

APPENDIX K

FEATURES AT THE PUNCHEON RUN SITE

FEATURES AT THE PUNCHEON RUN SITE

By

John Bedell
Charles LeeDecker

THE LOUIS BERGER GROUP, INC.
2300 N Street, NW
Washington, D.C. 20037

Submitted To

U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

and

DELAWARE DEPARTMENT OF STATE
Division of Historical and Cultural Affairs
Bureau of Archaeology and Historic Preservation

Prepared For

DELAWARE DEPARTMENT OF TRANSPORTATION
Division of Highways
Location and Environmental Studies Office



Eugene E. Abbott
Director of Planning

2004

TABLE OF CONTENTS

	PAGE
List of Figures	K-ii
I. FEATURES AT THE PUNCHEON RUN SITE	K-1
II. SIGNIFICANCE OF FEATURES TO THE RESEARCH PROGRAM	K-1
A. Delaware Pit Houses	K-2
B. Storage Pits, Sedentism, and Cultural Change	K-10
III. EXCAVATION METHODS	K-12
IV. FEATURE EXCAVATIONS IN THE SILO PIT AREA OF LOCUS 1	K-13
A. Phase II Feature Testing	K-13
B. Phase III Investigations	K-15
C. The Main Pit Cluster	K-15
D. Features 57, 58, 59, 61, and 64: The Red-Ringed Pits	K-17
E. Other Features	K-17
V. FEATURE EXCAVATIONS IN LOCUS 3	K-19
A. Fire-Cracked Rock Concentrations (Features 5, 7, 8, 9, 10, 11, 12, 15, 16)	K-19
B. The Chipping Cluster (Feature 4)	K-19
C. Natural Pits (Features 1, 2, 3, 6, 25, 26, 31, 34)	K-20
D. Small Storage Pits (Features 24 and 33)	K-20
E. Possible Pit Houses (Features 32 and 37)	K-20
F. Large Storage or Burial Pits (Features 30 and 38)	K-22
VI. FEATURE DESCRIPTIONS FOR LOCUS 1	K-24
VII. FEATURE DESCRIPTIONS FOR LOCUS 3	K-91
REFERENCES CITED	K-147
ATTACHMENT A: Feature List	K-152

LIST OF FIGURES

FIGURE	PAGE
K-1 Pit House Architecture	K-3
K-2 Taphonomy of Pit House Features	K-4
K-3 Snapp Site Feature 153, A “Well-Preserved Pit House”	K-5
K-4 Common Pit Types	K-6
K-5 Plan of Features in the Main Pit Cluster, Silo Pit Area	K-16
K-6 Plan of the Red-Ringed Pits, Silo Pit Area	K-18
K-7 Stratigraphic Profile of Feature 1, Facing West	K-25
K-8 Stratigraphic Profile of Feature 3, Facing South	K-27
K-9 Stratigraphic Profile of Feature 4, Facing West	K-30
K-10 Stratigraphic Profile of Feature 5, Facing East	K-33
K-11 Stratigraphic Profile of Feature 6, Facing North	K-35
K-12 Stratigraphic Profile of Features 7A and 7B, Facing East	K-37
K-13 Stratigraphic Profile of Feature 39, Facing North	K-41
K-14 Stratigraphic Profile of Feature 41, Facing North	K-44
K-15 Plan and Stratigraphic Profile of Feature 44	K-47
K-16 Stratigraphic Profile of Feature 46, Facing West	K-49
K-17 Stratigraphic Profile of Feature 47, Facing South	K-51
K-18 Stratigraphic Profile of Feature 48, Facing North	K-53
K-19 Stratigraphic Profile of Feature 50, Facing North	K-55
K-20 Stratigraphic Profile of Feature 51, Facing North	K-57
K-21 Stratigraphic Profile of Feature 53, Facing North	K-59

LIST OF FIGURES (continued)

FIGURE	PAGE
K-22 Stratigraphic Profile of Feature 57, Facing North	K-61
K-23 Stratigraphic Profile of Feature 58, Facing North	K-63
K-24 Stratigraphic Profile of Feature 59, Facing North	K-65
K-25 Plan of Feature 60	K-67
K-26 Stratigraphic Profile of Feature 60, Facing North	K-68
K-27 Stratigraphic Profile of Feature 61, Facing North	K-70
K-28 Stratigraphic Profile of Feature 64, Facing North	K-72
K-29 Stratigraphic Profile of Feature 66, Facing West	K-75
K-30 Stratigraphic Profile of Feature 67, Facing North	K-77
K-31 Stratigraphic Profile of Feature 68, Facing North	K-79
K-32 Plan of Feature 69	K-81
K-33 Stratigraphic Profile of Feature 69, Facing South	K-82
K-34 Plan of Feature 85	K-84
K-35 Stratigraphic Profile of Feature 85, Facing Southwest	K-85
K-36 Stratigraphic Profile of Feature 98, Facing East	K-87
K-37 Stratigraphic Profile of Feature 14, Facing East	K-89
K-38 Plan and Profile of Feature 1 (Locus 3)	K-92
K-39 Plan and Profile of Feature 2 (Locus 3)	K-94
K-40 Plan and Profile of Feature 3 (Locus 3)	K-96
K-41 Plan of Feature 4 (Locus 3)	K-98
K-42 Plan of Feature 7 (Locus 3)	K-100

LIST OF FIGURES (continued)

FIGURE	PAGE
K-43 Plan of Feature 8 (Locus 3)	K-102
K-44 Plan of Feature 9 (Locus 3)	K-104
K-45 Plan and Profile of Feature 13 (Locus 3)	K-106
K-46 Plan of Feature 16	K-108
K-47 Plan and Profile of Features 24 and 26	K-110
K-48 Plan and Profile of Feature 25	K-113
K-49 Plan of Features 30, 37, and 38	K-117
K-50 Stratigraphic Profile of Feature 30, Facing East	K-118
K-51 Stratigraphic Profile of Feature 31	K-122
K-52 Plan and Profile of Feature 32	K-124
K-53 Stratigraphic Profile of Feature 33, Facing South	K-127
K-54 Stratigraphic Profile of Feature 34	K-129
K-55 Plan of Feature 35	K-131
K-56 Stratigraphic Profile of Feature 37, Facing West	K-134
K-57 Stratigraphic Profile of Feature 38, Facing East	K-137
K-58 Stratigraphic Profile of Feature 38, Facing North	K-138
K-59 Plan of Feature 94	K-141
K-60 Plan of Feature 96	K-143
K-61 Plan of Feature 97	K-146

I. FEATURES AT THE PUNCHEON RUN SITE

A total of 113 features were identified at the Puncheon Run Site. Of these, 72 were excavated at least in part, and 31 were identified as probably cultural in origin. A further 12 features were thought to be possibly cultural, or partly cultural and partly natural (for example, a storage pit largely destroyed by rodent tunneling). Six features were fenceposts or other historic intrusions. The remaining 64 features were thought to be natural disturbances, such as rodent burrows, tree throws, or variations within the ancient subsoil of the site. During the Phase II testing, separate feature sequences were used for the different loci of the site, so that there is a Feature 1 in each of the loci; during the Phase III excavations, the features were all numbered in a single series, so the numbers above 14 do not repeat.

Most of the features identified as cultural were either storage pits or clusters of fire-cracked rock (FCR). Of the 14 FCR clusters, 13 were in Locus 3, and 12 of the 15 storage pits were in Locus 1. The only two prehistoric cultural features that do not fall under these two types were the metate in Locus 3, which was designated Feature 36, and Feature 4, a cluster of chipping debris also in Locus 3. A few additional small clusters of chipping debris were located in Locus 3 (Excavation Units 77, 83, and 89), but were not assigned feature numbers during excavation.

The purpose of this appendix is to make descriptive data on the Puncheon Run features readily available. Thousands of features have been excavated on prehistoric sites in Delaware, but detailed descriptions and profile drawings have been published for only a few. Because of disagreement about the origin of many features found on sites in Delaware, this is a serious omission. This appendix begins with a discussion of these controversies, so as to orient readers who are not familiar with the debate and to explain how the research program at Puncheon Run was intended to contribute to it. The significance of this debate extends beyond the narrow confines of taphonomic interpretation, because it has been widely asserted that pit storage represents a major change in prehistoric lifeways from a diffuse nomadism, to a more settled and stable regime focused on the richest environments and the most reliable resources. This change, it is argued, was the essential pre-condition to the development of complex societies in the Middle Atlantic region. The presence or absence of pit features may also relate to the degree of mobility in a society, the amount of warfare, and whether there are centralized political powers exacting tribute. It is difficult to approach these important questions if there is uncertainty regarding the cultural origin of pit features.

At Puncheon Run, various excavation strategies and analytical techniques were used in an attempt to understand the origin of features and the uses to which they may have been put. Soil chemistry, particle-size analysis, flotation, phytolith study, radiocarbon dating, and soil micromorphology were all employed. The bulk of this appendix consists of descriptions of the individual features, the associated artifacts, the results of analyses, and the inferred origins and functions of the features. The publication of this data is intended to assist other archaeologists in interpreting the features found on future sites as well as in evaluating the conclusions presented in this and other reports.

II. SIGNIFICANCE OF FEATURES TO THE RESEARCH PROGRAM

The presence of pit features was one of the reasons that the Puncheon Run Site was initially judged to be significant. Broadly speaking, two categories of features have been considered of high importance in the study of Delaware prehistory: storage pits and possible "pit houses." Storage pits are widely acknowledged to be a key feature of prehistoric sites throughout eastern North America, and their use is well documented in the ethnohistoric record. In the opinion of Custer (1984, 1989, 1994) and others, it was the use of storage pits to retain surplus foods, beginning in the early Woodland I or Late Archaic period, that made possible the

origin of complex societies. Therefore, the study of storage pits and their use is of central importance in understanding the prehistory of the region.

The pit houses of Delaware are much more controversial, with some observers considering these features to be tree falls or other natural disturbances (see below). While many storage pit features were identified at the Puncheon Run Site, no convincing examples of the pit house feature type were found. Other features types include FCR clusters and loci of repeated or sustained activity, such as debitage concentrations.

A. DELAWARE PIT HOUSES

The idealized reconstruction of a typical Delaware Woodland pit house (Figure K-1) shows a shallow, ovoid basement which measures 4 to 7 meters on the long axis. It also includes an interior storage pit, or sub-basement, at one end of the structure, opposite the doorway, as well as an interior hearth. The idealized form has a floor area of 23 to 25 square meters and is interpreted as housing for a nuclear family. Although postmolds are rarely found in association with these features, it is assumed that the houses included a superstructure of small saplings or branches.

During their Phase I and Phase II investigations at the Puncheon Run Site, Hunter Research, Inc. (HRI), located a number of pit features, some of which were tentatively identified as pit houses. Based on a review of previously excavated Delaware prehistoric sites, including the Carey Farm, Hickory Bluff, Island Farm, Leipsic, Pollack, and Snapp sites, they estimated that 300 to 400 pit features were probably present at Puncheon Run (Liebknecht et al. 1997:figure 9.10).

HRI's description of the pit features at the Puncheon Run Site was somewhat equivocal with regard to their cultural origin. Four pit features identified by HRI at Locus 1 were described as "at least partly cultural in origin" (Liebknecht et al. 1997:7-3), and two similar pit features were reported from Locus 2 (Liebknecht et al. 1997:7-9). HRI's description of the pit features in Locus 3 also suggests some doubt as to the origin of these features:

The pit features identified in Excavation Units 1, 12-24, 17-21, 24, 25, 27, 30, 34, 35, 40 and 56 are broadly consistent with others identified in Loci 1 and 2 to the west and at the Hickory Bluff Prehistoric Site [7K-C-411]; some can be *tentatively interpreted* as 'pit houses' . . . [emphasis added] [Liebknecht et al. 1997:7-25].

According to Custer (1994), basements for semisubterranean houses are an important feature of the Woodland I period in Delaware. The remains of prehistoric dwellings have been reported at the Delaware Park and Clyde farm sites in northern Delaware, and at the Snapp, Leipsic, and Carey Farm sites along the State Route 1 corridor. Thousands of these pit features have now been excavated in Delaware, yet there are lingering questions regarding their putative cultural origin.

The debate (Custer 1994; Custer and Silber 1995; LeeDecker 1998; Liebknecht 1995; Mueller and Cavallo 1995; Schuldenrein 1995; Thomas 1995; Thurman 1987) concerning the origin of these pit features was considered highly relevant to interpreting the Puncheon Run Site, and The Louis Berger Group, Inc. (Berger), attempted to investigate this issue during the extended Phase II investigations at the site. Based on the expectation of a large number of pit house features, Berger devised a battery of investigative techniques specifically to test this type of feature. In addition to extensive subsurface archaeological investigations, the field testing strategy involved geomorphological investigation, soil chemistry testing, a large-scale flotation

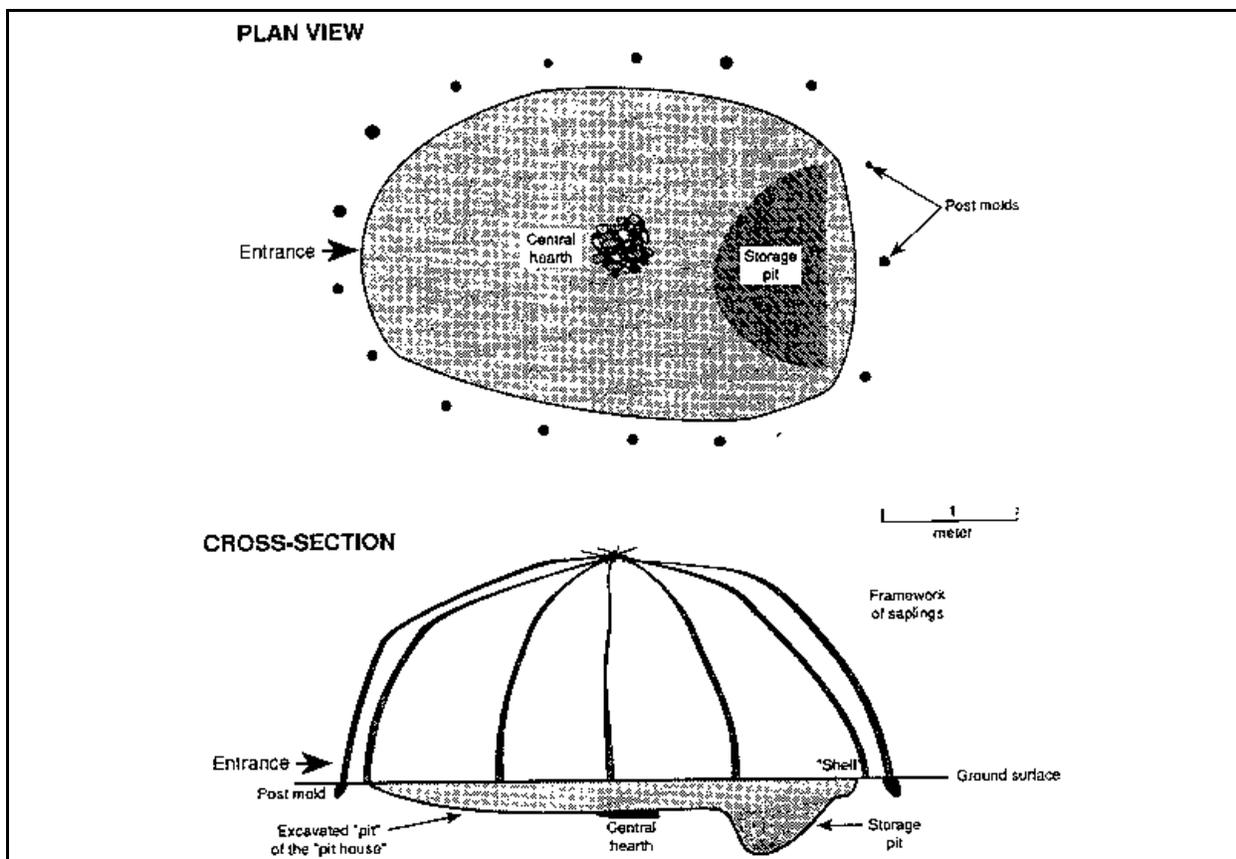


FIGURE K-1: Pit House Architecture

SOURCE: Custer 1994

recovery program for paleobotanical material, and a program of soil micromorphology. Perhaps the most unexpected result of Berger's extended Phase II testing was the failure to identify many features that could have been possible pit houses. Two features in Locus 3 were tested as possible pit houses, but evidence pointed to a natural (tree-related or animal-related) origin for one; the second may have been a small cultural pit overlaid with natural disturbance (LeeDecker, Holt, et al. 1998). In Loci 1 and 2, a number of storage pit features were identified, but no pit houses (LeeDecker, Jacoby, et al. 1998).

In Delaware, these pit houses are generally recognized in the archaeological record by subsurface pits which represent the basement of a structure that would have been covered with skins or bark over a structure of posts cut from saplings (see Figure K-1). After abandonment of the houses, the basement pits become filled with organic matter and other material, which enables recognition of such pits during archaeological excavation. The idealized reconstruction of a typical Woodland pit house shows a shallow, ovoid basement which may also include cooking/heating areas, represented by clusters of FCR, and deeper pits for the storage of surplus foods (Custer 1994). During the extended Phase II investigations at Puncheon Run, a number of FCR clusters were identified, but none appear to have been located within pit house features (LeeDecker, Holt, et al. 1998). Smaller pit features were also identified, but without evidence that they were associated with a semisubterranean house.

The identification of prehistoric house pits in northern Delaware has been viewed with skepticism by many archaeologists for a number of reasons. First, prehistoric houses throughout the Middle Atlantic region are generally recognized by the presence of postmolds, which represent the decayed supports for the house's superstructure. Most of the reported examples of Delaware pit houses lack associated postmolds; however,

this could be the result of poor preservation. Also, many of the Delaware pit houses lack associated cooking/heating areas or organic fills. The fill in many of these features is so similar to the natural soil, in both color and texture, that even seeing the boundaries can be difficult, especially when an intact E-horizon is present. Because these features do not resemble the postmold patterns that are usually identified as houses in the east, and because they do not contain obviously cultural fills, many archaeologists believe that they are disturbances in the soil that would result from natural processes such as the uprooting of trees during high winds or rodent activity.

The lack of associated postmolds may be explained by post-depositional processes, particularly historical cultivation. The typical scenario posits that repeated plowing would have truncated the postmolds associated with the pit house, as well as a large portion of the basement. Successive episodes of plowing and erosion would leave a smaller pit, finally ending with the small “D-shaped” pits that are most commonly found (Figure K-2).

At the Hickory Bluff prehistoric site, located across the St. Jones River from the Puncheon Run Site, a number of pit features were excavated during HRI’s partial data recovery program (Liebknecht et al. 1997). In some of the stratigraphic profiles included in HRI’s draft report for the Puncheon Run Connector investigations, the pit feature fills have exactly the same soil texture and Munsell soil colors as the adjacent subsoils (see Liebknecht et al. 1997:figure 8.5), demonstrating the difficulty of recognizing these features in the field.

At the Puncheon Run Site, and at other comparable sites in Delaware, key questions remain unresolved with regard to the identification and function of pit features. The most important problem relates to the identification of pit houses and whether these are legitimate representations of prehistoric structures, or

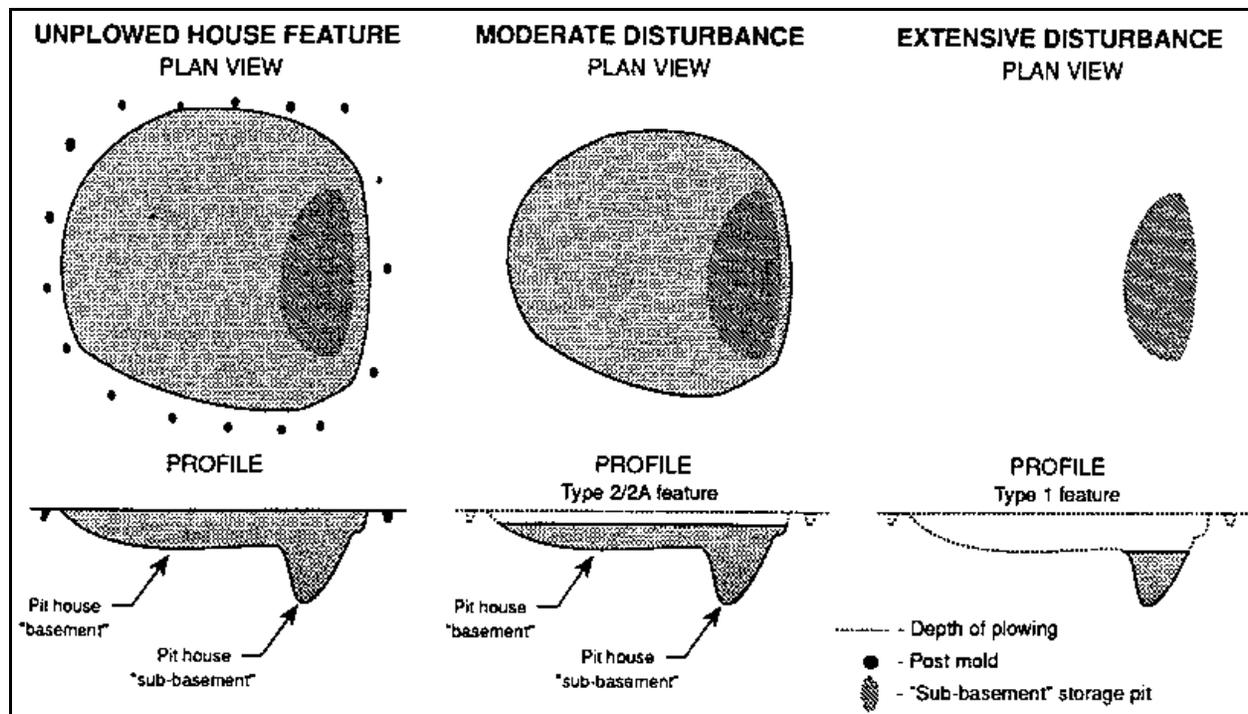


FIGURE K-2: Taphonomy of Pit House Features

SOURCE: Custer 1994

whether they are simply natural disturbances coincidentally found in archaeological contexts (see Small et al. 1990 and Mueller and Cavallo 1995). Feature 153 at the Snapp Site is considered to be one of the few examples of a well-preserved pit house feature (Figure K-3) (Custer and Silber 1995:43, figures 2, 3). However, only nine posts are represented in the proposed house outline, and Feature 153 is relatively large for so few posts. Perhaps this may eventually be considered a common pattern in Delaware prehistoric pit house construction. The problem is that there is an overwhelming number of similar house-like features in the archaeological record for Delaware, and most of them lack clearly defined posts. In fact, most of them cannot be clearly identified as cultural.

At the Carey Farm Site, nearly 2,000 pit features were excavated, and the majority were ultimately declared to be noncultural or historic. Among the noncultural features, most were determined to be tree-related. Tree-related features were identified by the presence of “irregular root protrusions that extended from the base of the soil stains” (Custer, Watson, and Silber 1996:71). Many pit types have been defined, based on their shapes; Figure K-4 illustrates the most common types defined in the Delaware Woodland I context (Custer 1994).

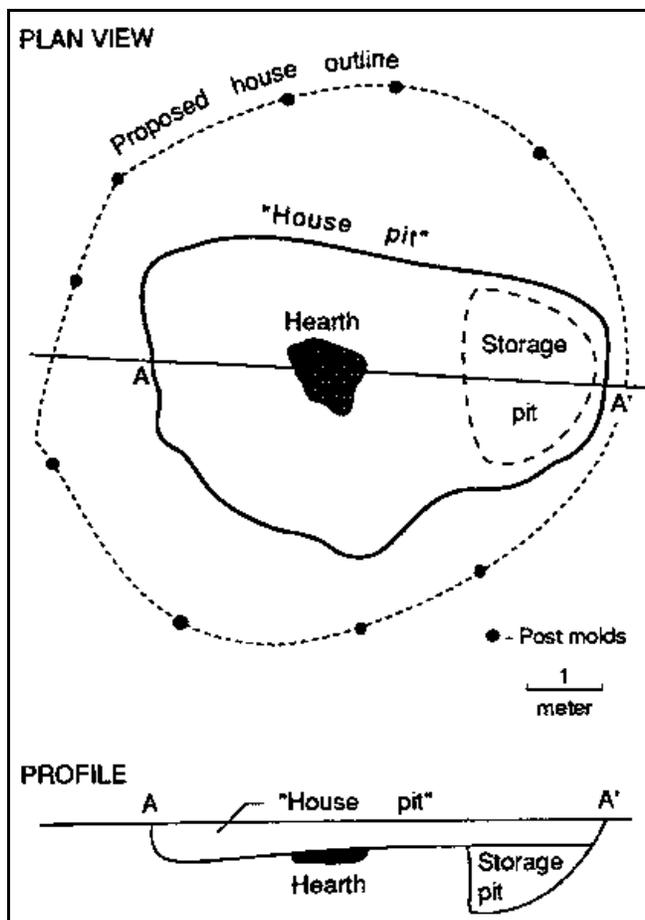


FIGURE K-3: Snapp Site Feature 153, "A Well-Preserved Pit House"
 SOURCE: Custer 1994

The recently excavated Whitby Branch Site (7NC-G-151) (Jacoby et al. 1997) provides another example of a Woodland I microband base camp with a possible house pit. The Whitby Branch Site included numerous cooking/heating areas represented by FCR clusters, as well as a refuse disposal area for lithic debris. The site also included a single possible house pit feature, with an interior storage area represented by a deeper storage pit with a volume of roughly 375 liters. The Whitby Branch Site was very well preserved, and most of the site had never been plowed. Intrasite patterning showed that the possible house pit was separated by some distance from a lithic refuse dump and the cooking/heating area represented by FCR clusters. Interpretation of this feature as a prehistoric house is supported by (1) its shape (roughly oval in plan view), (2) its large size (3.45x3.1 meters in plan), (3) elevated levels of phosphorous, in comparison to samples from nonfeature contexts, and (4) a radiocarbon date from the pit fill which falls in the Woodland I period. Aside from phosphorous, other soil chemical tests were somewhat equivocal regarding the prehistoric origin of this feature. Flotation samples from the pit fill contained no analytically significant material other than wood charcoal.

