

DELAWARE AIRPARK
CHESWOLD, KENT COUNTY, DELAWARE
ARCHEOLOGICAL DATA RECOVERY INVESTIGATIONS
AT THE
AIRPARK EAST (7K-C-431) AND
AIRPARK WEST (7K-C-382) SITES

GRANT NO. 3-10-0001-004-2003



PREPARED FOR
FEDERAL AVIATION ADMINISTRATION
HARRISBURG AIRPORTS DISTRICT OFFICE
CAMP HILL, PENNSYLVANIA
DELAWARE DEPARTMENT OF TRANSPORTATION
DOVER, DELAWARE

AND

DELAWARE RIVER AND BAY AUTHORITY
NEW CASTLE, DELAWARE

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VOLUME 2: APPENDICES

APPENDIX I

SCOPE OF WORK

PROPOSAL

**DELAWARE AIRPARK
CHESWOLD, KENT COUNTY, DELAWARE**

**Five Year Capital Improvement Program
Environmental Assessment AIP-05**

Phase III Archeological Data Recoveries

Sites 7K-C-382 and 7K-C-431

Submitted to

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1.0 INTRODUCTION

1.1 PURPOSE OF THE INVESTIGATION

John Milner Associates, Inc. (JMA) proposes to conduct Phase III archeological data recovery investigations of Sites 7K-C-382 and 7K-C-431 in advance of proposed improvements to the Delaware Airpark, located in Cheswold, Kent County, Delaware. The Federal Aviation Administration (FAA), the Delaware River and Bay Authority (DRBA), and the Delaware Department of Transportation (DelDOT) propose to improve the Delaware Airpark to meet FAA nationwide airport design standards. An Airport Master Plan and Environmental Inventory were prepared in advance of land acquisition and expansion of the airport. The Airpark is subject to FAA national design standards as a recipient of FAA-Airport Improvement Program Grants. Accordingly, proposed improvements fall within the jurisdiction of Section 106 of the National Historic Preservation Act, as amended. Cultural resources studies have been conducted under the Secretary of the Interior's *Standards and Guidelines for Archeology and Historic Preservation* (National Park Service 1983), as well as guidelines specific to the State of Delaware, including *A Management Plan for Delaware's Prehistoric Cultural Resources* (Custer 1986a; also Custer 1994), the *Management Plan for Delaware's Historical Archaeological Resources* (De Cunzo and Catts 1990), and the *Delaware Statewide Comprehensive Historic Preservation Plan* (Ames et al. 1987). The archeological investigations have also been conducted in accordance with the Delaware State Historic Preservation Office guidelines (Delaware State Historic Preservation Office 1993, 1997).

1.2 BACKGROUND FOR THE DATA RECOVERIES

JMA conducted an archeological background study across an early-defined Delaware Airpark project area (Siegel et al. 2001) and a Phase I archeological identification survey across the later-defined area of potential effects (APE) (McVarish and Siegel 2004). This survey resulted in the identification of seven new sites and the re-location of one previously documented site. Four of the sites are small scatters of chipped-stone artifacts and fire-cracked rocks (Sites 7K-C-427, 7K-C-429, 7K-C-428, 7K-C-430). Site 7K-C-430 produced a jasper Levanna point (Late Woodland); the other three yielded no temporally diagnostic artifacts.

Three other sites produced moderately large and diverse assemblages of artifacts spanning the Early/Middle Archaic, Late Archaic, Terminal Archaic, Early Woodland, and possibly Middle Woodland periods (Sites 7K-C-382, 7K-C-431, and 7K-C-432). Datable upland lithic scatters with diverse assemblages of artifacts are rare for this portion of Delaware. As such, these kinds of sites are important for augmenting our understanding of settlement patterns dating to specific periods in prehistory. Finally, Site 7K-C-426 is a farmstead that was occupied from the mid-nineteenth century to early twentieth-century.

