4.0 METHODS

4.1 ARCHIVAL METHODS AND RESEARCH DESIGN

An in depth archival investigation was previously researched for the historic land parcels which contained Sites 7NC-F-122, 7NC-F-124, and 7NC-F-126 by Hunter (Burrow et al. 2009, Liebeknecht and Burrow 2010). The study provided a chain of title for the historic agricultural properties in the project areas, reaching back to the original land patents in the 1700s. The early deeds were registered in Maryland before the colonial boundary was established, so documents were searched in both Cecil County, Maryland, and New Castle County, Delaware. The chains included deeds, wills, and probate records. An extensive search of historic maps was provided, as well as overlays of historic maps onto more recent maps and aerial photographs.

A research plan for the site evaluations was developed to build upon Hunter's body of research while retaining a site-specific focus. Evaluation of 7NC-F-122 was not expected to produce significant historic cultural resources, so archival research on this prehistoric site was limited to gathering of historic and modern topographic maps and aerial photographs to check for historic modifications of the land.

The Phase IB archaeological field survey by Hunter that identified 7NC-F-124 (Liebeknecht et al. 2010) noted the presence of a concentration of non-native shells that were waste products from button making in addition to a scatter of prehistoric artifacts. A goal of the current archival research was to gather information on the history of shell button making and to examine its temporal and geographic spread in Delaware. Another goal was to explore the possibility that owners or tenants of Indian Range Farm were employed by a local button-making factory or perhaps operated a small-scale button-making operation on the property.

The Phase IB archaeological survey that identified 7NC-F-126 (Liebeknecht et al. 2010) noted the presence of a number of early historic period artifacts, some of which could date to the 18th century. Later historic material, dating to the 19th century was noted, as well as a light density scatter of prehistoric cultural material, including diagnostic lithics dating to the Woodland I period. The site was slated for additional testing to identify a potential historic occupation site from the early colonial period, situated near an early historic road or cart path. Goals of the current archival research included gathering additional information on the known owners of the property to aid in interpreting the anticipated archaeological evidence of structures related to an early historic occupation. The early history of Indian Range was detailed in two previous archival studies of the Route 301 Corridor by Richard Grubb & Associates, Inc. (Grossman-Bailey and Hayden 2009) and Hunter Research, Inc. (Burrow et al. 2009). These studies were comprehensive in their coverage of the physical location of the property on historic maps, past ownership of the land, and domestic land use. They provided a framework for gathering of additional information on the property's owners and an expansion of land use into possible non-domestic functions. As such, in developing research objectives for the task technical proposal (Versar 2011) it was hypothesized that 7NC-F-126 may have been associated with a tavern or inn. One of the goals was to investigate known early

historic taverns in New Castle County in both the historic record and the archaeological literature, to look for patterns of tavern placement and of archaeological assemblage. Another hypothesis was that the site could have functioned as a point of interaction with local Native Americans, since the cart roads were said to originate as Native American footpaths, and local history told of Native Americans using the area for hunting. Information on the nature of early interaction between the settlers and local Native Americans was examined in the historical and archaeological records.

Archival information examined included topographic and other historic maps, aerial photographs, manufacturing and population censuses, business directories, genealogical data, tax records, tavern licenses, historic newspaper articles, and local and regional historical accounts. Repositories visited included the Delaware Public Archives in Dover, the Historical Society of Delaware in Wilmington, the Special Collections at the University of Delaware Morris Library in Newark, the Delawarean Collection at the Corbit-Calloway Memorial Library in Odessa, the U.S. Geological Survey in Reston, Virginia, and the Library of Congress in Washington, D.C. Of particular relevance were the exhibits on shell button-making at the Milton Historical Society's Museum in Sussex County. The assistance of the museum's director, Melinda L. Huff, and her willingness to share her knowledge of the local industry is gratefully acknowledged. Online sources of information consulted included federal population census records, genealogy websites, and historic newspaper articles.

4.2 ARCHAEOLOGICAL FIELD METHODS

Prior to initiated fieldwork, Versar developed a health and safety plan for the project. In addition, Versar coordinated with DelDOT on property owner and tenant farmer notification and contacted Miss Utility of Delmarva to ensure that all utilities were properly marked prior to the commencement of excavation. Century Engineering marked the LOC and the right-of-way centerline for all three sites according to the mist current draft of the plans.

Supplemental Phase I Survey

Phase IB survey of the project area was conducted using an early version of the project engineering plans. As a result of subsequent changes to the plans, some supplementary Phase I survey was required at 7NC-F-126, Bunker Hill North, to ensure complete coverage of the area. With reference to the semi-final plans provided by Century Engineering, this testing included systematic shovel testing on a 15-meter grid. Measurements were recorded in metric units. Soils were excavated by natural stratigraphy and details of each shovel test were recorded using a form to ensure standardization (e.g., depth, color, texture, transition, inclusion, presence of cultural material). Soil was screened through one-quarter-inch mesh hardware cloth to standardize artifact recovery, and recovered artifacts were provenienced by shovel test and stratigraphic level. Only those artifacts greater than 50 years of age were retained. Modern debris was documented and discarded in the field. Also certain classes of artifacts (i.e., brick, coal, slag, shell, nails) recovered from non-feature contexts was counted, weighed, and sampled as appropriate following discussions with DelDOT (see

2.3 Laboratory Methods below for greater detail). The location of each shovel test was mapped and plotted using a Global Positioning System (GPS) receiver. Photography was digital and met the standards for photography established by the DE SHPO.