Identification of the pit features as cultural rather than natural phenomena seems to be based primarily on their formal characteristics, i.e., a distinctive shape and slight variations in the soil color. At the Locust

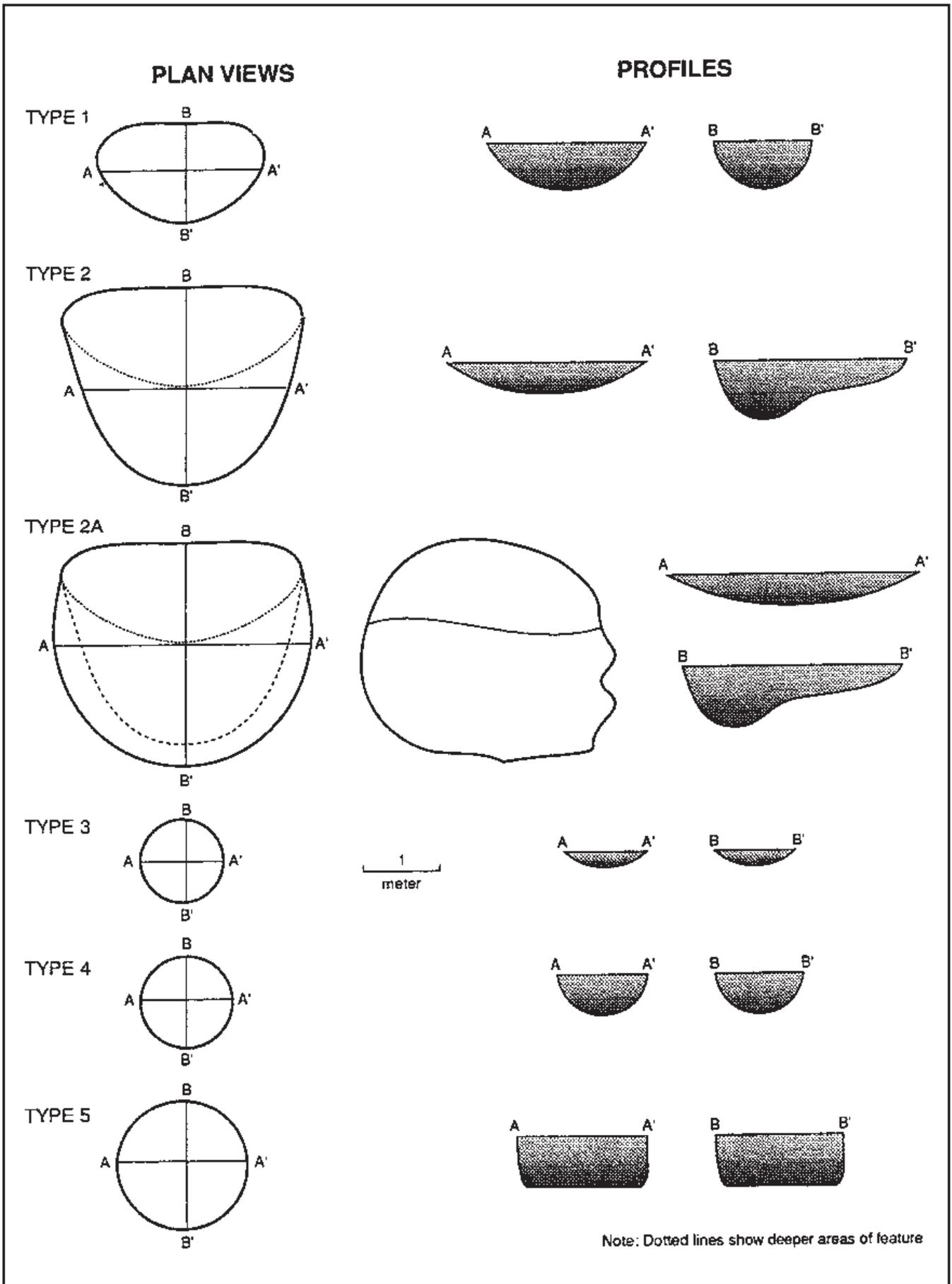


FIGURE K-4: Common Pit Types

SOURCE: Custer (1994)

Grove Site (7NC-F-13), what appeared to be a well-preserved example of a prehistoric house pit was found in the yard of a nineteenth-century farmhouse. During data recovery (Affleck et al. 1997), this feature (Feature 9) was treated as a possible prehistoric house pit and was fully excavated. Feature 9 at the Locust Grove Site exhibited a well-defined basin-shaped profile and an oval plan view, comparable to Type 2A features that have been interpreted as prehistoric house pits at other sites in Delaware (see Figure K-4) (Custer 1994). However, very little evidence of prehistoric occupation was recovered from the Locust Grove Site during Phase I, Phase II, and Phase III excavations.

A few pieces of lithic debitage were recovered, along with a narrow-bladed, stemmed projectile point. No prehistoric artifacts were recovered from the Feature 9 fill; only a small amount of historic glass and brick was recovered. No suitable charcoal samples were collected from the pit fill; however, four soil samples were processed for Oxidizable Carbon Ratio (OCR) dating. The OCR dating results were inconclusive; one control sample from the adjacent subsoil yielded a calculated OCR date of 5,569 years before present (BP), and three samples from the pit fill yielded OCR dates of 3,700 BP, 5,915 BP, and 6,100 BP (Affleck et al. 1997:65-67). Feature 9 at the Locust Grove Site was also investigated through a series of soil chemistry tests. Chemical readings from the Feature 9 fill did not differ significantly from those of the surrounding subsoil (Affleck et al. 1997:116-117).

A series of flotation samples from the Locust Grove Site were also processed, including a sample from Feature 9 and a control sample beneath Feature 9. The Feature 9 sample did not contain any botanical material that would suggest that it was a prehistoric house pit, and the control sample beneath Feature 9 contained modern weed seeds (Affleck et al. 1997:108-115). Overall, the investigation of Feature 9 at Locust Grove would indicate that it was a modern or historic disturbance, possibly produced by an uprooted tree, although it was visually indistinguishable from a Type 2A prehistoric pit house. Feature 9 also shared other characteristics with many Type 2A features, including the small number of prehistoric artifacts recovered, the presence of modern seeds in the fill, and the absence of identifiable prehistoric botanical remains.

A tree throw or tree fall refers to the uprooting of a tree and the attendant displacement of soil attached to the root mass, which typically creates a pit and an adjacent area of displaced soil attached to the root system. Tree throws are well-known phenomena in nature, having been studied scientifically for more than 100 years (cf. Shaler 1891). The uprooting of trees is considered a universal process in forests, and a large body of knowledge regarding tree throws has accumulated in the literature of forestry (Johnson 1993; Johnson and Watson-Stegner 1990). The natural modification of forested landscapes by the natural processes of tree throws is important to archaeologists, particularly as they attempt to understand site formation processes (Schiffer 1987; Strauss 1978). Indeed, William Henry Holmes, one of the grandfathers of Middle Atlantic archaeology, documented disturbance from tree throw and root disturbance to depths as great as 4-6 feet below ground surface more than a century ago (Holmes 1893). A general understanding of the natural processes which occur after a pit has been created in a forest environment is therefore useful for understanding the postdepositional processes that occur on archaeological sites.

Tree throws may assume distinct forms in different regions, with much variation attributable to local soil characteristics. Beatty and Stone (1986) have classified tree throws into various types; the two major types are *hinge* and *rotational*. All tree throw types produce some displacement of organic surface soil into subsoil contexts, but they may be incomplete, due to snagging in adjacent trees. Hinge-type tree throws are characterized by the raised flap of organic matter clinging to a shallow root system and an adjacent pit or depression. Rotational types resemble a ball-and-socket movement, wherein the tree's root ball and associated soil rotates within the surrounding soil matrix, leaving the bole of the tree over the pit; this type results in a relatively great volume of displaced soil and relatively deep burial of organic surface soil.

A distinct microtopography associated with tree throws is known as *cradle-and-knoll* or *mound-and-pit*, referring to the small heap of displaced subsoil and the associated depression in the forest floor. Many natural processes are associated with tree throw events. They are typically created during episodes of high wind, and they are more likely to occur in water-logged soils. Some historically known storms, such as tornadoes and hurricanes, can produce widespread tree throw topography. Tree throws are important not only to forest regeneration but also to certain fauna who are attracted to these microhabitats. Small mammals and rodents in particular often create burrows in the drier soils created by tree throw mounds, and then larger predators such as foxes may invade, creating a larger area of soil disturbance associated with the animal den (Johnson and Watson-Stegner 1990; Langohr 1993; Schaetzel et al. 1989; Waters 1992).

The natural processes associated with a tree throw event create distinct soil characteristics within the cradles and knolls, including bulk density, particle size distribution, moisture, and chemistry. The cradles develop more massive organic horizons as they fill in with debris; different levels of acidity (pH), phosphorous, potassium, calcium, magnesium, and organic matter may be observed between cradles and knolls (Beatty and Stone 1986; Myers and McSweeney 1995).

Citing examples from Delaware and Maryland, Thomas (1995) has addressed the tree throw/pit house controversy and has argued that the more than 2,000 reported pit houses in Delaware required a “giant leap of faith” to be accepted as cultural entities. After citing examples of documented bona fide pit houses at the Poplar Thicket, Bay Vista, Warrington, Mispillion, and Island Field sites, Thomas argues that many of the reported features have in effect been created by inexperienced excavators, compounded by the difficulty of working in loose, easily leached soils with little organic matter. Thomas advanced the argument that if these pit features were natural they should be found at locations other than prehistoric sites; he supported this argument with numerous examples, including the Mystery Site in Cecil County, Maryland, and the Gabor Site in northern Delaware. Another example cited by Thomas, the Hollingsworth Farm Site in Cecil County, Maryland, was notable for the presence of a large number of tree throw features. While excavated features at Hollingsworth Farm were determined to be noncultural (i.e., produced by natural events), some were apparently used as cultural loci. Perhaps the most unusual and most instructive feature at Hollingsworth Farm was a tree throw that was used as a prehistoric burial locus (Thomas and Payne 1981).

Mueller and Cavallo (1995) also argued that many of the D-shaped pits excavated in Delaware are probably tree throw features. At the Gabor Site, they applied soil chemical analysis and argued that one of the features previously believed to be a pit house was in fact a tree throw, based on higher levels of phosphorous from soil outside the feature. Another soil anomaly from the Gabor Site that was previously believed to be a pit house was later excavated and found to contain a pulley used as part of a block-and-tackle apparatus to uproot tree stumps (cited by Thomas 1995). Mueller and Cavallo concluded that a variety of natural and cultural processes may create archaeological pit features. They argued that many D-shaped pits were nothing more than tree throws, but they allowed that there could be situations where tree throw events occurred within pit houses, and pit houses were created within tree throws. Thus, there is a continuum of natural and cultural processes that create archaeological pit features, and some features cannot be viewed simply as wholly natural or wholly cultural.

In Delaware, there are numerous archaeological examples that fail to show a clear-cut pattern of association of pit features and prehistoric cultural deposits, which calls into question the attribution of prehistoric origin for these features. Similar pit features have been found at other historic sites that have been excavated in Delaware, such as the Locust Grove Site mentioned above. At the Moore-Taylor and the Benjamin Wynn Farmsteads, numerous soil discolorations have been documented and declared to be noncultural (Gretler et al. 1996). In plan view, these features exhibit the range of shapes and sizes that have been assigned to

various Woodland I pit house types. These historic site examples indicate that pit features are found throughout Delaware, on both historic and prehistoric sites, and it is often difficult to recognize the natural and cultural processes that created these features.

Perhaps the strongest argument for the prehistoric origin of these pit features is their occurrence at prehistoric sites; however, this argument is called into question when one considers that such features are found throughout Delaware, not only at prehistoric sites. The presence of these features at historic sites such as Locust Grove, and the Moore-Taylor and Benjamin Wynn farmsteads has been noted. At prehistoric sites, there are also anomalous intrasite distributional patterns which call into question the prehistoric origin of these pit features. At the Leipsic Site, for example, prehistoric artifacts were concentrated in the southern portion of the site, while pit features were found throughout the stripped area. The investigators argued that the paucity of artifacts in the northern portion of the site was due to erosion (Custer, Riley, and Mellin 1996). At the Puncheon Run Site, the greatest concentration of pit features was found in an area with relatively few artifacts, and there are other examples of sites (Kellogg et al. 1994; Liebknecht et al. 1997) with somewhat anomalous patterns of association between artifact deposits and pit features.

Another anomaly in the association of prehistoric material and the pit house features is the phenomenon of the “floating” FCR clusters. Some Woodland I pit houses reportedly have interior cooking/heating areas that would be represented in the archaeological record by clusters of FCR or burned earth, and the idealized reconstructions show a hearth area on the basement floor of the pit house (Custer 1994). However, there are a number of excavated examples, such as Features 16, 45, and 198 at the Snapp Site, in which the hearth area, represented by a FCR cluster, seems to “float” above the floor of the pit feature (Custer and Silber 1995:51, plate 16, 77, plate 29, 89). None of these examples could be interpreted as an interior hearth, as the FCR is stratigraphically above the fills that would have been deposited into the pit after its abandonment. At the Hockessin Valley Site, the stratigraphic position of the hearth area is questionable, as FCR was pedestaled above the pit floor during excavation (Custer and Hodny 1989:plate 1, 32, plate 2, 35). Exterior hearths, possibly communal processing areas, are also hypothesized for Woodland I base camps (Custer 1994), and the “floating” FCR features could represent such hearths. At the Whitby Branch Site, FCR clusters were located in a separate area, away from the possible pit house feature. A somewhat comparable pattern has been observed at the Puncheon Run Site, with the storage features in Locus 1 separated from the concentration of FCR features in Locus 3.

Although analogies may be found in the ethnographic record, it is ultimately necessary to deal with the archaeological representations of domestic structures. Surface structures, such as wigwam-type houses with shallow posts, are not uncommon in the ethnographic record, nor are igloo-shaped and longhouse forms, with straight posts sunk deeper into the subsoil, uncommon. Pit houses with excavated “basement” floors, but lacking posts are indeed rare; this leads to the argument that structures without posts represent the basal portion of structures compromised by plowing (Custer and Silber 1995). Logically, the *absence* of postmolds cannot be used to support the argument that the pits are cultural, notwithstanding the known effects of historic cultivation.

Another problem with proposed pit house features that is more pertinent to the Puncheon Run project area is the inconsistency in individual structure size and in the overall community pattern. In any culture area, there is a range in stylistic attributes and a range of variation in size for the prehistoric structures that characterize that region. For example, Monongahela houses in western Pennsylvania range between 4-6 meters in diameter, are circular in outline form, have central hearths, and form part of a community pattern that consists of a circular arrangement of structures around an open central plaza (George 1974). Even numerous episodes of structure rebuilding do little to obscure this general cultural pattern. The same kinds

of consistencies need to be discerned in Delaware pit house communities. Custer's argument that large sites with numerous overlapping pit features, such as the Carey Farm Site (Custer, Watson, and Silber 1996), the Snapp Site (Custer and Silber 1995), and the Leipsic Site (Custer, Riley, and Mellin 1996), represent a series of small, repeatedly occupied microband base camps, rather than a large macroband base camp, could explain the apparent lack of a community pattern at these Woodland I base camps.

At the Hickory Bluff Site, which is located across the St. Jones River from the Puncheon Run Site, pit features mapped in a machine-stripped drainage ditch area (Liebknecht et al. 1997:figure 9.8) show a lack of consistency in feature form and no clearly defined community pattern. The pattern that is apparent at the Hickory Bluff Site more closely resembles a natural pattern, i.e., that of a gallery forest. The highest density of features is closest to the streambank. If these features are nothing more than tree throws, then the expected density of such features would be highest near the stream, as they were recorded in the trench, because the open water of the stream area would have left a forest edge unprotected from winds that might cause tree throws.

The feature excavations at Puncheon Run were conducted against the backdrop of this debate. The extensive sampling and analysis carried out even for features that were thought to be natural were intended to help develop criteria for distinguishing cultural from natural pits. The two features in Locus 3 that were considered possible pit houses, Features 32 and 37, were both intensely investigated. Feature 32 was eventually identified as a probable tree disturbance. The origin of Feature 37 remains unclear; it contained no hearth or other structural remains, and one of its edges was too indistinct to locate precisely; however, it contained a concentration of debitage, and several scrapers were found around its edges. No good pit house candidates were found in Locus 1, but a number of semicircular pits were found, similar to those identified by Custer as storage pits below house basements, and a sample of these was excavated. One of these pits, Feature 69, was determined to be a cultural pit that had been severely disturbed by rodent tunneling and possibly other biological agents; however, the others pits, Features 60, 67, and 85, were determined to be tree-related. Rigorous criteria for distinguishing cultural from natural pits have proved elusive, but there has been some progress. Many of the Puncheon Run features can be confidently placed in one category or the other based on their shapes and the characteristics of their fills.

B. STORAGE PITS, SEDENTISM, AND CULTURAL CHANGE

Storage pits are among the most common features at prehistoric archaeological sites in eastern North America, and they are also well attested in the ethnohistoric record. What they imply about prehistoric peoples, however, is not at all certain. The pits first become common in the early Woodland I or Late Archaic period, and their use is associated by many writers with increasing sedentism. Sites where large storage pits are found are considered "base camps" where people stayed for months at a time, perhaps in substantial groups ("macrobands"). To Custer (1996:186), "the use of Late Archaic storage pits, which is uncommon, if not unknown, during earlier time periods, implies longer-term and more intensive occupation of base camp sites." Stewart (1975), in her typology of pit features, associates storage pits only with "village" sites. The association of storage pits with sedentism is widespread among archaeologists (DeBoer 1988). Beyond this, archaeologists have also argued that storage pits play a crucial part in enabling the rise of social complexity. Testart (1982:525) wrote that societies with food storage capabilities possessed "the material, social, ideological, or political prerequisites for the emergence of social inequalities." Ingold (1983:554) summed up this argument when he wrote the following:

In evolutionary terms, the potential significance of storage is considerable. First, by leveling out the effects of natural fluctuations in the availability of food resources, storage makes possible the support

of great concentrations of people over greater periods of time. Secondly . . . storage fosters sedentism, and inhibits residential flux. Thirdly, and perhaps most importantly, storage is a precondition for external trade.

If storage pits can be associated with sedentism, and, through sedentism, with the emergence of social complexity, then the origin and development of pit storage is a crucial theme in prehistory. However, the association of pit storage with sedentism, and storage pits with base camp sites, can be questioned for many reasons. A pit is not the only way to store surplus food; many historic Native American groups used above-ground granaries, or stored their food in baskets hung from the roofs of their houses. Weslager (1972:51) described both of these methods in use among the historic Lenape:

Strings of corn held together by their braided husks, strips of dried pumpkin, and clumps of roots, tobacco, red cedar, and medicinal herbs were tied to a pole across the smoky ceiling. . . . In front of each dwelling, there was a second fireplace where the family gathered to eat during the summer and where silo-shaped pits dug in the earth, each lined with straw and covered with bark lids, were used to store corn, beans, nuts and other edibles.

As DeBoer (1988) noted, the historical accounts of pit storage in North America tend to emphasize the role of pits for concealing stored goods, especially during times of site abandonment. In 1622 Isaack de Rasieres (1909:107-108) described storage pits among the Lenape of the lower Hudson, and he associated the pits with the practice of seasonally abandoning their villages:

The grain being dried, they put it into baskets woven of rushes or wild hemp, and bury it in the earth, where they let it lie, and go with their husbands and children in October to hunt deer, leaving at home with their maize the old people who cannot follow.

William Strachey (1967:115) described the Powhatan Indians placing food and other objects of value (“most things with them of value according to their owne estymation”) in pits to hide them from their neighbors. Other accounts specifically relate pit storage to warfare, implying that pits were used to hide food from enemies. The eighteenth-century Miami, according to a French observer, dug storage pits only “when they are obliged to be away from home for some time, or when they apprehend some irruption of the enemy” (DeBoer 1988:1). Storage pits may, therefore, be associated not with completely sedentary peoples, but with people who regularly abandoned their villages or camps and felt the need to hide their possessions from their enemies.

Custer has not argued, however, that the presence of storage pits implies a completely sedentary society:

The presence of pit houses, storage features, caches, and technologies which are not easily transported all indicate decreased mobility. However . . . the settlement pattern changes of the Late Archaic seem to imply a more focused and repeated use of certain productive environments within a large-scale seasonal movement pattern, rather than necessarily a sedentary lifestyle in restricted, or circumscribed, environments (Custer 1996:188).

The Lenape and Powhatan of the seventeenth century were, after all, agriculturalists who lived in their summer villages for several months at a time; this settlement pattern may have been very stable relative to the standards of Archaic hunter-gatherers. An argument could still be made that storage pits imply some degree of residential stability, even if not complete sedentism.

But are storage pit features associated only with base camp sites? A review of the archaeological literature from the Middle Atlantic region shows that they are not. In Delaware, a large “silo pit” feature very similar to those at Puncheon Run was identified during the Phase II testing of the Dragon Run North Site in New

Castle County, but so few artifacts were found at the site that no further excavations were carried out (Kellogg et al. 1994). A substantial cluster of storage pits was identified at Lums Pond, a Woodland I site in southern New Castle County, but that site is not a very good candidate for a “base camp” either (Petraglia et al. 1998). Roger Moeller (1992) has argued that pit features on floodplain sites in the upper Delaware Valley were used for short-term caching of gathered foods, not long-term storage. Storage pit features have also been identified at short-term occupation sites in other parts of North America (Nassaney and Lopinot 1986; Smith and McNees 1999). The storage pit features at the Puncheon Run Site, a site that was definitely not a base camp, are obviously relevant to this discussion.

III. EXCAVATION METHODS

Two feature excavation protocols were used in the Puncheon Run investigations. The first was developed for the extended Phase II excavations and was used in Locus 3 during the Phase III excavations. The second was used at the Locus 1 Silo Pit area during the Phase III investigations.

During the extended Phase II investigations, the plowzone was sampled and then mechanically removed from a number of 5x20-meter blocks. In one case, Block 4 in Locus 3, the E-horizon was also mechanically removed. Features identified after stripping the plowzone soils were initially mapped in plan view and recorded on a feature list. They were subsequently categorized into three groups: large and small pits, and FCR clusters. All large pits were subsequently excavated as possible pit-house-type anomalies according to a methodology developed specifically for this study. This methodology included the excavation of 1x0.5-meter units in cruciform trenches centered over each feature. Within each unit, excavation was carried out by natural strata and by 10-centimeter levels within strata. Flotation and soil chemistry samples were retained from each level for future analysis. These samples were taken in sequentially labeled columns measuring 10x20 centimeters per 10-centimeter level (200 square centimeters). For example, Sample 12-4 was taken from the fourth level of the twelfth column. Soil outside the apparent feature boundaries was excavated, screened, and sampled in the same way as was soil within the feature. Following the completion of the cruciform trench excavations, detailed stratigraphic profile drawings were prepared, and photographs were taken.

Soil micromorphology samples were removed from selected contexts to ascertain the taphonomy of larger features identified as possible pit houses (Goldberg and Arpin 1998). The samples were prepared for analysis by Dr. Paul Goldberg of Boston University, who employs a method that relies on microscopic examination of an intact soil column. Using this method, small fragments of B-horizon and C-horizon soil may be identified, which can help determine the origin of certain types of features. This technique has been used to identify tree throws and prehistoric living floors, and it was anticipated that it might be useful for identifying living floors associated with pit houses.

The excavation methodology for large, possible pit house features also involved the use of a soil penetrometer to measure soil resistance inside and adjacent to the anomalies. Soil compression was measured in pounds per square inch, with a reading taken every three inches of depth below the surface. This investigation was undertaken to determine whether or not feature soils were measurably less compact than the adjacent intact soils. The test hypothesis was that feature fills might be distinguished from intact subsoil by their relative compaction, and it was employed at the Puncheon Run Site as a possible method to distinguish various feature types. The results did not show any significant difference between pit fills and non-pit soils (LeeDecker, Holt, et al. 1998).

Small pit features and FCR clusters were investigated during the Phase II program. Approximately half of each feature group was excavated following a prioritized list based on apparent integrity and estimated age.

FCR features that appeared to have sustained minimal plow disturbance were selected over diffuse clusters that appeared to have been spread or truncated by plowing. FCR clusters were excavated by centering one or more 1x1-meter units over the cluster and pedestaling the rocks in the cluster for mapping and photography. Flotation samples were removed from immediately beneath the rocks in each cluster. Small pit features that contained gradual, or vague, weathered boundaries and interior matrices were given priority over anomalies with distinct or clear boundaries and highly organic interior matrices, which were thought likely to be recent disturbances. Small pit features were typically excavated by bisecting the feature along the longest axis, and then recording the bisection profile. The second half of each feature was then excavated following the removal of a 2-liter flotation sample. Excavation was terminated in features that were determined to be the result of bioturbation (primarily rodent and tree disturbances) after excavation of the first half.

During the Phase III excavations at Locus 3, these techniques were continued in a somewhat modified form. Features 30, 32, 37, and 38, the only large pits investigated in the locus, were all dug within a block of 1x1-meter units. Soils inside and outside the features were excavated, screened, and sampled in the same way. Numerous unit profiles were drawn, and units were excavated so as to expose long profiles through the features for recordation.

The features in the Silo Pit area of Locus 1 were treated differently during the Phase III excavations. After the mechanical removal of the plowzone, all exposed features were mapped before manual excavation began. No units were laid out or defined over the features. Instead, each feature was sectioned, and one half was excavated to subsoil in arbitrary 10-centimeter levels. All soil was screened through ¼-inch mesh, and any charcoal noted was retained. A rectangular block of subsoil around the excavated half of the feature was then dug out to expose the feature profile. Because the Phase II testing consistently showed that no artifacts were present in the natural subsoil, soil outside the features was not screened. In at least three cases, excavation of the block showed that the pit outline followed during the feature excavation was not actually the edge of the feature, so the subsoil removal was valuable in understanding the true form of the feature. If the feature was believed to be cultural after bisection, a third quadrant was then excavated to expose the transverse profile. Any strata identified in the profile were excavated separately, and strata more than 10 centimeters thick were excavated according to 10-centimeter levels. Samples for flotation, soil chemistry, and phytolith analysis were taken from the third quadrant of each feature. (If the third quadrant was not excavated, samples were taken from the profile). If the feature was not clearly stratified, samples were taken from the second level and the bottom level; if clear strata were noted, samples were taken from each strata. The final quadrant was then excavated by strata and levels.

