CULTURAL RESOURCES TESTING OF TWO SITES WITHIN THE WHITE OAK CREEK WILDLIFE MANAGEMENT AREA, BOWIE AND TITUS COUNTIES, TEXAS

by
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for
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and
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Fort Worth District

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This report chronicles the results of archeological test excavations conducted at two prehistoric sites, 41BW553 and 41TT670, located within the White Oak Creek Wildlife Management Area (WMA) in Bowie and Titus counties, Texas. The excavations were conducted at these sites, both of which are on federal property, in order to assess their eligibility for inclusion in the National Register of Historic Places (NRHP).

Excavations yielded significant evidence of multicomponent Archaic and Caddoan occupations at both sites, and are believed to contribute significantly to the archeological database for the Northeast Texas region. Considering these results, it is recommended that both 41BW553 and 41TT670 meet the criteria of eligibility for inclusion in the NRHP. The midden areas at each site are felt to have the greatest significance and the greatest research potential; within 41BW553's midden, for example, an *in situ* ceramic vessel was found in association with scraps of bone, and may represent the remains of a human burial. In light of the NRHP-status of these two sites, steps should be taken to preserve and protect them from loss due to any future actions or to mitigate the loss of data should protection prove to be infeasible.

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EXECUTIVE SUMMARY

This report presents the results of archeological test excavations conducted at two prehistoric sites, 41BW553 and 41TT670, located within the White Oak Creek Wildlife Management Area (WMA) in Bowie and Titus counties, Texas. Both of these sites area located on federal property, and excavations were conducted in order to assess their eligibility for inclusion in the National Register of Historic Places (NRHP).

The excavations yielded significant evidence of multicomponent Archaic and Caddoan occupations at both sites, and are believed to contribute significantly to the archeological database for the Northeast Texas region. Both sites were found to contain midden deposits and intact features, including an apparent burial at 41BW553 and a hearth at 41TT670, and both sites yielded moderate samples of osteological, malacological, and macrobotanical remains, as well as datable ceramics and lithic artifacts. Considering these results, it is believed that both 41BW553 and 41TT670 retain a high potential for containing data important for our understanding of the prehistory of Northeast Texas, and it is recommended that both sites be considered eligible for inclusion in the NRHP under Criterion D. In light of the NRHP-status of these two sites, steps should be taken to preserve and protect them from any future adverse impacts resulting from development of the White Oak Creek Wildlife Management Area, or to mitigate the loss of data should protection prove not to be feasible.

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ABSTRACT

From April 1 to April 21, 1996, archeological test excavations were conducted at two prehistoric sites, 41BW553 and 41TT670, located in the White Oak Creek Wildlife Management Area (WMA) in Northeast Texas. Site 41BW553 lies immediately northwest of Flag Lake, an abandoned oxbow of the Sulphur River in the south central portion of Bowie County, Texas, east of the confluence of the Sulphur River and White Oak Creek. Site 41TT670 is located adjacent to Little Grassy Lake, north of White Oak Creek in the northeastern portion of Titus County, Texas. This testing was conducted in order to assess each site's eligibility for inclusion in the National Register of Historic Places (NRHP).

Site 41BW553 covers approximately 56,000 m^2 and contains significant remains datable to the Terminal Archaic/Early Ceramic (ca. 200 B.C.-A.D. 800), Early Caddoan (A.D. 1000-1200), and Late Caddoan (A.D. 1400-1680) periods, with smaller amounts of material possibly dating to the Early Archaic (7,000-4,000 B.C.) and Middle Caddoan (A.D. 1200-1400) periods. The most intensive occupations were identified in the central and southern portions of the site, where cultural remains were recovered to a depth of 90 cm. A single posthole of uncertain age (Feature 1); a second posthole of possible Middle Caddoan age (Feature 5); a concentration of lithic and ceramic artifacts, bone, and charcoal of Early Caddoan age (Feature 3); and a Late Caddoan midden (Feature 6) were identified in the central portion of the site. An in situ ceramic vessel (Feature 7), associated with fragments of bone, was found beneath the midden and may represent the poorly-preserved remains of an Early Caddoan burial. As a result of coordination with the Fort Worth Corps of Engineers and the Caddo Tribe of Oklahoma, these remains were left in situ and reburied in accordance with the wishes of the Caddo.

Site 41TT670 covers a total area of approximately 39,375 m^2 and contains significant remains datable to the Early-Middle Caddoan period (A.D. 1000-1400), with smaller amounts of Late Archaic (2000-200 B.C.) and/or Early Ceramic (200 B.C.-A.D. 800) material. Three areas of high subsurface artifact densities were identified — one associated with an Early-Middle Caddoan midden located in the south central section of the site, one on the central high point of the westernmost knoll, and one at the southeastern edge of the site. These areas contained relatively large quantities of ceramics, lithics, shell, and bone. The most intensive occupation/activity area was located near the center of the southern ridge, where a probable posthole of unknown date (Feature 1), an in situ hearth of Early-Middle Caddoan date (Feature 2), and the midden (Feature 3) were identified.

As a result of this work, sites 41BW553 and 41TT670 are both recommended to be eligible for inclusion in the NRHP under Criterion D, and it is further recommended that both sites be avoided by future actions associated with development of the White Oak Creek WMA. Failing this, extensive data recovery operations should be carried out prior to the commencement of any development activities.

ACKNOWLEDGMENTS

The authors of this report would like to express their appreciation to the many individuals and organizations who contributed to the successful completion of this project. The Broseco Ranch personnel, particularly Ranch Manager Tom Woodward and Administrative Secretary Amy Cameron, were particularly helpful in arranging access to site 41TT670. Texas Parks and Wildlife Area Manager John Jones provided useful information and assistance concerning both sites, as well as the White Oak Creek WMA in general. Special thanks go to Mr. Jay Newman, U.S. Army Corps of Engineers Technical Representative, for his administrative guidance and support. In the field, the diligence and dedication of the crew members were essential to the successful completion of the fieldwork. The crew for the testing at site 41BW553 included Mr. Kyle Day, Ms. Virginia Hatfield, Mr. Mark Holderby, and Mr. Chris Hogan. The crew for the testing at site 41TT670 included Ms. Kim Morell, Mr. Jeff Weinburger, and Mr. Chris Kugler. Mr. Steven Hunt served as Field Supervisor at site 41TT670. Ms. Kellie A. Krapf, TOPCON technician, mapped both sites. Ms. Debra L. Beene (41TT670) and Mr. Floyd B. Largent, Jr. (41BW553), served as Project Archeologists under the direction of Dr. Maynard Cliff, Principal Investigator. Dr. Cliff and Project Geologist Dr. Whitney J. Autin of Louisiana State University conducted geological investigations of the White Oak Creek WMA, including both sites, with the assistance of Mr. Gary L. Shaw, Ms. Beene, Ms. Krapf, and Mr. Largent.

Artifact analysis and data input were undertaken by the staff of Geo-Marine, Inc., and a number of subcontractors, under the direction of Dr. Cliff. The prehistoric lithic materials were analyzed by Mr. Largent and described by Mr. Largent and Ms. Beene. Most of the lithic raw material types were identified by Mr. Largent and Ms. Sharlene Allday, with additional identifications by Mr. Larry Banks. Dr. Rebecca Procter analyzed and described the prehistoric ceramic material, with help from Dr. Cliff. Ceramic thin sections were made by Spectrum Petrographics, Inc., of Winston, Oregon, and petrographic analysis was done by Mark Ennes, of Geo-Marine, El Paso. The faunal material, with the exception of the mussel shell, was analyzed by Mr. Brian Shaffer of the University of North Texas. Dr. Richard Fullington analyzed the molluscan remains. Dr. Richard Holloway, of Flagstaff, Arizona, analyzed the macrobotanical material. Douglas Frink and the Archaeology Consulting Team of Essex Junction, Vermont, performed Oxidizable Carbon Ratio dating for soil samples from both sites. Radiocarbon samples from both sites were processed by Beta Analytic Inc., of Miami, Florida. Artifact illustration was by Ms. Julianne Gadsden. CAD maps, plans, and profiles were done by Ms. Kim Hill and Ms. Kellie Krapf. Three dimensional SURFER maps were done by Ms. Krapf. Dr. Cliff was responsible for final copy editing. Manuscript formatting and final production was performed by Ms. Denise Pemberton. Without the efforts of all these people this report could not have been completed.

CHAPTER 1
INTRODUCTION

by
Steven M. Hunt, Floyd B. Largent, Jr., Debra L. Beene, and Maynard B. Cliff

The following report presents the results of test excavations conducted at two prehistoric sites in the White Oak Creek Wildlife Management Area (WMA), in Bowie and Titus counties, Texas. This testing was conducted in order to assess each site's eligibility for inclusion in the National Register of Historic Places (NRHP) as part of the efforts of the U.S. Army Corps of Engineers (CE) to meet its responsibilities under Section 110 of the National Historic Preservation Act of 1966, as amended through 1992 (P.L. 89-665; 80 Stat. 915; 16 U.S.C. § 470 *et seq*).

The White Oak Creek WMA is a mitigation measure for the loss of natural resources (particularly wetlands) resulting from the construction of Cooper Lake, located farther west within the Sulphur River basin (Figure 1). Following the purchase of lands to comprise the WMA, the CE was required by federal law to assess the potential impacts to the cultural resources of this development under the National Historic Preservation Act of 1966, as amended through 1992; the Archeological and Historical Preservation Act of 1974, as amended (PL 93-291); and the National Environmental Policy Act of 1969 (PL 90-190).

Work began in the spring of 1990, with a survey of approximately 1,430 acres comprising the Moist Soils Management Area (MSMA) of the WMA in Cass county (Cliff and Peter, eds. 1992). Additional survey was conducted from 1990 to 1992 (Cliff, ed. 1994); and in 1993-1994, a final phase of survey was undertaken, involving 5,000 acres within three of the four counties (i.e., Bowie, Cass, and Titus) that include portions of the WMA (Cliff, White, Hunt, Pleasant, and Shaw 1996). All of this work was conducted as part of the CE's commitment to examine all accessible areas of the WMA for cultural resources. The final phase of survey at the WMA resulted in the recording of 59 cultural resources properties, 29 of which, including sites 41BW553 and 41TT670, were recommended to be of unknown eligibility for inclusion in the NRHP. Further work, in the form of additional archeological testing, was recommended for these sites in order to clarify their NRHP status. Sites 41BW553 and 41TT670 were chosen for test excavation subsequent to similar excavations previously carried out at sites 41CS150, 41CS151, and 41CS155/156 (Cliff and Hunt 1995).

In April and May of 1996, the recommended test excavations were conducted at these sites to determine whether they were eligible for inclusion in the NRHP. The work was performed by Geo-Marine, Inc., for Science Applications International Corporation (SAIC), under contract to the U.S. Army Corps of Engineers, Fort Worth District, Contract Number DACA63-95-D-0020, Delivery Order No. 26. Initial fieldwork was conducted from April 1 to April 21, 1996, by personnel under the direction of Dr. Maynard Cliff (Principal Investigator) and the direct supervision of Ms. Debra L. Beene (Project Archeologist for site 41TT670), Mr.

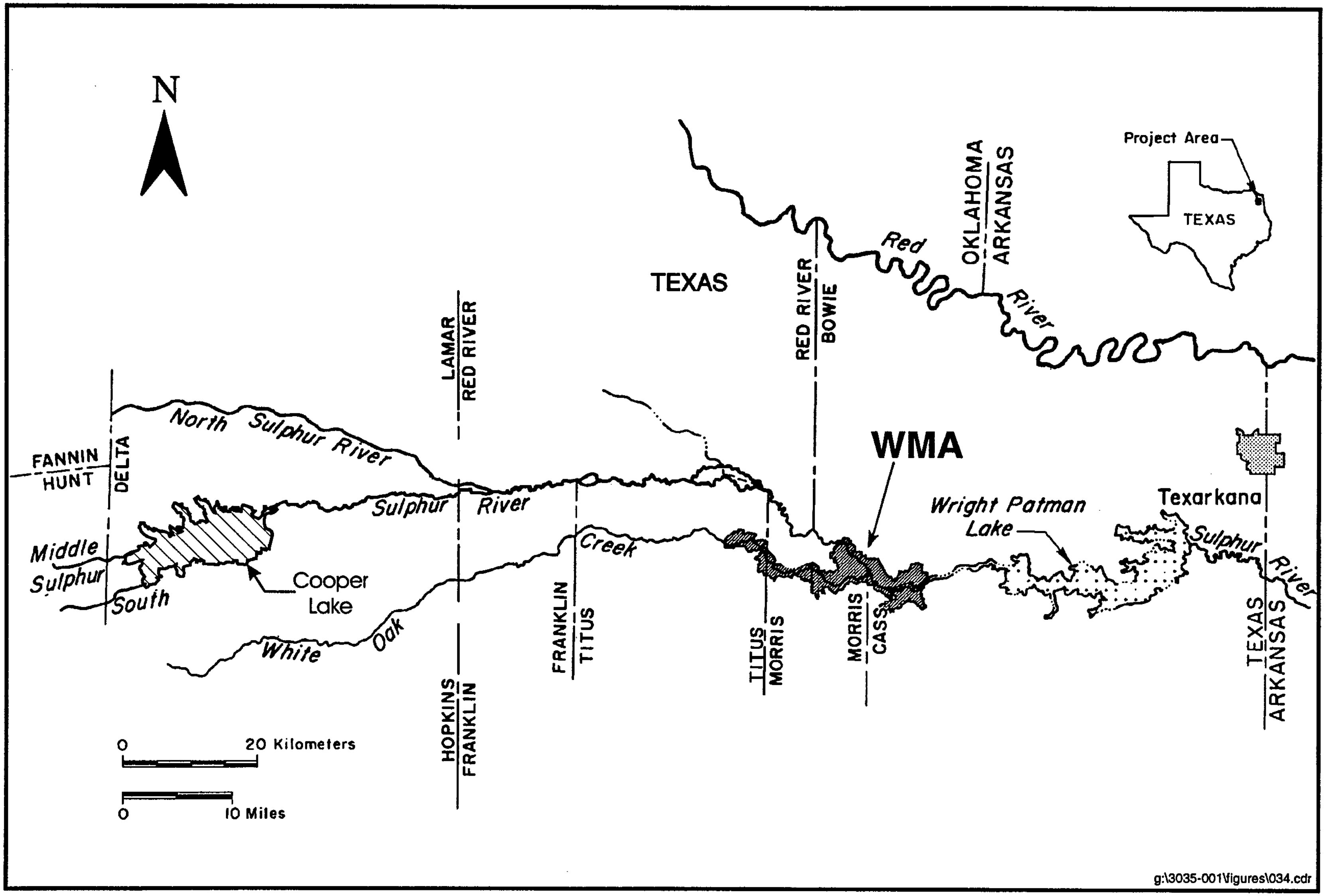

Figure 1. Location of the White Oak Creek Wildlife Management Area (WMA) within the lower Sulphur River basin, Northeast Texas.

Floyd Largent (Project Archeologist for site 41BW553), and Mr. Steven Hunt (Field Supervisor for site 41TT670). Subsequent geological investigations at the White Oak Creek WMA, which included work at both sites, was undertaken from May 20 to 24, 1996 by Dr. Whitney J. Autin of Louisiana State University, with the assistance of Dr. Cliff, Ms. Beene, Mr. Largent, Mr. Gary L. Shaw, and Ms. Kellie A. Krapf.

The present report consists of seven chapters and eight appendices. Chapter 1 consists of an introduction to the report. Chapters 2 and 3 provide the natural and cultural setting of the region, respectively. Research goals and methods are presented in Chapter 4. Discussion of the excavations at sites 41BW553 and 41TT670 are provided in Chapters 5 and 6, respectively. Finally, a summary of the research significance of each site, along with recommendations concerning their NRHP assessments and their treatment, is presented in Chapter 7. The appendices which follow the main body of the report present descriptions of selected test unit and backhoe trench profiles from both sites (Appendix A); analyses and discussions of the prehistoric ceramic artifacts recovered from the sites (Appendix B); the prehistoric lithic artifact classes used in the analysis and summary tables of all lithic artifacts collected (Appendix C); a discussion of the methodology used to analyze the few historic artifacts collected from these sites, as well as tabular summaries of the historic artifacts (Appendix D); descriptions of the vertebrate faunal remains recovered from both sites (Appendix E); descriptions of the macrobotanical remains recovered from both sites (Appendix F); the results of petrographic analysis of a sample of sherds from each site (Appendix G); results of both OCR and radiocarbon dating conducted at both sites (Appendix H); and a listing of curated material resulting from the test excavations at both sites (Appendix I).

CHAPTER 2
NATURAL SETTING OF THE WHITE OAK CREEK WILDLIFE MANAGEMENT AREA

by
Maynard B. Cliff, Steven M. Hunt, and Debra L. Beene

GEOLOGY AND GEOMORPHOLOGY

The White Oak Creek Wildlife Management Area (WMA) covers parts of Bowie, Cass, Morris, and Titus counties in Northeast Texas, and includes the lower portion of the flood plain of White Oak Creek, as well as parts of the flood plains of the Sulphur River and several of its tributaries (Figure 2). All of these counties lie within the Gulf Coastal Plains physiographic province which is a segment of the Mesozoic-Cenozoic coastal geosyncline (Murray 1960). This geosyncline forms a gradually sloping basin which dips toward the Gulf of Mexico and contains formations of limestone and sandstone deposited along the margins of an ancient receding coastline. The geologic strata forming Cass, Morris, and Titus counties, as well as the southern portion of Bowie County, were deposited during the Eocene, Pleistocene, and Holocene periods (Bureau of Economic Geology [BEG] 1964, 1979). Within the limits of the WMA, most exposed sediments are of Quaternary age (BEG 1979). These include extensive areas of recent (i.e., Holocene) alluvium within the flood plains of White Oak Creek, the Sulphur River, and their associated tributaries, as well as large areas of Pleistocene fluvial terrace deposits located south of White Oak Creek and between White Oak Creek and the Sulphur River in Morris and Titus counties, and north of the Sulphur River in Bowie County (Autin 1997). Wide bottomland areas along the Sulphur River and White Oak Creek cover much of the White Oak Creek WMA, while gently rolling to hilly features typify the non-flood plain perimeter of the WMA.

Besides the Pleistocene terraces and Holocene alluvium, only one geologic formation is present within the White Oak Creek WMA. This is the Tertiary-age Wilcox Group, which covers the non-flood plain slope and upland edge areas south of the WMA in much of Morris and Cass counties (Autin 1997; BEG 1979). The Wilcox Group is composed of mostly gray, very thinly bedded to massive, locally cross-bedded, silty and sandy clay, in part carbonaceous. Calcareous siltstone and ironstone concretions are common, as are local beds of clay, lignite, silt, and quartz sands. Plant fossils, including petrified wood, are abundant.

The landscape surrounding the White Oak Creek WMA consists of dissected uplands and is characterized by gently rolling ridges, with marshy bottomlands along streams. The highest elevations within the WMA, over 115 m amsl (above mean sea level), are in the area overlooking Caney Creek, in Cass County, while the lowest elevations, below 70 m amsl, occur in the most easterly sections of the WMA, adjacent to the Sulphur River.

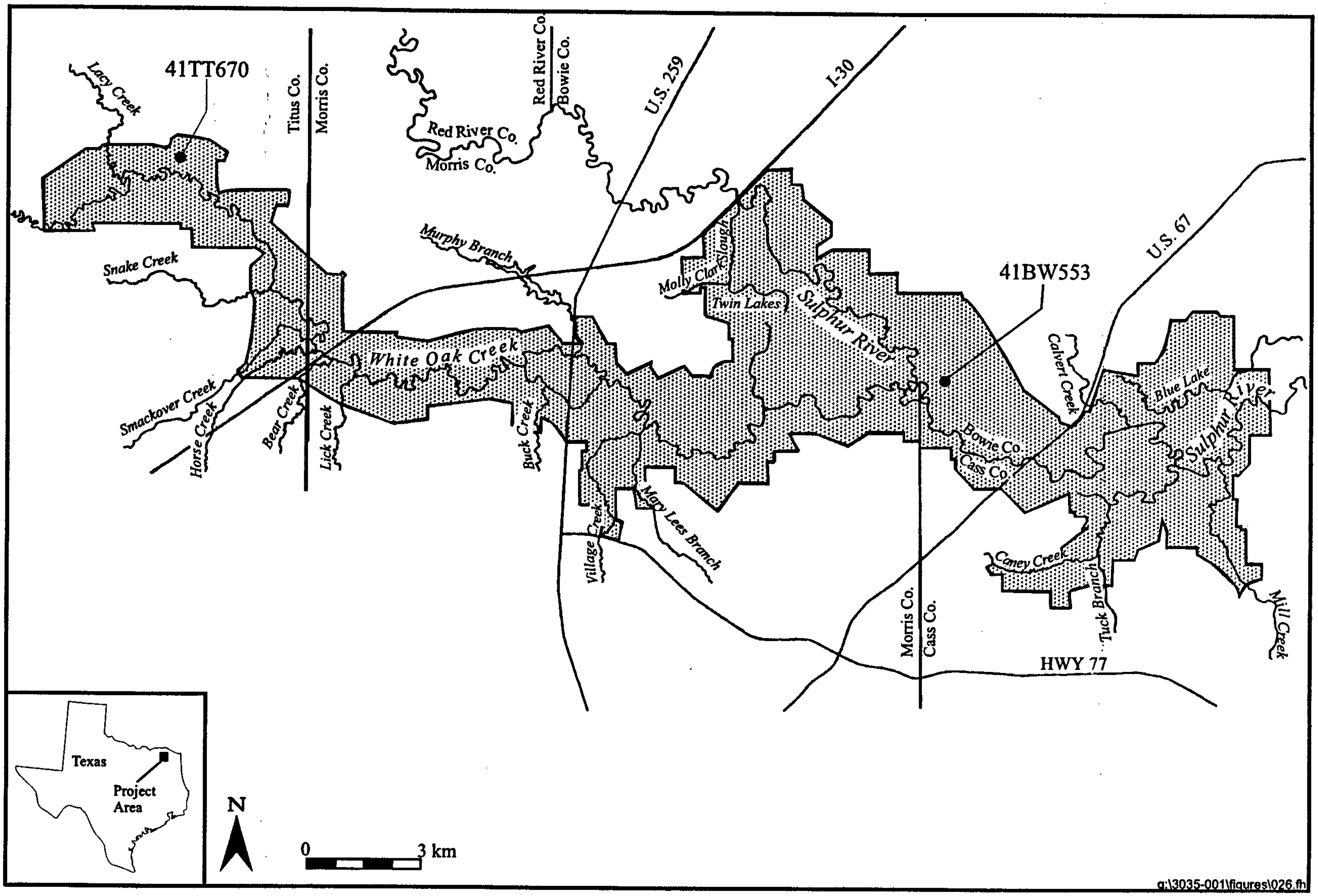

Figure 2. Map of the White Oak Creek Wildlife Management Area (WMA) in Bowie, Cass, Morris, and Titus counties, Texas, showing the locations of sites 41BW553 and 41TT670.

LITHIC RAW MATERIAL SOURCES

Lithic materials suitable for the production of some types of stone tools reportedly are present in the Wilcox Group (Fisher 1965). These include ferruginous sandstones and sandstone concretions which are suitable for use as small manos, nutting stones, anvil stones, various types of stone abraders, heavy choppers, or gouges. In addition, large pieces of petrified wood and chert gravels are reportedly present within the Wilcox Group (Fisher 1965:197), although it is doubtful that the material could be used consistently. Banks (1990:52) refers to the use of petrified wood (particularly, petrified palmwood) from the Wilcox Group by prehistoric Native Americans in East Texas as "obviously important, although probably fortuitous" since "there are few discrete concentrations of individual types that were used as primary sources of raw materials." Banks makes no mention of any other usable chert gravels in the Wilcox Group, although he does describe a dense, gray quartzite, which "could easily be confused with varieties of Ogallala quartzite" (see below) from Buzzard Bluff, Arkansas, whose origin is "probably a remnant of the Wilcox on top of Midway deposits" (Banks 1990:52).

One of the more important sources of lithic raw material in this area are upland lag gravel deposits of western origin, commonly referred to as the Uvalde Gravels (Banks 1990:56-57). These upland gravels have been identified in Central and South Texas (Byrd 1971; Hill 1891), North Central Texas (Menzer and Slaughter 1971), and East Texas (Banks 1990). Banks (1990:57) specifically refers to having seen such gravels "along the divide between the Red and Sulphur rivers in Northeast Texas and along the divide between the Sulphur and its principal southern tributary, White Oak Bayou." Their immediate origin is believed to be the Ogallala formation on the High Plains of West Texas, which consists of redeposited gravels whose ultimate source is New Mexico and the Rocky Mountains. Within various members of the Ogallala formation along the edge of the Llano Estacado, in and south of the Texas Panhandle, Holliday and Welty (1981:208-209) report the presence of light colored, dark gray to black, and purple, medium to coarse grained quartzites; Potter chert (a dense, gray to brown, silica cemented, very fine grained siltstone); red to brown to yellow jaspers; medium to dark gray and dark blue chert; flint; and petrified (silicified) wood. Within the Uvalde Gravels, many of these materials are repeated. In Central Texas, Byrd (1971:5) identifies chert, quartz, jasper, quartzite, limestone, and silicified wood, in sizes ranging from pebbles to boulders, within these gravels.

In contrast to the Uvalde Gravels, another source of lithic raw material for the White Oak Creek area appears to be an unnamed upland lag gravel, identified to the northeast of the WMA in central Bowie County (Cliff 1994). Although upland gravel deposits, containing pebbles and cobbles of usable raw material, were identified in 1989 along the divide between the Red and Sulphur rivers and along the headwaters of Elliott Creek in Bowie County (Peter and Cliff 1990a), it was not until later that the abundance of high quality chert in these gravels was recognized and their intensive utilization by prehistoric peoples verified (see Cliff 1994; Cliff and Hunt 1995). The possible presence of novaculite in some abundance in these gravels suggests an origin different from that of the Uvalde Gravels. These Bowie Gravels (for want of a better term at the present time) contain brownish yellow to pale brown, brownish yellow to yellowish brown, and brownish yellow to red chert (possibly novaculite); olive gray or "green" chert (possibly from the Arkansas Novaculite outcrops along the headwaters of the Kiamichi River in Oklahoma); black chert that weathers to a yellowish brown (possibly Battiest chert from the Ouachita Mountains in Oklahoma); coarse grained white quartzite; and a medium grained, gray quartzite which is very similar to what is called Potter chert in the Texas Panhandle. In addition, it appears that this gravel also includes weak red to reddish brown, pinkish gray to very pale brown, pale brown to dusky red, and very pale brown chert (possibly novaculite); gray to dark gray chert that weathers to yellowish brown; and a weak red, coarse grained quartzitic sandstone that weathers to yellowish brown. Finally, a number of upland sites in Bowie County have yielded flakes of Woodford chert (a gray to black, dull opaque chert present in the Woodford formation in the western Ouachita Mountains in Oklahoma) that may also have originated from these gravels (Cliff 1994). This lithology is radically different from that usually ascribed to the Uvalde Gravels (see above) and strongly suggests an origin to the north, in southeastern Oklahoma and southwestern Arkansas; although the occurrence of the Bowie Gravels on surfaces of the Midway and Wilcox groups suggests an age comparable to that of the Uvalde Gravels (BEG 1979).

Finally, reworked lithic materials from both the Uvalde and Bowie gravels, including possibly novaculite, chert, jasper, flint, and quartzite, presumably are present within the lower Pleistocene terraces and more recent gravel bar deposits along both the Sulphur and Red rivers, while the Red River would probably carry additional material from the Texas Panhandle, southwestern and southeastern Oklahoma, and southwestern Arkansas. Among the more notable of this material would be Tecovas jasper (a distinctive purplish red, mottled jasper which outcrops between the headwaters of the North Canadian and Cimarron rivers in western Texas and Oklahoma), Big Fork chert (a black to dark brown chert from the Big Fork formation in the western Ouachita Mountains of Oklahoma), Red River siltstone (including a brown variety which may be weathered Big Fork chert and a red to yellow variety which is fine-grained, dull, and opaque), "Lowrance chert" (a brown to gray cryptocrystalline flint, probably from the Oil Creek and Joins formations in the eastern Arbuckles of Oklahoma), and Woodford chert (Banks 1984, 1990; Banks and Winters 1975; Holliday and Welty 1981; Perttula 1984).

SOILS

The detailed mapping available for the Bowie County side of the Sulphur River suggests that the majority of the flood plain soils in proximity to the Sulphur River consist of Texark clay and Gladewater clay (the former mapped with small areas of Gladewater and Sardis, and the latter with Texark soils; U.S. Department of Agriculture [USDA] 1980), while the surrounding non-flood plain areas contain Annona loam, Ashford clay, Bryarly clay loam, Sawyer silt loam, Woodtell very fine sandy loam, and the Wrightsville-Rodessa complex (USDA 1980). Similarly, the detailed soil mapping available for Morris and Titus counties (USDA 1990) shows that the Sulphur River flood plain is largely covered by Texark clay (mapped with small areas of Nahatche and Woodtell soils), while the lower flood plain of White Oak Creek is covered by Gladewater clay (mapped with small areas of Kaufman, Texark, and Nahatche soils), which in the far western part of the WMA is replaced by Estes clay loam. The upland soils around the edges of the White Oak Creek flood plain include Bernaldo fine sandy loam, 1 to 3 percent slopes; Derly-Raino complex soils, 0 to 1 percent slopes; Ellis clay, 5 to 12 percent slopes, severely eroded; Freestone fine sandy loam, 1 to 3 percent slopes; Kirvin very fine sandy loam, 3 to 8 percent slopes; Talco-Raino complex soils, 0 to 1 percent slopes; Wolfpen loamy fine sand, 2 to 5 percent slopes; Woodtell fine sandy loam, 2 to 5 percent and 5 to 20 percent slopes; and Woodtell-Raino complex, 1 to 3 percent slopes. Nahatche loam-silty clay loam is present in the upper reaches of the smaller tributaries, mapped with small areas of Hopco, Iuka, and Bienville soils (USDA 1990), and sometimes between Gladewater soils and upland deposits. Estes, Gladewater, Ellis, and Sardis soils are Inceptisols; Kaufman and Texark soils are Vertisols; Iuka and Nahatche soils are Entisols; Annona, Ashford, Bernaldo, Bienville, Bryarly, Derly, Freestone, Raino, Rodessa, Talco, Wolfpen, Woodtell, and Wrightsville soils are Alfisols; Hopco soils are Mollisols; and Kirvin and Sawyer soils are Ultisols (USDA 1980:128; 1990:190). Archeological sites recorded by past surveys are associated with Annona, Bernaldo, Derly-Raino complex, Estes, Freestone, Gladewater, Kaufman, Nahatche, Sawyer, Texark, Wolfpen, Woodtell, and Woodtell-Raino complex soils. In particular, site 41BW553 is associated with Sawyer silt loam, 0 to 3 percent slopes, and site 41TT670 is associated with Woodtell fine sandy loam, 5 to 20 percent slopes.

The characteristics of these soils can be used to provide a tentative reconstruction of the land-use patterns of the White Oak Creek WMA during the prehistoric and early historic periods. Today, the flood plain soils in the northern portion of the WMA, along the Sulphur River and its major tributaries, (i.e., Gladewater clay and Texark clay) are considered to be well suited for flood plain hardwood forest and some improved pasture grasses (USDA 1990). Prior to the historic period, these areas were probably covered by bottomland forest composed of water-tolerant woodland species, interspersed with small open areas of native prairie grasses.

For the prehistoric and early historic inhabitants of the White Oak Creek WMA, the flood plain areas would have allowed easy access to water and provided temporary/seasonal campsites or work stations, although the yearly flooding probably would have precluded permanent occupation. The various major tributaries of White Oak Creek and the Sulphur River (such as Buck, Calvert, Caney, Mill, Tuck, and Village creeks and Mary Lees Branch) also most likely would have offered year-round access to water. The flood plain in general may have offered seasonal plant resources and scattered prairie areas would have provided good hunting. The trees would have provided building materials, fuel, and raw materials for manufactured articles, while the grasses would have provided material for baskets, clothing, etc. Today, these flood plain areas are considered poor candidates for crop production because of their frequent flooding (estimated as two to four times a year) and a water table that is near the surface during the winter and spring (USDA 1990). For the prehistoric inhabitants, however, the nature of the clay soils themselves was probably more critical in judging their suitability for horticulture. These dense clay soils would have been difficult, if not impossible, to cultivate using the stone and wooden tools available to the prehistoric inhabitants of the WMA. The same would probably have been true for the early historic inhabitants of the area, prior to the introduction of the iron plow.

The areas along the margins of the White Oak Creek WMA consist of upland slopes and edges. The soils in these areas are sandy and loamy, moderately well drained, and have a high available water capacity. For modern uses, they are limited by their steepness, which ranges from 5 to 20 percent and which results in erosion being a severe hazard. Today, these areas are considered to be well suited for woodland and pasture (USDA 1990), and prior to the historic period they were probably covered by an oak/hickory/pine forest interspersed with small areas of open native prairie.

Prehistoric activity in this area would have consisted primarily of small campsites or horticultural hamlets on flat, well-drained areas, placed to take advantage of the rich resource base of both uplands and bottomland. Early historic settlement probably consisted of small, self-sufficient family farms which focused on cropping of well and moderately well-drained upland soils and the grazing of animals on the remainder. Sites located on these areas (especially those above the major tributaries of White Oak Creek and the Sulphur River) would have been close to water without the danger of seasonal flooding. These areas would have provided both the prehistoric and early historic occupants of the WMA with a location to reside above the flood plain and close to water but outside of the flood zone. Such areas would have been suited to both temporary occupation during all seasons and permanent occupation. These locations would have provided easy access to the resources of both the bottomland hardwood forest and the upland mixed oak/hickory/pine forest.

As with the flood plain, these upland areas are today considered to be unsuited for crop production, due to their slope, low permeability, and hazard of erosion (USDA 1990). However, these difficulties would have been less serious for prehistoric horticulturalists. More importantly, the sandy soils would have been easily tilled using stone and wooden implements. The small size of the native cultivated plots could easily have been accommodated within the small areas with a low slope, which would also have decreased the potential for erosion and increased permeability. During the early historic period, these areas would have provided easy access to more level upland zones, considered more suitable for farming and grazing, while the use of the iron plow would have allowed the partial development of the bottomlands for agricultural production.

HYDROLOGY

The White Oak Creek Wildlife Management Area lies entirely within the drainage basins of the Sulphur River, which forms the boundary between Bowie, Morris, and Cass counties in this area, and White Oak Creek. The primary tributary systems of the Sulphur River include the Caney Creek/Tuck Branch/Jennings Lake system, Mill Creek, Calvert Creek, and the Blue Lake System in the eastern part, and the Twin Lakes/Molly Clark Slough system in the western part. In addition, the north side of the Sulphur River between Highway 67 and Interstate 30 contains a number of small unnamed sloughs which are probably former channels of the river. Within the White Oak Creek basin, primary tributary systems include the Village Creek/Mary Lees Branch system, Murphey Branch, and the Buck Creek/Dunlap Lake system in the central part, and Lick, Bear, Horse, Smackover, Snake, and Lacy creeks in the western part. The extreme eastern portion of White Oak Creek may follow a former channel of the Sulphur River, which was linked with Molly Clark Slough and Twin Lakes by way of Reddon Lake. In all cases, the headwaters of these creek systems are outside the boundaries of the WMA.

An ample yearly rainfall provides a constant water flow in most of these streams. The slow permeability of many of the surrounding soils, together with the rapid runoff from the sloping uplands, results in a rapid channeling of rainwater into the flood plains of the creeks and river, but the slow permeability and runoff of the flood plain soils means that much of this water stays in the flood plain, in extensive water-filled sloughs and marshes. These habitats undoubtedly attract a variety of flora and fauna requiring abundant water, resources which would have provided food and raw materials to both prehistoric and historic inhabitants of the area.

A number of springs are located throughout the region, nearly all of which flow from the Queen City sand, south of the WMA (Brune 1981). Important early historic springs were located near Linden, Mill Creek, Hughes Springs, Marietta, Douglasville, Atlanta, and McLeod in Cass County. White Sulphur Springs, near Marietta, is the closest of these to the WMA. Other nearby springs include Dalby Springs, to the northwest in Bowie County, and Glass Club Springs, east of Omaha in Morris County.

CLIMATE

The climate of the White Oak Creek WMA is subtropical, marked by long hot summers and short cool winters. The primary influences on the climate are the latitude, warm winds from the Gulf of Mexico to the south, and cooler northern winds from the continental land mass to the north. Cold waves in the winter are rare and not severe, usually lasting only one or two days. The average summer temperature is around 27° C and the average daily maximum temperature is 33 to 34° C. In winter, the average temperature is 6 to 7° C. The last freezing temperature in spring usually occurs before April 11 and the first freezing temperature in fall usually does not come until after November 1. The number of days in the growing season with temperatures above the freezing mark averages about 209 (USDA 1980:2, 81; 1990:2-3; Tables 1, 2, and 3).

Precipitation is fairly heavy throughout the year; prolonged droughts are rare, and the frequent afternoon thunderstorms in summer are adequate to maintain crops. Such afternoon thunderstorms occur about 50 days of the year in Bowie County and about 44 days out of the year in Morris County. Severe storms, including tornadoes, strike the area occasionally and often cause flooding and erosion. Every few years in the summer or fall, a tropical depression moves inland, causing extremely heavy rains for one to three days. Mean annual precipitation is about 1110 to 1140 mm, with 52 to 53 percent of this falling between April and September. The growing season for most crops falls within this period. As the average winter temperature is above freezing, snow fall is variable but rare (USDA 1980:2, 1990:3).

FLORA

The White Oak Creek WMA falls near the ecotone between the Pineywoods and the Post Oak Savannah of East Texas and includes within it several vegetation zones: the Willow Oak-Water Oak-Blackgum Forest and White Oak-Elm-Hackberry Forest within the bottomlands, and the Pine-Hardwood Forest (Shortleaf Pine-Post Oak-Southern Red Oak subtype), Other Native and/or Introduced Grasses, Post Oak Woods/Forest, and Post Oak Woods, Forest and Grasslands mosaic on the uplands (McMahan et al. 1984).

The Willow Oak-Water Oak-Blackgum Forest (whose overall distribution is principally in the lower flood plains of major rivers in northeastern Texas) is confined to the extreme eastern portion of the WMA along the Sulphur River and its tributaries, Mill, Calvert, and Tuck/Caney creeks. The most common trees present today within the bottomlands at the WMA are reported to be green ash, hackberry, elm, willow oak, water oak, eastern cottonwood, and sweetgum (USDA 1990:35, 43, 48). Other associated species within this vegetation zone include beech, overcup oak, chestnut oak, cherrybark oak, sycamore, southern magnolia, white oak, black willow, bald cypress, swamp laurel oak, hawthorn, bush palmetto, common elderberry, southern arrowwood, poison oak, supplejack, trumpet creeper, crossvine, greenbriar, blackberry, rhomboid copperleaf, and St. Andrew's Cross (McMahan et al. 1984:19).

The predominant vegetation type found on the remaining bottomlands within the WMA is the Water Oak-Elm-Hackberry Forest. Commonly associated plants include Cedar elm, American elm, willow oak, southern red oak, white oak, black willow, cottonwood, red ash, sycamore, pecan, bois d'arc, flowering dogwood, dewberry, coral-berry, dallisgrass, switchgrass, fescuegrass, bermudagrass, eastern gramagrass, Virginia wildrye, Johnsongrass, giant ragweed, yankeeweed, and Leavenworth eryngo (McMahan et al. 1984:22).

The most extensive vegetation group on the uplands within the WMA is the Post Oak Woods, Forest, and Grasslands Mosaic. It is closely associated with another major vegetation type within the WMA uplands, the Post Oak Woods/Forest. Both vegetation types are most apparent on the soils of the Post Oak Savannah. Plants commonly associated with the Post Oak Savannah include blackjack oak, eastern redcedar, mesquite, black hickory, live oak, sandjack oak, cedar elm, hackberry, yaupon, poison oak, American beautyberry, hawthorn, supplejack, trumpet creeper, dewberry, coral-berry, little bluestem, silver bluestem, sand lovegrass, beaked panicum, three-awn, spranglegrass, and tickclover (McMahan et al. 1984:19).

The Pine-Hardwood Forest (Shortleaf Pine-Post Oak-Southern Red Oak subtype) covers a large portion of Northeast Texas, including portions of all four counties in which the WMA is located, and occurs on sandy uplands. The most common trees present within this vegetation zone are red oak, post oak, hickory, and shortleaf pine (USDA 1990:52). Other associated species for this vegetation zone are loblolly pine, black hickory, sandjack oak, flowering dogwood, common persimmon, sweetgum, sassafras, greenbriar, yaupon, wax myrtle, American beautyberry, hawthorn, supplejack, winged elm, beaked panicum, spranglegrass, Indiangrass, switchgrass, three-awn, bushclover, and tickclover (McMahan et al. 1984:25).

The least extensive of the upland vegetation groups within the WMA is Other Native Grasses and/or Introduced Grass. This vegetation type was created by the clearing of the ancient forests. The plant communities are a mixture of native or introduced grasses and forbs on grassland sites or mixed herbaceous communities resulting from the clearing of woody vegetation and may represent the early stages in the development of the Young Forest vegetation type (McMahan et al. 1984:29).

In addition to the wood resources for domestic activity, acorns, nuts, berries, and grasses were available to both prehistoric and historic groups alike. In general, it is safe to say that vegetal foodstuffs would have been most abundant in the hardwood-dominated forests, but it is also clear that such resources would have been available in varying quantities throughout the WMA. The presence of acorns and hickory nuts would have proven beneficial in several ways. First, they are high in fats and provided a substantial portion of the diet for many southeastern Indian groups (Hilliard 1980), and second, during the fall, they would have attracted deer and turkey, both important prey species for most southeastern groups (Swanton 1946). Trees bearing edible nuts identified as being potentially present within the WMA include white oak, red oak, water oak, and hickory. Other nut-producing species which may have been present as well include blackjack oak, shagbark hickory, mockernut hickory, black walnut, and pecan (Heartfield and Dieste 1984a:2-5, 1984b:2-5).

Wild fruits and berries, such as blackberry, dewberry, wild grape, wild strawberry, persimmon, plum, and cherry, would have provided a source of vitamins and carbohydrates for both prehistoric and historic peoples.

Seeds of trees, shrubs, grasses, and weeds would have attracted animals, which would in turn have provided additional food. In addition, certain tubers available in the woodlands could have been collected for food as well as medicinal, craft, or ritual activities (Heartfield and Dieste 1984a:2-5; 1984b:2-5).

FAUNA

Faunal resources within the White Oak Creek Wildlife Management Area could have provided many of the daily needs for both prehistoric and early European populations. Animal products would have provided shelter, clothing, and a means of exchange, as well as bone, antler, and shell for tools, and feathers and various skins for decorations. In addition, it is safe to say that numerous types of invertebrates were abundant within the WMA, along with various types of molluscs, including both bivalves and gastropods, and crustaceans known to have been used by southeastern Indian tribes (Swanton 1946). Among the fish resources, economically important families for both prehistoric and historic populations probably would have included gar, crappie, bass, buffalo, shad, sucker, carp, bowfin, shiner, pickerel, catfish, sunfish, and drum (Heartfield and Dieste 1984a:2-5; 1984b:2-5). Of the amphibians, only true frogs are valued for dietary purposes today, while the full range of frogs, turtles, turtle eggs, salamanders, and alligators would have been useful for both prehistoric and early historic populations. A wide variety of migratory birds, such as ducks, geese, and cranes, would have been most numerous in the late fall and early winter, while other resident birds, such as turkeys, doves, and pigeons, would have been available on a year-round basis.

Species of mammals which are known to have provided staple meat supplies for southeastern Indian groups include deer, squirrel, and rabbit (Swanton 1946), and the same was undoubtedly the case for early European populations. Other important mammal resources included bear, opossum, and raccoon. Additional mammals present in northeastern Texas today include least shrew, southeastern short-tailed shrew, eastern mole, southeastern myotis, red bat, evening bat, nine-banded armadillo, eastern cottontail, gray squirrel, fox squirrel, eastern harvest mouse, fulvous harvest mouse, cotton mouse, cotton rat, eastern woodrat, woodland vole, raccoon, mink, and river otter (Schmidly 1983). One important resource of the early historic period would have been animal furs, which formed the basis of the early fur trade in Louisiana and East Texas (Usner 1992). Such valuable fur-bearing animals would have included rabbit, beaver, raccoon, weasel, mink, ringtail, opossum, red fox, gray fox, bobcat, coyote, badger, spotted skunk, striped skunk, muskrat, and otter. Many species, such as fish and waterfowl, may not presently be available within the area of the WMA but would have been available in the past.

Deer, rabbit, squirrel, and turtle bones have generally been among the most numerous animal remains recovered from archeological sites in Northeast Texas (Bruseth and Perttula 1981), and deer, due to its large size, actually provided the bulk of protein in the diet of prehistoric and early historic peoples. Reptiles other than turtle, and small rodent bones, have also been recovered from archeological contexts at many sites in Texas, but it is difficult to discern whether or not they contributed to the diet or were simply intrusive into the deposits (see Martin et al. 1987).

Obviously, the availability of both plant and animal resources, as well as that of botanical resources, may well have been different in the past as a result of regional climatic alterations which have been documented in pollen and geomorphological records in Texas and Oklahoma. In spite of this, faunal studies at archeological sites, such as Rodgers Rockshelter in southwestern Missouri, have shown that as climate changed over the past 9,000 to 10,000 years, different habitats comprising the mosaic of the total environment responded by increasing or decreasing in size. However, the climatic shift was never significant enough to precipitate a complete change in species composition (Purdue 1983). Thus, the modern distribution of animal species is probably much the same as it was in the past, and only the relative abundance of each species is different.

PALEOCLIMATIC RECONSTRUCTION

The prehistoric climatic history of northeastern Texas, as presently known, indicates a gradual warming trend following the end of the Pleistocene, interrupted only by a period of temperatures warmer than those experienced today (Bryant and Holloway 1985:56-66; Delcourt and Delcourt 1985:12-22). During the Late Wisconsin Full-Glacial Interval (ca. 23,000 to 16,500 years ago), it is believed that climatic conditions in northeastern Texas were considerably different from those of today, being much cooler and more mesic (Bryant and Holloway 1985). The subsequent Late Wisconsin Late-Glacial Interval (16,500 to 12,500 years ago) was apparently characterized by the persistence of a cool climate with an increased availability of precipitation during the summer growing season (Delcourt and Delcourt 1985:18-19).

During the Early-Holocene Interval (12,500 to 8,500 years ago) cool-temperature, mesic tree species became dominant throughout the mid-latitudes of the southeastern United States (Delcourt and Delcourt 1985:19). Reconstructed vegetation maps suggest that the White Oak Creek WMA was located in the Southeastern Evergreen forest with a Mixed Deciduous forest probably located to the north and west (Delcourt and Delcourt 1985:Figure 7b). In the Ouachita Mountains of eastern Oklahoma, pollen data from Ferndale Bog indicate that grasslands were replacing the previous deciduous conifer woodlands (Albert 1981). Spruce trees were probably no closer than 160 km (Bryant and Holloway 1985:53-54). Whether or not pollen data from the Ouachita Mountains are directly applicable to northeastern Texas remains to be demonstrated. As Bryant and Holloway (1985:55) suggest, the changes during this period were probably compositional in that the proportions of certain species increased while others decreased.

The Middle-Holocene Interval, also known as the Hypsithermal or Altithermal (8,500 to 4,000 years ago), was a period of warming and drying which resulted in the expansion of prairie at the expense of forest (Delcourt and Delcourt 1985:19). Recent data from northern Texas suggest that the height of the Altithermal in that area occurred from 7,500 to 4,500 years ago (Ferring 1995:30). By 5,000 years ago, the large areas of Mixed Deciduous forest north and west of the WMA had migrated to the northeast, and the Southeastern Evergreen forest had shifted from being dominated by xeric species of oak and hickory to being dominated by species of southern pine (Delcourt and Delcourt 1985:Figure 7c, 20).

Recent data from several areas in East Texas suggest that the Altithermal may have had a noticeable effect in that area. A matrix sample of organic carbon from a loamy fluvial deposit in the flood plain of the East Fork of Elliott Creek in Bowie County yielded a middle Holocene age of 6,370 ± 100 years, 4420 B.C., which falls in the middle of the Altithermal (Peter et al. 1991:Appendix H). A $^{13}C/^{12}C$ stable isotope ratio of -18.8‰ associated with this sample is heavier than the ratio of -23.5‰ associated with a soil with a modern date from the same area and suggests that C_3 plants were less of a component of the biosphere then than today, with climatic conditions possibly harsher (i.e., warmer and drier). Two buried paleosols in the Sulphur River flood plain in Cass County have yielded dates which also fall within the middle Holocene (6,540 ± 90 B.P. and 4,310 ± 90 B.P.; Cliff and Peter 1992). One of these two paleosols dates to the middle of the Altithermal, while the other dates just subsequent to its end. The stable carbon isotope ratios for these two soils (-19.9‰ and -23.1‰, respectively) also are heavier than that of the modern soil, and also suggest climatic conditions which were warmer and drier than today, with the harshest conditions present between approximately 6,500 and 6,000 years ago. Further west, carbon isotope data from the Aubrey Clovis site (41DN479) in Denton County and from the Finley Fan site (41HP159) at Cooper Lake on the South Sulphur River also indicate a middle Holocene dry period, but with harsher conditions than in the White Oak Creek area (Ferring 1995; Gadus, Fields, Bousman, Tomka, and Howard 1992). Geomorphologic data also indicate reduced sedimentation rates and soil formation in the Trinity and North Sulphur River basins, as well as the formation of middle Holocene dune fields in the Upper Trinity Basin (Ferring 1995:30-33). East Texas probably was affected less by the Altithermal than were areas farther west, but it apparently was not entirely unaffected. Delcourt and Delcourt (1985:20-21) suggest that modern conditions, with minor fluctuations, became prevalent subsequent to the beginning of the Christian era.

A relatively recent review of paleoenvironmental data from North Central Texas and the adjacent Southern Plains (Peter and Jurney 1988) suggests that a dry-moist-dry trend in effective moisture occurred between 3,200 and 150 years ago. The initial dry period is projected prior to 1,950 years ago, and a moist period follows until approximately 950 years ago. Between 950 and 700 years ago, drought conditions were prevalent and a drying trend which continues today was initiated. Three paleosols dating to the late Holocene have been identified within the Sulphur River flood plain in Cass County — one of which is very recent (3,480 ± 80 B.P.; 3,030 ± 100 B.P.; and 106.2 ± .8 percent of modern; Cliff and Peter 1992). These soils would probably have formed under what were essentially modern climatic conditions, although the earliest late Holocene paleosol appears to have formed under conditions wetter than today, the second under conditions drier than today, and the third under present conditions. The stable carbon isotope ratio for the earliest soil (-24.4‰) suggests a higher component of C_3 plants and moister conditions than today; the ratio for the second soil (-21.9‰) suggests that C_3 plants were less of a component of the biosphere with climatic conditions possibly harsher than today; and the ratio for the recent soil provides a baseline $^{13}C/^{12}C$ ratio (-23.5‰) for interpreting the data from the earlier periods.

Although this proposed episodic cycle of late Holocene climatic change is the most plausible reconstruction at the present time, there remains the problem of regional variability and the specificity of the paleoenvironmental record. The nature and extent of the associated vegetation shifts are very poorly understood. Throughout the entire Holocene, it is probable that the environmental shifts were gradual and variable across the ecotonal border of the eastern forests and the Southern Plains. It is also probable that the border did not shift in the normal sense, but rather that the mosaic of habitat patches changed in character and size. Unfortunately, our understanding of the timing and the nature of the Holocene environmental shifts in Northeast Texas is very generalized at this time and relies too much upon data from other regions which may or may not be applicable. Researchers will need to continue to pursue multiple lines of evidence (palynology, dating, sedimentology, malacology, archeofauna, and stable isotopes) in order to properly model the magnitude and timing of paleoenvironmental shifts in Northeast Texas.

CHAPTER 3
CULTURAL SETTING OF THE WHITE OAK CREEK WILDLIFE MANAGEMENT AREA

by
Maynard B. Cliff

INTRODUCTION

The area of extreme northeastern Texas, which includes the White Oak Creek WMA, lies within the archeological region known as the Great Bend (Schambach 1982a:1), which takes its name from the Great Bend of the Red River at Fulton, Arkansas. It includes that portion of the Red River drainage between extreme southeastern Oklahoma and the vicinity of Shreveport, Louisiana. As an archeological area, the Great Bend includes portions of Oklahoma, Texas, Louisiana, and Arkansas, and is centered in Arkansas and Louisiana (Schambach 1982a:Figure 1-2). In northeastern Texas, the Great Bend region includes the lower reaches of the Sulphur River and White Oak Creek, on which the WMA is located (Figure 3).

The following chapter is intended to provide a general background to the archeology of Northeast Texas, while providing the interested reader with sufficient references for a more in-depth coverage of the topic. The chapter is divided into three sections, the first of which gives a brief summary of previous archeological research carried out within the general area of the Sulphur River basin. The second briefly discusses the nature of the prehistoric and historic Native American archeological records in broad terms, while the third considers the historic Euro-American and African-American settlement in the area.

PREVIOUS ARCHEOLOGICAL RESEARCH

Prehistoric Research

In recent years, several detailed overviews of the development of prehistoric archeology in the vicinity of the White Oak Creek WMA specifically (Cliff and Peter 1992; Perttula 1988a; Peter et al. 1991:Appendix I), and in East Texas in general (Guy 1990), have been written and the interested reader is referred to them for more detail. Organized archeological research in the general vicinity of the WMA has a relatively long history, going as far back as 1911 with Clarence B. Moore's river boat survey of sites along the Red River in Louisiana, Arkansas, and Texas (Moore 1912; see also Miller 1986 and Schambach 1982a). Moore (1912:637-638) recorded three mound sites in Bowie County, Texas, but he failed to excavate into any of them. Subsequently, in the 1910s and 1920s, J.E. Pearce of the University of Texas (UT) became interested

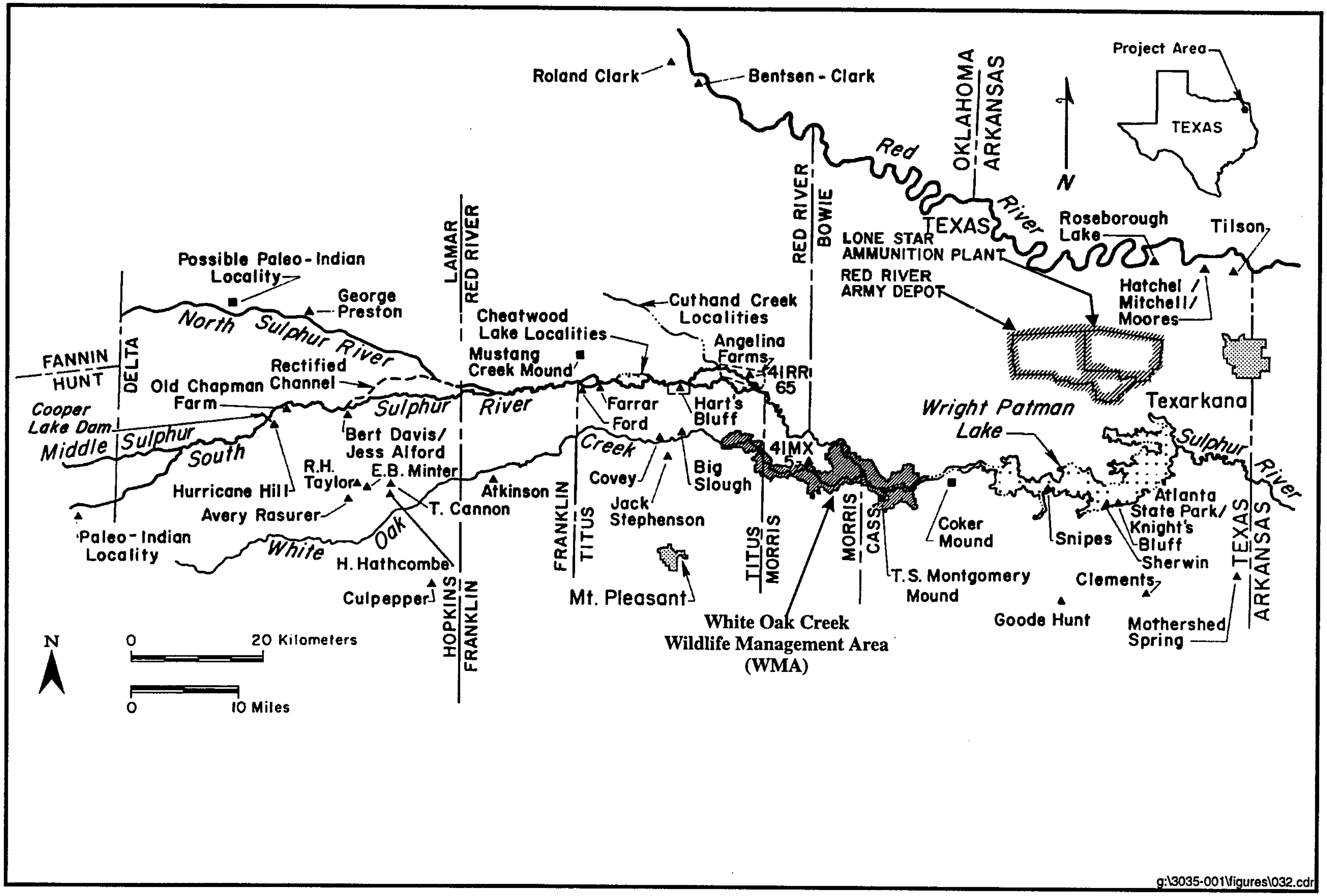

Figure 3. Important archeological sites in the Northeast Texas portion of the Great Bend and the Sulphur River basin.

in the archeology of Northeast Texas (Barnard 1939), but it was not until 1931 that the university began an intensive program of professional research (Pearce 1932; for specific reports of UT activities see Dickinson 1941; Goldschmidt 1935; Jackson 1932; Krieger 1946; Lewis 1987; Scurlock 1962).

For the four years prior to the outbreak of World War II, the Federal Works Progress Administration (WPA) was active in Northeast Texas, carrying out archeological excavations at several sites, including the Hatchel Mound (41BW3) and the Paul Mitchell site (41BW4) (Creel 1984; Davis 1970; Hamilton 1972; Schambach 1982a). At the same time, nonprofessionals and collectors from Dallas and Texarkana also began to excavate into Caddoan mound and cemetery sites in extreme Northeast Texas (see for example, Harris 1953).

At the end of World War II, and into the 1950s, federal archeology was linked to reservoir salvage programs in a number of states, including Texas. During this period, surveys were carried out at Wright Patman Lake, then known as Texarkana Reservoir, immediately east of the White Oak Creek WMA (Stephenson 1950), and at the proposed location of Cooper Lake, to the west of the WMA on the South Fork of the Sulphur River (Duffield 1959; Moorman and Jelks 1952). Subsequently, three sites, Knight's Bluff (41CS14), Sherwin (41CS26), and Snipes (41CS8), were excavated at Wright Patman Lake (Jelks 1961); a fourth, the Manton Miller site (41DT2), was tested by the Texas Archeological Salvage Project (TASP) in the area of Cooper Lake (Johnson 1962). At about the same time, the Dallas Archeological Society also undertook limited excavations at the L.O. Ray site (41DT21) along the Middle Sulphur River, within the proposed Cooper Lake area (Gilmore and Hoffrichter 1964). Additional limited survey was undertaken at Wright Patman Lake in 1970, in response to proposed changes in the lake level (Briggs and Malone 1970), while between 1970 and 1976, Cooper Lake was the focus of a program of intensive survey and excavation by Southern Methodist University (Doehner and Larson 1978; Doehner et al. 1978; Hyatt and Doehner 1975; Hyatt and Skinner 1971; Hyatt et al. 1974; for a detailed discussion of the results and significance of this research program, see Bousman et al. 1988:13-36). At the same time, crews from East Texas State University (ETSU) surveyed portions of Franklin, Morris, Red River, and Titus counties (East Texas State University 1971:50-84), while Milton Bell, of the Texas Highway Department surveyed portions of Cass, Morris, and Titus counties. Bell's work is especially important for the WMA since he surveyed a portion of the White Oak Creek drainage and recorded over 50 prehistoric sites, many of which date subsequent to A.D. 800 (Perttula 1988a:14). In fact, a few of Bell's sites in Morris (41MX13 and 41MX15) and Titus (41TT80 and 41TT82) counties fall within or adjacent to the WMA (Peter et al. 1990).

In the 1960s, limited efforts to salvage archeological data were carried out at several eroding Caddoan sites along the Red River, specifically in Bowie and Red River counties. Generally this work was sparked by the need to salvage mortuary features, such as single burials, larger shaft burials (Banks and Winter 1975), and mounds (Skinner et al. 1969). These salvage efforts continued into the 1970s, as much in response to increased pothunting and grave robbing as to erosion, and included feature recording at the Horace Cabe Mounds site (41BW14) in Bowie County (see Creel and Fields 1979). Partially as a result of this latter work, a conservation easement was obtained on the Horace Cabe Mounds site by the Archaeological Conservancy while portions of the Hatchel site were obtained by the General Land Office of the State of Texas (Perttula 1988a:14). More extensive archeological research north of the WMA on the Red River during the 1970s and 1980s included survey and testing along Big Pine Creek in Red River and Lamar counties (Mallouf 1976) and excavations by the Museum of the Red River at the Bob Williams, Holdeman (41RR11), and Rowland Clark (41RR77) sites (Perino 1983, 1994) and by the University of North Texas (UNT) at the Roseborough Lake site in Bowie County (Gilmore 1986; for more on this important contact site, see Miroir et al. 1975). At this same time, UNT instituted the Red River Archaeological Project, whose explicit goal was to develop a predictive model for prehistoric site location within the Red River basin in Bowie, Red River, and Lamar counties (Gilmore and McCormick 1980, 1982).

In 1986, plans for the construction of Cooper Lake were revived after being suspended in the 1970s, and a new phase of research began upstream from the WMA, in the Sulphur River basin (see Bailey et al. 1991; Bousman et al. 1988; Cliff et al. 1995; Fields et al. 1991, 1993, 1994; Gadus et al. 1991; Gadus, Fields, and

Bousman 1992; Gadus, Fields, Bousman, Tomka, and Howard 1992; Jurney and Bohlin 1993; Jurney et al. 1993; Lebo 1988; McGregor et al. 1996; Perttula 1988b, 1989, 1990; Perttula, ed. 1989; Winchell et al. 1992). From 1986 on, four separate research groups have been involved with prehistoric investigations at Cooper Lake (Bailey et al. 1991:Table 1). Between 1986 and 1987, UNT surveyed the Cooper Lake embankment area (Perttula 1988b) and subsequently carried out extensive excavations at the Hurricane Hill site (41HP106) (Perttula 1990). Between 1987 and 1989, the Archaeology Research Program of Southern Methodist University (SMU) surveyed much of the remainder of the lake area (Jurney and Bohlin 1993; Jurney et al. 1993; McGregor et al. 1996), tested a number of prehistoric sites, and excavated four of them (McGregor et al. 1996), including Lawson (41HP78), Thomas (41DT80), Doctors Creek (41DT124), and 41HP137 (Cliff 1989; McGregor 1996; Martin 1996a, 1996b). In 1990, Prewitt and Associates, Inc. (PAI), surveyed small portions of the lake and park areas, tested or reevaluated over a dozen sites, and excavated six prehistoric sites (Bailey et al. 1991; Fields et al. 1994; Gadus et al. 1991; Gadus, Fields, and Bousman 1992; Gadus, Fields, Bousman, Tomka, and Howard 1992). Finally, in 1994, Geo-Marine, Inc. (GMI), undertook test excavations at two prehistoric sites along the South Sulphur River, in the western end of the Cooper Lake area (Cliff et al. 1995).

Closer to the White Oak Creek WMA, recent archeological activities have included the 1987 excavation by the Texas Department of Highways and Public Transportation of a small Caddoan hamlet and cemetery at the Murphy Branch site (41MX5), north of White Oak Creek (Brewington et al. 1995); survey and testing along Little Mustang Creek and Cuthand Creek in Red River County, including work at the Cheatwood Place (41RR181) on Little Mustang Creek (Gaither et al. 1991; Perttula 1988a:15); and survey by UNT of pipelines in the Sulphur River and Cypress Bayou basins, and in Lamar County in the Red River basin (Perttula and Nathan 1989; Perttula et al. 1989). In 1988, a series of cultural resource studies began at the Red River Army Depot (RRAD) and the Lone Star Army Ammunition Plant (LSAAP) in central Bowie County northeast of the WMA, and has included surveys (Cliff and Peter 1994; Newman 1988; Peter and Cliff 1990a, 1990b), limited testing (Cliff and Peter 1988), and the preparation of a cultural resource overview of Bowie County and the Great Bend in general (Peter et al. 1991:Appendix I).

In mid-June of 1991 and 1992, the Texas Archeological Society (TAS) conducted field school excavations under the direction of staff members of the Texas Historical Commission (THC) at several sites in the vicinity of the E.A. Roitsch (or Sam Kaufman) site in Red River County, north of the White Oak Creek WMA (Bruseth 1992; Bruseth et al. 1991:1, 6-9; Martin 1992; Prikryl 1991, 1992; THC 1991:11-13). This research program included excavations at the Fasken Mounds (41RR14), at the Ray site (41LR135), at the Salt Well Slough site (41RR204), and at the E.A. Roitsch site itself. Also as part of this research effort, survey operations were conducted within the Big Pine Creek drainage to the west, recording or rerecording 100 sites. To the west of the WMA, in Titus and Franklin counties, extensive cultural resource investigations have been undertaken by Espey, Huston and Associates, Inc., in association with surface coal mining projects. At the Monticello B-2 Mine, north of Mount Pleasant, survey of approximately 20,000 acres resulted in the recording of 237 prehistoric and historic archeological sites (Jones et al. 1993). Subsequently, testing was conducted at six prehistoric sites (41TT154, 41TT370, 41TT372, 41TT373, 41TT550, and 41TT555) in 1991 (Kotter et al. 1993), and an additional 10 sites (41TT392, 41TT396, 41TT398, 41TT399, 41TT400, 41TT406, 41TT409, 41TT413, 41TT600, and 41TT601) in 1993 (Nash et al. 1995). On the basis of this work, data recovery was conducted at sites 41TT372 and 41TT550 in 1993 (Dixon et al. 1995). Elsewhere in Titus County, survey of 2,716 acres at the Monticello I Area, southwest of Mount Pleasant, recorded another 22 prehistoric and historic sites (Hoyt et al. 1994). Finally, data recovery excavations were recently undertaken at site 41BW422, along Barkman Creek north of Hooks in Bowie County, northeast of the WMA (Tucker 1994).

Historic Period Research

A concern for historic Euro-American and African-American archeological remains in Northeast Texas is an extremely recent development compared to prehistoric research in the area. Prior to the 1970s, historical archeological and architectural sites in Northeast Texas generally were not considered to have a significant research potential (Perttula 1988a:16). In the general vicinity of the White Oak Creek WMA, archeological investigations conducted at the Roseborough Lake site in 1976 by UNT resulted in the identification of architectural remains from the early 1800s (Gilmore 1986:22). At about the same time, the UNT Red River Archeological Project recorded a number of historic archeological sites dating to the nineteenth and twentieth centuries along the Red River in Bowie, Red River, and Lamar counties (Gilmore and McCormick 1980, 1982).

In the mid-1980s, the archeological investigations associated with the revival of the plans for Cooper Lake included a program of research into the Euro-American and African-American archeology of the area, separate from that oriented toward the Native American remains. As part of this research, UNT tested four late nineteenth-early twentieth century sites within the embankment area in 1986 (Perttula 1989) and conducted excavations at the James Frank site (41DT97) overlooking Doctors Creek (Perttula, ed. 1989). Subsequently, SMU conducted its own program of intensive survey, testing, and excavation (Jurney 1996; Jurney and Bohlin 1993; Jurney et al. 1993), while two historic cemeteries, Tucker (41DT104) and Sinclair (41DT105), were investigated as part of cemetery relocation (Lebo 1988; Winchell et al. 1992). Smaller surveys were also carried out by the U.S. Army Corps of Engineers, Fort Worth District (McGregor and Roemer 1989), and by Prewitt and Associates, Inc. (Bailey et al. 1991). Finally, in 1993 and 1994, GMI undertook data recovery at three historic sites (41DT192, 41DT208, and 41DT249) at Cooper Lake (Green et al. 1996).

Closer to the WMA, an archeological and endangered wildlife survey of a proposed transmission line right-of-way across the southeastern portion of the RRAD/LSAAP, conducted by Espey, Huston and Associates, Inc. (1980), recorded five historic sites, while UNT recorded a number of historic sites and localities as a result of pipeline surveys in the Sulphur River and Cypress Bayou basins and in Lamar County (Perttula and Nathan 1989; Perttula et al. 1989). A concerted program of historic research is also an integral part of the ongoing cultural resources program at the RRAD/LSAAP, north of the WMA; and for the first time in this area, a large amount of archival and chain-of-title data was generated for a number of historic sites (Cliff and Peter 1988, 1994; Peter and Cliff 1990a, 1990b).

Previous Research at the White Oak Creek WMA

GMI's research at the White Oak Creek WMA began in 1990, with the production of a research design for the cultural resources studies to be conducted there (Peter et al. 1990). This research design presented a number of research problems applicable to the White Oak Creek area as a whole, and discussed the known sites within the WMA at that time. These included possible site occupations dating to the Paleo-Indian (41TT80 and 41TT82); Archaic (41CS3, 41MX13, 41MX15, 41MX24, 41TT80, and 41TT82); and Early Ceramic/Caddoan (41CS3, 41CS4, 41CS5, 41CS126, 41MX5, 41MX13, 41MX15, 41MX25, 41MX26, 41TT80, and 41TT82) periods.

The first phase of survey work in the White Oak Creek WMA was undertaken in 1990 and included the intensive pedestrian survey of 430 acres of upland edge and the geoarcheological survey of portions of the adjacent flood plain within the Moist Soils Management Area (MSMA) south of the Sulphur River in Cass County. Sixteen cultural resource sites were located. Identified prehistoric components included Late Paleo-Indian, Early-Middle Archaic, Late Archaic, Early Ceramic, and Caddoan, with Caddoan occupations comprising 30 percent of the total (Cliff and Peter 1992).

The second phase of survey was undertaken between 1990 and 1992, with such an extended period being partially caused by delays in purchasing the property and partially due to the difficulties encountered by the field crews in gaining access to the property due to inclement weather. During this phase, approximately 4,000 acres were surveyed and 57 sites were recorded (four previously recorded and 53 previously unrecorded). Prehistoric components identified included Middle and Late Archaic, Early Ceramic, and Caddoan, while sites of the Protohistoric and Historic periods were also discovered (Cliff 1994).

In 1992-1993, test excavations were undertaken at four of the sites discovered during the MSMA survey, namely, 41CS150, 41CS151, 41CS155, and 41CS156, with the latter two sites being combined on the basis of testing data (Cliff and Hunt 1995). The testing results showed that all of the sites were eligible for inclusion in the National Register of Historic Places (NRHP) under Criterion D. Since a portion of site 41CS151 was to be impacted by the proposed development of the MSMA, mitigation was recommended for the relevant portion of that site, and extensive block excavation and machine scraping were carried out in 1993 (Cliff, Green, Hunt, Shanabrook, and Peter 1996).

