna to Pine Tree Corners, New Castle County, Delaware	1999	Bupp
7NC-J-192B	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
7NC-J-195A	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
Blackbird Creek Site (7NC-J-195D)	Management Summary: Phase II Evaluation of the Blackbird Creek Site, 7NC-J-195D, New Castle County, Delaware	1999	Auman and Bupp
	Determination of Eligibility for the National Register of Historic Places: The Blackbird Creek Site, 7NC-J-195D, SR1 Smyrna to Pine Tree Corners, New Castle County, Delaware	1999c	Auman
7NC-J-199/200	Management Summary: Phase II Evaluation of 7NC-J-199 and 7NC-J-200, New Castle County, Delaware	1999a	Auman
Jones Site (7NC-J-204)	Management Summary: Phase II Evaluation of 7NC-J-204, New Castle County, Delaware	1999	Abel and O'Neill
	Determination of Eligibility for the National Register of Historic Places: The Jones Site Complex, 7NC-J-224, SR1 Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman

Table 3-2. Compliance Documents Prepared for Sites in the Smyrna to Pine Tree Corners Portion of SR1

Site Number	Document	Date	Author (s)
Buckson Site (7NC-J-207)	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
Reynolds Tenancy Site (7NC-J-224)	Management Summary: Phase II Evaluation of the Frederick Lodge Site, 7NC-J-97/98/99/224, New Castle County, Delaware	1999	Bupp and Auman
	Management Summary: Phase II Evaluation Studies in the SR1 Corridor, Smyrna to Pine Tree Corners, New Castle County, Delaware	2000	Auman and Bupp
Black Diamond Site (7NC-J-225)	Management Summary: Phase II Evaluation of 7NC-J-225, New Castle County, Delaware	1999	Auman and Egghart
	Determination of Eligibility for the National Register of Historic Places: the Black Diamond Site, 7NC-J-225, SR1 Smyrna to Pine Tree Corners, New Castle County, Delaware	1999b	Auman
Sandom Branch Site Complex (7NC-J-227/7NC-J-228)	Management Summary: Phase II Evaluation of the Sandom Branch Site 7NC-J-227/228, New Castle County, Delaware	1999a	Rutherford
	Determination of Eligibility for the National Register of Historic Places: Sandom Branch Site Complex, 7NC-J-227/228, SR1 Smyrna to Pine Tree Corners, New Castle County, Delaware	1999b	Rutherford

were cleaned in plain water, and bagged by material type in 4-mil polyethylene zip-lock bags. Catalog numbers and provenience information were written in indelible ink on the outside of the bags, and an acid-free tag with the same information was placed within the bags. All developed images were curated in archival slide and print sleeves.

A full artifact inventory was compiled using dBase III+ database management software, which can be easily converted to other applications, such as Microsoft Access for analyses and for integration with Geographic Information Systems (GIS). These procedures were also applied to artifacts recovered during Phase I investigations of the Phase II sites by LBA. In addition to provenience information, coding for database entry included a variety of information (Table 3-3). Artifact inventories for each site are located in Appendix C. At the completion of the project, all artifacts, field documentation, photographs and negatives will be transferred to the Delaware State Museum for permanent curation.

Table 3-3. Cataloging Categories

Catalog Category	Definition
Group	Native American or historical period artifact
Material	for Native American artifacts, raw material type using general mineralogical terms
Morphological Type	for Native American artifacts, technologically derived terms are generally employed, though some widely accepted functional terms are used
Typology	for Native American artifacts, generally accepted morphological types associated with known chronological periods; for historical period artifacts, a subdivision based on manufacturing technology
Segment	completeness or, if incomplete, the section of the artifact represented (proximal, medial, distal)
Presence of Cortex	for flakes, expressed presence or absence
Color	recorded for lithic artifacts and relevant historical period artifacts
Size Grade	measured on debitage as an indication of geometric dimension, based on Ahler (1989)
Weight	expressed in grams, reported as an additional indication of artifact size

Once inventoried, the artifact assemblages were analyzed for information related to chronology, function, technology, and behavioral processes. The following methods and terminology were used in these analyses and studies.