In JMA's opinion, Sites 7K-C-427, 7K-C-429, 7K-C-428, 7K-C-430 were not eligible for listing in the National Register of Historic Places (NRHP), and as such no further treatment was recommended for these sites. In JMA's opinion, Sites 7K-C-382, 7K-C-431, 7K-C-432, and 7K-C-426 were potentially eligible for listing in the NRHP because of information that each may contain regarding regional prehistory or history.

A research design presented in the McVarish and Siegel (2004) report outlined expected site types based primarily on settlement models developed by Custer (1984a, 1984b, 1986a, 1986b, 1987, 1989, 1990, 1994; Kellogg and Custer 1994) and DeCunzo (DeCunzo and Catts 1990; DeCunzo

and Garcia 1992). That research design was used in the evaluations of Sites 7K-C-382, 7K-C-431, 7K-C-432, and 7K-C-426.

Each site was evaluated in terms of integrity of archeological deposits, size, chronology, and potential for substantially adding to a greater understanding of prehistory or history in the area. In the opinion of JMA, Sites 7K-C-382, 7K-C-431, and 7K-C-426 were eligible for listing in the National Register of Historic Places under Criterion D: “Properties may be eligible for the National Register if they have yielded, or may be likely to yield, information important in prehistory or history” (National Register Bulletin 15, Part VI). The integrity of deposits in the prehistoric sites (7K-C-382, 7K-C-431) was good, with substantial portions of the assemblages sealed in the sub-plowzone sediments. In Site 7K-C-382, some degree of culturally based spatial clustering was noted, especially in regard to a small possible Carey-complex occupation. Clustering was documented in Site 7K-C-431 in densities of fire-cracked rocks, suggesting distinct areas for cooking and general heating activities.

Site 7K-C-432 was small with very few artifacts. Many such sites have been documented in the Delaware Coastal Plain. Additional investigations in this site would result in redundant information that would add nothing to our understanding of prehistory in this area. As such, in the opinion of JMA, Site 7K-C-432 was not eligible for listing in the National Register of Historic Places under Criterion D.

The integrity of archeological deposits in Site 7K-C-426 was good, in both plowzone and sub-plowzone contexts. Spatial clusters were identified in the horizontal distributions of artifacts, and features were identified relating to the agricultural dwelling and outbuildings. In addition, primary archival documents are available for the dwelling specifically and the property in general. In the opinion of JMA, Site 7K-C-426 was eligible for listing in the National Register of Historic Places under Criterion D. In the Airpark project design, however, it has been determined that Site 7K-C-426 will be avoided; accordingly, no further treatment is required.

2.0 RESEARCH DESIGN

Research proposed for the Phase III data recoveries is designed to address spatial organization within small to moderate-sized camp sites, selective use of stone raw materials through time, lithic technology, paleoenvironmental setting, and regional settlement models.

2.1 SPATIAL ORGANIZATION

The study of intra-site spatial patterning of hunter-gatherer camps and villages has a long history in archeology (Binford 1980; David and Kramer 2001; Hietala 1984; Yellen 1977). Investigating the kinds, frequencies, and diversity of artifacts and features, by location within a site, will go a long way to address mobility patterns, the organization of activities, group composition, season of occupation, etc. Not every issue or question will be addressed at the same level of certainty. Preservation, stratigraphy, duration and number of occupations, horizontal segregation of components, multiple overlapping occupations, post-depositional land-use history, among others, are factors that must be considered when addressing the research potential of sites and their eligibility for listing in the National Register of Historic Places.

As previously discussed, the Phase II evaluations revealed some degree of spatial clustering in cultural occupations within Site 7K-C-382 and activity clustering in Site 7K-C-431. The sites were discontinuously occupied for thousands of years, from the Early/Middle Archaic possibly into the

Late Woodland period for Site 7K-C-382 and from the Middle/Late Archaic to the Middle Woodland period for Site 7K-C-431. Both sites retain considerable portions of the assemblages in the sub-plowzone sediments. The goal will be to distinguish culturally or functionally meaningful spatial components to address the internal behavioral organization of each site.