Finally, in 1993 and 1994, a 5,000-acre pedestrian survey was conducted in selected areas of the WMA. During the course of this final survey, a total of 59 sites and 34 nonsite localities were identified within Bowie, Morris, and Titus counties. Fifty-four of the sites are prehistoric in nature; one is historic; and four are multicomponent, having both historic and prehistoric aspects. Of the 59 sites, all but twelve were determined to be of unknown eligibility for inclusion in the National Register of Historic Places, and were deemed to require further investigation in order to clarify their final status. Two of these sites, 41BW553 and 41TT670, are the subjects of the current report.

NATIVE AMERICAN CULTURE HISTORY

The following brief discussion of the prehistoric archeological record in the vicinity of the WMA in Northeast Texas draws from previous summaries by Perttula (1988a), Story (1981, 1990), and Thurmond (1990). Following Kenmotsu and Perttula (eds. 1993), the period of Native American occupation in Northeast Texas has been subdivided into eight temporal divisions, with the later periods being the best dated (Table 1).

Table 1
Native American Cultural Sequence for the Great Bend Region of Northeast Texas

Temporal Period	Date
Paleo-Indian	9500 - 7000 B.C.
Archaic	7000 - 200 B.C.
Early Ceramic	200 B.C. - A.D. 800
Formative Caddoan	A.D. 800 - 1000
Early Caddoan	A.D. 1000 - 1200
Middle Caddoan	A.D. 1200 - 1400
Late Caddoan	A.D. 1400 - 1680
Historic Caddoan	A.D. 1680 - 1860

Paleo-Indian Period

The Paleo-Indian period in Northeast Texas (ca. 9500-7000 B.C.) generally includes those remains of human presence which can be dated to the very late Pleistocene and the immediate post-Pleistocene periods (for recent reviews of this period in Northeast Texas, see Johnson 1989; Peter et al. 1991:Appendix I; and Story 1990). As a matter of convenience, the period can be subdivided into an early Paleo-Indian period (ca. 9000-8500 B.C.) and a late Paleo-Indian period (8500-7000 B.C.). Unfortunately, although numerous diagnostic projectile points, such as Clovis, Plainview, Dalton, Scottsbluff, and San Patrice, have been recovered as isolated surface finds or in later excavated contexts (Perttula 1988a:17), few Paleo-Indian sites in good stratigraphic context have been found (Perttula 1988a:17; Preston 1972, 1974), and fewer have received any sort of systematic excavation. Both Perttula and Story have noted the possible presence of horizontally stratified early Paleo-Indian deposits at the Forrest Murphey site (41MR62), at Lake O' the Pines, but the site was reportedly destroyed by dam construction before being excavated (Perttula 1988a:17; Perttula et al. 1986:47; Story 1990:184-185). The situation of the Murphey site, and the discovery of the deeply buried Clovis-age Aubrey site (41DN479) along the Elm Fork of the Trinity River in North Central Texas (Ferring 1989), suggests that well-preserved Paleo-Indian sites in Northeast Texas will only be found by examining deeply stratified terraces or by penetrating more recent Holocene alluvium in modern flood plain situations.

Despite the lack of good data relating to the early Paleo-Indian period in Northeast Texas, some attempts have been made to generalize regarding settlement mobility and intensity of site occupation, drawing on what little is known and on assumptions based on comparisons with other areas. For instance, a number of researchers have seen evidence for a high degree of group mobility in the broad distribution of Paleo-Indian artifacts over the landscape and in the variety of presumably nonlocal lithic raw materials from which the artifacts were made (Meltzer and Smith 1986; Shafer 1977; Story 1990:177). Likewise, the well-documented exploitation of large megafauna by Paleo-Indians in the western United States, coupled with the known presence of similar species in Northeast Texas between 11,000 and 9,000 years ago (see Hemmings 1983; Slaughter and Hoover 1963), has resulted in the popular (and logical) conclusion that "big game hunting" was part of the Paleo-Indian subsistence strategy in Northeast Texas. Certainly, a possible association between a Clovis point and mastodon remains at the Murphey site (Story 1990:185) supports this likelihood, but increasing evidence from sites to the west (such as the Aubrey site) indicates that Paleo-Indian groups were less dependent upon "big game hunting" than has been assumed in the past.

The late Paleo-Indian period in the Great Bend region appears to be distinguished by the divergence of the earlier, widespread fluted point tradition into several distinctive subtraditions. The first of these includes Scottsbluff, Plainview, and similar lanceolate points which appear to be part of a more western, or "plains-derived" subtradition in terms of origin and style; the second includes Dalton and Dalton-related projectile points which have a wide distribution throughout the wooded southeastern and midwestern United States. Some researchers have suggested that this Dalton horizon represents an adaptation to the changing environment at the end of the Pleistocene (Goodyear 1982:389-391), a view that has found some support in the addition of a presumed "heavy, woodworking tool, the Dalton Adz," to what otherwise is viewed as a Paleo-Indian tool kit (Kelley et al. 1988:21). San Patrice, an important complex which may be related to Dalton, is found in eastern Texas, southeastern Oklahoma, northern Louisiana, and southern Arkansas, and is characterized by San Patrice points, Keithville points, and the so-called Albany Scraper (Ensor 1987; Schambach 1979; Webb et al. 1971).

In the vicinity of the WMA, apparent Paleo-Indian materials have been recorded at Wright Patman Lake to the east (Briggs and Malone 1970) and at the Keelan site (41BW12) on Barkman Creek to the northeast. Test excavations at site 41BW182 on the RRAD yielded a Plainview point in mixed context (Cliff and Peter 1988:48), while within the LSAAP, Plainview points have been reported from two unrecorded sites (Newman 1988). Within the WMA itself, two possible Paleo-Indian components are reported in Titus County. On the site recording forms, Bell reports that site 41TT80, north of White Oak Creek, contained an apparently mixed collection which included "paleo-like dart points;" while"Plainview-like" and "Meserve" points are specifically listed as part of a mixed collection from site 41TT82. More recently, survey and excavation in the eastern portion of the WMA, in Cass County, have yielded Dalton/Meserve, San Patrice, and Keithville points from one site (41CS151), and an end scraper apparently refashioned from a Dalton point from another (41CS155/156). Unfortunately, none of these artifacts appear to be in intact Paleo-Indian context (Cliff and Hunt 1995; Cliff and Peter 1992).

Archaic Period

The Archaic period in Northeast Texas is tentatively dated between 7000 and 200 B.C. As is true for many areas, a threefold division of the Archaic period, consisting of early, middle, and late "subperiods" has been applied in Northeast Texas. Although reliable dating for the Archaic period in this area is virtually nonexistent, these divisions have been given tentative dates on the basis of better dated sites in surrounding areas. Thus the Early Archaic has been dated from 7000 to 4000 B.C., the Middle Archaic from 4000 to 2000 B.C., and Late Archaic from 2000 to 200 B.C. (recent overviews which cover the Archaic in this portion of Texas include Peter et al. 1991:Appendix I; Story 1985, 1990; and Fields and Tomka 1993). Archaic remains are usually found in upland settings and are frequently mixed with later material (Campbell et al. 1983; Story 1981). General trends which have been proposed as characterizing the Archaic period in Northeast Texas include an increasing complexity of settlement systems, increasing population size and density, increasing sedentism, and the development of distinct group territories (Perttula 1988a:17; Story 1985:52). Despite these changes, however, no evidence of any level of food production (even incipient production) has been reported from any Northeast Texas Archaic site (Perttula 1988a:17; Story 1990a:Table 56), in spite of the fact that definite steps toward food production were being taken elsewhere in the eastern United States (Ford 1985:347-349; Watson 1988).

During the Early Archaic (ca. 7000-4000 B.C.), the occurrence of small and widely distributed sites has been suggested to reflect high group mobility within large and poorly defined territories, with a generalized hunting and gathering economy (Meltzer and Smith 1986; Story 1985:35, 39). Projectile point forms which may be associated with the Early Archaic in Northeast Texas include Kirk, Keithville, Palmer, Cossatot, Dawson, and Wells (Story 1990; Thurmond 1990). In comparison to the Early Archaic, the Middle Archaic period in the Great Bend area (4000-2000 B.C.) appears to be characterized by: (1) an increased diversity of tool types; (2) greater interregional variability; (3) the addition of ground, pecked, and polished stone tools; and (4) an increased use of plant foods, as indicated by the addition of mortars, pestles, and milling stones (Neuman 1984:77, 79). The dependence upon abundant forest resources (e.g., oak mast production, deer, and small mammals) which are evenly distributed over most of the region probably resulted in evenly distributed population densities and favored the development of exclusive or "fixed" territories (Plog and Upham 1983:202; Story 1985:41). Although grinding stones apparently were introduced during the Early Archaic period, it was not until the Middle Archaic that their use became widespread. Grinding and polishing were used to produce grooved axes, atlatl weights, and ground stone pendants at this time. Diagnostic dart points which may be associated with the Middle Archaic include Big Sandy, Calf Creek, Johnson, Carrollton, Morrill, Evans, Lone Oak, Trinity, and Wesley (Story 1990; Thurmond 1990).

Population density may have reached a peak during the Late Archaic period in Northeast Texas (ca. 2000-200 B.C.), as evidenced by an apparent increase in the number of sites, a greater distribution of sites over the landscape, and evidence of increasing degrees of sedentism. At the same time, group mobility may have become more limited and interregional contact may have become increasingly common. If greater spatial dispersal of sites is not a result of sampling error due to unequal destruction or burial of earlier sites, it may reflect an economic system making increasing use of all available floral and faunal resources. Unfortunately, the economic data to support this view are generally absent. Throughout the Great Bend region, Late Archaic period occupation sites are relatively common in the uplands and a number are known from the flood plain of the Red River, although no regional phases have yet been identified (Schambach 1982a:3-6). Dart points which may be diagnostic of the Late Archaic include Lange, Castroville, Ellis, Palmillas, Edgewood, Yarbrough, Ensor, and Kent (Story 1990; Thurmond 1990).

Early Ceramic Period

In Northeast Texas, the Early Ceramic period (200 B.C.-A.D. 800) is generally not well defined and is largely identified by similarities in pottery and projectile points to sites of the Fourche Maline tradition north of the Red River (recent overviews which provide good information for this period include Perttula et al. 1993; Peter et al. 1991:Appendix I; and Story 1990). Diagnostic artifacts consist of coarse plainware ceramics, tempered with either clay/grog or bone, and Gary projectile points. The ceramics generally are grouped together as Williams Plain; but, given the wide range of temporal and spatial variability present, they should probably be viewed as one or more undefined varieties of that type. Elsewhere in Texas, sandy paste ceramics (often known as Bear Creek Plain or Goose Creek Plain) appear to be common on Early Ceramic period sites from the Sabine River south to the Gulf Coast (Story 1981:146). Discounting ceramic differences at the varietal level, the remains of the Early Ceramic period in Northeast Texas, however, seem to be most closely related to Schambach's (1982b:188) Fourche Maline tradition in Arkansas. Despite other similarities to Fourche Maline, no Early Ceramic period burial mounds are known in the Texas portion of the Great Bend. The few that are known in East Texas occur to the south, in the Sabine and Neches river basins around the Toledo Bend and Sam Rayburn areas (see Story 1990:Figure 41), and at the Coral Snake (16SA48) and Jonas Short (41SA25) mound sites (Jensen 1968; McClurkan et al. 1966, 1980). The lack of such evidence in Northeast Texas leaves open the question of whether or not this area was undergoing the same processes of cultural evolution presumably responsible for the development of burial mound building elsewhere (see Perttula 1988a:18; Story 1990).

Perttula (1988a:18) has noted what appears to be a concentration of Early Ceramic period sites within the Sulphur River basin, although this may be more the result of intensity of research or factors of site preservation rather than the actual presence of an unusually large Early Ceramic population. In regard to modeling settlement patterns during this period, Perttula (1988a:18) suggests that "Early Ceramic or Fourche Maline settlements are . . . represented by villages and hamlets in the flood plains or terraces of larger streams, and by smaller components in the uplands." Many of the sites on which Perttula bases this model, including Snipes at Wright Patman Lake (Jelks 1961) and Tick, Thomas, Hurricane Hill, and Lawson at Cooper Reservoir (Doehner and Larson 1978; Martin 1996b; Perttula 1990), contain middens which are taken as indicating a more sedentary settlement pattern than that of the preceding Archaic period. Two apparent pits (Features 1 and 2) radiocarbon dated to the Early Ceramic period (1,460 ± 60 B.P., and 2,090 ± 30 B.P., respectively) at 41HP137 at Cooper Lake yielded hickory nut, acorn, wild tubers (possibly the Prairie turnip, *Pediomelum* or *Psoralea* sp.), and what may be fragments of cultivated squash or gourd (Fields et al. 1994:12; McGregor 1996:358).

Formative and Early Caddoan Periods

The Formative (A.D. 800-1000) and Early Caddoan (A.D. 1000-1200) periods in northeastern Texas are not well defined. Ceramics for both of these periods include Hickory Fine Engraved, Carmel Engraved, Crockett Curvilinear Incised, and Pennington Punctated-Incised (Thurmond 1990:Table 8). Thurmond has further distinguished between equivalents of these two periods on the basis of the presence of Davis Incised, Holly Fine Engraved, Kiam Incised, Spiro Engraved, and Weches Fingernail Impressed in the earlier (along with some late varieties of Coles Creek types); and Canton Incised, Haley Engraved, Maxey Noded Redware, Sanders Engraved, and Sanders Plain in the later, although some researchers are more inclined to put the latter four types in the Middle Caddoan period.

The Formative and Early Caddoan periods are characterized by what may best be termed the Alto complex or Alto sphere, a widespread manifestation related to the Alto phase, originally defined at the George C. Davis site in Cherokee County, Texas, south of the Great Bend area (Newell and Krieger 1949). The Alto complex shows strong influence from Coles Creek culture and appears to partially overlap it in time. However, it also shows a number of new characteristics (Neuman 1970), including new projectile point types (i.e., Hayes and Homan arrow points), new ceramic vessel forms (i.e., the carinated bowl and the bottle), and new modes of vessel decoration (i.e., fine engraving with red pigment filler).

It has been suggested that these and other cultural innovations, including the introduction of the bow and arrow and increased food production based on maize, led to increases in population and sociopolitical complexity during these periods (Perttula 1988a:18). The settlement system became increasingly complex, apparently involving sedentary villages and farmsteads, special function sites (what Binford [1980] has called logistical camps), and the mound centers, which were presumably ritual or ceremonial in function (see Perttula 1988a:18-19). A number of such mound centers occur within the vicinity of the WMA, including the T.M. Coles or Mustang Creek Mound (Jackson 1931) on a tributary of the Sulphur River to the west, and several mounds at Wright Patman Lake (Stephenson 1950). Further removed from the WMA, many more mound sites occur along the Red River and its immediate tributaries to the north, and others are present to the south in the Sabine, Cypress, and Neches river basins (Banks 1983; Miller 1986; Perttula 1994; Taylor 1949).

Middle Caddoan Period

The Middle Caddoan period (A.D. 1200-1400) in the Great Bend region includes what is known as the Haley phase, the definition of which is based generally on mortuary data, largely from C.B. Moore's excavations at the Haley site in Arkansas (3MI1; Moore 1912). The Haley phase appears to represent a development out of the earlier Alto complex and continuities from the earlier period include the use of shaft grave burials for some members of the society, who were accompanied into the afterlife by relatively rich grave offerings (Kelley et al. 1988:26). This phase was centered in the Great Bend area in Arkansas, but northwestern Louisiana and northeastern Texas did fall within its peripheral influence. A Haley phase component has been recognized at the Hatchel site in Bowie County (Davis 1970:44) and other Haley components are known in the area, including the Cabe Mounds site (Perttula et al. 1995) and the Mitchell site (Cliff et al. 1997). Despite its presence in Texas, however, the Haley phase was apparently most fully elaborated in the Arkansas portion of the Great Bend.

Most of the well-known Haley phase components, especially in Arkansas, relate to mound centers, although it is unclear whether all of them were associated with villages or not (Wyckoff 1974). One well-investigated nonmound habitation site is known from Arkansas, apparently a small farmstead located on "a natural levee" or "high ground overlooking riverine bottom lands" (Wyckoff 1974:106, 113). The site contained two circular house structures and a small trash dump, and has suggested to some that the Haley phase settlement pattern involved small, dispersed farmsteads surrounding vacant ceremonial centers (Hoffman 1970). However, Wyckoff (1974:107) also notes the existence of mound centers with "potentially large villages," as well as nonmound cemeteries located close to mound centers. Finally, he states that:

> [t]here is certainly an overall tendency for the Haley components, mound centers and non-mound habitation areas alike, to associate with a riverine valley setting. Most of the mound centers did occur in the valleys of major streams, but [some mound centers] were on the flood plains of streams tributary to the major rivers [Wyckoff 1974:112].

In regard to sociopolitical organization within Haley phase society, the complexity of the mortuary ceremonialism and apparent status ranking evident in the burials recovered from Haley phase sites, as well as the presumed organizational control necessary to construct the mound centers, strongly suggest that there was "a political and religious hierarchy that operated throughout the Haley Focus [sic] society" (Wyckoff 1974:110).

Late Caddoan Period

The Late Caddoan period (A.D. 1400-1680) includes the final part of the prehistoric period and the initial years of European contact (for the most recent overview of this period and the subsequent Historic Caddoan period, see Perttula 1992). The survivors of the de Soto entrada apparently entered Northeast Texas about midway through the Late Caddoan period and the latter part appears to have overlapped with the initial movements of European explorers and traders into northeastern Texas.

In the lower Sulphur River basin in Northeast Texas, two archeological complexes have been defined for the Late Caddoan period, the Titus phase and the Texarkana phase (Schambach 1982a; Thurmond 1985). The Titus phase appears to be largely located south and west of the White Oak Creek WMA, centering in Titus, Camp, and Marion counties. The Texarkana phase is located in the upper portion of the Great Bend of the Red River and extends southward to include a portion of the lower Sulphur River drainage (Wyckoff 1974:Figure 4). The definition of the Texarkana phase is based largely on WPA excavations conducted at the Hatchel mound and at the Mitchell and Moores cemeteries situated on the Red River northwest of Texarkana (Davis 1970:50-51). Texarkana phase sites such as Knight's Bluff and Sherwin on the lower Sulphur River probably existed as satellites to these large, permanent settlements on the Red River (Perttula 1988a).

Both the Titus and Texarkana phases appear to be characterized by small hamlets or farmsteads which were probably occupied by small family groups of shifting agriculturalists. These farmsteads were apparently characterized by a limited number of structures and a small family cemetery (see Brewington et al. 1995; Jelks 1961; Perttula 1988a). They presumably were associated with larger, more permanent suprahousehold sites (both mound centers and nonmound cemeteries) which served to integrate the scattered households into a united social group. In the case of the Titus phase, this function appears to have been served solely by large mortuary sites which served as cemeteries for a portion of the society. Perttula (1992:108) lists the H.R. Taylor (41HS3), Tuck Carpenter (41CP5), and Lower Peach Orchard (41CP7) sites as examples of such suprahousehold mortuary centers. In contrast to this, the Texarkana phase appears to have retained the older pattern of mounded ceremonial centers, such as the Hatchel site.

Historic Caddoan Period

The Historic Caddoan period (A.D. 1680-1860) began with the explorations of the survivors of la Salle's Texas colony and ended with the expulsion of the Caddo from Texas in 1859. Beginning in 1690, various French parties, first under the Sieur Henri de Tonti and later under Bienville and St. Denis, traveled through the upper Red River valley and made contact with the Native Americans residing in the area. The primary Native American groups inhabiting the Great Bend region at that time consisted of Caddoan speakers, presumably descendants of groups which had inhabited the area at least as far back as A.D. 800. The groups which appear to have been closest to the White Oak Creek WMA comprised the Kadohadacho Confederacy (Swanton 1946:141).

The Kadohadacho Confederacy was originally composed of five groups: the Kadohadacho, the Petit Caddo, the Upper Natchitoches, the Upper Nasoni, and the Nanatsoho. According to Williams (1974:286), the Upper Yatasi and the Cahinnio joined the Confederacy at a later time, possibly in the early eighteenth century in the case of the Cahinnio and in the 1760s in the case of the Yatasi. The Confederacy apparently controlled the entire Texas portion of the Great Bend region. Don Domingo Terán de los Rios, who in 1692 visited one of the Kadohadacho villages located just above the Great Bend of the Red River near present-day

Texarkana (Swanton 1946:57), seems to suggest that their power extended as far south as Big Cypress Bayou, south of the Sulphur River, which he described as emptying into a lake system which *belonged* to them (Hackney 1966:3, citing the Castañeda translation of Terán's journal). The origins of the Confederacy are unknown at present, but it may have arisen as a result of what was probably a severe demographic impact resulting from the de Soto entrada (see Smith 1989).

In 1800, the groups of the Kadohadacho Confederacy were forced south into Louisiana by the severity of Osage raids (Smith 1995:82-83; Williams 1974:297). At that time, they settled on Caddo Lake about 35 miles west of the main branch of the Red River (Smith 1995:83) where they were encountered by Freeman and Custis in 1806 (Flores 1984:16, fn 3). In the Caddo Treaty of 1835, the Kadohadacho sold their land in the United States and agreed to leave the country within one year (Smith 1995:122; Williams 1974:309); but as late as 1840, one band of Kadohadacho remained in the Caddo Lake area, possibly in the same village, which was along the Louisiana-Texas border (Smith 1995:143-146). In 1841, this band joined the rest of the Kadohadacho in Indian Territory (present-day Oklahoma) north of the Red River (Smith 1995:146). The rest of the Caddo had entered Texas and by 1854, they were residing, along with other Native American groups, on a tract of land on the Brazos River in North Central Texas which had been selected for them (with their help) by the federal government. Subsequently, they were moved north to Indian Territory in 1859 (Swanton 1946:99).

After the abandonment of the Great Bend region by the Kadohadacho, groups of displaced Native Americans from east of the Mississippi River began to move into Caddoan territory in Spanish Texas. These movements were in response to the increasing pressure to give up their traditional livelihoods and become incorporated into Anglo-American culture (Everett 1990). The Spanish initially welcomed these groups with the idea of using them to create a "buffer" between the Spanish settlements and the land-hungry North Americans. Unfortunately, as more of these groups (such as the Choctaw, Delaware, Quapaw, Shawnee, Cherokee, and Alabama-Koasati) moved into East Texas, they began increasingly to compete with the Caddo for a diminishing resource base (Perttula 1988a:21). This problem simply became exacerbated after 1815, when North Americans began moving into Northeast Texas, and was not ultimately resolved until both the Caddo and the immigrant groups were expelled following the Texas Revolution.

EUROPEAN AND AMERICAN HISTORICAL BACKGROUND

The period of European exploration and settlement, and the subsequent North American and African-American development of Northeast Texas is briefly covered in the remaining portions of this chapter. For more extensive treatments of this period in Northeast Texas see Peter and Cliff (eds. 1990a:Chapters 3 and 7) and Peter et al. (1991:Appendix J). For purposes of ease of presentation, the European and American history of the region has been subdivided into five periods:

1. European Exploration and Colonization (1542-1803);
2. Initial North American Settlement and Growth (1804-1860);
3. Civil War and Aftermath (1860-1870);
4. Initial Commercialization (1870-1920); and
5. Depression and Recovery (1920-present).

European Exploration and Colonization, 1542-1803

The initial European penetration into the general area of Northeast Texas occurred in the middle of the sixteenth century when the survivors of the de Soto entrada, led by Luís de Moscoso de Alvarado, entered Texas in their attempt to reach New Spain by land (Bruseth and Kenmotsu 1991; Weddle 1985). Recent reconstructions of the Moscoso route through Texas (Bruseth and Kenmotsu 1991) equate the province of

Naguatex with the Hatchel-Mitchell-Moores site complex in northern Bowie County, suggesting that from here the entrada moved southwest through Bowie County to cross the Sulphur River somewhere in the vicinity of Douglasville, where Wright Patman Lake now is located, to the east of the WMA.

In 1719, the Frenchman Jean-Baptiste Bénard de la Harpe traveled up the Red and Sulphur rivers from the French outpost at Natchitoches and founded a trading post among the Nasoni, probably in the vicinity of the Eli Moores site in Bowie County (Gilmore 1986; Wedel 1978). The Nassonite Post (as la Harpe's trading post has come to be known) may have been vacant or intermittently garrisoned after 1726, and then reestablished and relocated, probably at the Roseborough Lake site, in about 1731-1733 by Alexis Grappe (Gilmore 1986). This later post was garrisoned until sometime around 1778 when it was finally abandoned completely (Miroir et al. 1975:162).

Initial North American Settlement and Growth, 1804-1860

In the years following the sale of Louisiana to the United States in 1803, North American immigration into Northeast Texas intensified, although for a number of years it was not clear who actually owned the area south of the Red River. The United States considered it (and indeed, most of Texas) to be part of Louisiana and encouraged settlement of the area (Chandler and Howe 1939). Spain, on the other hand (and later Mexico), was violently opposed to this view, and at several times during the first few decades of the nineteenth century, the dispute nearly led to war (Smith 1991). The first official North American penetration of the region was by the Freeman-Custis Expedition of 1806, which was turned back at Spanish Bluffs, almost due north of the WMA on the Red River, by a Spanish military force (Flores 1984).

Despite Spain's claim, Northeast Texas was too close to the United States not to fall into the North American orbit of influence and settlement continued. The earliest settlements were confined to the areas immediately adjacent to the Red River, but after 1818, settlement pushed into the prairies along river tributaries and early roads, such as Trammel's Trace and Dayton's Road. Trammel's Trace, a popular immigrant route into Texas after 1813, crossed the Sulphur River at Epperson's Ferry, downstream from the WMA, and continued southwest through Cass County to Hughes Springs, founded in 1839, and then south to cross Cypress Bayou two miles west of Jefferson (Webb and Carroll 1952:2:793-794). Dayton's Road was a major east-west overland route which ran north of the WMA along the divide between the Sulphur and Red rivers.

The 1830s and 1840s were a period of steady population growth in this area of northeastern Texas. During the Republican period, the area of modern-day Bowie, Cass, Morris, and Titus counties was included first within Red River County (organized in 1836) and then within Bowie County after 1840. Cass and Titus counties were detached from Bowie County in 1846, while Morris County was created out of Titus County in 1875 (Webb and Carroll 1952:1:198; 2:238). Bowie County was named for Jim Bowie; Cass County for Lewis Cass, United States senator from Michigan who had favored the annexation of Texas (Webb and Carroll 1952:1:306); and Titus County for Andrew J. Titus, an early Texas legislator from Red River County (Webb and Carroll 1952:2:782-783). Morris County probably was named for W.W. Morris, another early state legislator and judge from Northeast Texas (Webb and Carroll 1952:2:238).

The original North American settlers in the area were apparently largely subsistence farmers residing on small holdings, with an economy reportedly based on grain and livestock production (Peter and Cliff 1990a:36). The commercial production of cotton apparently was not introduced until the 1830s (Fehrenbach 1968), a shift that was accompanied by increasing numbers of slaves in the region. In both 1850 and 1860, slaves made up over half of the population of Bowie County, while the other three counties were not far behind (see Campbell 1989:Maps 4 & 5). For the same years, the statewide percentages of slaves to the total population was much smaller, 27 percent for 1850 and 23 percent in 1860 (Jordan 1986). The town of Jefferson, on Cypress Bayou to the south, was the nearest cotton market to the WMA, and the Antebellum planters in the area undoubtedly sent their cotton there for sale (Peter and Cliff 1990a:39). This period also saw the first growth of nonagricultural industries in northeastern Texas. The first saw pit and lumber mill in Cass County was constructed during this time by T.J. Foster in order to supply lumber for the construction of the new county courthouse in Linden. The first lumber residence was built in the county in 1855 (Webb and Carroll 1952:1:306). Other major industries established about the same time included tanyards and syrup mills, while after 1857, railroad construction progressed to the north in Bowie County (Webb and Carroll 1952:1:198; 2:59).

Civil War and Aftermath, 1860-1870

After the presidential election of 1860, it is not too surprising that the sympathies of most of the Anglo-American residents of Northeast Texas lay with the secessionist southerners. After all, a majority of them had immigrated from the South; the region as a whole had a substantial slave population; and the cash economy of the area was built on slave-based agriculture. Although Bowie, Cass, and Titus counties (including present Morris and Franklin counties) all voted for secession in 1861, a large number of voters in Titus County (over 40 percent, in fact) did vote against secession (Pool 1975:109). Thus, a large number of Titus County voters followed the residents of most of the more westerly counties along the Red River (i.e., Lamar, Fannin, Grayson, Collin, Cooke, Montague, Wise, and Jack counties) in opposing secession and advising moderation. Pool (1975:108) suggests this was due to the lead of James Throckmorton and other prominent moderates, but it should also be noted that in most of these counties slavery was of less economic importance than farther east. For example, in 1860 only Lamar County had a population which included more than 25 percent slaves (Campbell 1989:Map 7). Nevertheless, in most of Northeast Texas, anti-Union feelings ran high. For example, the state legislature changed the name of Cass County to Davis County in 1861, to honor Jefferson Davis, but the name was changed back to Cass in 1871 (Webb and Carroll 1952:1:306).

Northeastern Texas escaped serious, direct effects from the Civil War, being too far from the centers of fighting to the east and south to be affected by Union forces, and too far east of the frontier to be affected by the resurgence of Native American problems, which accompanied the withdrawal of United States and Texas military forces (Pool 1975:110-113). Indeed, as a result of its isolated location, Northeast Texas became a refuge for slaves sent west by their owners to avoid their confiscation as contraband by the federal forces, and by the end of the war they had become a source of concern for some of the civilian authorities in the region (Campbell 1989:243-246). Throughout the war, Texas supplied valuable industrial products to the Confederate armies fighting in the east. The penitentiary at Huntsville was one of the most important industrial sites in Texas, producing various cloth products for the Confederate army, including both cotton and woolen goods (Webb and Carroll 1952:1:352). By 1864, industrial centers in Northeast Texas included Tyler, with a Confederate Quartermaster's Clothing Bureau depot producing shoes and equipage and a Field Transportation Bureau shop specializing in the manufacture and repair of military transportation equipment; Jefferson, with a shoe factory and Clothing Bureau depot; and Marshall, with a Clothing Bureau steam foundry producing skillets and camp kettles (Webb and Carroll 1952:1:352). Field Transportation Bureau shops in the region were also located in Rusk, Mount Pleasant, and Paris. Marshall was also a center of powder and ammunition production, and after the fall of Vicksburg in 1863 it became the seat of civil authority west of the Mississippi River and housed the wartime capital of Missouri and the headquarters of the Trans-Mississippi Postal Department (Webb and Carroll 1952:2:148).

The defeat of the South in 1865 brought with it the end of slavery in Texas and the breakdown of the old slave-based plantation system, the presence of a Union army of occupation, and a Radical Republican administration firmly in control of the state house. Despite this situation, conservative Democrats were able to blunt many of the radical reforms of the Reconstruction period (Moneyhon 1989), and in 1874, the Radical Republicans lost control of the state government and the Reconstruction period in Texas officially ended (Webb and Carroll 1952:2:446-447).

The end of slavery brought with it many changes in the economy of rural East Texas. Lacking the cheap and dependable labor resources provided by slavery, the large plantations of the pre-war period ceased to be economically feasible, and many were broken up and partially sold off. While this process sometimes included the disposal of productive land, it often involved the sale of unproductive or unimproved acreage in an attempt to obtain cash during the post-war recession. Whereas, previously slaves had been the primary form of disposable property, being bought and sold as much for investment purposes as for their labor (see, for example Campbell 1989), after the war land came increasingly to play this role. As a result, despite the large number of newly freed slaves, most of the land put on the market found its way into the hands of speculators and investors, with the result that a new system of share cropping or tenant farming replaced the old plantation system. Productive land was now often held by absentee landlords with the labor supplied by African-American or poor Euro-American share croppers or tenants. Although this system failed to improve the lot of the sharecroppers and tenants, it was a successful replacement for the pre-war system and by the beginning of the twentieth century, the bulk of the rural farms in Northeast Texas were operated by sharecroppers or tenants.

Initial Commercialization, 1870-1920

After 1870, the population of Northeast Texas began to increase and the region began to recover from the worst effects of the war and the subsequent recession. One of the most important factors in this recovery was the increasing role of the railroad in the regional economy. A small amount of railroad construction had occurred prior to the outbreak of the war, with more than 50 miles of track laid from Texarkana westward by the Memphis, El Paso, and Pacific Railroad in 1857. Following the end of the war, construction did not resume for four more years, but when it finally did, it continued at a relatively steady rate. Twenty-three miles of railroad were in operation in Bowie County in 1870, and in 1872 the Jefferson Branch of the Texas and Pacific Railroad went through the eastern portion of Cass County. In 1876, the East Line and Red River Railroad (later part of the Louisiana and Arkansas) crossed the southwest portion of Cass County, the southeast corner of Titus County and, building west from Jefferson, crossed Morris County. In 1878, the Tyler Tap Railroad (later the St. Louis and Southwestern of Texas) crossed Titus County. In 1880, the Texas and St. Louis Railroad (also later the St. Louis and Southwestern) crossed the northern part of Morris County from Texarkana, while in 1895 the Cotton Belt Railroad crossed the northwest corner of Cass County. Finally, an independent line, the Paris and Mt. Pleasant Railroad, was completed in Titus County in 1913 (Webb and Carroll 1952:1:306, 2:238, 783).

New towns sprang up along these railroad routes and developed as important shipping centers. These included Kildare, Atlanta, and Lanark in the eastern portion of Cass County; Avinger in southwestern Cass County; and Naples in northeastern Morris County. The old community of Hughes Springs in Cass County became a resort town as a result of the railroad's arrival (Webb and Carroll 1952:1:306).

The continuing expansion of the railroads after 1870, and the improved communications they brought, spurred the development of other local industries as well. During this period, lumbering assumed its place as an important industry in many areas of East Texas (Chandler 1937). It became one of the chief industries of Cass County prior to 1877 and reached its peak there in 1890 (Webb and Carroll 1952:1:306), while during the 1880s over 100 workers in Bowie County were employed by the lumber industry there. Titus County was also heavily lumbered, with four-fifths of its area being timbered (Webb and Carroll 1952:2:782). Sawmills to process this lumber also sprang up throughout Northeast Texas and provided another major source of employment. A number of these sawmills were located in the general vicinity of the WMA at this time. One major mill was located at Naples just south of White Oak Creek, another was at Redwater to the northeast, while three major lumber mills were in operation in Titus County during the 1880s (Brown and Gust 1976:xii; Webb and Carroll 1952:1:198; 2:783). All of these mills helped supply raw material to factories located at Texarkana (Webb and Carroll 1952:1:198).

Other industries established after 1870 included iron and coal. After 1877, the iron foundries established in Queen City became important in the economy of Cass County (Webb and Carroll 1952:1:306). In Morris County, Daingerfield was an early center of coal mining activities in the region (Webb and Carroll 1952:2:238).

In spite of the steady growth in nonagricultural industries during these years, farming continued to be important in Northeast Texas, with the small, owner-operated farm still prominent. Despite the inequities of the sharecropper and tenant systems, the participants were not locked into the system as had been the case under slavery, and the last three decades of the nineteenth century witnessed increasing numbers of African-Americans achieving the status of small landowners. They often settled in dispersed rural communities separate from those of their white neighbors. One such community was Evergreen, located between White Oak Creek and the Sulphur River in Titus County after 1900 (Brown and Gust 1976:xii).

Depression and Recovery, 1920-present

Between about 1920 and 1935, rural population seems to have generally declined, although the population of the region as a whole continued to grow (Webb and Carroll 1952:1:198). Some factors which may have influenced this demographic shift were the continued growth of urban industries, declining agricultural productivity of the land, and the depressed regional and national economy. Shallow lignite deposits in the western part of Titus County were extensively mined in the 1920s (Webb and Carroll 1952:2:782). The discovery of oil in Cass County in 1935 and in the Talco Field in Titus County in 1936 led to the development of new industries and increased employment in those counties, although the overall population of Cass County continued to fall (Webb and Carroll 1952:1:306; 2:783). During World War II, an iron ore plant located in the southwestern portion of Morris County at Lone Star helped spark renewed economic growth in that area (Webb and Carroll 1952:2:238).

The period following the end of World War II has been one of general prosperity and urbanization for the entire region. Demographic changes within this area have been dominated by the growth of medium-sized urban areas, such as Texarkana and Mt. Pleasant. For example, the population of Bowie County in 1970 was 67,813, with over half residing in Texarkana (35,000). Commercial patterns in the region have benefitted from the construction of a major interstate highway (I-30) which has served to link the area to major manufacturing centers to both east and west. The improved infrastructure, as well as the construction of several lakes in the area, such as Wright Patman Lake to the east of the WMA, also has brought increased prosperity in the form of tourism and the recreational dollar.

In spite of this growth, agriculture, livestock, and timber continue to play a major role in regional economy. Approximately 170,000 acres in Bowie County are in use today for hay or pasture for livestock, while an additional 100,000 acres are planted in soybeans, cotton, wheat, and rice (USDA 1980:1). A recent almanac listed beef and dairy cattle as important financial resources for Cass County, as well as wheat, soybeans, milo, corn, and rice (Kingston 1988). Cotton, corn, potatoes, peanuts, melons, and vegetables are produced in Morris County, while dairying and poultry are also important. Cattle raising has become the major rural industry in Titus County, while commercial lumbering has severely declined (Webb and Carroll 1952:2:783). Pine, gum, post oak, and white oak are still cut commercially in Morris County (Webb and Carroll 1952:2:238), while in Bowie County, about 290,000 acres are used for commercial timbering activities today (USDA 1980:1). Other resources in the area include lignite leasing in southern Bowie and Titus counties; oil products, iron ore, lignite, and clay in Cass County; shingles, cottonseed oil, and cotton fiber in Morris County; and oil and asphalt, meat packing, milk processing, pottery, and lignite in Titus County (USDA 1980:2; Webb and Carroll 1952:1:306, 2:238, 2:783).

CHAPTER 4
RESEARCH OBJECTIVES AND METHODS

by
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INTRODUCTION

The test excavations conducted at sites 41BW553 and 41TT670 were aimed at collecting sufficient data to allow a determination of each site's research potential, which in turn would allow a determination of each site's eligibility for inclusion in the National Register of Historic Places (NRHP). Although neither site is threatened by immediate construction or development, it was felt that test excavations would allow a final determination of NRHP eligibility and would contribute data useful for an understanding of the prehistoric Caddoan occupation of the White Oak Creek area.

A site's eligibility for inclusion in the NRHP is dependent on one or more specific criteria, designated Criteria A, B, C, and D, as defined in 36 CFR §60. These four criteria are applied following the identification of relevant historical themes or patterns. A property may possess significance for:

- its prehistoric or historic association with events or persons (Criteria A and B);
- its illustration of a period, type, or method of construction, or for aesthetic values (Criterion C); or
- its potential for yielding information important for understanding prehistory or history (Criterion D).

In view of the nature of the sites under investigation, they can only be evaluated under Criterion D, and any consideration of a property under this criterion must address whether the property contains information which can contribute to our understanding of history or prehistory, and whether that information is important.

The first step in the evaluation process should be to define the significance of the property by identifying the particular aspect of history or prehistory to be addressed and why information on that topic is important. The second step is to define the kinds of evidence or the data requirements that the property must exhibit to provide significant information. These data requirements in turn indicate the kind of integrity that the site must possess to be significant. This concept of integrity relates both to the contextual integrity of the archeological deposits and to the applicability of the potential data base to pertinent research questions. Without such integrity, the significance of a property is very limited.

Both sites under consideration here are located in the Texas portion of the Great Bend region. In order to identify the types of information that may be considered important to our understanding of prehistory in this area, a project-specific research design was developed for the White Oak Creek WMA area prior to the commencement of fieldwork (Peter et al. 1990). In that document, a series of research problems specific to the Native American occupation of the WMA, at the regional, local, and project-specific level, was set forth. These included:

- Paleoenvironmental Reconstruction,
- Culture History,
- Prehistoric Settlement-Subsistence Systems,
- Prehistoric Lithic Raw Material Use Patterns,
- Prehistoric Technology, and
- Historic Period Native American Sites.

All of these research problems have subsequently been subsumed under five broad, regional historic contexts, or research themes, identified by the Texas Historical Commission (THC) as having priority for research into the Native American occupation of East Texas (Kenmotsu and Perttula 1993). These historic contexts are:

- *Quaternary Environments and Archeology in Northeast Texas*,
- *Changes in Hunter-Gatherer Mobility in Northeast Texas*,
- *The Emergence of Sedentism in Northeast Texas, ca. 500 B.C. to A.D. 1000*,
- *The Development of Agriculture in Northeast Texas before A.D. 1600*, and
- *Effects of European Contact on Native and Immigrant Indians in Northeast Texas*.

With the exception of the first one (*Quaternary Environments and Archeology in Northeast Texas*), each of these contexts identifies a series of associated study units (Table 2). The authors are careful to point out that the list of study units for each context are not exhaustive, but are intended to suggest "the range and scope of investigations needed over the next five to 10 years to develop a better understanding of the archeological record" in regard to each historic context (Fields and Tomka 1993:93). A number of these study units are, in turn, associated with more specific research questions which can be applied to specific project areas (see, for example, Perttula et al. 1993:118-120). Thus, the first criterion of significance for any archeological property of Native American origin at the White Oak Creek WMA is its capability to yield information relevant to any of these historic contexts and study units.

Whether or not specific properties exhibit such potential or contain data relevant to any particular research theme or study unit is dependent upon a precondition of contextual integrity of the archeological deposits. For example, a prehistoric site that was buried by sediment within a levee of the Sulphur River has a far greater potential for containing undisturbed deposits than one located on an eroding upland surface. However, the nature of contextual integrity, as it affects research potential of a property, also must be viewed as relative, since different research problems require different types of data. In their introduction to the East Texas plan, Kenmotsu and Perttula (1993:10) note that:

> It is a truism that most archeological sites are disturbed due to a variety of natural and cultural processes, such as bioturbation and timbering. However, because they have been disturbed does not mean that their integrity has been unduly diminished or lost. It has been demonstrated time and again that archeological deposits containing significant information are still intact and have integrity even after agricultural activities, timbering, etc., have occurred, because these land-disturbing actions only penetrate a certain subsurface depth and can be expected to leave features and archeological deposits below a plow zone or churned soil.

Table 2
Historic Contexts and Associated Study Units for Northeast Texas
(from Kenmotsu and Perttula 1993)

Historic Context	Study Units
Quaternary Environments and Archeology in Northeast Texas	
	None
Changes in Hunter-Gatherer Mobility in Northeast Texas (Fields and Tomka 1993)	
	(1) Chronology and Typology
	(2) Settlement Systems and Site Planning
	(3) Subsistence
	(4) Trade and Exchange
	(5) Technological Change/Material Culture
The Emergence of Sedentism in Northeast Texas, ca. 500 B.C. to A.D. 1000 (Perttula et al. 1993)	
	(1) Paleoenvironments
	(2) Settlement Systems
	(3) Subsistence Systems
	(4) Social Systems
	(5) Demography and Health
	(6) Mortuary Practices
	(7) Intra- and Interregional Exchange and Interaction
	(8) Material Culture Characterizations
	(9) Technological Change
The Development of Agriculture in Northeast Texas before A.D. 1600 (Perttula 1993a)	
	(1) Chronology and Typology
	(2) Settlement Systems
	(3) Subsistence Systems
	(4) Social and Political Complexity
	(5) Demographic Change
	(6) Mortuary Practices
	(7) Local and Extra-local Trade and Exchange
	(8) Technological Change
	(9) Material Culture
Effects of European Contact on Native and Immigrant Indians in Northeast Texas (Perttula 1993b)	
	(1) Demography, Impacts of Diseases, and Health Conditions
	(2) Language
	(3) Religion, Ideology, and Ceremony
	(4) Social Structure and Social Status
	(5) Political Organization
	(6) Settlement Systems, Site Planning, and Architecture
	(7) Subsistence and Economic Systems
	(8) Artifacts and Technology
	(9) Trade and Exchange-Foreign Relations
	(10) Ethnicity and Territoriality
	(11) Missionization and Acculturation

> The best way to determine the condition and integrity of an archeological site is to examine its subsurface context through soil probes and exploratory test units dispersed across the site, and assess the level of soil churning, the stratigraphy, and the potential for middens and cultural features to be preserved.

Based on the results of the 1993-1994 survey (Cliff, White, Hunt, Pleasant, and Shaw 1996), it was felt that sites 41BW553 and 41TT670 had the potential to yield information relevant to some of these historic contexts and study units. Based on the survey data collected from these sites, it was felt that both of them might contain important data relating to any (or even all) of the identified study units for *The Emergence of Sedentism in Northeast Texas, ca. 500 B.C. to A.D. 1000* and *The Development of Agriculture in Northeast Texas before A.D. 1600* (see Table 2). The potential of either of these sites to provide significant data would largely depend on its observed integrity. Based on survey data, these sites appeared to contain significant amounts of cultural deposits containing artifactual materials. In addition, these deposits appeared to have a high probability of containing relatively large amounts of unmixed or minimally mixed material, either horizontally or vertically, which would allow the isolation of relatively pure artifactual assemblages which could be reliably dated. Beyond this, it was felt that the recovery of subsistence data, such as faunal remains or macrobotanical material, and of structural remains, such as postholes or features, would increase the integrity and potential of these sites; however, failure to find such preservation would not automatically indicate a lack of research potential.

The determination of eligibility, therefore, depends upon an assessment of a property's integrity, the types of data present, and the applicability of those data to important regional research questions. The data collection procedures outlined below were designed to accomplish these goals.

FIELD PROCEDURES

Investigations at each site began with the establishment of a grid baseline. This baseline was aligned to best fit the topography of the site area and was laid out using an optical theodolite and tape. Although the original site datums were left in place, in neither case were these tied directly into the resultant grid coordinate system. At site 41BW553, the central point of the grid system, where the north and south baselines crossed, was given the arbitrary designation of N500/E500. At site 41TT670, this point was N500/E816. As no benchmarks were easily accessible to tie into, site elevations were estimated from the USGS maps. Thus, the elevation of the central point on site 41BW553 (N500/E500) was estimated to be 77.00 m amsl; while the elevation of the central point on site 41TT670 (N500/E816) was estimated at 88.00 m amsl. Once the site grid was in place, a series of 50-x-50-cm test units was excavated along the baseline at uniform intervals to quickly determine the extent of the site. Subsequently, additional 50-x-50-cm units were excavated to one or both sides of the baseline in order to fill in the remainder of the grid over the site. Once the excavation of the 50-x-50-cm units was completed, a limited number of 1-x-1-m and 1-x-0.5 m units were excavated to test features and/or artifact concentrations identified on the basis of the 50-x-50-cm units. Occasional 30-x-30 cm shovel tests were also employed to help delineate the sites' boundaries and to test certain landforms.

All excavation units were placed so that the southeastern corner of the unit fell on even grid coordinates, and the elevation of this corner was later measured with an optical theodolite. All units were excavated in 10-cm arbitrary levels, using shovel and trowel, and all of the excavated matrix was passed through 6.4-mm (¼-in) hardware cloth. A unit level form was completed for each level excavated and all artifacts recovered from that level were bagged separately. The stratigraphy of each unit was measured and recorded, but profile drawings were produced in the field only for the 1-x-1-m units (see Appendix A) and for those units along the baseline at 41TT670. A photographic record was kept of the operations conducted at each site, including photographs of profiles, features, and general overviews. Descriptions of all of these photographs were recorded on a photolog form. Extensive field notes were maintained by both Project Archeologists and by the Field Supervisor.

When a feature was identified in an excavation unit, a plan and profile (if appropriate) were drawn on metric graph paper, photographs were taken, and a feature form completed. Half of the soil from each feature was screened at the site and the remainder was saved for flotation. Where midden, or culturally darkened, deposits were identified, flotation samples were removed from a 30-x-30-cm square from each 10 cm level which contained the deposits (i.e., a sample of 9 liters for each level).

Backhoe trenching was conducted at both sites, in order to better understand the stratigraphic history of the site. In each case, trench walls and backdirt piles were examined to determine whether they contained cultural materials or features, the stratigraphy of each trench was recorded, and their horizontal and vertical locations recorded using an optical theodolite. A sample of fill from each backhoe scoop was screened for cultural resources and approximate depth recorded. Nearly all of the backhoe trenches from both sites yielded artifacts, some of which were temporally diagnostic. Three locations on site 41BW553 were tested with the backhoe, while the adjacent flood plain stratigraphy, to a depth of 3 m, was examined in two hand auger test holes. All three backhoe trenches were placed in the southern portion of the site. One auger test was placed off the edge of the site to the south, and another was placed in the clayey bottomlands immediately to the west of the site. A third hand auger test hole was excavated to the east of Pine Lake, about 0.4 km northwest of site 41BW553, to clarify the nature of the geomorphological surface on which the site is located. At site 41TT670, four backhoe trenches were excavated across the southern arm of the site. No auger tests were excavated. A fifth backhoe trench was excavated approximately 0.4 km to the northwest of site 41TT670 to record the stratigraphy of the adjacent upland landform.

Once excavations were completed, both sites were mapped using a TOPCON total station laser transit. Each site was mapped in reference to the elevation and grid coordinates of the aforementioned central point. This methodology provided a detailed plot of the size, configuration, and variations in elevation across each site. The locations of all auger holes, backhoe trenches, and test units were also mapped in, as were all outstanding cultural and topographic features.

LABORATORY METHODS

Following the completion of the fieldwork, all artifacts and ecofacts were returned to the offices of Geo-Marine, Inc., in Plano, Texas, for processing and analysis. The analysis of the artifact assemblages recovered by the current project was designed to characterize as well as possible the range of activities conducted at the sites (see Appendices B and C for ceramic and lithic artifact definitions and summary tables, respectively; information about the few historic artifacts recovered is provided in Appendix D; and the faunal and macrobotanical material data are presented in Appendices E and F). A total of 7,280 specimens, consisting of 2,701 lithic artifacts, 1,258 ceramic artifacts, 34 historic artifacts, 162 burned rock fragments (weighing 2661 g), 413 baked clay/daub fragments (weighing 634.2 g), 2,430 bone fragments, and 282 shell fragments, was recovered by dry screening and flotation during the investigations at the two sites. During the analysis of this material, each specimen was examined in sufficient detail to allow the identification of specific attributes and its placement into a specific artifact or nonartifact class.

The major artifact classes utilized in this analysis include projectile points (both dart and arrow), bifaces, unifaces, lithic debitage (flakes, shatter, and cores), ground/battered/pecked stone, burned rock, and prehistoric ceramics and baked clay. The ceramic material was analyzed separately from the lithics (which included chipped stone, as well as ground/battered/pecked and incised stone). Nonartifactual cultural remains, including bone, shell, and macrobotanical remains, were counted and weighed and separated out for specialized analysis. All observed attributes for both ceramic and lithic artifacts were input on an IBM clone using dBase IV software.

All flotation samples were floated out of the field by froth technique using a machine and a deflocculent (sodium metahexaphosphate). Samples were first measured and the volume recorded on prepared tags. The floated samples were separated into heavy and light fractions, with the light fraction being diverted off of the surface into a flotation basket containing chiffon cloth. The heavy fraction consisted of the nonfloating residue which was left behind in a washtub with window screen (158.75 microns or .00625 inch) covering the bottom. Both fractions were subsequently sorted and all identifiable ceramics, lithics, bone, and shell removed and catalogued. The bone, shell, and macrobotanical remains were all analyzed separately by GMI consultants (see below).

Following completion of the analysis, all artifacts were catalogued, labeled, and bagged in compliance with the requirements of the Texas Archeological Research Laboratory (TARL), the University of Texas at Austin, for the preparation of archeological material collections. The photographic records compiled during the investigations were also catalogued in compliance with TARL standards. The final repository of the artifacts and records compiled as a result of this testing program is expected to be TARL.

Prehistoric Ceramic Analysis

Analysis of the prehistoric pottery recovered from the testing of sites 41BW553 and 41TT670 was undertaken to provide a database of basic technological and stylistic characteristics of the samples, and to provide typological identifications where possible (see Appendix B). The analysis was designed to recover information primarily from individual sherds in isolation, thus certain attributes were more accessible for investigation than others. For example, while the recording of vessel form and rim contours gives a preliminary indication of the range of vessels present in an assemblage, the relatively small size of most of the sherds and the limited numbers of rims present in the samples from these two sites prevented the systematic recording of these attributes. Thus, while it was not possible to obtain complete information on the full range of vessel forms and rim contours present in these samples, it was possible to document paste texture and nonplastic inclusions in considerable detail; and the best characterization of the samples from these two sites can be developed from observation of the microqualities related to technological variability. These attributes have been used to develop a detailed portrait of the two ceramic samples at a level complementary to that of the traditional type-variety system. The type and relative frequency of nonplastic inclusions was considered a secondary source of temporal information, in addition to being an indicator of technological practices at the two sites.

Sherds larger than 1 cm^2 in size were subjected to an analysis of specific attributes and were given type designations whenever possible. Sherds smaller than this were merely counted, and not subjected to additional analysis. Attributes chosen for recording relate to paste characteristics, firing, stylistic qualities, thickness and weight, and vessel contours (Table 3). Sherds believed to be from the same vessel, based on examination of color, texture, decoration, firing, and nonplastic inclusions, were recorded as such so that a count of minimum number of vessels could be obtained. This number, rather than the number of individual specimens, should be taken to represent the size and character of the samples as they are currently known.

Sherd weight was recorded in grams and sherd thickness in millimeters, both estimated to the first decimal place. Interior characteristics, such as core properties and nonplastic inclusions, were identified with the aid of a 15X hand lens. Estimates of percentages of inclusions were made using a visual chart for comparison with the sherds, with percentages rounded off to the nearest ten percent. These estimates should thus be considered relatively rough quantifications of broad distinctions between vessels with little nonplastic material and those with moderate or heavy amounts. Munsell colors were recorded for the exterior surfaces of all sherds. In those few instances where rim sherds were large enough to estimate rim diameters, a chart providing estimates to the nearest centimeter was used. Sherd texture was differentiated according to a subjective scale of fracturing characteristics, ranging from subconchoidal to laminated or contorted. Nonplastic inclusions were recorded according to type, particle size, and frequency for the two most prevalent types of inclusions. In most cases, there is only one type of visible nonplastic inclusion for a given sherd. A few sherds do have two main types of inclusions, but no more than two types were recorded for

Table 3
Ceramic Variables Recorded for Analysis

Paste Texture
Inclusions (Primary and Secondary)
Frequency of Inclusions
Surface Finishing
Decorations (Primary and Secondary)
Location of Decoration
Firing Core Type
Rim Type, Lip Form, Base Form
Exterior Surface Color
Thickness
Vessel Form
Rim Diameter
Weight
Quantity of Sherds Per Individual Specimen
Number of Individual Specimens
Minimum Number of Vessels

any specimen from either of these two sites. Any spurious or infrequent inclusions were recorded under separate comments. Firing atmosphere of vessels was inferred from the color and cross-section appearance of sherd interiors; red to brown cores were considered to be oxidized and gray to black cores were considered to be reduced. The presence of sharply defined or diffuse areas contrasting with the main core was also recorded.

Following completion of the ceramic analysis, a sample of 10 sherds from each of the two sites was selected for additional petrographic analysis (see Appendix G). In selecting these samples, an attempt was made to select as wide a range of variability as possible, in regard to past characteristics (i.e., texture and nonplastic inclusions) in hopes of obtaining some estimation of the petrographic characteristics of locally versus nonlocally produced vessels. At the same time, as many typed sherds as possible were included in the samples to provide some temporal control, although, admittedly, the primary concern with paste variability resulted in no more than 20-30 percent typed sherds being included in the samples.

Lithic Analysis

As noted above, the major classes of lithic artifacts recognized by this analysis consisted of projectile points (including both dart and arrow points), bifaces, unifaces, lithic debitage (flakes, shatter, and cores), and ground/battered/pecked stone (see Appendix C).

Artifacts identified as lithic tools included projectile points, bifaces, unifaces (which include both utilized and retouched flakes and more formal tools such as scrapers), and ground/battered/pecked stone. All tools, as well as some classes of lithic debitage (such as exhausted cores), were identified as to subclass or type and a number of variables recorded, including length, width, thickness, weight, and raw material type (including color). Projectile points were identified as to named types and varieties, whenever possible, and bifaces were placed into appropriate subclasses, consisting of "early aborted," "late aborted," "preform," "thinned," or "unidentified fragments." Additional attributes recorded for projectile points and bifaces (when applicable) included stem length, and both maximum and minimum stem width. Unifaces (or unifacial tools) were subdivided into "utilized," "marginally modified," or "steeply retouched" subclasses (see Appendix C). Additional variables recorded for unifaces included the form, location, and length of the working edge; and characteristics of the blank, including blank type, platform type (if applicable), and raw material type and color.

Lithic debitage includes cores, flakes, and shatter. Cores were separated and treated as tools in terms of the attributes recorded. No sign of use-wear was observed on any of the examined cores, so none were classified as formal tools. Variables recorded for the remaining debitage (flakes and shatter) included size; raw material type; type of debitage (i.e., flake, flake fragment, or shatter); amount of dorsal cortex (if present); whether or not the piece had been subjected to heat-treatment or burning; and weight.

Faunal and Macrobotanical Analysis

Two types of faunal remains were recovered from the testing of sites 41BW553 and 41TT670 — vertebrate remains (i.e., bone and teeth) and molluscan remains (i.e., mussel shell). Bone and shell remains were recovered from both hand screened and floated contexts at both sites. All of the bone was analyzed by Brian Shaffer of the University of North Texas, while the molluscan remains were identified by Dr. Richard Fullington, of Arlington, Texas (see Appendix E).

The Zooarchaeological Collection housed at the Institute of Applied Sciences, University of North Texas, was used for comparison and identification of the archeological vertebrate faunal materials recovered from both sites. Vertebrate remains recovered from sites 41BW553 and 41TT670 were analyzed for the purpose of identifying the taxa present and any cultural modification of the material. Identifications were based on direct comparisons to the type collection and were made to the most specific category possible, given the condition of the material. The faunal remains were assessed for taxon, type and portion of element, side, and basic taphonomic factors. The latter included weathering, breakage, and burning. Unique or culturally modified specimens were examined under magnification, using either a 10X hand lens, or a light microscope up to 30X. Data collected on the samples were entered into a database program for ease of manipulation (Shaffer and Baker 1992). Taxa were quantified using the "number of identified specimens" (NISP). The minimum number of individuals (MNI) for any identified taxon did not exceed one individual, although it must be emphasized that MNI only presents minimal estimates. Many of the samples were derived from flotation collection techniques; and these small specimens were mostly derived from larger elements and hence were unidentifiable below the level of class (Vertebrata). As a result, only a limited amount of information could be extracted from the samples. The results of the faunal analysis are discussed in detail in subsequent chapters, and are summarized in Appendix E.

The molluscan samples were analyzed by Dr. Richard Fullington. Freshwater bivalve units from each field sack were examined by hand. Only those units that could be determined to represent an individual specimen (umbos or large segments of valves) were counted. Generally, each field sack contained numerous unidentifiable valve fragments. Coloration of the identifiable units and fragments were examined for evidence of heating, and data were entered on Microsoft Access database and Microsoft Word software programs. The results are summarized with the faunal data in Appendix E.

Macrobotanical remains were recovered from flotation contexts at both sites. This material underwent preliminary sorting in the Geo-Marine, Inc., laboratory and was then sent out for analysis and identification. Analysis of the macrobotanical remains was undertaken by Dr. Richard Holloway, of Flagstaff, Arizona (see Appendix F). Upon receipt of the materials, the contents of the light fraction flotation samples were measured and then examined using a Meiji stereoscopic zoom microscope (7X-45X magnification). The heavy fractions of the flotation samples were examined for botanical remains but were not measured. Wood charcoal specimens were examined using a modification of the snap method of Leney and Casteel (1975) in order to expose fresh transverse surfaces. These are necessary since soil particles often fill the vessel elements of the wood charcoal, obscuring the characteristics necessary for identification. Identifications of wood charcoal and seed materials were based on published reference materials (Martin and Barkley 1961; Montgomery 1977; Panshin and de Zeeuw 1980; Schopmeyer 1974), as well as comparisons with modern reference specimens.

The charcoal specimens were not measured for volume. In many cases only a few items were present. Nut fragments were separated and identified whenever possible. The wood charcoal material was examined using the above method (Leney and Casteel 1975), although in many cases the specimens were too small for identification beyond the level of hardwood type. It is generally necessary to have at least one year of growth for identification purposes and many of the fragments were too small. The results of the analysis are presented in subsequent chapters and summarized in Appendix F.

Oxidizable Carbon Ratio Analysis

The Oxidizable Carbon Ratio (OCR) dating method is a new technique pioneered by the Archaeology Consulting Team (ACT) of Essex Junction, Vermont. According to ACT, the OCR method is best used for archeologically young contexts:

> The biochemical degradation of humic material and charcoal occurs in a slow, linear progression. This recycling process, which can be quantified as the ratio of total carbon to readily oxidizable carbon, is the basis of the Oxidizable Carbon Ratio (OCR) procedure (ACT 1996).

Sixteen samples (nine from 41BW553 and seven from 41TT670) were submitted to ACT for analysis. The 41BW553 samples came from Test Unit 67, both above and below the midden there, as well as from Features 1, 3, and 5; while the 41TT670 samples came from Test Unit 120, both above and below the midden, and from the fill of Feature 2. The results, which suggest a variety of Caddoan occupations at both sites, are presented in subsequent chapters and in Appendix H.

Radiocarbon Analysis

The archeological test excavations conducted at sites 41BW553 and 41TT670 resulted in the recovery of charcoal and carbonized macrobotanical remains from two midden areas and several prehistoric features. Although moderate amounts of datable material were recovered from these contexts, the remains tend to be small and fragmentary. Under these circumstances, it was felt that there were two ways to proceed in choosing material to be radiocarbon dated. The first was to pool charcoal from several excavation levels in order to obtain samples large enough to date conventionally (i.e., >1 g carbon). The second was to use Accelerator Mass Spectrometry (AMS) dating that requires much smaller amounts of carbon to date (.005-.3 g) and yields more accurate results. It was also clear that the use of AMS dates would allow the dating of individual specimens of nutshell from specific contexts. Taking into account all of these considerations, it was decided that AMS dating would be a much better use of available resources and would yield the most valid dates.

Thus, following completion of the macrobotanical analysis and return of the macrobotanical remains to Geo-Marine, Inc., six samples were selected for AMS radiocarbon dating. Samples were chosen to maximize the likelihood of reliable results as much as possible. Thus, in most cases feature contexts were dated, and whenever possible hickory shell was the preferred material for dating. When possible only individual shells were dated, to produce as tight a date as possible. The actual radiocarbon analysis was done by Beta Analytic, Inc., of Miami, Florida. The results are discussed in subsequent chapters and presented in Appendix H.

CHAPTER 5
RESEARCH RESULTS I: SITE 41BW553

by
Floyd B. Largent, Jr., Whitney J. Autin, Rebecca S. Procter,
Brian S. Shaffer, and Maynard B. Cliff

INTRODUCTION

Site 41BW553 is located on a low, north-south trending ridge system, approximately 200-300 m southwest of Pine Lake and 100-200 m northwest of Flag Lake, both of which are abandoned channels of the Sulphur River. This surface is an isolated remnant of late Pleistocene low terrace, covered by Holocene overbank sediments, and surrounded by the Holocene flood plain of the Sulphur River. The site is confined primarily to the ridge, which is dotted with small knolls or "pimple mounds," although a few artifacts were collected from the clayey bottomlands immediately surrounding the ridge system. The soil in this area is mapped as being Sawyer silt loam, a nearly level and gently sloping soil found in uplands and having slopes of 0-3 percent (USDA 1980). The typical soil profile for Sawyer silt loam begins with a surface layer of dark grayish brown silt loam approximately 15 cm thick; below this is a subsoil extending 200 cm or more in depth. The subsoil is a yellowish brown clay loam in the upper 23 cm, underlain by a yellowish brown clay loam with reddish and grayish mottling in the succeeding 28 cm, then a mottled gray, red, and dark brown clay in the lowest portions (USDA 1980:28-29). This largely agrees with what was found during excavation (see Sediments and Stratigraphy, below, and Appendix A). The surrounding bottomland area is dominated by dense, black Texark clays.

The site varies in elevation from approximately 76 to 78 m above mean sea level (amsl). Elevations of the surrounding Holocene flood plain backswamps are near 73 m above sea level. The site area is heavily wooded, with a mixture of immature oak, hickory, elm, ash, black locust, sweetgum, sycamore, and other hardwoods. An occasional juniper was also noted. Common understory plants include briars, goldenrod, grapevines, rattan, yaupon, violets and other wildflowers, and various forbs. Although most of the trees averaged perhaps 6-7 m in height and less than 20 cm in thickness, a few more mature trees were noted. The immature nature of the forest is believed to be the result of relatively recent timbering activities (ca. 1960-1970).

PREVIOUS RESEARCH

Site 41BW553 was originally located and recorded in October 1993. At that time, 33 30-x-30 cm shovel tests were excavated across the site area; 28 of these actually fell within the estimated site boundaries (Figure 4). Ninety-eight artifacts were recovered from subsurface contexts, with another ten collected from rodent

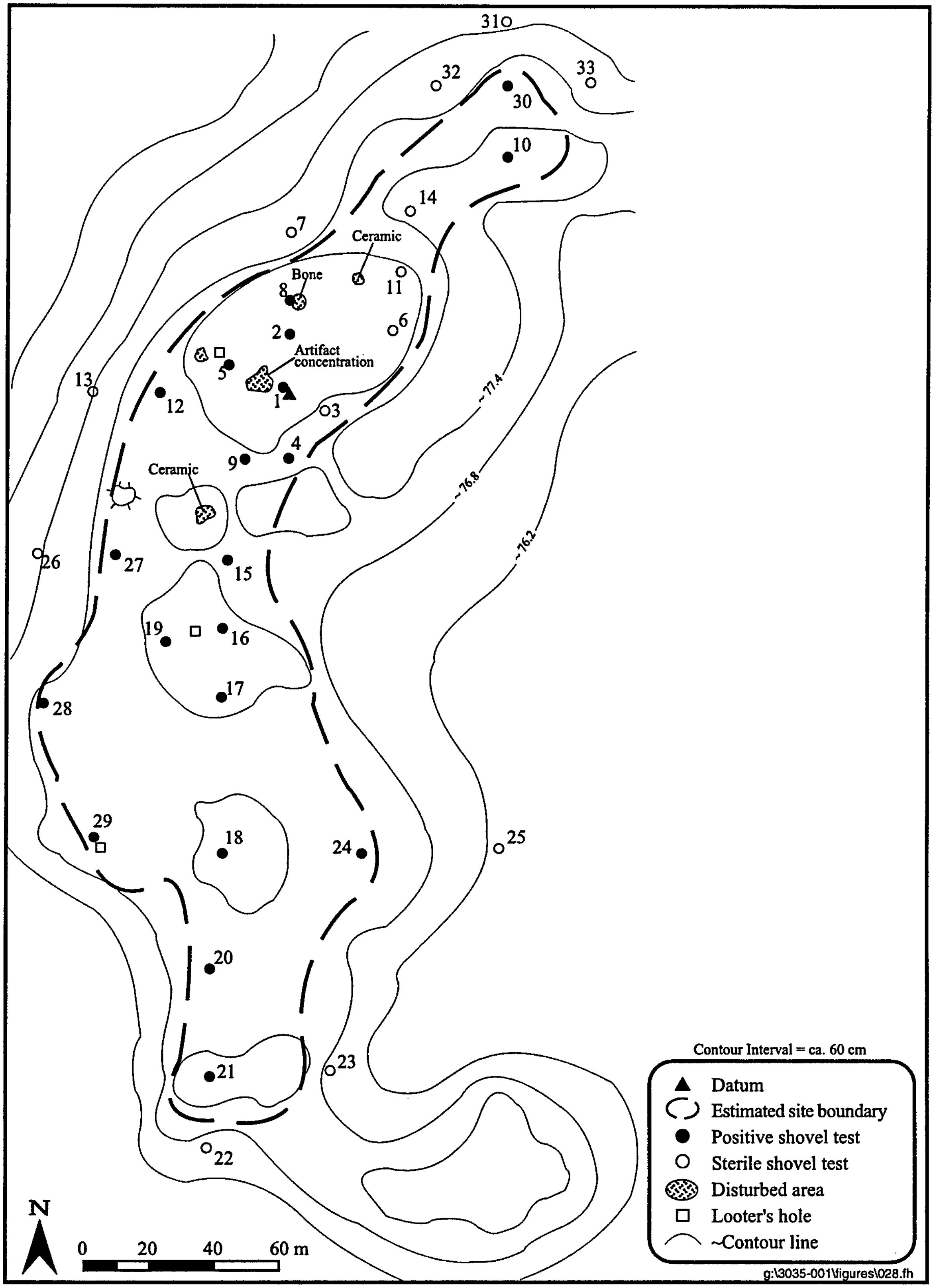


Figure 4. Original sketch map of site 41BW553, showing the locations of previous shovel tests (from Cliff, White, Hunt, Pleasant, and Shaw 1996:Figure 9).

backdirt piles on the surface. Among these were 63 prehistoric ceramic sherds, one utilized flake, 40 pieces of unmodified lithic debitage, three fragments of burned clay, and a burned rock. In addition to these artifacts, at least 15 mussel shell fragments, 11 bone fragments, and a charcoal sample were also collected. The general soil profile noted for the site was characterized by a dark yellowish brown to light yellowish brown (10YR 3/4 to 10YR 6/4) sandy loam in the upper 40-60 cm, underlain by a yellowish brown to very pale brown (10YR 5/4 to 10YR 7/3) compact silty loam extending to a depth of 70 cm below surface (bs). Most of the artifacts came from the upper 50 cm of the profile (Cliff, White, Hunt, Pleasant, and Shaw 1996). Perhaps the most diagnostic artifacts noted were a Coles Creek Incised sherd from 20-40 cm bs (Formative Caddoan; A.D. 800-1000) and a Nash Neck Banded sherd from the surface (Late Caddoan; A.D. 1400-1680). The bone consisted of mammalian remains, a few of which were identifiable as belonging to deer (*Odocoileus* sp).

Given the nature of the remains identified at site 41BW553, it was judged to be a Caddoan site with both Formative and Late Caddoan components. Furthermore, the range of artifacts present at the site was believed to reflect diverse activities within the site itself. Despite bioturbation and possible looting, the site was believed to be mostly intact. Considering its artifact density, good faunal preservation, multiple components, and its likelihood for producing intact subsurface features, it was judged to have a high potential for contributing to our knowledge of the Caddoan occupation of Northeast Texas. For these reasons, the site was recommended for additional testing prior to a final determination of National Register eligibility.

CURRENT INVESTIGATIONS

The current investigations at site 41BW553 began with the establishment of a site grid, in order to guide the planned excavations. Lines-of-sight were cleared with machetes, brush-hooks, and saws, and an optical theodolite was employed to lay in a baseline along the longest site axis, which in this case was oriented approximately 5°30' west of magnetic north — more or less coinciding with true north. Grid stakes were placed at 25 m intervals along the length of the baseline, which measured just over 300 m long. Thereafter, short east-west lines were placed at 50 m intervals perpendicular to the north-south baseline as necessary to guide the work. Sixty-four 50-x-50 cm units were then excavated across the site area, most at 25 m intervals, although 50 m intervals were sometimes used to identify the edges of the site, and in two cases units were spaced only 15 m apart for reasons of accessibility. Twenty-five 30-x-30 cm shovel tests were also excavated, most of which were employed to delineate the midden found near the center of the site (Feature 6). The remaining 30-x-30 cm units were excavated in an effort to determine the site's horizontal extent (Figure 5).