IV. FEATURE EXCAVATIONS IN THE SILO PIT AREA OF LOCUS 1

A. PHASE II FEATURE TESTING

The Silo Pit area was located in a fallow field on gently sloping terrain about 50 meters north of Puncheon Run. At the southern boundary of the area, the slope steepened noticeably, marking the edge of an old stream terrace. Puncheon Run at that point was a free-flowing stream, and the St. Jones River was 750 meters away to the east. The soil was well drained, described as either sandy loam or loamy sand. There were several active groundhog dens nearby.

The first discovery to suggest the potential of the Silo Pit area was an apparent pit feature encountered in a Phase I shovel test (Liebknecht et al. 1997). It is worth emphasizing the chance nature of this find. Very few artifacts were found in this area, and it would not have been investigated further if this one shovel test had not happened to be placed on top of an obvious anomaly. To investigate this anomaly, Unit 11 was

excavated, exposing more of the pit. The feature, which filled the northwest quadrant of the unit and extended beyond it, had steeply sloping sides and a nearly flat bottom. It was 50 centimeters deep below the plowzone, and at least 80 centimeters in diameter. Only two artifacts, both jasper flakes, were found in the feature. However, ten artifacts (eight pieces of debitage and two pieces of FCR) were found in the plowzone in this unit. This is not a large number of artifacts, but it is appreciably more than was found in any other unit nearby.

Berger chose to return to this location during the extended Phase II testing because of the possible presence of pit features in an area of low artifact density. One of the 5x20-meter blocks, Block 14, was laid out with HRI's Unit 11 in its approximate center. Five 1x1-meter units were excavated within the block, and then the plowzone was mechanically removed. The five units yielded a total of only 19 artifacts, all debitage from the plowzone. After the plowzone was removed, however, a number of soil anomalies became visible. The feature identified by HRI in Unit 11 was not relocated. Apparently, most of the feature had been within Unit 11, and the small amount of erosion that had taken place around the edges of the units before they were backfilled must have destroyed the rest. One of the anomalies, designated Feature 6, extended beyond the excavation block to the west, and a 3x3-meter extension was mechanically cleared to expose the entire feature. Five anomalies were investigated.

Two of the anomalies, Features 1 and 2, appeared to be natural disturbances. However, Features 3, 4, and 6 appeared to be cultural pits. The distinction between the natural and cultural pits was based on the overall shape of the features and their internal stratigraphy. The suspected cultural pits were all approximately round, with steeply sloping sides and nearly flat bottoms. They were designated "silo pits." These pits were 80 to 130 centimeters deep. Their stratigraphy consisted of a series of soil layers that had obviously built up from the bottom, meaning that the pits had been empty, and were filled with soil from outside. The suspected noncultural features were irregularly shaped. The stratigraphies of some of these noncultural pits showed a mixture of fills, some resembling pieces of the subsoil, as if they had been displaced by an uprooting tree or some similar disturbance. Prehistoric artifacts were found in all of the suspected cultural features and in Feature 1, one of the noncultural anomalies. The artifacts consisted primarily of debitage, with some FCR. Charcoal samples were obtained from all of the cultural features, and samples were also taken for soil flotation and soil chemistry analysis.

Feature 3 was the largest of the silo pits in the main cluster of Locus 1, and its shape and stratigraphy were fairly typical. At the bottom of the feature the sides sloped up very steeply, but the feature widened toward the top, as if the upper portion had been eroded. The top stratum in the feature, composing about the upper three quarters of the fill, was designated Stratum A. This layer consisted of a yellowish brown (10YR 5/4) sandy loam to loamy sand, with very little gravel and few artifacts. Beneath Stratum A were two soil lenses confined primarily to the outside of the feature, both somewhat darker and with a slightly higher clay content than Stratum A. These were designated Strata B and C, respectively. They appeared to represent slumping around the edge of the feature. At the bottom of the feature lay Stratum D, a layer of dark yellowish brown (10YR 4/4) sandy clay loam with 5 to 10 percent gravel content. The excavators originally suspected that the dark color of this layer derived from organic matter; however, the soil chemistry showed that this soil had a very low organic content. Stratum D contained no cultural artifacts. It was probably part of the original feature fill, the soil used to bury the bags or baskets of food stored in the pit. Three 2-liter flotation samples from Feature 3 were processed, but they contained little analytically significant material. Fragments of hickory nutshell were noted, as was wood charcoal. Modern (uncharred) seeds were present in all of the samples. Analysis of the soil chemistry in the feature did not produce any clear evidence of human activity, although some of the features had elevated levels of calcium and phosphorus.

B. PHASE III INVESTIGATIONS

Because of the discovery of an apparent cluster of prehistoric storage pits in Block 14, the Silo Pit area was selected for further investigation during the Phase III excavations. The approach was to excavate a sample of the plowzone in an area measuring approximately 40x40 meters, mechanically remove the remaining plowzone, and then investigate any features uncovered. The stripped area was carefully troweled, and a total of 44 subplowzone anomalies were identified and mapped. A majority of these anomalies appeared to be various forms of natural disturbances, including rodent burrows, drainage gullies, and older variations within the subsoil.

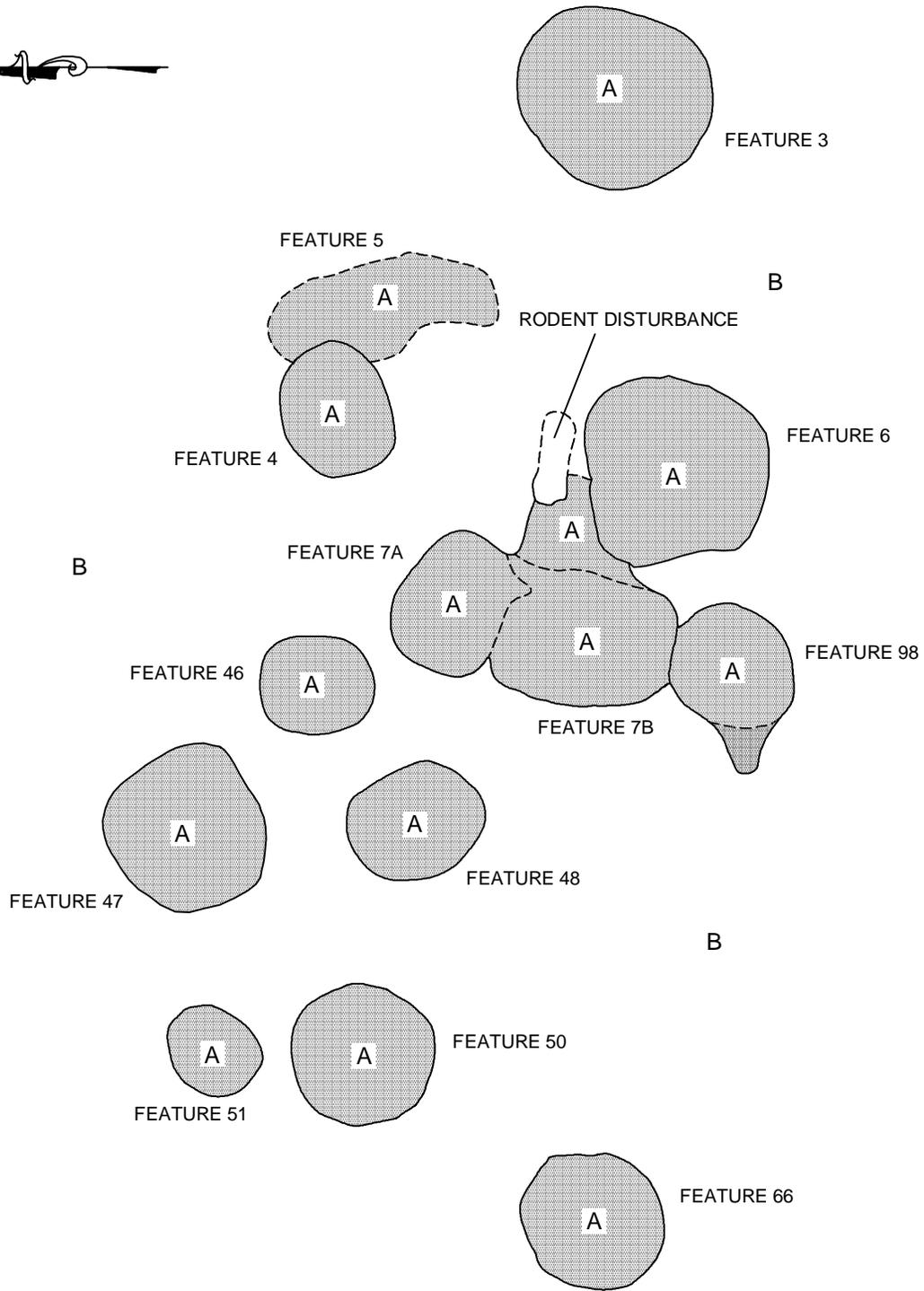
Interpretation of all the features was complicated by the high variability within the Pleistocene soils on the site. It seems that the Puncheon Run valley was once crossed by a network of braided streams, which have left a complex pattern of sand, gravel, and silt deposits. As a result, large variations within the subsoil from one side of a pit feature to the other are not unusual. Within this complexity the cultural pit features stood out because of their shapes and their apparent young age, based on organic content and the lack of development of their fill soils. However, some soil anomalies were encountered that somewhat resembled these cultural pits, but were identified by pedologist Dr. Daniel Wagner as ancient natural disturbances. Therefore, the interpretation of some features remains uncertain.

C. THE MAIN PIT CLUSTER

Most of the apparently cultural features in the stripped area were inside the Main Pit Cluster, an area measuring 12x5 meters within and just west of Phase II Block 14 (Figure K-5). Features 3, 4, 6, 7A, 7B, 46, 47, 48, 50, 51, 66, and 98 were all in this area, as was the feature identified in HRI's Unit 11. All of these features appeared to be cultural, and the tight clustering of the 12 pits suggests that they were dug and used within a relatively short time span, leaving the surrounding area clear throughout the period of their use. On the other hand, some of the pits overlapped, particularly Features 7A, 7B, and 98, so they cannot have been used simultaneously.

The pits varied in shape and size. All were roughly round in plan view, but they varied in diameter from 220 centimeters (Feature 3) to 85 centimeters (Feature 51). Features 3, 4, 6, 7A, 7B, 46, 47, 48, 66, and 98 were cylindrical, with flat bottoms and nearly straight sides. Depths varied from 54 centimeters (Feature 66) to 112 centimeters (Feature 98). Features 50 and 51 were shallower, and their shapes could be described as deep basins rather than silos.

Only about 260 artifacts were recovered from the features in the main cluster. These consisted mostly of debitage and small pieces of FCR. The only diagnostic artifacts from the pits were two small ceramic sherds. One sherd, found in Feature 47, had steatite temper and appeared to fit into the Marcey Creek category, circa 1200 to 800 BC. The other, found in Feature 51, was clay-tempered Coulbourn ware, dating to circa 400 to 100 BC. Charcoal samples were recovered from all of the features in the main cluster. Three pits, Features 50, 51, and 66, had lenses of charcoal and burned earth within their fills. Charcoal was also very common in the bottom of Feature 46 and throughout the fill of Features 7A and 7B. Radiocarbon dates from Features 3, 6, 7A, 7B, 46, 50, and 66 all clustered in the AD 1 to 450 period. Feature 51 produced two earlier dates, both between 805 and 395 BC; therefore, this feature may date to an earlier occupation.



LEGEND

- A FEATURE FILL: MIXED SOILS, PREDOMINANTLY YELLOWISH OR DARK YELLOWISH BROWN (10YR 5/4 TO 4/6) SANDY LOAM, WITH CHARCOAL FLECKING
- B SUBSOIL: YELLOWISH BROWN TO STRONG BROWN (10YR 5/6 TO 7.5YR 4.6) LOAMY SAND

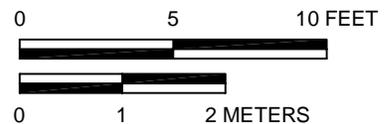


FIGURE K-5: Plan of Features in the Main Pit Cluster, Silo Pit Area

D. FEATURES 57, 58, 59, 61, AND 64: THE RED-RINGED PITS

At the southern edge of the stripped area was a small cluster of distinctive pits (Figure K-6). The subsoil in this area was very loose sand. The fill in these features was much firmer, with a significant silt content; after the plowzone had been stripped, the features actually stood up above the surrounding subsoil. Each feature was round and surrounded by a distinct reddish ring of soil. The features varied greatly in size, from 180 centimeters in diameter (Feature 64) to 50 centimeters (Feature 57), and excavation showed that they differed in shape and structure as well. Feature 57 was irregular and appeared to be a burrow. Features 58, 59, and 61 were shallow basins of rather regular form, all roughly 25 centimeters deep. Feature 64 was up to 72 centimeters deep. Very few artifacts were recovered from these features, although a broken projectile point with a finely serrated blade was recovered from the bottom of Feature 64. The nature of the red-ringed pits features is uncertain, but they do not resemble what were identified as tree-related disturbances in the same part of the site (i.e., Features 60 and 62). They may be a distinct type of cultural pit that differs from those of the Main Pit Cluster. Radiocarbon dates from Feature 64 date it to the second millennium BC, long before use of the Main Pit Cluster or Features 51 and 41.

E. OTHER FEATURES

One feature resembling those in the Main Pit Cluster was found some distance away, near the northeast corner of the excavation. Feature 41 appeared to be a round silo pit 92 centimeters deep. The stratigraphy of the pit was quite complex, with numerous subsoil intrusions, and members of the crew debated whether the feature was a natural disturbance or a silo pit that had experienced several episodes of slumping along the sides. The main pit fill was quite different from the pit fills in the Main Pit Cluster, and, although this fill was very sandy, it contained some charcoal. A date of $2,460 \pm 50$ radiocarbon years BP was obtained from the feature, which is earlier than the main silo pit cluster but similar to Feature 51.

The only two features in the Silo Pit area that contained more than a few prehistoric artifacts were two apparent natural disturbances, Features 60 and 69. Feature 60 was located near the red-ringed pits at the southern edge of the excavation, adjacent to two other similar disturbances, Features 62 and 63. In plan view, Feature 60 was roughly crescent shaped, but it contained many different fills, some of them obviously displaced subsoil. In profile, the feature was asymmetrical. All observers, including pedologist Dr. Daniel Wagner, agreed that the feature resembled a tree throw. However, the feature yielded a broken anvil or nutting stone; a bifurcate-based projectile point fragment; a small, narrow-bladed stemmed point resembling those found in large numbers at Locus 3; two broken bifaces; and more than 50 pieces of debitage.

Feature 69 was located near the western edge of the excavation. It appeared to be roughly semicircular in plan view, but it had been disturbed by so many rodent tunnels that much of its outline was obscured. In many ways the feature resembled a tree disturbance; however, it was up to 100 centimeters deep and, for the most part, no more than 125 centimeters wide—unusual dimensions for a tree throw. The feature was completely excavated and produced 216 prehistoric artifacts, including more than 100 sherds of steatite-tempered pottery, some identified as Marcey Creek and some as Selden Island vessel. The most likely interpretation is that there was some sort of prehistoric pit in this location, but that the pit was severely disturbed, obliterating its original outline. Groundhogs were certainly responsible for much of that disturbance, but a tree fall may also have contributed.

Excavation in the Silo Pit area was focused on those features that appeared to be cultural. However, a sample of suspected natural features was also tested. These features were distinguished from those identified as cultural primarily based on their shapes, which were highly irregular.

V. FEATURE EXCAVATIONS IN LOCUS 3

During the extended Phase II investigations, 30 features were identified in Locus 3. A further 11 features were identified during the Phase III excavations. The features consisted primarily of FCR concentrations and pits. Most of the pits were thought likely to be natural, although two very large cultural pits, Features 30 and 38, were identified and excavated.

A. FIRE-CRACKED ROCK CONCENTRATIONS (FEATURES 5, 7, 8, 9, 10, 11, 12, 15, 16)

In Locus 3, 13 FCR concentrations were identified, nine in the extended Phase II excavations and four in the Phase III excavations. Those found during the extended Phase II investigations were all in the machine-stripped blocks. They were all visible at the base of the plowzone. Some appeared to have been disturbed by plowing, and FCR was found in the plowzone near some of these features. These features ranged in size from 20x20 centimeters in the case of Feature 12, to 200x130 centimeters for Feature 16. No pits were visible around the concentrations, and no charcoal was noted.

Five of the nine FCR features identified during the extended Phase II investigations were excavated. A 2-liter soil sample from each of these features was floated to recover organic matter, but very little was found. No sample yielded more than half a gram of charcoal, and there were no carbonized seeds or nut fragments. None of the features was radiocarbon dated. The interpretation of these features is uncertain. The smaller examples may have been stone piles of the kind used to support pots over ground-set fires, or they could have been dumps of boiling stones. Features 15 and 16, the larger examples, may have been small fire platforms. There was no visible evidence of burned earth around any of these features.

Four additional FCR features were found during the Phase III excavations. One small and very diffuse cluster (Feature 35) was identified in one of the initial Phase III exploratory units. The remaining three, Features 94, 96, and 97, were located in the Metate block. Feature 96 was quite large, 300x200 centimeters, but Features 94 and 97 were small. Sufficient charcoal was recovered from these features for Accelerator Mass Spectrometry (AMS) dating, and they proved to date to the early Woodland I or Late Archaic period. More than 100 pieces of burned clay or daub were recovered from the units around these features, and this material may also be related to the hearths (Features 94, 96, and 97). The units containing these features did not stand out from the surrounding units in terms of soil chemistry, and no analytically significant material was recovered during flotation.

B. THE CHIPPING CLUSTER (FEATURE 4)

Feature 4 was a chipping cluster composed of cobbles, tested cobbles, and debitage. It was partially visible on the surface of Block 6 after the plowzone had been mechanically removed, and it was initially interpreted as a small cluster of FCR. A 1x1-meter unit (Unit 118) was laid out over the cluster and excavated, revealing that it was actually composed primarily of tested cobbles and debitage. In all, 516 pieces of debitage were recovered, as well as nine cores and four bifaces. There was no soil staining or other evidence of a pit around the cluster. Because the cluster appeared to extend beyond Unit 118 to the southeast, three additional units were laid out and excavated; however, most of the cluster had been within the first unit. The artifacts were contained within a single 10-centimeter level. The feature is interpreted as the remains of a single knapping episode, during which several bifaces and perhaps other expedient tools were manufactured.

C. NATURAL PITS (FEATURES 1, 2, 3, 6, 25, 26, 31, 34)

A number of features were excavated during the extended Phase II program that appeared to be natural disturbances. Features 1 and 3 were shallow, organic stains, probably rodent-related. Features 2 and 6 were small pits with very irregular profiles and mixed fills, and were thought to be tree throws. Features 25 and 26 appeared at first to be good candidates for cultural pits, so they were tested with the pit house methodology. Feature 26 was quickly identified as a shallow, tree-related disturbance. Feature 25, however, proved to be rather substantial.

In plan, Feature 25 was recorded as an irregular, roughly oval or kidney-shaped soil anomaly consisting of E-horizon-type feature fill intruding into undisturbed B-horizon matrix. Three lobes attached to the outside of the feature were also mapped as peripheral components of the feature. Excavation was begun with a 50-centimeter-wide test trench running east to west across the feature. A second trench was later excavated running north to south through the feature. Artifacts were recovered in lower densities in the feature than in the plowzone. The lower levels of the feature contained no cultural material. Recovered artifacts included debitage, FCR, and a nondiagnostic biface. During the excavation of the second trench, the boundaries of the feature increased significantly to the south and southwest, with areas of feature matrix undercutting layers of intact stratigraphy. The intact stratigraphy overlying parts of the feature is difficult to explain as an excavation made vertically from ground surface. In this respect the feature is more easily explained as a large animal burrow, diving and curving to the south and west. Areas where the feature was visible at ground surface may be the top of the burrow truncated by plowing, or, alternatively, portions of the burrow that collapsed.

D. SMALL STORAGE PITS (FEATURES 24 AND 33)

Feature 24 was found in Block 4 during the extended Phase II investigations. It was adjacent to Feature 26, and the two features were initially thought to be a single large feature approximately 2.5 meters in length. Because these features extended beyond Block 4 to the west, an extension was required to fully expose them. After the extension had been excavated, two distinct anomalies were recorded. A fairly clear pit in the southern part of the feature was defined as Feature 24, truncated by Feature 26 to the north. A trench composed of 50x100-centimeter units was then excavated across the features. The west wall profile of the trench indicated that Feature 24 had a well-defined basin-shaped outline. The pit measured about 100x135 centimeters and was 60 centimeters deep. Very few artifacts were recovered, and there was no analytically significant macrobotanical material. Feature 24 seems to be a small cultural pit, but this interpretation is not certain.

Feature 33 was a small pit encountered in Unit 337, between Blocks 1 and 2, during the initial stages of the Phase III excavations. It measured 50x50 centimeters and was about 30 centimeters deep. A small concentration of debitage was located adjacent to the pit, and a single stemmed “pebble point” was found in the bottom of the feature. Because of its shape and close association with the debitage concentration, Feature 33 is considered to be a cultural feature, possibly a small storage or processing pit.

E. POSSIBLE PIT HOUSES (FEATURES 32 AND 37)

Feature 32 was discovered by HRI and was identified as a possible pit house. HRI excavated four test units in this location and recovered 503 artifacts, 219 from within the feature. The edges of Feature 32 proved difficult to define because the feature fill closely resembled the natural E-horizon and because there was heavy root disturbance in the upper subsoil levels. However, the base of the feature was clear, 20 to 40 centimeters below the bottom of the plowzone.

A concentration of FCR was noted at the surface of the feature, adjacent to where Berger later defined Feature 15, a large FCR cluster. Of the 219 artifacts recovered from within Feature 32, 141 were fragments of FCR from the top subsoil level. An additional 178 pieces of FCR were recovered from the plowzone in these units. HRI's report (Leibknecht et al. 1997) identified this "hearth" as one piece of evidence to suggest that Feature 32 was a pit house; however, since the FCR concentration actually spreads across the top of the feature fill, it must postdate the abandonment and filling of the feature. Even excluding this FCR concentration, the artifacts were concentrated at the top of the feature (41 in Level 1, 17 in Level 2, 11 in Level 3, one in Level 4), and very few were found on the feature floor. There is therefore little reason to associate the artifacts recovered from inside the feature with its creation or use. The artifacts found include a bifacial jasper knife, 8.2 centimeters long, three small ceramic sherds, an argillite point base possibly of the Fox Creek variety, and two other biface fragments.

Berger excavated five additional 1x1-meter units in and around Feature 32. Three of those units were placed in line with HRI's Units 14 and 19, creating a five-meter-long trench through the feature. The profile of this trench shows one possible edge to the feature. The description of the soil immediately below the plowzone was the same for all of these units: yellowish brown (10YR 5/4) grading to brownish yellow (10YR 6/4) loamy sand. At the eastern end of the trench this soil was about 25 centimeters thick. At about the boundary between Units 335 and 324, the bottom of this level dropped about 25 centimeters within a distance of 15 centimeters, making the overall thickness of the stratum roughly 48 centimeters. However, this was the only edge of the feature that was ever clearly defined, and this leads to difficulties and discrepancies when attempting to tally the artifacts associated with the feature. The northern edge, explored by Berger, was more gradual, and HRI's work showed that along its eastern edge the feature seemed to merge imperceptibly into a thickened E-horizon. There was no evidence of a living surface on the feature floor; the floor was also not particularly flat.

Feature 32 was clearly some sort of soil disturbance or anomaly. Artifacts were found within the feature at depths of up to 40 centimeters below the base of the plowzone, whereas the units in nearby Block 3 were all sterile below the first subplowzone level. One clear, steep edge to the feature was defined. However, because the feature fill could not be distinguished from the natural E-horizon, no other edges could be identified. There is, of course, no requirement that a cultural feature have steep sides. However, given the vague shape of the feature and the absence of a living surface, an interpretation of the feature as a pit house seems untenable, and an interpretation as a tree throw seems more plausible. Feature 32 clearly antedates the main occupation of the surrounding areas, which produced the large FCR concentrations in Block 3, since one of these FCR clusters extends across the top of Feature 32.

Feature 37 was a large, somewhat amorphous pit discovered in Unit 380, one of the units excavated during Phase III to test the area around Feature 30. The fill in the feature resembled that in Features 30 and 38, including the presence of burned nut hulls and calcined bone; however, the feature was quite different in shape. In plan view it was pear-shaped, with the narrow end to the north, about 3 meters wide at its widest point and 4 meters long. It was rather shallow, mostly about 30 centimeters deep, with a flat bottom. The southern and western sides were steep and well defined; however, to the east the feature sloped up gently, and a true edge could not be defined. Feature 37 was excavated in a series of 1x1-meter units. It contained more than 400 prehistoric artifacts, none of them diagnostic. Concentrations of debitage within parts of the feature were much higher than anywhere else in the Feature 30 block; one unit yielded 99 pieces of debitage. However, since the feature lacked a distinctive shape, its nature is not known, and it may have been either a natural disturbance or an anthropogenic pit. No postholes or other clear architectural remains were found, and unlike most of the pit houses that have been identified in Delaware, the feature had no deeper section that could have been an internal storage pit.