2.2 LITHIC TECHNOLOGY AND RAW MATERIALS

Selection or preference for specific raw materials used in the production of stone tools may relate to settlement, mobility, and intergroup exchange patterns. Models of regional settlement patterns depict wide-ranging territorial distributions for Paleo-Indian and Early Archaic cultures, which relate to demographic and early post-Pleistocene environmental factors. Low population densities combined with a patchy environment selected for highly mobile groups of hunters and gatherers. As intrinsic rates of reproduction resulted in larger group sizes in the context of a gradually ameliorating environment, groups settled in to local environments and territorial ranges decreased in size. Custer (1996:165-166) has argued that lifeways during the Late Archaic, Early Woodland, and Middle Woodland periods were similar, and included larger groups that participated in far-flung exchange networks. Tracking relative frequencies of raw materials by time period will potentially enable us to address group territorial ranges and exchange patterns.

Stone-tool technology and production will be assessed within the framework of activity areas. Does the lithic assemblage reflect early-stage formal tool production, expedient flake-tool production and use, tool maintenance, or some combination? Systematically addressing these questions will help to characterize site functions and to place the sites into regional settlement models.

2.3 CERAMIC TYPOLOGY

It is expected that there will be minimal morphological/typological variability in the ceramic assemblages. Major goals of the ceramic analysis will be to identify types and/or classes. As in the case of other artifact classes, the analysis of the ceramics will be conducted within the context of site spatial organization and stratigraphy.

2.4 PALEOENVIRONMENTAL CONTEXT

Reconstruction of past climatic and environmental conditions plays a significant role in understanding prehistoric settlement and subsistence models. Custer (1986:22-27; 1994:171-172) has made a strong case for the importance of understanding local environmental settings associated with human occupations at various times in the past. To this end, JMA proposes to conduct paleoenvironmental research in connection with the wetlands adjacent to the archeological sites. Goals of this research will be to correlate environmental conditions to specific occupations of the two sites.

2.5 REGIONAL SETTLEMENT MODELS

Sites 7K-C-382 and 7K-C-431 will be evaluated in the context of site distributions documented for the Leipsic and St. Jones drainages. Goals will be to link these sites to larger settlement and subsistence systems. The explicit use of watersheds, as analytical units, is similar to Snow's (1980) drainage basin model, the watershed model currently promoted in Pennsylvania (Bureau for Historic Preservation 1996; Chiarulli et al. 2001), and Egghart et al.'s (2003:7-30) recent watershed range model. Sites 7K-C-382 and 7K-C-431 are located along the divide between the Leipsic and

St. Jones rivers. In the context of a riverine model, these sites could relate to one or both of these drainages.

3.0 METHODS

3.1 FIELDWORK

JMA proposes to conduct the data recoveries in two defined stages of excavation. The Phase II fieldwork provided a coarse-grained view of the internal structure of each site. Stage 1 of the data recovery will refine our view of the spatial structure of the sites, with the intent to recognize areas of relatively greater or lesser archeological productivity. A series of relatively tightly spaced 1-x-1-m units will be excavated between the Phase II units. The goal of this stage of fieldwork will be to identify productive areas of each site, which will be targeted for subsequent additional excavations in block configurations, constituting Stage 2 of the data recoveries. Overall goals of the fieldwork will be to recover data that relate to significant research questions, that are relevant for placing the sites into a larger archeological context, and that articulate with issues addressed in the DE SHPO state plan.

It is proposed to hand-excavate approximately 5 percent of each site in the data recoveries. This sampling fraction results in about 202 1-x-1-m excavation units in Site 7K-C-382 and about 87 1-x-1-m units in Site 7K-C-431. The Ap-horizon of each unit will be removed as a single layer; natural layers beneath the plowzone will be excavated in 10-cm levels. At least one 10-cm level will be excavated into culturally sterile Pleistocene subsoil in every excavation unit. Soil matrices, including the plowzone, will be screened through ¼-in.-mesh hardware cloth to ensure the uniform recovery of artifacts. Information on each unit will be recorded on standardized forms, which will include such observations as number and types of artifacts, soil stratigraphy, Munsell soil color, soil texture, and cultural associations. Selected unit profiles will be examined and described by the project soil scientist.