3.4.1 Lithic Assemblage Analysis

Points (Hafted Bifaces / Projectile Points). Attributes collected from hafted bifaces and projectile points included dimensional measurements, such as length, width, and thickness (Table 3-4). Points were classified by conventional types when possible.

Chipped Stone Tools. Chipped stone tools were categorized during the cataloging process based on manufacturing characteristics. Additional tool attributes were further identified through macroscopic analysis. Macroscopic and microscopic analytical techniques for lithics have been employed in numerous technical reports to examine and identify tool use and function. Experimental studies based on replication of tools and controlled use have provided a basis for examining variability on tool edge modification (e.g., Hayden 1979; Keeley 1980). Macroscopic analysis focuses on visible tool edge modification using low power magnification and estimation of edge angles (e.g., Andrefsky 1998; Chapman 1977). Microscopic analysis emphasizes variation in polish and striations along tool edges viewed under high magnification and attempts to determine type of activity, type of motion, and type of residue indicating material worked.

Table 3-4. Hafted Biface/ Projectile Point Attributes

Attribute	Description
maximum length	In millimeters
maximum width	In millimeters
maximum thickness	In millimeters
blade length	In millimeters
blade width	In millimeters
haft length	In millimeters
base width	In millimeters
neck width	In millimeters
shoulder width	In millimeters
notch width	In millimeters
notch depth	In millimeters

With any given archaeological tool kit, variations in use and re-use may blur functional interpretations. Interpretations by different researchers also vary. The purpose of this macroscopic analysis is to provide a basis for identifying patterning along tool edges using a simple, standardized, and cost-effective approach.

Tool edge angles and use wear were analyzed for all collected tools (except points) and modified flakes. Tool edge angle is considered to be a measurable attribute that is a basic indicator of tool use activities (Carmichael 1985; Wilmsen 1974) (Table 3-5). Use wear patterns or edge damage suggests different types of activities and/or materials or mediums on which tools were used (Carmichael 1985; Chapman 1977; Crabtree 1974; Hayden 1979) (Table 3-6).

Table 3-5. Edge Angles and Probable Tool Function

Edge Angle*	Basic Function
26 to 35 degrees	Light cutting activities; cutting meat, skin, or other soft materials; wood whittling; hide processing
46 to 55 degrees	Medium cutting and scraping activities; scraping hides; shredding plants; heavy cutting of bone, wood, or antler
66 to 75 degrees	Heavy cutting and scraping activities; heavy scraping; sawing, cutting, or working of hard materials

*edge angle categories are estimates

Because variation may occur along tool edges and faces on a single tool, employable units (EUs) were used as the focus of this analysis. EUs have been defined as " that segment or portion (an edge, projection, facial arris, or facial surface) of an implement that would provide a continuous work surface without reorienting the entire implement when that implement is used against another material to perform work" (Knudson 1979: 270). For this study, each portion of the tool edge with distinct or different retouch or use wear was defined as an EU (Knudson 1979).

Table 3-6. Use Wear Patterning and Suggested Activity

Use Wear Pattern	Suggested Activity
Unifacial Microflakes	Scraping activities
Bifacial Microflakes	Cutting or sawing activities
Rounding or Blunting	Cutting or scraping of soft materials (i.e., soft wood, grasses, hides)
Striations	Scraping of a medium harder than the tool; oriented in the direction of tool use
Polish	Cutting of vegetal materials; soft scraping of hides

All chipped stone tools were examined using a 10 power hand lens in bright light. Type of retouch and use wear were recorded along each working tool edge. Retouch was defined here as flake scars at least 3 mm in length perpendicular to the tool edge. Retouch may indicate initial manufacture, intentional edge modification (i.e., flake tools), tool shaping and resharpening episodes. Use wear was indicated by the presence of various types of edge degradation or use modification such as microflake removal (serial flake removal with flake scars less than 3 mm in length), polish, rounding, or blunting. Edge angle was also measured at the approximate center of each tool edge using a goniometer.