F. LARGE STORAGE OR BURIAL PITS (FEATURES 30 AND 38)

Features 30 and 38 were adjacent, large cultural pits that have been interpreted as storage or possibly burial pits. Feature 30 was first identified during the extended Phase II investigations and was completely excavated during Phase III. Phase III excavation of the feature began with two 1x1-meter units, Units 320 and 336, which, together with the original Phase II unit (Unit 156), formed a 3x1-meter trench oriented north-south, encompassing the entire western half of the feature. It proved difficult to discern the boundaries of the feature at the base of the plowzone. The feature fill was very similar in color to the natural E-horizon, and there was a high degree of root disturbance and other bioturbation in this area. The feature boundaries were clearly visible below the second or third level, as well as in the profile, but the mapped western boundary should be considered approximate. The first three units were taken to a maximum depth of 175 centimeters below ground surface. The feature's depth reached 165 centimeters. In those first three units, about 50 pieces of debitage, an endscraper, and nearly 100 very small fragments of calcined bone were recovered from the feature fill. Analysis of some of the larger bone fragments showed that they came from small mammals. The bone fragments were concentrated in the upper half of the feature fill, and they do not seem to have been intentionally placed in the feature.

After Units 156, 320, and 336 had been excavated, a feature profile was exposed which was notable for two reasons: 1) the uniformity of the organic-colored main feature fill; and 2) the symmetry of redeposited B-horizon soils along the exposed northern and southern edges of the feature. The main feature fill was a large mass of highly homogeneous soil (brown [7.5YR 4/4] sandy loam) that extended to a depth of 130 centimeters. Its boundaries were particularly well defined against the backdrop of the displaced/redeposited B-horizon soils.

Dr. Daniel Wagner, Berger's pedology consultant, noted that the displaced soil masses outside of the main feature fill were too homogeneous, unmixed with organic soil, to likely represent natural slumping of soil into open or abandoned pits. Dr. Wagner suggested that the rather loamy and compressible B-horizon soils may have been intentionally placed in the pit to form steps or ledges for storage shelves. The large size and depth of Feature 30 imply that access into the pit would indeed have been facilitated by a series of steps, and since the unstable sand forming the lower portion of the profile is not itself capable of supporting steps (or ledges), it is reasonable to view the displaced B-horizon soils as a possible load-bearing feature. Indeed, as Dr. Wagner pointed out, log-supported shelving would have been an efficient and practical method of large-scale underground food storage.

During the excavation of the second half of the feature, the possible lining was found to extend around the entire boundary of the feature; however, no further evidence of steps was found.

Analysis of the chemistry and particle size of the feature fill showed that it seemed to represent an average of all the soil layers through which it was dug. While the surrounding, intact subsoil varied substantially from the surface to the depth of the feature bottom, the feature itself was highly consistent. Therefore, the feature seems to have been filled with the soil that had been dug out of it, or from some similar pit nearby; this soil had become mixed in the process of being dug out and then placed back in the feature.

Three radiocarbon dates were obtained from Feature 30, and one was obtained from Feature 38. The date from Feature 38 fill, 1,300±80 radiocarbon years BP, or AD 615-895, seems to match the artifacts from the Feature 30 block fairly well. The dates from Feature 30, however, vary widely. The first, obtained from Level 3, was 310±50 radiocarbon years BP and probably represents the historical clearing of the area. The other two, both obtained from Level 8, were 4,610±40 and 4,480±60 radiocarbon years BP, both in the 3500 to 3000 BC range. These must represent earlier charcoal that was incorporated into the feature. All of these

were AMS dates obtained from very small samples. The discrepancies between these dates show the high degree of bioturbation around the feature and the amount that small objects can be moved by such forces in sandy soil.

Feature 30 seems to have been a large prehistoric storage pit, possibly lined with loamy soil, and possibly with earthen shelves around the north and south sides. An alternate interpretation of the feature is that it functioned as a burial or *chiacosan* pit. This function would also have made the use of the displaced subsoil masses as ledge supports, in this case to store the dead. Thurman (1985) has referred to charnel pits found somewhere within the St. Jones River valley. Chiacosan was the practice, documented for Lenape and Nanticoke groups in the 1600s, of burying corpses for a period and then removing the bones from the grave. It would be difficult to prove or disprove this practice archaeologically. However, it should be noted that no grave goods or other evidence reflecting mortuary behavior was recovered during the excavation of Feature 30.

Feature 38 was a large pit that intersected with the northern edge of Feature 30. Feature 38 was as large and nearly as deep as Feature 30. It measured 3 meters long, 2.2 meters wide, and 1.4 meters deep. The fill was very similar to that in Feature 30, and Feature 38 also appeared to have been lined. A thin layer of silty, B-horizon soil from near the top of the soil column was found on the sides and in the bottom of the pit. (The subsoil around the deeper parts of the pit was pure sand.) There is evidence of steps or shelves similar to those described for Feature 30. Artifacts found in the feature include four small ceramic sherds, a biface fragment, and more than 80 pieces of debitage.

VI. FEATURE DESCRIPTIONS FOR LOCUS 1

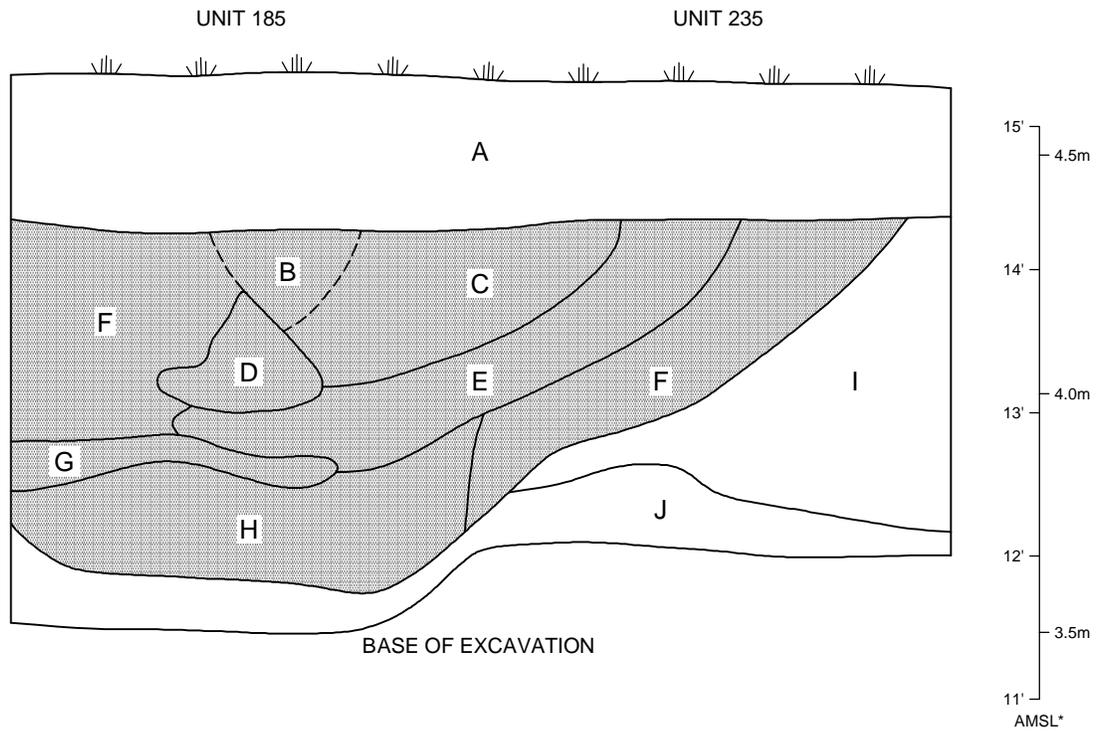
Feature 1

<i>Location</i>	<i>Artifacts</i>
Locus 1, Silo Pit area	4 chert debitage
Main Pit Cluster	
<i>Shape</i>	
Plan: irregular	
Profile: irregular basin	
<i>Dimensions</i>	
Surface:	380x250 cm
Depth:	74 cm

Feature 1 was discovered during the extended Phase II testing in the southeast corner of Block 14. During Phase II, the feature was only partially exposed; it was completely uncovered during the Phase III excavations. Its shape was irregular but roughly oval. The portion of the feature within Block 14, roughly one quarter of the whole feature, was excavated during the extended Phase II testing. The feature fill consisted of jumbled lenses of sandy and gravelly soil resembling parts of the surrounding subsoil (Figure K-7). One of the lenses had a high charcoal content. Because of its irregular shape and the jumbled nature of the fill, this feature is believed to have been a natural disturbance, such as a tree throw. The charcoal-rich lens is interpreted as part of a burned tree. Four pieces of debitage were recovered from the feature, all from Levels 1-3; the artifact density was therefore similar to that in the plowzone.

Sample List for Feature 1

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Flotation 2L	B	1	147	curated	Soil Chem.	-	3	150	processed
Soil Chem.	-	2	149	processed	Soil Chem.	-	4	151	processed



LEGEND

- A PLOWZONE: DARK YELLOWISH BROWN (10YR 4/6) SANDY LOAM
- B POSSIBLE HRI SHOVEL TEST : YELLOWISH BROWN (10YR 5/6) LOAMY SAND AND GRAVELS
- C FEATURE FILL: YELLOWISH BROWN (10YR 5/4) LOAMY SAND AND GRAVELS
- D POSSIBLE BURNED TREE STUMP : DARK GRAYISH BROWN (10YR 4/2) LOAMY SAND AND CHARCOAL
- E FEATURE FILL: DARK YELLOWISH BROWN (10YR 4/4) LOAMY SAND AND GRAVELS
- F FEATURE FILL: BROWNISH YELLOW (10YR 6/6) LOAMY SAND AND GRAVELS
- G RODENT BURROW : YELLOWISH BROWN (10YR 5/8) LOAMY SAND AND GRAVELS
- H FEATURE FILL: YELLOWISH BROWN (10YR 5/6) LOAMY SAND AND GRAVELS
- I SUBSOIL: YELLOWISH BROWN (10YR 5/8) LOAMY SAND AND GRAVELS
- J SUBSOIL: YELLOWISH BROWN (10YR 5/8) LOAMY SAND AND GRAVELS WITH POCKETS OF GLEYED SOIL



*ABOVE MEAN SEA LEVEL

FIGURE K-7: Stratigraphic Profile of Feature 1, Facing West

Feature 3

<i>Location</i>	<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area	nutshell (hickory)
Main Pit Cluster	wood charcoal (maple, hickory, oak)
<i>Shape</i>	<i>Artifacts</i>
Plan: round	1 tested cobble
Profile: steep sides, flat bottom	10 possible FCR
<i>Dimensions</i>	3 unmodified cobbles
Surface: 210x200 cm	18 debitage:
Bottom Diameter: 110 cm	6 chert
Depth: 106 cm	9 jasper
Volume: 2,563 L	1 quartz
<i>Radiocarbon Dates</i>	2 quartzite
1,820±80 BP Stratum A, Level 2	
1,820±80 BP Stratum A, Level 6	
1,870±100 BP Stratum B, Level 10	

Feature 3 was the largest of the silo pits in the main cluster of Locus 1. It was discovered during the Phase II testing of Locus 1, at which time the northern half was excavated. The southern half was excavated during Phase III. The feature had a complex internal stratigraphy and contained a number of large cobbles (Figure K-8). Three nearly identical radiocarbon dates were obtained from the feature, all around AD 100. At the bottom of the feature the sides sloped up very steeply, but the feature widened toward the top, as if the upper portion had been eroded.

The top stratum in the feature, composing about the upper three quarters of the fill, was a designated Stratum A. This layer consisted of yellowish brown (10YR 5/4) sandy loam to loamy sand with very little gravel and few artifacts. Beneath Stratum A were two soil lenses confined primarily to the outside of the feature, both somewhat darker and with a slightly higher clay content than Stratum A. These were designated Strata B and C. They appeared to represent slumping around the edge of the feature. In the bottom of the feature was Stratum D, a layer of dark yellowish brown (10YR 4/4) sandy clay loam with 5 to 10 percent gravel content. The excavators originally suspected that the dark color of this layer derived from organic matter, but the soil chemistry showed that this was not the case. Stratum D contained no cultural artifacts. It was probably part of the original feature fill, i.e., the soil used to bury the bags or baskets of food stored in the pit.

Three 2-liter flotation samples from Feature 3 were processed, but they contained little analytically significant material. Fragments of hickory nutshell were noted, as was wood charcoal. Modern (uncharred) seeds were present in all samples. Analysis of the soil chemistry in the feature did not produce any evidence of human activity.

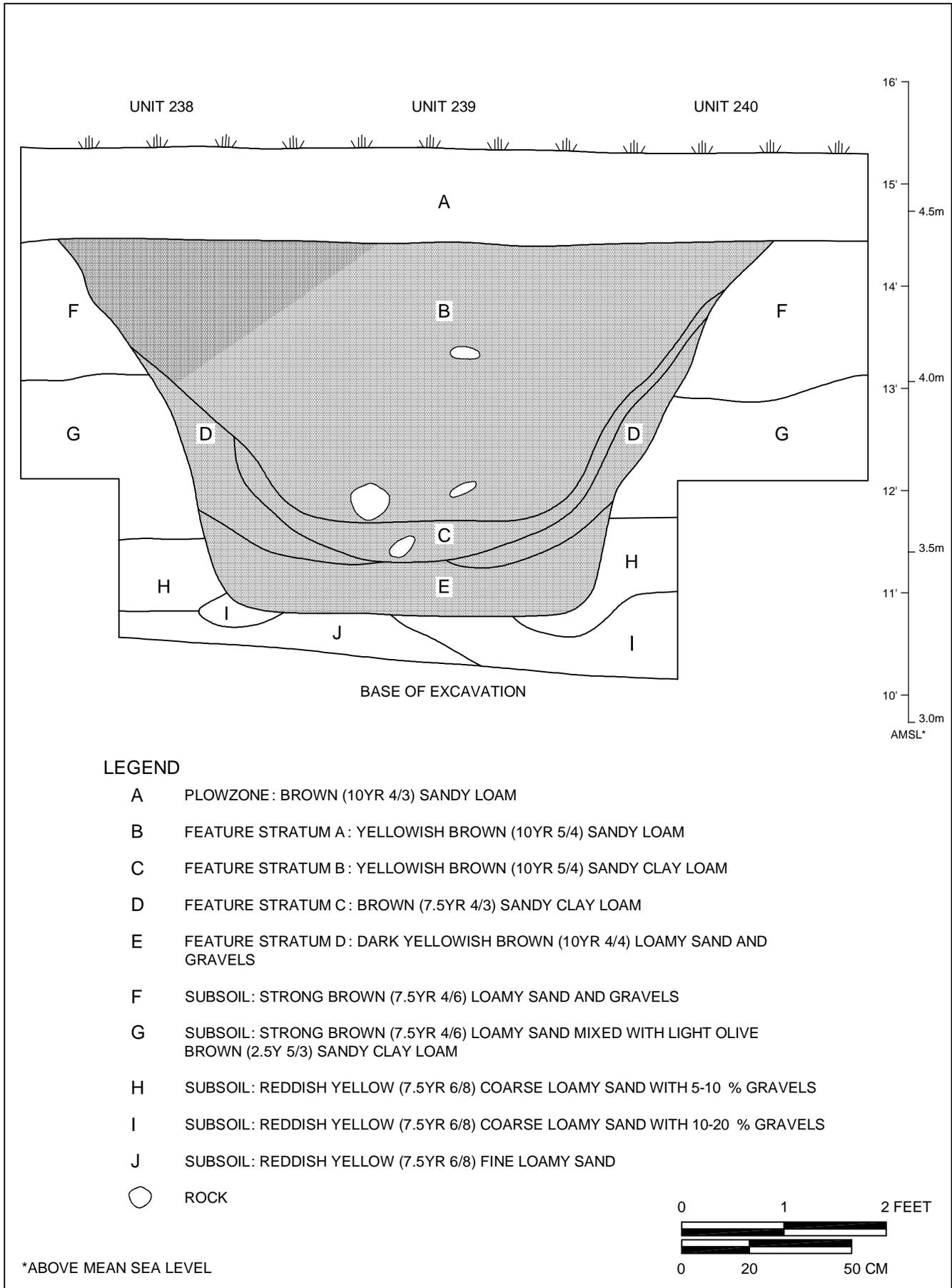


FIGURE K-8: Stratigraphic Profile of Feature 3, Facing South

Sample List for Feature 3

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	2	117	processed	Flotation 2L	A	5	145	curated
Charcoal	A	3	118	curated	Flotation 2L	A	8	169	processed
Charcoal	A	6	119	processed	Flotation 2L	D	10	170	processed
Charcoal	A	7	120	curated	Flotation 2L	D	11	171	processed
Charcoal	B	10	122	processed	Flotation 2L	B	3	1068	curated
Charcoal	C	8	123	curated	Flotation 2L	B	6	1082	curated
Charcoal	A	3	132	curated	Flotation 2L	C	5	1104	curated
Charcoal	B	4	1069	curated	Flotation 2L	E	10	1118	curated
Charcoal	B	5	1081	curated	Flotation 2L	G	10	1132	curated
Charcoal	B	7	1096	curated	Flotation 2L	B	5	1207	curated
Charcoal	B	8	1097	curated	Soil Chem.	A	3	163	processed
Charcoal	B	9	1098	curated	Soil Chem.	A	5	164	processed
Charcoal	C	3	1113	curated	Soil Chem.	A	7	165	processed
Charcoal	D	5	1114	curated	Soil Chem.	B	9	166	processed
Charcoal	E	10	1118	curated	Soil Chem.	C	10	167	processed
Charcoal	E	11	1128	curated	Soil Chem.	D	11	168	processed
Charcoal	B	2	1148	curated	Soil Chem.	B	3	1068	curated
Charcoal	B	3	1200	curated	Soil Chem.	B	6	1082	curated
Charcoal	B	4	1206	curated	Soil Chem.	C	5	1104	processed
Charcoal	B	5	1207	curated	Soil Chem.	E	10	1118	processed
Charcoal	B	6	1208	curated	Soil Chem.	G	10	1132	processed
Charcoal	B	7	1220	curated	Soil Chem.	B	5	1207	curated
Charcoal	B	8	1228	curated	Phytolith	B	3	1068	curated
Charcoal	B	9	1229	curated	Phytolith	B	6	1082	curated
Charcoal	B	11	1236	curated	Phytolith	C	5	1104	curated
Charcoal	D	10	1240	curated	Phytolith	E	10	1118	curated
Charcoal	D	11	1241	curated	Phytolith	G	10	1132	curated
Charcoal	E	12	1242	curated	Phytolith	B	5	1207	curated

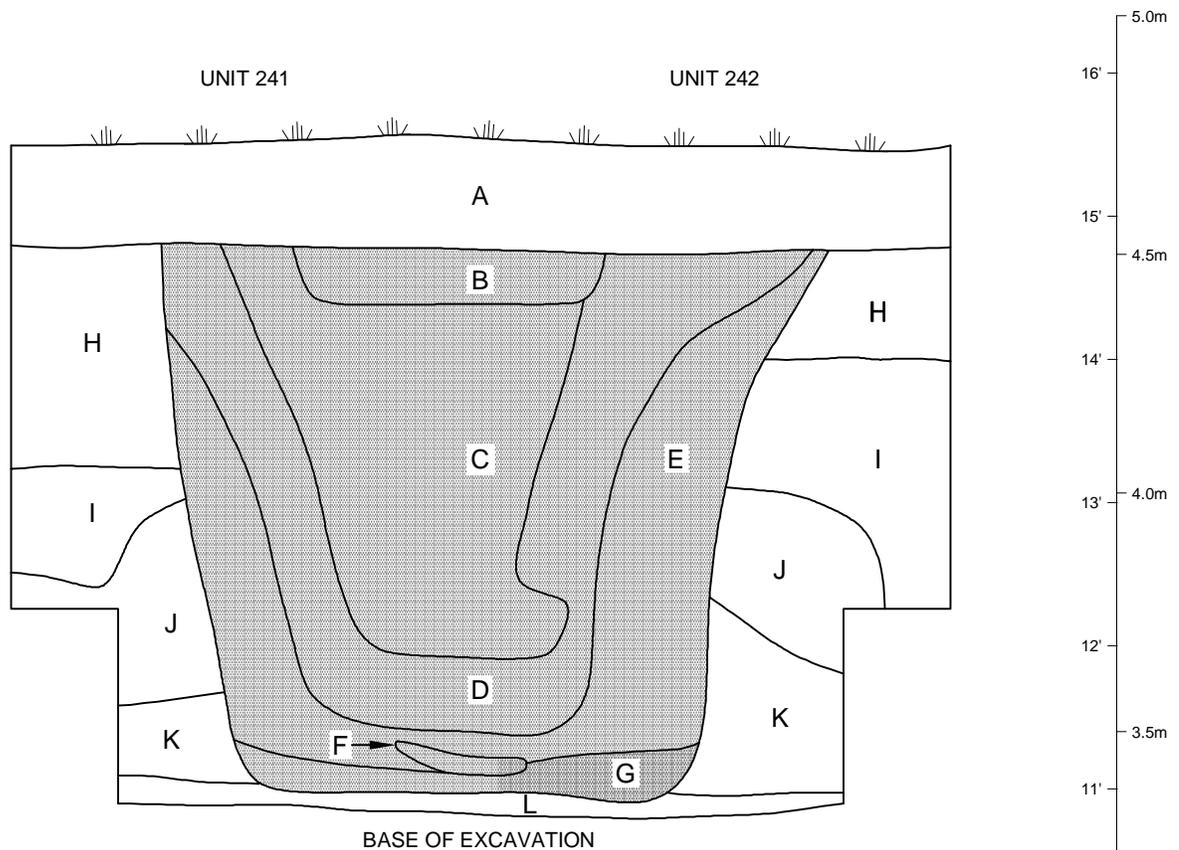
Feature 4

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		nutshell (hickory and acorns)
Main Pit Cluster		wood charcoal (maple, oak)
<i>Shape</i>		<i>Artifacts</i>
Plan: round		2 pieces burned clay or daub
Profile: steep sides, flat bottom		1 freehand core
<i>Dimensions</i>		6 possible FCR
Surface: 140x160 cm		1 small piece of ochre
Bottom Diameter: 90 cm		1 small fragment of petrified wood
Depth: 115 cm		20 debitage:
Volume: 1,302 L		3 chert
		6 jasper
		8 quartz
		3 quartzite

Feature 4 was a silo pit in the main cluster of Locus 1. It was discovered during the Phase II testing of the locus, at which time the eastern half was excavated. The western half was excavated during the Phase III excavations. Feature 4 overlapped with Feature 5, and the boundary between them could not be discerned until two levels of soil had been excavated. (Feature 5 is thought to be a natural disturbance.) Feature 4 had a complex internal stratigraphy, with several distinct strata (Figure K-9).

Stratum A was a lens of dark yellowish brown (10YR 4/4) sandy loam in the center of the feature, no more than 15 centimeters deep. As excavation proceeded below this lens, the feature fill resolved into two clearly distinct soils, an outer ring and an inner core. The inner soil, Stratum B, was yellowish brown (10YR 5/6) loamy sand, very even in color and texture and with very little gravel. The outer soil, Stratum C, was distinctly brighter in color (10YR 5/8). Inspection of the profile showed that Stratum B could in fact be separated into two soils, an inner and an outer, so that at some levels the feature resembled a target. Beneath these strata, in the bottom of the feature, was a layer of duller soil (10YR 5/4), 6 to 8 centimeters thick, designated Stratum D. A thin, spotty lens of brownish yellow (10YR 6/8) sand, apparently slump from higher up in the natural soil profile, lay on top of Stratum D.

Most of the artifacts were recovered from Stratum B, although one piece of FCR was found in Stratum A, and two pieces of debitage were found in Stratum C.



LEGEND

- A PLOWZONE: BROWN (10YR 4/3) SANDY LOAM
- B FEATURE STRATUM A: DARK YELLOWISH BROWN (10YR 4/4) LOAMY SAND
- C FEATURE STRATUM B: DARK YELLOWISH BROWN (10YR 4/6) LOAMY SAND
- D FEATURE FILL: YELLOWISH BROWN (10YR 5/6) LOAMY SAND
- E FEATURE FILL: YELLOWISH BROWN (10YR 5/8) SANDY LOAM
- F FEATURE FILL: BROWNISH YELLOW (10YR 6/8) LOAMY SAND
- G FEATURE FILL: YELLOWISH BROWN (10YR 5/4) LOAMY SAND
- H SUBSOIL: STRONG BROWN (7.5YR 5/6) SANDY CLAY LOAM WITH 5-10 % GRAVEL
- I SUBSOIL: BROWNISH YELLOW (10YR 6/8) LOAMY SAND MIXED WITH LIGHT YELLOWISH BROWN (2.5Y 6/4) LOAMY SAND AND REDDISH YELLOW (7.5YR 6/8) SAND AND 5-10 % GRAVEL
- J SUBSOIL: LIGHT YELLOWISH BROWN (2.5Y 6/4) MEDIUM SAND WITH 10-20 % GRAVEL
- K SUBSOIL: BROWNISH YELLOW (10YR 6/8) MEDIUM SAND WITH 10-20 % GRAVEL
- L SUBSOIL: LIGHT BROWNISH YELLOW (2.5Y 6/3) LOAMY SAND MIXED WITH BROWNISH YELLOW (10YR 6/8) SAND WITH 20-30 % GRAVEL



*ABOVE MEAN SEA LEVEL

FIGURE K-9: Stratigraphic Profile of Feature 4, Facing West

Sample List for Feature 4

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	C	3	1078	curated	Soil Chem.	B	7	177	processed
Charcoal	B	9	1100	curated	Soil Chem.	B/C	9	178	processed
Flotation 2L	B	3	182	processed	Soil Chem.	C	11	179	processed
Flotation 2L	F	11	184	processed	Soil Chem.	B	3	1077	curated
Flotation 2L	B	3	1077	curated	Soil Chem.	B	9	1100	curated
Flotation 2L	B	9	1100	curated	Soil Chem.	D	12	1105	curated
Flotation 2L	D	12	1105	curated	Soil Chem.	B	6	1131	curated
Flotation 2L	B	6	1131	curated	Phytolith	B	3	1077	curated
Soil Chem.	B	3	175	processed	Phytolith	B	9	1100	curated
Soil Chem.	B	5	176	processed	Phytolith	D	12	1105	curated

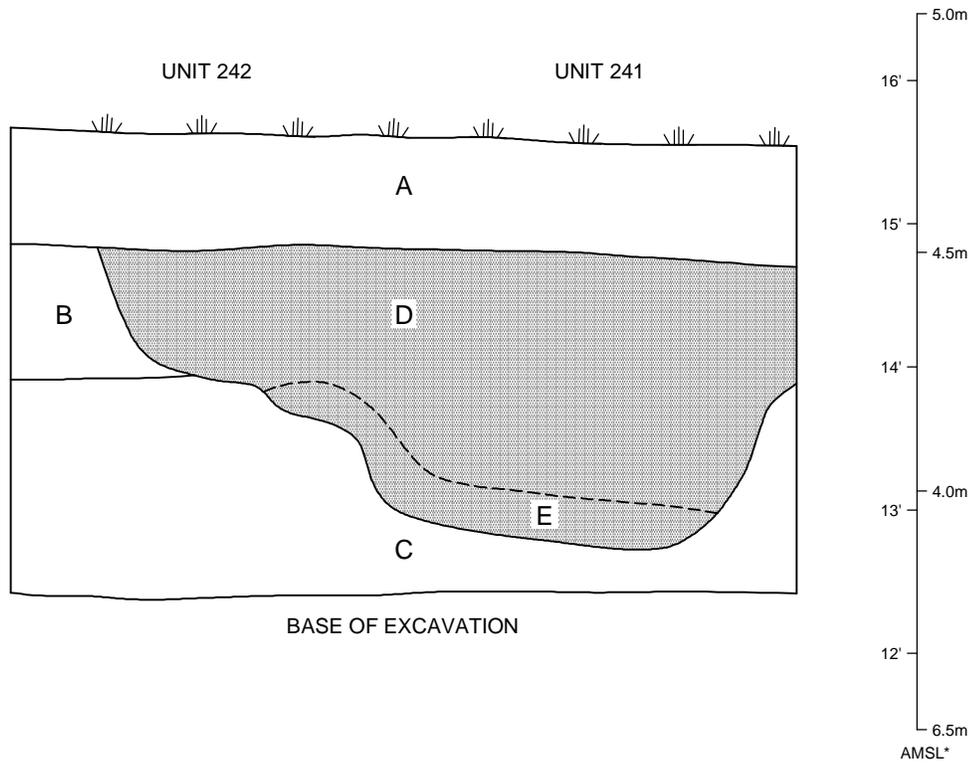
Feature 5

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		wood charcoal (hickory, oak)
Main Pit Cluster		<i>Artifacts</i>
<i>Shape</i>		none
Plan: oval		
Profile: irregular basin		
<i>Dimensions</i>		
Surface:	220x100 cm	
Depth:	60 cm	

Feature 5 was an apparent natural disturbance located within the main cluster of cultural pits. It overlapped with Feature 4, and a boundary between them could not be clearly distinguished until after two levels of soil had been excavated. The upper fill in Feature 5 was identical to that in Feature 4 and the other nearby cultural pits, a yellowish brown (10YR 5/6) sandy loam (Feature K-10). However, the profile of the feature (Figure K-10) was highly asymmetrical and the boundary irregular, with numerous small, root- or tunnel-like projections. The feature appeared to be a tree throw. No artifacts were recovered.