3.2 ANALYTICAL PROCEDURES

A variety of analyses will be conducted to address the research questions posed earlier. These may be broadly grouped into issues dealing with site structure and spatial organization, lithic technology, ceramic typology, environment and adaptation, and regional settlement models.

3.2.1 SITE STRUCTURE AND SPATIAL ORGANIZATION

Artifact classes and densities will be examined, spatially, across each site with the intent of identifying activity areas. An effort will be made to subdivide each site assemblage stratigraphically so that activity sets may be distinguished chronologically. Based on Phase II results, the stratigraphic distinction will probably be based on plowzone versus sub-plowzone deposits. Some horizontal segregation in cultural occupations may be apparent, especially in Site 7K-C-382. In addition, up to 50 soil samples will be collected for chemical analysis to assist in the identification of activity areas. General goals of this research will be to further our understanding of the internal use of space in small to moderate-sized procurement camps.

3.2.2 LITHIC TECHNOLOGY

Stone-tool production strategies will be addressed by a systematic analysis of debitage. Following Patterson (1990), Shott (1994), and more generally Ahler (1989), frequency of debitage per defined size categories will be plotted against percent of total debitage by raw material and meaningful sections of each site. Researchers have documented specific reduction trajectories associated with distinctive flake-size distributions (Ahler 1989; Henry et al. 1976; Patterson 1982, 1990; Patterson and Sollberger 1978; Shott 1994; Tomka 1989). Patterson (1990) in particular established semilog straight-line relationships between flake-size groups and percentages of flakes present for each group associated with bifacial-reduction trajectories. In addition, the relative slopes of log-linear relationships reflect stages or points in a biface-reduction continuum (Shott 1994: Fig. 2).

3.2.3 CERAMIC TYPOLOGY

The ceramic assemblages will be sorted into rim versus body sherds, and then into classes based on the nature of surface treatment (principally undecorated, smoothed, undecorated cordmarked, decorated, and undetermined) and technological characteristics (paste, temper, and color) within morphological classes. In so doing, the goal will be to identify ceramic types and/or classes.

3.2.4 ENVIRONMENT AND ADAPTATION

Soil samples will be collected for specific sets of data to address the paleoenvironment and adaptive strategies. Flotation samples will be collected to assist in the recovery of charred plant and animal remains. Based on the Phase II investigations in the Delaware Airpark sites (Siegel et al. 2004) and results reported in the Frederick Lodge excavations (Egghart et al. 2003:7-21-7-23) poor preservation of organic remains is expected. Flotation samples, approximately 10 liters in volume, will be collected from features and from selected excavation units across each site. In total, up to 20 flotation samples will be collected and processed. The water separation of these samples will be performed in JMA's laboratory in West Chester, Pennsylvania. Sorting and analysis of the heavy and light fractions will be conducted in the ethnobiological laboratory of New South Associates in Stone Mountain, Georgia.

Dr. Daniel Wagner, a soil scientist with Geo-Sci Consultants, Inc., will visit the site to address soil formation and the geomorphic context of the prehistoric occupations. During Stage 1 of the excavations, Dr. Wagner will visit the project to describe selected unit profiles and soil borings. In doing so, the project team will obtain a good understanding of depositional and soil formation processes, thus enabling informed field decisions and interpretations to be made. In addition, Dr. Wagner will participate in the wetlands coring research to identify lithostratigraphic units and depositional regimes. Sediment cores will be extracted from selected wetlands located within the APE with the goal of obtaining pollen, phytoliths, macrofossils, and geomorphological and pedological data. The wetlands provide an opportunity to obtain micro- and macro-botanical remains preserved in the anoxic sediments that may be useful in reconstructing changes in the local environment through the Holocene. The coring and pollen and macrofossil analyses will be conducted by Dr. Dorothy Peteet, a paleobotanist with the Lamont-Doherty Earth Observatory at Columbia University. Selected soil samples from the cores will be submitted to Dr. Susan Mulholland, a phytolith specialist with the Duluth Archaeology Center.