Based on the results of the 50-x-50 cm testing, several areas of the site were identified which warranted further effort: (1) an area containing an unusually high density of lithic artifacts and only a few ceramics in the southeastern portion of the site, in the area of Test Units 39, 44, and 53; (2) an area in the center of the site which produced a dark organic stain resembling a midden or house floor (Test Unit 13); (3) a small rise 50 m west of Unit 13, which yielded a dark midden soil at the surface as well as a feature (Feature 3) containing bone, charcoal, hematite, ceramics, and lithics from 70 cm bs in Test Unit 30; (4) an area near the original datum, where a moderately high artifact density was noted, in conjunction with good bone preservation; and (5) an area in the north-central section of the site which produced a high artifact density as well as an apparent posthole (Feature 1) in Test Unit 24. These observations stimulated the excavation of four 1-x-1 m units (Test Units 66, 67, 69, and 72) in the first four areas mentioned, in an attempt to gather more data to clarify the situation in each area (see Appendix A for a more detailed summary of the stratigraphy). In regard to the fifth area, an additional 50-x-50 cm unit (Test Unit 83) was placed adjacent to Unit 24, in hopes of locating additional postholes, but none were identified.

Three additional features (Features 5, 6, and 7) were identified as a result of the excavation of the four 1-x-1 m units, for a total of five (Features 2 and 4 were later determined not to be cultural in origin and their numbers were dropped). Feature 5 is an apparent posthole, which extends from the base of an organically enriched soil horizon, possibly a house floor or midden, into the underlying subsoil. This feature was observed only in the south wall of Test Unit 69, near the center of the site. Features 6 and 7 were both identified in Test Unit 67 — the former is the aforementioned dark midden soil extending 0-30 cm bs, and the latter is the remains of a possible human burial, represented by a few fragments of bone and a near-complete ceramic vessel, which was found approximately 60-65 cm bs. All of the cultural features will be discussed in more detail later in this chapter.

SEDIMENTS AND STRATIGRAPHY

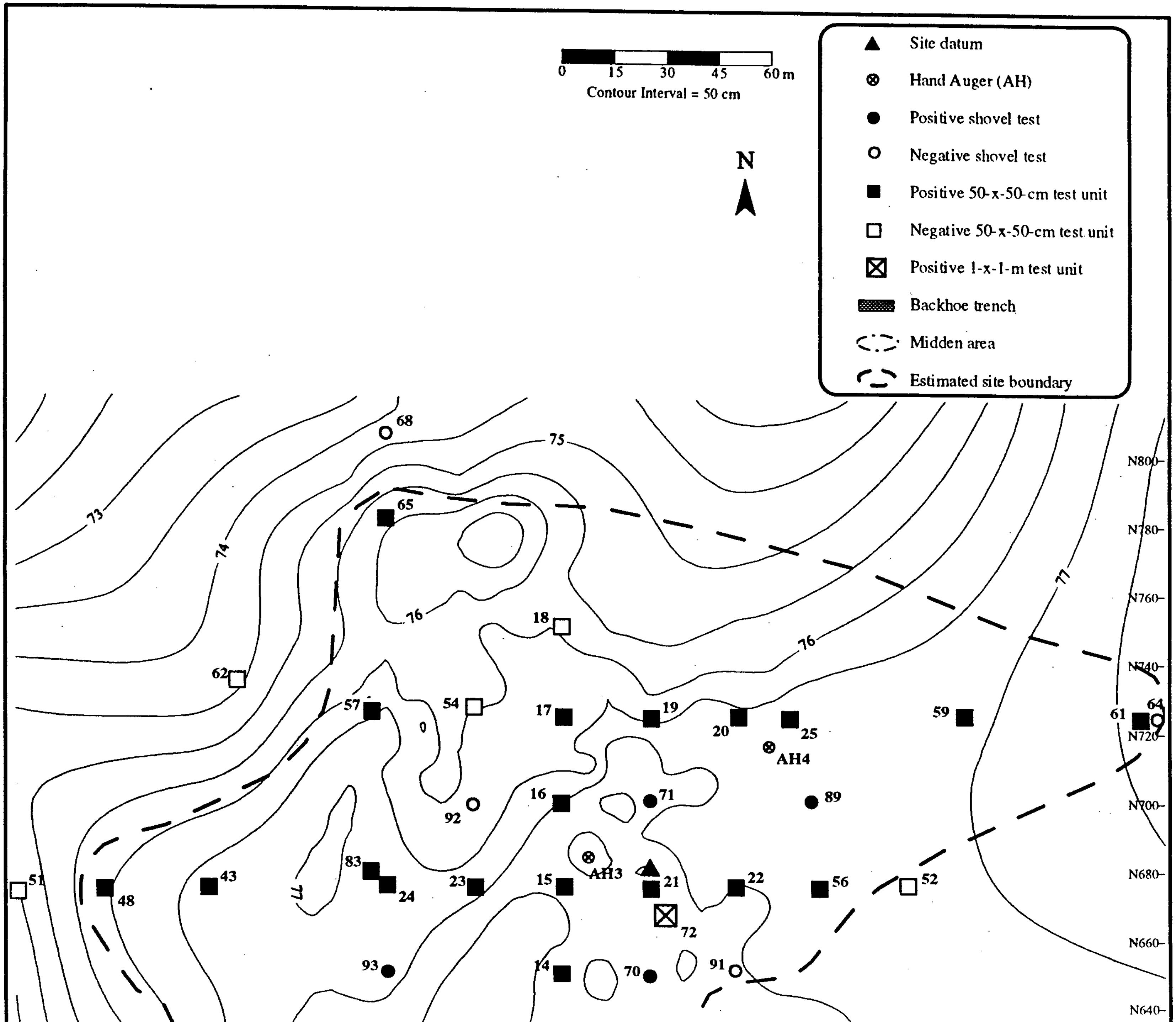
Site 41BW553 is situated on a low fluvial terrace of probable Late Pleistocene age. Extending the Lower Mississippi Valley and Lower Red River Valley geological nomenclature into this area suggests that the low fluvial terrace possibly correlates to the Prairie Complex (Autin 1996; Autin et al. 1991; Saucier 1994). The Prairie Complex is generally considered to be Sangamon to Wisconsin in age. In low fluvial terrace settings, remnant constructional features such as meander scars, abandoned channels, and point bars can be identified from their geomorphic expression.

The surface soil at site 41BW553 is mapped as Sawyer silt loam, 0 to 3 percent slopes (USDA 1980). Slopes at and around the site are within this range, and reach their maximum along the flanks of the site where the low terrace grades into the Holocene backswamp. The Sawyer series is classified as Aquic Paleudults, moderately well-drained soils with a distinct zone of clay accumulation (Bt horizons) and evidence of seasonal soil wetness. This soil series has a silt loam surface soil overlying a clayey subsoil. In Bowie County, the series is mapped on low terraces and higher landscapes (USDA 1980).

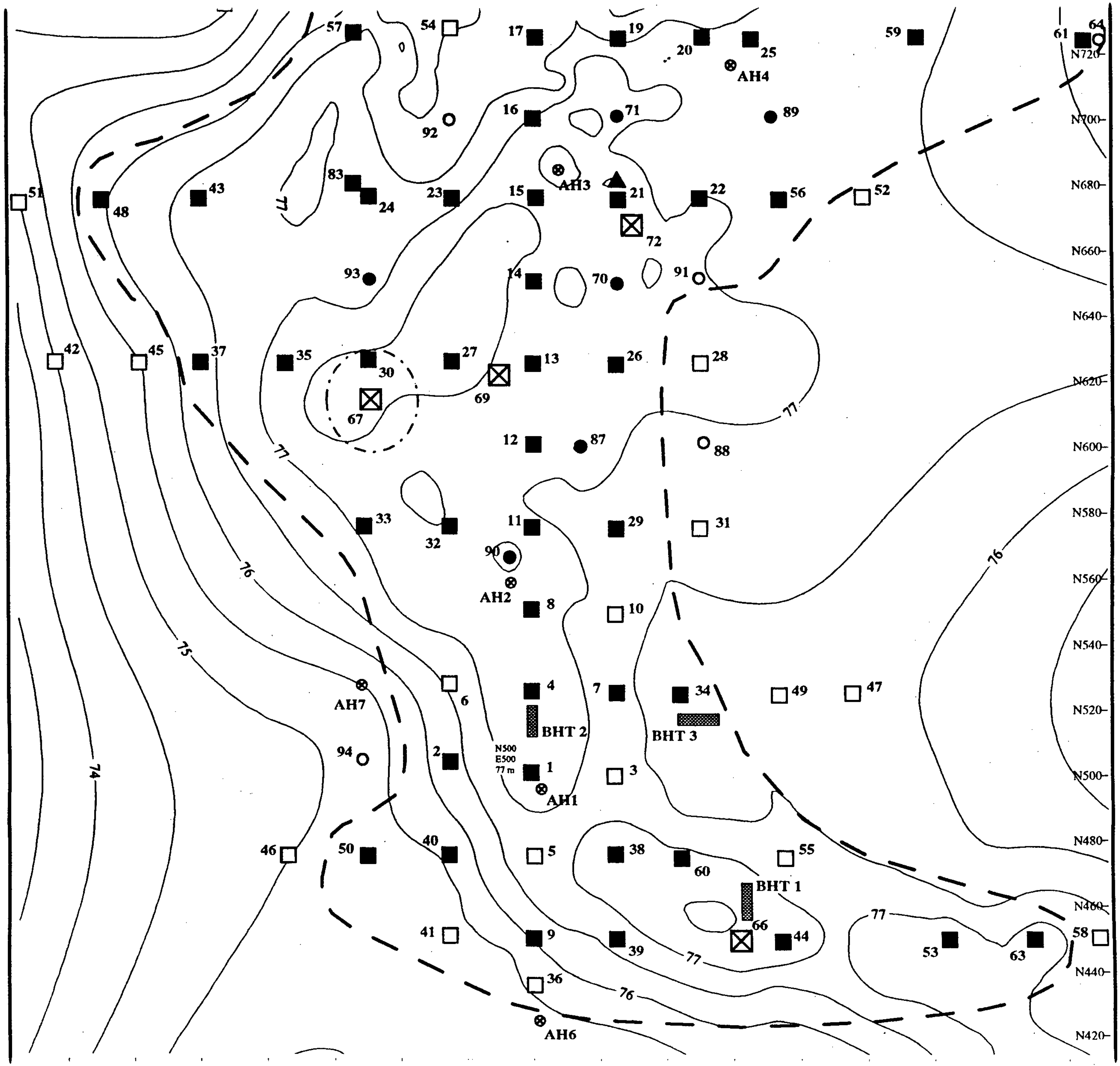
Surface soils and sediments were inspected and described in three soil auger profiles and three backhoe trenches. Five profiles were described from the site (Auger Holes 6 and 7; and Backhoe Trenches 1, 2, and 3), and one profile was inspected on an equivalent landscape position on a low terrace remnant east of Pine Lake (Auger Hole 5). The site data revealed four mappable surficial strata (Figure 6) — (1) a brown loamy cover deposit, (2) a reddish mottled clayey deposit, (3) a gray silty deposit, and (4) a lower sandy deposit. The definition of the Sawyer series (USDA 1980) is based on the recognition of the brown loamy and red mottled units within 2 m of the land surface.

The field lithologic and pedologic properties of the surficial sediments from the auger profiles and backhoe trenches are summarized in Table 4. The brown loamy sediment is a brownish mottled sandy loam to silt loam with weak granular soil structure. The soil horizon sequence is weakly expressed, with either A-C or A-Bw profiles. The red mottled unit is a grayish silty clay to silty clay loam with prominent reddish (7.5YR to 2.5YR) mottles. The soil horizons are hard to friable, and have either Bw or Bt expression. The gray silty unit is a grayish silt loam to clay loam with blocky soil structure. The Bt horizon has clay films on soil peds, root traces, oxide stains, and concretions. The sandy unit is a loamy sand to sandy loam that becomes water saturated with depth.

The sandy unit was deposited as bedload of the late Pleistocene Sulphur River, while the gray silty unit was deposited as contemporaneous, genetically associated late Pleistocene overbank sediment. The top of the Bt horizon in the gray silty unit marks a paleosol that is laterally continuous across the site. The red mottled unit differentially drapes the landscape and was probably deposited subsequent to flood plain abandonment and initial formation of the low terrace. The brown loamy unit was washed in by Holocene streams and differentially drapes the late Pleistocene paleosurface.



Site datum
Hand Auger (AH)
Positive shovel test
Negative shovel test
Positive 50-x-50-cm test unit
Negative 50-x-50-cm test unit
Positive 1-x-1-m test unit
Backhoe trench
Midden area
Estimated site boundary
0 15 30 45 60 m
Contour Interval = 50 cm
N
N800
N780
N760
N740
N720
N700
N680
N660
N640
73
74
75
76
77
AH3
AH4
14 15 16 17 18 19 20 21 22 23 24 25 43 48 51 52 54 56 57 59 61 62 64 65 68 70 71 72 83 89 91 92 93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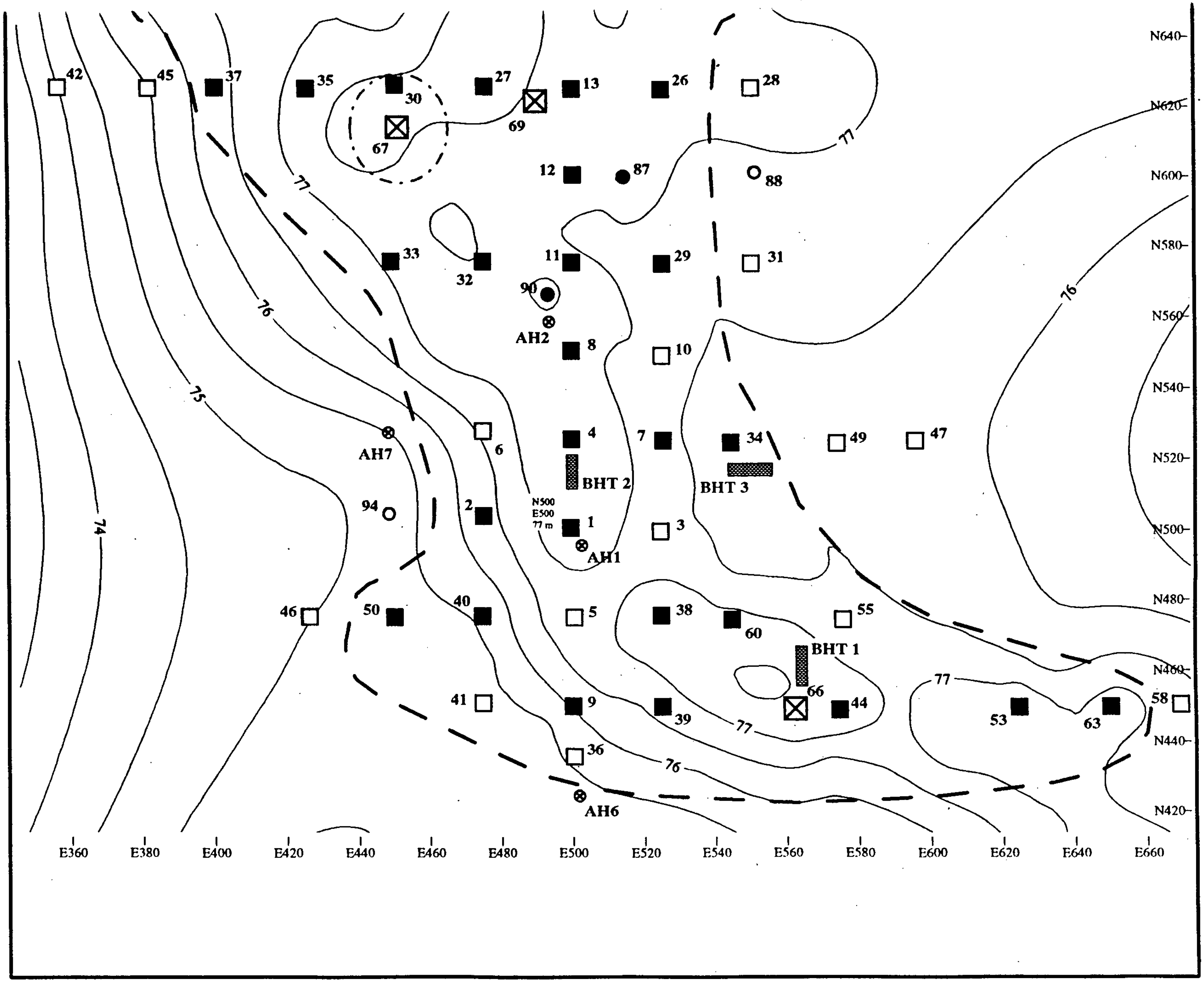


Figure 5. Map of site 41BW553, showing locations of test units, auger holes and backhoe trenches.

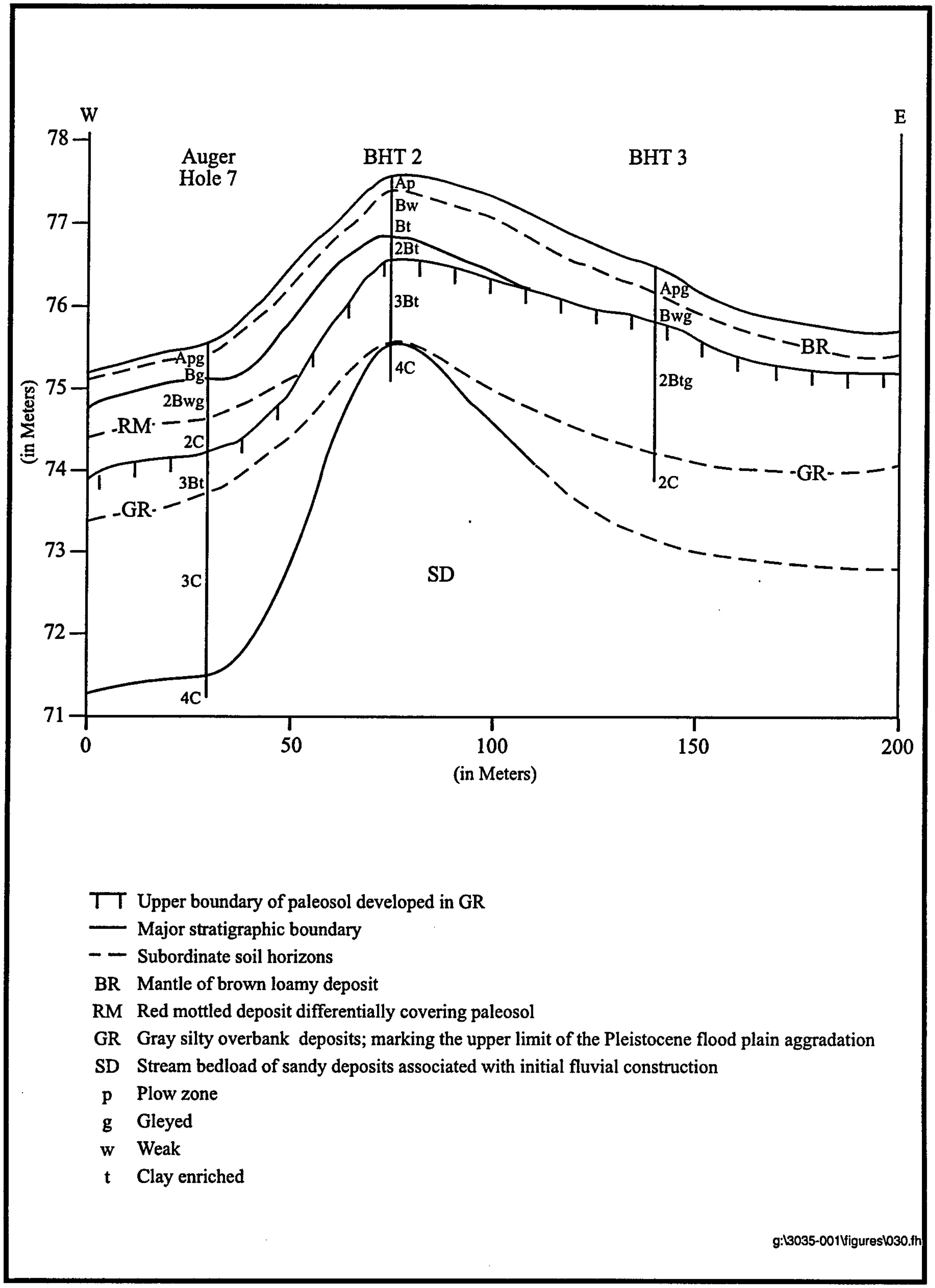


Figure 6. Generalized east-west cross section of the stratigraphy at site 41BW553.

Table 4
Lithologic and Pedologic Properties of Surficial Sediments at Site 41BW553

Unit		Horizon Sequence[1]	Color1[2]		Texture	Structure[3]	Consistence	Comments
Stratum	Profile		Matrix	Mottles				
Brown Loamy (BR)								
	Auger Hole 5	Ap-C	10YR 6/6		sandy loam		friable	roots; 10YR 2/2 stains
	Auger Hole 6	Ap-C-C & 2B	10YR 6/4	10YR 6/2	sandy loam		very friable	10YR 2/2 stains
	Auger Hole 7	Apg-Bwg	10YR 7/2	10YR 6/6	sandy loam		very friable	roots; charcoal
	Backhoe Tr. 1	Ap-Bw-Bt	10YR 5/4		loam	mod med gr	friable	roots
	Backhoe Tr. 2	Ap-Bw-Bt-Bt&2Bt	10YR 5/4	10YR 6/3	sandy loam	wk med gr	friable	roots; pores; ped coats
	Backhoe Tr. 3	Apg-Bwg	10YR 6/1	10YR 4/4	silt loam	wk fn ab	friable	roots
Red Mottled (RM)								
	Auger Hole 7	-2Bwg-2C	10YR 5/1	7.5YR 4/8	silty clay		hard	
	Backhoe Tr. 2	-2Btg	10YR 6/1	2.5YR 4/6	silty clay loam	mod med ab	friable	roots; films on peds
Gray Silty (GR)								
	Auger Hole 5	-2Btg	10YR 5/1	10YR 5/6	clay loam		hard	roots; 10YR 2/2 stains
	Auger Hole 7	-2Bwg-2C	10YR 7/2	10YR 5/8	silt loam		slightly plastic	iron stains; concretions; loamy interbeds
	Backhoe Tr. 1	-2Btg	10YR 6/2	10YR 6/6	loam	wk med ab	friable	
	Backhoe Tr. 2	-3Btg	10YR 6/1	10YR 5/6	silt loam	mod cse ab	hard	roots & root traces
	Backhoe Tr. 3	-2Btg-2C	10YR 6/1	7.5YR 5/8	silt loam	mod med sab	hard	iron stains; krotovina
Sandy (SD)								
	Auger Hole 6	-2Bw-2C	10YR 5/2	10YR 7/2	loamy sand		very friable	water saturated
	Auger Hole 7	-4C	10YR 7/2		sandy loam		loose	
	Backhoe Tr. 2	-4C	10YR 7/2		sandy loam		hard	

Footnotes:
[1] HORIZON designations and descriptive terms are adapted from Soil Survey Staff (1975, 1981).
[2] COLOR notations from Munsell Soil Colors.
[3] STRUCTURE

ab - angular blocky	sab - subangular blocky
gr - granular	wk - weak
mod - moderate	fn - fine
med - medium	cse - coarse

In summary, site 41BW553 is located on a remnant of a late Pleistocene low terrace, probably an abandoned point bar of the Pleistocene Sulphur River. Human occupation of the site in the Holocene occurred after the surface was abandoned and terraced. The cultural deposits found at the site are associated solely with the brown loamy unit, the youngest strata in the sequence. This unit was deposited during the Holocene as overbank sediments of the Sulphur River. Sedimentation was probably slow and flooding infrequent enough not to significantly inhibit human activity. However, accretion at the site effectively buried cultural deposits while pedogenic processes produced an apparently negligible effect.

HORIZONTAL AND VERTICAL EXTENT

While the original survey in 1993 suggested a site area of approximately 30,000 m^2 for site 41BW553 (Cliff, White, Hunt, Pleasant, and Shaw 1996), the current investigation indicates that the site actually covers a much larger area, exceeding 56,000 m^2 in size. The site extends at least 350 m north-south, and varies from 50 to 300 m wide east-west. The variance in site width is due to the irregular nature of the landscape feature on which the site rests; the site drops abruptly off into clayey backswamp on the north, south, and west sides of the landform, and the hospitable, well-drained loams grade into silty clay flats to the east. This topography limits the size of the site, although it is believed that outliers of the main site may exist on other small levee remnants to the north of 41BW553. Ridges of habitable soil extend to the east on the north and south ends of the site, giving it a generally arc-shaped appearance, and a similar ridge extends northward from the northwest side of the site.

The highest density of cultural materials at site 41BW553 occurs in the central portion of the site, and is centered around Test Unit 67, which showed a density of 3,367 artifacts and ecofacts per cubic meter of fill (Table 5). All five of the observed features also occurred in this central area. A second area of high artifact density is located to the north of the datum, centering around Test Unit 17. It is interesting to note that, in this portion of the site overall, a number of high density units (e.g., Units 12, 13, 16, 17, 19, 21, 30, 32, 35, 37, 43, and 67) surround a lower density area (i.e., Units 14, 15, and 23), forming a "ring" or"doughnut" configuration (Figure 7). Similar patterns, consisting of a ring of high subsurface artifact density enclosing a lower density interior have been noted for occupation areas at the Unionville site (41CS151), in Cass County, and at site 41DT59, in Delta County. In both of these cases, subsequent excavation and analysis has suggested that the sites were characterized by a series of overlapping reoccupations (Cliff et al. 1995; Cliff, Green, Hunt, Shanabrook, and Peter 1996). In this light, it is probable that this "doughnut-shaped" pattern of subsurface density may be a signature pattern indicating the presence of separate but overlapping occupation (or activity) areas.

A third area of high subsurface artifact density was centered around Test Units 44 and 66 in the southeastern portion of the site (see Table 5 and Figure 7). This area appears to be separated by a narrow zone of low subsurface artifact density area between two surface rises. The test units excavated in this area, Units 3, 5, and 41, yielded no cultural remains. The southeastern area of the site produced only three ceramic sherds from Units 44 and 66, although in some cases those came from deep contexts. Unit 44 yielded two very eroded sherds from Level 5, 40-50 cm bs, while Unit 66 yielded one incised body sherd from Level 2, 10-20 cm bs (see Appendix B). This area may represent a separate component, or possibly a lithic workshop area, but the evidence is currently insufficient to break it out as a separate activity area. Due to the high subsurface artifact densities present in the central portion of the site, the site's average subsurface density is approximately 437 artifacts/ecofacts per cubic meter of excavated fill.

An examination of the vertical distribution of the artifacts/ecofacts by 10 cm level reveals that, overall, the highest artifact densities occur in the upper three levels, particularly in Levels 2 and 3 (Table 6). Of course, these totals are skewed by the presence of the midden in the central portion of the site, which yielded tremendous amounts of faunal and artifactual material in these two levels. While there are occasional sterile

Table 5
Estimated Volumetrics of Nonsterile Test Units, Site 41BW553[1]

Unit	Dimensions (m)	Depth of Cultural Zone	Volume of Cultural Zone (m^3)	Artifact Frequency[2]	Artifact Density (per m^3)
1	.5 x .5	30 cm	.075	3	40
2	.5 x .5	40 cm	.100	7	70
4	.5 x .5	20 cm	.050	10	200
7	.5 x .5	30 cm	.075	1	13
8	.5 x .5	40 cm	.100	2	20
9	.5 x .5	30 cm	.075	3	40
11	.5 x .5	30 cm	.075	1	13
12	.5 x .5	60 cm	.150	46	307
13	.5 x .5	50 cm	.125	55	440
14	.5 x .5	30 cm	.075	2	27
15	.5 x .5	70 cm	.175	5	29
16	.5 x .5	60 cm	.150	33	220
17	.5 x .5	30 cm	.075	52	693
19	.5 x .5	60 cm	.150	33	220
20	.5 x .5	50 cm	.125	3	24
21	.5 x .5	50 cm	.125	33	264
22	.5 x .5	40 cm	.100	5	50
23	.5 x .5	40 cm	.100	5	50
24	.5 x .5	60 cm	.150	14	93
25	.5 x .5	80 cm	.200	15	75
26	.5 x .5	10 cm	.025	3	120
27	.5 x .5	80 cm	.200	27	135
29	.5 x .5	40 cm	.100	1	10
30	.5 x .5	80 cm	.200	135	675
32	.5 x .5	60 cm	.150	50	333
33	.5 x .5	70 cm	.175	19	109
34	.5 x .5	30 cm	.075	7	93
35	.5 x .5	60 cm	.150	40	267
37	.5 x .5	70 cm	.175	44	251
38	.5 x .5	60 cm	.150	12	80
39	.5 x .5	20 cm	.050	1	20
40	.5 x .5	20 cm	.050	3	60
43	.5 x .5	60 cm	.150	13	447
44	.5 x .5	80 cm	.200	50	250
48	.5 x .5	50 cm	.125	28	224
50	.5 x .5	20 cm	.050	1	20
53	.5 x .5	50 cm	.125	2	16
56	.5 x .5	20 cm	.050	13	260
57	.5 x .5	50 cm	.125	4	32
59	.5 x .5	70 cm	.175	5	29
60	.5 x .5	50 cm	.125	5	40
61	.5 x .5	20 cm	.050	1	20
63	.5 x .5	90 cm	.225	21	93
65	.5 x .5	40 cm	.100	4	40
66	1 x 1	60 cm	.600	46	77
67	1 x 1	67 cm	.724	2438	3367
69	1 x 1	40 cm	.400	71	178

Table 5 (cont'd)

Unit	Dimensions (m)	Depth of Cultural Zone	Volume of Cultural Zone (m^3)	Artifact Frequency[2]	Artifact Density (per m^3)
70	.3 x .3	20 cm	.018	5	278
71	.3 x .3	70 cm	.063	16	254
72	1 x 1	40 cm	.400	57	143
74	.3 x .3	10 cm	.009	2	222
75	.3 x .3	10 cm	.009	10	1111
76	.3 x .3	10 cm	.009	3	333
77	.3 x .3	10 cm	.009	3	333
78	.3 x .3	10 cm	.009	1	111
79	.3 x .3	10 cm	.009	15	1667
80	.3 x .3	10 cm	.009	9	999
81	.3 x .3	10 cm	.009	3	333
82	.3 x .3	10 cm	.009	6	666
83	.5 x .5	20 cm	.050	8	160
84	.3 x .3	10 cm	.009	9	999
85	.3 x .3	10 cm	.009	4	444
86	.3 x .3	10 cm	.009	1	111
87	.3 x .3	40 cm	.036	6	167
89	.3 x .3	20 cm	.018	4	222
90	.3 x .3	50 cm	.045	15	333
93	.3 x .3	50 cm	.045	6	133
Total			*7.757*	*3555*	

Footnotes:

[1] Does not include backhoe trenches.

[2] Includes contents of features and some ecofacts, such as bone and shell. Does not include macrobotanical remains such as charcoal.

levels within individual units, there are no obvious stratigraphic breaks. A close examination of the data does reveal some significant variability by depth, and it seems likely that some of this variability indicates different occupations, although the relationships remain unclear. The most obvious stratigraphic break between potential components occurs around 50 cm bs, but even this is not consistent across the site. Similarly, there are no distinct stratigraphic breaks for specific artifact types; both lithics and ceramics were observed from the surface down to 90 cm bs, and ecofacts were recovered down to 80 cm bs in the midden area (i.e., down to 67 cm bs in Test Unit 67, and 80 cm in Feature 3 of Test Unit 30). Overall, artifact frequencies drop significantly below Level 3, gradually tapering to 221 artifacts in Level 6, whereupon the frequency plunges to 23 artifacts in Level 7. A small peak occurs in Level 8 (n=55), but this is mostly due to the contents of Feature 3. Eight artifacts were found in Level 9; no artifacts or ecofacts were recovered from deeper contexts. All of the cultural material was recovered from the brown loamy (BR) unit identified as Holocene overbank deposits. The material did not seem to be confined to any particular soil horizon within this unit, although most came from A and Bw horizons with less material from the Bt horizon.

The horizontal and vertical distributions of artifacts and ecofacts at site 41BW553 suggests strongly that it was occupied more than once by several different prehistoric cultures, both before and during the Caddoan period. The "doughnut-shaped" pattern of high subsurface artifact density in the central portion of the site has been found elsewhere to be a signature pattern indicating the presence of separate but overlapping occupations, and the same may be true in this case. The cultural remains at the site are associated with Holocene overbank deposits from the Sulphur River and, given the depth from which cultural material was

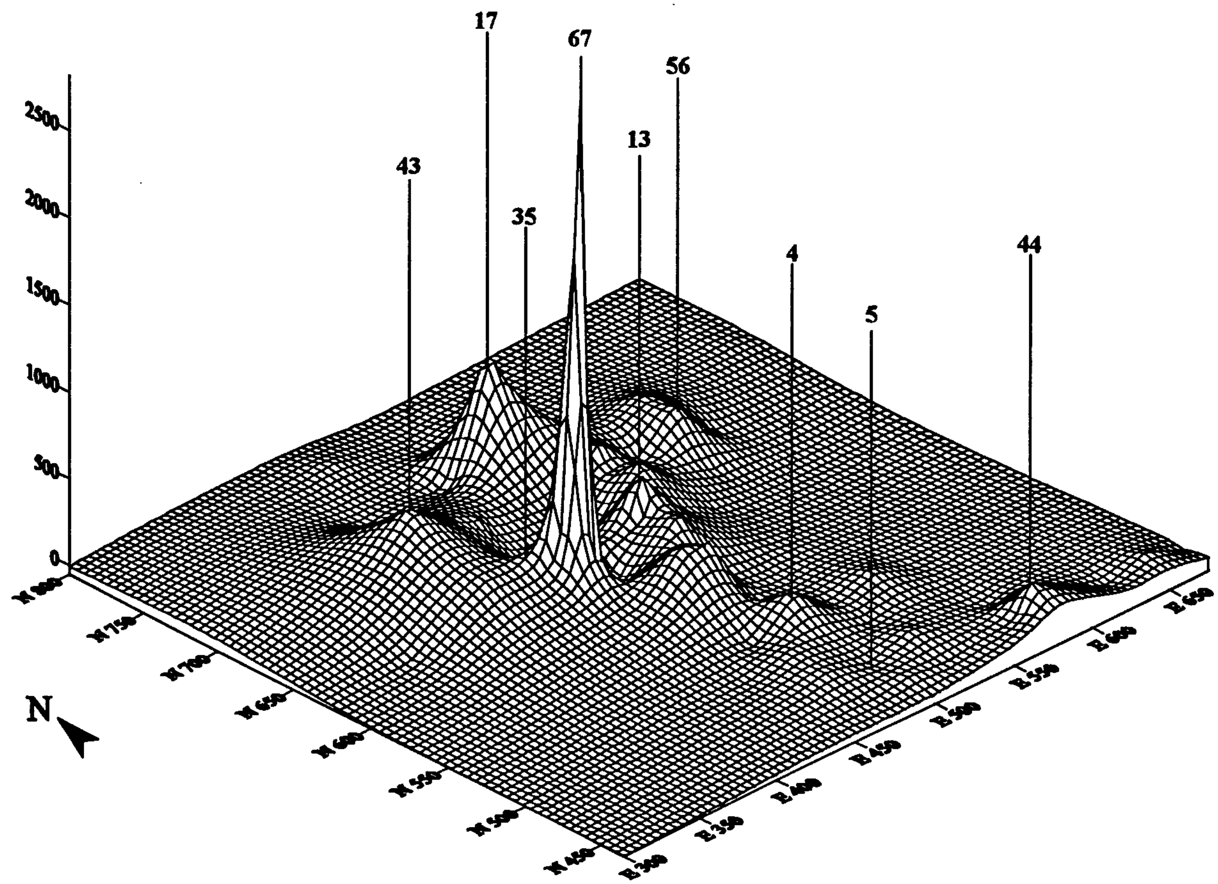


Figure 7. Three-dimensional surface showing standardized subsurface artifact densities per cubic meter across site 41BW553.

Table 6
Vertical Distribution of Prehistoric Artifacts and Faunal Remains by Level
in Nonsterile Test Units, Site 41BW553[1]

Unit	Depth by Level (10 cm arbitrary increments)										Total[2]
	1	2	3	4	5	6	7	8	9	10	
1	1	0	2	0	0	0	0	—	—	—	3
2	3	3	0	1	0	0	—	—	—	—	7
4	6	4	0	0	0	0	0	0	—	—	10
7	0	0	1	0	0	0	—	—	—	—	1
8	0	1	0	1	0	0	—	—	—	—	2
9	0	2	1	0	—	—	—	—	—	—	3
11	0	0	1	0	0	0	0	0	—	—	1
12	11	7	18	8	1	1	0	0	—	—	46
13	1	38	13	2	1	0	0	0	—	—	55
14	0	1	1	0	0	0	0	0	—	—	2
15	3	1	0	0	0	0	1	0	—	—	5
16	2	6	4	8	12	1	0	0	—	—	33
17	2	0	50	0	0	0	0	0	—	—	52
19	14	14	0	0	2	3	0	0	0	—	33
20	1	1	0	0	1	0	0	0	—	—	3
21	3	12	8	3	7	0	0	0	—	—	33
22	2	1	1	1	0	0	0	—	—	—	5
23	0	2	2	1	0	0	0	0	—	—	5
24	4	1	4	4	0	1	0	—	—	—	14
25	5	0	5	1	0	0	1	3	0	—	15
26	3	0	0	0	0	0	0	—	—	—	3
27	2	6	3	6	0	6	1	3	0	0	27
29	0	0	0	1	0	0	—	—	—	—	1
30	24	12	33	1	7	6	4	46	2	—	135
32	11	13	7	8	6	5	0	0	0	—	50
33	0	5	0	5	6	2	1	0	—	—	19
34	3	1	3	0	0	0	0	0	—	—	7
35	9	7	7	6	8	3	0	0	—	—	40
37	0	3	7	6	17	10	1	0	0	—	44
38	3	3	3	2	0	1	0	0	—	—	12
39	0	1	0	0	—	—	—	—	—	—	1
40	2	1	0	0	0	0	—	—	—	—	3
43	0	6	1	2	3	1	0	—	—	—	13
44	5	9	3	3	15	11	2	2	0	—	50
48	7	6	7	4	4	0	0	—	—	—	28
50	0	1	0	0	0	—	—	—	—	—	1
53	0	0	0	0	2	0	0	—	—	—	2
56	2	11	0	0	—	—	—	—	—	—	13
57	0	1	0	0	3	0	0	0	—	—	4
59	0	3	1	0	0	0	1	0	0	—	5
60	1	0	1	1	2	0	0	0	—	—	5
61	0	1	0	0	0	0	—	—	—	—	1
63	3	0	1	6	1	3	1	0	6	0	21
65	0	2	0	1	1	0	0	—	—	—	4
66	2	11	15	10	5	3	0	—	—	—	46
67	493	592	688	305	192	162	6	—	—	—	2438

Table 6 (cont'd)

Unit	Depth by Level (10 cm arbitrary increments)										Total[2]
	1	2	3	4	5	6	7	8	9	10	
69	9	42	13	6	1	—	—	—	—	—	71
70	3	2	0	0	0	—	—	—	—	—	5
71	4	4	1	3	0	2	2	0	—	—	16
72	30	16	8	2	1	0	—	—	—	—	57
74	2	—	—	—	—	—	—	—	—	—	2
75	10	—	—	—	—	—	—	—	—	—	10
76	3	—	—	—	—	—	—	—	—	—	3
77	3	—	—	—	—	—	—	—	—	—	3
78	1	—	—	—	—	—	—	—	—	—	1
79	15	—	—	—	—	—	—	—	—	—	15
80	9	—	—	—	—	—	—	—	—	—	9
81	3	—	—	—	—	—	—	—	—	—	3
82	6	—	—	—	—	—	—	—	—	—	6
83	6	2	0	0	0	0	0	—	—	—	8
84	9	—	—	—	—	—	—	—	—	—	9
85	4	—	—	—	—	—	—	—	—	—	4
86	1	—	—	—	—	—	—	—	—	—	1
87	0	3	0	3	0	0	0	—	—	—	6
89	3	1	0	0	0	0	0	—	—	—	4
90	0	2	1	2	7	0	2	1	—	—	15
93	2	1	0	1	2	0	0	0	—	—	6
Total	*751*	*862*	*914*	*414*	*307*	*221*	*23*	*55*	*8*	*0*	*3555*

Footnotes

[1] Does not include backhoe trenches.

[2] Includes contents of features and some ecofacts, such as bone and shell. Does not include macrobotanical remains such as charcoal.

recovered, the site was probably aggrading during the period of occupation. This would have resulted in the earlier materials being buried beneath later material, but an examination of the vertical distribution of cultural remains at the site shows no clear stratigraphic breaks and no identifiable occupation surfaces. As demonstrated in later sections of this chapter, even the diagnostic artifacts and their associated proveniences show no clear breaks between components, except perhaps between a minor Archaic occupation and the later, more intensive, Caddoan occupations. This lack of any clear stratigraphic breaks or easily recognizable occupation surfaces is probably due, at least partially, to a slow rate of aggradation and infrequent flooding, coupled with a high level of bioturbation; although it may also indicate a near-constant occupation of at least portions of the site, which could have led to the observed "blurring" between components.

Historic Occupation at 41BW553

In addition to the prehistoric occupation of the site, a sparse historic component, occurring on or near the surface, was identified. Although the historic material (which consisted primarily of metal and glass artifacts) was noted across the entire site area, it appeared to be densest in the southeastern portion of the site. One partially intact historic ceramic vessel, spittoon-shaped with a purple glaze, was present on the surface in this area, approximately 30 m southeast of the site datum. It is suspected that this refuse derives from a short-term historic occupation of the site area, although it is also possible that the historic material was left behind by loggers.

CULTURAL FEATURES

Although seven archeological features were initially identified in the field at 41BW553, complete excavation indicated that two of them resulted from bioturbation rather than human activity. Feature 2, a dark linear stain along the northern wall of Test Unit 22, is actually a rodent run. Feature 4, a small, loose cluster of five burned rocks, is not now considered to be an incomplete but in situ hearth, as was originally believed, since almost no charcoal, no burned earth, or similar attributes suggesting a hearth were found when it was excavated. Thus, only five features of cultural origin were identified at site 41BW553. Since the original numbering system has been retained for clarity, these cultural features consist of two apparent postholes (Feature 1 and Feature 5), a possible trash pit (Feature 3), a midden (Feature 6), and a possible burial (Feature 7).

Feature 1

Feature 1, an apparent posthole, was discovered within Test Unit 24 (see Figure 5). The top of this roughly circular feature, which consists of a lens of brown (10YR 5/3) sandy silt within a yellowish brown (10YR 5/6) sandy silt matrix, was first observed at 30 cm bs, at the contact between Levels 3 and 4. It seems likely that the uppermost portion of this feature was inadvertently removed before it was recognized. The feature measured 12 cm across and, when bisected east-west, proved to be approximately 7 cm deep (Figures 8 and 9). A flotation sample taken from the feature yielded two tiny, tertiary flake fragments of Bowie chert, and a third burned flake fragment of an unidentifiable material. In addition, a small fragment of baked clay — possibly wall daub — was collected from the level above the posthole.

A soil sample from Feature 1 was submitted for OCR dating and suggested an age of 759 $\pm$ 22 B.P. (A.D. 1169-1213; ACT No. 1989). This is close to the expected Early Caddoan age of greater than 800 B.P. (i.e., pre-A.D. 1200). If accurate, the OCR date would place the posthole's origin at about the transition between the Early and Middle Caddoan periods. However, Accelerator Mass Spectrometer (AMS) dating of a small fragment of nutshell yielded a significantly different age of 430 $\pm$ 70 B.P. (Beta-94628; charred nutshell; $\delta^{13}C=-26.0‰$). This yields an intercept of cal A.D. 1450 and a 1-sigma range of cal A.D. 1425-1505 and cal A.D. 1595-1620 (using the 1993 calibration of Stuiver et al. 1993). This suggests a Late Caddoan origin for the feature. Although a radiocarbon date (particularly from an AMS sample) would typically be considered to be more accurate than one derived using the new OCR dating method, this radiocarbon age is somewhat more recent than expected. While this does not preclude it from being more accurate than the OCR date for the same feature, there remains the possibility that the fragment of material dated was intrusive from a later occupation. Nevertheless, the fact that Feature 1 was identified significantly higher in the profile than Feature 3, whose OCR and radiocarbon ages are quite similar (see below), suggests that the radiocarbon age is the more accurate of the two. Whatever the case, the attempts to date the feature have proven contradictory, and the age of Feature 1 must remain uncertain.

Feature 3

Feature 3 consisted of a concentration of charcoal, bone, deer teeth, hematite fragments, and lithic and ceramic artifacts at 70-76 cm bs in Test Unit 30 (see Figure 5). The matrix in which these materials were embedded was a yellowish brown (10YR 5/4) sandy silt, mottled with dark yellowish brown (10YR 4/4) sandy loam. When originally identified at 70 cm bs, Feature 3 consisted of 19 fragments of charcoal, three unworked chunks of ferruginous sandstone, and seven fragments of animal bone (including what was later recognized as a deer tooth) scattered across the northern third of the 50-x-50 cm test unit (Figure 10). Bisection of the feature along an east-west reference line revealed an irregularly basin-shaped feature in profile, containing flakes, an early aborted biface, ceramic sherds, and additional charcoal fragments (Figure 11). All of the feature matrix (including the artifacts and the ecofacts) was collected and subjected to

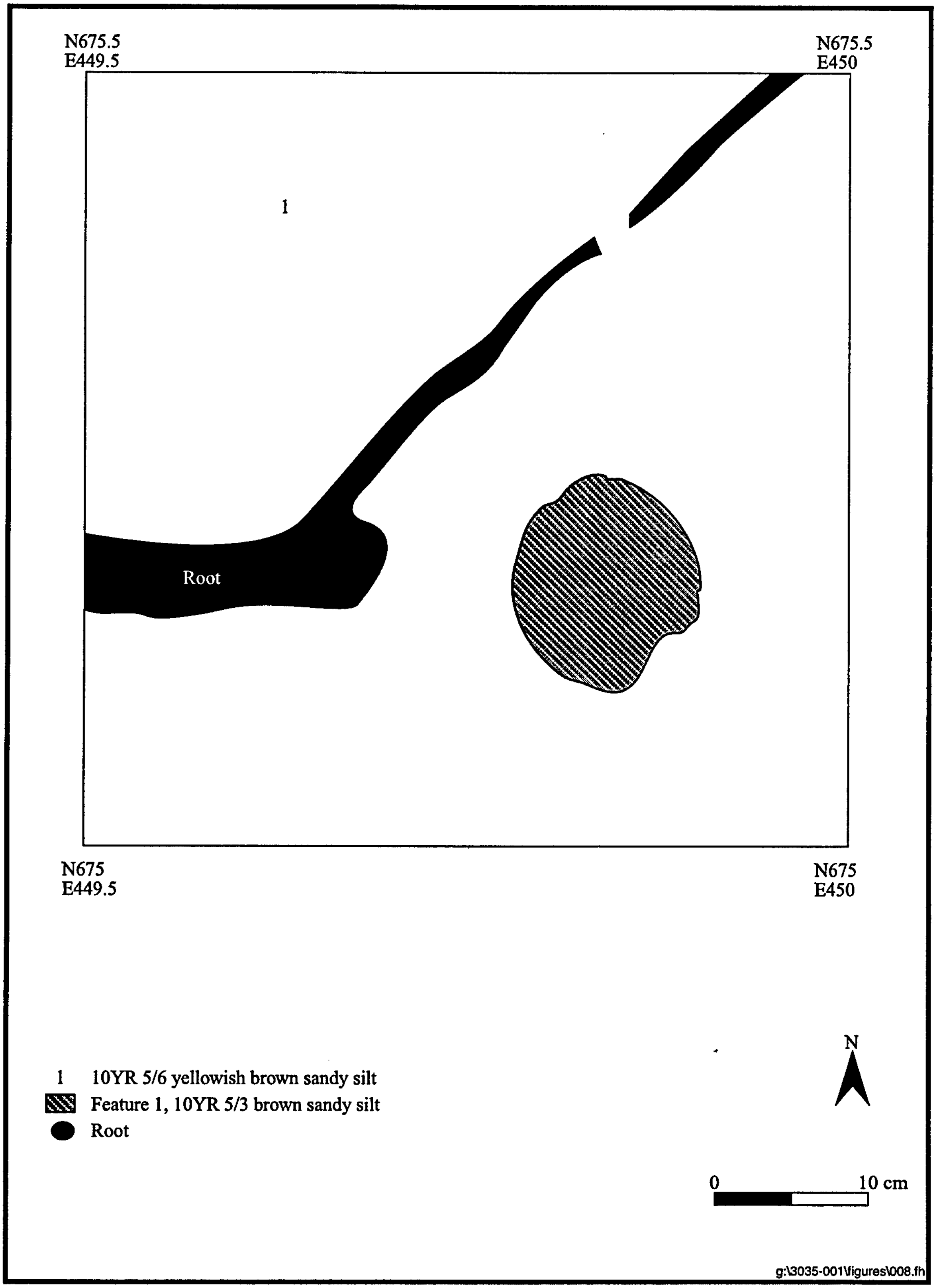


Figure 8. Plan of Feature 1, Test Unit 24, site 41BW553.

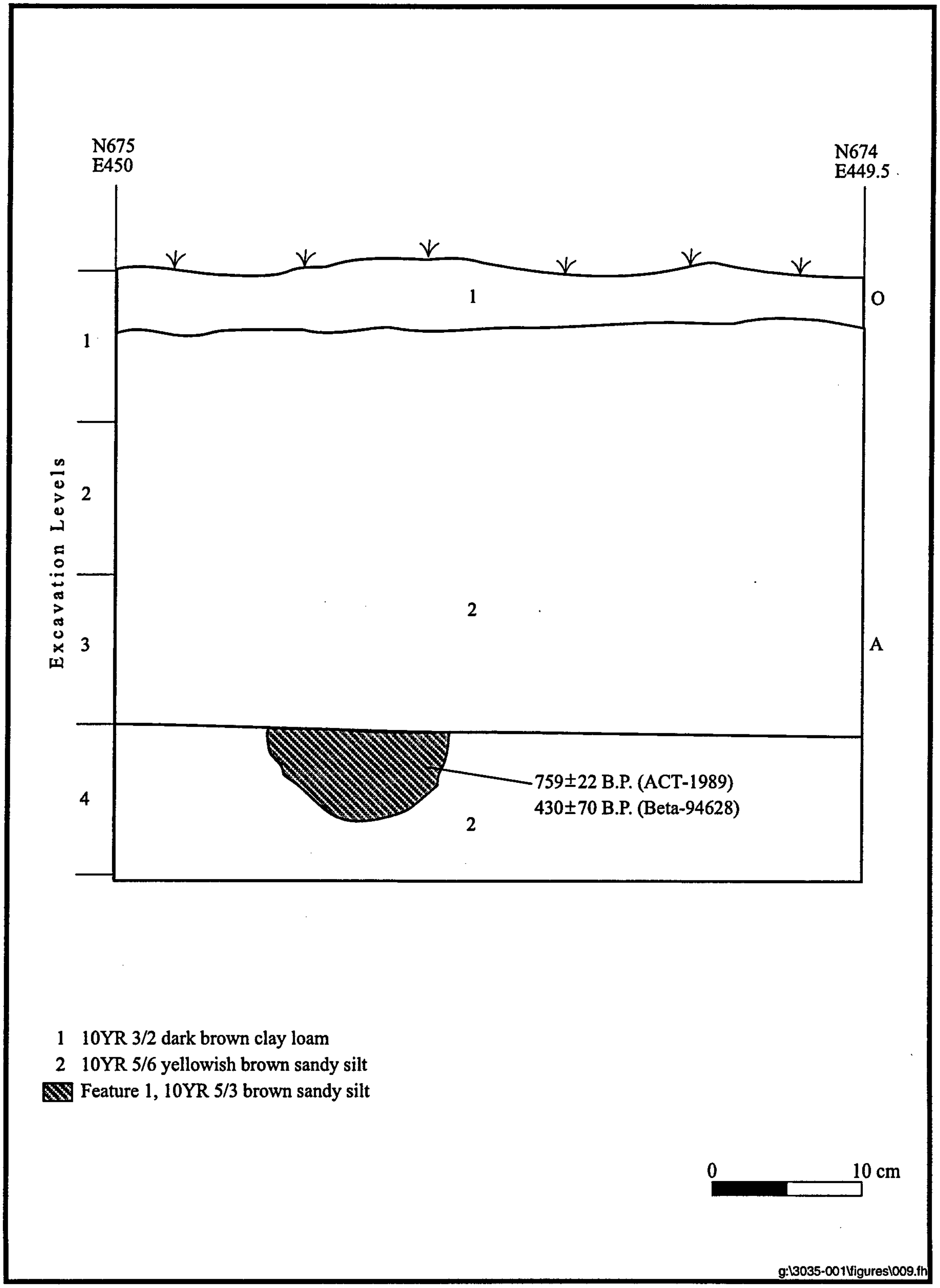


Figure 9. Profile of Feature 1, Test Unit 24, site 41BW553.

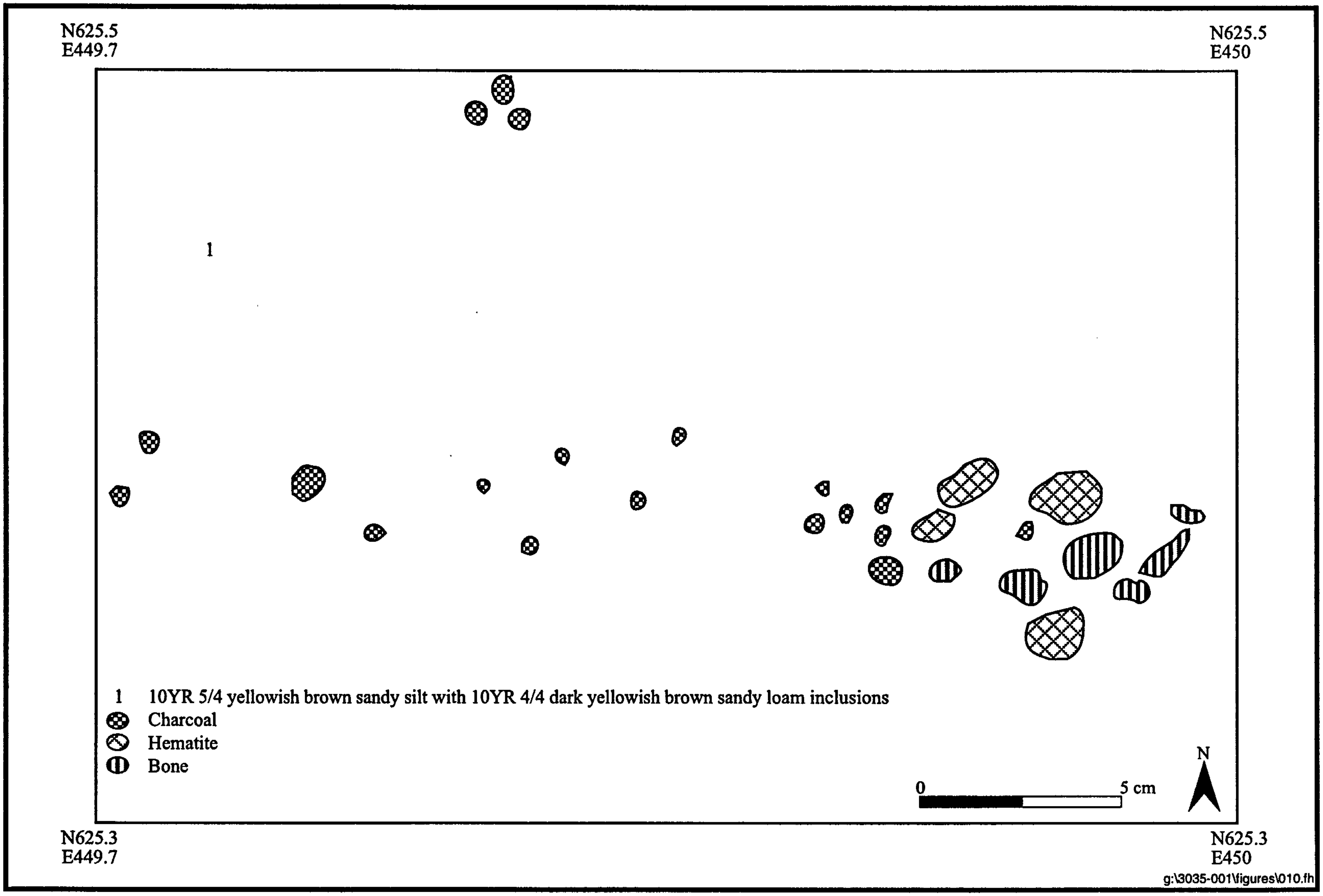


Figure 10. Plan of Feature 3, Test Unit 30, site 41BW553.

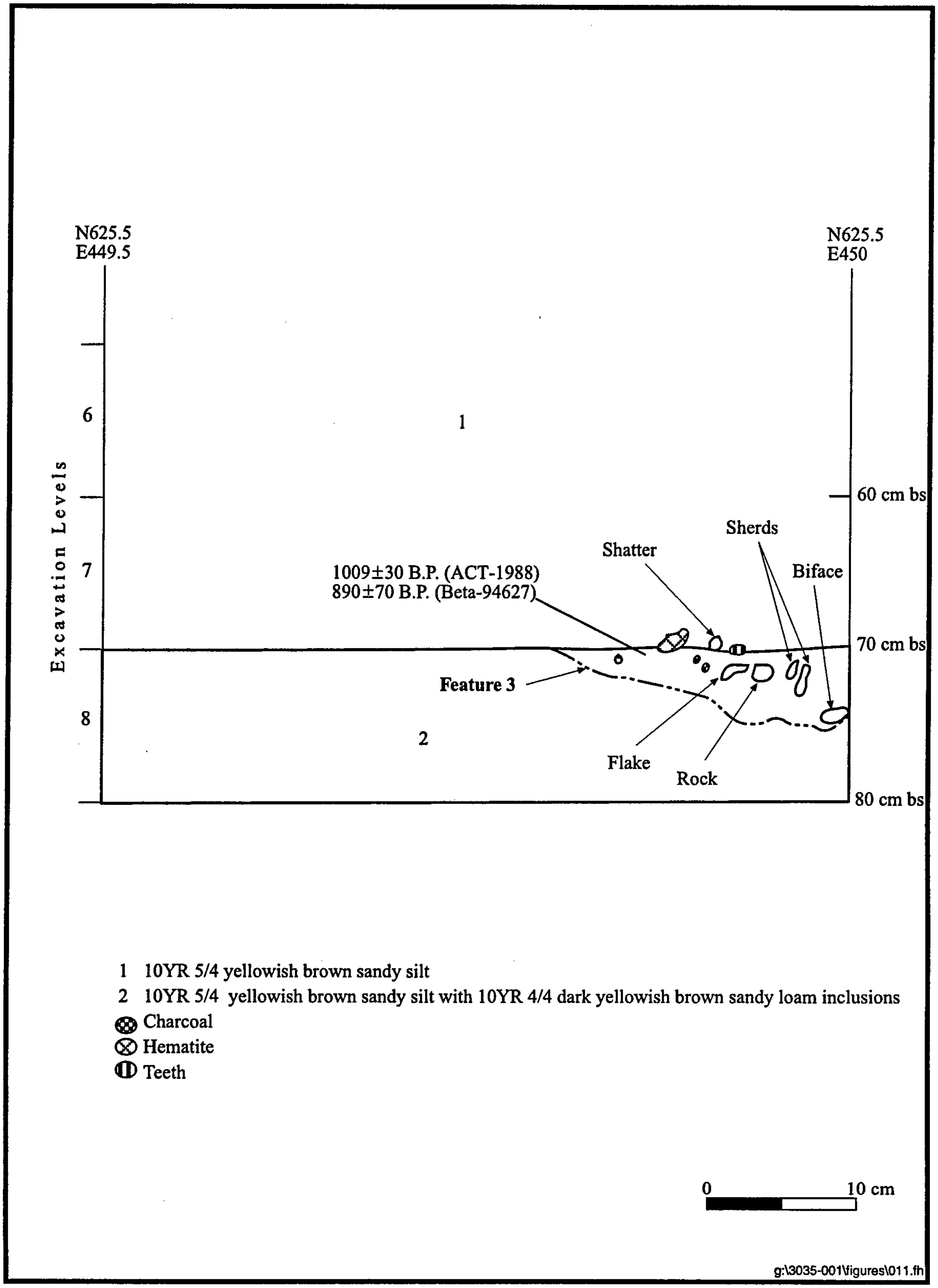


Figure 11. Profile of Feature 3, Test Unit 30, site 41BW553.

flotation. Material recovered from the feature fill included a total of four flakes, the aforementioned biface, three ceramic sherds, a sizable fragment of burned rock, additional charcoal, and 46 bones and bone fragments, including the upper molar of a deer (*Odocoileus* sp.). In addition to the deer tooth, indeterminate vertebrate, medium/large mammal, and medium-sized Artiodactyl remains were identified (see Appendix E). The remains identified as medium/large mammal and medium-sized Artiodactyl are most probably deer.

The function of Feature 3 is unclear, although it is unquestionably of human origin. It is suspected that it is the base of a trash pit, although no pit outline could be identified given the homogenous nature and color of the matrix. The presence of the feature here, even at 70-76 cm bs, is not surprising. This area of the site is extremely rich archeologically, and cultural material (including ceramics) were recovered as deep as 90 cm bs. The upper 10 cm of Test Unit 30 contained obvious midden deposits (Feature 6, see below), and both artifacts and ecofacts were abundant throughout the test unit's profile. This chronicles an intense occupation, as best represented by Feature 6, the dense midden centered around Test Unit 67. Although no diagnostic artifacts were recovered from Feature 3 (other than a few plain ceramic sherds) a soil sample yielded an OCR age of 1009 $\pm$ 30 B.P. (A.D. 911-971; ACT No. 1988), placing this feature firmly within the Formative/Early Caddoan period. Radiocarbon analysis of a fragment of nutshell from Feature 3 produced an age of 890 $\pm$70 B.P. (Beta-94627; charred nutshell; $\delta^{13}C$=-27.1‰). This yields an intercept of cal A.D. 1175 and a 1-sigma range of cal A.D. 1035-1235 (using the 1993 calibration of Stuiver et al. 1993), which suggests an Early to Middle Caddoan origin.

Feature 5

Feature 5 consisted of a possible posthole extending downward from a dark, organically enriched, buried 2A-horizon, exposed in Test Unit 69, which may be a culturally darkened horizon such as a prehistoric house floor (the evidence remains equivocal on this matter). The top of Feature 5 was at 36 cm bs, just at the base of the 2A-horizon, and it extended downward into a lighter colored subsoil, to a depth of approximately 53 cm bs (Figure 12). A small root cast extended slightly further down from the base of the feature, to 58 cm bs. This casts some doubt on the cultural nature of the feature, although it remains possible that this is indeed a posthole in which tree roots later grew. The feature measured approximately 12-14 cm across and was otherwise rectangular in profile. The feature fill consisted of a dark grayish brown (10YR 4/2) silty loam, mottled with pale brown (10YR 6/3) silt loam. The buried 2A-horizon above Feature 5 was a very dark grayish brown (10YR 3/2) silty loam, mottled with brown (10YR 4/3) silty loam, while the underlying subsoil (into which the feature extended) was a pale brown (10YR 6/3) silty loam, mottled with yellowish brown (10YR 5/8) clay and light gray to white (10YR 7/1-8/1) clay loam inclusions.

No artifacts or other cultural remains were recovered from Feature 5, so its origin remains uncertain. Its depth below surface is similar to that of Feature 1, suggesting a similar age; however, sedimentation rates for the site area are unknown, so this means little. Soil samples were collected from both the buried 2A-horizon and Feature 5 for OCR dating purposes. The sample collected from the base of the 2A-horizon yielded an age of 411 $\pm$ 12 B.P. (A.D. 1527-1551; ACT No. 1981). In contrast, Feature 5 yielded a slightly older age, 596 $\pm$ 17 B.P. (A.D. 1337-1371; ACT No. 1982). This would place the buried 2A-horizon within the Late Caddoan period, while Feature 5 would derive from the Middle Caddoan period. No radiocarbon samples were analyzed for this feature.

Feature 6

Feature 6 is a midden, consisting of a culturally darkened soil containing moderate to high densities of bone; shell; charcoal and other macrobotanical remains; daub/burned earth; and lithic, ceramic, and bone artifacts. Feature 6 was originally encountered as a thin ($<$20 cm thick) layer of very dark grayish brown (10YR 3/2)

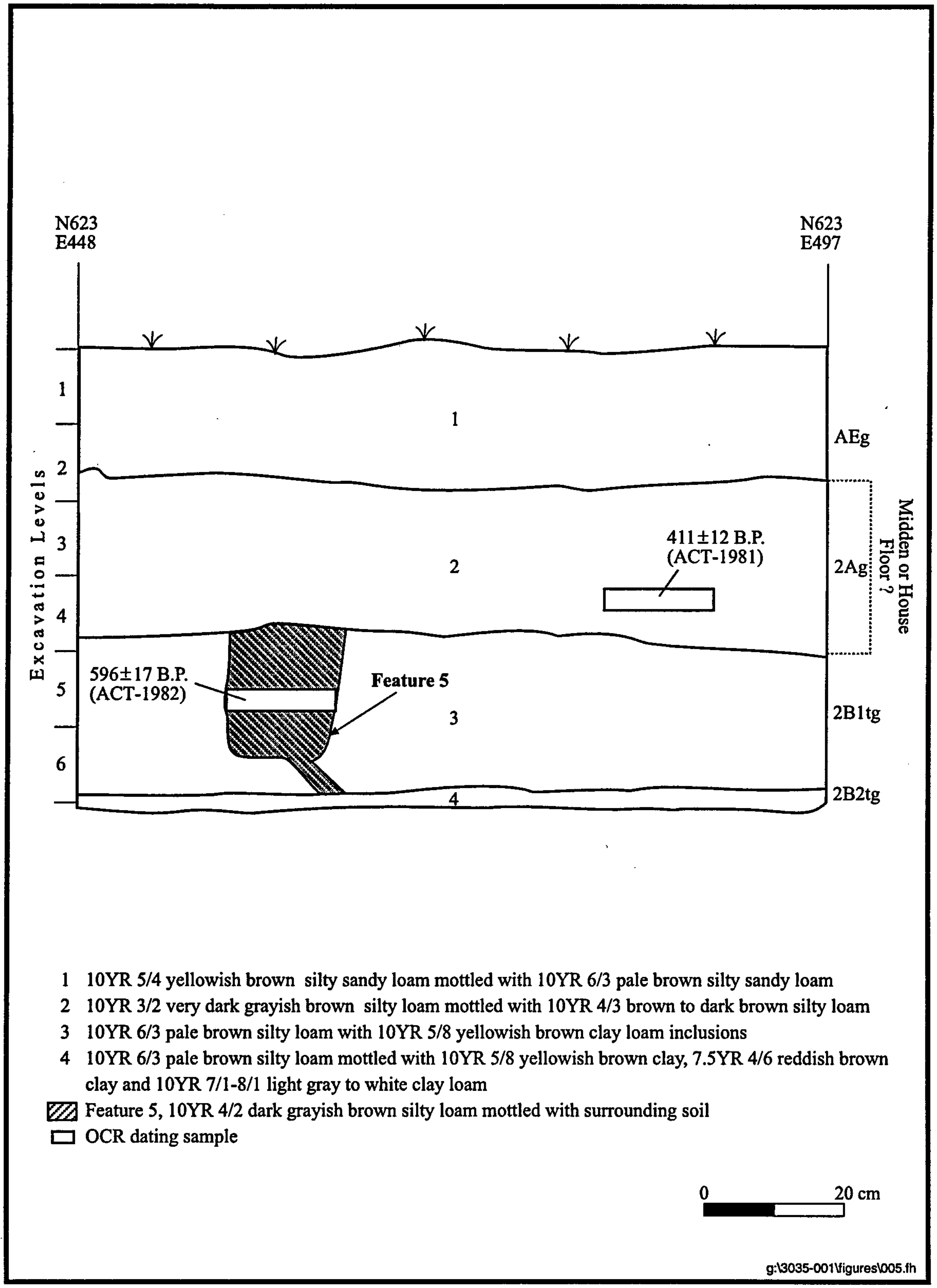


Figure 12. Profile of the south wall of Test Unit 69, site 41BW553, showing Feature 5.

surface soil with preserved faunal material in Test Unit 30, the unit which also contained Feature 3. However, it was not recognized as a midden at the time. Subsequent to the excavation of Unit 30, it was decided to place a 1-x-1 m unit (Test Unit 67) approximately 11 m south of Unit 30, given the high density of artifacts in that general area as well as the presence of a small rise there. This decision proved to be fortuitous, since Test Unit 30 lay at the extreme northern edge of the midden, and Unit 67 was placed near the center of the midden, where cultural remains were densest and organic preservation was best. The actual midden measured approximately 36-40 cm thick near its central point (Figure 13). Preservation was excellent both within and below the midden, since the carbonates in the mussel shell found throughout the midden had apparently leached downward, lowering the soil's natural acidity, which is destructive to organic remains. After Test Unit 67 was excavated, a 30-x-30 cm flotation column was removed from the west side of the unit, and all of the fill collected in large plastic bags for later analysis. Flotation of these samples yielded faunal and macrobotanical remains, as well as four fragments of burned rock, 18 ceramic sherds, and 281 flakes and flake fragments. Most of the chipped stone pieces were less than 1 mm in size, falling into the microflake category. Much of the cultural material collected from the flotation samples (including all the ceramics and 229 of the flakes) came from the midden levels (i.e., Levels 1-4, 0-40 cm bs).

In an effort to delimit the horizontal extent of Feature 6, a series of 13 shallow 30-x-30 cm shovel tests (Test Units 73-82, and 84-86) were excavated around it. The shovel tests were excavated at 2-4 m intervals until the edges of the midden were identified. Each was excavated to a depth of 10-20 cm; if it contained the typical dark midden soil as well as preserved bone or shell, it was considered to be within the midden. Using this methodology, Feature 6 was determined to be roughly ovoid in shape, to extend approximately 19 m north-south and 11 m east-west, and to cover about 209 m^2 (Figure 14). This is consistent with the size of other middens observed at Caddoan habitation sites elsewhere in the White Oak Creek WMA (see Cliff and Hunt 1995).

Artifact/ecofact densities for the excavation units and shovel tests in this area varied from 111 to 3,367 artifacts per cubic meter (see Table 5). Unit 67 produced the highest density (n=2,438). Artifact/ecofact density for the identified midden levels alone in Unit 67 (0-40 cm) is about 5,195 artifacts per cubic meter (n=2,078). Six tools were recovered from the midden. Unit 67 yielded one bone tool (an awl or projectile point), as well as a utilized flake, a uniface, and a fragment of ground stone. Units 75 and 80, both midden delineation units, produced a multidirectional core and a utilized flake, respectively. With the exception of the ground stone fragment, which is made of ferruginous sandstone, all the stone tools are Ogallala quartzite.