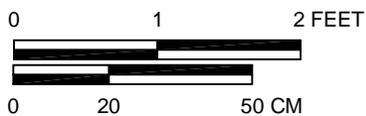
Sample List for Feature 5

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Flotation 2L	A	3	185	processed	Soil Chem.	A	6	191	processed
Flotation 2L	A	6	186	processed	Soil Chem.	A	2	1209	curated
Flotation 2L	A	2	1209	curated	Soil Chem.	B	2	1210	curated
Soil Chem.	A	3	189	processed	Phytolith	A	2	1209	curated
Soil Chem.	A	5	190	processed	Phytolith	B	2	1210	curated



LEGEND

- A PLOWZONE: DARK YELLOWISH BROWN (10YR 4/4) SANDY LOAM
- B SUBSOIL: STRONG BROWN (7.5YR 5/6) SANDY CLAY LOAM AND GRAVELS
- C SUBSOIL: BROWNISH YELLOW (10YR 6/8) LOAMY SAND AND GRAVELS MIXED WITH LIGHT YELLOWISH BROWN (2.5Y 6/4) LOAMY SAND AND REDDISH YELLOW (7.5YR 6/8) MEDIUM SAND
- D FEATURE FILL: YELLOWISH BROWN (10YR 5/6) LOAMY SAND
- E FEATURE FILL: BROWNISH YELLOW (10YR 6/8) LOAMY SAND



*ABOVE MEAN SEA LEVEL

FIGURE K-10: Stratigraphic Profile of Feature 5, Facing East

Feature 6

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		wood charcoal (hickory, oak)
Main Pit Cluster		<i>Artifacts</i>
<i>Shape</i>		5 possible FCR
Plan: round		2 small fragments petrified wood
Profile: steep sides, flat bottom		4 debitage:
<i>Dimensions</i>		1 chert
Surface: 205x180 cm		1 jasper
Bottom Diameter: 120 cm		2 quartz
Depth: 74 cm		
Volume: 1,421 L		
<i>Radiocarbon Dates</i>		
1,980±60 BP	Stratum C, Level 6	

Feature 6 was a silo pit in the main cluster of Locus 1. It was shallower than most of the other pits and was heavily eroded around the top. It contained very few artifacts. Feature 6 was discovered during the Phase II testing of the locus, at which time the southern half was excavated. The northern half was excavated during the Phase III excavations. The top of the feature was disturbed by several rodent tunnels. Excluding the tunnels, the top stratum was a dark yellowish brown (10YR 4/4) sandy loam (Figure K-11). During the Phase II testing, this stratum was thought to extend to the bottom of the feature. However, during Phase III it became apparent that the feature was, in fact, stratified; the distinctions between the strata were probably obscured by the rodent disturbance. As shown on the north-south profile drawn after three quarters of the feature were excavated, Stratum A extended only to a depth of 32 centimeters. Below was Stratum B, a lighter (10YR 5/4), sandier layer. Along the northern edge of the feature was a third stratum, apparently slump; it was described as mixed yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/6) loamy sand. All of the artifacts were recovered from the top three levels of the feature, within the rodent disturbance or Stratum A.

Sample List for Feature 6

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	C	5	128	curated	Flotation 2L	B	6	1235	curated
Charcoal	C	6	129	processed	Soil Chem.	B	2	195	processed
Charcoal	A	1	1147	curated	Soil Chem.	B	3	196	processed
Charcoal	A	2	1204	curated	Soil Chem.	B	5	197	processed
Charcoal	A	3	1205	curated	Soil Chem.	A	1	1147	curated
Charcoal	B	4	1211	curated	Soil Chem.	A	2	1204	curated
Flotation 2L	B	4	201	processed	Soil Chem.	B	6	1235	curated
Flotation 2L	A	1	1147	curated	Phytolith	A	1	1147	curated
Flotation 2L	A	2	1204	curated	Phytolith	B	6	1235	curated

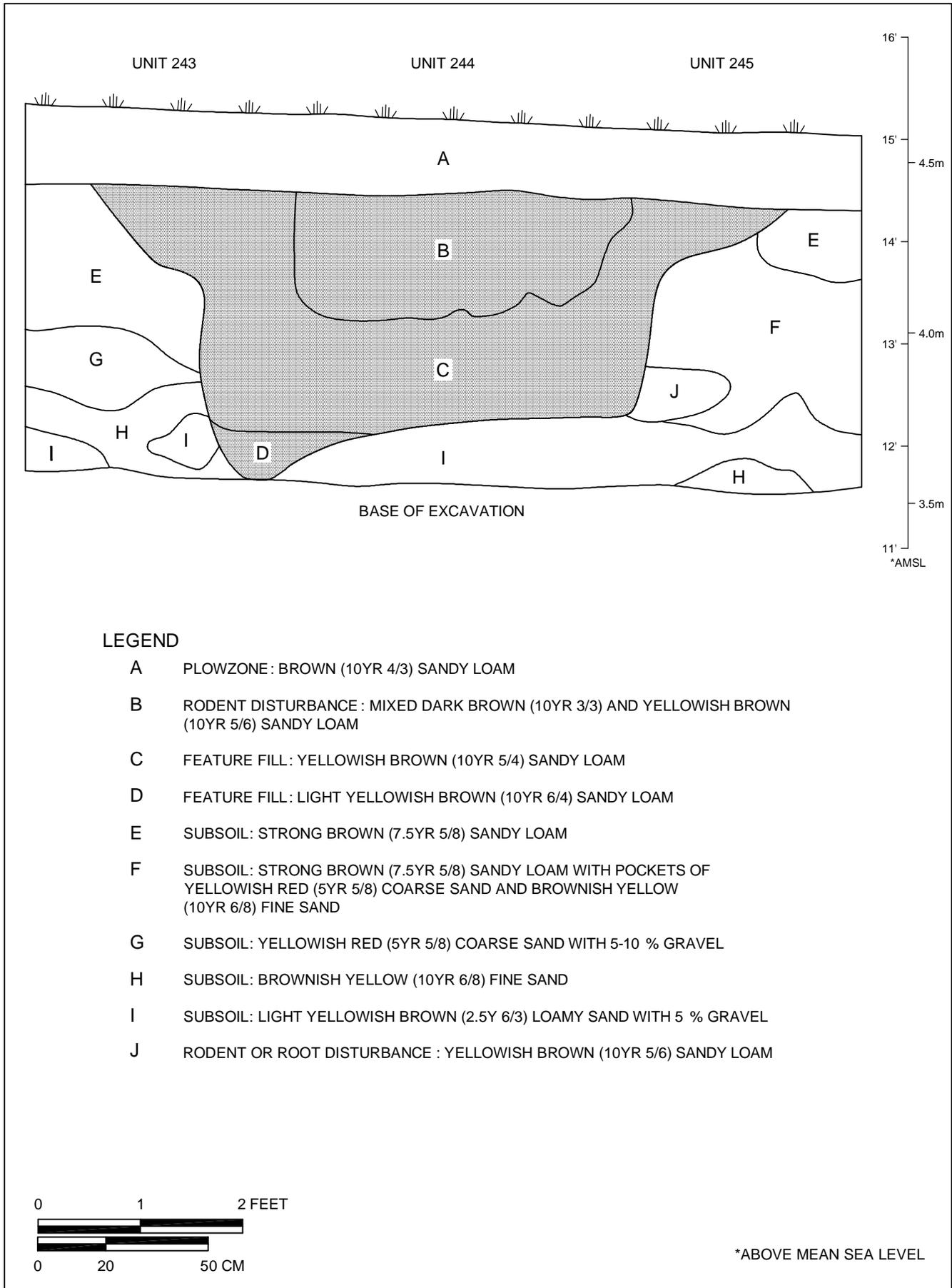


FIGURE K-11: Stratigraphic Profile of Feature 6, Facing North

Feature 7A

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		wood charcoal (hickory, oak, holly, chestnut,
Main Pit Cluster		pine); charred hickory nuts
<i>Shape</i>		<i>Artifacts</i>
Plan: round		8 possible FCR
Profile: steep sides, flat bottom		17 debitage:
<i>Dimensions</i>		6 chert
Surface: 155x140 cm		6 jasper
Bottom Diameter: 100 cm		5 quartz
Depth: 82 cm		1 piece burned clay or daub
Volume: 1,042 L		
<i>Radiocarbon Dates</i>		
1,850±70 BP	Stratum A, Level 5	
1,700±80 BP	Stratum A, Level 8	

Feature 7 was discovered during the Phase II testing in the small extension along the west side of Block 14 that was excavated to expose Feature 6. Only a small part of the Feature 7 was within the excavation, but based on the color and texture of the fill it was thought to be a cultural pit. When the feature was uncovered during the Phase III plowzone stripping, it appeared at first to be a crescent-shaped feature no more than a meter long. It was not closely investigated until late in the excavations, because it was very close to Features 46 and 48, and could not be excavated while work on those features was in progress. Upon close inspection, it was discovered that Feature 7 was quite large. The surface had been partly hidden by recent shallow disturbances, some of them obvious rodent tunnels. Careful troweling revealed that it was at least 2 meters long. This large feature was sectioned along the long axis, and excavation began on the western half. As excavation progressed, the size of the feature continued to grow until it measured 3 meters along its long axis (Figure K-12). This seemed very large for a single pit. It was thought for a time that the feature consisted of one round pit at the northern end and an amorphous disturbance running to the south. At the bottom of the first 10-centimeter level, the feature was divided into 7A (north) and 7B (south). At the bottom of Level 5, a strip of subsoil separating the two parts became visible. By the bottom of Level 3, a clear western boundary had been established for the amorphous Feature 7B, and it also proved to be a straight-sided pit. However, difficulties remained with the southern boundary, where rodent activity had been heaviest; only after three levels had been removed was a clear boundary for Feature 7B established. At that point, however, it became clear that there was still something beyond that clear boundary; that something proved to be another cultural pit, designated Feature 98. These features, although clearly separate at lower levels, all overlapped at the top. This indicates that they were not all in use simultaneously.

Feature 7A was round and straight-sided, with a flat bottom; this was one of the most perfect silo pits on the site. The main fill, Stratum A, was a dark yellowish brown (10YR 4/6) sandy loam heavily flecked with charcoal, with some of the pieces measuring as much as a centimeter on a side. It contained few artifacts. Stratum A made up most of the feature fill. However, along the north and east sides of the feature, another soil was detected, consisting of a mixture of soil identical to Stratum A with lighter (10YR 5/6), sandier soil. The bottom 10 to 15 centimeters of soil were described as light olive brown (2.5Y 5/4) in color, but the boundary between this soil and Stratum A was vague.

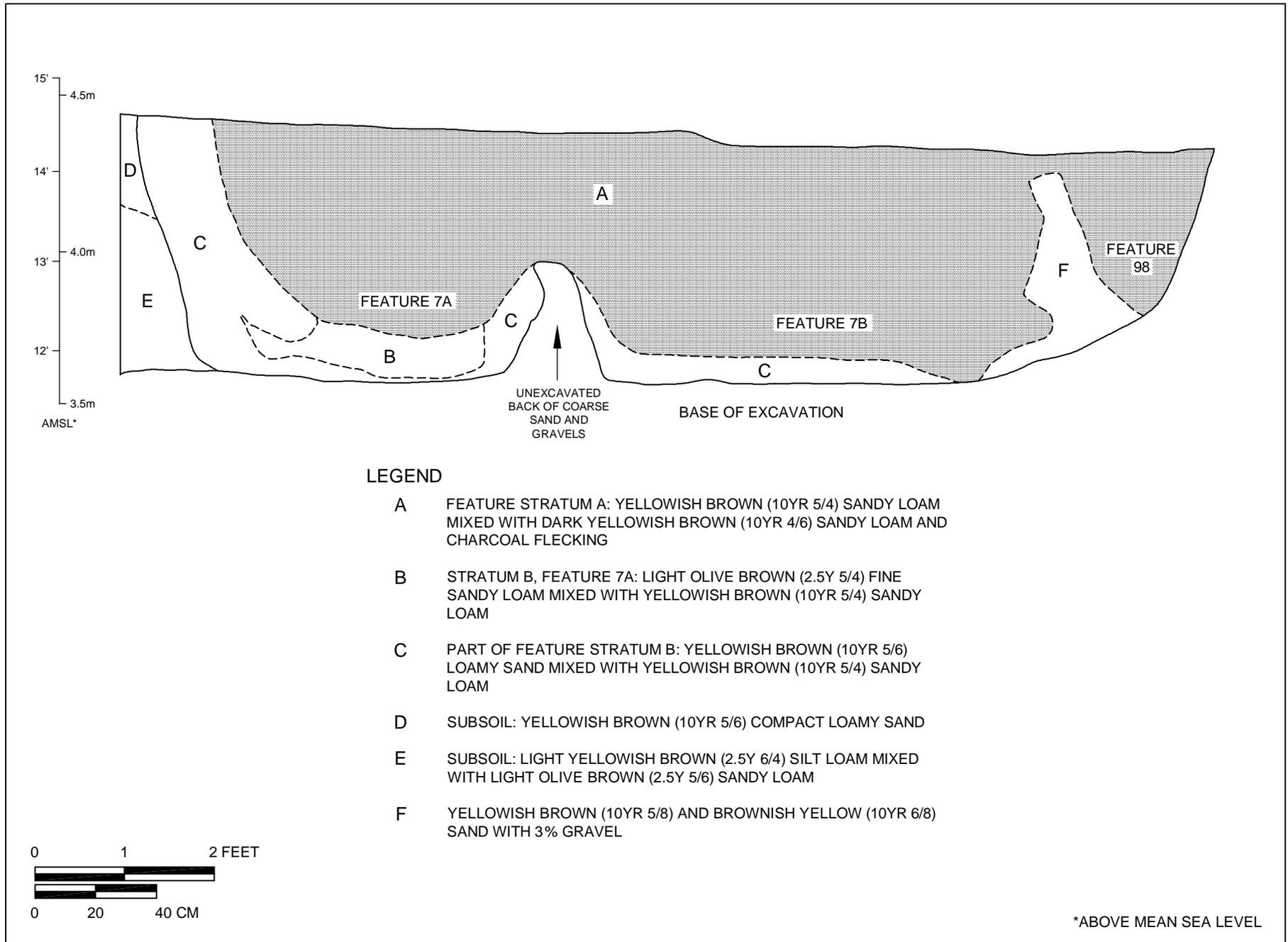


FIGURE K-12: Stratigraphic Profile of Features 7A and 7B, Facing East

Sample List for Feature 7A

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	1	1064	curated	Charcoal	B	4	1340	curated
Charcoal	A	2	1075	curated	Flotation 2L	A	2	1301	processed
Charcoal	A	3	1087	curated	Flotation 2L	A	7	1308	processed
Charcoal	A	4	1108	curated	Flotation 2L	B	6	1322	curated
Charcoal	A	5	1120	processed	Soil Chem.	A	2	1301	processed
Charcoal	A	6	1135	curated	Soil Chem.	A	7	1308	processed
Charcoal	A	7	1201	curated	Soil Chem.	B	6	1322	processed
Charcoal	A	8	1213	curated	Phytolith	A	2	1301	curated
Charcoal	B	-	1243	curated	Phytolith	A	7	1308	processed
Charcoal	A	8	1318	processed	Phytolith	B	6	1322	processed
Charcoal	A	9	1339	curated					

Feature 7B

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		wood charcoal (hickory, oak, holly, chestnut,
Main Pit Cluster		pine, tulip poplar)
<i>Shape</i>		<i>Artifacts</i>
Plan: oval		1 metate
Profile: steep sides, flat bottom		2 tested cobbles
<i>Dimensions</i>		3 possible FCR
Surface: 200x160 cm		15 debitage:
Bottom Diameter: 130 cm		4 chert
Depth: 82 cm		7 jasper
Volume: 2,089 L		2 quartz
		2 quartzite

Feature 7 was a large oval stain that proved, upon excavation, to include at least two separate pit features (see discussion under Feature 7A). Feature 7B, the southern part, was a large oval pit with nearly straight sides and a flat bottom. It intersected at the upper levels with both Feature 7A (to the north) and Feature 98 (to the south). Along its eastern edge the feature merged, without any distinct boundary, into a large disturbance that, it appeared, might have been an earlier pit feature. However, this disturbance intersected with Features 7B and 6 and was cut by several rodent tunnels, making it impossible to determine what its original shape might have been. This soil was excavated as Feature 7B, Stratum C.

Almost all of the fill in Feature 7B was composed of Stratum A, described as dark yellowish brown (10YR 4/6) sandy loam with heavy charcoal flecking (see Figure K-12). A pitted stone was recovered from Stratum C, the possible earlier pit to the east.

Sample List for Feature 7B

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	1	1065	curated	Charcoal	A	-	1343	curated
Charcoal	A	2	1076	curated	Flotation 2L	A	2	1303	processed
Charcoal	A	3	1088	curated	Flotation 2L	A	6	1321	processed
Charcoal	A	4	1110	curated	Soil Chem.	A	2	1303	curated
Charcoal	A	6	1136	curated	Soil Chem.	A	6	1321	curated
Charcoal	A	7	1202	curated	Phytolith	A	2	1303	curated
Charcoal	A	8	1214	curated	Phytolith	A	6	1321	curated
Charcoal	B	-	1337	curated					

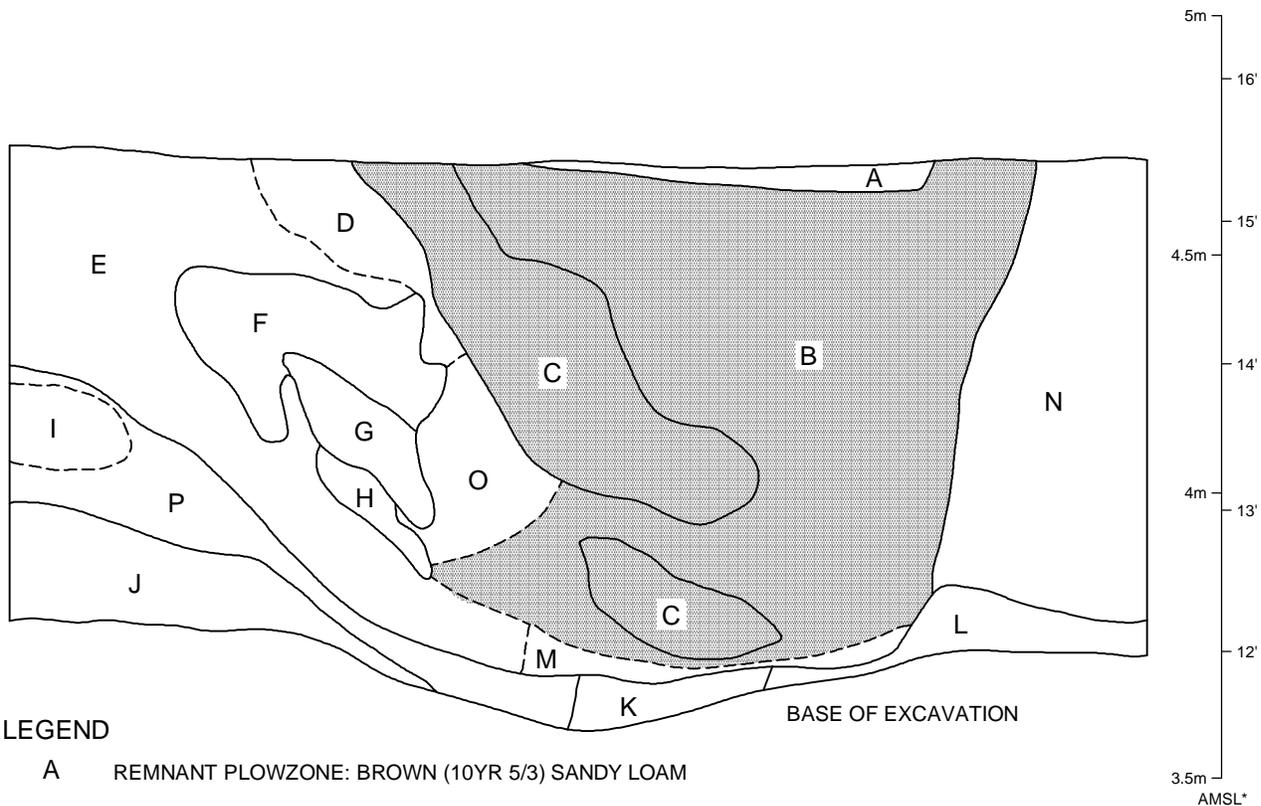
Feature 39

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		wood charcoal (not identified)
15 m east of Main Pit Cluster		<i>Artifacts</i>
<i>Shape</i>		1 small ceramic sherd, indeterminate temper, check-stamped exterior
Plan: round		2 possible FCR
Profile: steep sides, flat bottom		3 tested cobbles
<i>Dimensions</i>		1 unmodified cobble
Surface: 162x180 cm		8debitage:
Bottom Diameter: 66 cm		6 chert
Depth: 118 cm		2 jasper
Volume: 1,122 L		

Feature 39 was a soil anomaly 15 meters east of the Main Pit Cluster. It was excavated as a possible silo pit but it now seems more likely that it was some kind of natural disturbance. Feature 39 was located within a large, ancient soil anomaly that greatly complicated a determination of its boundaries and interpretation of its origin. Feature 39 was closely inspected by pedologist Dr. Daniel Wagner, who offered the opinion that its setting was such a confusing factor that instead of trying to understand this feature we ought to concentrate our efforts elsewhere.

Feature 39 appeared on the surface as an oval stain, similar in color and texture to the cultural pits in the main cluster. The feature was sectioned, and the southern half was excavated first. The boundaries were hard to determine, because the surrounding subsoil was browner (10YR 5/6 versus 7.5YR 5/8) and siltier than was usual in the area, closely resembling the feature fill. Inspection of the profile showed that this brown subsoil was filling a large pit or ditch, and that Feature 39 was located in the center of this pit (Figure K-13). Feature 39 contained artifacts, including a small ceramic sherd and a possible hammerstone.

After carefully inspecting the profile of the pit and the surrounding subsoil, Dr. Wagner suggested that the soil in the large pit was so well developed that it must be thousands of years older than the occupation of the site; however, he thought the soil in Feature 39 proper was quite recent and might be cultural. The presence of a cultural pit in the center of an ancient, silty soil anomaly would be a coincidence, but not an impossibility. However, an exactly similar situation had already been noted in the buried plowzone locus, where Feature 14 was also described as a recent, and possibly cultural, intrusion in the center of an ancient silty anomaly. It seems more likely that both of these features represent some kind of disturbance that forms naturally within these silty anomalies.