Bifaces. Bifacial artifacts were defined by the presence of bifacial flake removal along a minimum of one edge. Most bifaces were also defined by a regularized shape. All complete bifaces were measured for length, width, thickness, and weight.

Bifaces were subdivided into two categories during the cataloging process: early stage and late stage. These subdivisions were based on the overall appearance, the degree of shaping, thickness, and sinuosity of edge profiles. These characteristics are related to the stage of completion of the biface. Early stage bifaces result from the initial efforts at producing a bifacial edge on a cobble, pebble, or flake blank. Typically, early stage bifaces exhibit random flaking generally produced by hard hammer percussion and appearing as wide and deep flake scars. The amount of flaking may vary from minimal to fairly evident. Bifacial edges are typically sinuous in profile with little shaping evident. The bifaces are relatively thick in cross-section and often contain remnant cortex. By contract, late stage bifaces typically display slightly greater width: thickness ratios than early stage bifaces, indicating that further thinning had been accomplished. Late stage bifaces also exhibit a greater degree of shaping and straighter edges in profile, suggesting more designed and patterned flaking. Edge modification may be present in the form of platform preparation, implying the use of more controlled flaking.

Unifaces. Unifacial artifacts were defined by the presence of unifacial flake removal along a minimum of one edge. Complete unifaces were measured for length, width, thickness, and weight.

Retouched Flakes. Retouched flake tools typically were characterized by margin flake scars at least 3 mm in length perpendicular to the flake edge and exhibiting minimal shaping along the flake perimeter. The focus of these types of tools is edge modification rather than formal shaping. At least one edge had to exhibit retouch in order to be classified in this tool category.

Utilized Flakes. Utilized flake tools were identified by the presence of use wear along the edges. Use wear was indicated by the presence of various types of edge degradation or modification such as microflake removal, polish, rounding, or blunting. These artifacts exhibited no attributes of intentional modification (e.g., flake scars).

Manufacturing Debris. Manufacturing debris consisted of cores and debitage.

Cores. Cores represent one of the basic residues of lithic reduction. They can range in size and complexity from pebbles (6 mm-64 mm) or cobbles (64 mm-256 mm) with only a single flake removal, to an exhausted cobble core that is rounded and unworkable. In most cases, cores that occur archaeologically are pieces that were rejected because additional flake removal was impractical, either because of poor material quality (in the case of a tested cobble or a fractured core), or because the size or shape of the core made further flaking difficult. By general implication, cores are usually assumed to have been used for flake production. While it is recognized that some cores were worked into bifacial tools, it can be difficult to discern intent in the early stages of reduction when only one or two flakes have been removed.

Cores were separated into two categories based on flake removal patterning: multidirectional and bipolar. Multidirectional cores were defined as cores with flake removal occurring in a random pattern from multiple platforms. Bipolar cores were identified by the crushed proximal and distal ends resulting from force generated from the percussor and the anvil.

Debitage. Debitage was separated into two basic categories: flakes and chips. Flakes were defined by the presence of identifiable attributes such as bulbs of percussion, platforms, dorsal flake scars, and feather, snap, or hinge terminations. Chips, also known as shatter, represented small angular pieces of lithic material with no identifiable flake attributes.

Flaking debris usually represents by far the majority of the artifactual material recovered from Native American archaeological sites. Efficient analysis of such a large number of artifacts can be challenging. A useful approach to this task involves analysis of size based on interval data (Henry et al. 1976; Stahle and Dunn 1984; Shott 1994). The process used in the current study is based on techniques of so-called flake aggregate, or mass analysis, as documented by Ahler (1986, 1989). The procedure consists of grading the artifacts according to standardized size intervals, and retrieving various quantitative data from each size grade (Table 3-7).

Table 3-7. Debitage Size Grades

Size Grade	Size
1	< 1 cm
2	≥ 1 cm and < 2 cm
3	≥ 2 cm and < 3 cm
4	≥ 3 cm and < 4 cm
5	≥ 4 cm and < 5 cm
6	≥ 5 cm

Cobblestone/Groundstone Tools. Cobble tools were used for a variety of tasks including battering, abrading, grinding, and pecking. These tools consisted of rounded cobbles apparently procured from streambeds or otherwise culled from local deposits. For the purposes of analysis, they were separated into functional categories including hammerstones, pitted stones, abraders, and axes. Some cobble tools contained multiple use wear and were categorized based on most frequent use type.