In an attempt to better understand the age and origin of Feature 6, a number of OCR and radiocarbon samples were collected from various points in and below the midden and submitted for analysis. Soil samples for OCR dating were taken from Test Unit 67 at 10-11 cm bs; 20-21 cm bs; 30-31 cm bs; 48-50 cm bs; and 59-61 cm bs (the last was directly above the in situ ceramic vessel described below as Feature 7). Nutshell fragments for radiocarbon dating were collected from the base of the midden (30-40 cm bs) and from the level above Feature 7 (50-60 cm bs). From top to bottom, the five OCR samples from Test Unit 67 yielded ages of 276 $\pm$ 8 B.P. (A.D. 1666-1682; ACT No. 1983), 299 $\pm$ 8 B.P. (A.D. 1643-1659; ACT No. 1984), 383 $\pm$ 11 B.P. (A.D. 1556-1578; ACT No. 1985), 537 $\pm$ 16 B.P. (A.D. 1397-1429; ACT No. 1986), and 907 $\pm$ 27 B.P. (A.D. 1016-1070; ACT No. 1987). The first three samples came directly from Feature 6, the fourth was taken from below Feature 6, and the final sample was taken from directly above the in situ ceramic vessel in Feature 7 (see below). The midden samples all suggest an origin during the latter part of the Late Caddoan period (A.D. 1400-1680). However, there is a strong possibility that some or all of the midden OCR samples have been contaminated by high levels of oxidizable carbon which one might find within a midden, which would result in a misleadingly young age for the midden levels. The radiocarbon date run on the midden in this unit suggests that this might be the case. AMS dating of a fragment of *Carya* nutshell from Level 4, 30-40 cm bs (the base of the midden), yielded an age of 550 $\pm$ 90 B.P. (Beta-94629; charred nutshell; $\delta^{13}C$=-26.9‰). This yields a calibrated intercept of cal A.D. 1410 and a 1-sigma range of cal A.D. 1310-1365 and cal A.D. 1375-1440 (using the 1993 calibration of Stuiver et al. 1993), which

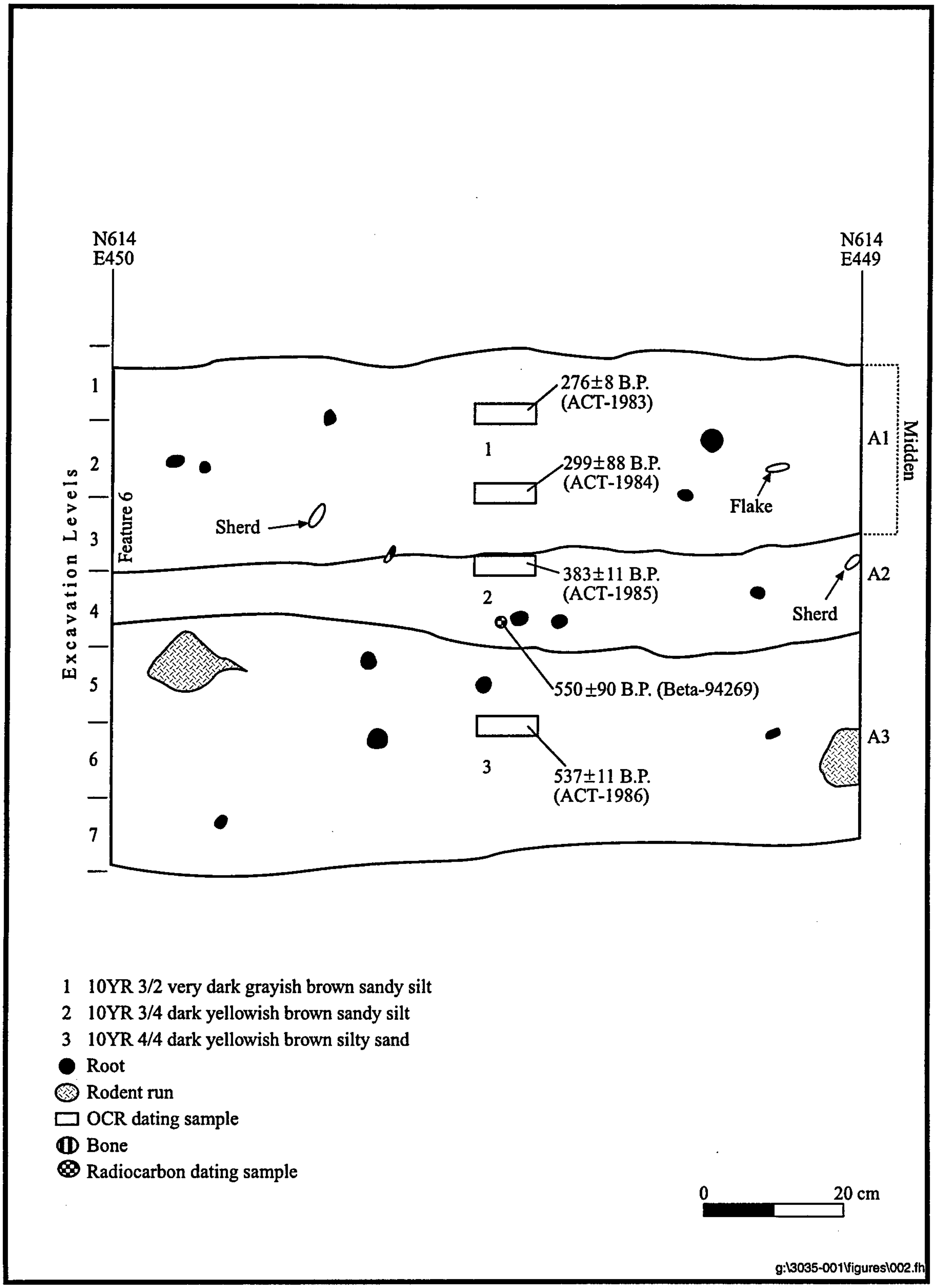


Figure 13. Profile of the south wall of Test Unit 67, site 41BW553, showing Feature 6.

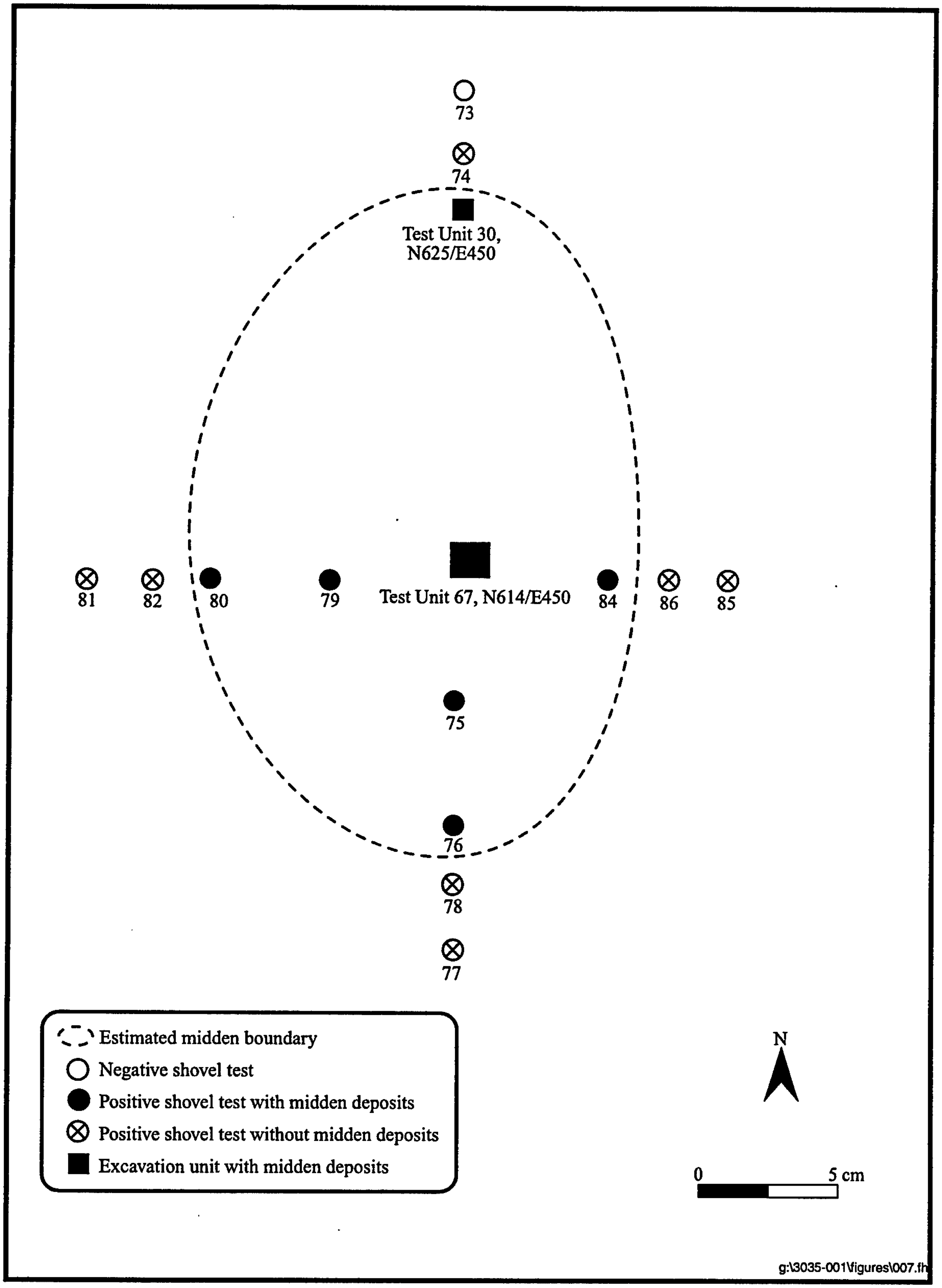


Figure 14. Horizontal extent of midden (Feature 6) at site 41BW553.

is older than the OCR age for the same level (A.D. 1556-1578), but equivalent to the OCR age of the underlying level (A.D. 1397-1429). Taken together, these dates suggest that Feature 6 may date to the Middle to Late Caddoan period.

Feature 7

The discovery of Feature 7, which consisted of an in situ prehistoric ceramic vessel associated with a few fragments of bone, led to the abandonment of Test Unit 67. The vessel lay at a depth of approximately 67 cm bs, and it had been crushed into several large fragments, probably by the weight of the overlying soil or by bioturbation. All the pieces remained articulated and in place, however, with the exception of one rim fragment, about the size of a quarter, which was not located. The vessel lay 3 cm west of the east wall of Test Unit 67 (Figure 15), and had the unit been placed 20 cm further west, the vessel would have been missed entirely.

Feature 7 is believed to be the remains of a poorly preserved burial. It lay well below the midden (Feature 6) in this area, and would have received little if any of the ameliorating preservative effects caused by the lowering of soil acidity due to the leaching of mussel shell (Figure 16). The associated bone, which consisted of three small fragments, is believed to be human, although this is not definite since no osteologist was present at the time of discovery and it was determined best not to remove the bone. The ceramic vessel, which appeared to be a small hemispherical bowl or cup (Figure 17) measured approximately 11.5 cm in diameter by 6.3 cm deep. The vessel walls were about 4 mm thick. It had a plain brown paste, and had been burned. The paste included finely ground grog with gray (N6/0) and black (N2/0) mottles and inclusions. The surface was undecorated, and incompletely burnished around the rim. A thin brown (7.5YR 7/4) oxidized layer was noted on both the exterior (ca. 1 mm) and the interior (ca. 0.5 mm) of the vessel.

As previously mentioned, a soil sample was collected from the matrix immediately above the vessel for OCR dating. This consisted of a dark yellowish brown (10YR 4/4) silty sand. This sample yielded an age of 907 ± 27 B.P. (A.D. 1016-1070; ACT No. 1987), suggesting an Early Caddoan origin for Feature 7. AMS dating of a fragment of nutshell from approximately 3-13 cm above the feature yielded an age of 880 ± 80 B.P. (Beta-94626; charred nutshell; $\delta^{13}C$=-27.4‰). This yields a calibrated intercept of cal A.D. 1180 and a 1-sigma range of cal A.D. 1035-1250 (using the 1993 calibration of Stuiver et al. 1993), which is consistent with the OCR age obtained from the base of the same stratigraphic level. On this basis, it is believed that Feature 7 dates to the Early Caddoan period.

Although it remains uncertain whether Feature 7 represents an actual burial, the excavators worked under the assumption that it was. On many Caddoan sites, intact vessels are only found in association with mortuary remains, and it was the excavators' general impression that Feature 7 might be an infant burial. Mr. Jay Newman, CE, conferred with Mr. David Scholes of the Caddo Nation in order to comply with the modern Caddo Nation's position concerning their ancestral remains, and because the Native American Graves Protection and Repatriation Act of 1993 (NAGPRA) provides stringent guidelines on how to deal with human burials discovered on federal land or during federal actions. The vessel and associated bone were left in situ as requested by Mr. Scholes. After profiling, artifact sketching, and OCR sampling was completed, the excavation unit was abandoned, the feature carefully covered with hand-packed soil, and the unit backfilled.

ARTIFACTUAL REMAINS

The artifact sample recovered from site 41BW553 during testing was quite large, consisting of 1,634 artifacts (exclusive of ecofacts, which will be discussed later). Included in the sample are 712 ceramic sherds, 12 projectile points, 18 bifaces or biface fragments (including some projectile point fragments), 10 unifaces,

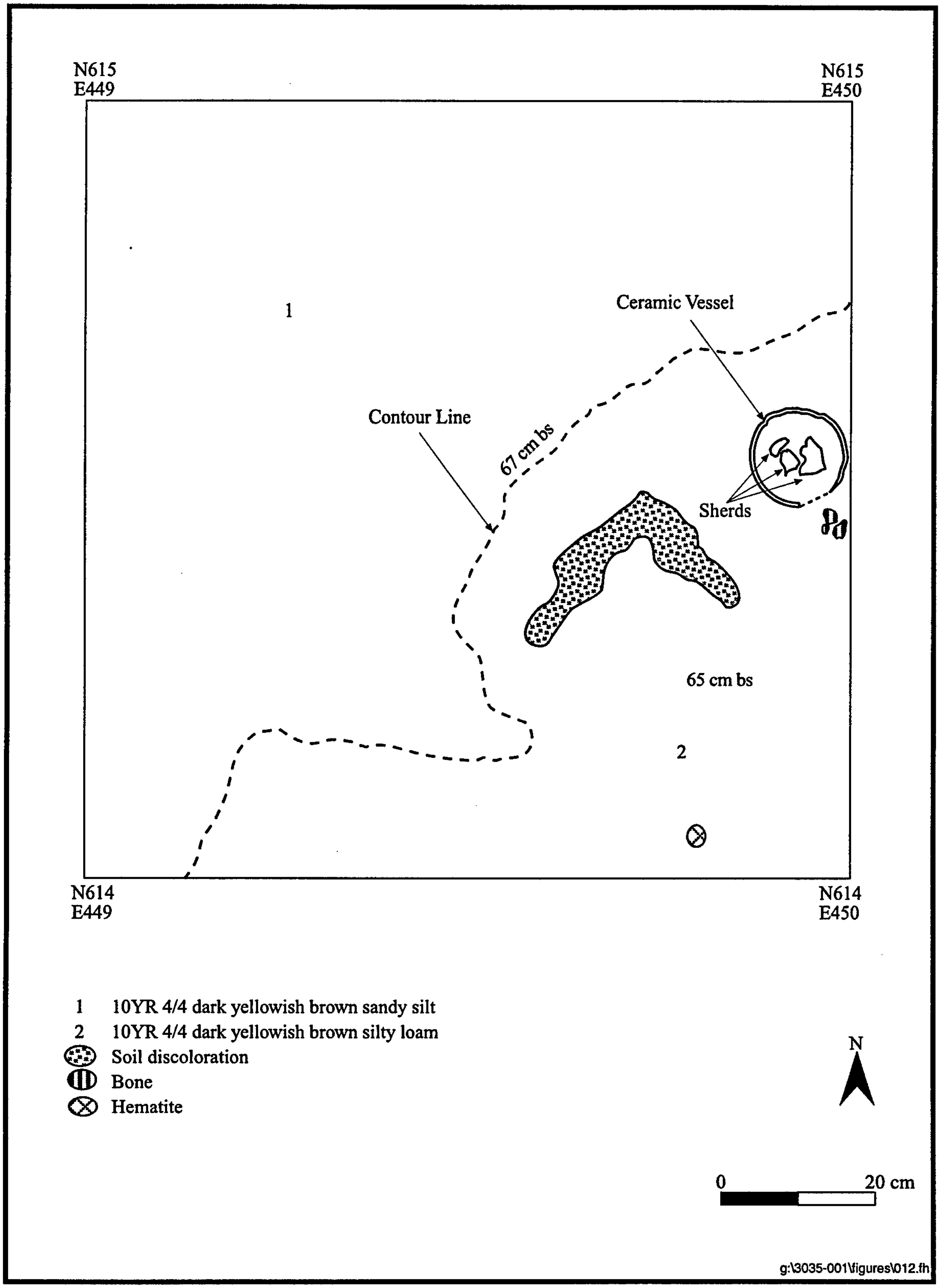


Figure 15. Plan of Feature 7, Test Unit 67, site 41BW553.

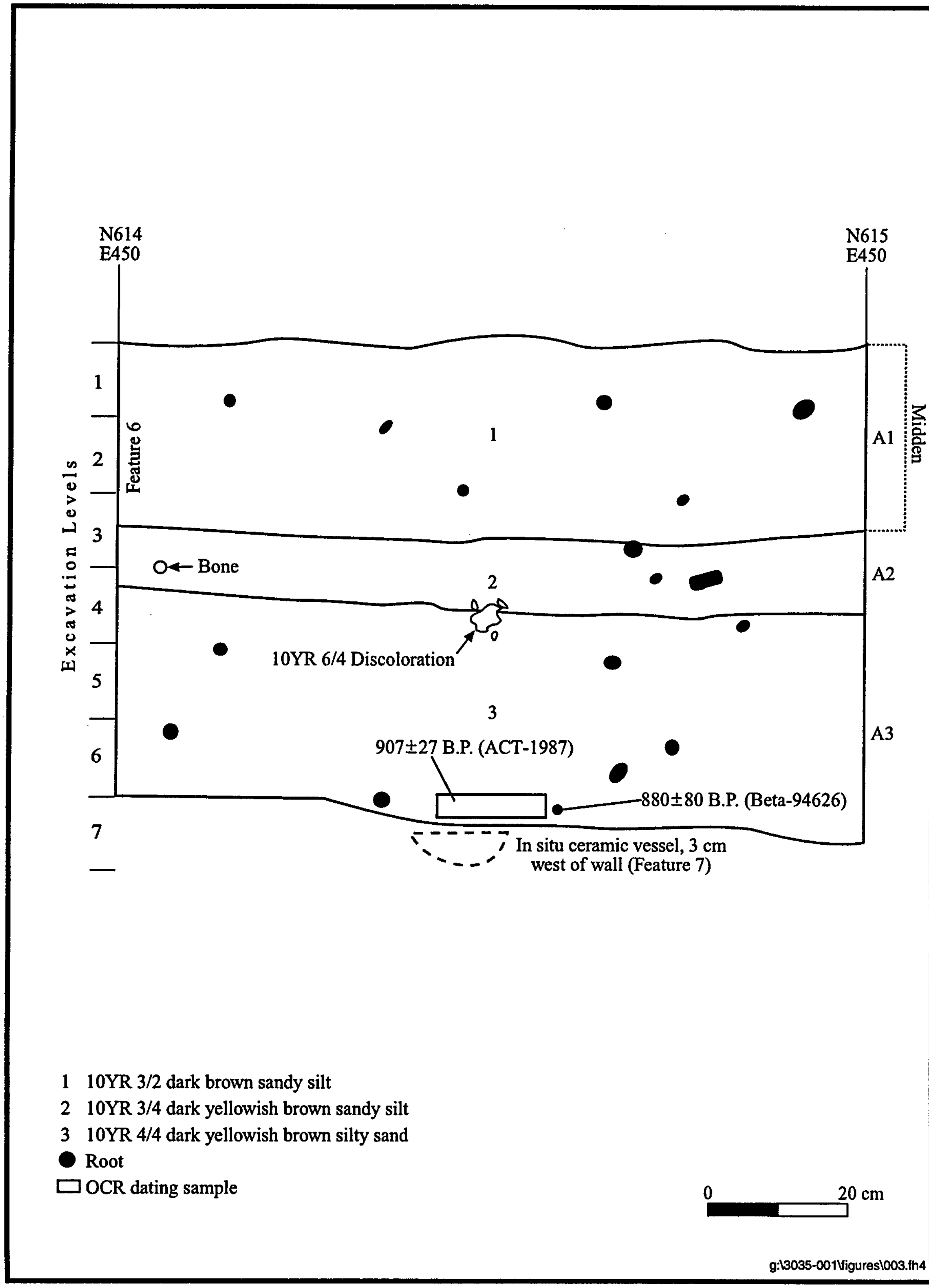


Figure 16. Profile of the east wall of Test Unit 67, site 41BW553, showing Features 6 and 7.

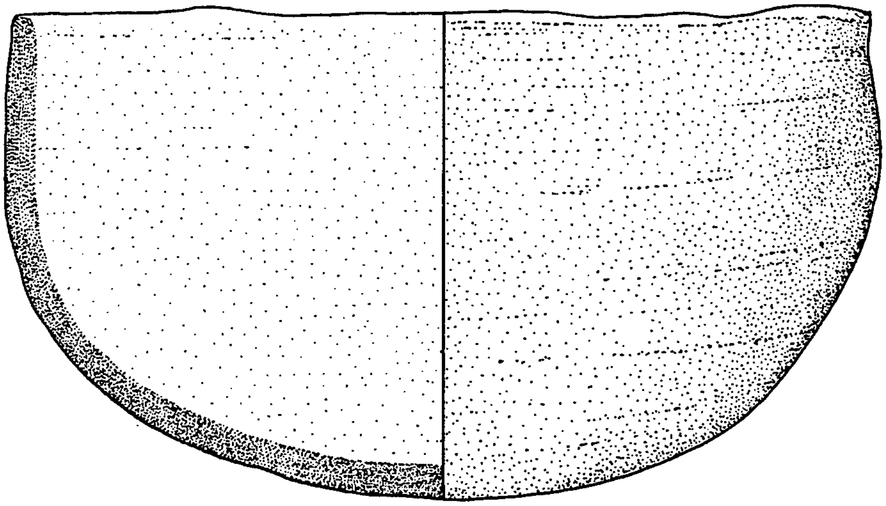


Figure 17. Ceramic vessel associated with Feature 7, Test Unit 67, site 41BW553 (Scale 1:1).

three ground pieces of ferruginous sandstone, a ground fragment of limonite pigment, a carved hematite fragment, four cores, and 873 pieces of lithic debitage. Also included in the sample are 27 fragments of burned rock, weighing a total of 586.9 g, and 105 pieces of burned earth or baked clay, weighing 100.5 g (see Appendices B and C).

Ceramics

Of the 712 ceramic artifacts collected from subsurface contexts at site 41BW553 during the testing phase, only 376 were considered sufficiently large to analyze (i.e, > 1 cm^2). In the following discussion, an attempt is made to characterize the distribution of analyzable pottery over the entire site in a general sense, with particular attention to the chronological implications of recognized types and decorative techniques. Within the limits of a testing project, these observations remain preliminary and suggestive. Nevertheless, they provide sufficient information to allow an assessment of the cultural environment of the site as represented by ceramic remains, and will provide a means of planning future treatment of the site. The earlier paragraphs in this section describe very simply the range of technological characteristics observed in the sample, while the latter paragraphs address chronological associations suggested by type identifications and general observations of surface treatments present. These data are summarized in Appendix B.

Clear identification of vessel form was not possible for most of this sample. Thirty-five jar fragments and one possible bowl fragment can be recognized. One pipe bowl fragment and a pipe stem fragment are also present. Rim sherds account for 7.9 percent of the total sherd count (n=30 sherds). Most rims are thinned, with rounded lips (Table 7), but thinned flat rims occur, as do direct rounded rims. Single examples of a few other types of rims also are present. Shoulder sherds make up 2.4 percent of the sample from 41BW553 and base sherds form only 0.8 percent of the total. Two of the base sherds are from flat, defined bases; the third base sherd is unidentified. A single neck sherd is present.

Firing atmospheres for the material from 41BW553 were inferred from the interior color of sherds. Vessels fired in a reducing atmosphere appear to far outweigh those from an oxidized atmosphere, making up 82.2 percent of the sample. Most of these have no distinctive core or cores with diffuse margins (Table 8). A small percentage show a reducing atmosphere with sharp and distinct core margins. Of the sherds that appear to be oxidized, most have no core and a small minority have diffuse core margins.

Table 7
Location on Vessel and Rim and Base Form for Analyzed Sherds from Site 41BW553 (n=376)

Sherd Location	Sherd Form	Frequency
Rims	Thinned	
	Flat	6
	Flat, beveled outward	1
	Rounded	12
	Rounded, flattened on interior	1
	Rounded, flattened on exterior	1
	Direct	
	Flat	5
	Rounded	2
	Indeterminate	
	Rounded, flattened on interior	1
	Indeterminate lip form	1
	Total Rim Sherds	*30*
Bases	Flat, defined	2
	Indeterminate	1
	Total Base Sherds	*3*
Neck Sherds		1
Shoulder Sherds		9
Body Sherds		333

Table 8
Inferred Firing Atmosphere for Sherds from Site 41BW553

Core Type	Quantity	Percentage
Oxidized, no core	56	14.9
Oxidized, diffuse margins	10	2.6
Reduced, diffuse margins	103	27.4
Reduced, no core	170	45.2
Reduced, sharp margins	36	9.6
Indeterminate	1	0.3
Total	*376*	*100.0*

Surface decoration, when present on sherds from this site, was weighted toward simple incising. Forty-nine sherds, or 13.0 percent of the total sample, have incising as the primary form of decoration (Table 9). Of these, six sherds also show punctation as a secondary decorative technique. More is said later in this section about type identifications for these sherds. Engraving and punctation as primary decorations are almost equal, with eight engraved sherds and nine punctated sherds. Finger pinching and brushing are found as the primary decorations on one sherd each, and applique, either as fillets or nodes, appears on four sherds. Secondary forms of decoration are quite rare. Aside from the five incised/punctated sherds mentioned above, there is one punctated sherd with brushing as a secondary form.

Table 9
Decorative Treatments on Sherds from Site 41BW553

Primary Decoration	Secondary Decoration	Quantity	Percentage
Incising	—	43	58.1
Incising	Punctating	6	8.1
Engraving	—	3	4.0
Fine Engraving	—	5	6.7
Punctating	—	8	10.8
Punctating	Brushing	1	1.4
Applique	—	4	5.4
Finger pinching	—	1	1.4
Brushing	—	1	1.4
Indeterminate	—	2	2.7
Total decorated sherds		*74*	*100.0*

Nonplastic inclusions in the ceramics from 41BW553 consist primarily of clay/grog, with bone, either as a primary or a secondary inclusion, as the second most common material (Table 10). Shell occurs rarely as a tempering material, and a very few isolated examples of other materials are present. These include grit/rock and sand, with hematite appearing in only two instances as a secondary inclusion, although incidental occurrences of hematite are not uncommon.

The distribution of analyzable pottery across the site at 41BW553 follows, to a great extent, the distribution of other artifact types. Ceramics were found in almost all parts of the site, although the great majority of the pottery was recovered from the midden area in the center of the site, and noticeably less pottery was present in the southern and extreme eastern areas. By far the majority of classifiable sherds were found in the central area. Seven test units account for over 90 percent of the analyzable pottery (Units 13, 16, 27, 30, 37, 67, and 69). Test Units 13, 27, 30, 37, 67, and 69 all fall within a contiguous area extending about 50-60 m east of the midden (Feature 6). Test Unit 16 is located about 75 m to the north. Decorated pottery was found in far fewer areas, with the majority of the decorated sherds recovered from the two units in the midden (Test Units 30 and 67).

It has been noted that simple incising and combinations of incising and punctation form the most common decorative treatments in this sample. If the spatial distribution of decorated material is taken into consideration, it is evident that examples of simple incising occur in almost every excavation unit that contains decorated pottery. Other treatments are found almost exclusively within units in and around the

Table 10
Primary and Secondary Nonplastic Inclusions, Site 41BW553 (n=376)

Primary Inclusion	Secondary Inclusion	Quantity	Percentage
Clay/grog	—	316	84.0
Clay/grog	bone	12	3.0
Clay/grog	Shell	5	1.3
Clay/grog	Sand	4	1.1
Clay/grog	Hematite	1	.3
Clay/grog	Grit/rock	1	.3
Clay/grog	Indeterminate	1	.3
Shell	Clay/grog	1	.3
Shell	—	2	.5
Bone	—	9	2.4
Bone	Clay/grog	17	4.5
Bone	Hematite	1	.3
Bone	Sand	1	.3
Grit/rock	Shell	1	.3
Grit/rock	—	1	.3
Sand	—	1	.3
None visible	—	1	.3
n/a	—	1	.3
Total		*376*	*100.1*

midden (Feature 6) at the center of the site. The occurrence of incising and punctation on a number of Caddoan ceramic types, and the generally small size of the sherds in this sample, makes it difficult to identify most of the incised and punctated specimens as to specific type. Likewise, since incising and punctation occur on certain ceramic forms throughout the entire Caddoan sequence, it is difficult to place most of this material within a particular temporal period.

With regard to other decorative treatments in the sample, the number of examples is so small, and so closely corresponds to sherds that have been tentatively assigned type names, that it is more useful to continue the discussion on the basis of ceramic types present. Traditional types that have tentatively been recognized in this sample include McKinney Plain, Bullard Brushed, Pease Brushed-Incised, Pennington Punctated-Incised, Maydelle Incised, Nash Neck Banded, and Holly or Hickory Fine Engraved (Tables 11 and 12). The number of sherds of each type varies from one to six, but does not approach the frequency of smoothed plainware sherds and sherds with incised/punctated decoration. Individual specimens and small groups of specimens are discussed here in terms of temporal associations.

Several types that could be ascribed to the Early Caddoan period are present, including six specimens that are probably either Holly or Hickory Fine Engraved, and one which appears to be Pennington Punctated-Incised (Krieger 1946; Suhm and Jelks 1962; Suhm et al. 1954; Thurmond 1990:Table 8). It should be noted that Hickory Fine Engraved lasts into the Middle Caddoan Haley phase (Wyckoff 1974:109) and that both Holly and Hickory Fine Engraved may be present in what is arguably late Middle Caddoan context at site 41CS150, elsewhere in the White Oak Creek WMA (Cliff and Hunt 1995:72-73). All seven of these

Table 11
Proveniences of Typed Sherds, Site 41BW553 (n=15)

Tentative Ceramic Type	Excavation Unit	Vertical Provenience
Holly/Hickory Fine Engraved	13	Level 2, 10-20 cm bs
Holly/Hickory Fine Engraved	16	Level 4, 30-40 cm bs
Pease Brushed-Incised	16	Level 5, 40-50 cm bs
Pennington Punctated-Incised	16	Level 5, 40-50 cm bs
McKinney Plain	25	Level 3, 20-30 cm bs
cf. Barkman Engraved	30	Level 3, 20-30 cm bs
Bullard Brushed	30	Level 3, 20-30 cm bs
Nash Neck Banded	30	Level 3, 20-30 cm bs
Holly/Hickory Fine Engraved	37	Level 3, 20-30 cm bs
Holly/Hickory Fine Engraved	67	Level 1, 0-10 cm bs
Holly/Hickory Fine Engraved	67	Level 1, 0-10 cm bs
Maydelle Incised	67	Level 1, 0-10 cm bs
Nash Neck Banded	67	Level 3, 20-30 cm bs
Holly/Hickory Fine Engraved	67	Level 5, 40-50 cm bs
Maydelle Incised	67	Level 5, 40-50 cm bs

Table 12
Age Ranges for Identifiable Ceramics from Site 41BW553 (n=15)

Tentative Ceramic Type	Minimum Number of Vessels	Approximate Dates (from Thurmond 1990:Table 8; and Suhm et al. 1954)
Pennington Punctated-Incised	1	A.D. 800-1300
Holly/Hickory Fine Engraved	6	A.D. 800-1300
McKinney Plain	1	A.D. 1200-1500
cf. Barkman Engraved	1	A.D. 1200-1600
Pease Brushed-Incised	1	A.D. 1300-1500
Bullard Brushed	1	A.D. 1400-1500
Maydelle Incised	2	A.D. 1400-1600
Nash Neck Banded	2	A.D. 1400-1680

specimens come from excavation units in the central portion of the site (i.e., Test Units 13, 16, 37, and 67). Each of the sherds tentatively identified as Holly/Hickory Fine Engraved is quite small, with very fine engraved rectilinear patterns or simple parallel lines. Their identification as Holly/Hickory Fine Engraved is based on the lack of curvilinear designs and of more substantial engraving. These specimens generally exhibit relatively thin walls and fine to finely irregular paste. A typical specimen of Holly/Hickory Fine

Engraved, collected from Unit 16, Level 4 (30-40 cm bs), is illustrated in Figure 18a. One possible specimen of Pennington Punctated-Incised was identified in Unit 16, Level 5 (40-50 cm bs). This type is also generally dated to the Early Caddoan period (Suhm and Jelks 1962; Suhm et al. 1954; Thurmond 1990:Table 8). Although this specimen is small, it has been identified as Pennington Punctated-Incised on the basis of straight line incising coupled with punctation. Finally, it should be mentioned that although securely identified specimens of the early type, Williams Plain, are not present in this sample, the majority of plain sherds are clearly smoothed, in contrast to the brushed treatment typically seen on later forms of utility ware. A typical smoothed rimsherd from the midden (Feature 6) in Test Unit 67 is illustrated in Figure 18b. The question of whether this indicates a persistence of smoothed plain wares in the White Oak Creek area or is related to a predominance of earlier occupation debris cannot be resolved at this time.

A single specimen of Pease Brushed-Incised, a type belonging to the Middle-Late Caddoan period (Suhm and Jelks 1962; Webb 1948), was recovered from Test Unit 16. A single specimen tentatively identified as McKinney Plain, recovered from Test Unit 25, may also belong generally to the Middle-Late Caddoan period. This sherd has an appliqued fillet similar to those known to be common on McKinney Plain jars (Krieger 1946; Suhm and Jelks 1962; Suhm et al. 1954). It has an irregular texture and relatively low amount of clay/grog temper. It is notable that neither of these possible Middle Caddoan specimens are associated with the midden area in the central portion of the site. Both are actually from the high density area north of the site datum, about 100-125 northeast of the midden (Feature 6).

Identified types in this sample that are more commonly associated with the Late Caddoan period include Maydelle Incised, Nash Neck Banded, Bullard Brushed, and cf. Barkman Engraved (Bell and Baerreis 1951; Krieger 1946; Suhm and Jelks 1962; Suhm et al. 1954; Thurmond 1990:Table 8). The two specimens identified as Maydelle Incised come from Unit 67, in the midden (Feature 6). Both are relatively thick and coarse, with clay/grog temper and oxidized firing cores (one is illustrated in Figure 18c). Both are characterized by diagonal parallel incised lines on an outflared rim that is typical of Maydelle Incised. A specimen identified as Bullard Brushed was recovered from Unit 30, also within the midden (see Figure 18d). This specimen is thick and relatively fine in texture, though with coarse clay/grog temper. The two probable specimens of Nash Neck Banded consist of one neck sherd and one possible neck sherd, and were identified as Nash Neck Banded primarily on the basis of the relative care with which the banding has been executed. One comes from Unit 30 and the other from Unit 67, both within the midden (see Figure 18e). Finally, a single engraved specimen that appears similar to Barkman Engraved, a type that is considered to belong exclusively to the Late Caddoan Texarkana phase (Suhm and Jelks 1962), is present but the match is not totally satisfactory and this sherd is listed as only comparing favorably (cf.) to Barkman Engraved (Figure 18f). This rimsherd has a spontaneous, somewhat careless, and self-contained rectilinear design field, and a fine to irregular paste with bone temper. This sherd was also recovered from Test Unit 30. It is notable that all of these probable Late Caddoan sherds were recovered exclusively from units within the midden (Feature 6).

In addition to the pottery vessel fragments, a pipe bowl fragment and a small pipe stem fragment were recovered from site 41BW553. The pipe bowl fragment is from Unit 16, Level 3 (20-30 cm bs), north of the midden area. It is characterized by a rounded, thinned profile and has been burnished. The rim is 1.5 mm thick, while the wall is 9 mm thick. Based on the section present, the complete pipe bowl would have measured approximately 30 mm in diameter. An arc-shaped contact facet opposite the mouth of the bowl is believed to be where the bowl was attached to the stem prior to firing. If this is the case, the bowl would have been only approximately 15 mm high, and the stem would have been approximately 16-17 mm in diameter. Given its cultural significance, it was not broken for analysis, so the type of temper and paste used were not determined; nor was the atmosphere in which it was fired. Based on the reconstructed bowl and stem measurements, this fragment is identified with some confidence as a Red River pipe, Haley variety, dating to the Middle Caddoan period in the Red River drainage (Hoffman 1967:10).

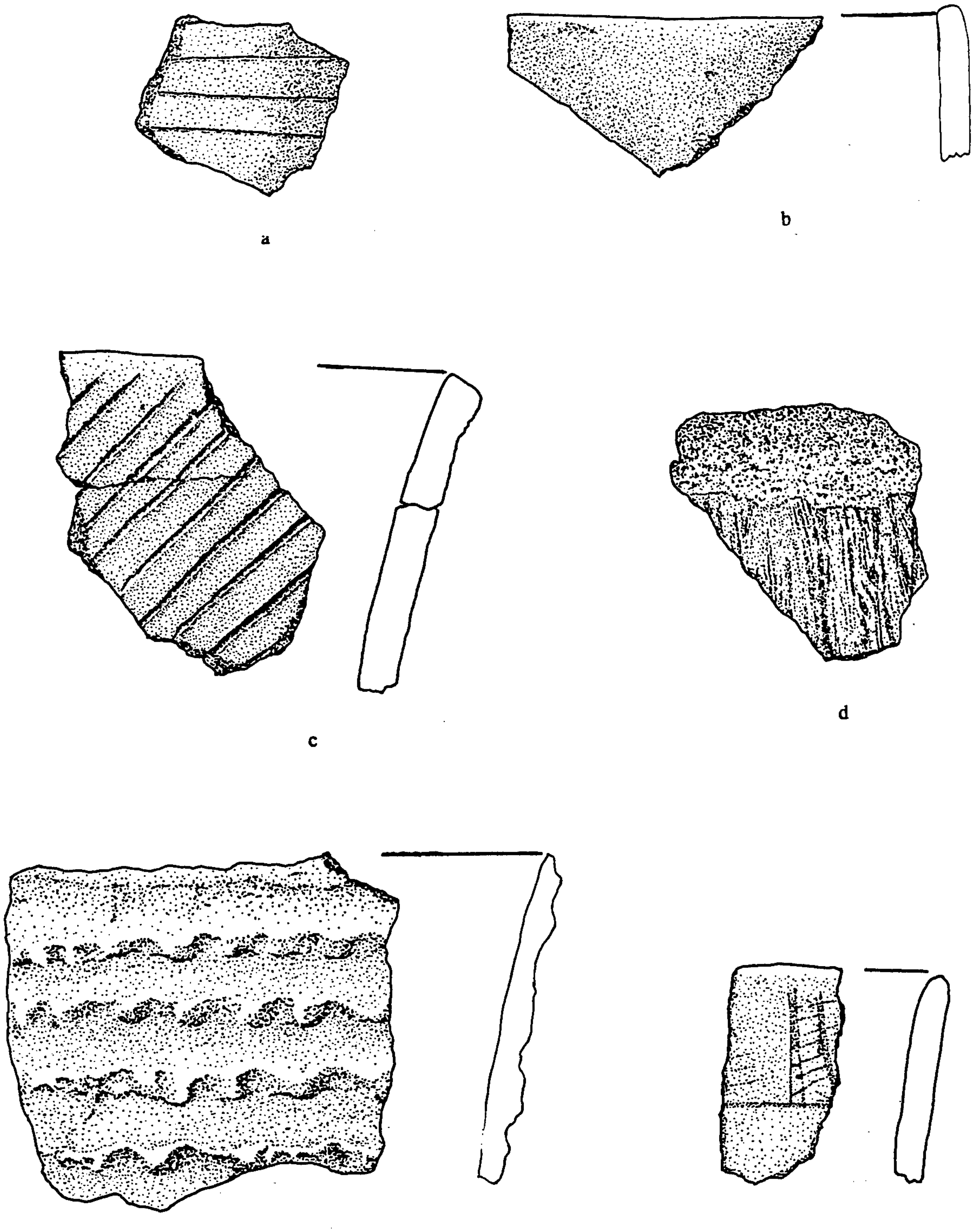


Figure 18. Ceramics recovered from site 41BW553: (a) Holly/Hickory Fine Engraved, Test Unit 16, Level 4 (30-40 cm bs); (b) smoothed rimsherd from the south wall of Test Unit 67, 25 cm bs; (c) Maydelle Incised rimsherd, Test Unit 67, Level 4 (30-40 cm bs); (d) Bullard Brushed, Test Unit 30, Level 3 (20-30 cm bs); (e) Nash Neck Banded, Test Unit 67, Level 3 (20-30 cm bs); and (f) engraved rimsherd, cf. Barkman Engraved, Test Unit 30, Level 3 (20-30 cm bs) (Scale 1:1).

The pipe stem fragment, although very small, was also somewhat diagnostic. This fragment, which was recovered from Level 5 of Unit 67 (40-50 cm bs, beneath the midden), is made of a fine, red paste (10R 4/4) with inclusions of quartz sand and possibly finely ground bone. It has been broken both transversely and longitudinally, but originally may have been cylindrical in shape. One end is flat and is presumed to be original. The extant fragment measures only 8 mm long by 7 mm wide, and represents about one-third of the arc of the original pipe stem, but it is reconstructed as having been originally 8 mm in diameter. It has a wall thickness of 1.5 mm, meaning the hole would originally been about 5 mm in diameter. The wall thickness is uniform from end to end, suggesting that the central hole was not drilled out. It was originally uncertain whether this piece represented a ceramic bead or a pipe stem; but its measurements are more characteristic of a pipe stem than of a bead (Table 13). Based on the dimensions of the specimen, and the fineness of the paste, it is believed to have come from a Red River pipe, possibly Miller's Crossing variety, dating to the Early Caddoan period (Hoffman 1967:9).

Table 13
Comparison of the Pipe Stem Fragment from Site 41BW553 with Similar Specimens Elsewhere

Specimen	Length (mm)	Outer Diameter (mm)	Hole Diameter (mm)	Wall Thickness (mm)
BW553 specimen	8+	ca. 8	ca. 5.0	1.5
Ceramic Beads (Brown 1996; Newell and Krieger 1949)				
Spiro Bead	59	20	5.5	9
Spiro Bead	43	16	5.5	5
Davis	31.8	19	—	—
Davis	31.8	19	—	—
Davis	31.8	22	—	—
Red River Pipe Stems (Stokes and Woodring 1981)				
Davis 1	26	7	4	1.5
Davis 2	19	—	—	2
Davis 3	28	9	4.4	2.3
Davis 4	22	10.5	4.5	3
Davis 5	14	7.5	4.9	1.3
Davis 6	52	7	4.6	1.2
Davis 7	10	8	4	2
Davis 8	24	6.2	3.2	1.5
Davis 9	7	7.5	3.9	1.8
Davis 10	50	10	6	2
Davis 11	15	—	—	2
Davis 12	13	—	—	2
Davis 13	24	—	—	2.3
Davis 14	14	—	—	1.9
Davis 15	16	—	—	2

Petrographic Analysis of Ceramics

Ten sherds from site 41BW553 were thin-sectioned and analyzed with the petrographic microscope (see Appendix G). The sample set consisted of one sherd of Pease Brushed-Incised, one sherd of Pennington Punctated-Incised, one unidentified incised sherd, one unidentified red slipped sherd, and six undecorated sherds with smoothed exterior surfaces. Based on both horizontal and vertical stratification, it is estimated that three of the samples date to the Early Caddoan period, four to the Middle Caddoan period, and three to the Late Caddoan period.

Four discrete primary inclusion groups were identified by the analysis, including ground sherd (n=3), crushed shell (n=3), ground sherd and bone mixed (n=2), bone exclusively (n=1), and crushed siltstone (n=1). Seven of these samples were correctly identified by previous visual examination. The exceptions were the sherd with crushed siltstone inclusions, originally identified as sherd/grog, and the two sherds with sherd/bone inclusions, originally identified as only having sherd/grog. The three samples exhibiting crushed shell as the primary inclusion are associated only with the Late Caddoan period. Samples exhibiting either ground sherd or sherd/bone combined as the primary inclusion are associated with both Early and Middle Caddoan contexts. Crushed siltstone is also associated with the Early Caddoan period, while the use of bone alone is associated with the Middle Caddoan period. On the basis of this data, it appears that the Early and Middle Caddoan periods were very similar in their use of tempering materials. The presence of crushed siltstone and bone temper alone in one period and not in the other may be the result of sampling error and not reflective of any actual difference in the use of these tempering materials through time. Likewise, the lack of any tempering material other than shell from Late Caddoan contexts is also due to sampling error, since other materials were undoubtedly used during the Late Caddoan period. What does seem to be real, is the lack of crushed shell inclusions from contexts earlier than the Late Caddoan period.

In addition to the primary inclusion groups, five discrete compositional groups that crosscut the primary inclusion groups were identified, including one consisting of monocrystalline quartz with smaller percentages of quartzite, and trace epidote (n=6); one containing monocrystalline quartz and hematite with smaller percentages of quartzite and potassium and plagioclase feldspar (n=1); one containing monocrystalline quartz and quartzite exclusively (n=1); one consisting of monocrystalline quartz, hematite, plagioclase feldspar and quartzite (n=1); and, finally, one containing monocrystalline quartz and trace plagioclase feldspar (n=1). The first of these groups is represented by 60 percent of the total sample set, and includes samples identified as being from both Early (n=3) and Middle (n=3) Caddoan contexts. Because of the high percentage of ceramics in this group, it is suggested that these may have been locally manufactured. If this group represents local manufacture during the Early and Middle Caddoan periods, then it is probable that ceramics with several production technologies were being produced contemporaneously during both periods. The choice of which temper type to use and the size and amount that should be added during paste preparation may have been mediated by functional and/or size considerations. Interestingly, all of the shell-tempered (Late Caddoan) and one of the sherd-tempered samples (Middle Caddoan) exhibit compositions that are discrete from that suspected of representing local manufacture. In the case of the Middle Caddoan sample, it is possible that this represents a nonlocally manufactured vessel, while the three Late Caddoan samples could represent either nonlocal manufacture or the use of a new local clay source with different secondary inclusions (the variability shown by the Late Caddoan sample would seem to argue against this latter interpretation). If these compositional groups do represent nonlocal manufacture then the exchange of shell- and sherd-tempered pottery may be indicated for the Middle and Late Caddoan periods at site 41BW553.

Chipped Stone

The chipped stone sample recovered from site 41BW553 (n=917) includes 12 projectile points; 18 bifaces or biface fragments, 10 unifaces, four cores, and 873 pieces of lithic debitage.

Tools

Forty tools were collected from subsurface contexts at 41BW553. This includes aborted bifaces, which are considered to be incomplete tools. Twelve of the tools are projectile points. Ten of these are dart points/knives, while the remaining two are arrow points. In addition, six bifacially worked fragments (out of 18 bifaces) are apparently projectile point fragments of an unidentifiable nature. The remainder of the tools are unifaces, mostly utilized flakes.

Projectile Points

Seven of the ten dart points (70 percent; Table 14) are identifiable as belonging to the Gary type, which is highly variable in morphology. Gary points in Northeast Texas are generally dated from the latter part of the Late Archaic to the Early Ceramic, and possibly into the Early Caddoan (Schambach 1982b; Story 1990; Thurmond 1990:Table 8). The seven points in this sample all display the triangular body and tapered stem typical of the Gary type, and are made of a variety of materials, including local cherts, Red River siltstone, Arkansas novaculite, and Ogallala quartzite.

One of the Gary points is of an unidentifiable variety. The blade is triangular and appears heavily reworked, and the shoulders are weak and lack barbs. However, the base has been snapped off and this lack precludes identification as to variety in this case (Figure 19a). Two other Gary points, both fragmentary, bear characteristics placing them within the *Colfax* variety, as defined by Johnson (1962:165) for Northeast Texas — slightly concave edges; prominent, unbarbed shoulders with slight outflaring; and a slightly contracting, somewhat square base. One of the Gary *var. Colfax* points consists of a diagnostic base and medial portion only, while the other is a basal fragment (neither is illustrated due to their fragmentary nature). Two other Gary points apparently fit within Johnson's *Kaufman* variety (Johnson 1962:161). These points exhibit broad, triangular blades with prominent shoulders; contracting, pointed stems; and fair workmanship (see Figure 19b and 19c). Of the two remaining Gary points, one is crude, thick, and somewhat lozenge-shaped, with a long triangular blade, a rounded base, and very weak barbs (see Figure 19d). It appears to fit into Johnson's *Panna Maria* variety (Johnson 1962:165). The remaining Gary point exhibits characteristics of both the *Kemp* and *Emory* varieties, with a narrow, triangular blade, weak shoulders, and a wide, rounded base (see Figure 19e).

None of the three remaining dart points is readily identifiable. However, one can be characterized as Wells-like, and a second as Marshall-like. The Wells-like point is made of very dark gray Woodford or Big Fork chert, and exhibits a short, triangular blade and a long, parallel-sided stem making up almost half the point's length (Figure 20a). It lacks the long blade characteristic of Wells points, although it is clear that this specimen has been extensively reworked. Furthermore, no stem grinding was noted. This point came from Level 5 of Test Unit 44 (40-50 cm bs), in the southeastern portion of the site. This unit also produced an unidentified Archaic-style point from a deeper context (see discussion below). If this is indeed a reworked Wells point, it dates from the Early Archaic period (7000-4000 B.C.) or later.

The Marshall-like point was collected from Backhoe Trench 2, also located in the southeastern portion of the site. It was recovered from approximately 75-90 cm bs. The point is fragmentary with only the lower third present (see Figure 20b). It exhibits deep corner notches, as well as a relatively narrow, slightly expanding stem with a very slightly concave base. In Central Texas, Marshall points have been dated to approximately 1000 B.C. (Turner and Hester 1993); while elsewhere in the White Oak Creek area, a Marshall point recovered from the Unionville site (41CS151) was dated to the Late Archaic on circumstantial evidence (Cliff, Green, Hunt, Shanabrook, and Peter 1996). This point also bears some resemblance to the Late Archaic/Early Ceramic Marcos style, although that type typically has a wider, more sharply expanding stem.

Table 14
Projectile Points Recovered from Site 41BW553

Identification Number[1]	Type	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Stem Length (mm)	Minimum Stem Width (mm)	Maximum Stem Width (mm)	Raw Material	Color
BHT 2.6.1[2]	Marshall-like (base/stem)	25.9	32.5	7.0	6.2	11.9	14.3	15.8	Red River siltstone	10YR 5/8
16.5.1	Gary, *var. Colfax*. (base)	15.0	16.5	7.1	1.7	—	—	—	Arkansas novaculite	N5
25.7.1	Gary, *var. Colfax* (base/medial)	39.3	23.9	8.1	6.8	18.5	11.2	16.9	Ogallala quartzite	5YR 3/3
30.2.1	Agee-like arrow point	14.7	8.0	3.4	.3	5.3	6.4	8.0	Ogallala quartzite	10YR 6/3
44.5.1	Wells-like	42.4	24.2	7.7	6.6	17.2	13.7	17.2	Woodford or Big Fork chert	10YR 3/1
44.8.1	Unidentified (Early Archaic?)	34.8	17.8	6.2	3.8	9.0	15.8	16.7	Woodford or Big Fork chert	10YR 4/1
50.2.1	Gary, *var. Panna Maria*	61.6	24.6	10.8	14.5	19.8	5.6	21.2	cf. "Lowrance chert"	10YR 5/1
63.4.1	Gary, *var. Kemp/Emory*	30.7	16.5	6.4	2.7	10.0	9.0	12.7	Bowie chert	10YR 5/3
63.6.1	Gary, var. unidentified	30.0	20.5	8.0	4.5	—	—	—	Red River siltstone	10YR 3/2
66.4.1	Gary, *var. Kaufman*	30.0	16.0	5.3	2.2	14.1	6.1	13.3	Ogallala quartzite	2.5YR 5/3
67.5.1	Scallorn arrow point	16.3	13.6	2.9	.3	3.9	6.8	7.6	Ogallala quartzite	10YR 6/2
87.2.1	Gary, *var. Kaufman*	41.6	21.7	6.4	5.0	14.6	4.7	13.6	Ogallala quartzite	10YR 5/2

Footnotes:
[1] Identification Number includes unit, followed by level, followed by unique artifact number.
[2] Backhoe trenches were screened in 15-cm thick levels, so this point was recovered from 75-90 cm bs.

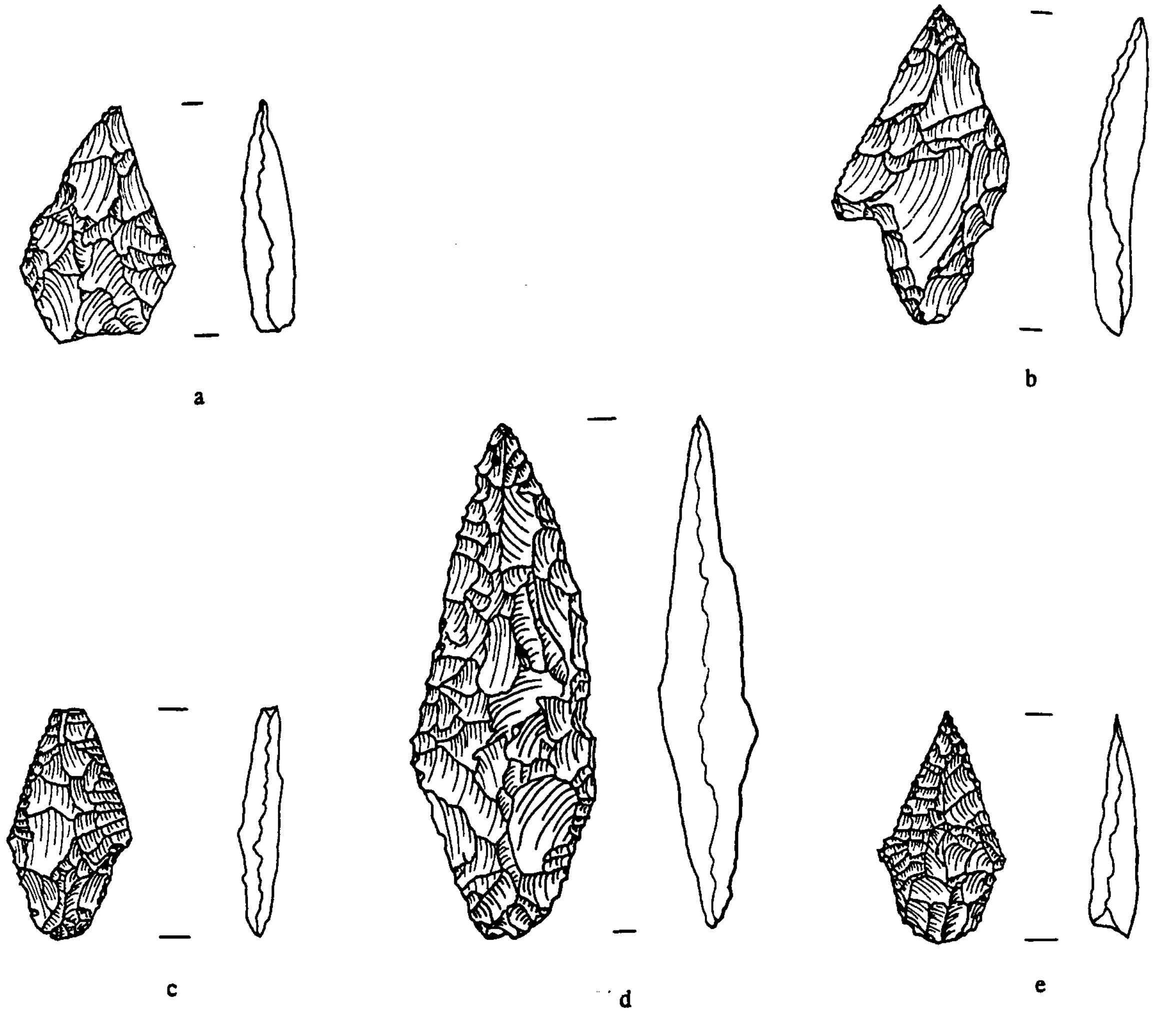


Figure 19. Gary dart points collected from site 41BW553: (a) unidentified variety, Test Unit 63, Level 6 (50-60 cm bs); (b) *var. Kaufman*, Test Unit 66, Level 4 (30-40 cm bs); (c) *var. Kaufman*, Test Unit 87, Level 2 (10-20 cm bs); (d) *var. Panna Maria,* Test Unit 50, Level 2 (10-20 cm bs); and (e) *var. Kemp/Emory,* Test Unit 63, Level 4 (30-40 cm bs) (Scale 1:1).

The third dart point, which remains unidentified, came from a context 70-80 cm bs in Test Unit 44, the unit which also produced the Wells-like point. This point exhibits a triangular blade, very weak shoulders, and a square, partially ground flat base (see Figure 20c). In some respects, it resembles a Paleo-Indian/Early Archaic San Patrice point, although it does not really fit into that type morphologically. It is made from the same very dark gray Woodford or Big Fork chert from which the Wells-like point was manufactured and is believed to date from the very Early Archaic (ca. 7000 B.C.), given its features.

Two arrow points, both intact and made from similar Ogallala quartzite, were also collected from 41BW553. One very small point was recovered from beneath the midden (Feature 6) in Test Unit 67 (see Figure 20d). It has been classified as a Scallorn type, which has been dated between A.D. 700 and 1200 elsewhere in Texas (Turner and Hester 1993:230). The other arrow point is a tiny, extremely reworked point with serrated edges and a short stem with a convex base. It lacks barbs (they appear to have been broken off) but otherwise resembles an Agee point (see Figure 20e). For this reason, it has been designated as Agee-like.

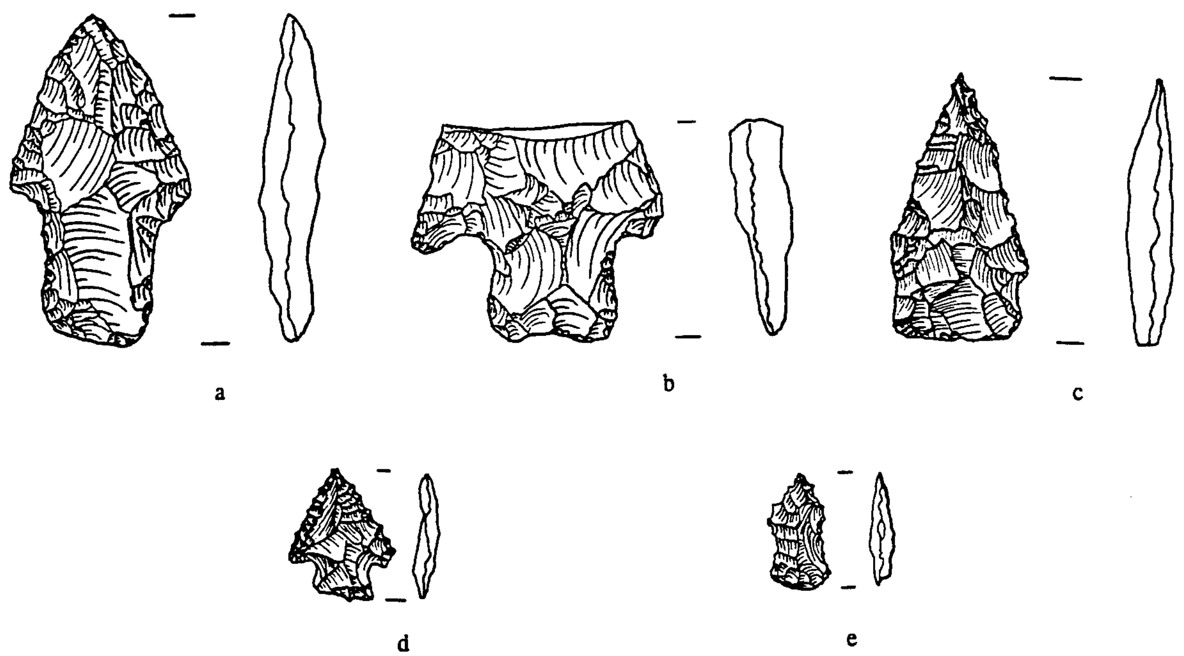


Figure 20. Other projectile points from site 41BW553: (a) Wells-like dart point, Test Unit 44, Level 5 (40-50 cm bs); (b) Marshall-like dart point, Backhoe Trench 2 (75-90 cm bs); (c) unidentified Archaic dart point, Test Unit 44, Level 8 (70-80 cm bs); (d) Scallorn arrow point, Test Unit 67, Level 5 (40-50 cm bs); and (e) Agee-like arrow point, Test Unit 30, Level 2 (10-20 cm bs) (Scale 1:1).

It also resembles the Homan style, which shares the Agee's distribution and is considered here to be a variant of Agee. Both types date from about A.D. 800-1300 in this region (Schambach 1982a; Suhm et al. 1954). This point is from Unit 30, which lies at the northern periphery of the midden (Feature 6), and was recovered 10-20 cm bs, at the base of the midden deposits in that area.

Although the sample of projectile points from site 41BW553 is small, they appear to cluster in three areas of the site: (1) in the high density area north of the datum; (2) in the central area including, and stretching eastward from, the midden (Feature 6); and (3) in the more spatially distinct southern area. Given the high artifact densities in these areas, this is not unexpected. The area north of the datum (including Test Units 16 and 25) yielded two of the ten dart points from the site. Interestingly enough, both were Gary, *var. Colfax* points (the only two recovered from the site). The central area of the site yielded the two arrow points (the Agee-like point and the Scallorn point) from below the midden (Feature 6), and a single Gary, *var. Kaufman* dart point from Unit 87, about 60 m to the east. The majority of the dart points from the site (70 percent of the dart point sample) came from the southern area. Most of these were clustered in the vicinity of Test Units 44 and 66 and Backhoe Trench 1, all of which are within 8 m of one another. One outlier on the southwestern corner of the site, the Gary, *var. Panna Maria* point from Test Unit 50, was found in an otherwise sterile clayey unit west of the main portion of the site and is believed to have been washed down slope by natural processes from the southeastern site area. The other points from this portion of the site include the Marshall-like point; the Wells-like point; the unidentified, possibly Early Archaic, dart point; the Gary, *var. Kemp/Emory* point; the Gary, *var. Kaufman* point; and the Gary, unidentified variety point.

Bifaces

Eighteen additional bifaces or biface fragments were also collected from various contexts at 41BW553 (Table 15). These pieces represent all phases of lithic reduction, from initial "roughing out" of the biface to final preforming. Included in the sample are four early aborted bifaces (i.e., those discarded early in the lithic reduction process). One of these is complete, while the others are fragmentary. Three late aborted bifaces, all fragmentary, were also identified. Only two preforms were noted, both of which came from the southeastern portion of the site, as did two of the late aborted bifaces. Both preforms appear to be for Gary dart points. Finally, nine tools or tool fragments of various types were identified. One, a small flake drill, was found in Backhoe Trench 2, 30-45 cm bs, between Test Units 1 and 2 (see Figure 5). This piece, which is made of Bowie chert (Figure 21), is typical of Caddoan assemblages from other sites, and several have been recovered from Caddoan occupations in the White Oak Creek area (Cliff and Hunt 1995). None of the remaining bifacial tools or tool fragments are diagnostic. These include a point barb or base which is too small and fragmentary to further identify; a projectile point barb; an arrow point tip; a lateral fragment; a dart point base, probably from a Gary point; a dart point medial fragment; an unidentifiable biface base; and an unidentifiable tool fragment.

Most of the bifaces are made of Ogallala quartzite, although specimens made of silicified wood, Red River siltstone, Arkansas novaculite, and various cherts were also noted (see Table 15). The bifaces are spread more evenly across the site than are the projectile points, but overall, more were recovered from the southeastern portion of the site than anywhere else.

Unifaces

Ten unifaces were identified in the sample from site 41BW553 (Table 16). Five of these are utilized flakes, which bear evidence of expedient use along their lateral edges. No deliberate retouch of those edges is evident. All types of edges were used — irregular, convex, concave, and straight. Five pieces were identified which were deliberately modified.

Two of these were only marginally retouched — again along the lateral edges — and three were more steeply retouched. Among these is a multiuse tool with both a well-polished scraper edge and a graver spur. Also present are a very thick flake with a steeply chipped edge, and a curious uniface which very much resembles a Gary *var. Kaufman* projectile point base — but only when viewed from the worked side. The unworked side is untouched and covered with cortex, and the piece merely appears to be an oddly shaped flake from that vantage. It may have been used as a borer or awl.

Lithic Debitage

The sample of lithic debitage from site 41BW553 (n=877) includes four cores, 121 pieces of shatter, and 752 flakes or flake fragments. The cores include two tested cobbles (one of which is Red River siltstone and the other petrified wood), and two multidirectional, complete cores (one made of Ogallala quartzite, the other of unidentified siltstone). All are made from materials easily available in the immediate area and none are distinctive (Table 17). All are somewhat small and it is suspected that the complete cores were actually cobbles in the process of being reduced to bifaces (although this does not obviate their usefulness as flake sources). Given the sample size, little can be said about their distribution across the site.

The remaining 873 pieces of debitage were collected from all areas of the site. A moderate percentage of the sample is heat-treated (n=147, 16.8 percent) or burned (n=191, 21.88 percent). As previously noted by Cliff and Hunt (1995), elsewhere in the White Oak Creek area, most of the debitage is small, suggesting it was produced from small cores, possibly the modest stream cobbles common to the area. The vast

Table 15
Bifaces Recovered from Site 41BW553

Identification Number[1]	Description	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Stem Length (mm)	Minimum Stem Width (mm)	Maximum Stem Width (mm)	Raw Material	Color
Early Aborted Bifaces										
30.8.1	Complete	42.3	36.0	15.0	20.3	—	—	—	Ogallala quartzite	7.5YR 6/2
43.5.1	Unidentified fragment (crude)	28.0	31.9	10.4	8.6	—	—	—	cf. "Lowrance chert"	10YR 3/2
44.3.2	Proximal/medial fragment	49.5	39.6	12.4	19.8	—	—	—	Ogallala quartzite	10YR 6/3
67.6.1	Indeterminate fragment	17.6	18.3	8.6	3.1	—	—	—	Red River siltstone	10YR 5/6
Late Aborted Bifaces										
32.6.1	Proximal fragment	34.0	23.6	10.0	10.2	—	—	—	Ogallala quartzite	7.5YR 5/3
44.5.2	Indeterminate fragment	47.8	24.0	13.1	12.9	—	—	—	Ogallala quartzite	10R 4/4
63.4.2	Proximal fragment	31.7	22.5	8.2	6.6	—	—	—	Ogallala quartzite	2.5YR 4/3
Preforms										
44.5.3	Gary preform (?)	33.4	25.0	15.9	10.5	—	—	—	Silicified wood	10R 3/3
63.6.2	Gary preform	56.7	29.8	11.2	16.6	—	—	—	Ogallala quartzite	10R 5/2

Table 15 (cont'd)

Identification Number[1]	Description	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Stem Length (mm)	Minimum Stem Width (mm)	Maximum Stem Width (mm)	Raw Material	Color
Tools/Tool Fragments										
BHT 2.3.1[2]	Small flake drill	26.0	11.0	1.4	.6	—	—	—	Bowie chert	5YR 4/3
4.2.1	Unidentified fragment; point base or barb	8.6	10.0	5.0	.2	—	—	—	Arkansas novaculite	N4
12.4.1	Arrow point tip	19.3	11.0	2.2	.4	—	—	—	Red River siltstone	7.5YR 5/4
30.2.2	Indeterminate tool fragment	19.5	14.3	3.8	.7	—	—	—	Red River siltstone	10YR 4/4
34.3.1	Indeterminate point medial section or base	12.4	10.3	3.1	.4	—	—	—	Woodford or Big Fork chert	7.5YR 3/2
38.1.1	Point barb?	17.9	8.8	6.7	.6	—	—	—	Arkansas novaculite	N8
44.1.1	Biface base	11.4	16.9	4.3	1.0	—	—	—	Ogallala quartzite	2.5YR 4/2
48.3.1	Dart point medial section	14.4	18.5	6.6	2.5	—	—	—	Arkansas novaculite	N7
63.7.1	Dart point base (?)	12.4	18.0	5.0	1.0	—	—	—	Ogallala quartzite	5YR 3/2

Footnote:
[1] Identification Number includes unit, followed by level, followed by unique artifact number.
[2] Backhoe trenches were screened in 15-cm thick levels, so this tool was recovered from 30-45 cm bs.

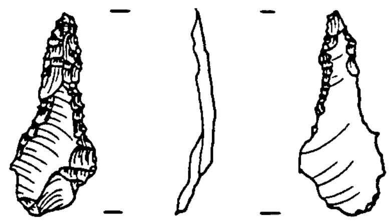


Figure 21. Small flake drill recovered from Backhoe Trench 2 (30-45 cm bs), site 41BW553 (Scale 1:1).

majority of the debitage measures less than 19 mm in size, and only 13 pieces were larger than this. It may have been impossible to produce many flakes larger than this, given the apparent size of the raw materials being reduced. Even including the very small debitage, less than 6.3 mm in size (the size of the typical dry screen), most of which were derived from the flotation samples, most of the debitage still falls between 6.3 and 19 mm in size. Although the debitage underwent only a general analysis in this case (limited primarily to size, weight, cortex type, and material type), statistical methods are available which can aid in determining what type of lithic reduction was occurring. In 1990, Leland Patterson proposed an "elegant and intuitively understandable" method (Shott 1994) by which debitage-size distribution data is plotted against the percentage of total debitage. In its simplest form,

> When percent of flakes is plotted vs. flake size an exponential curve form is obtained, with higher percentages of smaller flakes . . . This curve form is obtained for flakes from a single manufacturing event or from a mixture of flakes from several biface-manufacturing events (Patterson 1990).

Both Patterson (1990) and Shott (1994) have tested this method extensively, with good results. However, Shott (1994:94) cautions that other lithic reduction methods besides bifacial reduction may also produce similar distributions and, when results deviate from the expected exponential curve form, the method fails to indicate what other sorts of lithic reduction were occurring. However, within its limits, the Patterson method is useful in testing whether bifacial reduction was indeed occurring.

The sample tested here (n=560) includes only those flakes and shatter greater than 6.3 mm in size. The smaller pieces were excluded from the sample because they were recovered only from limited flotation samples and thus do not represent the true distribution of artifacts of this size across the site. Besides, as Patterson notes, "the exponential curve can be observed without working with very small flakes" (Patterson 1990:553).

This proved to be the case with the sample from 41BW553. Although the results must be regarded with caution, since the sample almost certainly material from several different cultural components, plotting of the data produced the expected exponential curve (Figure 22). While the curve was not perfect — there was a slight bump due to the presence of more debitage measuring 9.5-12.5 mm (Size Grade 3) than expected — it does suggest that bifacial reduction was the predominant lithic reduction activity at the site. The deviations suggest that other reduction activities were going on as well, though in limited amounts.