LEGEND

- A REMNANT PLOWZONE: BROWN (10YR 5/3) SANDY LOAM
- B FEATURE STRATUM A: YELLOWISH BROWN (10YR 5/4) LOAMY SAND MIXED WITH SOME LIGHT YELLOWISH BROWN (10YR 6/4) SANDY LOAM; CHARCOAL FLECKING
- C PART OF FEATURE STRATUM A: LIGHT OLIVE BROWN (2.5Y 5/4) LOAMY SAND MIXED WITH SOME YELLOWISH BROWN (10YR 5/6) LOAMY SAND
- D POSSIBLE RODENT DISTURBANCE: LOOSE YELLOWISH BROWN (10YR 5/6) LOAMY SAND MIXED WITH YELLOWISH BROWN (10YR 5/4) SANDY LOAM
- E COMPACT YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH BROWNISH YELLOW (10YR 6/6) SANDY CLAY LOAM
- F YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH YELLOWISH BROWN (10YR 5/8) SAND
- G YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH BROWNISH YELLOW (10YR 6/6) LOAMY SAND
- H BROWNISH YELLOW (10YR 6/8) MEDIUM SAND AND GRAVEL MIXED WITH YELLOWISH BROWN (10YR 5/6) SAND
- I YELLOWISH BROWN (10YR 5/6) MEDIUM SAND, 40 % GRAVEL
- J BROWNISH YELLOW (10YR 6/8) MEDIUM SAND LIGHTENING WITH DEPTH, WELL- DEVELOPED LAMELLAE
- K DARK YELLOWISH BROWN (10YR 4/6) MEDIUM SAND
- L BROWNISH YELLOW (10YR 6/8) MEDIUM TO FINE MICACEOUS SAND
- M YELLOWISH BROWN (10YR 5/4) LOAMY SAND
- N YELLOWISH BROWN (10YR 5/8) SANDY LOAM
- O DARK YELLOWISH BROWN (10YR 4/6) COMPACT SANDY LOAM WITH CHARCOAL FLECKING
- P YELLOWISH BROWN (10YR 5/8) MEDIUM SAND



*ABOVE MEAN SEA LEVEL

FIGURE K-13: Stratigraphic Profile of Feature 39, Facing North

Sample List for Feature 39

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	3-8	700	curated	Flotation 2L	A	11	1052	curated
Charcoal	A	3-8	700	curated	Soil Chem.	A	5	894	curated
Charcoal	A	2-9	1051	curated	Soil Chem.	A	5	895	curated
Charcoal	A	10-11	1053	curated	Soil Chem.	A	11	1052	curated
Charcoal	A	9	1247	curated	Soil Chem.	D	10	1248	curated
Flotation 2L	A	5	894	curated	Phytolith	A	5	894	curated
Flotation 2L	A	5	895	curated	Phytolith	A	11	1052	curated

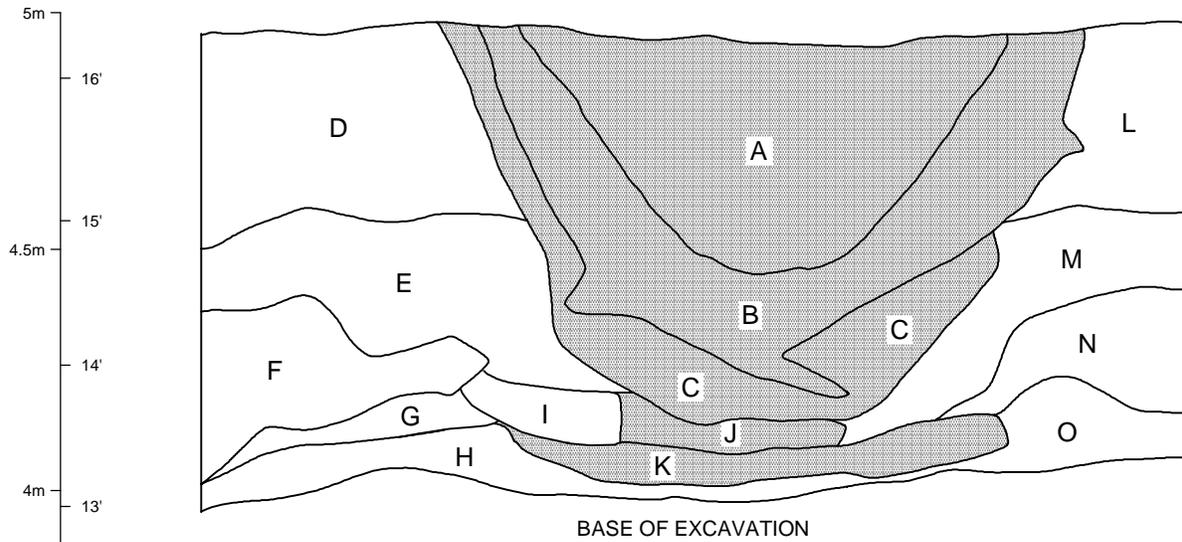
Feature 41

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		wood charcoal (oak)
20 m northeast of Main Pit Cluster		<i>Artifacts</i>
<i>Shape</i>		5 debitage:
Plan: round		1 chert
Profile: sloping sides, flat bottom		3 jasper
<i>Dimensions</i>		1 quartz
Surface:	122x134 cm	
Bottom Diameter:	100 cm	
Depth:	92 cm	
Volume:	961 L	
<i>Radiocarbon Dates</i>		
2,460±50 BP	Stratum C, Level 7	

Feature 41 was a possible silo pit located 20 meters northeast of the Main Pit Cluster. The excavators strongly disputed the nature of this feature; some believed it was cultural, and others believed it was natural. It seems most likely that it was a cultural pit, but that the walls had collapsed or slumped, creating the jumbled stratigraphy revealed by the excavation (Figure K-14). The radiocarbon date from the feature was 600 years earlier than most of the pits from the main cluster, indicating that if Feature 41 was cultural it was not part of the same occupation as those other pits. However, similar dates were obtained from Feature 51, indicating that the site was occupied around that time.

On the surface, Feature 41 presented a dark yellowish brown (10YR 4/4), roughly round core surrounded by a lighter ring (10YR 6/4) that formed a distorted square. The inner core was designated Stratum A, and the outer ring was designated Stratum B. Both strata were loamy sand. Stratum B darkened below the surface, but it remained distinct from Stratum A. Near the surface, the edges of the feature were clear. However, as the excavation progressed it proved difficult to follow the edges down. Below Level 3, the excavation was simply taken down in a roughly straight line, and only at the very bottom was a clear edge established again. Beneath Strata A and B was a third major layer, Stratum C, described as mixed yellowish brown (10YR 5/6) and light olive brown (2.5Y 5/4) loamy sand. Beneath Stratum C was a series of sand lenses designated Stratum D. In the bottom of the feature was Stratum E, a thin but very distinct layer of dark yellowish brown (10YR 4/6) loamy sand. The clear outer edges of Stratum E approximately lined up with the boundaries of the feature at the top.

Analysis of the soil chemistry showed a concentration of calcium and strontium, both at levels about twice the average for the area, in the center of the feature. The excess of these elements may derive from the disposal of refuse containing bone or shell.



LEGEND

- A FEATURE STRATUM A: BROWN (10YR 5/3) LOAMY SAND MIXED WITH SOME YELLOWISH BROWN (10YR 5/6) SANDY LOAM; HEAVY CHARCOAL FLECKING
- B FEATURE STRATUM B: YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH LIGHT OLIVE BROWN (2.5Y 5/6) LOAMY SAND; CHARCOAL FLECKING
- C FEATURE STRATUM C: LIGHT OLIVE BROWN (2.5Y 5/4) LOAMY SAND, MIXED WITH YELLOWISH BROWN (10YR 5/6) SANDY LOAM
- D SUBSOIL: COMPACT YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED
- E SUBSOIL AND POSSIBLE SLUMP INTO FEATURE : DARK YELLOWISH BROWN (10YR 4/6) SANDY LOAM
- F SUBSOIL: YELLOWISH BROWN (10YR 5/6) LOAMY SILT MIXED WITH PALE YELLOW (5Y 7/3) SILT
- G SUBSOIL: YELLOWISH BROWN (10YR 5/6) SAND MIXED WITH POCKETS OF VERY PALE BROWN (10YR 7/4) SAND
- H SUBSOIL: YELLOWISH BROWN (10YR 5/8) MEDIUM SAND
- I YELLOWISH BROWN (10YR 5/6) LOAMY SAND MIXED WITH BROWNISH YELLOW (10YR 6/8) SAND
- J PART OF FEATURE STRATUM D : YELLOWISH BROWN (10YR 5/4) LOAMY SAND MIXED WITH YELLOWISH BROWN (10YR 5/8) LOAMY SAND
- K FEATURE STRATUM E: YELLOWISH BROWN (10YR 5/6) LOAMY SAND
- L SUBSOIL: DARK YELLOWISH BROWN (10YR 4/6) LOAMY SAND
- M SUBSOIL AND POSSIBLE SLUMP INTO FEATURE : YELLOWISH BROWN (10YR 5/6) MEDIUM SAND
- N SUBSOIL: YELLOWISH BROWN (10YR 5/8) MEDIUM SAND
- O BROWNISH YELLOW (10YR 6/8) MEDIUM SAND

*ABOVE MEAN SEA LEVEL

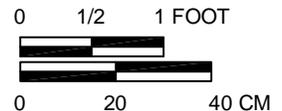


FIGURE K-14: Stratigraphic Profile of Feature 41, Facing North

Sample List for Feature 41

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	1	591	curated	Soil Chem.	Bt	-	1421	processed
Charcoal	A	4-9	717	curated	Soil Chem.	BC	-	1422	processed
Charcoal	C	6	1102	curated	Soil Chem.	CB	-	1423	processed
Charcoal	C	7	1106	processed	Soil Chem.	CB	-	1424	processed
Flotation 2L	A	2	1079	curated	Soil Chem.	2C	-	1425	processed
Flotation 2L	B	2	1080	curated	Soil Chem.		1-4	1426	curated
Flotation 2L	A	4	1094	processed	Soil Chem.		5-6	1427	curated
Flotation 2L	B	6	1101	processed	Soil Chem.		7-8	1428	curated
Flotation 2L	E	10	1116	processed	Soil Chem.		9	1429	curated
Soil Chem.	A	2	1079	curated	Soil Chem.		10	1430	curated
Soil Chem.	B	2	1080	curated	Phytolith	A	2	1079	curated
Soil Chem.	A	4	1094	curated	Phytolith	B	2	1080	curated
Soil Chem.	B	4	1095	curated	Phytolith	A	4	1094	curated
Soil Chem.	B	6	1101	curated	Phytolith	B	4	1095	curated
Soil Chem.	E	10	1116	curated	Phytolith	B	6	1101	curated
Soil Chem.	Bt1	-	1419	processed	Phytolith	E	10	1116	curated
Soil Chem.	Bt2	-	1420	processed					

Feature 44

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		wood charcoal (not identified)
10 m east of Main Pit Cluster		<i>Artifacts</i>
<i>Shape</i>		43 possible FCR
Plan: irregular, roughly oval		1 tested cobble
Profile: shallow basin		(plus 62 other pieces of FCR
<i>Dimensions</i>		apparently from this feature but disturbed
Surface: 120x180 cm		by backhoe)
Depth: 22 cm		1 jasper debitage

Feature 44 was a shallow, irregular pit 10 meters east of the main cluster of Locus 1. It contained a concentration of FCR and appeared to be the remains of a hearth (Figure K-15). The feature as a whole was roughly oval, measuring about 180 by 120 centimeters. Most of the feature was not more than 5 centimeters deep. The FCR was concentrated in a small area in the center of the feature, measuring about 50 by 40 centimeters. The cracked rock was all located near the top of the feature; underneath the cracked rock, the feature deepened to 15 to 20 centimeters. Some of the top of the feature was removed by backhoe. The feature was recognized while the backhoe bucket was about half way across, and the bucket was halted at that point. Sixty-two pieces of FCR were found in the soil dropped by the backhoe bucket, and it is believed that these were from Feature 44.

Sample List for Feature 44

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	2	573	curated	Soil Chem.	A	2	573	curated
Flotation 2L	A	2	573	curated	Phytolith	A	2	573	curated

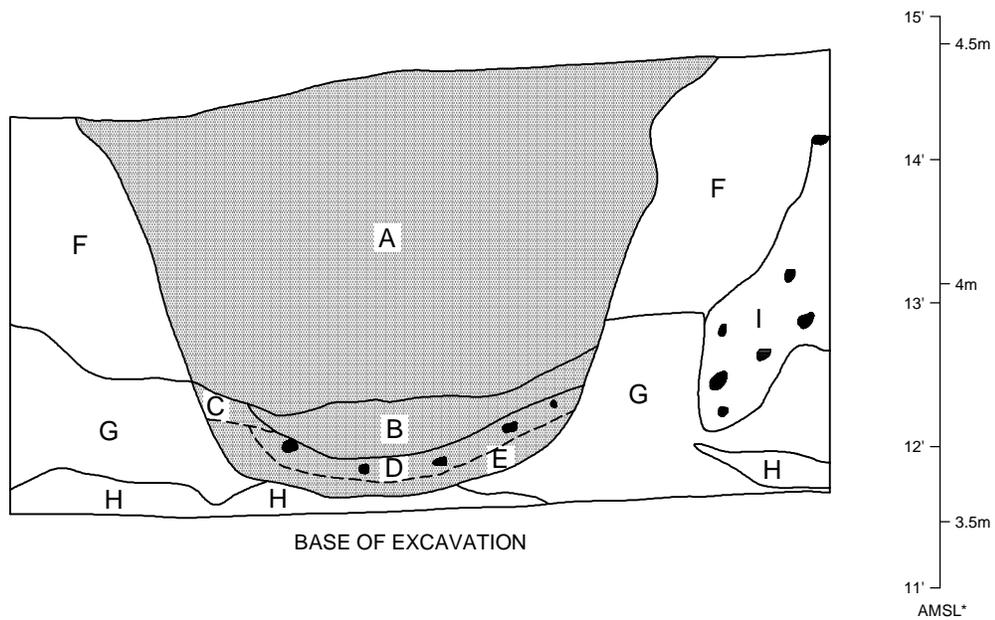
Feature 46

<i>Location</i>		<i>Macrobotanical Remains</i>	
Locus 1, Silo Pit area		wood charcoal (maple, hickory, dogwood,	
Main Pit Cluster		holly, oak)	
<i>Shape</i>		<i>Artifacts</i>	
Plan: round		12 possible FCR	
Profile: steeply sloping sides, flat bottom		19 debitage:	
<i>Dimensions</i>		10 chert	
Surface:	170x140 cm	4 jasper	
Bottom Diameter:	70 cm	3 quartz	
Depth:	95 cm	2 quartzite	
Volume:	946 L		
<i>Radiocarbon Dates</i>			
1,930±40 BP	Stratum A, Level 2		
1,850±70 BP	Stratum C, Level 9		

Feature 46 was a silo pit in the Main Pit Cluster. It was somewhat less of a cylinder in shape than most of these pits, with sides that sloped more gently and a slightly rounded bottom. Most of the feature fill was Stratum A, which was described as yellowish brown (10YR 5/4) sandy loam (Figure K-16). All of the artifacts were recovered from this layer. Beneath Stratum A, in the bottom of the feature, was a series of lenses of loamy sand. One of these lenses, Stratum C, contained maple, hickory, dogwood, holly, and oak charcoal.

Sample List for Feature 46

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	2	722	processed	Flotation 2L	A	6	1126	curated
Charcoal	A	3	724	curated	Flotation 2L	B	1	1127	curated
Charcoal	A	4	725	curated	Flotation 2L	C	1	1133	processed
Charcoal	A	5	727	curated	Flotation 2L	D	1	1134	processed
Charcoal	A	6	729	curated	Soil Chem.	A	2	1084	curated
Charcoal	A	7	730	curated	Soil Chem.	A	6	1126	curated
Charcoal	A	8	732	curated	Soil Chem.	B	1	1127	curated
Charcoal	A	9	735	curated	Soil Chem.	C	1	1133	curated
Charcoal	A	2	1084	curated	Soil Chem.	D	1	1134	curated
Charcoal	A	3	1111	curated	Phytolith	A	2	1084	curated
Charcoal	A	4	1112	curated	Phytolith	A	6	1126	processed
Charcoal	B	1	1127	curated	Phytolith	B	1	1127	curated
Charcoal	C	1	1133	processed	Phytolith	C	1	1133	processed
Charcoal	D	1	1134	curated	Phytolith	D	1	1134	processed
Flotation 2L	A	2	1084	processed					



LEGEND

- A FEATURE STRATUM A: YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH SOME DARK YELLOWISH BROWN (10YR 4/6) SANDY LOAM; CHARCOAL FLECKING
- B FEATURE STRATUM B: YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH SOME BROWNISH YELLOW (10YR 6/8) LOAMY SAND
- C INCLUSION IN FEATURE : BROWNISH YELLOW (10YR 6/6) LOAMY SAND
- D FEATURE STRATUM C: YELLOWISH BROWN (10YR 5/6) SANDY LOAM WITH HEAVY CHARCOAL FLECKING AND 12-15 % GRAVEL
- E FEATURE STRATUM D: YELLOWISH BROWN (10YR 5/6) SANDY LOAM WITH 12- 15% GRAVEL
- F B-HORIZON: YELLOWISH BROWN (10YR 5/8) SANDY LOAM
- G B-HORIZON: VERY PALE BROWN (10YR 7/4) SILT LOAM
- H C-HORIZON: BROWNISH YELLOW (10YR 6/8) COARSE SAND
- I SUBSOIL: YELLOWISH BROWN (10YR 5/8) SAND WITH INCLUSIONS OF VERY PALE BROWN (10YR 7/4) SILT LOAM AND 30 % GRAVEL
- ROCK



*ABOVE MEAN SEA LEVEL

FIGURE K-16: Stratigraphic Profile of Feature 46, Facing West

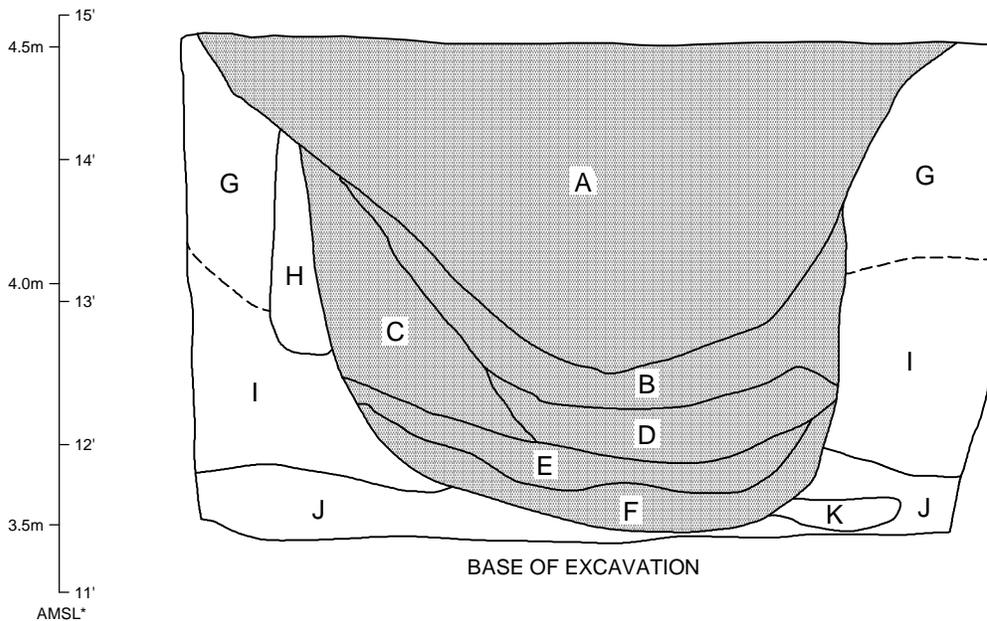
Feature 47

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		(not identified)
Main Pit Cluster		<i>Artifacts</i>
<i>Shape</i>		1 small Marcey Creek ceramic sherd
Plan: round		1 quartzite freehand core with cobble cortex
Profile: steeply sloping sides, flat bottom		16 possible FCR
<i>Dimensions</i>		14 debitage:
Surface: 150x160 cm		3 chert
Bottom Diameter: 76 cm		11 jasper
Depth: 102 cm		
Volume: 1,074 L		

Feature 47 was a silo pit in the Main Pit Cluster. The top of the feature had been enlarged by erosion, and the upper sides sloped rather gradually; however, below Level 3 the sides were nearly straight. The upper feature fill, within the eroded area, was Stratum A, which was described as yellowish brown (10YR 5/6) sandy loam (Figure K-17). Most of the artifacts were recovered from this layer. Below Stratum A along the east side of the feature was a large lens of sand identical to the uppermost subsoil layer in that area, clearly indicating an episode of slumping. Otherwise, there were four other strata, all layers of loamy sand. Although the bottom layer in most of these pit features was darker than the fill above it, in Feature 47 the bottom layer was a brownish yellow (10YR 6/6) sand lighter than the rest of the feature.

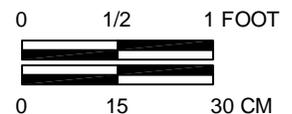
Sample List for Feature 47

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	3	577	curated	Flotation 2L	B	5	867	curated
Charcoal	A	9	585	curated	Flotation 2L	B	8	878	curated
Charcoal	A	10	587	curated	Flotation 2L	C	7	888	curated
Charcoal	B	5	867	curated	Soil Chem.	B	5	867	curated
Charcoal	B	6	870	curated	Soil Chem.	B	8	878	curated
Charcoal	B	9	892	curated	Soil Chem.	C	7	888	curated
Charcoal	A	3	1223	curated	Phytolith	B	5	867	curated
Charcoal	A	4	1224	curated	Phytolith	B	8	878	processed
Charcoal	B	8	1226	curated	Phytolith	C	7	888	curated
Flotation 2L	A	2	749	curated					



LEGEND

- A FEATURE STRATUM A: YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH SOME DARK YELLOWISH BROWN (10YR 4/6) SANDY LOAM; CHARCOAL FLECKING
- B FEATURE STRATUM B: YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH SOME YELLOWISH BROWN (10YR 5/8) LOAMY SAND
- C FEATURE STRATUM C (SLUMP?): YELLOWISH BROWN (10YR 5/8) SANDY LOAM
- D PART OF FEATURE STRATUM B: YELLOWISH BROWN (10YR 5/8) SANDY LOAM MIXED WITH SOME LIGHT YELLOWISH BROWN (10YR 6/4) SANDY LOAM
- E PART OF FEATURE STRATUM B: YELLOWISH BROWN (10YR 5/8) SANDY LOAM MIXED WITH SOME YELLOWISH BROWN (10YR 5/4) SANDY LOAM
- F PART OF FEATURE STRATUM B: BROWNISH YELLOW (10YR 6/6) SANDY LOAM
- G B-HORIZON: YELLOWISH BROWN (10YR 5/8) SANDY LOAM MIXED WITH SOME LIGHT YELLOWISH BROWN (10YR 6/4) SANDY LOAM
- H SUBSOIL: BROWNISH YELLOW (10YR 6/6) SANDY LOAM MIXED WITH YELLOW (10YR 7/6) SAND
- I B-HORIZON: LIGHT GRAY (10YR 7/2) LOAMY SAND WITH INCLUSIONS OF YELLOWISH BROWN (10YR 6/6) SANDY LOAM
- J C-HORIZON: STRONG BROWN (7.5YR 5/8) SAND
- K POSSIBLE RODENT BURROW: PALE YELLOW (2.5Y 7/3) SILT LOAM



*ABOVE MEAN SEA LEVEL

FIGURE K-17: Stratigraphic Profile of Feature 47, Facing South

Feature 48

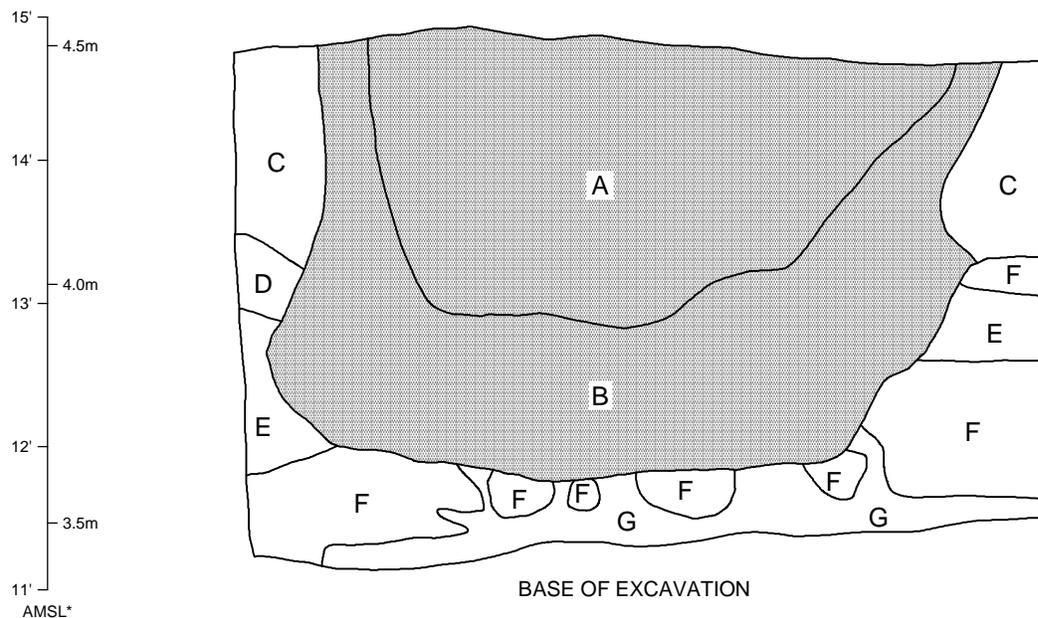
<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		wood charcoal (not identified)
Main Pit Cluster		<i>Artifacts</i>
<i>Shape</i>		6 possible FCR
Plan: round		21 debitage:
Profile: steeply sloping sides, flat bottom		7 chert
<i>Dimensions</i>		12 jasper
Surface: 143x156 cm		1 quartz
Bottom Diameter: 106 cm		1 rhyolite
Depth: 96 cm		
Volume: 1,250 L		

Feature 48 was a silo pit in the Main Pit Cluster. It was distinctive in that it had two clearly different fills, an inner fill and an outer fill (Figure K-18). The inner fill, Stratum A, was described as light yellowish brown (10YR 5/4) sandy loam. The outer fill, Stratum B, was a mixture of light yellowish brown (10YR 5/4) and brownish yellow (10YR 6/6) sandy loam, noticeably lighter than Stratum A and significantly more compact. Of the 27 artifacts found in the feature, 24 were in Stratum A and only three in Stratum B, even though Stratum B made up more than half of the feature volume.

The stratigraphy of this pit suggests that it filled in and was then redug as a much smaller pit, which was defined by Stratum A.