3.4.2 Ceramics Assemblage Analysis

Major emphasis of the ceramic analysis was placed on technological and functional aspects of early ceramic production. Given this approach, the vessel lot unit of analysis was selected over traditional analysis of individual sherds. A vessel lot was comprised of a group of sherds that were determined to be minimally from the same vessel. Determination of lots was based upon the identification and analysis of similarities of specific artifact attributes. Grouping the sherds in this way offered an advantage over more traditional minimum vessel counts because body sherds could be utilized in addition to rims. This approach to the analysis placed a greater emphasis on the vessel form, which in turn could yield information about the vessel function and manufacture. And the use of vessel lots, versus individual sherds, provided a more even and consistent description of ceramic frequencies and variability while it also provided information about vessel distribution at the site.

Methodology. Excavations at 7NC-H-95JKL yielded 151 prehistoric ceramic sherds. First, each sherd was individually examined and catalogued for six attributes: temper, interior surface treatment, exterior surface treatment, decoration, weight, and thickness. After this analysis, sherds were sorted visually into broad categories based on temper and dominant surface treatments. Cross-mending was undertaken to reunite sherds from individual vessels and to restore as many portions of vessels as possible.

The analysis resulted in the determination that all the individual sherds of the ceramic assemblage from Site 7NC-H-95JKL composed a single vessel lot. A vessel lot was comprised of a group of sherds that were determined to be minimally from the same vessel on the basis of cross-mends, distinctive attributes, similar decoration (or lack of decoration), and rims. This was based on formal and technological attributes which included paste, temper (amount, type, size, and shape), surface treatment (exterior and interior), direction of cordage twist, vessel shape, vessel size, rim form, and decoration. Once this lot was determined, the artifact attributes that defined it were analyzed and described. Finally, this vessel lot was compared and contrasted with more traditional ware classifications.

The ceramic paste was the most important criteria for determining a lot. First, the dominant temper material and the variety of inclusions were identified by visual inspection. Measurements were taken in mm to quantify the range of particle size. Magnification was used to estimate percentages of various inclusions utilizing the Orton, Tyers, and Vince Estimation Chart (Orton et al. 1993: 238). Next, the texture of the paste was recorded, using somewhat subjective terms, to characterize the feel and describe the relative blend and compaction of the paste.

The predominant color for the vessel lots was recorded for the exterior, interior, and core of a representative sherd, utilizing a Munsell® Color Chart. When differences were evident, either between sherds or areas of the vessel, a range of the major distinctions was recorded.

Surface treatment on both the exterior and interior of sherds was examined for evidence of scraping, smoothing, finger impressions, fabric/mat/net impressions, cordage impressions, adherent residue, and any other surface variation present. When applicable, information regarding cordage twists, size, and orientation was also recorded. This information was gathered to display the general attributes of the lot, as well as the individual peculiarities that may be displayed on a single sherd within a lot.

The vessel lot was examined for decoration separately from surface treatment. Decoration implied a more specific attempt to control appearance, which may also carry further symbolic meaning for the makers and users of these ceramics.

Information regarding vessel form was gathered to the fullest extent possible given the fragmentary nature of the vessel. Descriptions were prepared for three portions of a vessel: lip, rim, and body/base. Measurements (in mm) were recorded for the full range of sherd thickness, and recorded for each of these sub-areas. Vessel lips were examined and described by variations such as flattened, thickened, rounded, or pointed. Rim segments were examined for degree of tapering, and/or angle between sections was recorded (i.e. straight, everted, or inverted). Base and body sherds were examined to determine vessel shape, type of manufacture (modeled or coil), and breakage patterns.

Comparison. After the individual vessel lot was assigned, that unit was compared to the known wares and types established in the Delmarva and Middle Atlantic region. The lot was then classified as a known type. An examination of this ceramic collection in the framework of established ware typologies facilitated the discussion of chronology. This helped to highlight the similarities and differences of the 7NC-H-95JKL assemblage to others in the region.