When the debitage is broken out by raw material type some interesting variations stand out. Although a large number of individual raw material types were identified (see Appendix C), they may be reduced to six major classes, including chert, quartzite (primarily Ogallala quartzite), siltstone (including Red River siltstone), novaculite (mostly from Arkansas), other (including petrified and silicified woods, limestone, palmwood,

Table 16
Unifacial Tools Recovered from Site 41BW553

Identification Number[1]	Description of Working Edge	Location of Retouch	Length of Retouched Edge (mm)	Raw Material	Color
Utilized					
16.5.2	Irregular	Lateral dorsal edge	17.8	Bowie chert	7.5YR 6/6
33.5.1	Convex	Lateral edge	36.4	Silicified wood	7.5YR 3/4
44.8.2	Concave	Lateral dorsal edge	9.7	Arkansas novaculite	N8
67.2.1	Straight	Lateral dorsal edge	18.4	Ogallala quartzite	2.5YR 4/3
80.1.1	Straight	Lateral dorsal edge	16.2	Ogallala quartzite	2.5Y 6/4
Marginally Modified/Retouched					
13.2.1	Straight to convex	Lateral dorsal edge	24.0	Bowie chert	10YR 6/6
44.2.1	Straight	Lateral dorsal edge	18.7	Red River siltstone	2.5YR 4/3
Steeply Retouched					
37.2.1	Scraper with graver spur	Distal and both lateral dorsal edges	7.0 & 7.5 (lateral) 17.1 (distal)	Bowie chert	10YR 6/6
44.3.1	Unifacially worked thick flake	Distal and lateral edges	16.0 (lateral) 23.0 (distal)	Bowie chert	10R 4/6
67.2.2	Blank for Gary point base (?)	Proximal edges	30.0 (total)	Ogallala quartzite	2.5YR 5/3

Footnote:
[1] Identification Number includes unit, followed by level, followed by unique artifact number.

Table 17
Cores Recovered from Site 41BW553

Identification Number[1]	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Core Type	Raw Material	Color
29.4.1	50.3	27.8	20.0	29.3	Tested nodule/cobble	Red River siltstone	7.5YR 5/3
35.3.1	79.0	39.3	24.5	100.8	Tested nodule/cobble	Petrified wood	2.5YR 4/4
44.2.2	40.0	30.0	18.5	26.7	Multidirectional, multiple platforms	Siltstone	10YR 5/8
75.1.1	33.0	51.7	22.4	41.5	Multidirectional, Bifacial platform	Ogallala quartzite	2.5YR 6/2

Footnote:
[1] Identification Number includes unit, followed by level, followed by unique artifact number.

and sandstone), and the unidentified category, which includes both those fragments of unidentifiable cortex and those rendered unidentifiable through burning. The general chert category includes fine-grained material (such as Bowie chert, "green" chert from the Arkansas Novaculite formation, and Battiest chert) from local upland lag gravels, including the Bowie gravels to the north and the Uvalde gravels to the west, and from alluvial gravels in the Sulphur and Red River valleys. The quartzite class is dominated by Ogallala quartzite, although material resembling Potter chert and other coarse-grained orthoquartzites are included as well. The siltstone class consists largely of material apparently originating from Red River gravels; while the novaculite appears to be from the Arkansas Novaculite formation to the north and northeast, although some may occur naturally in more local upland lag gravels in Bowie County and alluvial gravels in the Red and Sulphur river basins. The materials in the "other" category — petrified wood, silicified wood, palmwood, ferruginous sandstone, and limestone — are uncommon types which are generally available locally in bedrock or reworked alluvial sources.

With the most common materials — chert, quartzite, and siltstone — the exponential curves remain recognizable, but they flatten out for the other types (Figure 23). Although little can be said about the unidentifiable category, for the remaining categories — novaculite and other — this suggests that those materials were *not* undergoing full reduction at the site. It seems likely, given the rarity of this material, that the debitage derives from tool sharpening episodes. The tools from which they were removed must have been manufactured elsewhere.

A plot of the debitage size distribution by cortex type (Figure 24) also reveals a series of exponential curves, expressed most vividly for tertiary debitage (i.e., that debitage retaining no cortex; see Appendix C). This curve is quite smooth and approaches the expected exponential form. The plot for secondary debitage is more ragged and the one for primary debitage is nearly flat. This plot provides more information about the lithic reduction methods used at the site. Comparatively few primary and secondary debitage pieces are present, although tertiary debitage is extremely common. This suggests that lithic reduction at this site was

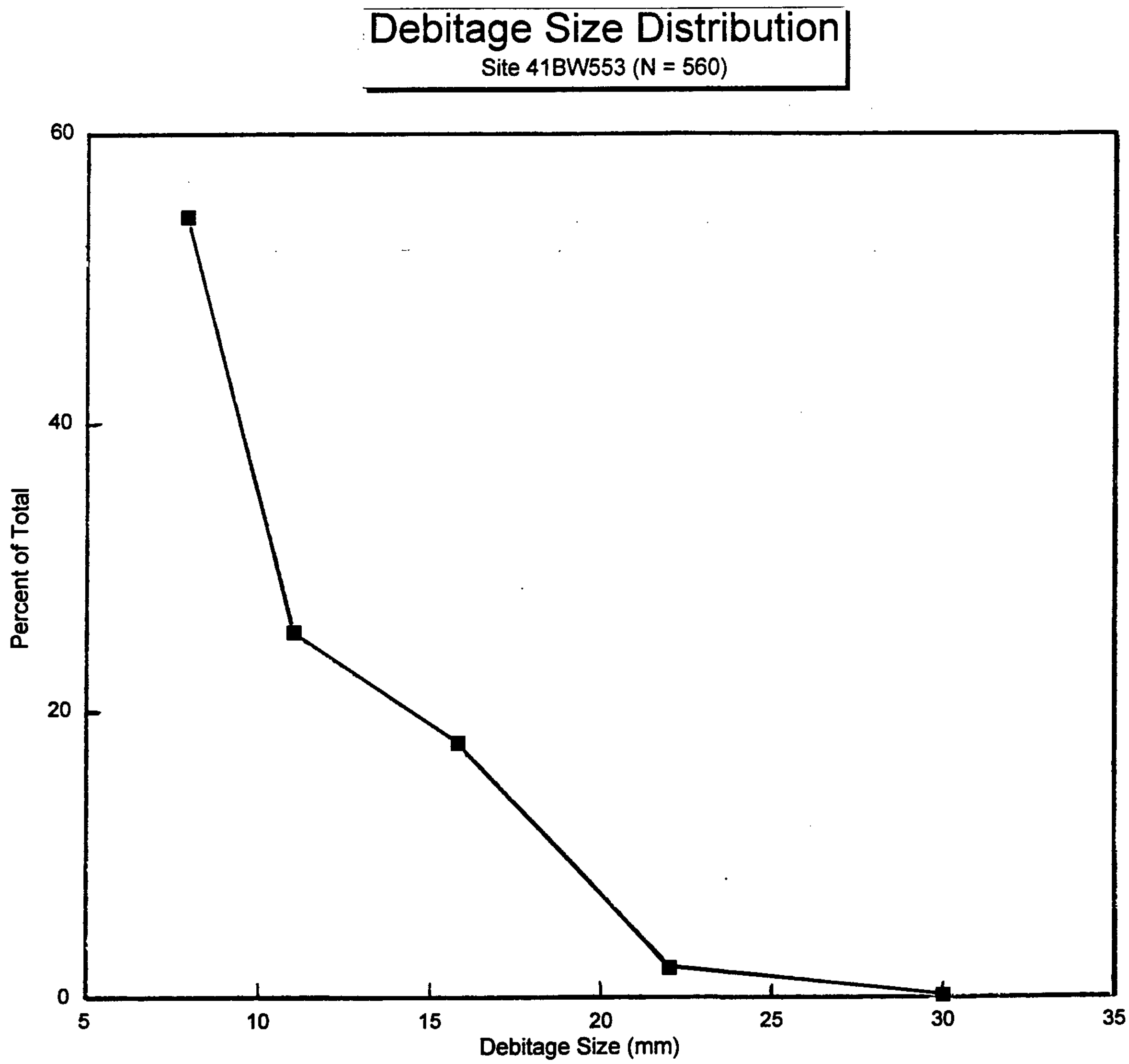


Figure 22. General debitage size distribution plot for site 41BW553.

not focused on initial decortication. Of course, there are always lower percentages of primary and secondary debitage than tertiary debitage in most lithic assemblages, simply due to the nature of bifacial reduction. If this were a quarry area or an area specialized in initial lithic reduction, a higher percentage of primary/secondary testing debitage would be expected. The graph also suggests a slight correlation between debitage size and presence of cortex, with those primary and secondary pieces measuring 9.5-12.5 mm (Size Grade 3) showing a slightly higher than expected occurrence. This may be due to the small average size of the cobbles used here as cores.

The smaller primary/secondary debitage may have resulted from later decortication efforts. Another possibility is that prepared flake blanks from larger cobbles were being used to produce the bifaces. As noted

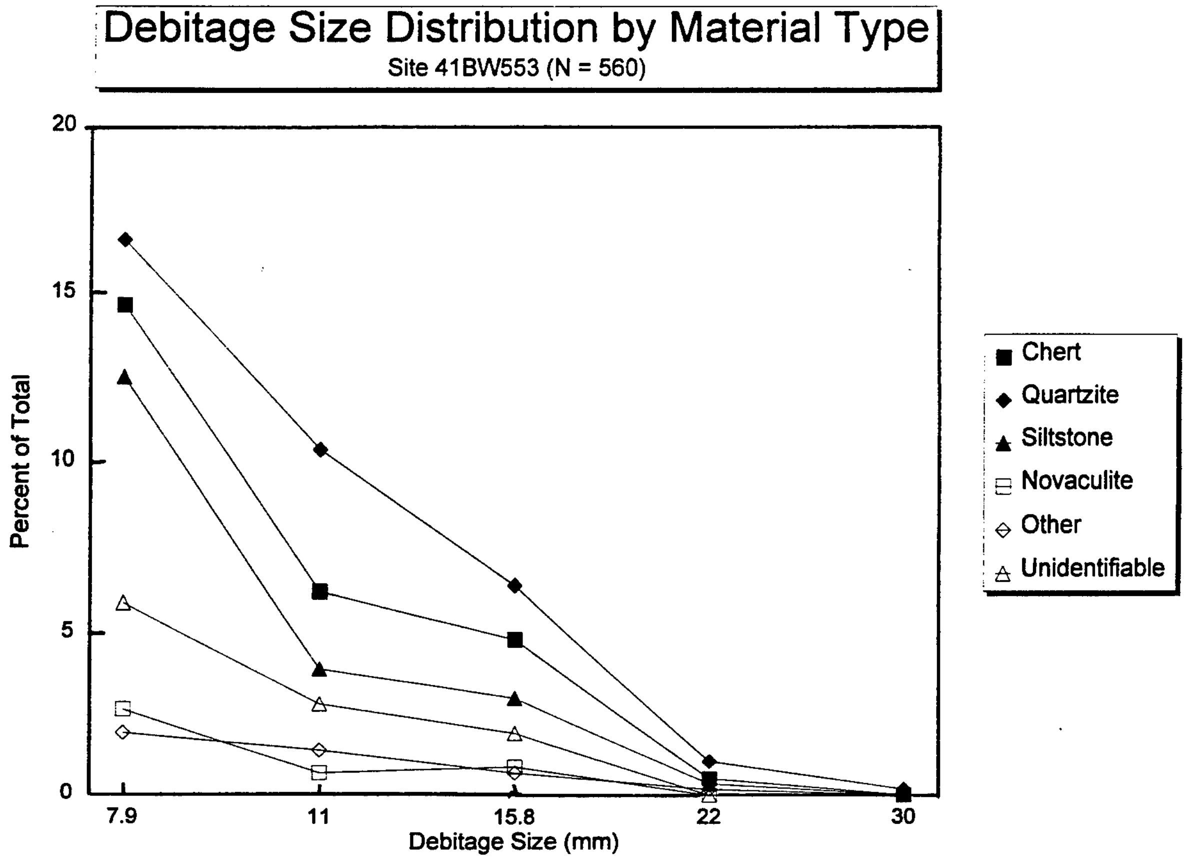


Figure 23. Debitage size distribution plot by raw material type, site 41BW553.

by Peter and McGregor (1987), in reference to bifacial replication efforts as part of the Richland Creek Archeological Project south of Dallas:

> . . . the debris from flake blank reduction exhibits a pattern very similar to that of cobble reduction. The size of the flakes is merely smaller throughout the reduction trajectory (Peter and McGregor 1987:207).

They also noted that, for flake blanks, "the relative frequencies of cortical flakes . . . are significantly lower than that produced by bifacial core reduction" (Peter and McGregor 1987:207).

As can be seen from Table 18, chert, siltstone, and quartzite dominate the debitage assemblage (n=873, excluding cores). Over a third of the sample was classified as chert, and together, these three classes account for 83.8 percent of the lithic debitage. Of the remaining 16.2 percent, novaculite accounts for a little over 5 percent, and the "other" category accounts for about 3 percent. Interestingly, when all debitage less than 6.3 mm in size is excluded from the sample (leaving a total of n=560) the numbers change significantly (Table 19). Quartzite replaces chert as most frequent, while siltstone remains about the same (within 1 percentage point). The percentage of novaculite and the "other" category also remain within 1 percentage point of the previous sample, but the unidentifiable material increases by almost 3 percentage points. The decrease in the proportion of chert in the sample of larger material indicates that significantly more microdebitage was being produced from chert than from the other categories of raw material. This could

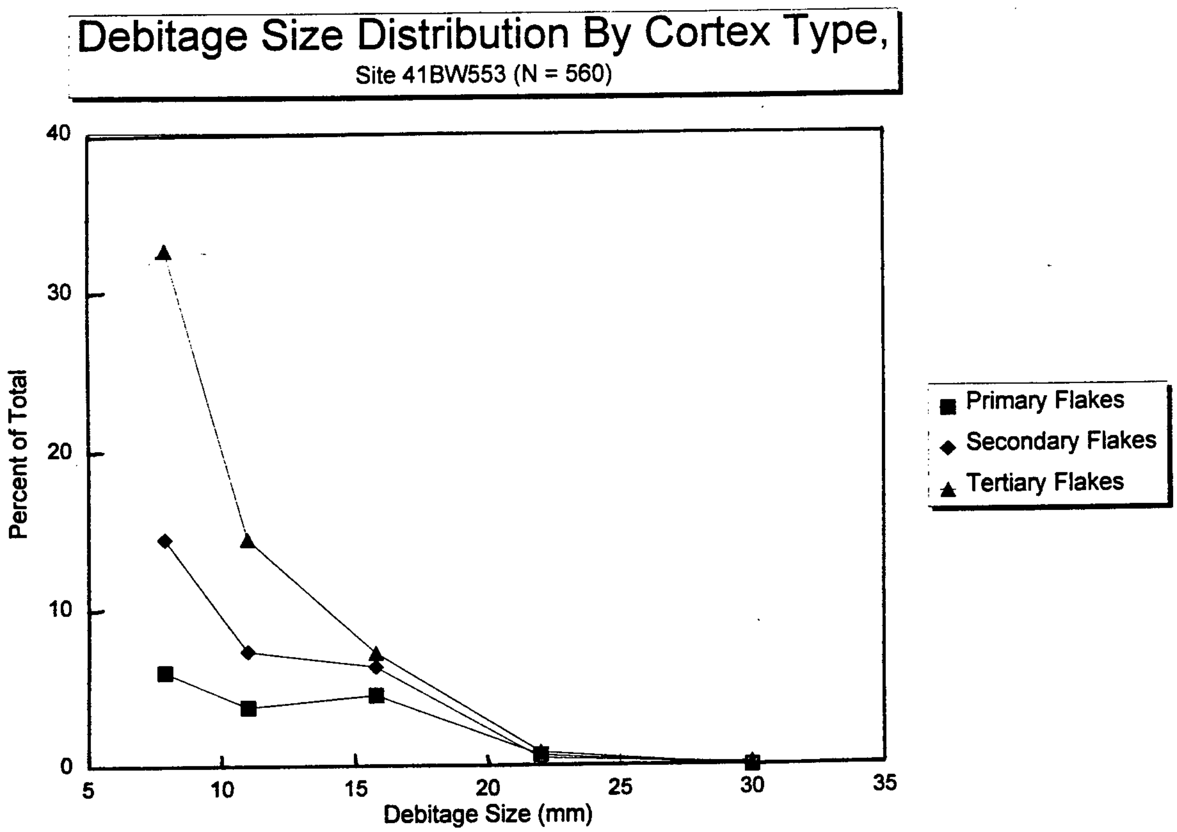


Figure 24. Debitage size distribution plot by cortex type, site 41BW553.

Table 18
Chipped Stone Raw Material Types Recovered from Site 41BW553

Raw Material	Tools			Debitage		Total
	Points	Bifaces	Unifaces	Flakes and Shatter	Cores	
Chert	4	3	4	305	—	316
Quartzite	5	8	3	244	1	261
Siltstone	2	3	1	183	2	191
Novaculite	1	3	1	46	—	51
Other[1]	—	1[2]	1[2]	27	1[3]	30
Unidentifiable	—	—	—	68	—	68
Total	*12*	*18*	*10*	*873*	*4*	*917*

Footnotes:
[1] Category includes petrified wood, silicified wood, palmwood, ferruginous sandstone, and limestone.
[2] Tool made of petrified wood.
[3] Tool made of silicified wood.

Table 19
Percentages of Chipped Stone Raw Material Types Recovered from Site 41BW553

Raw Material	Tools	Percentage	Debitage (All)	Percentage	Debitage (>6.3 mm)	Percentage
Chert	11	27.5	305	34.9	147	26.3
Quartzite	16	40.0	244	27.9	194	34.6
Siltstone	6	15.0	183	21.0	111	19.8
Novaculite	5	12.5	46	5.3	24	4.3
Other[1]	2	5.0	27	3.1	24	4.3
Unidentifiable	0	0.0	68	7.8	60	10.7
Total	*40*	*100.0*	*873*	*100.0*	*560*	*100.00*

Footnote:
[1] Category includes petrified wood, silicified wood, palmwood, ferruginous sandstone, and limestone.

have been caused by either (1) the chert tools at the site were undergoing more intensive reduction than tools made from other materials (possibly the result of bifacial reduction as opposed to flake tool production), or (2) the initial size of the raw material may have been smaller for chert than for other raw material types, thus yielding larger amounts of smaller flakes, even with the same reduction trajectory.

When amount of dorsal cortex is plotted against raw material type (Figure 25), it supports the view that chert and quartzite tools were being taken through to the final stages of bifacial production more often than tools made from other material types, producing significantly more debitage. An examination of the raw materials used to make the recovered lithic tools supports this observation (see Table 19). The raw material proportions for the tools are, in most cases, strikingly similar to the raw material proportions when the microflakes are removed from the sample. Since it was always possible to identify the material type used to make a tool at 41BW553, the "unidentified" category does not apply and the debitage proportions were recalculated without this category. For three out of the five raw material categories, these corrected raw material proportions for debitage are within 2 percentage points of the proportions for tools (chert — 29.4 percent, quartzite — 38.8 percent, and other — 4.8 percent). Notable differences do occur, however, for siltstone and novaculite. The difference between proportions of siltstone tools (15.0 percent) and siltstone debitage (22.2 percent) could be due to statistical sampling or to some other factor, such as the siltstone tools being made onsite more frequently than chert or quartzite tools, or being resharpened more frequently. In contrast, the difference between proportions of novaculite tools (12.5 percent) and novaculite debitage (4.8 percent) suggests that most or all of the novaculite tools were made elsewhere and the debitage recovered onsite derived from tool-sharpening or reworking episodes.

Summary of the Chipped Stone Data

The general analysis performed on the chipped stone from site 41BW553 suggests that the lithic tradition was oriented toward biface production, using small river cobbles, mostly of local derivation. An examination of the proportions of various types of decortication debitage indicates that, while all stages of reduction were occurring here, most of the debris resulted from the end-stages of the bifacial lithic trajectory. Of the 40 chipped stone tools identified in the sample, 30 were bifaces; the remainder were unifaces, mostly utilized flakes. Cores were extremely uncommon. Only four were identified in an assemblage of 917 chipped stone

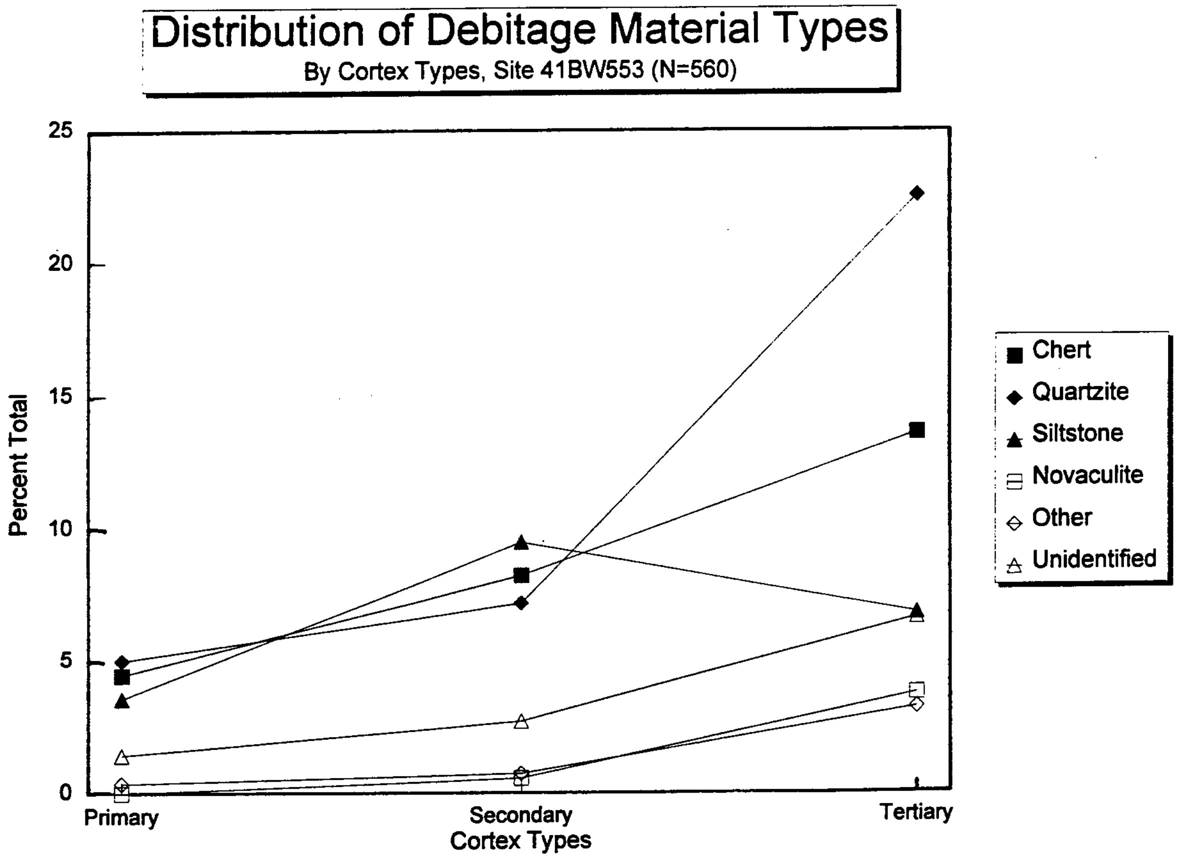


Figure 25. Distribution of debitage raw material types by cortex types, site 41BW553.

artifacts (.44 percent). Of these, two were only tested cobbles and the others appear to have been on their way to becoming bifaces. This suggests that little initial lithic decortication and purely debitage-oriented lithic production was occurring at the site. This supposition is supported by the fact that no hammerstones, which would have indicated initial lithic reduction activity or core reduction, were recovered. Much of the debitage collected from the site bore evidence of heating (n=147, or 16.8 percent) or burning (n=191, or 21.88 percent), suggesting that heat-treatment of lithic material was a routine occurrence. These high percentages may represent flakes removed from the outer surfaces of heat-treated cobbles. Various types of chert, quartzite, and siltstone were most commonly used, though more exotic material, such as novaculite, was sometimes utilized.

Ground and Incised Stone

The sample of ground or incised stone from site 41BW553 includes only five pieces — three ground pieces of ferruginous sandstone, a carved hematite fragment, and a fragment of soft, powdery limonite (Table 20). The limonite and the three sandstone pieces were all probably used for the production of ochre for cosmetic purposes. The largest piece may have served as a grinding slab, while the smaller, smoothed pieces were probably ground for powder. The incised stone is perhaps the most curious (though undiagnostic) artifact

Table 20
Ground and Incised Stone Recovered from Site 41BW553

Identification Number[1]	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Type	Raw Material	Color
27.7.1	30.6	25.4	13.2	17.5	Incised stone; square pattern with tickmarks	Hematite	10R 3/1
44.4.1	22.4	11.9	9.8	4.9	Ochre source?	Ferruginous sandstone	2.5YR 4/3
63.3.1	90.3	43.4	22.6	76.1	Grinding slab fragment	Ferruginous sandstone	5YR 3/4
66.3.1	19.6	15.5	7.1	2.5	Ochre source?	Ferruginous sandstone	2.5YR 3/3
67.6.2	26.4	26.0	5.0	2.9	Cosmetic source	Limonite	5YR 7/6

Footnote:
[1] Identification Number includes unit, followed by level, followed by unique artifact number.

collected from the site. This artifact, which is made of a red hematite, bears an incised square in one face, with tickmarks scratched along the edges at irregular intervals (Figure 26). The purpose of this artifact is unknown, although it may have served some entertainment or calendric function. The square incised stone and the fragment of limonite were recovered from the central site area, in the vicinity of the midden (Feature 6). All three of the fragments of sandstone came from the southeastern site area.

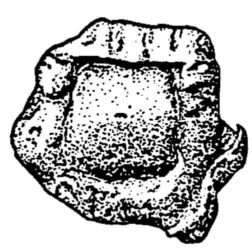


Figure 26. Incised hematite artifact from Test Unit 27, Level 7 (60-70 cm bs), site 41BW553 (Scale 1:1).

Burned Rock and Baked Clay/Burned Earth

Unlike sites previously excavated in the WMA (Cliff and Hunt 1995; Cliff, Green, Hunt, Shanabrook, and Peter 1996), 41BW553 produced a somewhat small assemblage of burned rock — just 27 fragments weighing a total of 586.9 grams (Table 21). Most of the identifiable raw material proved to be ferruginous sandstone and coarse quartzite, although one piece is petrified wood. As previously stated by Cliff, Green, Hunt, Shanabrook, and Peter (1996:70), "[t]he high proportion of ferruginous sandstone in the burned rock sample should not be too surprising, given its abundance in the underlying bedrock (i.e., Wilcox Group) in this area." With the exception of one burned fragment of quartzite, which came from Unit 44, all the burned rock came from the central portion of the site, most from the immediate vicinity of the midden area — although no burned rock was recovered from the midden itself. Unit 37 produced nine fragments of burned rock totaling 241.8 g from three levels. This supports the view that a highly dispersed hearth remnant occurred in this unit. A concentration of burned rock, originally called Feature 4 but later dropped from the feature list on closer examination, was noted during excavation. A fragment of burned rock was also collected from Feature 3.

Table 21
Provenience of Burned Rock Recovered from Site 41BW553

Provenience	Sample (n)	Total Weight (g)	Raw Material Type
Unit 21, Level 5	1	10.70	Unidentifiable
Unit 24, Level 3	1	1.50	Ferruginous sandstone
Unit 27, Level 4	1	7.70	Quartzite
Unit 30, Level 8 (Feature 3)	1	24.10	Quartzite
Unit 35, Level 2	1	1.70	Ferruginous sandstone
	1	45.20	Unidentifiable
Unit 37, Level 3	1	54.30	Ferruginous sandstone
Unit 37, Level 5	1	57.60	Quartzite
	2[1]	108.20	Quartzite
	1[1]	10.70	Petrified wood
	3[1]	8.20	Ferruginous sandstone
Unit 37, Level 6	1	2.80	Ferruginous sandstone
Unit 44, Level 5	1	16.80	Quartzite
Unit 48, Level 1	1	20.20	Unidentifiable
Unit 48, Level 4	1	25.50	Ferruginous sandstone
	3	28.50	Unidentifiable
Unit 67, Level 5	1	3.00	Petrified wood
Unit 67, Level 6	4	25.40	Ferruginous sandstone
Unit 69, Level 1	1	135.10	Unidentifiable
Total	*27*	*586.9*	

Footnote:
[1] Burned rocks recovered from a single concentration, originally identified as Feature 4.

One hundred and five fragments of burned earth or baked clay, totaling 100.5 g, were recovered. All of this material was recovered from the central portion of the site, much of it from Test Unit 67 within the midden (Feature 6). Some or all of this material may be daub used to waterproof house walls. None can be positively identified as wall daub, but the possibility cannot be discounted. However, three pieces — all from Unit 67 — appear to have impressions of some sort on one side, strengthening the possibility that they are indeed wall daub fragments.

FAUNAL AND MACROBOTANICAL REMAINS

Vertebrate Remains

Vertebrate remains recovered from site 41BW553 were analyzed for the purpose of identifying the taxa present, as well as any cultural modification of the material. These data were entered into a database program (Shaffer and Baker 1992) for manipulation. Faunal attributes recorded included taxon, element, portion of element, side, and basic taphonomic information, including weathering, breakage, and burning. Unique or culturally modified specimens were observed under magnification, using either a 10X hand lens, or a light microscope up to 30X. Specimens were quantified using the number of identified specimens (NISP). The minimum number of individuals (MNI) for any identified taxon did not total more than one.

Many of the specimens were recovered through flotation, and are quite small. These small specimens were mostly derived from larger elements and hence were unidentifiable below the level of class (i.e., Vertebrata). As such, only a limited amount of information could be extracted from the samples. Vertebrate remains from 41BW553 include fish, turtle, bird, and mammalian remains, as well as bone fragments which could only be identified as vertebrate (Table 22). Of the fish remains, bowfin, drum, gar, and unidentified bony fishes (small and medium-sized) were found to be present at 41BW553. Turtle remains are represented by shell portions, but were too fragmented for further identification with the exception of some carapace peripheral fragments which were identified as Kinosternidae (mud or musk turtle). All the identified bird remains are turkey or compare favorably with turkey, and it is suspected that some of the unidentified bird remains are those of either turkey or duck. In regard to the identifiable mammal remains, site 41BW553 exhibits a wide variety of taxa, with leporids (rabbits and hares, of which jackrabbit was positively identified), rodents (of which squirrel was identified), raccoon, deer, and medium-sized artiodactyl fragments that are probably deer remains as well, but were too fragmented for specific identification.

A taphonomic discussion of the faunal remains from the site is not wholly representational in that the quantities are more reflective of the amount of degradation and recovery methods, rather than providing a reliable and comparative database. General trends are probably a better indicator, more so than actual frequencies for this sample. Most of the recovered remains were burned and nearly every specimen was fragmented.

Most (n=1,699) of the 1,703 specimens are broken. Twenty-two of these exhibit spiral or fresh bone fractures. All of the specimens except two exhibit light weathering, although the small size of most of the fragments made assessment of marked deterioration through weathering difficult. Burning was identified on 1,187 specimens, of which 675 are charred and 512 calcined. This indicates their use as a food source. Four specimens exhibit rodent gnawing. No specimens were identified with cut marks. This is probably due to the small size and the fragmented condition of most of the remains.

Due to the size of most of the specimens recovered and the low frequency of identified taxa, little dietary, cultural, or ecological information can be gleaned from the data. The presence of fish and kinosternid turtles at the site indicates exploitation of riverine or wetland resources. The presence of rabbit, turkey, deer, and squirrel indicates terrestrial exploitation, with the latter three being likely forest or forest edge habitat species

Table 22
Vertebrate Remains Recovered from Site 41BW553

Taxon	Common Name	No. of Individual Specimens Present
Vertebrata	Vertebrates	1465
Osteichthyes	Small bony fish	9
cf. Osteichthyes	Small bony fish	2
cf. Osteichthyes	Medium bony fish	1
Lepisosteidae	Gars	5
Amia calva	Bowfin	1
Sciaenidae	Drums, croakers, etc.	3
Testudinata	Turtles	64
Kinosternidae	Mud and musk turtles	5
Aves (Large)	Large birds	2
Meleagris gallopavo	Turkey	1
cf. *Meleagris gallopavo*	Turkey	1
Mammalia (Small/medium)	Rabbit/canid-sized mammals	2
Mammalia (Medium/large)	Canid/deer-sized mammals	115
Mammalia	Mammals	2
Leporidae	Rabbits and hares	2
Lepus sp.	Jackrabbits	6
Rodentia (Medium)	Rat-sized rodent	3
Sciuridae	Squirrels and chipmunks	2
Procyon lotor	Raccoon	1
Artiodactyla (Medium)	Deer/pronghorn-sized ungulates	8
Odocoileus sp.	Deer	3
Subtotal		*1703*

and the jackrabbit being a prairie or grassland habitat species. Aside from burning and spiral fracturing, few specific and diagnostic cultural modifications were noted on any of the faunal material. Thus, the patterns of cultural exploitation, butchering, or use of these taxa by humans cannot be realistically assessed with this sample.

Several pieces (all from Test Unit 67) bear evidence of intentional modification. One bone tool, possibly a bone awl or arrow point, consists of a bipointed fragment of indeterminate mammalian bone with cross striae visible on both ends (Figure 27). This piece, which was collected from the base of the midden in Unit 67 (Level 4, 30-40 cm bs), measures 37 mm in length, 6 mm wide, and 2.9 mm thick, and weighs .5 g. A second piece of modified bone was also collected from Test Unit 67, Level 4 (30-40 cm bs). This artifact, which appears to be a fragment of an artiodactyl metatarsal (i.e., a deer foot-bone), exhibits striae on one end. The same end appears to be faceted from use. This piece measures 58 mm long, 9 mm wide, and 8.9 mm thick, and weighs 4.5 g. In addition to these artifacts, a small piece of bone from just below the midden in Unit 67 (Level 5, 40-50 cm bs) bears evidence of possible modification.

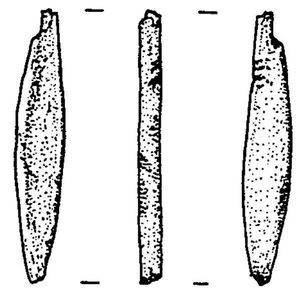


Figure 27. Bone tool recovered from Test Unit 67, Level 4 (30-40 cm bs), site 41BW553 (Scale 1:1).

Molluscan Remains

Relatively few mussel shell fragments were collected from site 41BW553, although it is believed that they were once a significant component of the midden. The abundance of intact faunal material, in soils typically extremely acidic and destructive to bone, supports this likelihood. One hundred and sixty-two fragments were analyzed. The eighteen which are identifiable represent three species within the family Unionidae (Table 23). Among these are five specimens of *Amblema plicata*, ten specimens of *Lampsilis teres,* and three specimens of *Quadrula quadrula*. Five of the 18 specimens are burned, direct evidence of their utilization as a food source. The predominant species, *Lampsilis teres,* generally inhabits shallow streams, although this species will tolerate deeper water if it is clear and flowing. *Quadrula quadrula* inhabits similar aquatic areas, particularly gravelly riffle zones. Conversely, *A. picata* favors deeper, pooled areas. This suggests that the prehistoric occupants of site 41BW553 were exploiting the resources of a relatively narrow, shallow stream characterized by a few pooled areas and somewhat clear water. This is quite unlike the present situation. The major streams of the region, White Oak Creek and the Sulphur River, are sluggish and muddy. Other nearby bodies of water, such as Pine Lake and Flag Lake, are remnant oxbow lakes with limited (if any) flow. It is apparent that the hydraulic regime of the area has changed significantly since the time the site was occupied.

Table 23
Identified Freshwater Bivalvia from Site 41BW553

Taxa	Number of Specimens
Family Unionidae	
Amblema plicata (Say)	5
Lampsilis teres (Rafinesque)	10
Quadrula quadrula (Rafinesque)	3
Total	*18*

Macrobotanical Remains

The macrobotanical sample from site 41BW553 proved somewhat disappointing, providing no definite evidence of agricultural practices among the prehistoric occupants of the site. However, it is possible to obtain some idea of both the types of material the occupants were burning for fuel, as well as what they were eating. Charred fragments of *Quercus* (oak), *Carya* (pecan or hickory), *Salix* (willow), *Ulmus* (elm), and some species of conifer (*Pinus* or *Juniperus*) could all be identified (Table 24). All of these are local species, common to the area today. Many of the other macrobotanical remains, both from features and elsewhere, consist of *Carya* shell fragments. On this basis, it appears that hickory, and/or pecan, was a staple food source at site 41BW553. Among the seeds identified were two from a species of sorrel (*Oxalis*) and five from goosefoot (*Chenopodium*), both of which might have served as a food source. Indeed, chenopods are common cultigens in prehistoric contexts. Unfortunately, all of these seeds were uncharred, suggesting that they may represent modern contaminants. Other identified seeds include one from a species of juniper (*Juniperus*), and two possibly from the legume family (cf. Fabaceae).

Table 24
Identified Macrobotanical Remains from Site 41BW553

Provenience	Identified Remains
Feature 1 (posthole)	
Unit 24, Level 4 (30-40 cm bs)	Hardwood charcoal, *Quercus* charcoal, *Carya* shell fragments
Feature 3 (trash pit)	
Unit 30, Level 8 (70-80 cm bs)	Hardwood charcoal, *Carya* shell fragments
Feature 6 (midden)	
Unit 30, Level 2 (10-20 cm bs)	*Carya* charcoal
Unit 30, Level 3 (20-30 cm bs)	*Carya/Salix* charcoal, *Carya* shell fragments
Unit 67, Level 1 (0-10 cm bs)	*Carya* shell fragments, *Juniperus* seed-1, cf. Fabaceae seeds-2
Unit 67, Level 2 (10-20 cm bs)	*Carya* charcoal, *Carya* shell fragments
Unit 67, Level 3 (20-30 cm bs)	Hardwood charcoal, *Carya* charcoal, *Carya* shell fragments
Unit 67, Level 4 (30-40 cm bs)	*Oxalis* seed-1 (uncharred)
General Excavation Fill	
Unit 3, Level 8 (70-80 cm bs)	*Carya* charcoal
Unit 13, Level 3 (20-30 cm bs)	Conifer charcoal (incompletely charred)
Unit 13, Level 4 (30-40 cm bs)	*Carya* charcoal
Unit 19, Level 2 (10-20 cm bs)	Hardwood charcoal
Unit 27, Level 4 (30-40 cm bs)	*Carya* charcoal
Unit 32, Level 4 (30-40 cm bs)	cf. *Carya* charcoal, *Carya* shell fragments
Unit 33, Level 4 (30-40 cm bs)	*Chenopodium* seeds-5 (uncharred)
Unit 35, Level 6 (50-60 cm bs)	Hardwood charcoal, cf. *Carya* shell fragments, *Oxalis* seed-1 (uncharred)
Unit 44, Level 2 (10-20 cm bs)	*Salix* charcoal
Unit 44, Level 4 (30-40 cm bs)	Hardwood charcoal, *Salix/Ulmus* charcoal
Unit 44, Level 5 (40-50 cm bs)	Hardwood charcoal, *Salix* charcoal
Unit 44, Level 6 (50-60 cm bs)	*Carya* charcoal
Unit 48, Level 3 (20-30 cm bs)	*Carya* shell fragments
Unit 67, Level 4 (30-40 cm bs)	*Carya* shell fragments
Unit 67, Level 5 (40-50 cm bs)	*Carya* shell fragments
Unit 67, Level 6 (50-60 cm bs)	Hardwood charcoal, *Quercus* charcoal, *Carya* charcoal, *Carya* shell fragments
Unit 67, Level 7 (60-70 cm bs)	Hardwood charcoal, *Ulmus* charcoal
Unit 89, Level 1 (0-10 cm bs)	*Carya* charcoal, *Carya* shell fragments

IDENTIFICATION AND DATING OF COMPONENTS

Two methods for dating the prehistoric components present at site 41BW553 are available — relative and absolute. Relative dating is dependent upon identifying the temporally diagnostic artifact types, such as ceramic and projectile point types, present in the sample, and then using their commonly assigned date ranges to date the site. Absolute dating relies on some form of uniform physical reaction which proceeds at a known rate over time, such as radioactive decay, to provide an absolute calendrical age for a natural substance, such as charcoal, which is then used to assign an age to an associated archeological context. The two primary sources of relative dating at site 41BW553 are ceramics and projectile points. The two methods of absolute dating which were used were radiocarbon dating and a relatively new method known as Oxidizable Carbon Ratio (OCR). OCR is a purely chemical dating technique which measures the remaining oxidizable carbon fraction in a soil sample and uses that ratio to determine the sample's age.

The ceramic sample from site 41BW553 suggests several different Caddoan occupations — one during the Early Caddoan period, one during the Late Caddoan period, and one possibly during the Middle Caddoan period. All of the identifiable ceramics, indeed nearly all of the ceramics in general, were recovered from the central and northern portions of the site, most in the vicinity of the midden. Almost all of the types which are generally considered to be Late Caddoan were recovered from the midden or immediately below it (i.e., Barkman Engraved, Bullard Brushed, Maydelle Incised, and Nash Neck Banded), indicating a Late Caddoan age for the midden, which fits well with the OCR and radiocarbon data presented below. The only exception to this are the sherds of McKinney Plain and Pease Brushed-Incised, which were recovered from the area north of the datum, and which may relate to a different, possibly Middle Caddoan, occupation.

In addition to the Late Caddoan ceramics present in the midden, a number of sherds of Early-Middle Caddoan age were also present in this area (i.e., Holly/Hickory Fine Engraved and Pennington Punctated-Incised). Unfortunately, it was not possible to vertically separate the different occupations in the midden area based on the ceramics alone, since two of the three sherds identified as being early in this area (i.e., Hickory/Holly Fine Engraved) were recovered from midden levels which also contained late material (specifically, Maydelle Incised). Although it should be remembered that the type identifications are only tentative, this suggests that there has been some vertical mixing in this area, probably due to bioturbation.

Temporally diagnostic lithic tools from 41BW553 include the twelve projectile points and the flake drill. The drill is not strongly diagnostic, although it is typical of Caddoan assemblages from several East Texas sites. Two such drills were collected from site 41CS155/156 in nearby Cass County (Cliff and Hunt 1995), and other drills of this type were recovered from the Yarbrough site (Johnson 1962:Figure 8w), the Limerick site and the Addicks Reservoir area (Duffield 1961:Figures 8h, I), and the George C. Davis site (Newell and Krieger 1949:Figures 57ee, ff). The Yarbough and Limerick sites are largely Archaic in date, with later Caddoan material present as well, while the Davis site is largely Caddoan in age. A similar drill — which was made on an arrow point — was recovered at site 41TT670, a Caddoan site with some Archaic material, in Titus County (see Chapter 6 for more information). It seems reasonable to assume, then, that this drill is a Caddoan form. However, this begs the question of *which* Caddoan period is represented by this tool.

The projectile point sample from 41BW553 is of similarly limited diagnostic utility. The most common point type from the site is the Gary point, various varieties of which were recovered from all parts of the site, although most came from the southeastern area. Gary points are common in Late Archaic and Early Ceramic contexts, and are often found on Caddoan sites, although whether this indicates that their use lasted into the Caddoan period or that many Caddoan sites are mixed is still a matter of some dispute. At site 41BW553, most of the Gary points present are of the smaller varieties thought to be typical of the later end of the Gary time range (e.g., Ford and Webb 1956:52-54; Turner and Hester 1993: 123). Two Gary *var. Colfax* points were recovered from the northern portion of the site, north of the site datum, in an area which may contain a Middle Caddoan component (interestingly, no other *var. Colfax* points have been recovered from excavations in the White Oak Creek area). No Gary points were recovered from the midden area, and only one was recovered from the central area — a *var. Kaufman* from the small Shovel Test Unit 87, about 60 m east of the midden. The bulk of the Gary points, as well as the three other dart points recovered from site 41BW553 (i.e., one Wells-like, one Marshall-like, and one unidentified Archaic) came from the southeastern site area. This fact, coupled with the relative lack of pottery in this area, indicates an Archaic and/or Early Ceramic occupation. Unfortunately, the vertical distribution of points in this area is not clear-cut. The Gary points were present from 10 cm to 60 cm bs, with half from 30-40 cm; the Marshall-like point (ca. Late Archaic) was collected between 45-60 cm bs; the Wells-like point (possibly. Early Archaic) came from 40-50 cm bs; and the unidentified point (also, possibly Early Archaic) came from 70-80 cm bs. This suggests an Early Ceramic (or Terminal Archaic) occupation overlying an earlier (possibly Early) Archaic occupation in this portion of the site.

Two arrow points — almost certainly dating from the Caddoan occupation of 41BW553 — were collected from contexts at the base of and just below the midden in the central portion of the site. The Scallorn point collected from beneath the midden may date to the Early Caddoan component in this area; while the Agee-like point was collected from the base of the midden in Unit 30. Agee points have been dated in southwestern Arkansas to between A.D. 900 and 1300 (Schambach 1982a; Suhm et al. 1954), and it may also be associated with a putative Early Caddoan occupation in this area.

The final category of diagnostic artifact recovered from site 41BW553 consists of pipe fragments. A fragment of pipe bowl, identified as being from a Red River pipe, Haley variety, was recovered from Test Unit 16, in the area north of the site datum. Red River pipes, Haley variety, are most closely associated with the Middle Caddoan Haley phase in the Red River basin (Hoffman 1967:10). The area north of the datum at site 41BW553 may represent an occupation distinct from those in the central and southern portions of the site; and the presence of the Haley variety pipe fragment, as well as sherds identified as Pease Brushed-Incised and McKinney Plain, types which are not identified elsewhere on the site, raise the possibility of a small Middle Caddoan occupation in this area. A second pipe fragment, believed to be from a Red River pipe, Miller's Crossing variety was recovered from just below the midden in Test Unit 67. The Miller's Crossing variety of Red River pipe dates generally to the Early Caddoan period in the Red River basin (Hoffman 1967:9). The occurrence of this variety of pipe below Feature 6 provides additional evidence for an Early Caddoan occupation in the central portion of the site.

Four fragments of nutshell from features in the central area of site 41BW553 were submitted for radiocarbon analysis (Table 25 and Appendix H). All of these were taken from features in the central portion of the site. These include one from Feature 1, a possible posthole; one from Feature 3, a possible trash pit below the midden; one from Feature 6, the midden; and one from below Feature 6, immediately above Feature 7, believed to be a human burial. Based on these results, Feature 1 appears to date well within the Late Caddoan period (cal. A.D. 1425-1620), while the midden (Feature 6) straddles the latter part of the Middle Caddoan and the early part of the Late Caddoan period (cal. A.D. 1310-1440). In light of the ceramic data from the midden, the latter part of this range may better reflect the age of the feature. In contrast, Feature 3 and Feature 7 both appear to date from the Early Caddoan period to the early part of the Middle Caddoan (cal. A.D. 1035-1235 and cal. A.D. 1035-1250, respectively).

In addition to the radiocarbon dates, nine soil samples were analyzed for OCR dates (Table 26 and Appendix H). As was the case with the radiocarbon samples, most of the OCR samples were taken from features in the central portion of site 41BW553. These include one from Feature 1; one from Feature 3; one from Feature 5, another possible posthole; four in stratigraphic sequence from within and immediately below Feature 6; one from immediately above Feature 7; and one from what was believed to be a possible occupation zone or house floor in Test Unit 69. These dates confirm a Late Caddoan date for the midden (Feature 6) in Test Unit 69 and an Early Caddoan date for Feature 7 below it. The OCR dates for Feature 6 are in stratigraphic order, running from A.D. 1666-1682 at the top, to A.D. 1556-1578 at the bottom. These dates do seem unusually young and may have been caused by the high level of oxidizable carbon typical of middens. The sample from immediately below the midden also yielded a largely Late Caddoan age (A.D. 1397-1429); while the sample from Feature 7, 10 cm lower, is quite a bit earlier (A.D. 1016-1070).

Table 25
Radiocarbon Dates from Site 41BW553

Laboratory Number	Provenience	Material	^{14}C Age Years B.P.[1]	$^{13/12}C$ (‰)	$^{13/12}C$ Age Years B.P.[1]	Calibrated Age and Intercepts[2]
Beta - 94626	Below Feature 6 (Test Unit 67, Level 6)	*Carya* shell	920 ± 80	-27.4	880 ± 80	A.D. 1035 (1180) 1250
Beta - 94627	Feature 3 (Test Unit 30, Level 8)	*Carya* shell	930 ± 70	-27.1	890 ± 70	A.D. 1035 (1175) 1235
Beta - 94628	Feature 1 (Test Unit 24, Level 4)	*Carya* shell	450 ± 70	-26.0	430 ± 70	A.D. 1425 (1450) 1505 and A.D. 1595 to 1620
Beta - 94629	Feature 6 (Test Unit 67, Level 4)	*Carya* shell	580 ± 90	-26.9	550 ± 90	A.D. 1310 to 1365 and A.D. 1375 (1410) 1440

Footnotes:
1 All date ranges one-sigma (68 percent probability).
2 Calibrated date ranges are one-sigma (68 percent probability); calibrations are based on Stuiver et al. 1993.

Table 26
Oxidizable Carbon Ratio (OCR) Dates from Site 41BW553

Sample Number	Provenience	Depth (cm)	OCR Age Years B.P.	Calendrical Age [1]
ACT - 1981	Test Unit 69	34-36	411 ± 12	A.D. 1527 (1539) 1551
ACT - 1982	Feature 5 (Test Unit 69)	44-46	596 ± 17	A.D. 1337 (1354) 1371
ACT - 1983	Feature 6 (Test Unit 67)	10-11	276 ± 8	A.D. 1666 (1674) 1682
ACT - 1984	Feature 6 (Test Unit 67)	20-21	299 ± 8	A.D. 1643 (1651) 1659
ACT - 1985	Feature 6 (Test Unit 67)	30-31	383 ± 11	A.D. 1556 (1567) 1578
ACT - 1986	Below Feature 6 (Test Unit 67)	48-50	537 ± 16	A.D. 1397 (1413) 1429
ACT - 1987	Feature 7 (Test Unit 67)	59-61	907 ± 27	A.D. 1016 (1043) 1070
ACT - 1988	Feature 3 (Test Unit 30)	70-80	1009 ± 30	A.D. 911 (941) 971
ACT - 1989	Feature 1 (Test Unit 24)	30-40	759 ± 22	A.D. 1169 (1191) 1213

Footnote:
[1] Calendrical age ranges are one-sigma (68 percent probability).

The other OCR dates are not as satisfactory. The OCR date from Feature 1 (A.D. 1169-1213) is radically different from the radiocarbon date from the same feature; while the OCR date from Feature 3 (A.D. 911-971) is earlier than the radiocarbon date, although not by much. The OCR sample from the possible occupation zone in Test Unit 69 dates to the Late Caddoan period (A.D. 1527-1551); while Feature 5 seems to date to the Middle Caddoan period (A.D. 1337-1371). Given the dates from Feature 6, the dating of the possible occupation zone in Unit 69 to the Late Caddoan period is probably correct. However, the ascription of a Middle Caddoan date to Feature 5 must be viewed with some skepticism, given the apparent lack of Middle Caddoan diagnostics in this area and the questionable dates obtained from Feature 1.

On the basis of the data presented above, it appears that site 41BW553 contains multiple components, with both horizontal and vertical stratification. The earliest evidence for occupation at site 41BW553 seems to occur in the southeastern area of the site, where there are indications suggesting stratified Terminal Archaic, or aceramic Early Ceramic, remains overlying earlier Archaic (possibly Early Archaic) material. No features were identified which could be associated with either of these components and it is probable that both represent short-term campsites. At the beginning of the Caddoan period, the focus for occupation at site 41BW553 apparently shifted to the central portion of the site, where an Early Caddoan component can be clearly identified. Occupation during this component may have been on a more long-term basis, since a probable human burial (Feature 7) and a possible trash pit (Feature 3) may be associated. Following the Early Caddoan period, occupation may have once again shifted to the north, with a tentatively identified Middle Caddoan component in the area north of the site datum. The evidence for this component is sparse and it may actually be a part of one of the other Caddoan occupations at the site. If this area does represent a Middle Caddoan presence at the site, it may have been only a short-term occupation, since no features can unequivocally be dated to the Middle Caddoan period (the OCR date for Feature 5 is an exception but it is viewed as being unreliable). The final occupation at site 41BW553 appears to date to the Late Caddoan period, when the central portion of the site was reoccupied and a midden deposited on top the earlier Early Caddoan remains. In addition to the midden (Feature 6), a possible posthole (Feature 1) and a possible occupation surface or house floor in Test Unit 69 may date to the Late Caddoan period. This suggests the presence of a relatively permanent habitation site at this time. Although no structural patterns could be identified, the midden associated with this component may mark the location of a house. The presence of a relatively large amount of burned clay (much of which is thought to be daub) within the midden area in Test Unit 67 supports this possibility. It may be that at this time site 41BW553 was a small agricultural farmstead, although no evidence for cultigens were recovered from the midden.

CHAPTER 6
RESEARCH RESULTS II: SITE 41TT670

by
Debra L. Beene, Whitney J. Autin, Rebecca S. Procter, Floyd B. Largent, Jr., Brian S. Shaffer, and Maynard B. Cliff

INTRODUCTION

Site 41TT670 is located on an isolated remnant of Pleistocene upland terrace adjacent to Little Grassy Lake at the confluence of two small drainages, north of White Oak Creek. The landform has been isolated by erosion and is surrounded on three sides by flood plain. It is connected by a low saddle to an upland ridge to the northwest. The site is in close proximity to a terrace escarpment that overlooks the Holocene flood plain of White Oak Creek. Surface elevations at the site are between about 84 and 88 m above sea level. Elevations of the adjacent Holocene flood plain are below 82 m (Figure 28). The highest area of the site is located along the southern edge overlooking Little Grassy Lake. The lake is located at the edge of the White Oak Creek flood plain and it may occupy a portion of an old creek channel. Duck Slash is an elliptical-shaped wetland swamp situated to the east of the site. The westernmost knoll on the site is separated from the rest by a low saddle. The remainder of the site is covered with small, natural rises and wraps around a large slough located near the center of the landform. The site is in an open woodland composed of box elder, red and white oak, hickory, sassafras, and elm, with a dense underbrush of greenbriar, mixed grasses, and forbs. An old two-track roadbed passes through the site from north to south, and there are fairly large areas of ground disturbance which may be related to logging activities which took place in the earlier part of this century. The site has also been subjected to bioturbation, soil deflation, and localized slopewash and colluvial redeposition. Site 41TT669 is located to the northwest of site 41TT670, and although both sites are located on the same eroded landform, they have been defined as two sites immediately adjacent to one another. The sites are divided by a small, sterile gap as well as two intermittent drainages which drain the internal slough located on site 41TT670.

The soil in this area is mapped as Woodtell fine sandy loam, 5-20 percent slopes, a gently sloping to moderately steep soil found in uplands. The typical soil profile begins with a surface layer (A horizon) of dark brown fine sandy loam or loam approximately 7.5-15 cm thick (USDA 1990:104-105). Below this is a dark yellowish brown fine sandy loam 7.5-15 cm thick (E horizon). The subsoil (B horizon) is a red or yellowish red clay in the upper 50 cm, underlain by a yellowish brown clay with light grayish brown mottling and few distinct red mottles in the succeeding 30 cm, then a light gray clay loam with strong brown mottles in the following 25 cm. The C horizon is a light brownish gray clay loam over a stratified light gray shale and strong brown sandy clay loam. The stratigraphy at site 41TT670 somewhat resembles the Woodtell series with a mappable thickness of loamy cover over a sandy clay loam to sandy loam with distinctive clay films.

PREVIOUS RESEARCH

Site 41TT670 was initially recorded during the 1993-1994 White Oak Creek Wildlife Management Area (WMA) survey (Cliff, White, Hunt, Pleasant, and Shaw 1996:123-127). At that time, 44 30-x-30-cm shovel tests were excavated judgmentally across the site area (designated Test Units 1-44). Of these, 35 were found to contain cultural material (see Figure 28). The site boundary was determined by the topography and the extent of positive shovel tests. In addition, several isolated surface artifacts were observed, including a concentration near the site datum in the southeastern area. In all, 278 prehistoric artifacts were collected during the initial survey from surface (n=2) and subsurface (n=276) contexts at the site. This sample included 80 prehistoric sherds, six pieces of baked clay, one finished bifacial tool, two unfinished bifaces, five utilized flakes, 165 pieces of unmodified debitage, two fragments of ground stone, and 17 pieces of burned rock. In addition, four fragmentary pieces of animal bone were recovered. More than one third of the sample was recovered from Test Units 10 through 13, located along the southern high ridge of the site immediately west of the old roadbed (Test Unit 13 is not shown on Figure 28, but it was in the vicinity of Test Unit 122). Another area of high subsurface artifact density was noted along the far eastern edge of the southern high ridge, in the vicinity of Test Units 22 and 23. Most of the artifacts were recovered at this time were within 80 cm of the surface (Cliff, White, Hunt, Pleasant, and Shaw 1996).

The archeological evidence collected from site 41TT670 by the survey suggested a primary occupation during the Formative-Early Caddoan period (A.D. 800-1200), with a possible minor Middle-Late Caddoan (A.D. 1200-1680) occupation as well (Cliff, White, Hunt, Pleasant, and Shaw 1996:127). Based on this information, together with the good contextual integrity and preservation evinced by the site, it was concluded that it probably contained preserved, potentially significant deposits and that the site should be considered of unknown potential for inclusion in the National Register of Historic Places (NRHP). The site was recommended for additional testing prior to a final determination of its National Register eligibility.

CURRENT INVESTIGATIONS

The current program of research at site 41TT670 began with the laying out of a grid. Since the site is roughly horseshoe-shaped with a high ridge along the southern edge overlooking Little Grassy Lake, the east-west baseline (N500) was placed across the long axis of the southern ridge. The north-south baseline (E816) was placed immediately east of the large slough near the site center. The grid as a whole was oriented 10° east of true north. An optical theodolite was employed to lay in the baselines and the majority of the grid points. When necessary, additional units were placed by triangulating from grid points established with the theodolite. The grid was expanded to cover a maximum area of 235 m north-south and 311 m east-west. The westernmost point along the east/west baseline was arbitrarily labeled N500 E500 and all units were placed to the east of this point. Stakes were usually placed at 25 m intervals, although some were placed as far apart as 40 m or more ,depending upon the topography and location of large trees.

Testing was initiated along the east-west baseline at the southwestern edge of the upland terrace and proceeded to the east and to the north. Excavation units were not placed within the large slough or on ground surfaces with slopes greater than 5 degrees. Sixteen 30-x-30 cm shovel tests (Test Units 45-59 and 126), 59 50-x-50 cm excavation units (Test Units 60-118), three 1-x-.5 m excavation units (Test Units 119-121), four 1-x-1 m excavation units (Test Units 122-125), and four backhoe trenches (Backhoe Trenches 127-130) were excavated across the site (see Figure 28). Most of the smaller units (i.e., Tests Units 45-47 and 60-118) were placed somewhat systematically across the site in to identify areas of high artifact concentrations and/or features.

The placement of the 1-x-.5 m and 1-x-1 m units was determined by subsurface artifact densities, as revealed by the smaller excavation units (Table 27). Three areas of high subsurface artifact densities were identified on the basis of this data — the first associated with a probable midden located in the central section of the southern terrace edge overlooking Little Grassy Lake (Area A), the second on the central highpoint of the westernmost knoll (Area B), and the third on the baseline at the southeastern edge of the terrace (Area C).

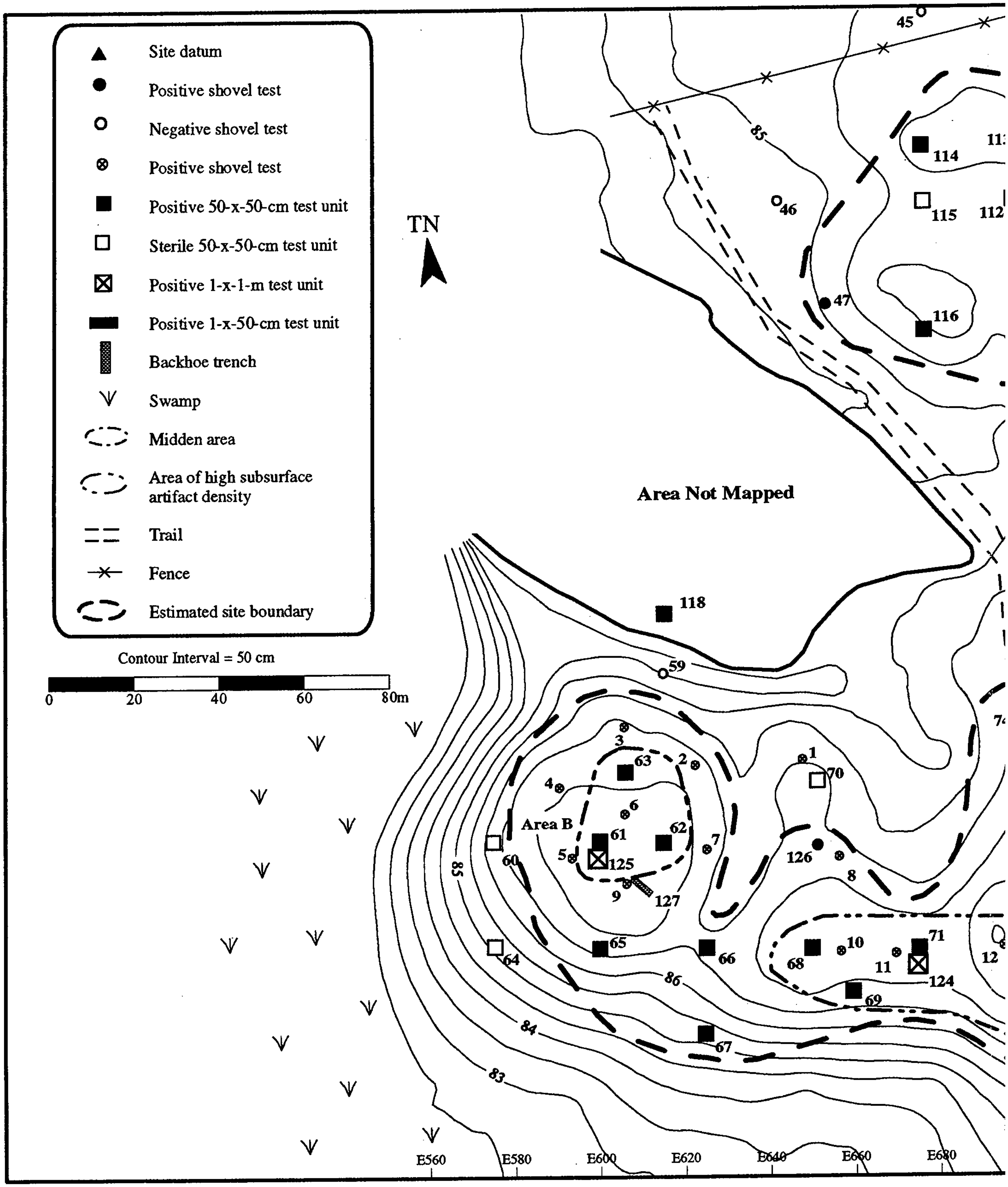
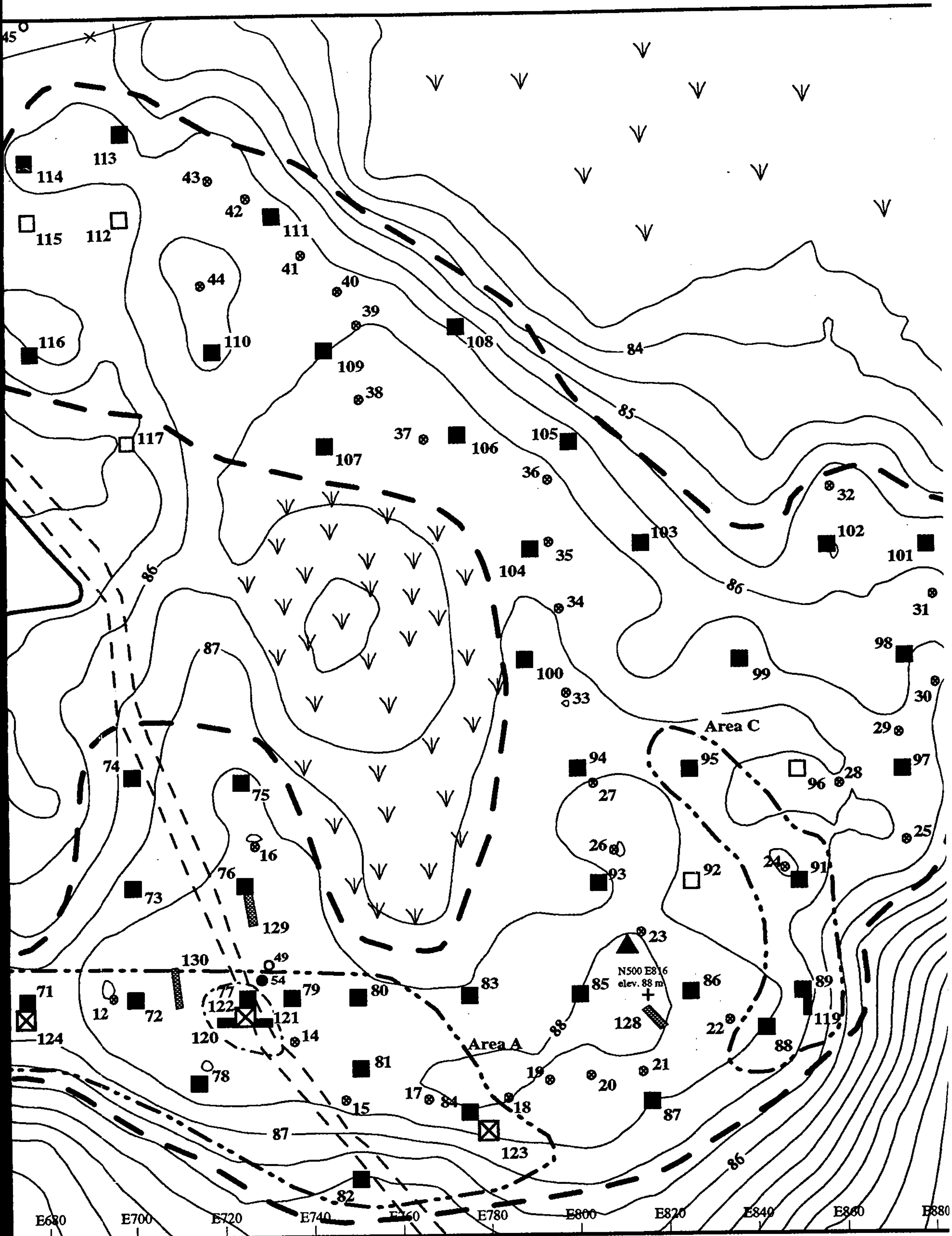


Figure 28. Map of site 41TT670, showing locations of test units, shovel tests, and backhoe trenches.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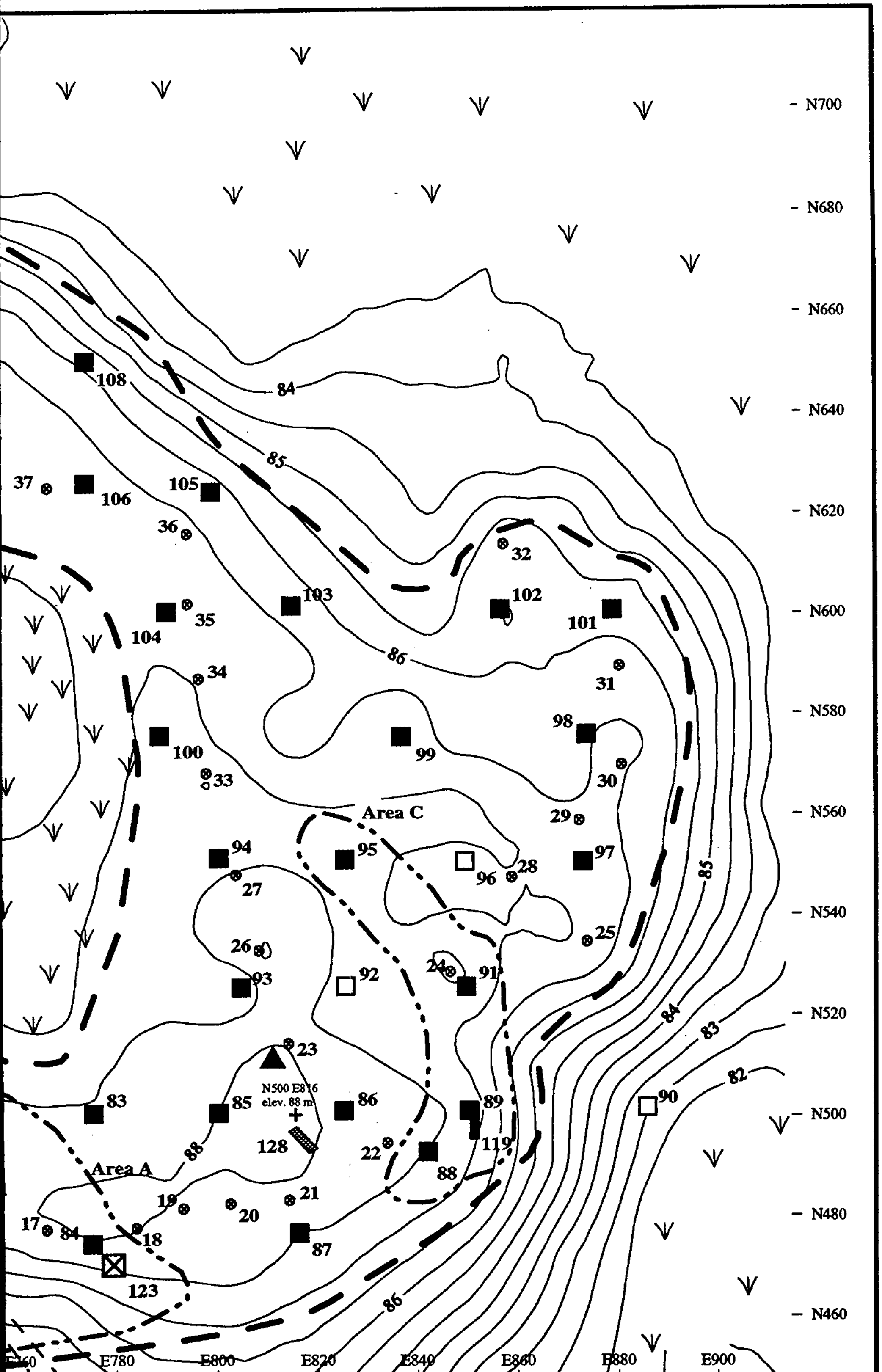

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Table 27
Estimated Volumetrics of Nonsterile Test Units, Site 41TT670[1]

Unit	Dimensions (m)	Depth of Cultural Zone	Volume of Cultural Zone (m^3)	Artifact Frequency[2]	Artifact Density (per m^3)
47	.3 x .3	70 cm	.063	2	32
48	.3 x .3	60 cm	.054	7	129
50	.3 x .3	40 cm	.036	1	28
51	.3 x .3	60 cm	.054	10	185
52	.3 x .3	60 cm	.054	7	129
53	.3 x .3	40 cm	.036	9	250
54	.3 x .3	40 cm	.036	9	250
55	.3 x .3	40 cm	.036	9	250
56	.3 x .3	20 cm	.018	5	278
57	.3 x .3	40 cm	.036	8	222
58	.3 x .3	40 cm	.036	3	83
61	.5 x .5	70 cm	.175	45	257
62	.5 x .5	100 cm	.200	13	65
63	.5 x .5	40 cm	.100	6	60
65	.5 x .5	30 cm	.075	2	27
66	.5 x .5	40 cm	.100	3	30
67	.5 x .5	40 cm	.100	1	10
68	.5 x .5	70 cm	.175	19	108
69	.5 x .5	30 cm	.075	10	133
71	.5 x .5	60 cm	.150	53	353
72	.5 x .5	110 cm	.275	65	236
73	.5 x .5	80 cm	.200	14	70
74	.5 x .5	80 cm	.200	14	70
75	.5 x .5	70 cm	.175	6	34
76	.5 x .5	120 cm	.300	21	70
77	.5 x .5	90 cm	.225	82	364
78	.5 x .5	60 cm	.150	45	300
79	.5 x .5	100 cm	.250	61	244
80	.5 x .5	70 cm	.175	74	422
81	.5 x .5	50 cm	.125	39	312
82	.5 x .5	70 cm	.175	59	337
83	.5 x .5	40 cm	.100	4	40
84	.5 x .5	110 cm	.275	125	454
85	.5 x .5	80 cm	.200	10	50
86	.5 x .5	80 cm	.200	8	40
87	.5 x .5	40 cm	.100	9	90
88	.5 x .5	70 cm	.175	19	108
89	.5 x .5	60 cm	.150	29	193
91	.5 x .5	80 cm	.200	23	115
93	.5 x .5	90 cm	.225	17	75
94	.5 x .5	50 cm	.125	6	48
95	.5 x .5	70 cm	.175	19	108
97	.5 x .5	60 cm	.150	9	60
98	.5 x .5	60 cm	.150	34	226
99	.5 x .5	90 cm	.225	9	40
100	.5 x .5	70 cm	.175	10	57
101	.5 x .5	110 cm	.275	19	69

Table 27 (cont'd)

Unit	Dimensions (m)	Depth of Cultural Zone	Volume of Cultural Zone (m³)	Artifact Frequency[2]	Artifact Density (per m³)
102	.5 x .5	40 cm	.100	11	110
103	.5 x .5	50 cm	.125	7	56
104	.5 x .5	80 cm	.200	23	115
105	.5 x .5	70 cm	.175	13	74
106	.5 x .5	80 cm	.200	23	115
107	.5 x .5	80 cm	.200	16	80
108	.5 x .5	80 cm	.200	3	15
110	.5 x .5	100 cm	.250	6	24
111	.5 x .5	80 cm	.200	3	15
113	.5 x .5	50 cm	.125	8	64
114	.5 x .5	70 cm	.175	5	28
116	.5 x .5	50 cm	.125	1	8
118	.5 x .5	50 cm	.125	2	16
119	1.0 x .5	60 cm	.300	82	273
120	1.0 x .5	70 cm	.350	356	1017
121	1.0 x .5	110 cm	.550	812	1476
122	1.0 x 1.0	110 cm	1.10	257	233
123	1.0 x 1.0	90 cm	.900	523	581
124	1.0 x 1.0	60 cm	.600	169	281
125	1.0 x 1.0	70 cm	.700	137	195
126	.3 x .3	40 cm	.036	1	27
Total			*13.38*	*3510*	

Footnote:
[1] Does not include backhoe trenches.
[2] Includes contents of features and some ecofacts, such as bone and shell. Does not include macrobotanical remains such as charcoal.