Characterizing the past climate and ancient environment is important for understanding human-land relations in prehistory. Pollen, phytolith, and macrofossil data may be used to evaluate the environmental setting(s) and the nature of resources available to the settlement occupants.

3.2.5 REGIONAL SETTLEMENT MODELS

To the extent that data are available, information from all reported prehistoric sites in the Leipsic and St. Jones drainages will be examined in terms of topographic setting, location within the drainage, artifact content, and cultural affiliation. The archeological site files for the Leipsic and St. Jones watersheds that are housed in the DE SHPO will be reviewed. Digitizing the locations of all known sites within the two drainages and entering them into GIS, will afford us the opportunity to investigate spatial patterns and relationships of sites within and across drainages and to calculate correlations between sites and environmental attributes. This inductively driven model will result in a set of expectations that may be tested and refined as new data become available.

It is also proposed to examine a sample of archeological collections housed in Delaware-state-authorized repositories. Collections from sites located in the lower, middle, and upper sections of the Leipsic and St. Jones drainages will be selected for analysis. Goals of this collections analysis will be to supplement the site file research and to provide a more informed comparative aspect to the settlement modeling. Specific components of this research will address relative frequencies of debitage, morphologically identifiable tools, projectile point and ceramic types, and lithic raw materials, depending on the quality and integrity of the collections.

3.3 LABORATORY PROCESSING AND CURATION

All recovered artifacts will be cleaned and inventoried in accordance with the *Guidelines and Standards for the Curation of Archaeological Collections* published by the Delaware State Museums (Fithian n.d.). Cataloged artifacts will be placed in heavy-duty archivally stable plastic bags for permanent storage. An acid-free provenience tag will be placed in each bag. Provenience information will also be written on the exteriors of the bags, using a permanent marker. All artifacts, maps, photographs, and field notes will be submitted to the Delaware State Museums for permanent curation.

4.0 PROJECT ADMINISTRATION, PUBLIC OUTREACH, DELIVERABLES, AND SCHEDULE

4.1 PROJECT ADMINISTRATION

This task includes activities necessary to ensure the efficient and timely conduct of the investigation to current professional standards. JMA will coordinate closely with R.A. Wiedemann & Associates, Inc., FAA, DRBA, DelDOT, and DE SHPO, as warranted and appropriate, during the course of the project. JMA assumes that project staff will attend two meetings and participate in four conference calls over the course of the project.

4.2 PUBLIC OUTREACH

JMA proposes to invite interested members of the community and professional archeologists to visit the excavations in progress. The visit will be planned for a day near the completion of fieldwork so that people can view open excavation units and be provided with useful information about field results and initial interpretations. Project staff will be on hand to answer questions and to assist in matters of safety. A popular brochure will be prepared that describes the research and preliminary

results. JMA will submit a master copy of the brochure to R.A. Wiedemann & Associates, Inc. for printing and distribution.

4.3 DELIVERABLES

Six copies of the draft report will be submitted. Eight copies of the final report will be submitted, four of which go to the DE SHPO. One of the DE SHPO copies of the final report will be unbound and contain original plates. On completion of the final report, artifacts, maps, photographs, and field notes will be submitted to the Delaware State Museums for permanent curation. As appropriate, digitized site locations within the St. Jones and Leipsic drainages will be submitted as GIS layers to the DE SHPO, DelDOT, FAA, and DRBA.

4.4 SCHEDULE

JMA will mobilize a crew and commence fieldwork within one week of receiving a Notice to Proceed. Barring adverse weather or other factors beyond the control of JMA, fieldwork will be completed within ten weeks following Notice to Proceed. Artifact processing and data analysis will commence on completion of fieldwork. A draft report detailing results of fieldwork and analysis will be submitted within 32 weeks following completion of fieldwork.