Sample List for Feature 48

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	3	705	curated	Charcoal	A	8	885	curated
Charcoal	A	4	706	curated	Charcoal	B	8	886	curated
Charcoal	A	5	709	curated	Charcoal	B	10	899	curated
Charcoal	A	6	710	curated	Charcoal	B	11	900	curated
Charcoal	A	7	712	curated	Charcoal	B	11	1050	curated
Charcoal	A	8	714	curated	Flotation 2L	A	2	738	curated
Charcoal	A	2	738	curated	Flotation 2L	A	7	873	curated
Charcoal	B	3	747	curated	Flotation 2L	B	9	893	curated
Charcoal	B	4	852	curated	Soil Chem.	A	2	738	processed
Charcoal	A	6	871	curated	Soil Chem.	A	7	873	processed
Charcoal	B	6	872	curated	Soil Chem.	B	9	893	processed
Charcoal	A	7	873	curated	Phytolith	A	7	873	curated
Charcoal	B	7	884	curated	Phytolith	B	9	893	curated



LEGEND

- A FEATURE STRATUM A: YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH SOME DARK YELLOWISH BROWN (10YR 4/6) SANDY LOAM; CHARCOAL FLECKING
- B FEATURE STRATUM B: YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH SOME BROWNISH YELLOW (10YR 6/6) SANDY LOAM
- C SUBSOIL: YELLOWISH BROWN (10YR 5/8) SANDY LOAM.
- D SUBSOIL: BROWNISH YELLOW (10YR 6/8) LOAMY SAND
- E SUBSOIL: YELLOWISH BROWN (10YR 5/8) LOAMY SAND
- F SUBSOIL: LIGHT BROWNISH GRAY (2.5YR 6/2) SILT LOAM
- G SUBSOIL: BROWNISH YELLOW (10YR 6/8) COARSE SAND



*ABOVE MEAN SEA LEVEL

FIGURE K-18: Stratigraphic Profile of Feature 48, Facing North

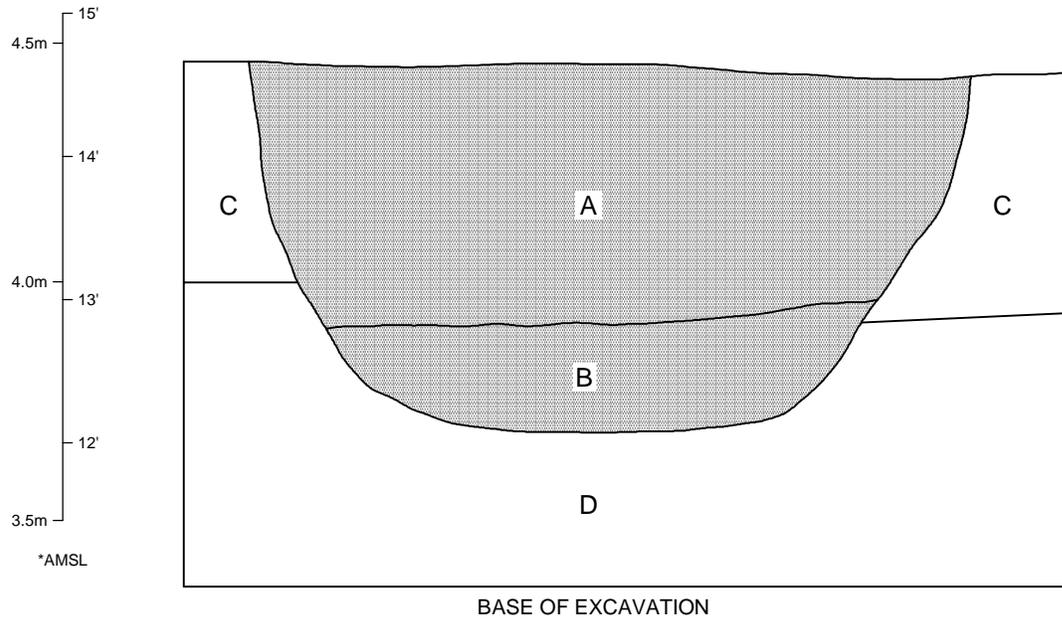
Feature 50

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		charred hickory nut hulls
Main Pit Cluster		wood charcoal (oak)
<i>Shape</i>		<i>Artifacts</i>
Plan: round		1 small Coulbourn ceramic sherd
Profile: deep basin		5 possible FCR
<i>Dimensions</i>		1 hammerstone
Surface: 150x150 cm		5 debitage:
Bottom Diameter: 76 cm		1 chert
Depth: 55 cm		3 jasper
Volume: 572 L		1 quartz

Feature 50 was a deep, basin-shaped pit in the Main Pit Cluster. It was very round, and contained two distinct fills (Figure K-19). Stratum A was a dark yellowish brown (10YR 4/6) sandy loam with heavy charcoal flecking. Stratum B, which was about 10 centimeters deep, was a mixture of yellowish brown (10YR 5/4) and brownish yellow (10YR 6/6) loamy sand. Both strata contained small pockets of red soil that appeared to have been burned. A small sherd of clay-tempered pottery with a check-stamped exterior design was found in the feature and was identified as a Coulbourn type; a small amount of burned hickory nutshells was also identified.

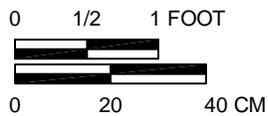
Sample List for Feature 50

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	2	584	curated	Charcoal	B	6	1115	curated
Charcoal	A	3	586	curated	Charcoal	A	2	1140	curated
Charcoal	A	4	588	curated	Charcoal	A	5	1142	curated
Charcoal	A	1	597	curated	Flotation 2L	A	2	1062	processed
Charcoal	A	6	702	curated	Flotation 2L	B	5	1092	processed
Charcoal	A	2	1061	curated	Soil Chem.	A	2	1062	processed
Charcoal	A	2	1062	curated	Soil Chem.	B	5	1092	processed
Charcoal	A	4	1091	curated	Phytolith	A	2	1062	curated
Charcoal	B	5	1092	curated	Phytolith	B	5	1092	processed



LEGEND

- A FEATURE STRATUM A: DARK YELLOWISH BROWN (10YR 4/6) SANDY LOAM MIXED WITH SOME YELLOWISH BROWN (10YR 5/6) SANDY LOAM; CHARCOAL FLECKING
- B FEATURE STRATUM B: LIGHT YELLOWISH BROWN (10YR 6/6)
- C SUBSOIL: YELLOWISH BROWN (10YR 5/8) SANDY LOAM
- D SUBSOIL: STRONG BROWN (7.5YR 5/8) SAND



*ABOVE MEAN SEA LEVEL

FIGURE K-19: Stratigraphic Profile of Feature 50, Facing North

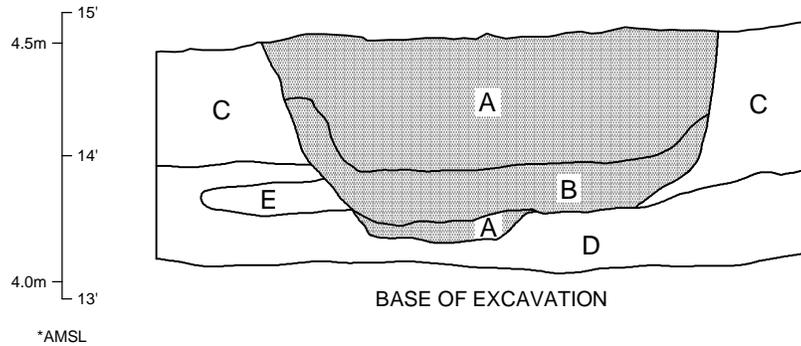
Feature 51

<i>Location</i>		<i>Macrobotanical Remains</i>	
Locus 1, Silo Pit area		charred hickory nut hulls	
Main Pit Cluster		wood charcoal (hickory, ash, black walnut, oak)	
<i>Shape</i>		<i>Artifacts</i>	
Plan: round		10 small pieces burned clay or daub	
Profile: deep basin		6 possible FCR	
<i>Dimensions</i>		2 unmodified cobbles	
Surface:	96x98 cm	4debitage:	
Bottom Diameter:	62 cm	2 jasper	
Depth:	42 cm	2 quartz	
Volume:	209 L		
<i>Radiocarbon Dates</i>			
2,530±50 BP	Stratum A, Level 2		
2,440±50 BP	Stratum A, Level 3		

Feature 51 was the smallest feature in the main cluster. It was a very round, basin-shaped pit. It yielded 10 small pieces of burned clay or daub and a quantity of charred hickory nut hulls (Figure K-20). The fill was made up of two layers. Stratum A, which filled most of the feature, was primarily a dark yellowish brown (10YR 4/4) sandy loam. However, it had heavy charcoal flecking and contained pockets of scorched, yellowish red (5YR 4/6) soil and very dark grayish brown (10YR 3/2) sand. Stratum B, which was about 10 centimeters deep, was a brown (10YR 4/3) sandy loam, with more burned pockets. The two radiocarbon dates obtained from the feature are consistent with each other but 600 years earlier than most of those from the Main Pit Cluster, suggesting that this feature, despite its proximity to the others, was not part of the same occupation. Because of the burning and the visible nut hulls, a large number of flotation samples were taken from the feature.

Sample List for Feature 51

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	2	743	processed	Flotation 2L	B	4	1203	curated
Charcoal	A	3	744	curated	Soil Chem.	A	4	745	processed
Charcoal	A	2	850	curated	Soil Chem.	A	2	850	processed
Charcoal	B	3	856	curated	Soil Chem.	B	3	856	processed
Charcoal	A	3	857	curated	Soil Chem.	A	2	1054	curated
Charcoal	A	3	1145	processed	Soil Chem.	A	3	1145	curated
Flotation 2L	A	4	745	curated	Phytolith	A	4	745	processed
Flotation 2L	A	2	850	curated	Phytolith	A	2	850	processed
Flotation 2L	B	3	856	curated	Phytolith	A	2	1054	curated
Flotation 2L	A	2	1054	processed	Phytolith	A	3	1145	curated
Flotation 2L	A	3	1145	processed					



LEGEND

- A FEATURE STRATUM A : DARK YELLOWISH BROWN (10YR 4/4) SANDY LOAM MIXED WITH SOME YELLOWISH BROWN (10YR 5/6) SANDY LOAM; CHARCOAL FLECKING
- B FEATURE STRATUM B : DARK BROWN (10YR 3/3) SANDY LOAM WITH LUMPS OF BURNED CLAY AND HEAVY CHARCOAL FLECKING
- C SUBSOIL: STRONG BROWN (7.5YR 5/6) LOAMY SAND
- D SUBSOIL: STRONG BROWN (7.5YR 5/8) SAND
- E SUBSOIL: STRONG BROWN (7.5YR 5/8) SAND MIXED WITH BROWNISH YELLOW (10YR 6/8) SILT LOAM



*ABOVE MEAN SEA LEVEL

FIGURE K-20: Stratigraphic Profile of Feature 51, Facing North

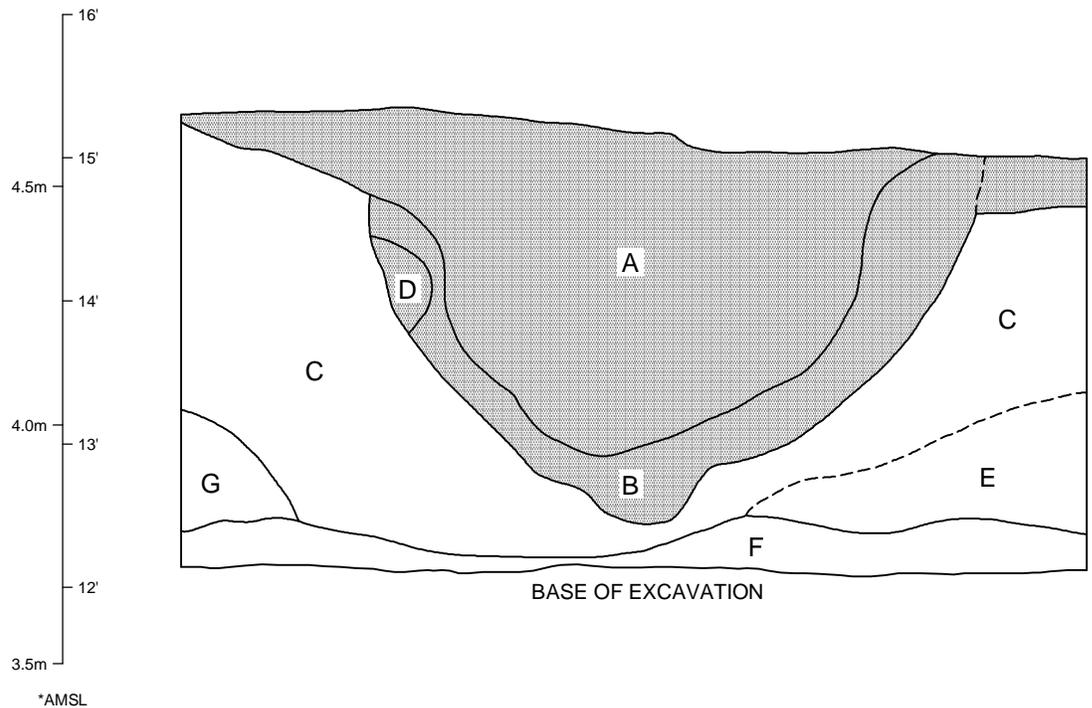
Feature 53

<i>Location</i>		<i>Artifacts</i>
Locus 1, Silo Pit area		5 debitage:
5 m north of Main Pit Cluster		1 chert
<i>Shape</i>		4 quartzite
Plan: round		
Profile: deep, irregular basin		
<i>Dimensions</i>		
Surface:	180x220 cm	
Depth:	82 cm	

Feature 53 was excavated as a possible silo pit, but it is now thought to have been a natural disturbance. On the surface it appeared to be roughly round, with a shallow extension or disturbance running off to the southeast; however, that extension turned out to be as deep as the rest of the feature, giving it a tear-drop shape (Figure K-21). The feature was not stratified; the fill consisted of yellowish brown (10YR 5/6) sandy loam, leached around the edge to brownish yellow (10YR 6/6). This soil was more even in color than that in most of the cultural pits, without the many small flecks of darker and lighter soil that characterized the cultural features. Feature 53 contained a few artifacts. Its shape was quite irregular, with some parts of the edge sloping steeply and others sloping much more gradually. There was a deeper section, a sort of “point,” at the very bottom. A soil chemistry control column was taken adjacent to the feature, and the values of phosphorus or calcium inside the feature were little different from those in the control column.

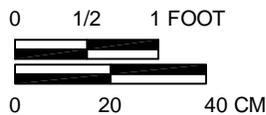
Sample List for Feature 53

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	2	589	curated	Soil Chem.	Bt1		1431	curated
Charcoal	A	3	590	curated	Soil Chem.	Bt2		1432	curated
Charcoal	A	4	718	curated	Soil Chem.	BC1		1433	curated
Charcoal	A	5	719	curated	Soil Chem.	BC2		1434	curated
Charcoal	A	6	720	curated	Soil Chem.	2BC		1435	curated
Charcoal	A	2	853	curated	Soil Chem.	3C		1436	curated
Charcoal	A	2	1232	curated	Soil Chem.		1-2	1437	processed
Flotation 2L	A	2	853	curated	Soil Chem.		3-4	1438	processed
Flotation 2L	B	3	864	curated	Soil Chem.		5-6	1439	processed
Flotation 2L	A	6	879	curated	Soil Chem.		7-8	1440	processed
Flotation 2L	B	6	880	curated	Soil Chem.		9	1441	processed
Flotation 2L	A	7	887	curated	Phytolith	A	2	853	curated
Soil Chem.	A	2	853	curated	Phytolith	B	3	864	curated
Soil Chem.	B	3	864	curated	Phytolith	A	6	879	curated
Soil Chem.	A	6	879	curated	Phytolith	B	6	880	curated
Soil Chem.	B	6	880	curated	Phytolith	A	7	887	curated
Soil Chem.	A	7	887	curated					



LEGEND

- A FEATURE STRATUM A: YELLOWISH BROWN (10YR 5/6) SANDY LOAM
- B FEATURE STRATUM B: LIGHT YELLOWISH BROWN (10YR 6/4) SANDY LOAM MIXED WITH YELLOWISH BROWN (10YR 5/6) SANDY LOAM
- C SUBSOIL: STRONG BROWN (7.5YR 5/6) SANDY LOAM, INCREASINGLY SILTY WITH DEPTH
- D FEATURE INCLUSION: LIGHT YELLOWISH BROWN (10YR 6/4) SANDY LOAM, MIXED WITH STRONG BROWN (7.5YR 5/6) SANDY LOAM
- E SUBSOIL: YELLOWISH BROWN (10YR 5/8) SANDY LOAM
- F SUBSOIL: LIGHT YELLOWISH BROWN (2.5Y 6/4) SANDY LOAM
- G SUBSOIL: BROWNISH YELLOW (10YR 6/6) SILT LOAM MIXED WITH STRONG BROWN (7.5YR 4/6) SILT LOAM



*ABOVE MEAN SEA LEVEL

FIGURE K-21: Stratigraphic Profile of Feature 53, Facing North

Feature 57

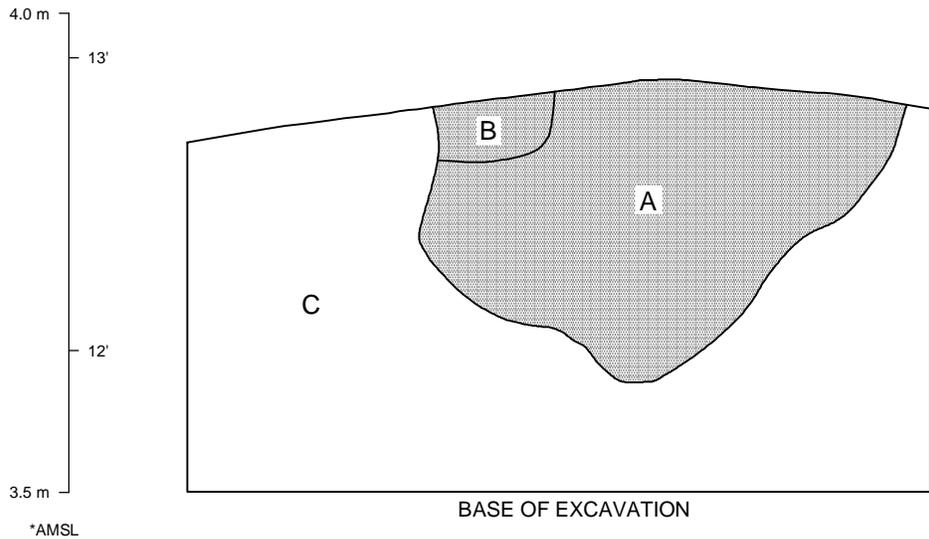
<i>Location</i>		<i>Artifacts</i>
Locus 1, Silo Pit area		none
Red-Ringed Pits, 10 m south of Main Pit Cluster		
<i>Shape</i>		
Plan: round		
Profile: irregular basin		
<i>Dimensions</i>		
Surface:	56x46 cm	
Depth:	32 cm	

Feature 57 was a small, red-ringed pit, located within the cluster of similar pits, about 10 meters south of the Main Pit Cluster. This feature is now thought to have been an ancient natural disturbance of some kind. The subsoil around the pit was pure sand, but the feature soil was a compact sandy loam much more resistant to disturbance. After plowzone stripping and troweling, these pits stood up above the surrounding subsoil. Their most distinctive feature was the reddish ring around the outside of the feature. In Feature 57, the main feature fill was a yellowish brown (10YR 5/6) sandy loam, with small inclusions of dark grayish brown (10YR 4/2) sandy loam (Figure K-22). Around the outside of the feature, however, was a band of reddish yellow (7.5YR 6/8) soil. This band was not continuous or even. In two places it was 8 centimeters thick, but for the most part it was about 5 centimeters thick; for about a third of the circumference it was not present at all.

Excavation of the feature showed that it had an irregular profile, with rounded lobes extending under the subsoil. No artifacts were recovered. Feature 57 resembled a rodent burrow.

Sample List for Feature 57

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Flotation 2L	A	1	1249	curated	Phytolith	A	1	1249	curated
Soil Chem.	A	1	1249	curated					



LEGEND

- A FEATURE 57, STRATUM A : YELLOWISH BROWN (10YR 5/6) SANDY LOAM MIXED WITH DARK GRAYISH BROWN (10YR 4/2) SANDY LOAM
- B FEATURE 57, STRATUM B ("RED RING") : REDDISH YELLOW (7.5YR 6/8) SANDY LOAM MIXED WITH DARK GRAYISH BROWN (10YR 4/2) SANDY LOAM
- C SUBSOIL: STRONG BROWN (7.5YR 5/6) COARSE SAND



*ABOVE MEAN SEA LEVEL

FIGURE K-22: Stratigraphic Profile of Feature 57, Facing North

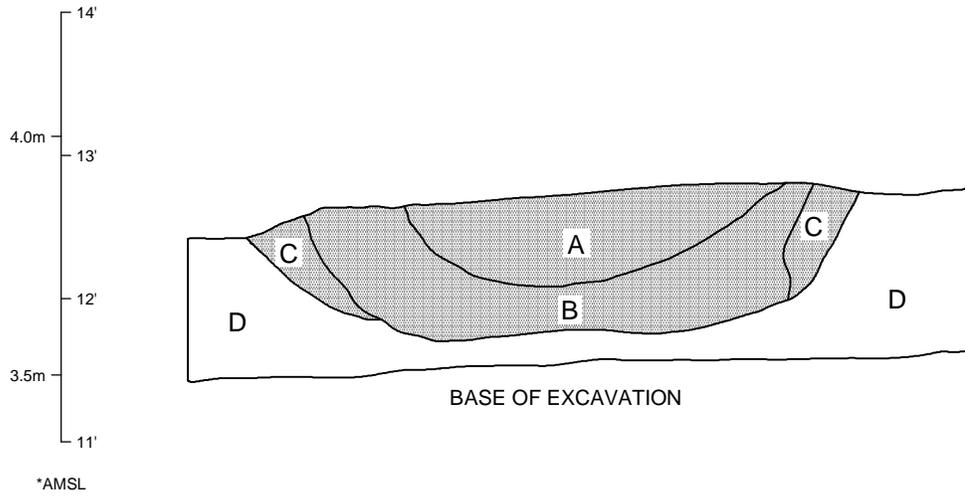
Feature 58

<i>Location</i>		<i>Artifacts</i>
Locus 1, Silo Pit area		1 jasper debitage
Red-Ringed Pits, 10 m south of Main Pit Cluster		
<i>Shape</i>		
Plan: irregular oval		
Profile: shallow, irregular basin		
<i>Dimensions</i>		
Surface:	130x110 cm	
Depth:	33 cm	

Feature 58 was one of the red-ringed pits, part of the cluster located about 10 meters south of the Main Pit Cluster. This feature is now thought to have been an ancient natural disturbance of some kind. The subsoil around these pits was pure sand, but the feature soil was a compact sandy loam. These pits were of different sizes and shapes, but they all had a reddish ring around their outside. In Feature 58, the interior soil (Stratum A) was described as a yellowish brown (10YR 5/6) loamy sand, while the exterior ring (Stratum B) was a strong brown (7.5YR 5/8) sandy loam (Figure K-23). Unlike in Features 57 and 59, Stratum B in Feature 58 extended across the bottom of the feature. The distinctive reddish rings that characterized these features were probably created by natural chemical processes which are related to the drainage characteristics of the soil. The soil within the pits was of a finer texture (predominantly silt) than the surrounding subsoil, creating increased water flows along the feature boundary; this area also dried out faster because it was in contact with the surrounding sand. The combination of increased water flow and rapid drying led to increased oxidation, creating the red color. Because of the irregular shape of some of these pits, especially Features 57 and 58, they are now thought to be natural.

Sample List for Feature 58

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Flotation 2L	A	2	1212	curated	Soil Chem.	B	2	1234	curated
Flotation 2L	B	2	1234	curated	Phytolith	A	2	1212	curated
Soil Chem.	A	2	1212	curated	Phytolith	B	2	1234	curated



LEGEND

- A FEATURE STRATUM A : YELLOWISH BROWN (10YR 5/6) SANDY LOAM
- B FEATURE STRATUM B : DARK YELLOWISH BROWN (10YR 4/6) SANDY LOAM
- C FEATURE STRATUM C ("RED RING") : REDDISH YELLOW (7.5YR 6/8) COARSE LOAMY SAND
- D SUBSOIL : BROWNISH YELLOW (10YR 6/8) LOAMY SAND BANDED WITH STRONG BROWN (7.5YR 5/6) COARSE SAND



*ABOVE MEAN SEA LEVEL

FIGURE K-23: Stratigraphic Profile of Feature 58, Facing North

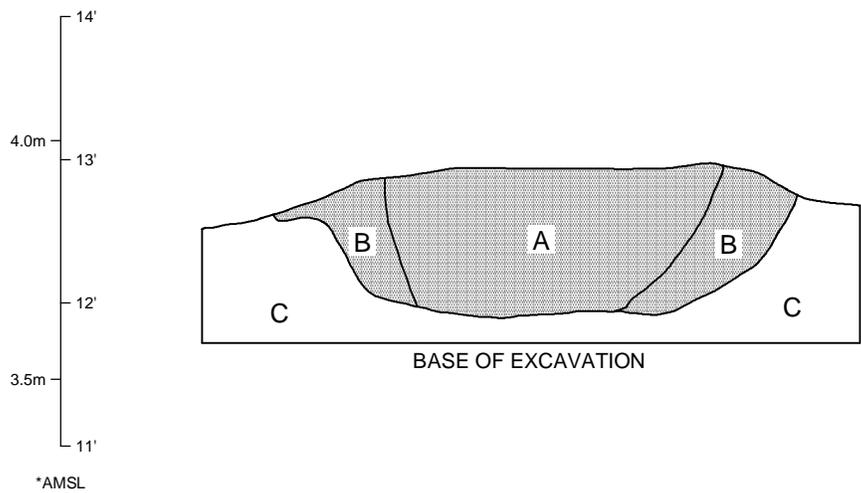
Feature 59

<i>Location</i>		<i>Artifacts</i>	
Locus 1, Silo Pit area		2 debitage:	
Red-Ringed Pits, 10 m south of Main Pit Cluster		1 chert	
<i>Shape</i>		1 jasper	
Plan: irregular ovoid			
Profile: shallow, irregular basin			
<i>Dimensions</i>			
Surface:	110x100 cm		
Depth:	30 cm		

Feature 59 was one of the red-ringed pits, part of the cluster located about 10 meters south of the Main Pit Cluster. These pits were probably ancient natural disturbances of some kind (see discussion of Feature 58). Feature 59 was the most regular of these features, since it was nearly round and had a very consistent ring (Figure K-24). The interior soil (Stratum A) was described as a dark yellowish brown (10YR 4/4) sandy loam, while the exterior ring (Stratum B) was a strong brown (7.5YR 5/8) sandy loam. Two small pieces of debitage were recovered from Stratum A.