All three of these areas are located on the southern side of the site and may represent separate activity areas or separate occupations. All three areas yielded diagnostic cultural artifacts, including dart points, arrow points, and ceramics. Two arrow points or fragments were recovered from Levels 1 and 2 (0-20 cm bs), and 11 dart points or fragments were recovered from Levels 2-10 (10-100 cm bs) in Area A. One reworked arrow point was recovered from Level 3 (20-30 cm bs), and two dart points were recovered from Levels 6 and 7 (50-70 cm bs) in Area B. Finally, four dart points or fragments were recovered from Levels 5 and 6 (40-60 cm bs) in Area C. Five additional dart points or fragments were recovered outside of these areas of high subsurface artifact density, in Levels 5-8 (40-80 cm bs). The arrow points were stratigraphically located above the dart points in all cases except in Area A, where an arrow point distal fragment was found in Level 2 (10-20 cm bs) in Test Unit 122 and a Gary, *var. Kaufman* dart point was found in Level 2 (10-20 cm bs) of Test Unit 79. Although Gary dart points are most prevalent during the Terminal Archaic and Early Ceramic periods, it is not uncommon to find Gary dart points on Caddoan sites. The arrow point horizon appears to be located at a slightly deeper level in Areas B (Level 3, 20-30 cm bs) and C (Level 4, 30-40 cm bs) than in Area A (Levels 1 and 2, 0-20 cm bs). Ceramic types of probable Early Caddoan affiliation were recovered from Area A, Levels 3 (20-30 cm bs) and 5-7 (40-70 cm bs), and from Area B, Level 6 (50-60 cm bs). In addition, one probable Early Caddoan sherd was recovered from the vicinity of Area C, from Level 6 (50-60 cm bs). One sherd of Early-Middle Caddoan range was recovered from Area A, Level 5 (40-50 cm bs) and five from Area B, Levels 4-6 (30-60 cm bs). Finally, one sherd of probable Middle Caddoan date was recovered from Area A, Level 7 (60-70 cm bs), and another from Area B, Level 5 (40-50 cm bs).

In both cases, the probable Middle Caddoan sherds were stratigraphically located below or mixed with possible Early Caddoan material. The earlier and later types may coexist during the Middle Caddoan period while the earlier types found in isolation may represent an Early Caddoan occupation.

Artifact density in the northeastern area of the site, north of Area C, suggests light to moderate occupation/activity, with most of the units averaging between 40 and 110 artifacts per m^3. An exception to this is found in Test Unit 98, where a localized area of much higher subsurface artifact density (226 artifacts per m^3) was identified. Subsurface densities were generally even lower in the northernmost area of the site, north of Area A and northwest of Area C, with densities of between 15 and 115 artifacts per m^3. These densities are also believed to indicate only light occupation/activity in this portion of the site. No excavation units larger than 50-x-50 cm were placed in this section of the site.

Following the completion of this program of hand excavation at site 41TT670, backhoe trenching was carried out to gain additional data on the depositional context of the site, and to identify the age and stratigraphic history of the landform on which the site was located. Four shovel loads of soil were screened per backhoe bucket from each backhoe trench, and all cultural materials collected. Four backhoe trenches were excavated across the site near the east-west baseline. Backhoe Trench 127 was place adjacent to Area B, Backhoe Trench 128 was placed to the west of Area C, and Backhoe Trenches 129 and 130 were placed within and to the north of Area A, respectively. In addition, a fifth backhoe trench (Backhoe Trench 131) was excavated approximately 400 m to the northwest of site 41TT670 (location not shown on Figure 28), on a higher land surface, in order to verify the colluvial nature of the 41TT670 site area (see following section on Sediments and Stratigraphy). Finally, the long profile exposed by Test Units 120, 121, and 122 in Area A was reexcavated and examined by the project geomorphologist.

Area A

Investigations in Area A were most concentrated in the area of Test Unit 77. The soil in this unit was found to be much darker than any soils encountered elsewhere and appeared to be associated with a midden. In addition, this unit, and Test Unit 84 to the southwest, contained some of the highest artifact densities in any of the 50-x-50 cm units, 364 and 454 artifacts per m^3, respectively (see Table 27). The surrounding units located along this portion of the ridge, and down slope, yielded between 236 and 422 artifacts per m^3. As a result of this, two 1-x-1 m units (Test Units 122 and 123) were placed adjacent to Test Units 77 and 84, respectively. The exposures in Test Unit 122 seemed to confirm the presence of a midden, but raised some questions concerning the relationship between it and the underlying subsoil. Consequently, two 1-x.-5 m units (Test Units 120 and 121) were opened to either side of Test Unit 122 to provide a 3-meter profile through the midden. In addition to the midden, a probable posthole (Feature 1) was discovered in Test Unit 122 and an in situ hearth (Feature 2) was discovered in Test Unit 120. The midden (Feature 3) was defined by the presence of a dark brown (7.5YR 3/2 or 10YR 3/3), organically enriched soil containing dense artifactual material with some bone and shell. Eleven 30-x-30 cm shovel tests (Test Units 48-58) were excavated to better delineate the extent of Feature 3. Test Units 52 and 53 tested positive for midden material as defined by the layer of organic enrichment and/or the presence of shell and/or bone, while the remaining tests were negative. The Area A concentration gradually decreased to the west, while dramatically decreasing to the east and north. An additional 1-x-1 m unit (Test Unit 124) was placed in the western portion of Area A, adjacent to Test Unit 71.

Area B

Area B is separated from Area A and the rest of the site by a narrow saddle (see Figure 28). Test Unit 61 was placed on the central highpoint of an isolated knoll in this area and was subsequently followed by a 1-x-1 m unit (Test Unit 125) which was placed adjacent to it. While both of these units showed high subsurface densities (257 and 195 artifacts per m^3, respectively), density was limited to 65 and 60 artifacts per m^3 in the nearby Test Units 62 and 63, respectively (see Table 27). The other units on the periphery of this knoll yielded between 0 and 30 artifacts per m^3. No additional units were placed in Area B.

Area C

Area C is located on the southeastern edge of the site, overlooking Little Grassy Lake (see Figure 28). A 1-x-.5 m unit (Test Unit 119) was placed adjacent to Test Unit 89, overlooking the slope in this area. Test Unit 89 averaged 193 artifacts per m^3, while Test Unit 119, in turn, showed 273 artifacts per m^3 (see Table 27). The other units placed within Area C (Test Units 87, 88, 91, and 95) all averaged more than 90 artifacts per m^3, while the units surrounding Area C (Test Units 85, 86, 93, 94, 99, and 100) yielded between 40 and 75 artifacts per m^3, with the exception of two sterile units located in depressed areas (Test Units 92 and 96) and one sterile unit located down slope to the east (Test Unit 90). No additional testing was carried out in Area C.

SEDIMENTS AND STRATIGRAPHY

Site 41TT670 is situated on a Pleistocene upland terrace between White Oak Creek and the Sulphur River valleys. Extending the geological nomenclature from existing correlation schemes and Quaternary models developed in the Lower Mississippi and Lower Red River valleys (Autin 1996; Autin et al. 1991; Saucier 1994) suggests that this upland terrace correlates to the Upland Complex. An abrupt unconformity generally makes the base of the Upland Complex easy to recognize. This unconformity was recognized in cores collected during a previous investigation in this area (Saucier 1967). Regional relationships suggest that the Upland Complex was derived from highlands adjacent to the Lower Mississippi Valley and Gulf Coastal Plain. Possible geomorphic influences on the deposition of this unit are poorly understood, and climatic, eustatic, and tectonic mechanisms have been previously inferred.

A regionally pervasive paleosol has been identified at the upper boundary of the Upland Complex (Autin et al. 1991). Common recognition properties of this paleosol include reddish colors (5YR to 10R), multiple generations of clay films on ped surfaces, clay mineral alterations, and redoximorphic features formed by tree rooting. The paleosol formed by an intense long-duration weathering of sandy to loamy parent materials in a warm to hot, humid upland forest setting over timescales probably greater than 10,000 to 100,000 years.

On most stable landscapes, the Upland Complex is buried by veneers of loess, yellow loams, and/or cover deposits. The patterns of eolian loess veneers are regionally systematic, however, properties of veneer deposits are also locally landscape dependent (Washer and Collins 1988).

The surface soil at site 41TT670 is mapped as Woodtell fine sandy loam, 5 to 20 percent slopes (USDA 1990). Slopes in the vicinity of archeological test excavations and soil geomorphic backhoe trenches are generally less than 5 percent, but slopes along the escarpment may locally exceed 20 percent. The Woodtell series is classified as Vertic Hapludalfs, moderately well-drained soils with a distinct zone of clay accumulation (Bt horizons) and evidence of vertical displacement of soil material by the shrinking and swelling of clays. This soil series consists of a sandy loam surface soil overlying a subsoil of clay that grades downward to clay loam. This soil mapping unit was originally typified and characterized in Titus County on Tertiary marine formations, but it is also mapped on the topographically highest Pleistocene surfaces in the county.

Surface soils and sediments were inspected and described in four backhoe trenches on the site and one backhoe trench north of the site (see Figure 28). Backhoe Trench 131, located at the highest topographic elevation north of the site, has a profile that most closely resembles the Woodtell series. The trenches on the site (Backhoe Trenches 127-130) revealed a mappable thickness of loamy cover over a Pleistocene paleosol developed in fluvial deposits of the Upland Complex (Figure 29). The paleosol forms the lower B and C horizons of the Woodtell series.

The field lithologic and pedologic properties of the surficial sediments from the backhoe trenches are summarized in Table 28. The loamy cover is a 7.5YR friable loamy sand to sandy loam with weak soil structure. The general pedogenic expression of the unit is relatively weak, with Bw horizons probably formed by plant and animal bioturbation. The paleosol in the Upland Complex has colors that range from 7.5YR to 2.5YR. It is a friable sandy clay loam to sandy loam with the Bt horizon characterized by clay films that coat soil peds and infill root traces and tongues formed by plant rooting. The paleosol has slightly thinner Bt horizons along the escarpment than on more stable landscapes upslope.

The boundary between the loamy cover and the Upland Complex paleosol shows evidence of pedogenic mixing and soil profile evolution concurrent with landscape development along the escarpment. Basal Bw horizons of the loamy cover are mixed with the surface horizons of the paleosol to form B&2E horizons (shown as the mixed horizon in Figure 29). The surface horizons of the paleosol show evidence of downward growth as underlying Bt horizons have been partly transformed to surface horizons to form mixed 2E/B horizons.

The cultural deposits at site 41TT670 are associated with the loamy cover. The underlying Upland Complex paleosol, which appears to predate human occupation of the area, is probably Early to Middle Pleistocene (?) in age and shows local evidence of profile truncation. Human occupation of the site in the Holocene could have occurred concurrently with slopewash accumulation at the foot slope position next to the escarpment. The loamy cover, derived from erosion of surface horizons of the Upland Complex paleosol, provided a mechanism to bury archeological deposits during site occupation. Plant and animal bioturbation probably had a lesser effect on cultural deposits than did soil profile accretion by slopewash processes.

HORIZONTAL AND VERTICAL EXTENT

Based on the initial recording of site 41TT670, the site was estimated to cover approximately 37,500 m^2, in a curve or lunate shape, measuring 500 m long by 75 m wide (Cliff, White, Hunt, Pleasant, and Shaw 1996). The current investigations resulted in a slight extension of the site on the northern boundary and it is now calculated to cover approximately 39,375 m^2, in a curve about 525 long by 75 m wide. As noted above, three areas of high subsurface artifact densities were identified on site 41TT670 (Figure 30). The first of these was associated with a midden located in the south central portion of the site (Area A), the second was on the southwesternmost knoll of the site (Area B), and the third was on the baseline at the southeastern edge of the site (Area C). The remainder of the site is characterized by low to moderate subsurface densities. Area designations are used to distinguish concentrations of high artifact densities for discussion purposes only and may or may not represent separate activity or occupation areas.

Area A

The highest density area on the site is located in the central section of the southern terrace edge and extends down slope toward Little Grassy Lake in the area of Test Units 68, 69, 71, 72,77-82, 84, and 120-124, and Shovel Tests 48-56 and 58 (see Figure 28). It measures roughly 150 m east-west and a maximum of 50 m north-south, covering approximately 4,600 m^2. Test excavations in this area yielded 2,087 artifacts and 722 faunal fragments from ten 30-x-30 cm shovel tests, eleven 50-x-50 cm units, two .5-x-1 m units, and two 1-x-1 m units. Macrobotanical remains were also recovered and three features were identified. A probable posthole (Feature 1) and an in situ hearth (Feature 2) were found beneath the intact midden (Feature 3) in this area. Test Units 77 and 120-122, and Shovel Tests 52 and 53 all penetrated this midden, which is restricted to the north-central portion of Area A. Fourteen of the 22 test units containing artifact densities

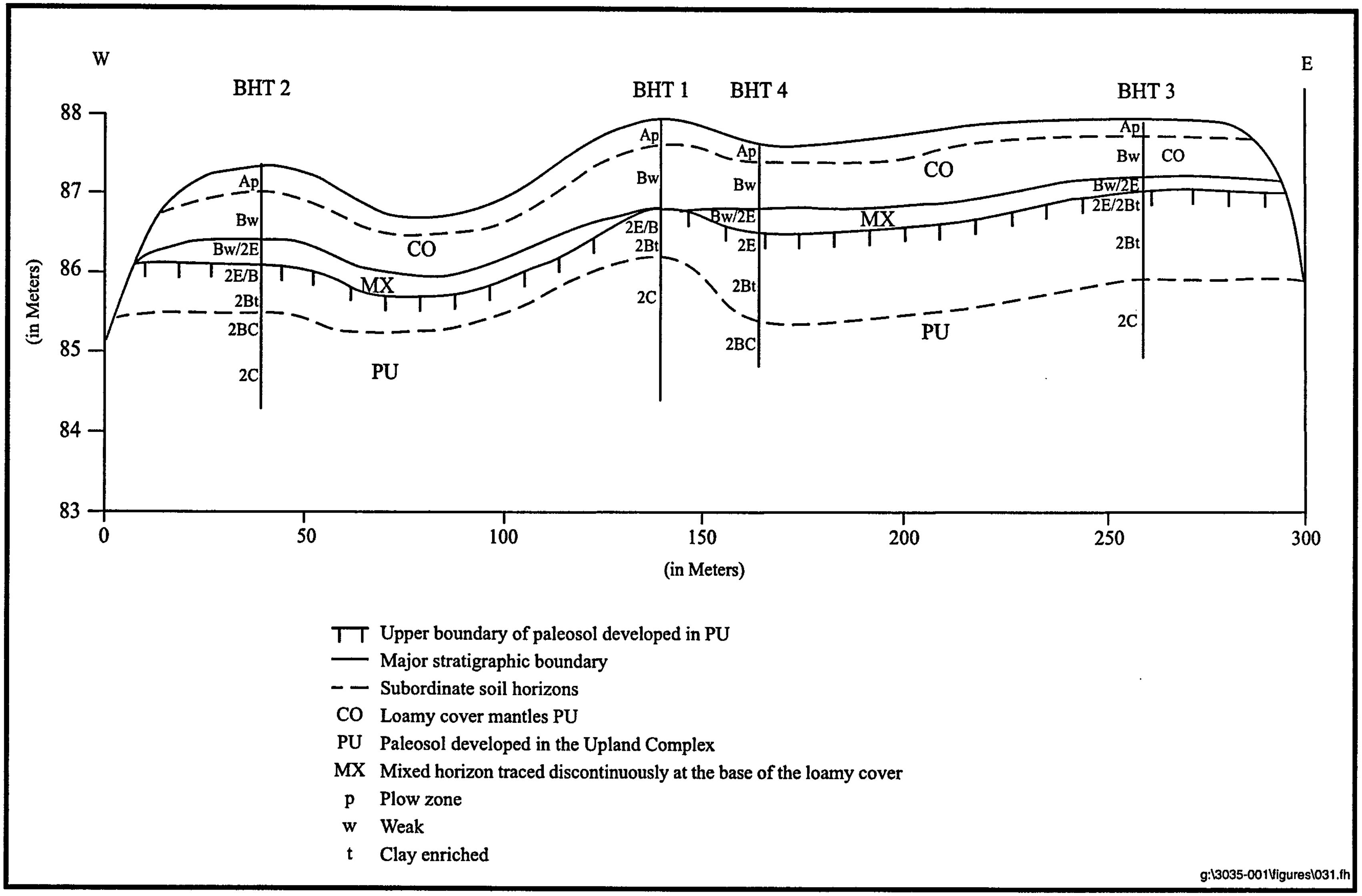


Figure 29. Generalized geological cross section of site 41TT670, based on backhoe trenches.

Table 28
Lithologic and Pedologic Properties of Surficial Sediments at Site 41TT670

Unit		Horizon Sequence[1]	Color[2]		Texture	Structure[3]	Consistence	Comments
Stratum	Profile		Matrix	Mottles				
Loamy Cover (CO)								
	Backhoe Tr. 127	Ap-Bw-Bw&2E	7.5YR 3/3	7.5YR 6/3	sandy loam	wk med sab	very friable	common roots & pores; faint laminations
	Backhoe Tr. 128	Ap-Bw-Bw&2E	7.5YR 4/4	7.5YR 6/4	sandy loam to loamy sand	wk med gr	friable	common roots & pores; charcoal
	Backhoe Tr. 129	Ap-Bw-Bw&2E	7.5YR 5/3		loamy sand	wk fn sab	friable	few roots; abundant pores; iron concretions
	Backhoe Tr. 130	Ap-Bw	7.5YR 4/3	7.5YR 6/3	loamy sand	mod fn gr	very friable	common roots & pores
	Backhoe Tr. 131	UNIT NOT PRESENT						
Upland Complex (PU)								
	Backhoe Tr. 127	-2E/B-2Bt-2BC-2C	7.5YR 5/4	10YR 6/4	sandy clay loam to loamy sand	mod med sab	friable	films on peds; iron stains
	Backhoe Tr. 128	-2E/Bt-2Bt-2C	5YR 5/6	10YR 6/8	sandy clay loam to sandy loam	mod med sab	friable	films on peds; tongues of sandy loam; iron stains; interbeds
	Backhoe Tr. 129	-2E/Bt-2BC	7.5YR 5/6	10YR 6/8	sandy clay loam	wk med sab	friable	films on peds; tongues of sandy loam
	Backhoe Tr. 130	-2E/B-2Bt-2C	7.5YR 4/3		sandy loam to sand	mod med sab	friable to loose	films on peds; bedded; lamellae
	Backhoe Tr. 131	Ap-E-Bt-BC-C	2.5YR 5/6	10YR 7/6	clay loam to sandy clay loam	mod med sab	friable	films on peds; iron stains; faint beds; roots & root traces

Footnotes:
[1] HORIZON designations and descriptive terms are adapted from Soil Survey Staff (1975, 1981).
[2] COLOR notations from Munsell Soil Colors.
[3] STRUCTURE

ab - angular blocky
gr - granular
mod - moderate
med - medium
sab - subangular blocky
wk - weak
fn - fine
cse - coarse

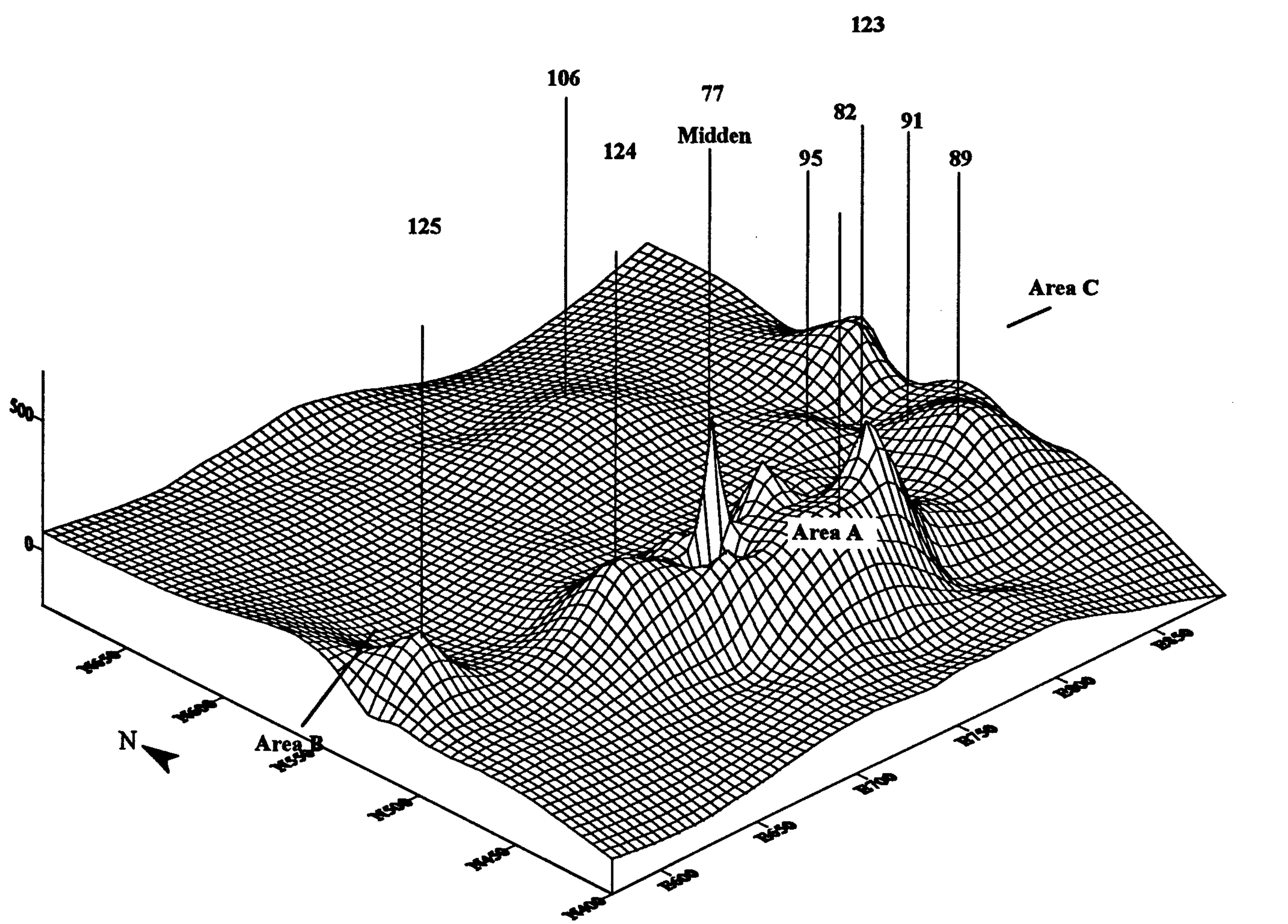


Figure 30. Three-dimensional surface showing standardized subsurface artifact densities per cubic meter across site 41TT670.

greater than 200 artifacts per m^3 are located within Area A (see Table 27). In addition, the only units containing over 400 artifacts per m^3 (Test Units 80, 84, 120, 121, and 123) were located in this area. From the area of the midden, Area A extends to the west, with subsurface artifact densities gradually diminishing. A low saddle separates this end of Area A from Area B. A large slough and various small low areas surround the northwestern, western, and northeastern edges of Area A and the southern boundary slopes downward into Little Grassy Lake. None of the test units immediately surrounding Area A (Test Units 66, 67, 73, 76, 83, and 126) contained densities greater than 70 artifacts per m^3.

Sixty-eight artifacts were recovered from the eleven 30-x-30 cm shovel tests (Test Units 48-58) excavated around the area of the midden (Feature 3) in an effort to define the limits of that feature. Since these shovel tests were intended to delineate the perimeter of the midden only, they were not excavated to the bottom of the cultural zone but went to a depth of between 40 and 60 cm bs. The cultural deposits identified in Area A went to 110 cm bs, with an average depth of 78 cm bs (Table 29). However, most of the material (60 percent) was recovered between 20 and 60 cm bs, which corresponds with the bottom of the Ap and most of the Bw horizon of the loamy cover which overlies the Upland Complex paleosol, as well as with the thickness of the midden deposits.

Area B

This area consists of two units with high subsurface artifact densities located adjacent to each other (Test Units 61 and 125), and two units with moderately low subsurface artifacts densities (Test Units 62 and 63), all located on top of the westernmost knoll on the site (see Table 27). Area B measures approximately 22-x-25 m and covers approximately 550 m^2. Test excavations in this area yielded 201 artifacts and faunal fragments from three .5-x-.5 m units and one 1-x-1 m square. Cultural materials were recovered from the surface down to 100 cm bs, with an average depth of 66 cm bs. However, the majority of cultural materials (62 percent) were found between 30 and 60 cm bs (see Table 29) which corresponds with the Bw horizon of the loamy cover which overlies the Upland Complex paleosol. This knoll is separated from the rest of the site by a small saddle and the units placed down slope from the top of the knoll yielded few artifacts.

Area C

Area C consists of two adjacent units with high subsurface artifact density (Test Units 89 and 119), located on the terrace edge overlooking the Holocene flood plain of White Oak Creek, and several more units to the north and southwest (Test Units 87, 88, 91, and 95). Area C is defined as roughly arc-shaped, following the edge of the bluff on the southeastern margin of the site, and then curving to the northwest, away from the bluff. This curved area is approximately 10-15 m wide and about 100 m long, covering approximately 1,200 m^2. Excavations in Test Units 89 and 119 yielded 111 artifacts, while Test Units 87, 88, 91, and 95 yielded an additional 70 artifacts. Cultural materials were recovered from the surface down to 60 cm bs in Test Units 89 and 119, and somewhat deeper in several of the other units (Test Units 88 and 95 yielded material down to 70 cm bs, while Test Unit 91 contained material down to 80 cm bs). Most of this material (54 percent) was recovered between 30 and 50 cm bs (see Table 29).

The area located between Areas A and C, as well as that located north of Area C and east of the large slough, exhibited evidence for light to moderate occupation/activity with four units with subsurface densities of more than 100 artifacts per m^3 (Test Units 98, 102, 104, and 106). The rest of this area contained units with only moderate to low densities of artifacts (Test Units 83, 85, 86, 92-94, and 96-105). Artifacts were recovered from the surface down to 100 cm bs, with the majority (62 percent) found between 30 and 60 cm bs.

Table 29
Vertical Distribution of Prehistoric Artifacts and Faunal Remains by Level
in Nonsterile Test Units, Site 41TT670[1]

Unit	Depth by Level												Total[2]
	1	2	3	4	5	6	7	8	9	10	11	12	
Units Excavated in 20-cm Arbitrary Levels:													
48	1	5	1	—	—	—	—	—	—	—	—	—	7
50	0	1	—	—	—	—	—	—	—	—	—	—	1
51	3	2	5	—	—	—	—	—	—	—	—	—	10
52	3	2	2	—	—	—	—	—	—	—	—	—	7
53	6	3	—	—	—	—	—	—	—	—	—	—	9
54	5	4	—	—	—	—	—	—	—	—	—	—	9
55	5	4	—	—	—	—	—	—	—	—	—	—	9
56	5	—	—	—	—	—	—	—	—	—	—	—	5
57	3	5	—	—	—	—	—	—	—	—	—	—	8
58	0	3	—	—	—	—	—	—	—	—	—	—	3
126	0	1	0	0	—	—	—	—	—	—	—	—	1
Subtotal	*31*	*30*	*8*	*0*	—	—	—	—	—	—	—	—	*69*
Units Excavated in 10-cm Arbitrary Levels:													
47	0	0	0	0	1	0	1	—	—	—	—	—	2
61	0	4	3	5	8	18	7	—	—	—	—	—	45
62	0	2	0	0	3	3	0	2	2	1	—	—	13
63	1	3	1	1	0	0	0	—	—	—	—	—	6
65	0	0	2	—	—	—	—	—	—	—	—	—	2
66	0	1	0	2	—	—	—	—	—	—	—	—	3
67	0	0	0	1	—	—	—	—	—	—	—	—	1
68	0	0	2	6	4	4	2	0	1	—	—	—	19
69	3	2	5	—	—	—	—	—	—	—	—	—	10
71	4	7	6	13	14	9	—	—	—	—	—	—	53
72	4	2	9	11	10	5	5	9	4	2	4	—	65
73	2	2	2	2	5	0	0	1	0	0	—	—	14
74	2	2	1	0	0	2	0	7	0	0	—	—	14
75	0	0	0	0	1	0	5	0	0	—	—	—	6
76	0	0	0	3	1	4	4	0	4	2	0	3	21
77	8	6	6	11	25	8	4	8	6	0	—	—	82
78	2	3	13	9	13	5	—	—	—	—	—	—	45
79	4	9	12	7	12	7	4	2	2	2	—	—	61
80	3	9	10	31	5	13	3	—	—	—	—	—	74
81	11	15	7	3	3	—	—	—	—	—	—	—	39
82	1	6	6	7	10	19	10	—	—	—	—	—	59
83	0	3	0	1	—	—	—	—	—	—	—	—	4
84	2	8	15	14	17	11	9	26	12	8	3	—	125
85	0	0	0	3	2	2	0	3	—	—	—	—	10
86	0	1	0	0	3	3	0	1	—	—	—	—	8
87	0	1	5	3	—	—	—	—	—	—	—	—	9
88	0	0	4	5	1	5	4	—	—	—	—	—	19
89	1	3	3	12	5	5	—	—	—	—	—	—	29
91	0	0	2	6	1	3	1	10	—	—	—	—	23

Table 29 (cont'd)

Unit	Depth by Level												Total[2]
	1	2	3	4	5	6	7	8	9	10	11	12	
93	1	0	1	1	5	2	3	1	3	0	—	—	17
94	0	1	0	1	3	1	0	0	—	—	—	—	6
95	0	0	2	2	6	8	1	0	0	—	—	—	19
97	0	0	0	0	2	7	—	—	—	—	—	—	9
98	0	0	4	8	10	12	0	0	—	—	—	—	34
99	0	0	1	0	0	0	1	5	2	0	—	—	9
100	0	0	2	0	2	3	3	0	0	0	—	—	10
101	0	1	0	4	1	7	2	1	1	2	—	—	19
102	0	0	0	11	—	—	—	—	—	—	—	—	11
103	0	0	3	3	1	—	—	—	—	—	—	—	7
104	2	1	1	6	0	2	9	2	0	—	—	—	23
105	0	0	3	3	2	1	4	—	—	—	—	—	13
106	1	1	3	5	5	2	3	3	—	—	—	—	23
107	0	0	2	2	4	3	3	2	0	—	—	—	16
108	0	0	0	0	1	0	1	1	—	—	—	—	3
110	0	0	1	0	1	1	0	1	1	1	—	—	6
111	0	0	0	0	0	1	1	1	—	—	—	—	3
113	0	0	0	6	2	—	—	—	—	—	—	—	8
114	0	0	0	0	0	2	3	—	—	—	—	—	5
116	0	0	0	0	1	—	—	—	—	—	—	—	1
118	0	0	0	0	2	0	0	0	—	—	—	—	2
119	0	5	11	21	35	10	—	—	—	—	—	—	82
120	0	10	31	66	213	23	13	—	—	—	—	—	356
121	181	154	171	70	64	56	46	39	18	12	1	—	812
122	19	24	84	55	15	15	15	6	14	4	6	—	257
123	30	48	59	48	95	63	81	71	28	—	—	—	523
124	20	26	51	33	36	3	—	—	—	—	—	—	169
125	3	16	30	29	37	21	1	—	—	—	—	—	137
Subtotal	*305*	*376*	*574*	*531*	*694*	*372*	*250*	*202*	*98*	*34*	*14*	*3*	*3441*
Total													*3510*

Footnotes:

[1] Does not include backhoe trenches.

[2] Includes contents of features and some ecofacts, such as bone and shell. Does not include macrobotanical remains such as charcoal.

The northernmost section of the site, located north of the large slough in the center of the terrace, exhibited evidence for only light occupation/activity. Most of the units in this area (Test Units 47 and 107-117). showed subsurface densities of less than 35 artifacts per m^3, although Test Units 107 and 113 showed densities as high as 71 and 64 artifacts per m^3, respectively. Cultural materials were recovered between 20 and 100 cm bs, with the majority (59 percent) recovered between 40 and 70 cm bs.

Overall, the vertical distribution of cultural remains at site 41TT670 supports the likelihood of one or more buried components, as suggested by the results of geological investigations. Most of the cultural materials were recovered from the upper part of the Bw horizon of the loamy cover which mantles the Upland Complex paleosol in this area, with a small amount of cultural material recovered higher, in the Ap horizon, as well as deeper in the Bw horizon (see Figure 29). In general, cultural material became progressively less common below 50 cm bs. None of the units were excavated into the Upland Complex surface, and only an occasional unit reached the top of the mixed Bw/2E horizon which discontinuously overlay the Upland Complex paleosol.

CULTURAL FEATURES

All of the features found during the testing of site 41TT670 — a probable posthole (Feature 1), an in situ hearth (Feature 2), and the midden (Feature 3) — were located in Area A. Although four features were initially recorded in the field, further analysis suggested that one of these resulted from bioturbation rather than human activity. An amorphous stain, located between 87 and 110 cm bs along the southern wall of Test Unit 122, was originally designated a feature but it was later determined that this stain was actually the result of rodent activity and the feature designation was removed. The in situ hearth, originally labeled Feature 2, was first observed as a layer of burned earth in the west wall of Test Unit 122. Subsequently, when the top of the hearth was exposed approximately 40 cm west of the burned earth, it was labeled Feature 4; but as soon as it was realized that the layer of burned earth (Feature 2) was part of the lining for the hearth (Feature 4), the entire feature was designated Feature 2, and the Feature 4 label was dropped. The midden area, which was not given a feature designation in the field, is currently referred to as Feature 3.

Feature 1

Feature 1 is a possible posthole, located 40 cm bs in the east-central portion of the 1-x-1 m Test Unit 122 in Area A (Figure 31). The top of the feature was first identified at 40 cm bs (the bottom of Level 4) within a brown loamy sand with numerous roots. It was located approximately 8 cm below the bottom of the very dark brown sandy loam midden (Feature 3) and extended to about 54 cm bs. Feature 1 appeared as a roughly circular stain with a diameter of approximately 16 cm. When first identified, it showed up very well as a dark brown (10YR 3/1) stain, mottled with fine yellowish brown (10YR 5/4) inclusions. The fill of the feature consisted of a fine sandy loam with charcoal flecking. Feature 1 was pedestaled at 44 cm bs, and the western half removed and screened through 6.4-mm hardware cloth. A single piece of debitage was recovered as a result. The profile of Feature 1 (Figure 32) shows a slight tapering inward with a rounded base and a portion of the northern perimeter appeared to be disturbed by insect, small mammal, or root activity. While it is possible that this feature is the result of natural activities, it is believed to represent a posthole modified by later disturbances. A flotation sample, consisting of the eastern half of the feature, yielded five indeterminate invertebrata fragments (both burned and unburned), one small unanalyzed sherd, two pieces of lithic debitage, and ten fragments of nut shell identified as *Carya* (pecan or hickory). Due to the lack of diagnostics, the date of Feature 1 remains uncertain. However, one sherd typed as Williams Plain and a second sherd typed as Pennington Punctated-Incised were recovered from above Feature 1 in Level 3, and it is probable that the feature dates to the Early Caddoan period (A.D. 1000-1200).

Feature 2

Feature 2 is an in situ hearth, located in the eastern portion of the 1-x-.5 m Test Unit 120, in Area A (Figure 33). This feature was located at the base of the midden (Feature 3) and was first identified as a lens of reddened oxidized soil (7.5YR 5/6) in the western profile of the 1-x-1 m Test Unit 122, near the southwestern corner. The top of this lens was located at 40 cm bs and extended to 44 cm bs at the southwestern corner of Test Unit 122, pinching out out approximately 28 cm north of the south wall at 42.75 cm bs. Although an increase in the amount of burned clay was noted in the immediate area during the excavation of Test Unit 122, no distinct feature could be identified and the lens was recorded as Feature 2, photographed, and drawn in profile (Figure 34).

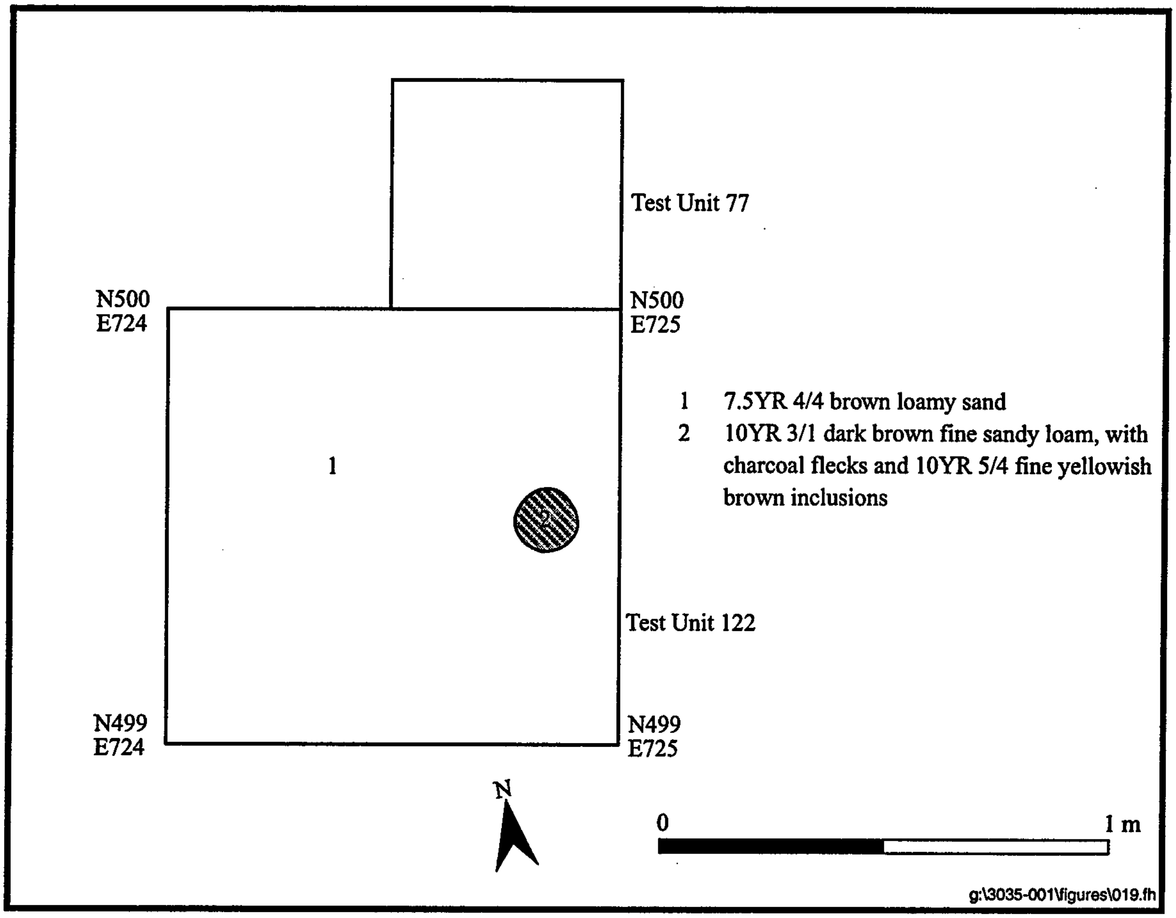


Figure 31. Plan of Test Unit 122, site 41TT670, showing the location of Feature 1.

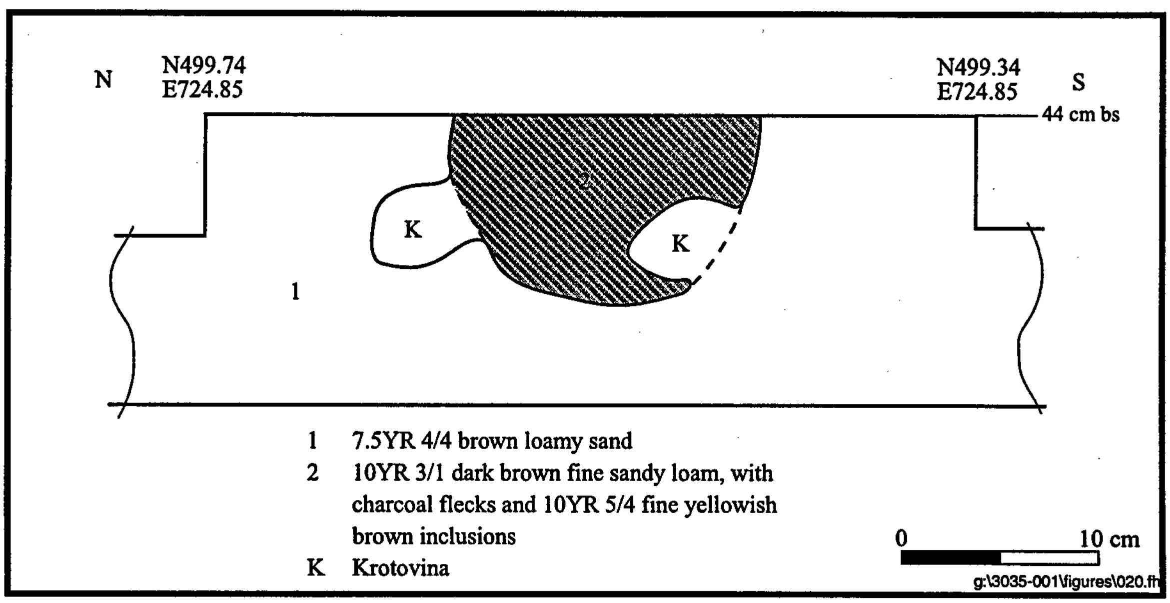


Figure 32. North-south profile of Feature 1, Test Unit 122, site 41TT670.

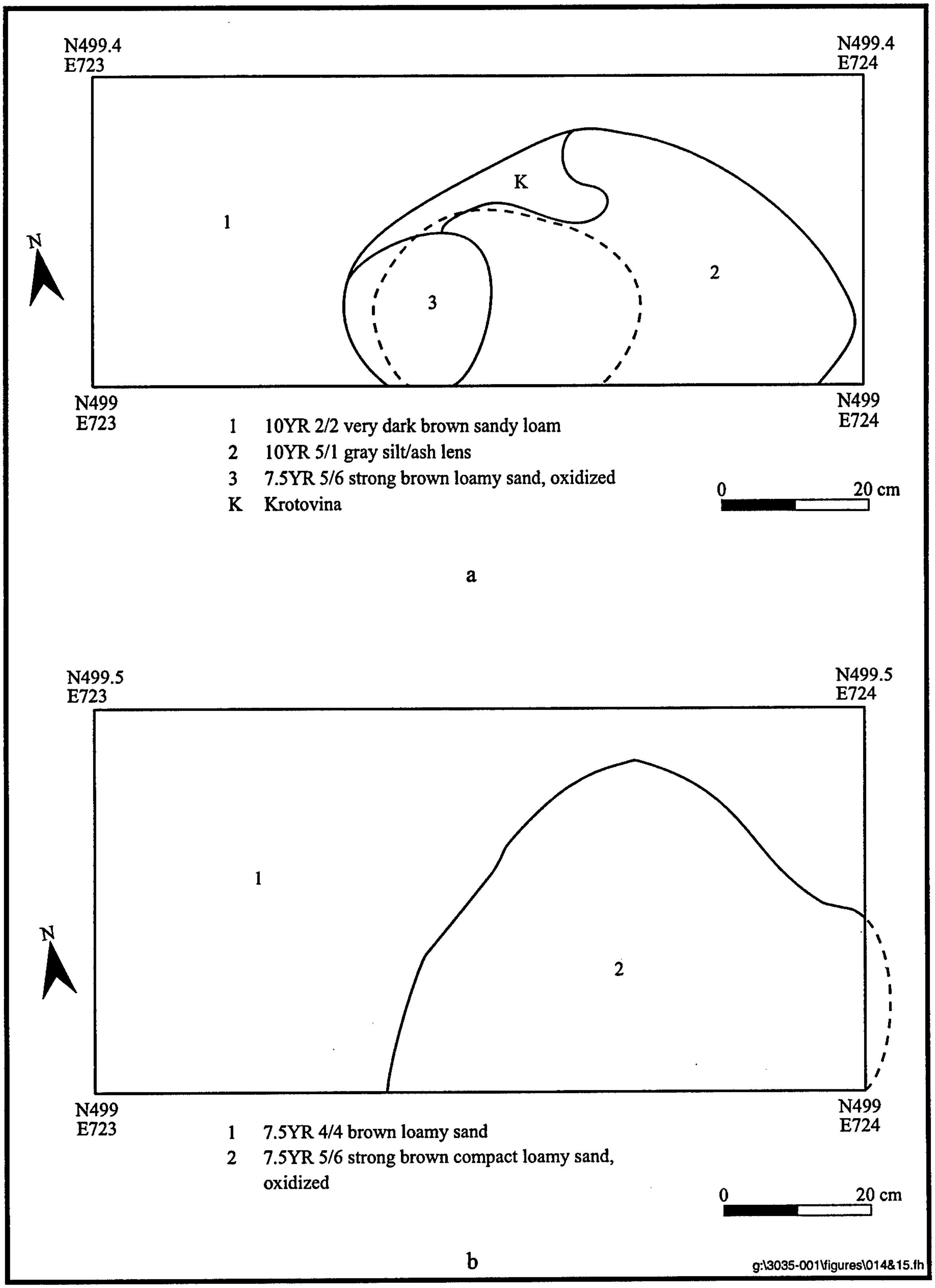
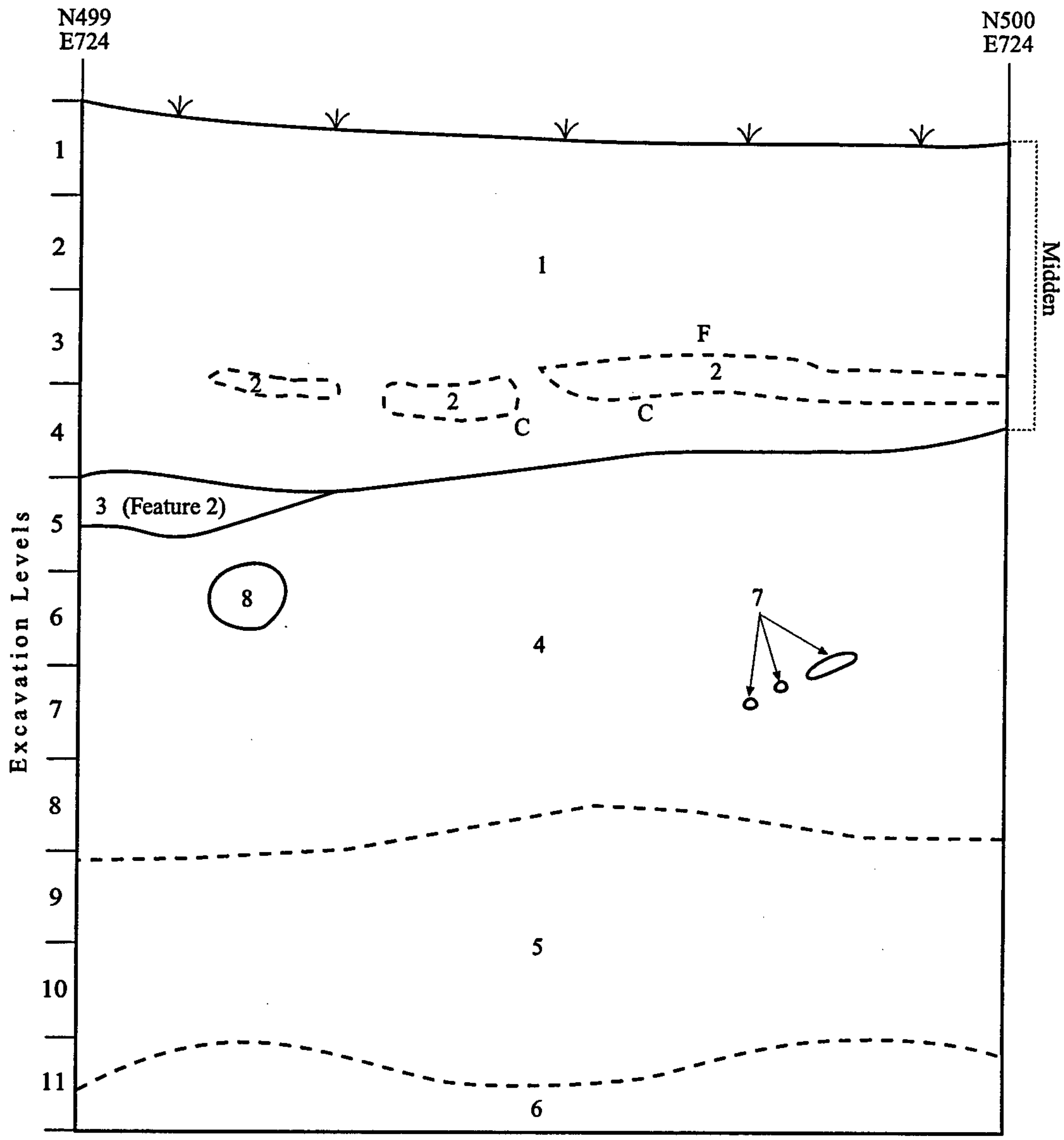


Figure 33. Plan of Feature 2, Test Unit 120, site 41TT670: (a) extent of ash fill of feature at 33 cm bs (dashed lines) and at 40 cm bs (solid lines); (b) extent of oxidized soil below ash at 44 cm bs.



1 10YR 2/2 very dark brown sandy loam with occasional patches of 7.5YR 4/4 brown mottling
2 Discontinuous lens of 10YR 2/2 very dark brown sandy loam mixed with 7.5YR 5/6 strong brown sandy loam mottling
3 7.5YR 5/6 strong brown compact loamy sand, oxidized (eastern limits of Feature 2)
4 7.5YR 4/4 brown loamy sand with some 10YR 2/2 and 10YR 5/4 mottling and intrusions
5 10YR 5/4 loamy sand with some 10YR 4/4 silt loam mottling
6 7.5YR 4/6 sandy clay loam with heavy 10YR 5/4 silt loam mottling
7 10YR 2/2 loamy sand intrusions
8 Mixed 10YR 2/2 loam and 10YR 5/4 loamy sand intrusions
C Charcoal fleck
F Flake
Indefinite boundary

0 20 cm

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Figure 34. Profile of the west wall of Test Unit 122, site 41TT670, showing Feature 2 in the southwestern corner.

The bulk of the hearth was unearthed during the subsequent excavation of Levels 4 and 5 (30-50 cm bs) of the adjacent Test Unit 120. The feature was first delineated at 33 cm bs (see Figure 33a) as an oval area of hard, dry ash nodules (10YR 6/1), burned clay, charcoal, and burned mussel shell and bone fragments, measuring about 32-x-18 cm. A plan was drawn at this elevation and the feature was pedestaled. The oval area increased in diameter to 60-x-42 cm with depth, appearing to extend into the south wall and the southeastern corner of Test Unit 120 at 44 cm bs (see Figure 33b). Approximately 25-40 percent of the feature appeared to extend into the unexcavated area to the south. The northern half of the feature within Test Unit 120 was removed and screened through 6.4-mm hardware cloth, while the southern half was collected for flotation. Since the feature extended into the southern profile of Test Unit 120, it was not excavated. Feature 2 was drawn in plan view at 44 cm bs and, after removal of the subsequent Levels 5 through 7 of Test Unit 120 (40-70 cm bs), it was drawn in profile as observed in the southern wall of Test Unit 120 (Figure 35).

The base of Feature 2 appeared to be roughly basin-shaped, with its highest point at 35 cm bs along the western rim, and its lowest point at 47 cm bs in the approximate center (see Figure 35). It consisted of a 3-to-4-cm-thick lens of oxidized soil, exhibiting minor evidence of bioturbation. This basin appeared to have been dug into the basal soil in this area, a brown silt loam (7.5YR 4/4) with frequent mottles of very dark brown and yellowish brown (10YR 2/2 and 10YR 5/4, respectively), which underlay the base of the midden (Feature 3) and which may represent an old ground surface which predates the deposition of the midden.

Artifactual remains recovered from Feature 2 include two small, unanalyzed sherds and three pieces of lithic debitage. Faunal remains included a small number of mussel shell fragments, and 10 burned and unburned bone fragments, including one *Odocoileus* (deer) phalange, five medium/large mammal bones, one Testudinata (turtle) bone, and three unidentified fragments. A flotation sample from the northern portion of Feature 2 in Test Unit 120 yielded 159 unidentified bone fragments, one Osteichthyes (medium sized bony fish) bone, seven Testudinata (turtle) bones, one medium-sized Rodentia bone, and one *Geomys* (pocket gopher) bone. Molluscan remains included approximately 26 shell fragments from at least four freshwater bivalve species (*Amblema plicata*, *Lampsilis teres*, *Quadrula quadrula*, and *Potamilus Purpuratus*). Macrobotanical remains recovered from Feature 2 consisted of fifteen charcoal fragments identified as cf. *Carya* (pecan or hickory) and several cf. *Carya* shell fragments.

A stratified series of soil samples (10-x-10-x-10 cm) for Oxidizable Carbon Ratio (OCR) dating were collected from the south wall of Test Unit 120, at roughly 10-cm intervals (see Figure 35). This series of OCR samples includes three collected from the midden (Feature 3) above Feature 2, one collected from within the ashy fill of Feature 2, one collected from the burned zone at the base of Feature 2, and two from the deposits below Feature 2. The soil sample from the fill of Feature 2 yielded an OCR date of 746±22 B.P. (A.D. 1182-1226; ACT No. 1977); while the sample from the oxidized basal lining of the feature gave an age of 788±23 B.P. (A.D. 1139-1185; ACT No. 1978). These results indicate a late Early Caddoan, or possibly early Middle Caddoan, date for Feature 2. Nut shell fragments collected from the fill of Feature 2 were sent to Beta Analytic, Inc., for AMS dating and the results produced a roughly similar age for the feature — 840±100 B.P. (Beta-94631; charred nutshell; $\delta^{13}C$=-26.1‰), with a calibrated intercept of A.D. 1220 and a 1-sigma range of cal A.D. 1045-1105 and cal A.D. 1115-1280 (using the 1993 calibration of Stuiver et al. 1993).

Feature 3

Feature 3 is the midden identified in Area A (see Figure 28). It is characterized by a dark brown to very dark brown (7.5YR 3/2 to 10YR 2/2), organically enriched sandy loam, containing dense artifactual material, such as lithics, ceramics, daub and burned earth, and charcoal and other macrobotanical remains, with some bone and shell present. Although not initially identified as a midden, the upper 23 cm of soil within the 50-x-50 cm Test Unit 77, was noted as being much darker and extending much deeper than the dark humic zone

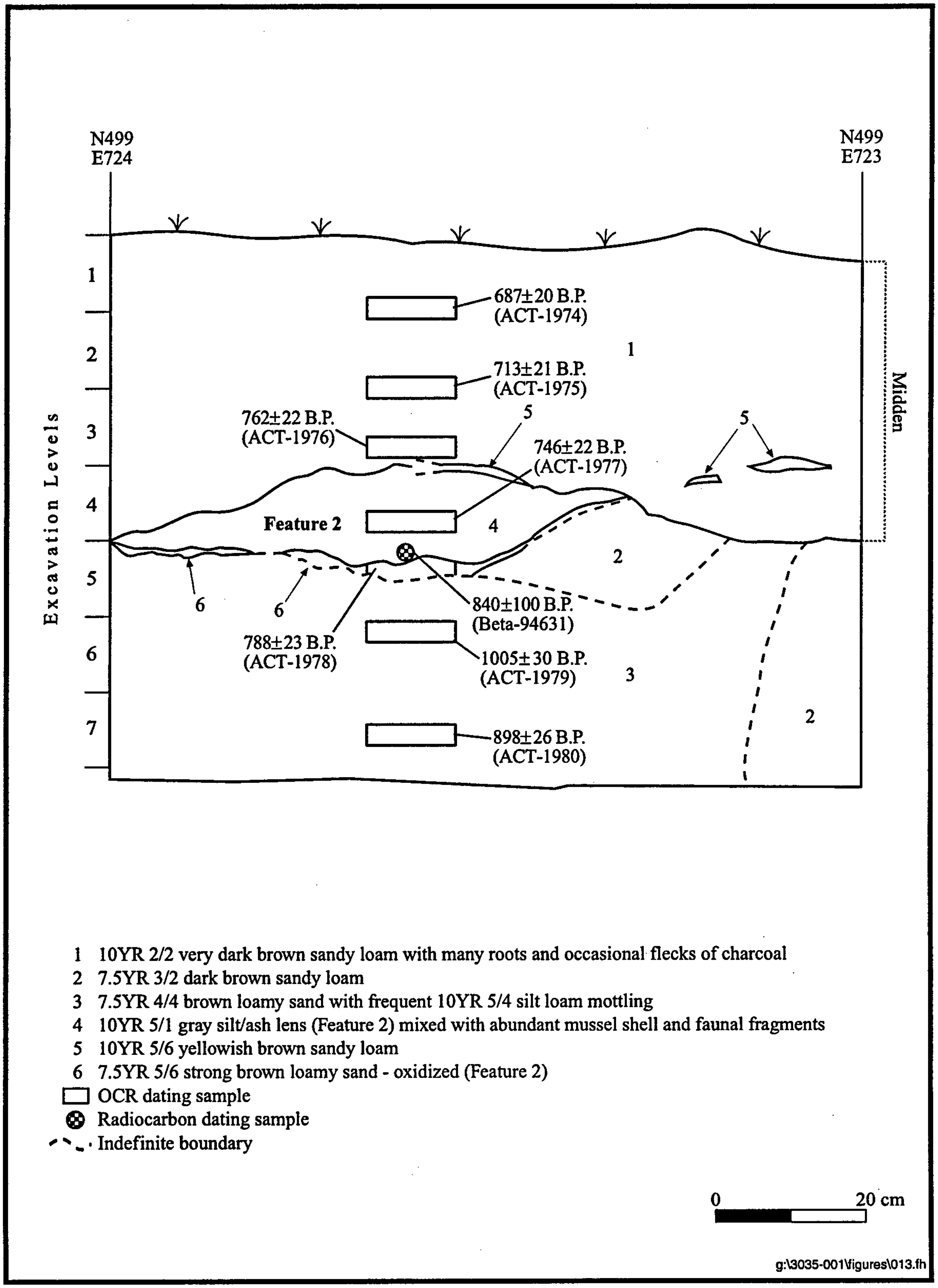


Figure 35. Profile of Feature 2 in the south wall of Test Unit 120, site 41TT670.

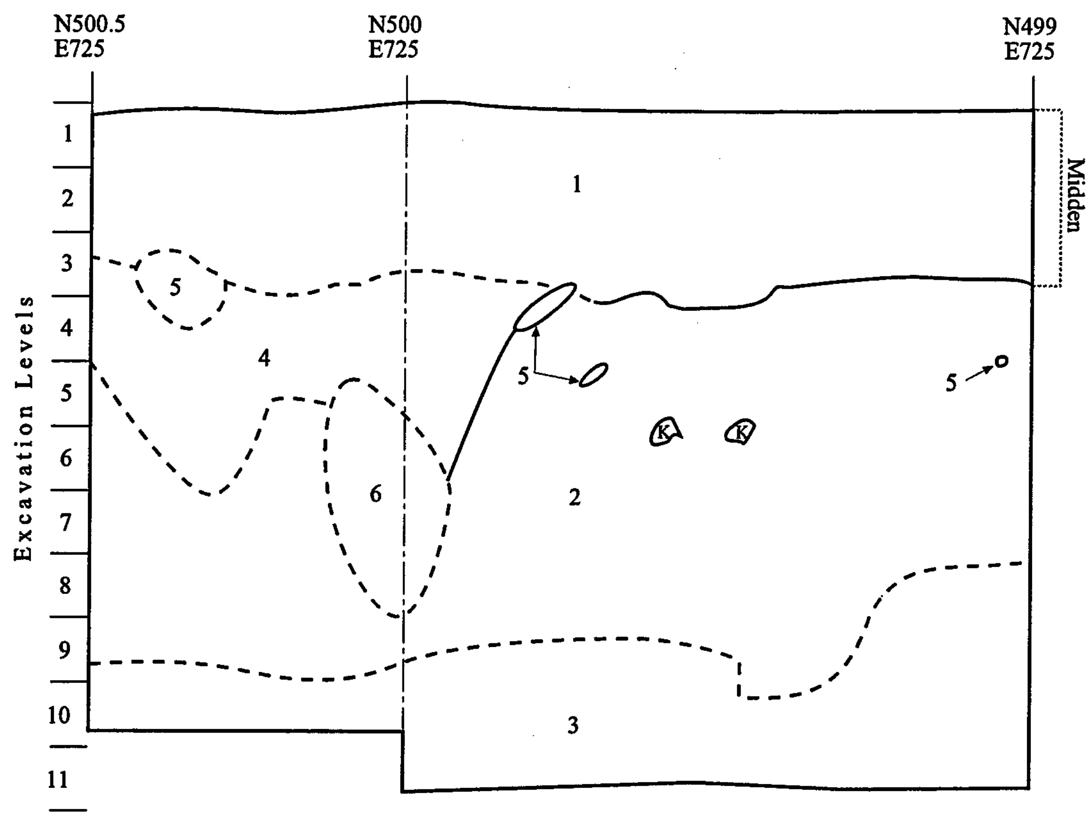
recorded elsewhere in this area of site (Figure 36). In additional, Test Unit 77 was one of four test units at the site containing over 350 artifacts per m^3. Based on these observations, a 1-x-1 m unit (Test Unit 122) was placed adjacent to Test Unit 77, in order to better evaluate the nature of the archeological deposits in this area. As a result, the upper 30-40 cm of deposit in this area were identified as midden. In addition, Feature 1, a possible posthole, was identified approximately 40 cm bs, and the edge of the hearth, Feature 2, was located about 44 cm bs in this unit. Because Test Units 77 and 122 were located in the center of an abandoned road, the contextual integrity of the cultural deposits and the origin of the midden was questionable. Therefore, in order to further investigate the midden, two 1-x-.5 m units (Test Units 120 and 121) were excavated on the eastern and western sides of Test Unit 122, exposing a 1.5-m-long profile through the midden (Figure 37).

The contact between the midden and the underlying matrix in Test Unit 77 was indistinct and variable, becoming somewhat lighter between 23 and 38 cm bs, and reaching its greatest depth at 80 cm bs in the southern edge of the unit (see Figure 36, profile units 1, 4, 5, and 6). The midden observed in Test Unit 122 proved to have a clearer contact, occurring between 29 and 32 cm bs in the eastern profile of the unit (see Figure 36) and between 32 and 44 cm bs in the western and southern profiles (see Figures 34 and 37). This contact was observed as an extremely straight line sloping down to the southwest. A narrow, intermittent zone of yellowish brown sandy loam (10YR 5/6) was observed between 28 and 32 cm bs in Test Units 120, 121, and 122 (see Figure 37). This zone is relatively level, even though the base of the midden appears to slope downward from northeast to the southwest. This zone is located above the level of Feature 2, and in one case overlies it, and may represent an occupation surface postdating the use of the hearth (Feature 2) but predating the deposition of the majority of the midden (this zone is represented by profile unit 2 in Figure 34 and 5 and 9 in Figure 37).

Eleven 30-x-30 cm shovel tests (Test Units 48-58) were excavated to better delineate the horizontal extent of the midden. These shovel tests were excavated in various directions radiating out from Test Unit 122 until the approximate edge of the midden was identified. The shovel tests were excavated between 40 and 60 cm bs, to just below the base of the midden, as known from Test Units 77 and 120-122. Each shovel test was determined to be positive or negative for midden material, on the basis of the presence or absence of the dark, (7.5YR 3/2-10YR 3/3) organically enriched midden soil, and/or the presence of shell and/or bone. On this basis, the midden was determined to be oval in shape and to extend approximately 8 m north-south and 4.5 m east-west, and to cover approximately 30 m^2 (Figure 38). This is consistent in size with the midden located at 41BW553, and with other middens observed at Caddoan occupation sites elsewhere within the WMA (see Cliff and Hunt 1995).

The subsurface density of cultural material (including artifacts and faunal remains) for the shovel tests (Test Units 52 and 53) and the larger excavation units (Test Units 77 and 120-122) which penetrated Feature 3 vary from as low as 129 artifacts per m^3, for the small Test Unit 52, to as high as 1,476 artifacts per m^3, for the larger Test Unit 121 (see Table 27). Test Units 120 and 121 produced the highest densities, 1,017 and 1,476 artifacts per m^3, respectively. Artifact/ecofact density for the identified midden levels in Test Unit 77 (0-38 cm) is about 370 artifacts per m^3 and 444 artifacts per m^3 for Test Unit 53 (0-40 cm).

The midden measured between 29 and 44 cm thick, becoming thicker to the west (see Figure 37). Preservation was excellent both within and below the midden, probably due to the presence of mussel shell throughout the matrix (the carbonates in the shell serve to lower the soil's natural acidity, which is destructive to organic remains). Diagnostic projectile points recovered from the midden levels include an arrow point tip from Level 2 (10-20 cm bs); a Gary, *var. Kaufman* dart point from Level 3 (20-30 cm bs); and a large, untyped dart point with a contracting stem and a flat base in Level 4 (30-40 cm bs). Seven lithic tools were also collected from the midden, including three bifaces or biface fragments, one uniface, two utilized flakes, and an indeterminate distal tip fragment. These were distributed among the units in Levels 2-4 (10-40 cm bs). Fifty-six ceramic sherds were recovered from Levels 2-5 (10-50 cm bs). Half of these were recovered in Level 3 (20-30 cm bs), and another third were recovered from Level 4 (30-40 cm bs). The only diagnostic



1 10YR 2/2 very dark brown sandy loam with many roots
2 7.5YR 4/4 brown loamy sand with many roots
3 10YR 5/4 yellowish brown loamy sand with heavy 7.5YR 4/4 mottling
4 7.5YR 3/4 dark brown loamy sand with some 7.5YR 4/4 and 10YR 5/4 mottling
5 10YR 2/2 very dark brown loamy sand with 10YR 4/4 mottling - probably root casts
6 Mixed 10YR 2/2, 10YR 5/4, and 7.5YR 4/3 loamy sand in rodent run
Indefinite boundary
Discontinuity in wall of units
K Krotovina

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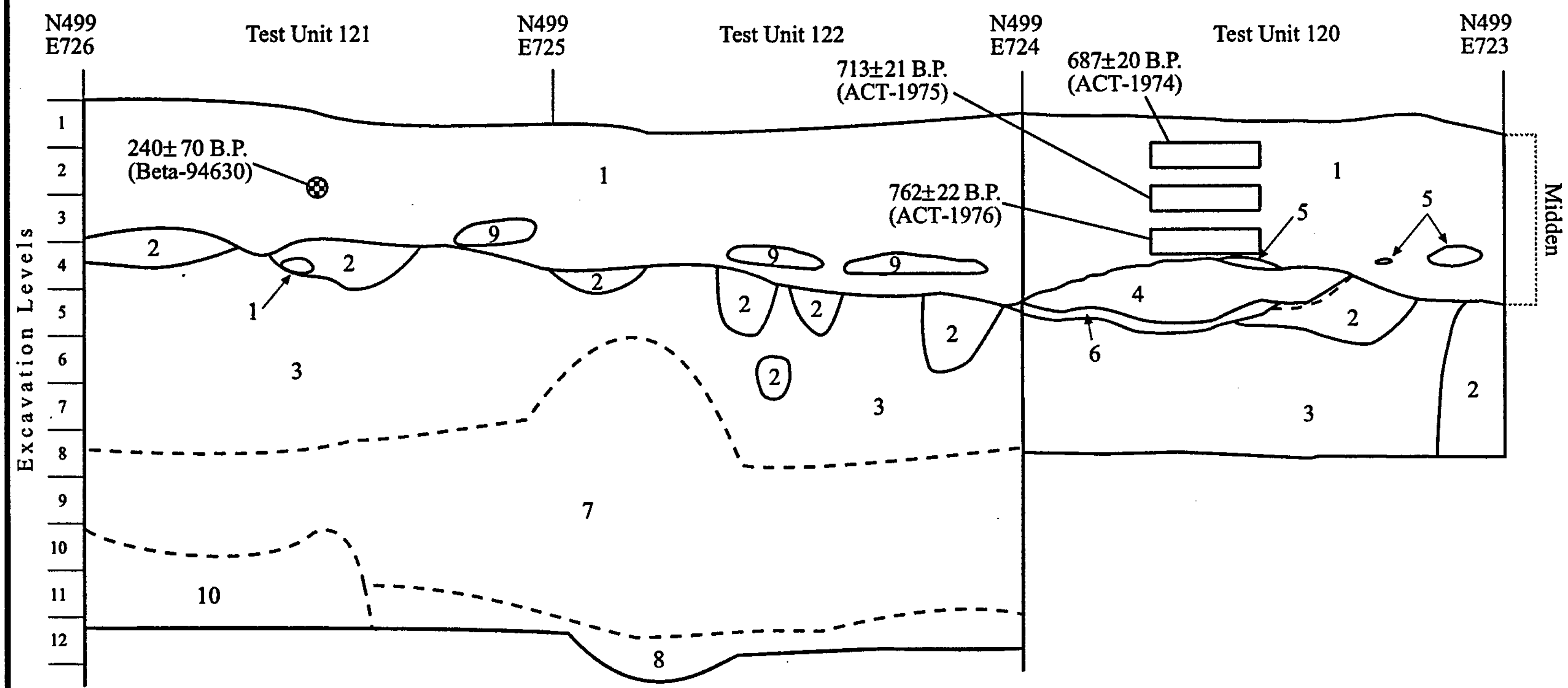
Figure 36. Profile of the east wall of Test Units 77 and 122, site 41TT670, showing Feature 3.