3.4.3 Historical Artifact Assemblage Analysis

All historical artifacts were categorized in groups and classes to organize the data and to provide a structure that allowed for comparison of artifact assemblages (Table 3-8). The groups and classes were based, with some modifications, on those developed by South (1977). Standard attributes recorded for the historical artifacts included the raw material, standard type name, decoration, function, segment; and color of the body, glaze, and decoration, where relevant.

3.4.4 Features

In the field, features were bisected and sampled to determine their shape and to retrieve their contents. The initial characterization of the features during analysis consisted of typing on the basis of general form. The typology used was one developed for a similar array of features documented at the Hickory Bluff site (7K-C-411) on the St. Jones River south of Dover (Petraglia et al. 2002). The descriptions of the feature types in this system that were applicable to the current range of features (Table 3-9). Two main forms were recognized in the present analysis: concentrations of artifacts (thermally altered stone [TAS] fragments) and excavated basins.

3.5 SPATIAL DISTRIBUTION

Analysis of final artifact distributions within sites was conducted using commercially available software (SURFER®) that generates contour plans from grid-based data. The software was

Table 3-8. Historical Artifact Groups and Classes

Group	Class	Examples
Activity	Hardware	Bolt, Washer, Tack
	Stable	Stirrup, Horseshoe
	Container	Bucket
	Tool	Calipers
Architectural	Construction Material	Window Glass, Brick, etc.
	Hardware	Nail, Hinge, Padlock, etc.
Arms	Ammunition	Musketball, Percussion Cap
	Gun Part	Gunflint
Clothing	Fastener	Button, Buckle, etc.
	Sewing	Straight Pin, Scissors
Domestic	Bottle	Glass or Ceramic Bottle
	Cutlery	Knife, Fork
	Food Consumption/Serving	Ceramic Tableware
	Food Preparation	Ceramic Milkpan, Bowl, etc.
	Food Storage	Ceramic Jug, Crock, Jar, etc.
	Furniture	Drawer Pull, Furniture Tack
	Lighting/Heating	Coal, Lamp Chimney Glass
	Vessel	Glass Tableware or Other Vessel
Personal	Coin	Coin
	Hygiene	Chamber Pot
	Jewelry	Cuff Link
	Key	Key
	Medical	Vial, Ointment Jar
	Recreation	Toy Marble
	Tobacco	Smoking Pipe

Table 3-9. Cultural Feature Typology Developed for the Hickory Bluff Site.

Cultural Feature Types	Description
Type A - Artifact Features	cultural aggregation of artifacts
Type A1	concentration of thermally altered stone
A1 subtypes	
A1-a	<1 m in diameter
A1-b	>1 and <2 m in diameter
A1-c	>2 m in diameter
Type A2	concentration of diagnostic artifacts
Type A3	concentration of modified lithic raw materials
Type A4	concentration of lithic raw materials
Type B - Basins	displacement of soil
Type B1	large, >2 m in greatest horizontal dimension
B1 subtypes	
B1-a	>2 m in greatest horizontal dimension; >1 m in depth
B1-b	>2 m in greatest horizontal dimension; length 2x width
B1-c	>2 and <3 m in greatest horizontal dimension
B1-d	>3 m in greatest horizontal dimension
Type B2	medium, >1 and <2 m in greatest horizontal dimension
Type B3	small, <1 m in greatest horizontal dimension

originally designed to produce topographic maps diagramming the physiographic features of a landscape. The software has subsequently been adopted by other disciplines, including archaeology, to model various additional types of data. Archaeologists regularly use the software to perform a type of cluster analysis that results in plans of horizontal artifact distribution. Isopleths, or lines connecting areas of equal magnitude (in this case frequency), are determined by one of a series of interpolation algorithms that estimate the distribution of material at a given point within the site grid by examining the arrangement of the surrounding data. Artifact concentrations are implied by contour lines that form concentric polygons indicating regions of higher or lower artifact frequency. When appropriate, distribution maps were created to identify temporal and functional variation within both Native American and historical sites.