Sample List for Feature 59

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	1	1149	curated	Soil Chem.	A	2	1230	curated
Flotation 2L	A	1	1218	curated	Soil Chem.	A	3	1233	curated
Flotation 2L	A	2	1230	curated	Phytolith	A	1	1218	curated
Flotation 2L	A	3	1233	curated	Phytolith	A	2	1230	curated
Soil Chem.	A	1	1218	curated	Phytolith	A	3	1233	curated



LEGEND

- A FEATURE STRATUM A: DARK YELLOWISH BROWN (10YR 4/6) SANDY LOAM
- B FEATURE STRATUM B ("RED RING"): STRONG BROWN (7.5YR 5/6) SANDY LOAM
- C SUBSOIL: BROWNISH YELLOW (10YR 6/8) LOAMY SAND BANDED WITH STRONG BROWN (7.5YR 5/6) COARSE SAND



*ABOVE MEAN SEA LEVEL

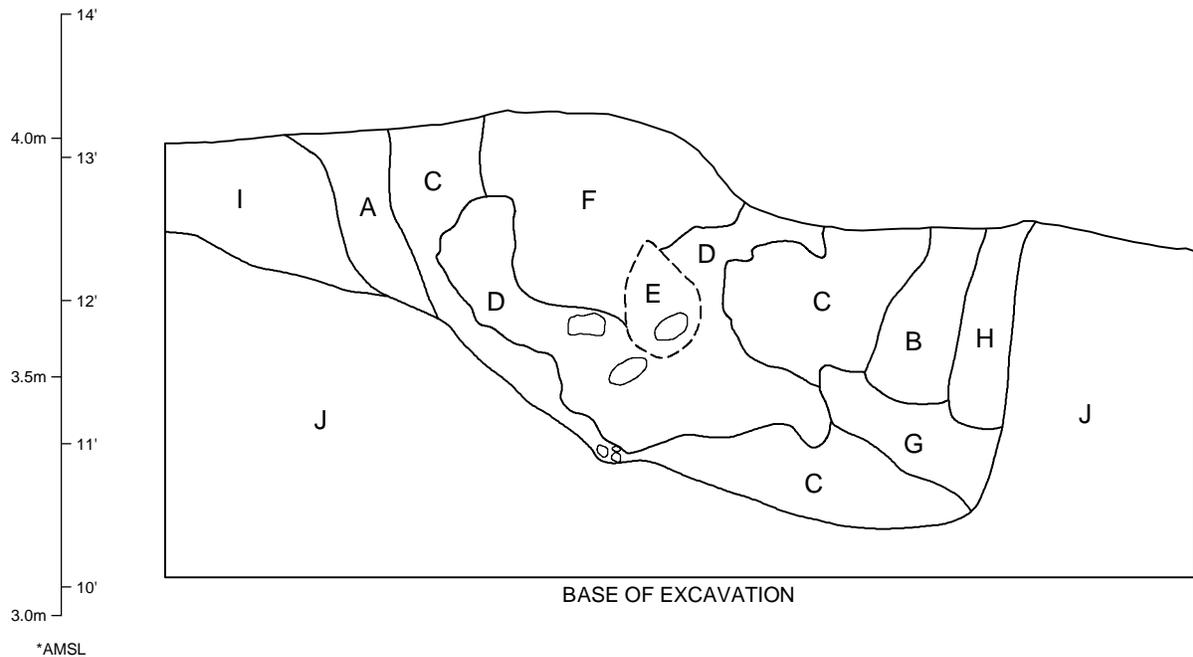
FIGURE K-24: Stratigraphic Profile of Feature 59, Facing North

Feature 60

<i>Location</i>		<i>Artifacts</i>
Locus 1, Silo Pit area		1 jasper stemmed projectile point
Red-Ringed Pits, 10 m south of Main Pit Cluster		1 jasper bifurcate-based projectile point
<i>Shape</i>		1 broken chert late-stage biface
Plan: irregular semicircle		1 broken chert biface
Profile: irregular basin		1 jasper freehand core
<i>Dimensions</i>		2 small pieces burned clay or daub
Surface:	380x185 cm	18 possible FCR
Depth:	87 cm	53 debitage:
		29 chert
		22 jasper
		2 quartz

Feature 60 was one of two extremely problematic features in Locus 1 that appeared from their shapes and stratigraphies to be natural but contained large numbers of prehistoric artifacts. (The other was Feature 69). Feature 60 was located near the red-ringed pits at the southern edge of the excavation, adjacent to another similar disturbance, Feature 62. In plan view, Feature 60 was roughly crescent shaped, but it contained many different fills, some of them obviously displaced subsoil (Figure K-25). In profile, the feature was asymmetrical and jumbled (Figure K-26). All observers, including Dr. Wagner, agreed that the feature resembled a tree throw. However, a small trench excavated across the feature yielded a broken anvil or nutting stone and 22 other stone artifacts. Because of the consensus that the feature was natural, no more of the feature was excavated at that time. At the end of the excavation, a larger sample of the remaining feature fill was shoveled out and screened simply to obtain more artifacts. This fill yielded a bifurcate-based projectile point, a small-stemmed point resembling those found in large numbers at Locus 3, two broken bifaces, and more than 50 pieces of debitage.

The origin of these artifacts is obscure. Plowzone sample units excavated near the feature yielded very few artifacts, and the nearby features were mostly sterile. Therefore, it seems unlikely that they could represent part of a generalized artifact scatter that somehow became incorporated into a natural disturbance. However, the artifacts are not likely to have been derived from a single prehistoric feature, since the bifurcate-based point and the small-stemmed point must come from different periods. Perhaps there was one prehistoric feature, of Late Archaic or Early Woodland date, that contained the stemmed point and most of the debitage, and the bifurcate-based point is an intrusion. In that case, the Early Woodland pit was destroyed by the tree fall that created the overall shape of Feature 60.



LEGEND

- A DARK YELLOWISH BROWN (10YR 4/6) COARSE SAND
- B STRONG BROWN (7.5YR 4/6) LOAMY SAND, 10 % GRAVELS
- C STRONG BROWN (7.5YR 4/6) SANDY LOAM, MIXED WITH YELLOWISH BROWN (10YR 5/4) SANDY LOAM
- D LIGHT YELLOWISH BROWN (10YR 6/4) SANDY LOAM
- E BROWN (10YR 5/3) SANDY LOAM WITH CHARCOAL FLECKING
- F DARK YELLOWISH BROWN (10YR 4/4) SANDY LOAM
- G DARK YELLOWISH BROWN (10YR 4/6) LOAMY SAND MIXED WITH STRONG BROWN (7.5YR 4/4) AND BROWNISH YELLOW (10YR 6/6) LOAMY SAND
- H BROWNISH YELLOW (10YR 6/6) COARSE SAND
- I YELLOWISH BROWN (10YR 5/6) LOAMY SAND, MIXED WITH BROWNISH YELLOW (10YR 6/6) LOAMY SAND
- J BROWNISH YELLOW (10YR 6/6) SAND, BANDED WITH BROWN (7.5YR 4/4) HORIZONTAL LAMELLAE
-  ROCK
-  SMALL PEBBLES



*ABOVE MEAN SEA LEVEL

FIGURE K-26: Stratigraphic Profile of Feature 60, Facing North

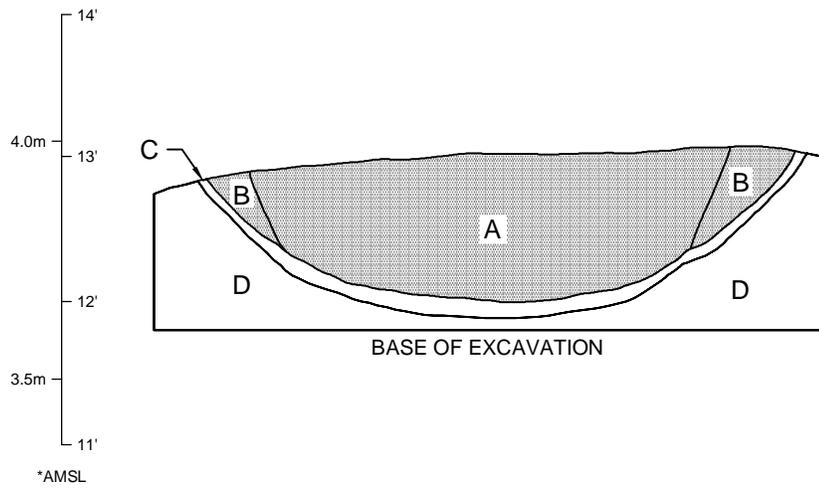
Feature 61

<i>Location</i>	<i>Artifacts</i>
Locus 1, Silo Pit area	none
Red-Ringed Pits, 10 m south of Main Pit Cluster	
<i>Shape</i>	
Plan: irregular ovoid	
Profile: shallow, irregular basin	
<i>Dimensions</i>	
Surface:	132x114 cm
Depth:	28 cm

Feature 61 was one of the red-ringed pits, part of the cluster located about 10 meters south of the Main Pit Cluster. These pits are now thought to have been ancient natural disturbances of some kind (see discussion of Feature 58). These pits were of different sizes and shapes, but they all had a reddish ring around their outsides. Feature 61 had a peculiar extension running off to the north, about 15 centimeters wide and extending for at least 40 centimeters. This extension was shallow (less than 10 centimeters) and resembled a rodent tunnel. The soil in the extension was apparently identical to Stratum B (the exterior soil or red ring) in the main feature. Stratum B was described as a strong brown (7.5YR 5/8) sandy loam. The interior soil (Stratum A) was described as a yellowish brown (10YR 5/8) sandy loam (Figure K-27). Stratum B did not extend across the bottom of the feature, but only formed a discontinuous ring around the outside. No artifacts were found in Feature 61.

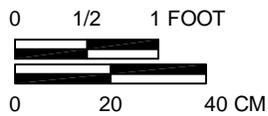
Sample List for Feature 61

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Flotation 2L	B	1	1304	curated	Soil Chem.	A	2	1305	curated
Flotation 2L	A	2	1305	curated	Phytolith	B	1	1304	curated
Soil Chem.	B	1	1304	curated	Phytolith	A	2	1305	curated



LEGEND

- A FEATURE STRATUM A : YELLOWISH BROWN (10YR 5/6) SILT LOAM
- B FEATURE STRATUM B ("RED RING") : STRONG BROWN (7.5YR 5/8) SANDY LOAM
- C SUBSOIL: BROWNISH YELLOW (10YR 6/8) LOAMY SAND BANDED WITH STRONG BROWN (7.5YR 5/6) COARSE SAND
- D UNEXCAVATED SUBSOIL



*ABOVE MEAN SEA LEVEL

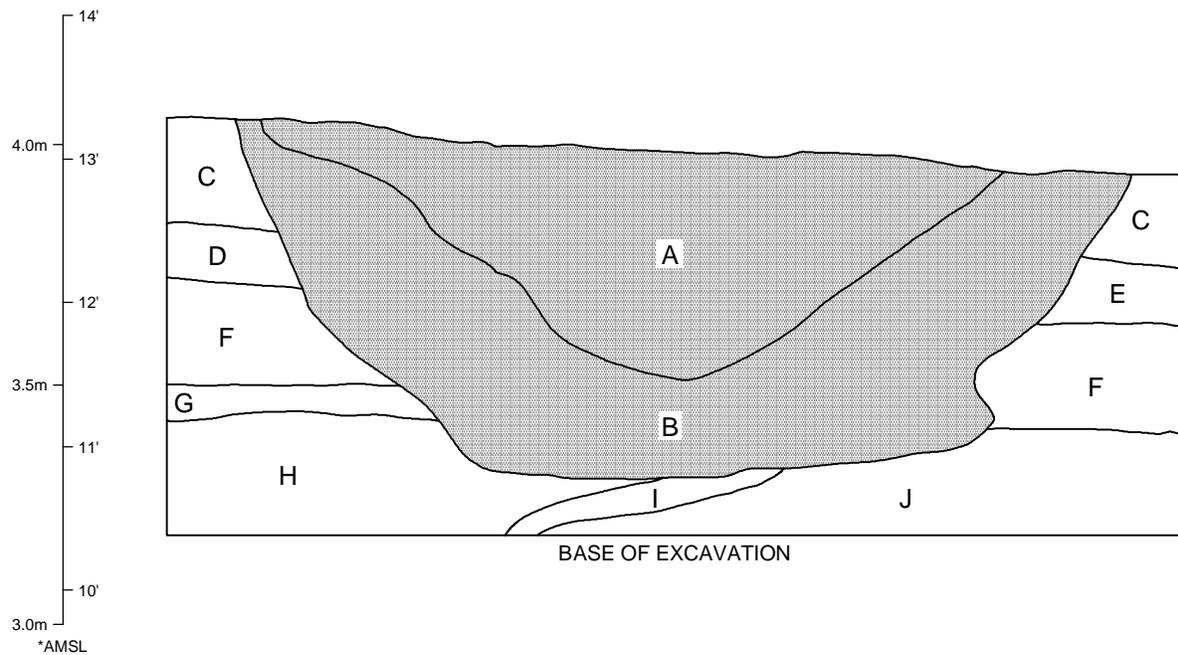
FIGURE K-27: Stratigraphic Profile of Feature 61, Facing North

Feature 64

<i>Location</i>		<i>Macrobotanical Remains</i>
Locus 1, Silo Pit area		wood charcoal (not identified)
Red-Ringed Pits, 10 m south of Main Pit Cluster		<i>Artifacts</i>
<i>Shape</i>		1 Kirk corner-notched projectile point
Plan: roughly circular		5 debitage:
Profile: basin		2 chert
<i>Dimensions</i>		2 jasper
Surface: 188x194 cm		1 quartz
Depth: 72 cm		
<i>Radiocarbon Dates</i>		
3,600±50 BP	Stratum A, Level 2	
2,830±50 BP	Stratum A, Level 4	

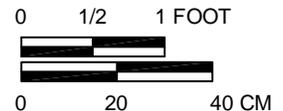
Feature 64 was the largest of the red-ringed pits, located about 10 meters south of the Main Pit Cluster. These pits are now thought to have been ancient natural disturbances of some kind, although it is possible that Feature 64 was a cultural pit. Feature 64 straddled a clear break in the subsoil of the site, associated with a remnant terrace edge visible as a steepening of the slope. North of the feature the subsoil was mostly sandy loam, but to the south it was pure sand. The stratigraphy of Feature 64 was somewhat different from that of the smaller red-ringed pits (see discussion of Feature 58). There were, as with the others, two main soils. Stratum A, the interior soil, was described as a dark yellowish brown (10YR 4/4) loamy sand, and Stratum B, the exterior soil, as a mixture of light olive brown (2.5Y 5/6), yellowish brown (10YR 5/8), and dark yellowish brown (10YR 4/6) loamy sand, somewhat siltier than Stratum A. Stratum B was not just an exterior ring, as in Features 57 and 59, but a massive deposit, up to 40 centimeters thick and composing more than half of the feature's volume (Figure K-28).

The exterior boundary of the feature was complex and presented some difficulties. Although the feature fill was dramatically different in texture from the underlying sands, there were nevertheless places where the boundary was very irregular, leaving pockets of sandy subsoil nearly surrounded by feature fill. Some of the excavators thought this irregular boundary implied the feature was a tree hole or other natural disturbance. There were also a number of small lenses of sandy soil between the main feature fill and the subsoil. A Kirk corner-notched point about 9,000 years old was found in one of these lenses, at the bottom of the feature. Small pieces of charcoal found in Stratum A yielded dates of 3,600±50 and 2,830±50 radiocarbon years BP, suggesting that the pits are not as old as the point.



LEGEND

- A FEATURE STRATUM A : DARK YELLOWISH BROWN (10YR 4/6) LOAMY SAND, 10% GRAVELS
- B FEATURE STRATUM B : YELLOWISH BROWN (10YR 5/8) SANDY LOAM MIXED WITH LIGHT YELLOWISH BROWN (10YR 6/4) SANDY LOAM
- C B-HORIZON: STRONG BROWN (7.5YR 5/8) SAND, 5 % SMALL PEBBLES
- D B-HORIZON: YELLOWISH BROWN (10YR 5/6) SAND AND 50 % GRAVELS
- E B-HORIZON: YELLOWISH BROWN (10YR 5/6) SAND
- F B-HORIZON: BROWNISH YELLOW (10YR 6/6) SAND WITH STRONG BROWN (7.5YR 5/6) LAMELLAE
- G C-HORIZON: BROWNISH YELLOW (10YR 6/6) SAND WITH 50 % GRAVELS
- H C-HORIZON: STRONG BROWN (7.5YR 5/8) COARSE SAND WITH 15 % GRAVELS
- I C-HORIZON: REDDISH YELLOW (7.5YR 6/6) COARSE SAND WITH 50 % GRAVELS
- J C-HORIZON: BROWNISH YELLOW (10YR 6/6) SAND WITH STRONG BROWN (7.5YR 4/6) LAMELLAE AND 15 % ROUNDED GRAVELS
- K C-HORIZON: BROWNISH YELLOW (10YR 6/6) SAND, BANDED WITH BROWN (7.5YR 4/4) HORIZONTAL LAMELLAE



*ABOVE MEAN SEA LEVEL

FIGURE K-28: Stratigraphic Profile of Feature 64, Facing North

Sample List for Feature 64

Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	1	723	curated	Soil Chem.	A	5	1070	curated
Charcoal	A	2	726	processed	Soil Chem.	B	2	1124	curated
Charcoal	A	3	728	processed	Soil Chem.	B	6	1138	processed
Charcoal	A	5	733	curated	Soil Chem.	D	8	1332	curated
Charcoal	A	2	1056	curated	Soil Chem.	Bt	-	1442	curated
Charcoal	B	1	1123	curated	Soil Chem.	2BC	-	1443	curated
Charcoal	B	2	1124	curated	Soil Chem.	2C	-	1444	curated
Charcoal	B	6	1138	curated	Soil Chem.	3C	-	1445	curated
Charcoal	B	7	1139	curated	Soil Chem.	4BCb	-	1446	curated
Flotation 2L	A	2	1056	curated	Soil Chem.	4C	-	1447	curated
Flotation 2L	A	5	1070	curated	Phytolith	A	2	1056	curated
Flotation 2L	B	2	1124	curated	Phytolith	A	5	1070	curated
Flotation 2L	B	6	1138	curated	Phytolith	B	2	1124	curated
Flotation 2L	D	8	1332	curated	Phytolith	B	6	1138	curated
Soil Chem.	A	2	1056	processed	Phytolith	D	8	1332	curated

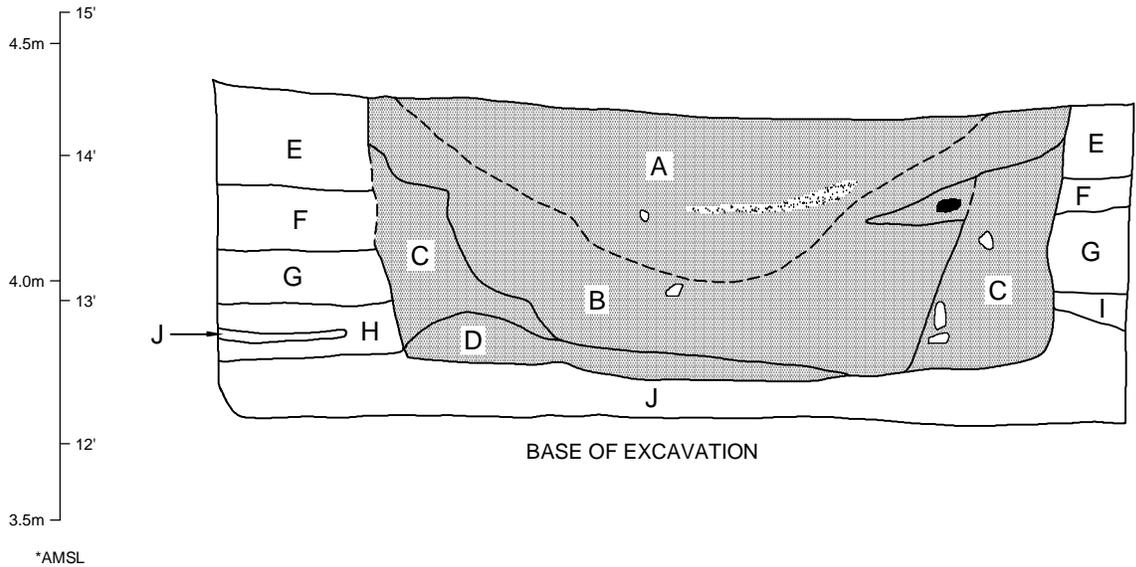
Feature 66

<i>Location</i>		<i>Macrobotanical Remains</i>	
Locus 1, Silo Pit area		charred hickory nut hulls	
Western edge of the Main Pit Cluster		wood charcoal (maple, hickory, holly, oak)	
<i>Shape</i>		<i>Artifacts</i>	
Plan: round		2 small ceramic sherds, crushed quartz temper,	
Profile: straight sides, flat bottom		check-stamped exterior	
<i>Dimensions</i>		8 possible FCR	
Surface:	150x145 cm	1 hammerstone	
Bottom Diameter:	136 cm	1 small piece of petrified wood	
Depth:	55 cm	7 debitage:	
Volume:	860 L	6 chert	
<i>Radiocarbon Dates</i>		1 quartz	
1,850±60 BP	Stratum A, Level 2		
1,730±90 BP	Stratum A, Level 4		

Feature 66 was a silo pit at the western edge of the main cluster. It was quite shallow for its size, compared to the others in the cluster. The feature contained four different fills (Figure K-29). The uppermost fill, Stratum A, was predominantly dark yellowish brown (10YR 4/6) loamy sand, with small inclusions of slightly darker (10YR 4/4) and lighter (10YR 5/6) soil and heavy charcoal flecking. Stratum A included several small and one large lens of charcoal and burned soil; these lenses were extensively sampled for flotation. Beneath Stratum A was Stratum B, which was very similar to Stratum A but contained less charcoal and was somewhat more even in color. Around the edges of the feature, beneath Stratum B, was slumped subsoil, designated Stratum C. Because Stratum C was identical to the uppermost subsoil layer, it was not seen to be part of the feature until after the window was dug around the first excavated half. Beneath Strata B and C was Stratum D, a thin layer of yellowish brown (10YR 5/4) loamy sand in the bottom of the feature. Feature 66 yielded two small ceramic sherds, a possible hammerstone, and a small piece of petrified wood. Chemical analysis of the soils in Feature 66 showed that the levels of calcium, potassium, and phosphorus were raised slightly above those of the surrounding subsoil.

Sample List for Feature 66

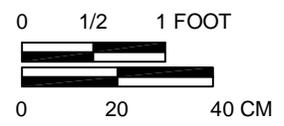
Type	Strat.	Level	Cat. #	Status	Type	Strat.	Level	Cat. #	Status
Charcoal	A	1	704	curated	Flotation 2L	A	2	868	processed
Charcoal	A	2	707	processed	Flotation 2L	B	2	869	processed
Charcoal	A	3	708	curated	Flotation 2L	A	6	898	processed
Charcoal	A	4	711	processed	Flotation 2L	A	2	1072	processed
Charcoal	A	5	713	curated	Flotation 2L	B	6	1103	curated
Charcoal	A	1	859	curated	Soil Chem.	A	2	868	processed
Charcoal	A	2	868	curated	Soil Chem.	B	2	869	processed
Charcoal	A	5	897	curated	Phytolith	A	2	868	processed
Charcoal	A	1	1066	curated	Phytolith	B	2	869	curated
Charcoal	A	2	1072	curated					



LEGEND

- A FEATURE STRATUM A: DARK YELLOWISH BROWN (10YR 4/6) LOAMY SAND MIXED WITH YELLOWISH BROWN (10YR 5/6) LOAMY SAND, ABUNDANT CHARCOAL
- B FEATURE STRATUM B: DARK YELLOWISH BROWN (10YR 4/6) SANDY LOAM MIXED WITH YELLOWISH BROWN (10YR 5/6) SANDY LOAM, VERY LITTLE CHARCOAL
- C FEATURE STRATUM C: YELLOWISH BROWN (10YR 5/8) SAND MIXED WITH DARK YELLOWISH BROWN (10YR 4/6) LOAMY SAND
- D FEATURE STRATUM D: YELLOWISH BROWN (10YR 5/4) LOAMY SAND MIXED WITH YELLOWISH BROWN (10YR 5/8) LOAMY SAND
- E B-HORIZON: STRONG BROWN (7.5YR 5/8) LOAMY SAND, 10 % PEBBLES
- F B-HORIZON: BROWNISH YELLOW (10YR 6/8) SAND, 15 % PEBBLES
- G B-HORIZON: BROWNISH YELLOW (10YR 6/6) LOAMY SAND WITH 5 % GRAVELS
- H C-HORIZON: STRONG BROWN (7.5YR 5/8) COARSE SAND AND GRAVELS
- I C-HORIZON: BROWNISH YELLOW (10YR 6/6) VERY FINE SAND
- J C-HORIZON: REDDISH YELLOW (7.5YR 6/8) SAND WITH LENSES OF SMALL PEBBLES

-  CHARCOAL LENS
-  ROCK
-  HAMMERSTONE



*ABOVE MEAN SEA LEVEL

FIGURE K-29: Stratigraphic Profile of Feature 66, Facing West