1 10YR 2/2 very dark brown loam with many roots and occasional flecks of charcoal
2 7.5YR 3/3 dark brown loam
3 7.5YR 4/4 brown silt loam with frequent 10YR 5/4 yellowish brown silt loam mottling (B horizon)
4 10YR 5/1 gray silt/ash lens (Feature 2) mixed with abundant mussel shell and faunal fragments
5 10YR 5/6 yellowish brown silt loam
6 7.5YR 5/6 strong brown silt loam, burned (Feature 2)
7 10YR 5/4 yellowish brown silt loam with frequent 10YR 4/4 dark yellowish brown mottling
8 7.5YR 4/6 strong brown silty clay loam with frequent 10YR 5/4 silt loam mottling
9 Intermittent zone of mixed 10YR 5/6 brown silt loam and 10YR 2/2 very dark gray loam
10 10YR 6/4 light yellowish brown loam
Indefinite boundary
Radiocarbon dating sample
OCR dating sample

0 20 cm

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Figure 37. Profile of the south walls of Test Units 120, 121, and 122, site 41TT670, showing Feature 3.

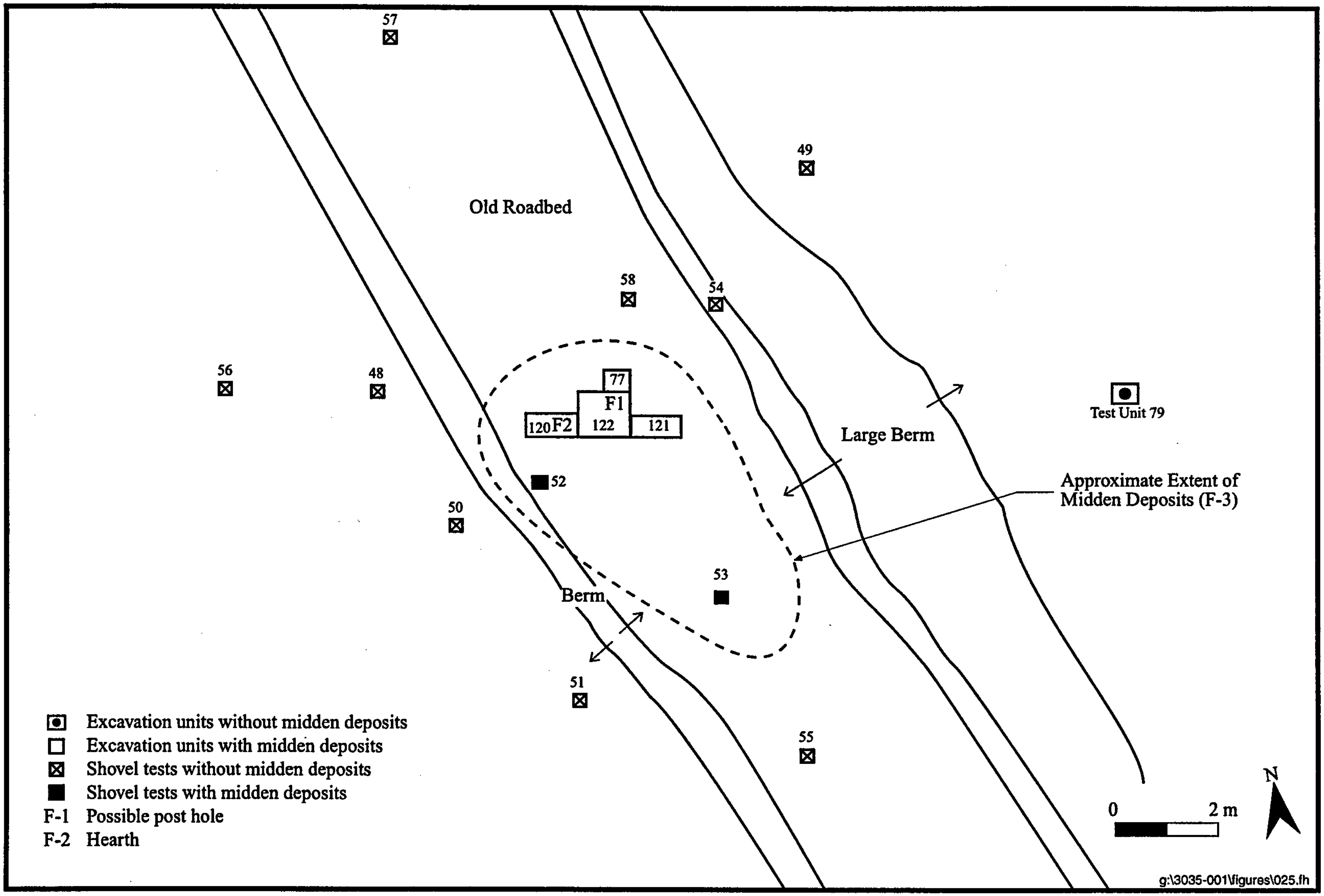

Figure 38. Estimated areal extent of midden, Feature 3, site 41TT670.

ceramic types identified, a sherd of Pennington Punctated-Incised and one of Williams Plain, came from Test Unit 122, Level 3 (20-30 cm bs). These sherds were directly associated with the Gary, *var. Kaufman* dart point. Both of these ceramic types are currently recognized as dating generally to the Early Caddoan period (A.D. 1000-1200). The greatest amount of faunal material recovered by dry-screening came from Level 4 (30-40 cm bs), while the greatest amount recovered by flotation came from Level 3 (20-30 cm bs). The greatest amount of mussel shell was recovered from Levels 1, 3, and 5 (0-10, 20-30, and 40-50 cm bs, respectively). In general, the cultural remains within the midden were densest, and organic preservation was best, within Levels 3, 4, and 5 (20-50 cm bs).

In an effort to obtain an absolute date for Feature 3, a series of soil samples were collected from a column in the south wall of Test Unit 120, at roughly 10-cm intervals, for Oxidizable Carbon Ratio (OCR) dating (see Figures 35 and 37). This OCR series included three from within the midden, one from within the fill of the hearth (Feature 2) at the base of the midden, one within the basal lining of the Feature 2, and two from below the midden (see Appendix H). From top to bottom, the three soil samples from the midden gave OCR dates of 687±20 B.P. (A.D. 1243-1283; ACT No. 1974), 713±21 B.P. (A.D. 1216-1258; ACT No. 1975), and 762±22 B.P. (A.D. 1166-1210; ACT No. 1976). These results indicate a very late Early Caddoan to Middle Caddoan date for Feature 3. A single nut shell fragment collected from near the top of the midden (Test Unit 121, 10-20 cm bs) was submitted to Beta Analytic, Inc., for AMS dating (see Appendix H). Unfortunately, this sample gave an unacceptably late date — 240±70 B.P. (Beta-94630; charred nutshell; $\delta^{13}C$=-27.8‰), with a calibrated intercept of A.D. 1660 and a 1-sigma range of cal A.D. 1640-1680, cal A.D. 1755-1805, and cal A.D. 1940-1950 (using the 1993 calibration of Stuiver et al. 1993). This date is not in agreement with either the OCR dates from the midden or with the archeological remains, and is presumed to be on a recent nut shell not associated with the midden. Thus, the OCR dates are believed to more accurately reflect the true age of Feature 3.

ARTIFACTUAL REMAINS

A total of 2,788 artifacts was recovered from site 41TT670 during the testing investigations. Included in the sample are 566 ceramic sherds, 308 baked clay/daub fragments, one ground/pecked/battered stone, and 1,788 pieces of chipped stone. The chipped stone sample from the site includes 18 projectile points and point fragments, 34 bifaces and biface fragments (including some projectile point fragments and one drill made on an arrow point), 25 unifaces, and 1,701 pieces of lithic debitage including nine cores. Also recovered from the site were 135 fragments of burned rock, weighing a total of 2,124.3 g (see Appendix C).

Ceramics

The sample of 566 prehistoric ceramic sherds recovered from site 41TT670 includes one cylindrical pipe stem, 376 body sherds, four shoulder sherds, eight base sherds, 38 rim sherds, and 139 sherds considered too small for analysis. Vessel forms identified in this sample include neckless jars and bowls, but as with site 41BW553, most sherds were too small to allow firm identification. Eight bowls, 67 indeterminate jars, and five neckless jars were recognizable in this sample. Rim sherds comprise 8.9 percent of the total analyzed sample of 427 sherds. Of these, the great majority are thinned rims, with a few direct rims present (Table 30).

As with material from site 41BW553, the pottery from 41TT670 appears to have been primarily reduced in firing. Over three-fourths of the sample (75.7 percent) appear to have been fired in a reducing atmosphere, most with no visible core (Table 31). A fairly large number (27.4 percent of the total sample) have diffuse core margins, while a few reduced sherds (8.7 percent of the total sample) have cores with sharp margins. A smaller percentage of the material appears to be oxidized (24.4 percent), again with most sherds showing no visible core (18.9 percent). Those oxidized sherds with cores visible have diffuse core margins (see Table 31).

Table 30
Location on Vessel and Rim and Base Form for Analyzed Sherds from Site 41TT670 (n=427)

Sherd Location	Sherd Form	Frequency
Rims	Thinned	
	Flat	11
	Rounded	12
	Rounded, flattened on interior	2
	Indeterminate	4
	Direct	
	Flat	2
	Rounded	4
	Rounded, flattened on interior	1
	Rounded, flattened on exterior	1
	Indeterminate	1
	Total Rim Sherds	*38*
Bases	Flat, defined	2
	Flat, rounded, undefined	1
	Indeterminate	5
	Total Base Sherds	*8*
Shoulder Sherds		4
Body Sherds		376
Pipe Stem Fragments		1

Table 31
Inferred Firing Atmosphere for Sherds from Site 41TT670 (n=427)

Core type	Quantity	Percentage
Oxidized, no core	81	18.9
Oxidized, diffuse margins	23	5.4
Reduced, no core	169	39.6
Reduced, diffuse margins	117	27.4
Reduced, sharp margins	37	8.7
Total	*427*	*100.0*

Decorative techniques present in the ceramic sample from site 41TT670 include incising, appliques, punctating, brushing, and engraving (Table 32). As was the case at site 41BW553, most of the decorated sherds from 41TT670 have simple incising (Figure 39a). Four sherds show incising with punctation as a secondary decoration (Figure 39b), but only one of these shows definite tool punctations (Figure 39c). Thirty-six sherds exhibit some form of punctation as a primary decoration (Figures 39d, 39e, and 39f), only one of which resulted from tool punctation. One punctated sherd shows brushing as a secondary decoration (Figure 40a), while six punctated sherds show incising as a secondary decoration (Figure 40b). These may

Table 32
Decorative Treatments on Sherds from Site 41TT670

Primary Decoration	Secondary Decoration	Quantity	Percentage
Incising	—	52	53.1
Incising	Punctating	4	4.1
Applique, nub	Incising	1	1.0
Punctating	—	30	30.6
Punctating	Incising	6	6.1
Punctating	Brushing	1	1.0
Fine engraving	—	4	4.1
Indeterminate	—	(15)	—
Total decorated sherds		*98*	*100.0*

represent the same type as the incised/punctated sherds with the sole distinction being the relative amount of punctation visible on a given sherd. Four sherds display fine engraving (Figure 40c). One sherd shows incising with an appliqued nub (Figure 40d). Fifteen sherds could not be positively identified as to decoration and the remaining sherds are plain. More detailed discussion of type identifications for decorated sherds is given below.

Nonplastic inclusions identified in the pottery from this site are very similar to those observed for 41BW553. Clay/grog tempering is by far the most prevalent material and most vessels show no other type of inclusion (Table 33). Eighty-three percent of the sherds are identified as having grog temper, very close to that for 41BW553. Another 14.8 percent contain grog as the primary inclusion, in combination with bone (10.8 percent), sand (.4 percent), hematite (1.5 percent), grit/rock (1.6 percent), limestone (.2 percent), or indeterminate (.2 percent). Bone temper is present in 12.6 percent of the sample, occurring as a secondary inclusion much more frequently than as a primary type (10.8 percent and 1.8 percent, respectively). Sand temper was observed in only one specimen, and the temper is either indeterminate or not visible on a second. The variety of tempering agents is widely distributed vertically and horizontally across the site and patterns could not be discerned.

The distribution of analyzable pottery at 41TT670 appears to be slightly more than for 41BW553, in the sense that there is almost no part of the site that is completely lacking in ceramic remains. The exception to this is the northernmost area of the site, north of the large slough, which is lacking ceramics. By far the greatest amount of ceramic material was recovered from Test Units 120 to 125, all six of which were 1-x-1 m or 1-x-.5 m units placed in areas of high subsurface artifact density. Test Units 120, 121, and 122 were excavated in the midden in Area A (Feature 3); Test Units 123 and 124 were in Area A peripheral to the midden; and Test Unit 125 was located on the central knoll of Area B. The excavation units containing some amount of analyzable pottery include Backhoe Trenches 127 and 130; Shovel Tests 50, 52, 53, 57, and 58; and Test Units 61-63, 71-74, 77-82, 84, 86, 88-89, 91, 93, 95, 97, 98, 100-103, 106, and 118-125 (see Figure 28). Aside from the midden area and the center of Area B, there are relatively substantial amounts of pottery from Test Units 71, 72, 78, 80, 81, 82, and 84, located in Area A, to the west, south, and east of the midden. All of these units are located near the slope that marks the southern boundary of the site. Many probably represent the central occupation/activity area of the site, but some may also represent dumping spots.

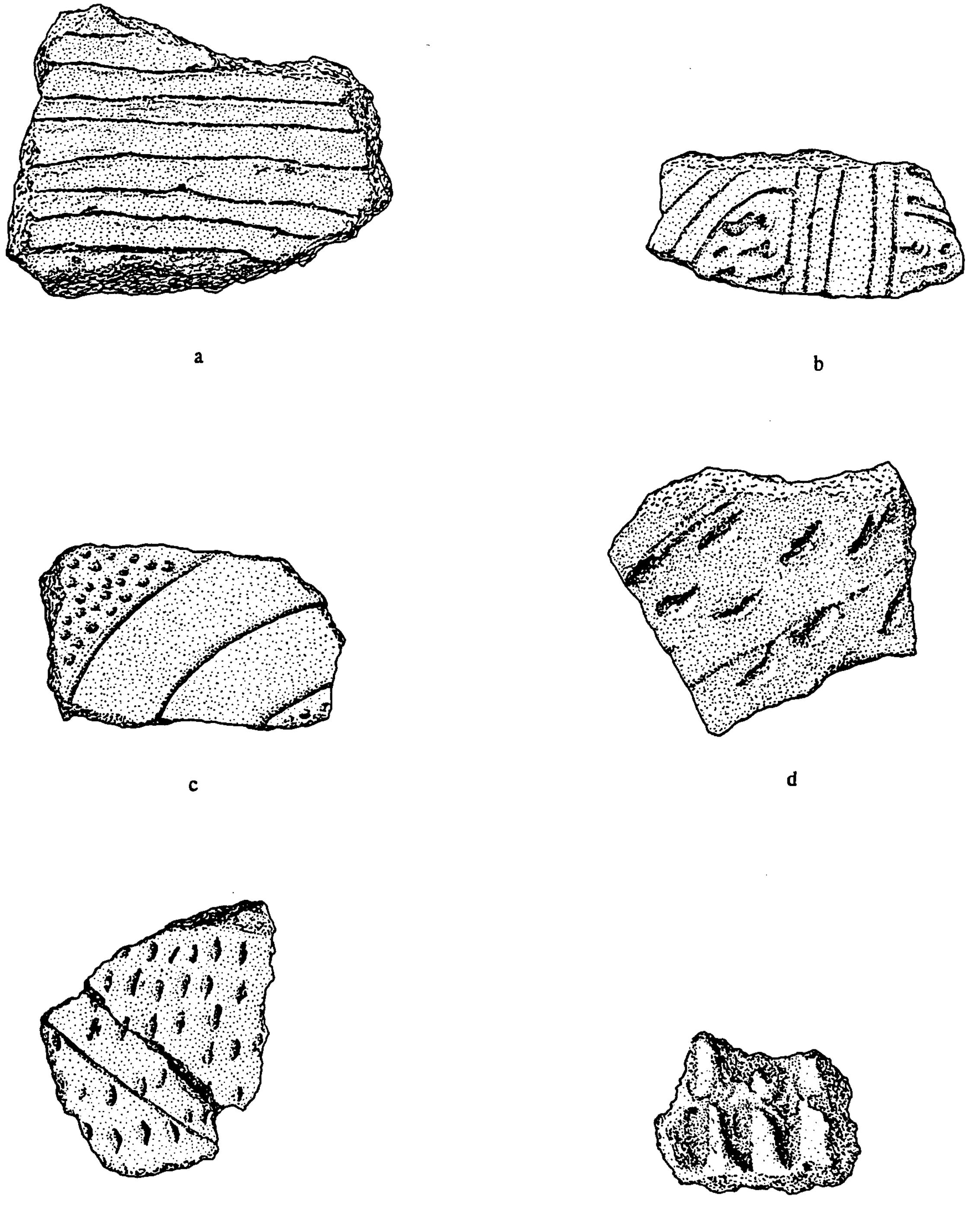

Figure 39. Ceramics recovered from site 41TT670: (a) Williams Incised, Test Unit 84, Level 7 (60-70 cm bs); (b) unidentified incised and punctated, Test Unit 84, Level 5 (40-50 cm bs); (c) unidentified incised and punctated, Test Unit 80, Level 2 (10-20 cm bs); (d) unidentified finger punctated, Test Unit 124, Level 1 (0-10 cm bs); (e) unidentified punctated and incised, Test Unit 121, Level 4 (30-40 cm bs); (f) unidentified deeply punctated, Test Unit 123, Level 5 (40-50 cm bs) (Scale 1:1).

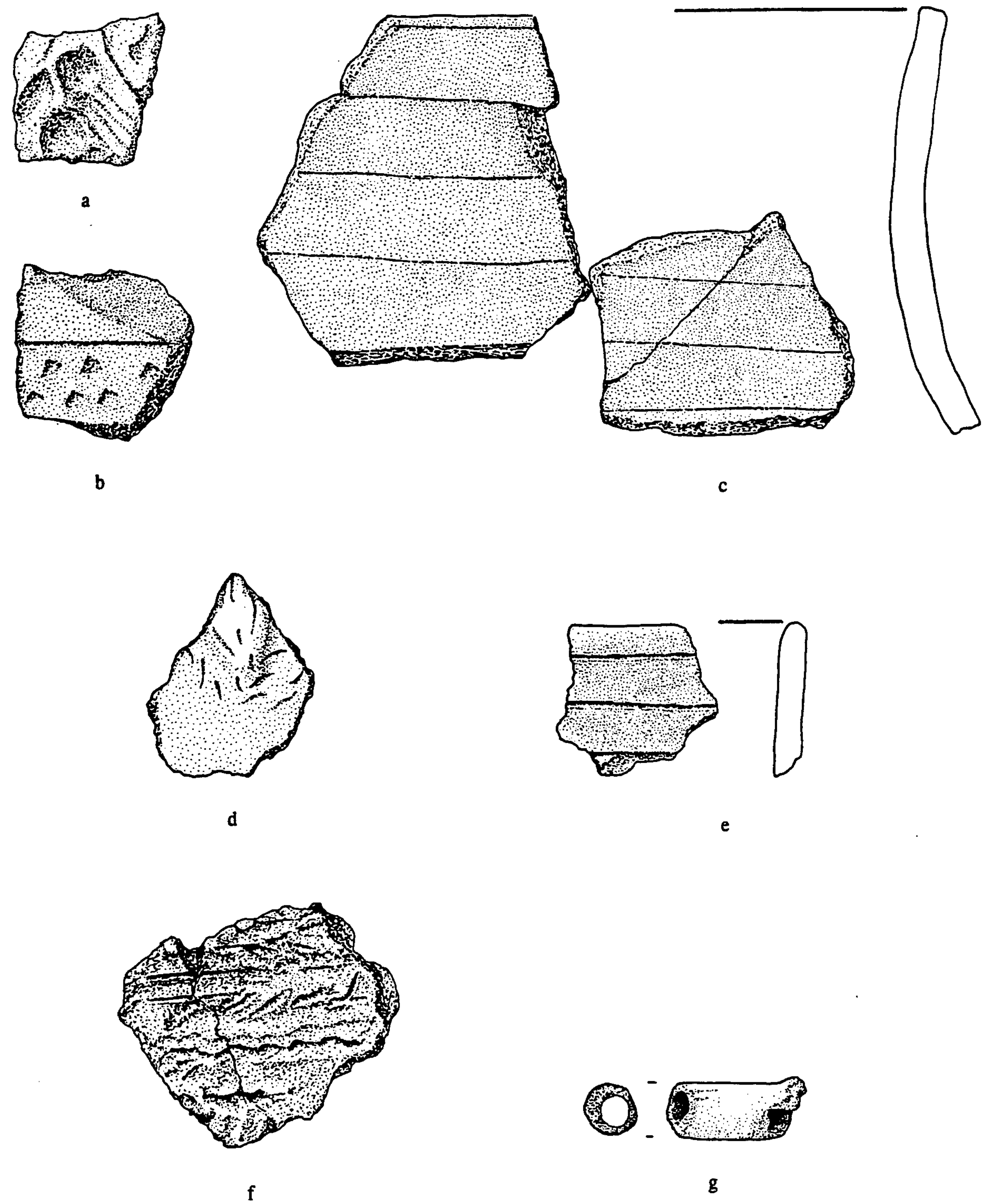

Figure 40. Ceramics recovered from site 41TT670: (a) Pease Brushed-Incised, Test Unit 123, Level 7 (60-70 cm bs); (b) Pennington Punctated-Incised, Test Unit 97, Level 6 (50-60 cm bs); (c) Holly/Hickory Fine Engraved, Test Unit 80, Level 6 (50-60 cm bs); (d) unidentified incised with applique nub, Test Unit 122, Level 3 (20-30 cm bs); (e) Davis Incised, Test Unit 125, Level 5 (40-50 cm bs); (f) Sinner Linear-Punctated, Test Unit 125, Level 5 (40-50 cm bs); and (g) cylindrical pipe stem, Test Unit 120, Level 2 (10-20 cm bs) (Scale 1:1).

Table 33
Primary and Secondary Nonplastic Inclusions, 41TT670 (n=427)

Primary Inclusions	Secondary Inclusions	Quantity	Percentage
Clay/grog	-	354	83.0
Clay/grog	Bone	46	10.8
Clay/grog	Sand	2	.5
Clay/grog	Hematite	6	1.5
Clay/grog	Grit/Rock	7	1.6
Clay/grog	Limestone	1	.2
Clay/grog	Indeterminate	1	.2
Sand	-	1	.2
Bone[1]	-	1	.2
Bone	Clay/grog	7	1.6
None visible	-	1	.2
Total		*427*	*100.0*

Footnotes:
[1] Pipe stem fragment.

As noted previously, the general trends in decorative techniques at site 41TT670 appear superficially to resemble those at 41BW553. However, there are important differences. One type of surface treatment present at 41BW553 that is not seen at 41TT670 is finger pinching. In addition, the number of sherds with applique and brushing is considerably higher at 41BW553 than at 41TT670. As the typological discussion makes clearer, the lack of these forms of surface treatment is probably related to the temporal placement of site 41TT670. Incising is most common at 41TT670, as it is at 41BW553, but punctating is far more common at the former site than at the latter, with 41.8 percent of the known decorated sample showing punctation, either alone or a combination with incising or brushing (see Table 32). Unfortunately, most of this material cannot be reliably typed; therefore, the inferred chronological placement of 41TT670 is based primarily on other evidence.

Fourteen specimens were typed on at least a tentative basis, using various published sources (Ford 1951; Newell and Krieger 1949; Suhm and Jelks 1962; Suhm et al. 1954; and Webb 1948). These include Holly or Hickory Fine Engraved, Pennington Punctated-Incised, Williams Plain, Williams Incised, Pease Brushed-Incised, Sinner Linear-Punctated, and Davis Incised (Table 34). The most significant point to be drawn from this inventory is that all of the currently recognized types in this sample can be placed in either the Formative/Early Caddoan (A.D. 800-1200) or Middle Caddoan (A.D. 1200-1400) periods (Table 35).

The most frequently identified decorated type at 41TT670 is a fine engraved ware which may be either Holly or Hickory Fine Engraved (the two are difficult to distinguish with small sherds). These fine engraved specimens resemble those found at 41BW553, with fairly thin walls, fine to finely irregular paste, and rectilinear or simple parallel line designs (see Figure 40c). This type is generally dated to the Early Caddoan period, although elsewhere in the White Oak Creek area fine engraving appears to be last into the Middle Caddoan period (Cliff and Hunt 1995). At this site, this fine engraved ware was recovered in association with Williams Plain, Davis Incised?, and Sinner Linear-Punctated. One other sherd of Williams Plain and one sherd identified as Williams Incised were also recovered from 41TT670. Williams Plain is generally dated from the latter part of the Early Ceramic period (200 B.C.-A.D. 800) into the Formative/Early

Table 34
Proveniences of Typed Sherds, Site 41TT670 (n=14)

Tentative Type Label	Excavation Unit	Vertical Provenience
Holly/Hickory Fine Engraved	80	Level 6, 50-60 cm bs
Holly/Hickory Fine Engraved	80	Level 6, 50-60 cm bs
Holly/Hickory Fine Engraved	84	Level 4, 30-40 cm bs
Williams Incised	84	Level 7, 60-70 cm bs
Pennington Punctated-Incised?	97	Level 6, 50-60 cm bs
Pennington Punctated-Incised?	122	Level 3, 20-30 cm bs
Williams Plain?	122	Level 3, 20-30 cm bs
Holly/Hickory Fine Engraved	123	Level 5, 40-50 cm bs
Williams Plain	123	Level 6, 50-60 cm bs
Holly/Hickory Fine Engraved	123	Level 6, 50-60 cm bs
Pease Brushed-Incised?	123	Level 7, 60-70 cm bs
Sinner Linear-Punctated	125	Level 5, 40-50 cm bs
Davis Incised?	125	Level 5, 40-50 cm bs
Holly/Hickory Fine Engraved	125	Level 5, 40-50 cm bs

Table 35
Age Ranges for Identifiable Ceramics from Site 41TT670 (n=14)

Tentative Ceramic Type	Minimum Number of Vessels	Approximate Dates (from Thurmond 1990:Table 8; and Suhm et al. 1954)
Williams Plain	2	200 B.C. - A.D. 800
Williams Incised	1	200 B.C. - A.D. 800
Holly/Hickory Fine Engraved	6	A.D. 800-1300
Pennington Punctated-Incised	2	A.D. 800-1300
Davis Incised?	1	A.D. 800-1300
Sinner Linear-Punctated	1	A.D. 1300-1500
Pease Brushed-Incised	1	A.D. 1300-1500

Caddoan period (A.D. 800-1200). One of these sherds was found in association with a sherd of Pennington Punctated-Incised in the midden in Area A, with a possible Middle Caddoan date. The incised specimen (see Figure 39a) is very thick, well within the range for Williams Plain, and has multiple parallel diagonal lines. Williams Incised is not formally described in the literature but at least one group of researchers alludes to its existence (Suhm and Jelks 1962).

Other possibly early types from site 41TT670 included two sherds identified as Pennington Punctated-Incised (see Figure 40b), a tentatively identified sherd of Davis Incised (Figure 40e), and several sherds of an unidentified finger-punctated type (see Figure 39f).

Middle Caddoan ceramic types identified in this sample include one sherd of possibly Pease Brushed-Incised (see Figure 40a) and one sherd of Sinner Linear-Punctated (see Figure 40f).The sherd of Sinner Linear-Punctated has a dark, coarse paste and finely spaced rows of diagonal punctations placed so closely together that they resemble cord-marking. This sherd was recovered in association with a sherd tentatively identified as Davis Incised? and one sherd of Holly/Hickory Fine Engraved. The presence of these two later types, coupled with the large number of untyped incised and punctated specimens, suggests that a substantial Middle Caddoan component could be present at the site. On the other hand, the total lack of clear late diagnostic attributes, such as broad line incising, neck banding, and large amounts of brushing, suggest that site 41TT670 lacks a Late Caddoan occupation.

In addition to the vessel sherds, a single fragment of ceramic pipe stem was recovered from Test Unit 120, Level 2 (10-20 cm bs) (Figure 40g). Based on the outer diameter of the stem, the diameter of the hole, and the thickness of the stem wall, it is believed to have come from a Red River pipe, probably either Miller's Crossing or Graves Chapel variety (Hoffman 1967:9). Both of these varieties appear to date to the latter part of the Formative Caddoan (A.D. 800-1000) and the Early Caddoan (A.D. 1000-1200) periods, although the Miller's Crossing variety may precede the Graves Chapel variety.

Petrographic Analysis of Ceramics

The sample of sherds from site 41TT670 selected for thin-sectioning and petrographic analysis consisted of one sherd identified as Williams Plain, one sherd identified as Holly/Hickory Fine Engraved, one unidentified punctated sherd, one unidentified slipped sherd, and six undecorated sherds with smoothed exterior surfaces (see Appendix G). All of this material probably comes from the same occupation, which spans the Early and Middle Caddoan periods. However, in order to examine temporal change in the sample set from 41TT670, the sherds were divided on the basis of whether they are believed to date to the earlier (Early Caddoan) or to the later (Middle Caddoan) half of this occupation. Thus, four samples have been placed in the Early Caddoan period and six samples have been placed in the Middle Caddoan period.

Three discrete primary inclusion groups were identified by the analysis, including ground sherd and bone (n=5), ground sherd exclusively (n=4), and bone exclusively (n=1). Six of these samples were correctly identified by previous visual examination. The exceptions were three sherd-and-bone-tempered specimens originally identified as just sherd (it appears that bone inclusions present in proportions of less than 5 percent may be missed by visual examination alone), and one sherd-tempered specimen originally identified as having limestone as a secondary inclusion (in this case, the petrographic analysis identified the presence of 4.0 percent siltstone, believed to be naturally occurring). Of the five samples exhibiting sherd/bone inclusions, three have been judged to be Early Caddoan in age, while the other two are believed to be Middle Caddoan. In contrast, the samples with exclusively sherd inclusions consist of three samples dated to the Middle Caddoan period and one dated to the Early Caddoan period. Finally, the single specimen with exclusively bone inclusions is also dated to the Middle Caddoan period. This suggests that combined sherd/bone temper was more frequent during the Early Caddoan period (75 percent) but decreased in frequency during the Middle Caddoan period (33.3 percent), giving way to the use of either sherd or bone temper, exclusively (50.0 and 16.7 percent, respectively). In addition, it seems that, overall, a slightly greater amount of primary inclusions were added to the paste during the Middle Caddoan period (mean=13.8 percent) than during the Early Caddoan period (mean=13.1 percent). Likewise, the overall size of the primary inclusions appears to have been slightly larger during the Middle Caddoan (mean=.51 mm) than during the Early Caddoan (mean=.48 mm) period. These differences may be related to changes in vessel size and/or functional requirements through time. Of possibly more significance is the fact that the proportion of voids in the samples decreased from the Early Caddoan period (mean=11.5 percent) to the Middle Caddoan period (mean=8.5 percent), implying that the vessels represented by the Middle Caddoan samples were less porous, overall. Unfortunately, the question of whether or not these differences are actually due to changes in ceramic technology or in vessel size and/or function through time, or simply the result of sampling error, cannot presently be answered.

In addition to the primary inclusion groups, five qualitatively discrete compositional groups were recognized, including: (1) one consisting of monocrystalline quartz and quartzite, with lesser percentages of potassium feldspar and hematite (n=4; one Early Caddoan, three Middle Caddoan); (2) one composed of monocrystalline quartz, naturally occurring siltstone, potassium feldspar, and quartzite (n=2; both Middle Caddoan); (3) one characterized by the presence of siltstone, monocrystalline quartz, quartzite, potassium feldspar, and hematite (n=1; Early Caddoan); (4) one composed of monocrystalline quartz, potassium feldspar, and quartzite (n=2; one Early Caddoan, one Middle Caddoan); and, finally, (5) one comprised of monocrystalline quartz and quartzite (n=1; Early Caddoan). The first of these groups, including specimens identified as Early Caddoan and Middle Caddoan was the most common at the site (40 percent) and may have been locally manufactured. The data suggest that only pottery of the first and the fourth compositional groups were in use during both the Early and Middle Caddoan occupation of the site. This supports the idea that the first group is of local origin, and suggests that the same may be true of the fourth group. The third and fifth compositional groups are associated only with samples dated to the Early Caddoan period, but since each group consists of only a single sample, it is possible that these associations are only the result of sampling error. Of possibly more significance is the association of the second compositional group only with samples ascribed to the Middle Caddoan period. While this could also result from sampling error, it is possible that it indicates either (1) a nonlocal source of pottery only available during the Middle Caddoan period, or (2) a source of local clay which was not exploited prior to the Middle Caddoan period. Complete resolution of this problem must await a comparative analysis of locally occurring clays.

Chipped Stone

The chipped stone assemblage recovered from site 41TT670 includes 18 projectile points or point fragments (17 dart point/knives and one arrow point); 34 bifaces or biface fragments, consisting of 21 unfinished bifaces and 13 bifacial tools or tool fragments, including some projectile point fragments and one drill made on an arrow point; 25 unifaces (19 utilized flakes, five marginally modified pieces, and one steeply chipped piece); and 1,701 pieces of lithic debitage (including 222 pieces of shatter, 1,470 flakes or flakes fragments, and nine cores).

Tools

Seventy-seven chipped stone tools were collected at site 41TT670, all of which were recovered from subsurface contexts. Eighteen are complete or partial projectile points, of which 17 are dart point/knives and one is an arrow point. In addition, 10 bifacially worked fragments are apparently point fragments of a largely unidentifiable nature — two are arrow-point-sized fragments and six are dart-point-sized fragments. The remainder of the tools are unifaces, mostly utilized flakes.

Projectile Points

Nearly all of the 18 projectile points collected from site 41TT670 are dart points (n=17, 94.4 percent) and, as with site 41BW553, most of these fall into the highly variable Gary type (n=13, 76.5 percent of the dart point sample; Table 36). The Gary style dart point probably dates from the Late Archaic period (ca. 1000 B.C.) up to the early part of the Caddoan period (post-A.D. 800). Most of the Gary points from site

Table 36
Projectile Points Recovered from Site 41TT670

Identification Number[1]	Type	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Stem Length (mm)	Minimum Stem Width (mm)	Maximum Stem Width (mm)	Raw Material	Color
61.7.1	Gary, var. unidentified	53.7	25.6	10.4	9.5	15.5	8.5	14.0	Ogallala quartzite	5YR 5/3
79.2.1	Gary, *var. Kaufman* (reworked)	46.1	27.4	6.3	5.2	16.1	7.2	20.0	Red River siltstone	10YR 4/4
81.1.1	Bonham arrow point	13.0	11.7	3.3	0.4	4.5	2.0	6.0	Bowie chert	10R 4/5
86.8.2	Gary, *var. Emory*	38.3	20.9	7.8	4.9	14.4	6.8	14.3	Ogallala quartzite	2.5YR 4/3
89.5.1	Gary, *var. Runge*	36.7	21.0	6.4	4.0	18.3	8.6	16.0	Ogallala quartzite	10YR 6/4
89.6.1	Gary, var. unidentified (reworked)	67.0	22.2	7.4	11.6	17.8	9.2	17.4	Ogallala quartzite	10YR 5/6
97.5.1	Gary, *var. Hobson*	37.1	19.7	5.3	2.8	16.3	5.0	16.1	Red River siltstone	10YR 5/4
108.8.1	Gary, *var. Hobson*	29.4	23.7	7.0	4.1	14.1	8.0	16.7	Red River siltstone	7.5YR 5/4
119.5.1	Gary, *var. Gary/Kaufman*	40.0	31.3	7.1	6.5	13.6	2.8	19.8	Ogallala quartzite	7.5YR 5/3
121.7.1	Gary, *var. Hobson/Colfax*	41.4	24.1	7.1	6.1	12.1	13.0	15.0	Red River siltstone	10YR 4/6
121.9.1	Edgewood (reworked)	22.5	17.2	5.6	13.6	10.6	2.2	17.2	Edwards chert	10YR 7/2
122.3.1	Gary, *var. Kaufman* (?)	31.9	27.0	8.6	6.2	18.0	2.7	16.9	Ogallala quartzite	7.5YR 5/3
122.4.1	Untyped contracting stem	58.3	39.4	8.3	16.8	18.7	11.8	24.0	Petrified wood	10YR 4/1
123.7.1	Gary, *var. Kemp* (?)	28.8	16.4	6.0	2.6	16.1	4.1	13.2	Bowie chert	10R 3/4
123.8.1	Palmillas	63.0	28.6	11.7	17.2	17.8	14.9	18.0	Cortex, cf. Johns Valley Shale fm	2.5Y 6/1
123.9.1	Gary, var. unidentified	36.2	19.0	7.2	4.5	12.1	3.3	12.0	Ogallala quartzite	10YR 6/4
123.9.2	Gary, *var. Kemp*	36.6	23.0	7.0	5.5	12.2	9.0	15.8	Ogallala quartzite	5YR 5/6
125.6.1	Edgewood (reworked)	32.5	18.4	8.0	4.6	9.5	14.8	18.4	cf. "Lowrance chert"	N7

Footnotes
[1] Identification Number includes unit, followed by level, followed by unique artifact number.

41TT670 are made of Ogallala quartzite, although Red River siltstone and various cherts were also commonly used. Three of the Gary points cannot be identified as to variety. One of these has unusually strong shoulders, along with the characteristic triangular body and contracting stem of the Gary type (Figure 41a). The second of these is made of coarse-grained yellowish quartzite, and is extremely reworked (Figure 41b). The third Gary point which cannot be identified as to variety has a snapped base (Figure 41c). One Gary point exhibits characteristics of the *Emory* variety, as described by Johnson (1962:164) — a long, contracting stem about one-half the specimen's length, with a wide, somewhat flattened base (Figure 41d). Another fits into the *Runge* variety (Johnson 1962:164), with its short, triangular body and long, tapered stem (see Figure 41e). Two Gary points also appear to fit into the previously described *Kemp* variety (see Chapter 5).

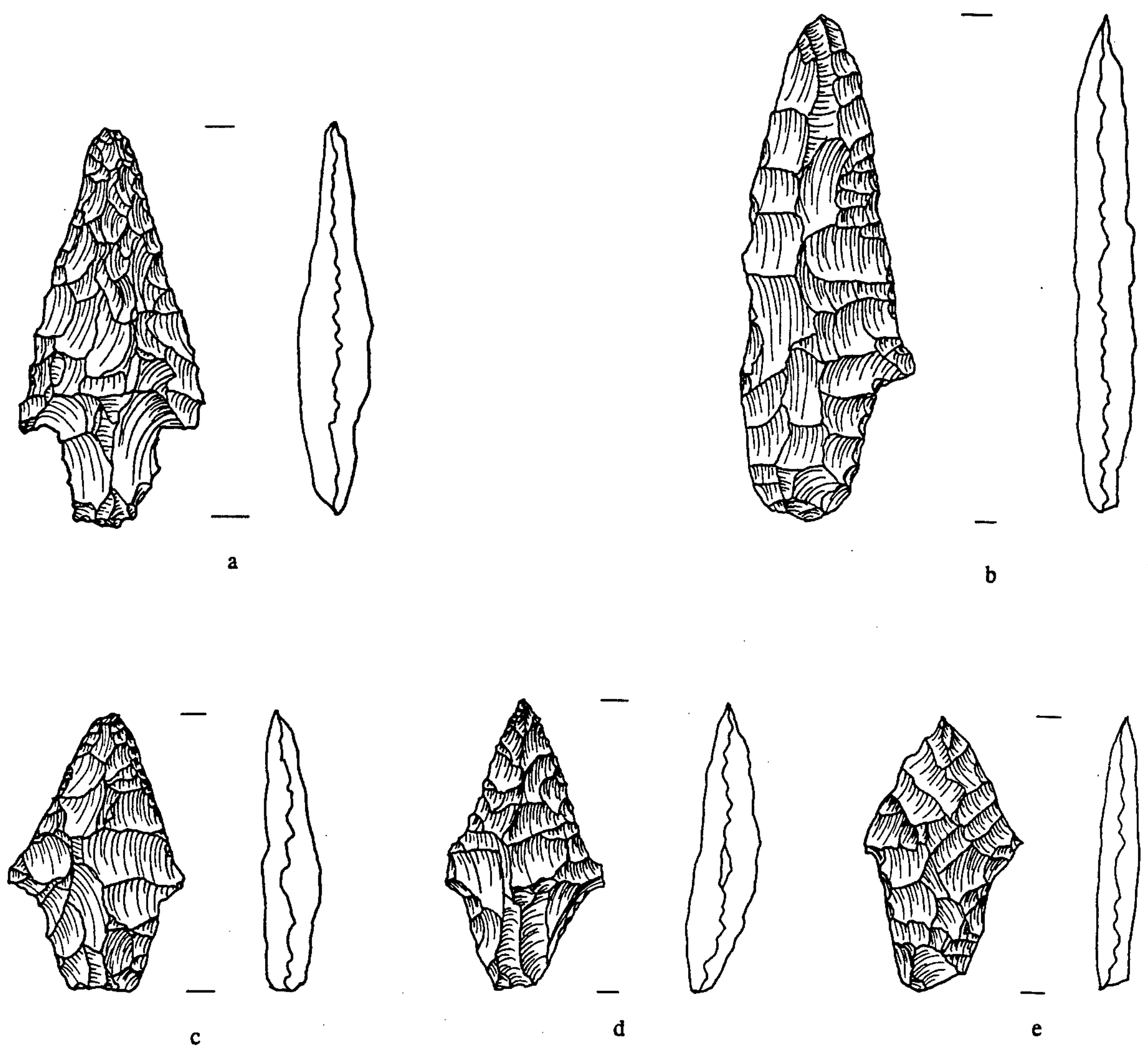

Figure 41. Gary dart points recovered from site 41TT670: (a) unidentified variety, Test Unit 61, Level 7 (60-70 cm bs); (b) unidentified variety, Test Unit 89, Level 6 (50-60 cm bs); (c) unidentified variety, Test Unit 123, Level 9 (80-90 cm bs); (d) *var. Emory*, Test Unit 86, Level 8 (70-80 cm bs); and (e) *var. Runge*, Test Unit 89, Level 5 (40-50 cm bs) (Scale 1:1).

Of the six remaining Gary points from site 41TT670, two fall into Johnson's *Kaufman* variety (Figure 42a), and another (Figure 42b) exhibits the broad, triangular body and equally broad base, tapering to a point, which places it within both Schambach's *Gary* variety, as described for Arkansas (Schambach 1982b:174-175), and Johnson's *Kaufman* variety in Northeast Texas. Two other Gary points (Figure 42c) fit within Johnson's *Hobson* variety, which is characterized by a lack of barbs, a stem one-third to over one-half the total point length, and a contracting, somewhat rounded base. One of these, from Test Unit 108, Level 8 (70-80 cm bs), consists only of a diagnostic base and a portion of a medial section. The final Gary point combines elements of both *Hobson* and *Colfax* varieties (see Chapter 5 for a description of the *Colfax* variety), but seems to be more typical of the latter. The stem is short and slightly rounded but somewhat flattened, one barb is present, and the blade is broad (Figure 42d).

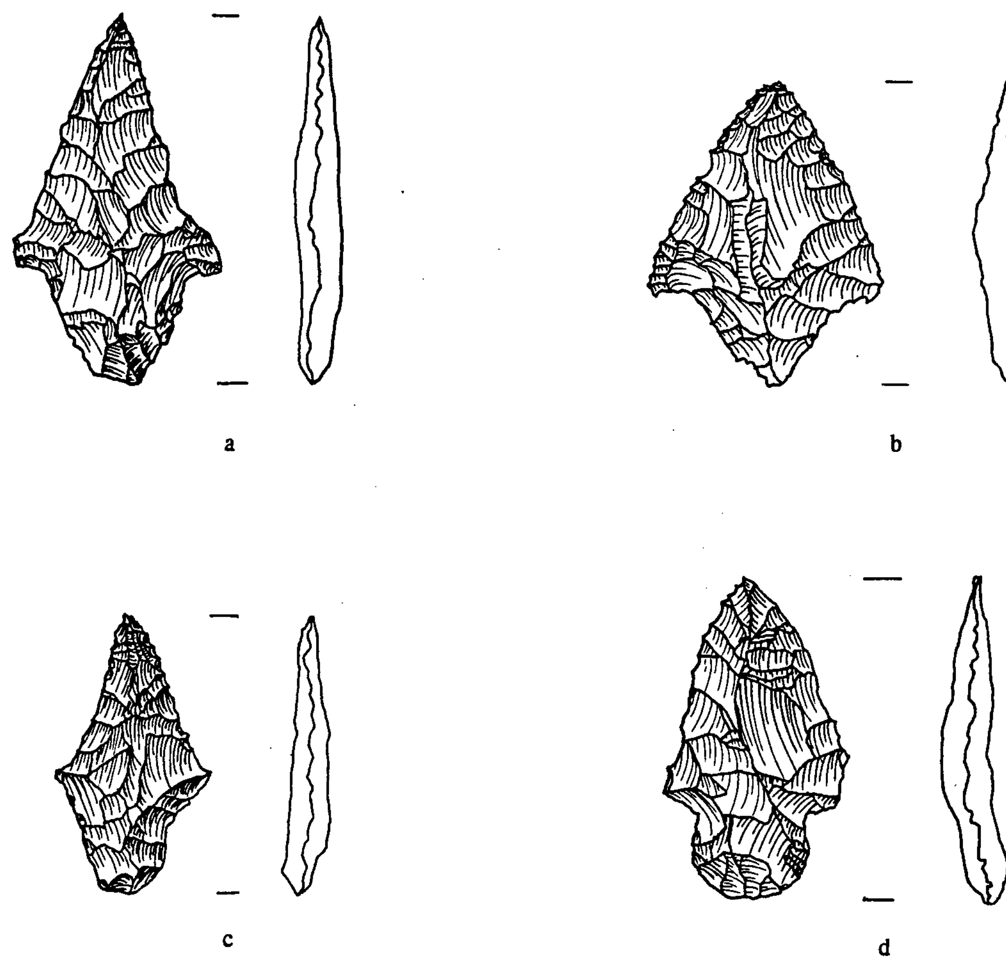

Figure 42. Additional Gary dart points recovered from site 41TT670: (a) *var. Kaufman*, Test Unit 79, Level 2 (10-20 cm bs); (b) *var. Gary/Kaufman*, Test Unit 119, Level 5 (40-50 cm bs); (c) *var. Hobson*, Test Unit 97, Level 5 (40-50 cm bs); and (d) *var. Hobson/Colfax*, Test Unit 121, Level 7 (60-70 cm bs) (Scale 1:1).

Four other dart points were also recovered from 41TT670. Two of these are extremely reworked Edgewood points (Figure 43a and 43b). One, from Test Unit 121, Level 9 (80-90 cm bs), appears to be made of Central Texas, Georgetown chert from the Edwards formation. The other, from Test Unit 125, Level 6 (50-

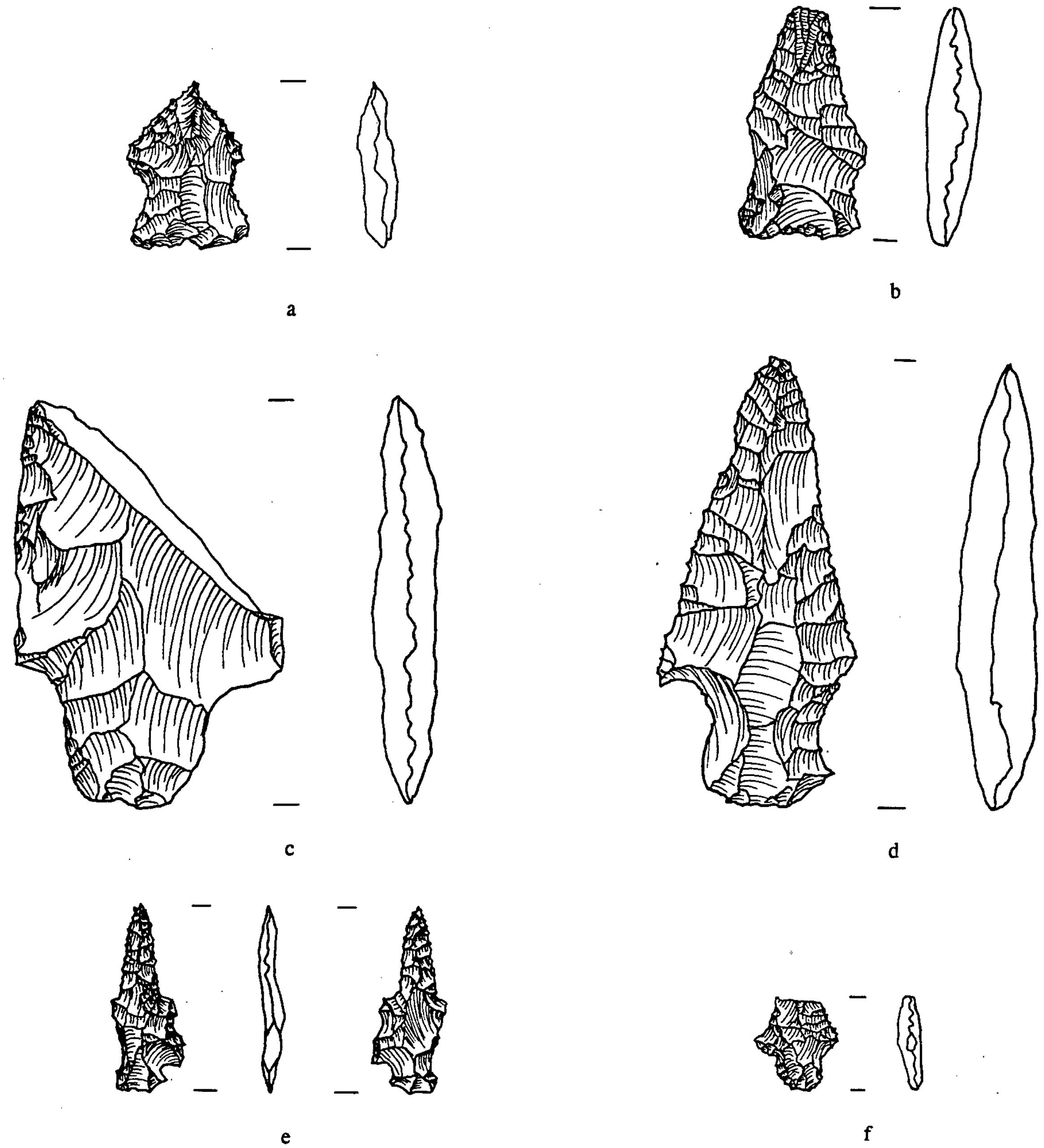

Figure 43. Other projectile points collected from site 41TT670: (a) reworked Edgewood dart point, Test Unit 121, Level 9 (80-90 cm bs); (b) reworked Edgewood dart point, Test Unit 125, Level 6 (50-60 cm bs); (c) untyped contracting stem dart point, Test Unit 122, Level 4 (30-40 cm bs); (d) Palmillas dart point, Test Unit 123, Level 8 (70-80 cm bs); (e) Bonham arrow point, Test Unit 81, Level 1 (0-10 cm bs); and (f) drill made on arrow point, Test Unit 125, Level 3 (20-30 cm bs) (Scale 1:1).

60 cm bs), is made of an unidentified quartzitic chert. Both are extremely reworked, making them unidentifiable in regard to variety. Edgewood points generally are dated to the Late Archaic period in Northeast Texas (2000-200 B.C.). A single untyped point with a transverse fracture was also collected. The accident which snapped it may have occurred during either manufacture or use; but the latter is believed to be the case, since the point seems to be otherwise complete. This piece, which is characterized by a broad

triangular blade and a slightly contracting, flat-based stem, is made of a very dark gray, fine-grained petrified wood (Figure 43c). The final point has a long, triangular body, one surviving barb, and a bulbar base (Figure 43d). These characteristics — particularly the distinctive base — place it within the poorly defined Palmillas type. Palmillas may also date to the Late Archaic period in this area.

One fragmentary arrow point was collected from near the surface at site 41TT670 (Figure 43e). Although only the stem and part of the blade remain intact, the rounded base is diagnostic of the Bonham type, which dates from approximately A.D. 800-1200 (Suhm et al. 1954). This would place it within the Formative to Early Caddoan period.

With only two exceptions, the entire projectile point sample was collected from the south side of the site. Most of these (56 percent) came from the central portion of the southern ridge (Area A), while 11 percent came from Area B, and 22 percent came from Area C. One dart point was recovered 55 m north of Area C and one dart point came from the northernmost part of the site. Particularly high densities were noted in and around the midden and in Test Unit 123, a 1-x-1 m unit excavated on the extreme southern edge of Area A.

Overall, the projectile point data indicate the presence of a Terminal Archaic component with curated Late Archaic dart points. Gary points, which were used from the Late Archaic (ca. 2000 - 200 B.C.) to Caddoan times (post-A.D. 800), are common at Caddoan sites like this one. However, clearly Late Archaic point styles were found in direct association with the Gary points, and in some cases were found above Gary points in the same units. In the midden area, a large untyped contracting stem was collected from 30-40 cm bs, while in an adjoining unit — less than 1 m away — a Late Archaic Edgewood point was collected from a context 80-90 cm bs. In this same area, Gary dart points were collected between 20-30 and 70-80 cm bs. Nevertheless, it appears that the Edgewood style points probably predate the Gary dart points while the Palmillas style point is probably contemporaneous with Gary. Bioturbation might have displaced some of the artifacts upwards or downwards, or more recent activity such as logging or road-building might have had a similar effect.

Bifaces

Thirty-four additional bifaces or biface fragments were collected from various contexts at site 41TT670 (Table 37). These pieces represent all phases of lithic reduction, from initial "roughing out" of the biface to final preforming. Included in the sample are seven early aborted bifaces (three of which are complete, while the others are fragmentary); six late aborted bifaces (just one complete); and five preforms (one for an arrow point and four for dart points, one of each is complete). The dart point preforms appear, without exception, to be blanks for Gary points. In addition, three indeterminate biface fragments were identified. Finally, the sample includes 13 bifacial tools or tool fragments. The most significant of these is a small drill or borer made on the distal end of an arrow point (Figure 43f). While the point is not readily identifiable due to its modification, it may belong to Alba, Bonham, or Scallorn types. This artifact is very similar to the flake drill found at site 41BW553 and probably dates to the Caddoan period. It was recovered between 20 and 30 cm bs in Area B. The remaining tools and tool fragments are less diagnostic. Included among them are an indeterminate tool fragment, an unidentifiable biface tip (perhaps from a point), an indeterminate point tip, an arrow point tip, two dart point tips, a midsection from an indeterminate point type, an indeterminate biface base, a basal fragment, and three dart point bases.

Nearly a third of the bifaces (n=11) are made of Ogallala quartzite, and on this basis it can be supposed that it was the most accessible and available lithic material for this part of the WMA. The distribution of these bifaces across the site is nearly identical to that of the projectile points — all but one is located on the extreme southern edge of the site, and half the sample (n=34) came from Area A. This supports the view that the southern portion of the site was the area most intensely occupied in prehistoric times.

Table 37
Bifaces Recovered from Site 41TT670

Identification Number[1]	Description	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Stem Length (mm)	Minimum Stem Width (mm)	Maximum Stem Width (mm)	Raw Material	Color
Early Aborted Bifaces										
68.9.1	Perversely broken fragment	37.4	29.0	14.2	19.8	—	—	—	Ogallala quartzite	2.5YR 5/3
81.2.1	Complete	33.8	19.0	8.6	5.8	—	—	—	Ogallala quartzite	2.5YR 4/3
119.4.2	Indeterminate fragment	28.2	25.8	11.8	10.8	—	—	—	Arkansas novaculite	2.5Y 8/1
120.4.1	Indeterminate fragment	21.0	34.5	12.4	9.3	—	—	—	Bowie chert	10R 3/3
121.10.1	Distal fragment	29.0	19.7	10.2	4.8	—	—	—	Ogallala quartzite	7.5YR 6/4
122.7.1	Complete	37.3	24.9	13.7	12.8	—	—	—	Ogallala quartzite	10YR 5/4
125.5.1	Complete	58.0	24.3	13.5	16.4	—	—	—	Silicified wood	7.5YR 3/2
Late Aborted Bifaces										
74.6.1	Lateral fragment	30.8	14.5	7.0	2.3	—	—	—	Unidentified chert (burned)	2.5YR 2.5/2
77.9.1	Proximal fragment	27.6	26.3	9.4	9.3	—	—	—	Ogallala quartzite	5YR 4/2
88.3.1	Indeterminate fragment	21.4	16.8	5.2	2.7	—	—	—	Ogallala quartzite	10R 3/3
121.4.1	Indeterminate fragment	12.5	23.0	4.5	1.4	—	—	—	Johns Valley Shale formation chert	10YR 4/2
123.8.3	Complete	29.0	21.7	8.1	4.5	—	—	—	Unidentifiable (burned)	2.5YR 4/1
125.4.3	Indeterminate fragment	11.4	27.9	5.3	2.4	—	—	—	cf. "Lowrance chert"	N8

Table 37 (cont'd)

Identification Number[1]	Description	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Stem Length (mm)	Minimum Stem Width (mm)	Maximum Stem Width (mm)	Raw Material	Color
Preforms										
84.7.2	Arrow point preform	36.0	17.3	7.7	5.2	—	—	—	Siltstone	10YR 4/4
119.4.1	Arrow point preform fragment	28.2	25.8	11.8	10.8	—	—	—	Arkansas novaculite	2.5Y 8/1
121.11.1	Dart point preform fragment	53.7	27.8	9.0	6.1	—	—	—	Ogallala quartzite	2.5YR 4/1
123.8.2	Dart point preform fragment	26.1	22.5	6.3	4.9	10.0	10.0	16.0	Ogallala quartzite	2.5YR 5/2
123.9.3	Dart point preform	40.9	23.0	8.0	6.2	—	—	—	Red River siltstone	10YR 5/8
Indeterminate fragments										
122.3.2	Indeterminate fragment	10.4	14.1	7.7	1.4	—	—	—	Ogallala quartzite	2.5Y 5/3
123.7.2	Indeterminate fragment	13.2	17.5	5.0	1.1	—	—	—	Bowie chert	10R 5/2
124.2.1	Indeterminate fragments	10.0	16.7	6.0	.8	—	—	—	Woodford or Big Fork chert	10YR 3/1
Tools/Tool Fragments										
47.7.1	Indeterminate point midsection	26.0	15.5	5.3	2.0	—	—	—	Red River siltstone	5YR 7/1
76.7.1	Dart point tip	21.0	19.9	6.8	2.8	—	—	—	Bowie chert	7.5YR 4/4
88.3.2	Biface tip	13.5	15.0	3.5	.5	—	—	—	Arkansas novaculite	10YR 8/1
91.5.1	Dart point base	12.6	16.0	7.3	1.5	—	—	—	Ogallala quartzite	10YR 6/4
121.8.1	Indeterminate base	13.8	13.6	3.9	.7	—	—	—	cf. Potter chert	2.5YR 5/4
122.2.1	Indeterminate point tip	18.4	13.2	5.8	1.0	—	—	—	Arkansas novaculite	10YR 7/1

Table 37 (cont'd)

Identification Number[1]	Description	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Stem Length (mm)	Minimum Stem Width (mm)	Maximum Stem Width (mm)	Raw Material	Color
Tools/Tool Fragments (cont'd)										
122.2.2	Arrow point tip	13.6	12.4	2.8	.5	—	—	—	Red River siltstone	10R 4/4
122.5.1	Indeterminate fragment	6.4	12.0	3.7	.2	—	—	—	Bowie chert	10R 3/4
122.10.1	Dart point base	16.0	14.3	6.6	1.9	—	—	—	Arkansas novaculite	5Y 4/1
123.6.1	Dart point tip	33.0	26.4	5.1	4.6	—	—	—	Arkansas novaculite	2.5Y 8/1
124.4.1	Basal fragment	5.9	15.5	5.6	.4	—	—	—	cf. "Lowrance chert"	10YR 4/3
125.3.1	Drill made on reworked arrow point	26.4	8.0	3.0	.7	4.0	4.7	6.2	Ogallala quartzite	2.5YR 5/4
127.6.1	Dart point base	—	—	5.5	1.5	14.3	12.5	14.0	Unidentifiable (burned)	5Y 3/1

Footnotes:
[1] Identification Number includes unit, followed by level, followed by unique artifact number.

Unifaces

Twenty-five unifaces are present in the lithic sample from site 41TT670 (Table 38). All but six are utilized flakes, which bear evidence of expedient use along their lateral or dorsal edges but no evidence of deliberate working. All types of edges were used — irregular, convex, concave, and straight. Of the six pieces which do seem to have been deliberately modified, three are marginally modified/retouched pieces, and one is a steeply chipped piece. None of these artifacts are distinctive.

Lithic Debitage

The debitage sample from site 41TT670 consists of nine cores, 222 pieces of shatter, and 1,470 flakes or flake fragments. The cores include five unidirectional, multiplatform cores, two of which are made of Red River siltstone, two of a material resembling Potter chert, and one of Ogallala quartzite. The remaining four cores are multidirectional, multiple platform cores. Two are made of Red River siltstone, one of Bowie chert, and one of the Potter chert-like material. As with the material from site 41BW553, all of these cores are made from materials easily available in the immediate area, and none are distinctive (Table 39). All of these cores are somewhat small, and it is suspected that they were actually cobbles discarded during the process of being reduced to bifaces. Too few cores are present for their distribution to be significant.

The remaining 1,692 pieces of debitage were collected from all areas of the site, although the southern edge of the site is again the best represented area. Most of the debitage pieces are small, suggesting they were derived from small cores, possibly the modest stream cobbles common to the area. A much smaller percentage appear to be heat-treated than was noted for site 41BW553 (n=120; 7.1 percent), although a similar percentage is burned (n=381; 22.51 percent). Only 25 pieces measured more than 19 mm in size, with only three over 25 mm in size, again suggesting that small cobbles (or perhaps flake blanks) were being used. Even including the pieces less than 6.3 mm in size (the size of a typical dry screen), most of which were derived from the flotation samples, most of the debitage (n=1,116; 70 percent) still falls between 6.3 and 19 mm in size. The 41TT670 sample was also subjected to Patterson's simple analytical method, described in Chapter 5 of this report. The sample tested here (n=1,141) includes only the debitage (flakes and shatter) greater than 6.3 mm in size, for reasons previously noted.

As with site 41BW553, plotting of the data from site 41TT670 produced the expected exponential curve (Figure 44), but with an even better fit than for 41BW553. This graph strongly indicates that bifacial reduction was the predominant lithic reduction activity at site 41TT670, with no obvious deviations. When the debitage is broken out by raw material type, a few notable trends are visible (Figure 45). The material classes used here again include chert, quartzite, siltstone, novaculite, other (including petrified wood, silicified wood, ferruginous sandstone, etc.), and unidentifiable. With the most common materials — chert, quartzite, and siltstone — the exponential curves remain visible, but they flatten out for the other types. Quartzite is by far the most common material present in the sample. It shows a minimal peak in the 12.5-19 mm range (Size Grade 3), suggesting that this may have been the average size for quartzite cobbles in the area. Although little can be said about the unidentifiable category, the near-flat curves for novaculite and the "other" category indicates that these materials were not undergoing significant reduction at the site. The presence of these materials in the debitage sample may have resulted from the maintenance of tools manufactured elsewhere, or perhaps even acquired via a trade network. This is particularly the case for novaculite.

Table 38
Unifacial Tools Recovered from Site 41TT670

Identification Number[1]	Description of Working Edge	Location of Retouch	Length of Retouched Edges (mm)	Raw Material	Color
Utilized Flakes					
55.1.1[2]	Straight	Multiple lateral dorsal edges	27.9 (total)	Red River siltstone	10YR 4/6
69.2.1	Convex	Lateral dorsal edge	27.7	Ogallala quartzite	2.5YR 6/2
74.8.1	Straight	Lateral dorsal edge	10.5	Ogallala quartzite	10R 5/4
82.3.1	Irregular	Lateral ventral edge	13.5	Arkansas Novaculite fm. "green chert"	2.5Y 4/3
84.7.1	Straight	Lateral dorsal edge	6.7	Bowie chert	10YR 6/6
86.2.1	Concave	Lateral dorsal edge	19.8	Arkansas Novaculite fm. "green chert"	2.5Y 5/3
105.6.1	Straight	Distal dorsal edge	7.1	Ogallala quartzite	7.5YR 6/2
107.8.1	Irregular	Multiple later dorsal edges	28.0 (total)	Johns Valley Shale formation chert	10YR 4/1
121.2.1	Straight	Lateral dorsal edge	8.6	Ogallala quartzite	10R 4/4
121.3.1	Convex	Lateral dorsal edge	12.0	Ogallala quartzite	2.5YR 4/4
122.6.1	Irregular	Lateral and distal dorsal edges	23.0 (total)	Bowie chert	10R 4/4
122.9.1	Convex	Distal dorsal edge	16.3	Red River siltstone	7.5YR 4/4
123.2.1	Straight	Multiple lateral dorsal edges	20.7 (total)	Ogallala quartzite	10YR 5/3
123.4.1	Convex	Lateral dorsal edge	19.0	Ogallala quartzite	10R 4/3
123.7.3	Straight	Lateral dorsal edge	13.0	Ogallala quartzite	10YR 4/2
124.3.2	Straight	Lateral dorsal edge	9.7	Bowie chert	2.5YR 3/4
125.4.1	Straight	Lateral and distal dorsal edges	33.3 (total)	Quartzite from unidentified source	5YR 4/3
125.4.2	Irregular	Lateral dorsal edge	8.3	Woodford or Big Fork chert	10YR 4/2
126.1.1[2]	Convex	Distal dorsal edge	10.0	Bowie chert	2.5Y 6/1
Marginally Modified/Retouched					
77.4.1	Straight	Lateral dorsal edge	13.1	Arkansas novaculite	2.5Y 7/1
86.8.1	Straight	Lateral dorsal edge	6.0	Ogallala quartzite	10YR 5/4
98.6.1	Convex	Distal dorsal edge	19.8	Ogallala quartzite	5YR 5/4
110.10.1	Straight	Lateral dorsal edge	9.1	Unidentified chert (burned)	2.5YR 7/2
124.3.1	Irregular	Lateral dorsal edge	28.1	Red River siltstone	10YR 5/6
Steeply Retouched					
119.2.1	Straight	Lateral dorsal edge	28.0	Red River siltstone	10YR 5/6

Footnote:
[1] Identification Number includes unit, followed by level, followed by unique artifact number.
[2] These units excavated in 20-cm arbitrary levels.

Table 39
Cores Recovered from Site 41TT670

Identification Number[1]	Length (mm)	Width (mm)	Thickness (mm)	Weight (g)	Core Type	Raw Material	Color
71.6.1	58.1	27.5	21.1	50.4	Unidirectional, multiple platforms	cf. Potter chert	2.5YR 5/2
72.7.1	45.0	33.2	27.9	42.7	Multidirectional, multiple platforms	cf. Potter chert	10YR 6/3
105.7.1	30.0	18.1	18.8	16.8	Unidirectional, multiple platforms	Red River siltstone	2.5YR 6/6
106.8.1	29.0	26.0	13.0	13.4	Unidirectional, multiple platforms	Red River siltstone	2.5YR 5/6
116.7.1	50.0	27.5	19.0	28.1	Multidirectional, multiple platforms	Red River siltstone	10YR 6/3
123.7.4	25.0	27.0	17.0	8.6	Multidirectional, multiple platforms	Red River siltstone	10YR 6/6
123.7.5	47.0	23.0	12.9	26.3	Multidirectional, multiple platforms	Bowie chert	7.5YR 5/6
123.7.6	40.5	26.0	12.0	19.7	Unidirectional, multiple platforms	Ogallala quartzite	10YR 4/2
123.7.7	48.3	23.1	16.0	21.2	Unidirectional, multiple platforms	cf. Potter chert	10YR 6/2

Footnote:
[1] Identification Number includes unit, followed by level, followed by unique artifact number.

Material type frequencies are similar to those recorded at site 41BW553 (Table 40). Chert and quartzite dominate the complete debitage sample (n=1,692), with 27.9 percent (n=472) and 45.1 percent (n=763), respectively. Siltstone was much less commonly used at 41TT670 than at 41BW553 — its frequency is only 13.7 percent (n=231) at 41TT670, compared to 21.0 percent (n=183) at 41BW553. The frequency of novaculite is 4.5 percent (n=76), that of the "other" category is 4.0 percent (n=68), and that of unidentifiable material is 4.8 percent (n=82). When all debitage less than 6.3 mm in size is dropped out of the sample (leaving a total of n=1,141) the numbers change significantly (Table 41). The percentage of chert drops to 22.5 (n=257); that of quartzite rises to 51.0 (n=582), and that of siltstone falls to 13.0 (n=148). In addition, the frequency of novaculite drops to 3.7 percent (n=42). The "other" category rises only slightly, to 4.7 percent (n=54), as does the "unidentifiable" category (n=58, 5.1 percent). Again, the decrease in chert frequencies (though not as large as at site 41BW553) may indicate that either (1) the chert tools at the site were undergoing more fine retouching than tools made from other materials, producing significantly more microdebitage, or (2) the initial size of the raw material may have been smaller for chert than for other raw material types, thus yielding larger amounts of microdebitage.