Phase II Evaluations

The primary goal of the proposed Phase II evaluations was to determine if any of the three sites were eligible for inclusion in the NRHP. The general level of effort included systematic test unit excavation on a 10 to 20-meter grid interval as well as some targeted excavation based on geophysical survey results and Phase IB surface collection densities. Test units generally measured 1x1 meter (m) and measurements were recorded in metric units. Soils were excavated by natural stratigraphy and in 10cm levels within each natural stratigraphic layer. Plowzone soils were excavated as a single level. All test units were cleanly scraped upon reaching the top of the subsoil to determine the presence of features. Excavations 20 cm into subsoil were completed. Two test units per site were excavated to a depth of 1m to provide geomorphological data. Details of each test unit were recorded using a form to ensure standardization (e.g., depth, color, texture, transition, inclusion, presence of cultural material). Representative profiles were drawn to document soils. Plan maps were completed as appropriate to document potential features.

Soils were screened through one-quarter-inch mesh hardware cloth to standardize artifact recovery, and recovered artifacts were provenienced by test unit and stratigraphic level. Only those artifacts greater than 50 years of age were retained. Modern debris was documented and discarded in the field. Also certain classes of artifacts (i.e., brick, coal, slag, shell, nails) recovered from non-feature contexts were counted, weighed, and sampled as appropriate following discussions with DelDOT (see 2.3 Laboratory Methods below for greater detail). The location of each test unit was mapped and plotted using a GPS receiver. Photography was digital and met the standards for photography established by the DE SHPO.

Geophysical Survey

Three instruments were used to locate subsurface remains at 7NC-F-126: a magnetometer; ground-penetrating radar; and magnetic susceptibility meter. The magnetometer, a Geoscan Research FM 256 fluxgate gradiometer, was used to collect eight readings per meter along transects spaced 50 cm apart. Magnetic survey has the capacity to identify larger features, concentrations of iron objects, areas of burning, and brick features, among other things. After the magnetic survey, a Sensors & Software Noggin 500 ground-penetrating radar was used to survey the site at a medium-high density (25 cm transect spacing, 40 traces per meter). The results of the magnetic and initial radar surveys were preliminarily interpreted in the field. In areas with anomalies of interest, additional radar data was collected along transects running perpendicular to the initial survey, thus doubling the radar data density. In addition, a Bartington MS2 magnetic susceptibility system was employed to detect possible midden soils.

Once processed and compiled into site maps, the geophysical data was interpreted to identify cultural features. All anomalies of interest were identified and ranked according

to their probability of being a cultural feature. A selection of high-probability anomalies was examined with hand-excavated test units. For a complete discussion of geophysical methods see Appendix A.

Test Unit Bank and Optional Backhoe Stripping

At the conclusion of the test unit excavations, there was a field meeting minimally involving Versar archaeologists and DelDOT archaeologists (also representing DE SHPO interests) to determine if further test unit excavation or backhoe stripping was warranted. For each site, a test unit bank equaling 20 percent of the total number of units was available. Time for backhoe stripping, using a flat blade bucket so as not to damage any sub-plowzone features, was also available for each site as necessary.

4.3 LABORATORY METHODS

At the conclusion of fieldwork, artifacts recovered from the field-testing investigations were delivered to the Versar laboratory in Springfield, Virginia, for processing, cataloging, and analysis following the *Delaware State Museums Sampling and Curation Policy* (DESHPO 1993). The artifacts were cleaned in plain water and bagged in 4-mil polyethylene zip-lock bags according to provenience and material type. Consecutive bag numbers were assigned in the field for each provenience from which artifacts are recovered. The provenience numbers were written in indelible ink on the exterior of the artifact bags and acid-free tags with printed provenience data were placed within the bags.

Substantial amounts of coal were encountered at Site 7NC-F-126, however, and therefore this material was counted and weighed in the field, as outlined in the culling and discard guidelines provided by DelDOT:

- ***Coal*** and ***Coal Slag*** will be counted and weighed in the field. A small representative sample will be collected from non-feature contexts and the remainder will be discarded. Coal from feature contexts will be collected.

Therefore, only a representative sample of coal from each non-feature provenience was kept. The culling data was recorded on field tags and included with the retained sample and the remainder of the artifacts. Other artifact types were not culled or discarded because the counts were low.

Artifacts were classified by general category (i.e., Prehistoric or Historical period), followed by group (e.g., Agriculture or Building Material), raw material, function or morphological design, and segment. Additional descriptive attributes were recorded where they contributed to the determination of the artifact function or temporal range. Measurements taken on lithic debitage included size grade, color, presence/absence of cortex, and weight in grams. Lithic size grades were recorded as 1 for <1cm; 2 for ≥1cm and <2cm; 3 for ≥2cm and <3cm; 4 for ≥3 cm and <4cm; 5 for ≥4cm and <5cm, and 6 for ≥5 cm. Lithic tools and cores were also measured in length, width, and thickness in millimeters. The artifact database structure and data from the Phase I survey by Hunter

for each of the three sites was reformatted to match the Phase II database. The complete artifact inventory and artifact measurements are found in Appendix C.

The current project included preparing both the Phase I and Phase II artifacts from the three sites for permanent curation. Diagnostic artifacts were hand-labeled with the DHCA Provenience/Catalog Control number using acryloid B-72 sealant and black or white pigment ink. The collections were organized in archival partitions/trays within 20” x 20” x 3” corrugated polypropylene flat boxes. Field records, including field notes and digital photographs, were organized and labeled. Photographs were printed on archival paper and stored in archival sleeves. Two bound copies of the final report will be submitted with the collection to the DHCA.