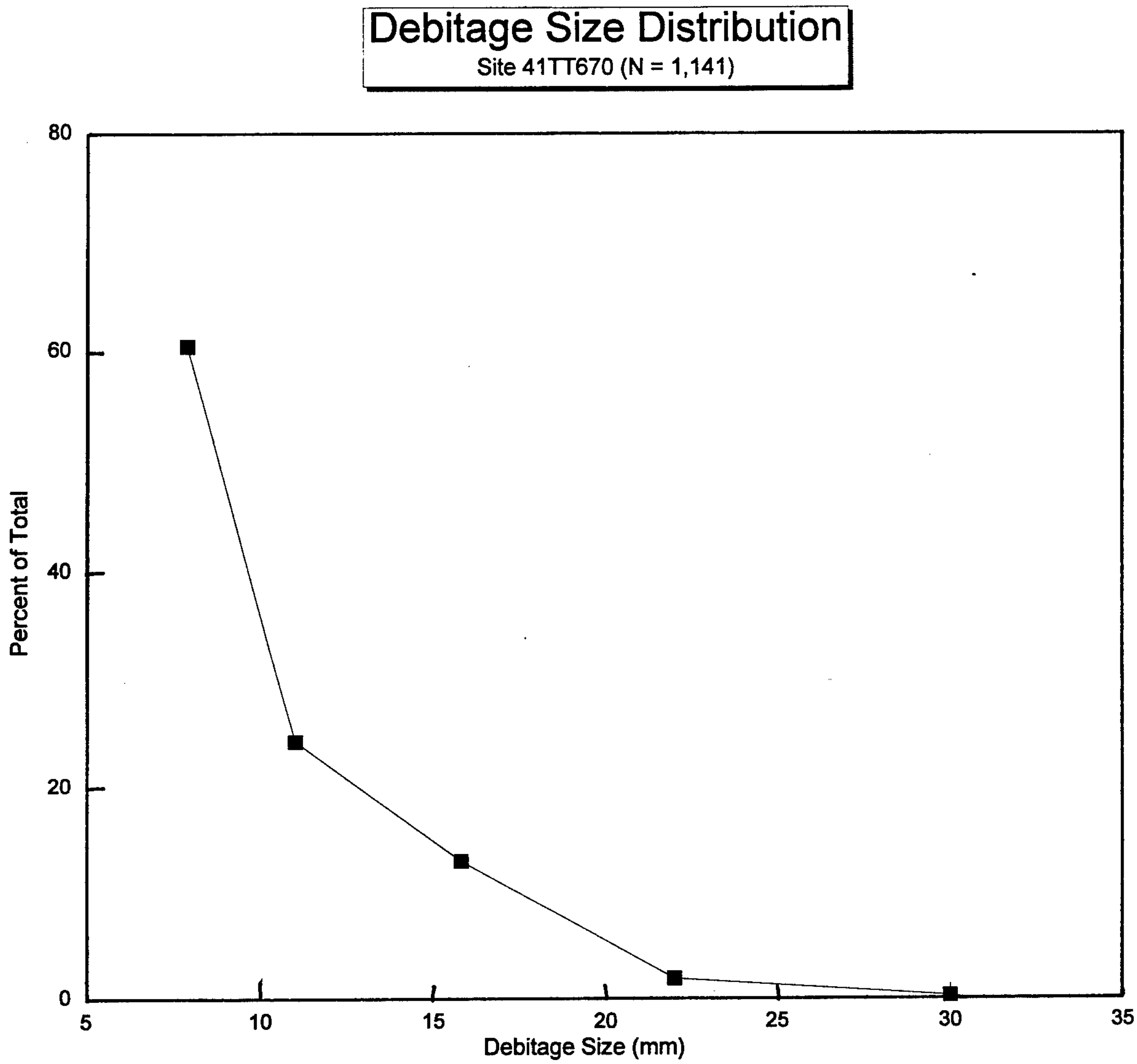

Figure 44. General debitage size distribution plot for site 41TT670.

A breakdown of debitage size by amount of dorsal cortex yields the expected exponential curve for tertiary flakes, while the curves for primary and secondary flakes are essentially flat (Figure 46). This is consistent with the data from site 41BW553. A plot of cortex type versus raw material type, indicates that chert and quartzite tools (particularly the latter) were being taken through to the final stages of bifacial production significantly more often than tools made from other material types (Figure 47). At site 41BW553, there was a close correlation between the percentage of debitage made of a particular raw material type and tools made of the same raw material type. No such strong correlation exists for the 41TT670 sample. Of the 77 tools, 26 (33.8 percent) are chert, as opposed to just 22.5 percent of the debitage (leaving out those flakes smaller than 6.3 mm, most of which were recovered from the flotation sample). This discrepancy suggests that some of the tools collected were manufactured elsewhere, either off the site or in an undiscovered lithic workshop area. Twenty-eight tools (36.4 percent) are quartzite, which makes up 51.0 percent of the debitage. Perhaps quartzite tools were being used elsewhere, or traded away. Siltstone constitutes 15.6 percent of the tool

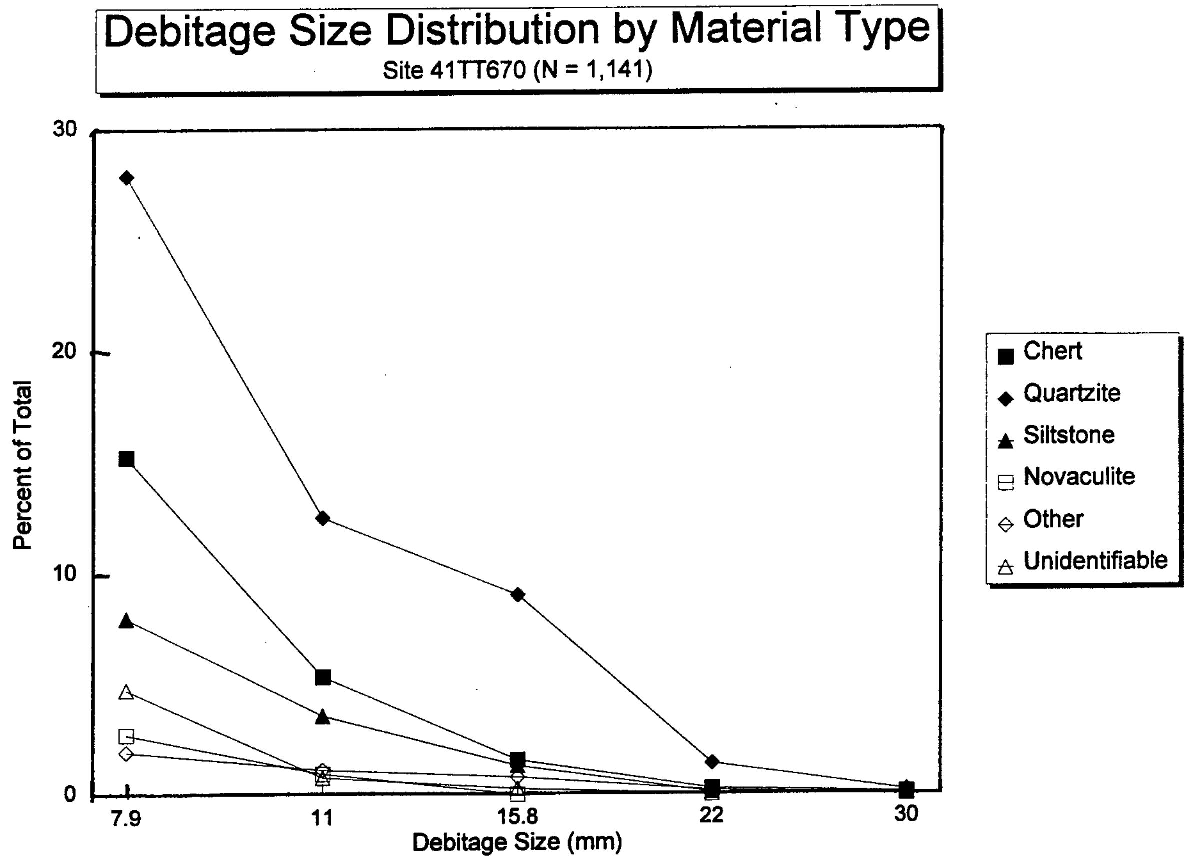

Figure 45. Debitage size distribution plot by raw material type, site 41TT670.

sample and 13.0 percent of the debitage. These numbers are similar enough to suggest onsite lithic reduction and usage in this case. The proportion of novaculite tools again outweighs the proportion of novaculite debitage by a ratio of 3-to-1. This suggests that most, or all, of the novaculite tools were made elsewhere and brought onto the site. The novaculite debitage may derive from tool-sharpening or reworking episodes. Both the "other" and the "unidentifiable" categories contained 2.6 percent of the tool sample, with adjusted debitage percentages of 4.7 and 5.1, respectively.

Summary of the Chipped Stone Data

The general analysis performed on the lithic sample from site 41TT670 suggests that lithic reduction at that site was oriented toward the production and maintenance of bifaces, using small river cobbles of local derivation. An examination of the percentages of various types of decortication debitage suggests that, while all stages of reduction were present on the site, most of the debris resulted from the end-stages of the bifacial reduction trajectory. Of the 77 chipped stone tools identified in the sample, 52 were bifaces. The remainder were unifaces, mostly expediently utilized flakes. Cores were uncommon, making up only .5 percent (n=9) of the chipped stone sample, and some of these may in actuality be very crude bifaces. This indicates that little initial lithic decortication and purely debitage-oriented lithic production was occurring on the site. This supposition is supported by the fact that only one hammerstone was recovered. It is assumed that a site

Table 40
Chipped Stone Raw Material Types Recovered from Site 41TT670

Raw Material	Tools			Debitage		Total
	Points	Bifaces	Unifaces	Flakes and Shatter	Cores	
Chert	5	10	11	472	1	499
Quartzite	8	11	9	763	4	795
Siltstone	4	4	4	231	4	247
Novaculite	—	6	1	76	—	83
Other[1]	1[2]	1[3]	—	68	—	70
Unidentifiable	—	2	—	82	—	84
Total	*18*	*34*	*25*	*1692*	*9*	*1778*

Footnotes:
[1] Category includes petrified wood, silicified wood, palmwood, ferruginous sandstone, and limestone.
[2] Made of petrified wood.
[3] Made of silicified wood.

Table 41
Percentages of Chipped Stone Raw Material Types Recovered from Site 41TT670

Raw Material	Tools	Percentage	Debitage[1] (All)	Percentage	Debitage[1] (>6.3 mm)	Percentage
Chert	26	33.8	472	27.9	257	22.5
Quartzite	28	36.4	763	45.1	582	51.0
Siltstone	12	15.6	231	13.7	148	13.0
Novaculite	7	9.1	76	4.5	42	3.7
Other[2]	2	2.6	68	4.0	54	4.7
Unidentifiable	2	2.6	82	4.8	58	5.1
Total	*77*	*100.00*	*1692*	*100.00*	*1141*	*100.01*

Footnotes:
[1] Does not include cores.
[2] Category includes petrified wood, silicified wood, palmwood, ferruginous sandstone, and limestone.

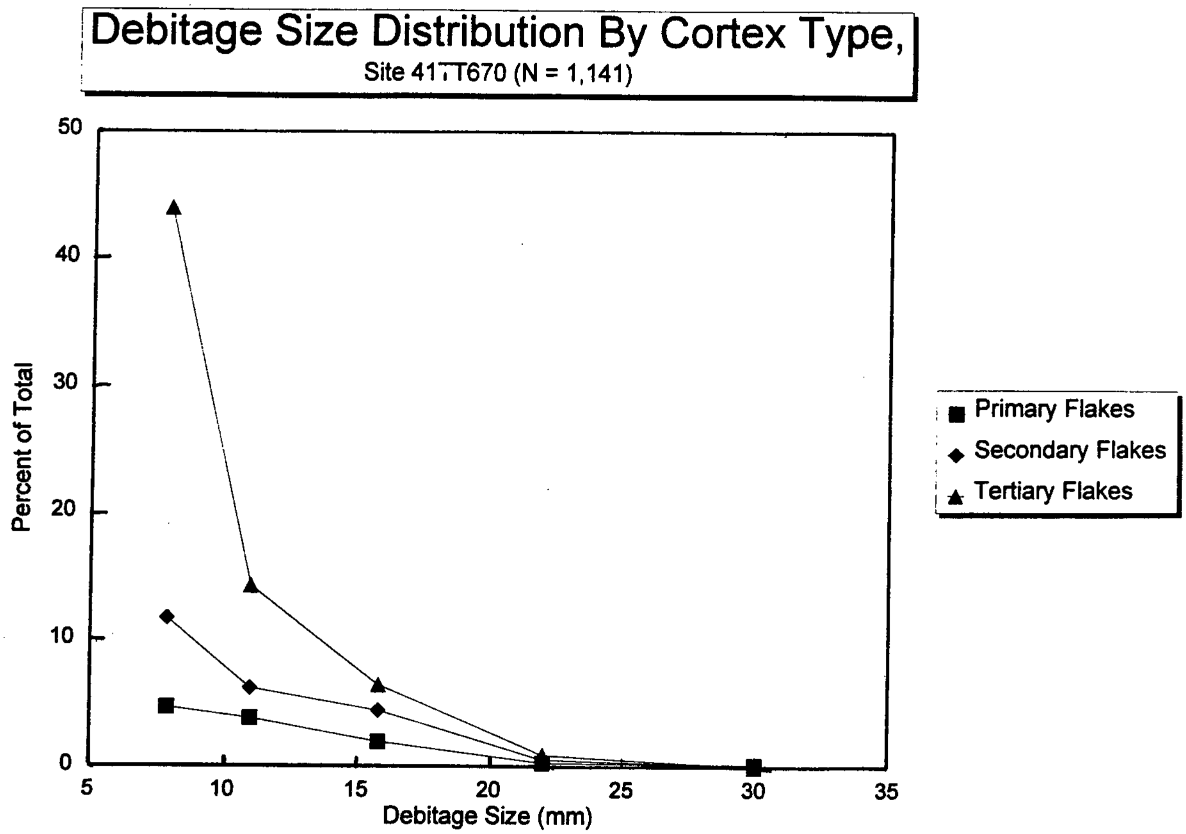

Figure 46. Debitage size distribution plot by cortex type, site 41TT670.

where debitage production or initial lithic reduction of source materials was important would produce a larger sample of hammerstones. Much of the debitage recovered from the site bore evidence of either heating (n=120; 7.1 percent) or burning (n=381; 22.5 percent), suggesting that heat-treatment of lithic material was a common occurrence, although not as common as at site 41BW553.

Chert, quartzite, and siltstone were the most often used raw material, although other materials, such as novaculite, limestone, petrified and silicified wood, and ferruginous sandstone, were sometimes utilized. Interestingly, for some categories of raw materials (chert, quartzite, and novaculite, in particular), the percentage of tools was a good deal higher than the percentage of debitage of those materials. This indicates that at least some of the tools were being made elsewhere; perhaps they were being traded in, or some percentage of the population was nomadic, making this site a part of their seasonal round. An alternate (and perhaps more likely) explanation is that some or most lithic reduction was occurring in an unidentified specific workshop area. Several sites, particularly 41TT668 and 41TT669, are located very close by and were, in all likelihood, outliers of the main site at 41TT670. Although this possibility has not been investigated, it is possible that one or more of these sites functioned as a specific activity area for site 41TT670.

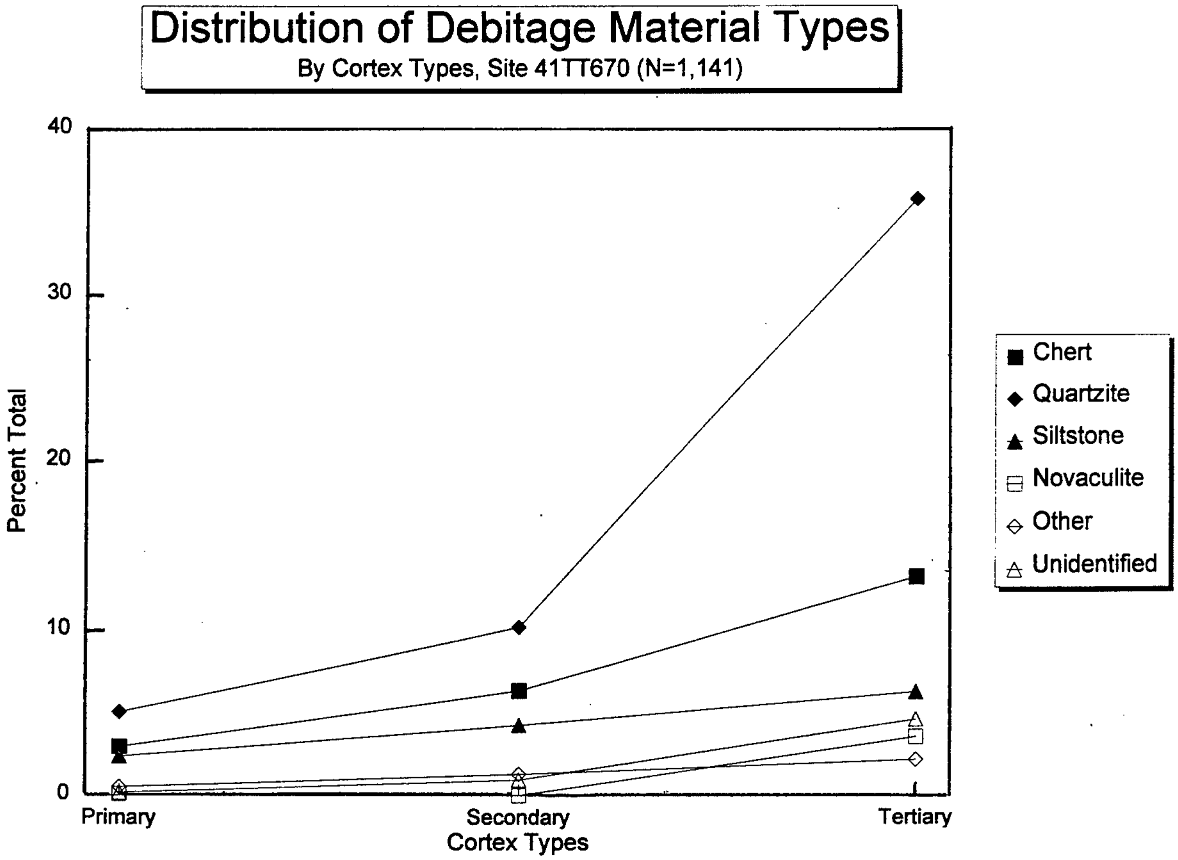

Figure 47. Distribution of debitage raw material types by cortex types, site 41TT670.

Ground/Pecked/Battered Stone

Only one tool falls into this particular category — a hammerstone collected from Test Unit 123, Level 3 (20-30 cm bs). This artifact is a quartzite cobble, measuring 51 mm long, 41 mm wide, and 38 mm thick, with a weight of 117.5 grams. One end is extremely battered. Aside from being the only hammerstone found on the site, it was also the only riverine cobble recovered. This piece is clear evidence that some initial lithic reduction was occurring at site 41TT670, but the very scarcity of this sort of artifact suggests the rarity of such activities.

Burned Rock and Baked Clay/Burned Earth

A total of 2,124.3 g of burned rock (n=135) was recovered from the test units excavated at 41TT670 (Table 42). Each of the three areas identified as containing high subsurface artifact densities (Areas A, B, and C), as well as one area northeast of the large slough in the center of the site, contained burned rock. By frequency and weight, most of these remains were recovered from Area A (n=92, 68 percent), and over half of this material came from the two southernmost test units (Test Units 84 and 123). Very little burned rock (14 percent) came from the midden (Feature 3), and only two burned rocks were found in the levels associated with the ash-filled hearth (Feature 2) located at the base of the midden. Presumably, the burned rock was discarded outside of the midden area, possibly down slope toward Test Units 84 and 123 where the

Table 42
Provenience of Burned Rock Recovered from Site 41TT670

Provenience	Sample (n)	Total Weight (g)	Raw Material Type
Area A			
Unit 84, Level 4 (30-40 cm bs)	1	4.10	Sandstone
Unit 84, Level 5 (40-50 cm bs)	1	6.70	Ogallala quartzite
Unit 84, Level 6 (50-60 cm bs)	1	25.40	Limestone
Unit 84, Level 7 (60-70 cm bs)	2	104.80	Ferruginous sandstone
Unit 84, Level 8 (70-80 cm bs)	1	16.10	Sandstone
	1	79.10	Ogallala quartzite
Unit 84, Level 9 (80-90 cm bs)	3	109.30	Ogallala quartzite
Unit 84, Level 10 (90-100 cm bs)	1	52.10	Ogallala Quartzite
Unit 123, Level 4 (30-40 cm bs)	1	10.10	Ogallala quartzite
Unit 123, Level 5 (40-50 cm bs)	8	15.80	Sandstone
Unit 123, Level 6 (50-60 cm bs)	11	94.00	Sandstone
Unit 123, Level 7 (60-70 cm bs)	1	2.50	Quartzite
	1	2.30	Petrified wood
	7	112.40	Sandstone
	6	31.10	Ferruginous sandstone
Unit 123, Level 8 (70-80 cm bs)	1	6.80	Quartz
	12	13.50	Sandstone
	13	173.60	Ferruginous sandstone
	1	4.90	Unidentifiable
Unit 123, Level 9 (80-90 cm bs)	1	12.80	Ogallala quartzite
Unit 124, Level 4 (30-40 cm bs)	1	2.10	Ferruginous sandstone
Midden (Levels 1-5 only)			
Unit 52, Level 1 (0-10 cm bs)	1	1.00	Sandstone
Unit 77, Level 4 (30-40 cm bs)	1	152.00	Ogallala quartzite
Unit 77, Level 9 (80-90 cm bs)	1	5.60	Ferruginous sandstone
Unit 120, Level 3 (20-30 cm bs)	1	3.70	Ogallala quartzite
Unit 120, Level 4 (30-40 cm bs)	1	16.40	Sandstone
Unit 120, Level 5 (40-50 cm bs)	1	7.10	Sandstone
Unit 120, Level 7 (60-70 cm bs)	1	26.00	Sandstone
	1	4.00	Ogallala quartzite
Unit 121, Level 1 (0-10 cm bs)	5	2.90	Ferruginous sandstone
	2	27.90	Ogallala quartzite
Unit 121, Level 5 (40-50 cm bs)	1	6.30	Ferruginous sandstone
Unit 121, Level 7 (60-70 cm bs)	1	9.80	Sandstone
Peripheral to Area A			
Unit 73, Level 3 (20-30 cm bs)	1	92.90	Sandstone
Unit 74, Level 8 (70-80 cm bs)	1	86.10	Ogallala quartzite

Table 42 (cont'd)

Provenience	Sample (n)	Total Weight (g)	Raw Material Type
Area B			
Unit 61, Level 6 (50-60 cm bs)	2	46.30	Ogallala quartzite
Unit 61, Level 7 (60-70 cm bs)	2	22.00	Ferruginous sandstone
Unit 62, Level 6 (50-60 cm bs)	1	4.70	Ogallala quartzite
Unit 62, Level 9 (80-90 cm bs)	1	27.20	Ogallala quartzite
Unit 125, Level 3 (20-30 cm bs)	1	35.80	Ogallala quartzite
Unit 125, Level 5 (40-50 cm bs)	2	51.30	Sandstone
Unit 125, Level 6 (50-60 cm bs)	5	113.40	Sandstone
BHT 127, Level 4 (45-60 cm bs)	4	21.00	Ogallala quartzite
BHT 127, Level 5 (60-75 cm bs)	1	2.70	Ogallala quartzite
Area C			
Unit 89, Level 6 (50-60 cm bs)	1	14.70	Ogallala Quartzite
Unit 91, Level 4 (30-40 cm bs)	1	33.20	Sandstone
Unit 91, Level 8 (70-80 cm bs)	2	32.40	Sandstone
	1	3.60	Ferruginous sandstone
	1	4.40	Unidentifiable
Unit 95, Level 6 (50-60 cm bs)	2	9.30	Ogallala quartzite
Unit 119, Level 5 (40-50 cm bs)	3	59.10	Sandstone
Peripheral to Area C			
Unit 93, Level 9 (80-90 cm bs)	1	25.80	Ferruginous sandstone
Northeast of Large Slough			
Unit 104, Level 4 (30-40 cm bs)	4	91.20	Sandstone
Unit 104, Level 7 (60-70 cm bs)	1	21.10	Sandstone
Unit 104, Level 8 (70-80 cm bs)	1	49.70	Sandstone
Unit 105, Level 7 (60-70 cm bs)	1	8.50	Sandstone
	1	7.10	Ferruginous sandstone
	1	16.00	Ogallala quartzite
Unit 107, Level 7 (60-70 cm bs)	1	102.60	Quartzite
Total	*135*	*2,124.3*	

greatest number of burned rocks (n=62) were recovered from Levels 6-9 (50-90 cm bs). However, a midden was not observed in these units and no clear concentration of burned rock was identified. It seems likely that much of the burned rock at site 41TT670 was being removed to that area from the midden located approximately 50 m upslope, and it may represent a dumping area.

As noted above, most of the burned rock at site 41TT670 was recovered from Areas A, B, and C. In fact, the only burned rock found away from these three areas was recovered from Test Units 104, 105, and 107, immediately northeast of the large slough in the center of the site (see Figure 28). These units yielded 7 percent of the burned rock recovered from the site (n=10).

The most frequent types of raw material used for burned rock at site 41TT670 were Ogallala quartzite (n=28; 721.5 g), ferruginous sandstone (n=34; 384.9 g), and sandstone (n=61; 755.6 g). Other raw material types include silicified wood (n=1), limestone (n=1), and quartzite (n=2). In addition, two pieces of unidentifiable stone were present. Ferruginous sandstone is found in the underlying bedrock (i.e., Wilcox Group) in this area (Cliff and Hunt 1995:70).

Three hundred and eight fragments of burned or baked clay, totaling 533.7 g, were recovered from site 41TT670 as well. Although the occurrence of baked clay in the archeological record has often been related to the presence of architecture, it may also be the result of hearth residue. Almost all of the units that contained burned rock at site 41TT670 also contained baked clay, thus indicating use associated with hearth construction. The horizontal distribution of baked clay is very similar to that of burned rock. Areas A, B, and C, as well as the area northeast of the large slough, yielded baked clay, with the greatest amount recovered in Area A (77 percent). Although none of this material can be positively identified as wall daub, 40 pieces did appear to have impressions of some sort on one side, supporting the view that they are indeed daub fragments. Almost half of these impressed pieces were recovered from Level 4 (30-40 cm bs) of Test Units 120 and 121, which contained very little burned rock, suggesting the possibility of a structure at this locality. In contrast, 22 percent of all of the baked clay found at site 41TT670 (n=36; 117.5 g) was recovered in the same Test Unit 120 in Levels 4 and 5 (30-50 cm bs) — associated with the ash filled hearth (Feature 2) — suggesting use in hearth construction. Outside of this, only a small amount of baked clay (4 percent) was recovered from the midden, while the greatest overall amount of baked clay (n=122; 184.5 g) came from the two southernmost units of Area A (Test Units 84 and 123). Again, it appears that the burned clay was being discarded down slope of the midden area.

FAUNAL AND MACROBOTANICAL REMAINS

Vertebrate Remains

Identifiable vertebrate remains from site 41TT670 include fish, turtle, and mammal (Table 43). Of the fish remains, bowfin and unidentified, small and medium-sized bony fishes were found to be present. Turtle remains are represented by shell portions but were too fragmentary for further identification, with the exception of some carapace peripheral fragments which were identified as Kinosternidae (mud or musk turtle) and one carapace fragment identified as a possible box turtle (cf. *Terrapene* sp.). The list of identifiable mammals recovered is limited to rodent (of which only one gopher was identified), deer, and medium-sized artiodactyl (probably also deer).

Unfortunately, a taphonomic discussion of the faunal remains from site 41TT670 is not wholly representational in that the quantity of material recovered is more reflective of the amount of degradation and recovery methods used, rather than providing a reliable and comparative database. Thus, general trends are probably a better indicator, more so than actual frequencies for this sample. At site 41TT670, every specimen (n=727) is fragmented, but eight exhibit spiral or fresh bone fractures. All of the specimens exhibit light weathering, although the small size of most of the fragments made assessment of marked deterioration through weathering difficult. Five hundred and forty-two of the recovered remains are burned (75 percent), of which 197 are charred and 345 calcined, thus indicating use as a food source. None of the specimens exhibit rodent gnawing and none of the specimens have cut marks. This is probably due to the small size and the fragmented condition of most of the remains.

Due to the size of most of the specimens recovered (84 percent from flotation) and the low frequency of identified taxa, little dietary, cultural, or ecological information can be gleaned from the data. The presence of fish and kinosternid turtles at the site indicates exploitation of riverine or wetland resources, while the presence of box turtle and deer indicates terrestrial exploitation of forest or forest edge habitat species.

Table 43
Vertebrate Remains Recovered from Site 41TT670

Taxon	Common Name	No. of Individual Specimens Present
Vertebrata	Vertebrates	651
Osteichthyes	Small bony fish	2
Osteichthyes	Medium bony fish	1
cf. Osteichthyes	Medium bony fish	4
Amia calva	Bowfin	1
Testudinata	Turtles	30
Kinosternidae	Mud and musk turtles	2
cf. *Terrapene* sp.	Box turtles	2
Mammalia (Medium/large)	Canid/deer-sized mammals	29
Mammalia	Mammals	1
Rodentia (Medium)	Rat-sized rodent	1
Geomys sp.	Pocket gophers	1
Artiodactyla (Medium)	Deer/pronghorn-sized ungulates	1
Odocoileus sp.	Deer	1
Subtotal		*727*

Aside from burning and spiral fracturing, little specific or diagnostic cultural modification was noted on any of the faunal material. Thus, the patterns of cultural exploitation, butchering, or use of these taxa by humans cannot be realistically assessed with this sample. Most of the faunal material (86 percent) was recovered from the midden (Feature 3). This is probably a result of the numerous small faunal fragments found during the processing of the flotation samples (all of the flotation samples were taken from the midden area). However, the midden also produced the greatest amount of faunal material recovered during screening at the site (78 percent). An additional 18 percent of the faunal specimens were recovered in the immediate area surrounding the midden and only 4 percent was found elsewhere (two from Test Unit 61). This suggests any number of specialized activities, such as food preparation, butchering, cooking, etc., occurring within the midden and the immediate area, but the midden may also represent a dumping area. Of additional interest is the near lack of faunal materials recovered from Test Unit 123, which contained the greatest amount of burned rock and baked clay. It has been suggested that the burned rock was being removed to that area from the midden and may represent a dumping area away from the midden. If this is the case, the faunal debris was not being collected along with the burned rock.

Molluscan Remains

Of the 119 freshwater bivalve fragments collected and analyzed, 21 could be identified as to species (Table 44). The majority of the specimens were recovered from the midden. Twelve fragments are burned, which is suggestive of utilization as a food source. Four species are represented in the sample, including *Amblema plicata*, *Lampsilis teres*, *Quadrula quadrula*, and *Potamilus purpuratus*. The predominant species, *Amblema plicata,* inhabits pooled areas of streams where the water is three to five feet deep. *Potamilus purpuratus* occupies a similar habitat. The other two species, *Lampsilis teres* and *Quadrula quadrula* inhabit shallow and riffle areas of streams. This suggests that the prehistoric occupants of site 41TT670 were exploiting the resources of relatively small, pooled deep water areas alternating with shallow, riffle zones.

Table 44
Identified Freshwater Bivalvia from Site 41TT670

Taxa	Number of Specimens
Family Unionidae	
Amblema plicata (Say)	7
Lampsilis teres (Rafinesque)	5
Quadrula quadrula (Rafinesque)	5
Potamilus purpuratus (Lamarck)	4
Total	*21*

Site 41TT670 is presently surrounded by shallow and relatively deep pooled areas of water which appear stagnant, lacking the flow necessary to produce riffled or choppy water. However, the tributaries of White Oak Creek which surround the site may occasionally become active during periods of heavy rainfall.

Macrobotanical Remains

Macrobotanical remains recovered at site 41TT670 by flotation and excavation include charcoal, wood, and seeds (see Appendix F). The majority of the wood charcoal recovered from site 41TT670 has been identified as *Carya*, and a considerable amount of *Carya* shell fragments were recovered (Table 45). Unfortunately, the species (pecan or hickory) could not be determined. Other species identified in the charcoal sample include *Ulmus* (elm) and *Celtis* (hackberry). Although common in the area today, only one specimen of *Ulmus* was recovered (from Level 4 of Test Unit 61 in Area B). The *Celtis* charcoal was recovered in Area A (Test Unit 123, Level 4, and Test Unit 120, Levels 5 and 6, adjacent to Feature 2). Several fragments of *Carya* charcoal were recovered from Feature 1 (a probable posthole) in Test Unit 122. *Carya* charcoal and shell fragments were also recovered from the fill of the hearth in Test Unit 120 (Feature 2), along with additional fragments identified only as hardwood charcoal. In the area of the midden (Feature 3), charcoal fragments, including *Carya* charcoal and *Carya* shell fragments, were found both within and below the midden. It is possible from this data to suggest that the occupants of 41TT670 were burning *Carya* and *Celtis* for fuel and most likely eating *Carya* nuts as well.

Several of the samples taken from the midden also contained seeds identified as *Juniperus* (cedar; n=7) and *Chenopodium* (goosefoot; n=38). *Chenopodium* seeds were recovered both charred and uncharred, and could have served as a food source, along with *Carya*. However, the smallness of the sample size prevents any reliable conclusions concerning the economic use of *Chenopodium* seeds at the site. Cedar is more likely to have served a nonfood function, such as for wood, oil, or incense. The only other seeds encountered at site 41TT670 include several from the Fabaceae (legume) family, of which one is identified as cf. *Lupinus*, and one possibly from the Euphorbiaceae (spurge) family. Both of the Fabaceae seeds were found near the surface and are uncharred; and as a result, they are felt to probably be modern. The Euphorbiaceae seed was recovered from below the midden in Unit 121 and is probably also a modern contaminant. The identified trees — *Carya* (hickory or pecan), *Celtis* (hackberry), *Ulmus* (elm), and *Juniperus* (cedar) — are all local species common to the area today.

Table 45
Identified Macrobotanical Remains from Site 41TT670

Provenience	Identified Remains
Feature 1 (posthole?)	
Unit 122, Level 4 (44-53 cm bs)	Hardwood charcoal, *Carya* charcoal, *Carya* shell fragments
Feature 2 (hearth)	
Unit 120, Level 5 (40-50 cm bs)	*Carya* charcoal, *Carya* shell fragments
Feature 3 (midden)	
Unit 52, Level 1 (0-20 cm bs)	Hardwood charcoal
Unit 120, Level 5 (40-50 cm bs)	cf. *Celtis* charcoal, *Carya* charcoal
Unit 120, Level 6 (50-60 cm bs)	*Carya* shell fragments
Unit 121, Level 1 (0-10 cm bs)	Hardwood charcoal, *Juniperus* seeds-6, shell fragments, *Carya* shell fragments, Fabaceae cf. *Lupinus* seed (uncharred)
Unit 121, Level 2 (10-20 cm bs)	*Carya* charcoal, *Chenopodium* seeds-3, shell fragments, *Carya* shell fragments, Fabaceae seed (uncharred)
Unit 121, Level 3 (20-30 cm bs)	*Carya* charcoal, *Carya* shell fragments, *Chenopodium* seeds-17, *Juniperus* seed-1
Unit 121, Level 4 (30-40 cm bs)	*Carya* charcoal, *Chenopodium* seeds-10, *Carya* shell fragments
Unit 121, Level 5 (40-50 cm bs)	*Carya* charcoal, *Chenopodium*
Below Feature 3 (midden)	
Unit 121, Level 5 (40-50 cm bs)	cf. *Carya* shell fragments
Unit 121, Level 6 (50-60 cm bs)	Shell fragments, *Carya* shell fragments
Unit 121, Level 7 (60-70 cm bs)	*Carya* shell fragments, cf. Euphorbiaceae seed-1
Unit 121, Level 8 (70-80 cm bs)	*Carya* shell fragments
Unit 121, Level 9 (80-90 cm bs)	*Chenopodium* seeds-4, *Carya* shell fragments
Unit 121, Level 10 (90-100 cm bs)	*Carya* shell fragments
Unit 122, Level 9 (80-90 cm bs)	Hardwood charcoal, *Carya* shell fragments
Unit 122, Level 10 (90-100 cm bs)	*Carya* charcoal, *Carya* shell fragments
Unit 122, Level 11 (100-118 cm bs)	*Carya* shell fragments (nut fragments)
General Excavation Fill	
Unit 61, Level 4 (30-40 cm bs)	*Ulmus* charcoal
Unit 91, Level 4 (30-40 cm bs)	Hardwood charcoal
Unit 91, Level 5 (40-50 cm bs)	*Carya* charcoal
Unit 114, Level 6 (50-60 cm bs)	Hardwood charcoal
Unit 119, Level 3 (20-30 cm bs)	*Carya* charcoal
Unit 123, Level 4 (30-40 cm bs)	*Celtis* charcoal
Unit 125, Level 4 (30-40 cm bs)	cf. *Carya* charred wood
BHT 127, Level 9 (75-90 cm bs)	Hardwood charcoal

IDENTIFICATION AND DATING OF COMPONENTS

The identification of components at site 41TT670 presents some problems, resulting largely from an inadequate understanding of the use-life of particular artifact types, and the practice of dividing what is essentially a continuum of development into discrete, archeological periods, which we then tend to think of as mutually exclusive. Add to this the difficulties caused by tentative type identifications of artifact fragments (i.e., sherds) and one has an idea of the problems caused by the data base at site 41TT670.

Ignoring the artifacts for a moment, a series of absolute dates (OCR and AMS) from a stratified midden (Feature 3) and hearth (Feature 2) in Area A provides a good starting point for identifying the components present at the site. A series of seven stratified soil samples taken from a column in Test Unit 120 provided a series of reasonable and interpretable OCR dates (Table 46) for Feature 3, Feature 2, and the horizon below Feature 2. On the basis of these dates, Feature 3, a Caddoan midden, appears to date largely to the Middle Caddoan period, from about A.D. 1160 to A.D. 1280. Feature 2, an intact hearth lying immediately below the midden, appears to date largely to the Early Caddoan period, from about A.D. 1140 to A.D. 1230. Finally, the sediments below Feature 2 appear to date to the Formative/Early Caddoan period, from about A.D. 910 to A.D. 1080. It is important to remember that the depositional context of site 41TT670 as a whole is aggrading colluvium derived from the hill south of the site, which explains the sequence of dates derived from the OCR samples.

Table 46
Oxidizable Carbon Ratio (OCR) Dates from Site 41TT670

Sample Number	Provenience	Depth (cm)	OCR Age Years B.P.	Calendrical Age [1]
ACT - 1974	Feature 3 (Test Unit 120)	7-10	687 ± 20	A.D. 1243 (1263) 1283
ACT - 1975	Feature 3 (Test Unit 120)	17-20	713 ± 21	A.D. 1216 (1237) 1258
ACT - 1976	Feature 3 (Test Unit 120)	25-28	762 ± 22	A.D. 1166 (1188) 1210
ACT - 1977	Feature 2 (Test Unit 120)	35-38	746 ± 22	A.D. 1182 (1204) 1226
ACT - 1978	Feature 2 (Test Unit 120)	40-43	788 ± 23	A.D. 1139 (1162) 1185
ACT - 1979	Below Feature 2 (Test Unit 120)	49-51	1005 ± 30	A.D. 915 (945) 975
ACT - 1980	Below Feature 2 (Test Unit 120)	63-66	898 ± 26	A.D. 1026 (1052) 1078

Footnote:
[1] Calendrical age ranges are one-sigma (68 percent probability).

In addition to the OCR dates, two AMS dates were also run on samples from this area of the site (Table 47). The first sample, a nut shell from near the top of Feature 3, gave an unacceptably late date (A.D. 1640-1950) and is rejected as being on a recent shell. The other sample, taken from near the base of Feature 2, yielded a more acceptable date, and generally supports the OCR dates for the feature. Although the calibrated standard deviation of the AMS date is wider than those of the OCR dates, it supports a date for Feature 2 within the Early-Middle Caddoan period, between cal. A.D. 1045 to A.D. 1280, with an intercept of cal. A.D. 1220 (see Table 47 and Appendix H).

Table 47
Radiocarbon Dates from Site 41TT670

Laboratory Number	Provenience	Material	^{14}C Age Years B.P.[1]	$^{13/12}C$ (‰)	$^{13/12}C$ Age Years B.P.[1]	Calibrated Age and Intercepts[2]
Beta - 94630	Top of Feature 3 (Test Unit 121, Level 2)	*Carya* shell	280 ± 70	-27.8	240 ± 70	A.D. 1640 (1660) 1680 and A.D. 1755 to 1805 and A.D. 1940 to 1950
Beta - 94627	Base of Feature 2 (Test Unit 120, Level 5)	*Carya* shell	860 ± 100	-26.1	840 ± 100	A.D. 1045 to 1105 and A.D. 1115 (1220) 1280

Footnotes:
1 All date ranges one-sigma (68 percent probability).
2 Calibrated date ranges are one-sigma (68 percent probability); calibrations are based on Stuiver et al. 1993.

Thus, the OCR dates, and the single AMS date support the dating of Feature 2 to the Early Caddoan period and Feature 3 to the Middle Caddoan period. However, the use of this terminology implies the existence of at least two components in this area — a view which is not supported by the data. Indeed, the lack of any clear stratigraphic break between Feature 2 and Feature 3 suggests a continuous occupation, which began in the Early Caddoan period, sometime between A.D. 1050 and A.D. 1150, with the construction and use of a ground-level hearth, and continued into the early part of the Middle Caddoan period, until approximately A.D. 1280.

Diagnostic artifacts recovered from this area (i.e., from Test Units 120, 121, and 122) include a Red River pipe stem fragment from Test Unit 120, Level 2 (10-20 cm bs; OCR date range A.D. 1216-1258); one sherd typed as Pennington Punctated-Incised, one sherd typed as Williams Plain, and one Gary, *var. Kaufman* dart point from Test Unit 122, Level 3 (20-30 cm bs; OCR date range A.D. 1166-1210); one large, untyped contracting stem dart point (knife?) from Test Unit 122, Level 4 (30-40 cm bs; OCR date range A.D. 1182-1226); one Gary, *var. Hobson/Colfax* dart point from Test Unit 121, Level 7 (60-70 cm bs; OCR date range A.D. 1026-1078; and one reworked Edgewood dart point from Test Unit 121, Level 9 (80-90 cm bs). All of these artifacts except the Gary *var. Hobson/Colfax* point and the Edgewood point appear to be associated with the putative Early-Middle Caddoan occupation in this area. The Gary *var. Hobson/Colfax* point and the Edgewood point are from levels below Feature 2 and may come from one or more earlier occupations, possibly Late Archaic to Early Ceramic (although the OCR date from Level 7 [63-66 cm bs] argues against this in at least the case of the Gary point).

In the immediate vicinity of Feature 3, several diagnostic artifacts were recovered close enough to the surface to suggest an association with the latter part of this Early-Middle Caddoan occupation. These include a reworked Gary, *var. Kaufman* point from Test Unit 79, Level 2 (10-20 cm bs), and a Bonham arrow point from Unit 81, Level 1 (0-10 cm bs). Two sherds identified as Holly/Hickory Fine Engraved from Test Unit 80, Level 6 (50-60 cm bs), may be associated with the early part of this occupation. To the southeast of Feature 3, the adjacent Test Units 84 and 123 yielded a number of ceramic diagnostics which probably date to this occupation, although what part is not so clear. Test Unit 84 yielded one sherd of Holly/Hickory Fine Engraved from Level 4 (30-40 cm bs), and one sherd of Williams Incised from Level 7 (60-70 cm bs); while Test Unit 123 yielded one sherd of Holly/Hickory Fine Engraved from Level 5 (40-50 cm bs), one sherd of Holly/Hickory Fine Engraved and one of Williams Plain from Level 6 (50-60 cm bs), and one sherd identified as Pease Brushed-Incised from Level 7 (60-70 cm bs), in association with a dart point identified as Gary, *var. Kemp*. The presence of a possible sherd of Pease Brushed-Incised from this deep in this area suggests that either (1) all of this material belongs to the latter part of the Early-Middle Caddoan occupation, or (2) it represents a mixture of earlier and later material and can only be referred to the Early-Middle Caddoan occupation as a whole. It should also be noted that ceramics drop out below Level 8 (80 cm bs) in this area and the presence of a Palmillas point (Test Unit 123, Level 8 [70-80 cm bs]), and Gary, *var. Kemp* and Gary, var. unidentified points (Test Unit 123, Level 9 [80-90 cm bs]) from the deeper levels suggests an earlier Late Archaic-Early Ceramic occupation in this area as well.

Elsewhere on the site, the ceramic sample appears very similar to the material associated with the putative Early-Middle Caddoan occupation in Area A and it is difficult to separate out earlier from later material. In Area B, for example, Test Unit 125 yielded sherds identified as Sinner Linear-Punctated, Davis Incised, and Holly/Hickory Fine Engraved, all from Level 5 (40-50 cm bs) and it is difficult to decide if this material is mixed or represents the latter part of the Early-Middle Caddoan occupation, but the preponderance of thinner-walled sherds in the Level 5 sample suggests the latter. A drill on an untyped arrow point from Test Unit 125, Level 3 (20-30 cm bs), a reworked Edgewood point from Test Unit 125, Level 6 (50-60 cm bs), and a Gary, var. unidentified point from Test Unit 61, Level 7 (60-70 cm bs), may also be associated with the Early-Middle Caddoan component in this area.

Overall, Area C and the adjacent units yielded fewer ceramics and of those that were recovered, most were undecorated. In addition, low numbers of artifacts in the upper levels of many units in this area suggests a more deeply buried occupation zone that was the case in Area A. Finally, a number of dart points were recovered in this area suggesting a Late Archaic-Early Ceramic occupation. In the densest part of Area C, Test Unit 89 yielded one Gary, *var. Runge* point from Level 5 (40-50 cm bs), and one reworked Gary, var. unidentified point from Level 6 (50-60 cm bs). Neither of these were associated with any ceramics, and only one sherd was recovered from Level 4 (30-40 cm bs). The adjacent Test Unit 119 yielded one Gary, *var. Gary/Kaufman* point from Level 5 (40-50 cm bs). This same level contained four sherds, but the entire unit as a whole contained only five sherds. The other units in Area C (i.e., Test Units 87, 88, 91, and 95) yielded only 11 more sherds, five of them too small to be analyzed. The nearby Test Unit 86 yielded one sherd identified as Holly/Hickory Fine Engraved from Level 6 (50-60 cm bs) and a Gary, *var. Emory* point from Level 8 (70-80 cm bs). To the north of Area C, Test Unit 97 yielded a Gary, *var. Hobson* from Level 5 (40-50 cm bs), and seven sherds (including one identified as Pennington Punctated-Incised) from Level 6 (50-60 cm bs); while Test Unit 108 yielded no ceramics, and a Gary, *var. Hobson* point from Level 8 (70-80 cm bs).

On the basis of this data, it is suggested that the earliest component on site 41TT670 dates to sometime during the Late Archaic or Early Ceramic period. Evidence from Area A and Area C, as well as the northern portion of the site, suggest one or more occupations in these areas. Artifacts believed to date to this time period include a Gary, *var. Hobson/Colfax* dart point, a Gary, *var. Kemp* dart point, a Gary, var. unidentified dart point, an Edgewood dart point, and a Palmillas dart point from Area A; a Gary, *var. Runge* dart point, a Gary, *var. Gary/Kaufman* dart point, a Gary, *var. Emory* dart point, and a Gary, var. unidentified dart point from Area C or the immediate vicinity; and two Gary, *var. Hobson* dart points from north of Area C.

The primary occupation at the site, located in the south central (Area A) and southwestern (Area B) areas is believed to date to the Early and Middle Caddoan periods, between about A.D. 1050 and A.D. 1280, and to have been a residential occupation. With larger ceramic samples it may be possible to subdivide this occupation into several ceramic phases, but this can only be hinted at on the basis of this study. Ceramic types believed to be associated with this occupation as a whole include Holly/Hickory Fine Engraved, Pennington Punctated-Incised, Davis Incised, Williams Plain, and Williams Incised. In addition, the later types Pease Brushed-Incised and Sinner Linear-Punctated probably appeared at the end of this occupation. Also present, at least by the end of this occupation, were Red River pipes and Bonham arrow points. The lithic sample believed to be associated with this occupation also includes several dart point types, probably collected and reused from the earlier component. These include Gary, *var. Kaufman*, Gary, *var. Kemp*, Gary, var. unidentified, and Edgewood types.

CHAPTER 7
SUMMARY AND RECOMMENDATIONS

by
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The final chapter of this report is intended to summarize the results of the testing conducted at sites 41BW553 and 41TT670 in the White Oak Creek Wildlife Management Area (WMA), to discuss their significance, and to present recommendations for their future treatment. The first section of this chapter consists of a research summary and compares the two sites in terms of their age, spatial organization, artifact content, and potential function. The second section discusses the significance of the two sites and their potential for providing important data, and concludes by presenting recommendations for treatment of each site.

SUMMARY OF RESEARCH RESULTS

The 1996 testing conducted at sites 41BW553 and 41TT670 involved the hand excavation of 40 30-x-30-cm shovel tests, 123 50-x-50-cm squares, eight 1-x-1-m and three 1-x-0.5 m test units, and seven auger holes, as well as the machine excavation of seven backhoe trenches. Within the two sites, eight cultural features were identified, including one spatially limited midden at each site; a hearth and posthole at site 41TT670; and two postholes, an artifact/ecofact concentration, and a possible burial beneath the midden at site 41BW553.

Archaic, Early Ceramic, and Early, Middle, and Late Caddoan components were identified at site 41BW553, while Archaic and/or Early Ceramic, and Early-Middle Caddoan components are believed to be present at site 41TT670. Both sites are present within aggraded Holocene deposits on top of older Pleistocene landforms. Site 41BW553 is within Holocene flood deposits originating from the Sulphur River, while site 41TT670 is within Holocene colluvial deposits eroded from a higher Pleistocene terrace to the south of the site. In both cases, these deposits appear to have been aggrading during the time that the archeological remains were being deposited, resulting in some stratification and the partial burial of the more recent cultural deposits. The archeological deposits at site 41BW553 cover approximately 56,000 m^2 and extend to a depth of 100 cm in the most intensively occupied southern and central portions of the site. All of the features were located in the central site area, including a single posthole (Feature 1); an artifact/ecofact concentration, possibly a trash dump (Feature 3); a possible posthole (Feature 5); a midden (Feature 6); and an apparent burial containing a complete ceramic vessel (Feature 7). Site 41TT670 covers an area of approximately 39,375 m^2 and extends to a maximum depth of 110 cm. The most intensive occupation/activity area occurred near the center of the southern edge of the site, where a probable posthole (Feature 1), an in situ hearth (Feature 2), and a midden (Feature 3) were discovered. The midden at site 41BW553 measures approximately 19 m long by 11 m wide and is about 36-40 cm thick. The midden at site

41TT670 is smaller, measuring only 8 m long by 4.5 m wide, but it also extends to a maximum of 40 cm below the surface.

Both sites appear to have important Caddoan components, although the primary occupation at each one dates to a different period. Previous site testing and excavation in and around the WMA (Brewington et al. 1995; Cliff, Green, Hunt, Shanabrook, and Peter 1996; Cliff and Hunt 1995) suggests that at least three Caddoan ceramic phases can be identified in this area (Table 48). All of these phases have been radiocarbon dated, although the ceramic samples from sites 41CS150, 41CS151, and 41CS155/156 all suffer from small sample problems. The data from these sites indicate that the ceramic changes generally associated with the transition from Early to Middle Caddoan, occurred around A.D. 1300 in the White Oak Creek area, rather than 1200, and may have involved the addition of new coarse (or utility) wares, such as Pease Brushed-Incised, and Sinner Linear Punctated, to earlier fineware types, such as Hickory and/or Holly Fine Engraved, Crockett Curvilinear Incised, and Davis/East Incised. The Late Caddoan period (A.D. 1400-1680), in contrast, is notable for the addition of a broad range of new fineware engraved types, along with some new coarsewares, but with the continuation of Pease Brushed-Incised. The Murphy Branch site (41MX5) has yielded what appears to be a complete assemblage from this time period (Brewington et al. 1995).

Table 48
Tentative Caddoan Ceramic Chronology for the White Oak Creek Area

Early Period (A.D. 1000-1300)[1]	Middle Period (A.D. 1300-1400)[2]	Late Period (A.D. 1400-1680)[3]
41CS151-Area C (A.D. 1040-1225) 41CS155/156 (A.D. 1265-1300)	41CS150 (A.D. 1300-1415)	41MX5 (A.D. 1375-1475)
Holly Fine Engraved	Hickory Fine Engraved	Barkman Engraved
Crockett Curvilinear Incised	Holly Fine Engraved	Belcher Engraved
Pennington Punctated Incised	Crockett Curvilinear Incised	Hempstead Engraved
Davis/East Incised	Davis/East Incised	Avery Engraved
		Friendship/Hodges Engraved
Duren Neck Banded	Pease Brushed Incised	Ripley Engraved
Weches Fingernail Impressed	Sinner Linear Punctated	Simms Engraved
Williams Plain	Canton/Maydelle Incised	Hatchel Engraved
Red River, var. Haley pipe		Nash Neck Banded
		Pease Brushed Incised
		Maydelle Incised
		Emory Punctate
		McKinney Plain

Footnotes:
[1] Data from Cliff and Hunt 1995:75-146, 147-208.
[2] Data from Cliff and Hunt 1995:43-74.
[3] Data from Brewington et al. 1995:99-141, 157-160.

The recovery of late ceramic types from the midden at site 41BW553 (cf. Barkman Engraved, Nash Neck Banded, and Maydelle Incised), together with a series of late radiocarbon and OCR dates from the same feature, points toward a strong Late Caddoan component at that site. In addition, the presence of what has been identified as Holly or Hickory Fine Engraved and a Red River, Miller's Crossing variety pipe, together with early radiocarbon and OCR dates, from beneath the Late Caddoan midden indicates an earlier, less significant, Early Caddoan component. Finally, a possible Middle Caddoan component is suggested by the association of Hickory/Holly Fine Engraved, Pease Brushed-Incised, possibly McKinney Plain, and a Red River, Haley variety pipe in the northern part of the site. Site 41TT670, in contrast, shows a strong Early-Middle Caddoan component (ca. A.D. 1050-1280), with Pennington Punctated Incised, Holly and/or Hickory Engraved, Davis Incised, Williams Plain, Williams Incised, and possibly Pease Brushed-Incised and Sinner Linear Punctated, as well as Red River, Miller's Crossing or Graves Chapel variety pipes. In addition to the Caddoan remains, there is some evidence for Early Archaic and Terminal Archaic/Early Ceramic material at site 41BW553, while site 41TT670 may contain a Late Archaic or Early Ceramic occupation as well.

Sufficient testing was done at both sites 41BW553 and 41TT670 to recover roughly comparable samples of both artifacts and ecofacts from each one. A quick examination of the samples from each site reveals some immediate differences in regard to the amount of perishable materials, the frequency of ceramics and lithics, and the amount of burned rock present. The amount of perishable material present (i.e., bone, macrobotanical remains, etc.) largely varies with the depositional context, and relates most to the presence of midden deposits and mussel shell (Table 49).

Table 49
Comparison of Excavated Contents of Sites 41BW553 and 41TT670

Cultural Remains	41BW553[1]	41TT670[2]
Ceramics	712[3]	566[3]
Lithic Tools		
Arrow Points	2	1
Dart Points	10	18
Bifaces	18	34
Unifaces	10	25
Subtotal	**40**	**77**
Lithic Debitage		
Cores	4	9
Flakes/Shatter	873[3]	1,692[3]
Subtotal	**877**	**1,701**
Ground/Battered Stone	5	1
Total Lithics	**922**	**1,779**
Total Ceramics and Lithics	**1,634**	**2,345**
Burned Rock (g)	586.9	2,143.3
Baked Clay (g)	100.5	533.7
Vertebrate Faunal Remains	1,703	709
Mussel Shell	18	21
Macrobotanical Remains (g)	42.4	25.3

Footnotes:
[1] Excavated volume of cultural zone from site 41BW553 = 7.76 m^3.
[2] Excavated volume of cultural zone from site 41TT670 = 13.36 m^3.
[3] Includes contents of flotation samples; only light fraction measured.

Site 41BW553 has significantly more ceramics than does site 41TT670 — ceramics make up 43.6 percent of the artifact sample from 41BW553 (not including burned rock and baked clay), but only 24.1 percent of the sample from 41TT670. This may be due to the presence of a strong Late Caddoan component at the former site. In regard to the amount of lithic material present, however, the opposite is true. At site 41TT670, lithic material makes up 75.9 percent of the artifact sample, as opposed to 56.4 percent for site 41BW553. This suggests that lithic reduction may have been more important at the former site. One important caveat, however, must be considered — although in some areas cultural material was collected to a depth of 100 cm or more, by and large the cultural deposits at site 41BW553 tended to be shallower than those at site 41TT670. At 41BW553, 7.8 m^3 of culture-bearing sediments were removed during the course of the excavations, as opposed to 13.3 m^3 at site 41TT670 (no attempt has been made to determine the total amount of soil moved at each site). In light of this difference, it is possible that the greater amount of lithics recovered from site 41TT670 is a function of the amount of cultural deposits excavated, rather than any real difference in the nature of the occupation. An examination of the ratios of lithics per volume of cultural fill excavated (118.8 lithics/m^3 for 41BW553 versus 133.2 lithics/m^3 for 41TT670) suggests that this may be the case. The ratio of ceramics per volume of cultural sediments fill, however, (91.8 sherds/m^3 for 41BW553 versus 42.4 sherds/m^3 for 41TT670) strengthens the view that ceramics were more common at the former site.

As for the proportion of lithic tools present (including aborted bifaces), the two sites have surprisingly similar tools ratios — 4.36 for site 41BW553 versus 4.33 for site 41TT670. As used here, the tool ratio represents the proportion of both bifacial and unifacial chipped stone tools in relation to the total chipped stone assemblage (i.e., tool ratio = number of chipped stone tools/total number of chipped stone x 100). Presumably, as this ratio decreases, it reflects an increased amount of non-tool-making activities. For example, a quarry site would theoretically have a low tool ratio reflecting a concentration on lithic reduction activities, a kill/butchering site would have a high tool ratio reflecting a concentration on a nonreduction activity, and a campsite would fall somewhere in between reflecting a mixture of activities. The tool frequencies from both sites are relatively low (less than five percent), indicating that no intensive specialized lithic activities were occurring in the excavated portions of either site. Cliff and Hunt (1995:211) observed similar frequencies in most of the areas they examined at sites 41CS150, 41CS151, and 41CS155/156, although a tool ratio of 13.0 was observed in one area of site 41CS151. The low tool ratios for 41BW553 and 41TT670 may at least partially reflect multiple reoccupations with changing site functions. Interestingly, the tool ratios observed within the middens at each site are very low (1.52 for 41BW553 and 2.8 for 41TT670; Table 50), suggesting that the lower tool ratios may be a function of a lack of focus on intensive lithic use in the midden areas. This fits with the observation by Cliff and Hunt (1995:214) that:

> Taking the Caddoan occupation areas [of sites 41CS150, 41CS151, and 41CS155/156] as a whole, it appears that the norm is for a moderate tool index overall (ca. 6.0-8.0), and a low (or very low) tool index within midden areas (ca. 1.0-5.0), the latter possibly related to the function of such features as trash disposal areas.

In regard to frequency of burned rock, the differences between the two sites are striking. At site 41BW553, only 27 fragments of burned rock, weighing 587 g, were recovered from across the site area. Most of this was concentrated in and around the midden, and in the southeastern portion of the site. At site 41TT670, in contrast, 135 fragments of burned rock, weighing 2,143.3 g, were recovered — about twice as much (41BW553 yielded 75.6 g/m^3 versus 160.4 g/m^3 at 41TT670). This larger amount of burned rock cannot be attributed merely to the larger volume of cultural deposits excavated at 41TT670. Some other factor appears to have been in play. The individual specimens of burned rock from 41TT670 tend, also, to be larger than those from 41BW553. More than half of the material from site 41TT670 (55 percent) came from two units south of the midden (Test Units 84 and 123), and it is possible that much of the burned rock at this site was in secondary context and that it was removed to that area from a primary use-area located elsewhere. No such area was identified at site 41BW553, but it is possible that such a dump is present at that site and was simply not located. Burned rock would have had numerous uses, including food and lithic material preparation, and even sporadic occupations should produce a significant amount of burned rock over the centuries.

Table 50
Comparison of Midden Contents from Sites 41BW553 and 41TT670

Material	41BW553 Feature 6[1]	41TT670 Feature 3[2]
Ceramics	208	76
Lithic Tools		
Arrow Points	2	—
Dart Points	—	2
Bifaces	1	5
Unifaces	2	3
Subtotal	**5**	**10**
Lithic Debitage		
Cores	1	—
Flakes/Shatter	327	340
Subtotal	**328**	**340**
Ground/Battered Stone	-	-
Total	**333**	**350**
Bone tools		
Awl	1	—
Burned Rock (g)	—	217.3
Baked Clay (g)	44.8	120.8
Vertebrate Faunal Remains	1,484	627
Mussel Shell	107	114
Macrobotanical Remains (g)	13.7	9.3

Footnotes:
[1] Includes contents of midden levels in Units 30, 67, 75, 76, 79, 80, and 84, as well as flotation samples from Unit 67; excavated volume of Feature 6 = 0.556 m^3.
[2] Includes contents of midden levels in Units 52, 53, 77, 120-122, as well as flotation samples from Unit 122 & Feature 2 in Unit 120; excavated volume of Feature 3 = 1.047 m^3.

A total of 376 ceramics were analyzed from site 41BW553, while the sample for site 41TT670 was slightly higher, at 427 (Table 51). As a whole, the texture of the pottery can be subjectively classed as ranging from fine to irregular, judging from the pattern of breakage observed in the sample sherds. Grog (i.e., crushed sherd) temper was most frequent in the overall sample, followed by bone, both as a secondary inclusion accompanying grog and as a primary inclusion. A few sherds show fine to medium quartzitic sand or grit inclusions, which are interpreted as being primarily natural inclusions in the original clay raw material; although there is, admittedly, no direct evidence of this. The interpretation of sand as a natural inclusion is based on the predominance of other types of tempering materials in Caddoan pottery that are clearly added deliberately. Pottery color was found to range from the 2.5YR light and dusky reds, through the 5YR reddish browns, the 7.5YR strong browns, and the 10YR yellowish browns. The majority of the specimens, however, fall into the 7.5YR and 10YR ranges. Smoke smudging, whether from firing or from usage, is common on these sherds, typically being heavier on the interior surfaces. Most sherds have been smoothed to a greater or lesser extent, and a few show a level of smoothing that approaches burnishing. Observed designs fall most often on sherds from rims, necks, and shoulders or near-shoulder body areas of vessels.

The overwhelming majority of the analyzed sherds from these two sites are undecorated, from grog-tempered vessels with fairly well-smoothed surfaces. It is possible that some of these sherds represent plain types, such

Table 51
Comparison of Analyzed Ceramics from Sites 41BW553 and 41TT670

Ceramic Variable	Site 41BW553		Site 41TT670	
	Frequency	Percentile	Frequency	Percentile
Decorated Surface				
Incising	43	58.0	52	46.0
Incising, punctating	6	8.0	4	3.5
Punctating	8	10.8	30	27.0
Punctating, brushing	1	1.4	1	0.8
Punctating, incising	0	—	6	5.4
Engraving	3	4.1	0	—
Fine engraving	5	6.7	4	3.5
Applique	4	5.4	0	—
Applique, incising	0	—	1	0.8
Finger pinching	1	1.4	0	—
Brushing	1	1.4	0	—
Indeterminate	2	2.7	15	13.0
Subtotal	**74**	**20.0**	**113**	**26.0**
Undecorated (Plain) Surface				
Subtotal	**302**	**80.0**	**314**	**74.0**
Temper				
Clay/grog	316	84.0	354	83.0
Clay/grog, bone	12	3.0	46	10.7
Clay/grog, shell	5	1.3	0	—
Clay/grog, sand	4	1.0	2	0.4
Clay/grog, hematite	1	0.3	6	1.5
Clay/grog, grit/rock	1	0.3	7	1.7
Clay/grog, limestone	0	—	1	0.2
Clay/grog, indeterminate	1	0.3	1	0.2
Shell	2	0.5	0	—
Shell, clay/grog	1	0.3	0	—
Bone	9	2.4	1	0.2
Bone, clay/grog	17	4.5	7	1.7
Bone, sand	1	0.3	0	—
Bone, hematite	1	0.3	0	—
Grit/rock	1	0.3	0	—
Grit/rock, bone	1	0.3	0	—
Sand	1	0.3	1	0.2
None visible	1	0.3	1	0.2
n/a	1	0.3	0	—
Total	**376**	**100**	**427**	**100**
Core Type				
Oxidized, no core	56	14.9	81	18.9
Oxidized, diffuse margins	10	2.6	23	5.4
Reduced, diffuse margins	103	27.4	117	27.4
Reduced, no core	170	45.2	169	39.6
Reduced, sharp margins	36	9.6	37	8.7
Indeterminate	1	0.3	0	—
Total	**376**	**100**	**427**	**100**

Table 51 (cont'd)

Ceramic Variable	Site 41BW553		Site 41TT670	
	Frequency	Percentile	Frequency	Percentile
Identified types[1]				
cf. Barkman Engraved	1	6.7	0	—
Bullard Brushed	1	6.7	0	—
Maydelle Incised	2	13.3	0	—
Nash Neck Banded	2	13.3	0	—
McKinney Plain	1	6.7	0	—
Pease Brushed Incised	1	6.7	1	7.1
Sinner Linear Punctated	0	—	1	7.1
Davis Incised ?	0	—	1	7.1
Holly/Hickory Fine Engraved	6	40.0	6	42.9
Pennington Punctated-Incised	1	6.7	2	14.3
Williams Incised	0	—	2	14.3
Williams Plain	0	—	1	7.1
Total	**15**	**100**	**14**	**100**
Unanalyzed Specimens	336	—	119	—

Footnotes:
[1] Measured in Minimum Number of Vessels

as Williams Plain or McKinney Plain, but because it is usually impossible to tell if plain sherds come from plain vessels or from the undecorated portions of decorated vessels, a secure type identification was not made for these. That said, it is nonetheless possible to make a few comparisons between sites, on the basis of surface decoration, temper inclusions, inferred firing atmosphere (based on sherd core types, as explained in Chapter 4), and frequencies of identified ceramic types. Incising was the most popular method of surface decoration at both sites, followed by punctating, engraving, and combinations of the above. Punctating was more than twice as common in the sample from site 41TT670, suggesting that this decorative mode was more important in the Early and Middle Caddoan periods than in the Late Caddoan period. Furthermore, the lack of a significant amount of punctating in Early and Middle Caddoan samples from the eastern portion of the White Oak Creek WMA (i.e., from sites 41CS150, 41CS151, and 41CS155/156) also suggests a cultural boundary between the eastern and western portions of the WMA in the Early and Middle Caddoan periods. Punctating combined with incising, and applique with incising, are unique to site 41TT670; while coarse engraving, punctating with brushing, plain applique, neck banding, and brushing was present only in the 41BW553 sample.

Grog was the most common type of temper at both sites, accounting for 84 percent of the sample at 41BW553 and 83 percent at 41TT670 (see Table 51). These strikingly similar percentages may reflect a traditional method of tempering ceramics which, though the surface decorations and other factors varied, remained constant over both space and time within the White Oak Creek area. Whatever the case, other tempering materials were somewhat uncommon, and most are some variations of clay/grog temper with additional inclusions such as bone, shell, sand, hematite, grit/rock, limestone, and indeterminate materials. Shell temper was unique to site 41BW553 (2.1 percent). The most common tempering combination is grog and bone. At site 41BW553, this accounts for 7.5 percent of the sample (3 percent grog/bone, 4.5 percent bone/grog), while at 41TT670 it makes up 12.4 percent (10.7 grog/bone, 1.7 percent bone/grog). Overall, grog and grog mixture tempers characterized 95 percent of the ceramic sample from site 41BW553, and 99.4 percent of the sample from site 41TT670.

Evidence of firing atmospheres were based on the core types of the ceramics observed. Again, the percentages are very similar (see Table 51). Oxidized sherds (i.e., those fired in an atmosphere containing plenty of oxygen) made up 17.6 percent of the sample from site 41BW553 and 24.3 percent of the sample from site 41TT670. Some 82.2 percent of the 41BW553 sample and 75.7 percent of the 41TT670 sample was fired in a reducing environment.

Lithic raw material types present in the site samples were also compared (Table 52). Unfortunately, raw material usage appears to show no strong trends, although there does seem to be some minimal correlation between spatial location and the types of lithic materials used. For example, site 41BW553 shows a higher proportion of chert in comparison to quartzite (34.3 percent for chert versus 28.0 percent for quartzite), although this trend reverses itself if flakes smaller than 6.3 mm are removed from the sample. In contrast, site 41TT670 shows a markedly higher proportion of quartzite in comparison to chert (44.7 percent for quartzite versus 28.3 percent for chert). Although the samples are small, this suggests that the occupants of 41BW553, located north of the Sulphur River, had greater access to chert than did the occupants of site 41TT670, farther west along White Oak Creek. In regard to nonlocal material (i.e., siltstone and novaculite, material types not likely to be found within the Sulphur River basin in Bowie and Titus counties), it is clear that, while occupants of both sites had access to such nonlocal materials, the occupants of 41BW553 had greater access. Of the total amount of chipped stone from 41BW553, 5.5 percent was identified as novaculite and 20.7 percent as siltstone, as compared to 4.7 and 13.9 percent, respectively, for site 41TT670. This pattern could result if the occupants of 41BW553 had a greater need for and/or access to nonlocal raw material than did the occupants of 41TT670, and were able to satisfy it by obtaining material from the Red River basin to the north. The discrepancy may be related merely to the fact that site 41BW553 is north of the Sulphur River and is closer to the Red River by some 35 km.

Table 52
Frequencies of Lithic Raw Material Types for Sites 41BW553 and 41TT670

Raw Material Type	41BW553		41TT670	
	Frequency	Percentile	Frequency	Percentile
Chert[1]	316	34.3	499	28.0
Quartzite	261	28.3	796	44.7
Novaculite[1,2]	51	5.5	83	4.7
Siltstone[1,2]	191	20.7	247	13.9
Silicified Wood	13	1.4	14	.8
Petrified Wood	10	1.1	32	1.8
Petrified Palmwood[1]	1	.1	0	—
Limestone	1	.1	6	.3
Quartz	0	—	1	.1
Hematite	1	.1	0	—
Limonite	1	.1	0	—
Ferruginous Sandstone	8	.9	17	1.0
Unidentifiable	68	7.4	84	4.7
Total	*922*	*100*	*1,779*	*100*

Footnotes:
[1] Lithic types classified as being fine-grained material.
[2] Lithic types classified as being nonlocal in origin (i.e., not available within the Sulphur River basin).

Subsistence data, consisting of faunal and macrobotanical remains, were concentrated in the middens at both sites (Table 53). At site 41BW553, faunal remains were found almost exclusively in the midden, but macrobotanical remains were present throughout the site. Preservation was good in the middens at both sites, although it is obvious that the site 41BW553 midden had a greater density of preserved material (e.g., vertebrate faunal material density is 2,670 specimens/m^3 at site 41BW553, and just 644 specimens/m^3 at site 41TT670). It should be cautioned that much of the material at both sites was fragmentary. Similar vertebrate assemblages were collected from both middens. It is clear from the taxa identified that the inhabitants of both sites were exploiting riverine/lacustrine resources (fish and turtles) as well as forest resources (deer/artiodactyla, squirrel/medium-sized rodent, and indeterminate mammals). Despite this, there are some differences in the samples. Gar, drum, and bowfin fish remains were collected from the 41BW553 midden but not from the 41TT670 midden, while the 41TT670 midden similarly lacks the turkey, small-medium-sized mammal, squirrel, and rabbit/hare remains present in 41BW553's midden. This may indicate that the people at 41TT670 were not exploiting these resources. However, it must be remembered that the data may have more to do with sampling error than actual dietary biases by the occupants of either site.

Mollusc shell was collected from both middens, though not in great quantities. Only 11.1 percent (18 of 162) of the specimens at site 41BW553 and 17.5 percent (21 of 120) of those from site 41TT670 were identifiable. Four species were identified, three of them common to both sites — *Amblema plicata, Lampsilis teres,* and *Quadrula quadrula*. One species, *Potamilus purpuratus*, was unique to site 41TT670. Their presence suggests that the occupants of these sites were exploiting narrow, clear, swift-flowing streams with gravelly riffle zones. Although no such watercourses were identified near either site today, this does not preclude the possibility that such watercourses were nearby during the period of occupation. It is clear from their presence that bivalves served as a food source for the occupants of both sites, although lack of preservation precludes us from determining how important a food source they actually were. The presence of similar species from the two middens suggests that bivalve exploitation was constant both spatially and temporally.

As for the macrobotanical remains, based on the material recovered, it appears that nuts from one or more species of *Carya* (e.g., pecan or hickory), were an important wild food source for the occupants of both sites. *Carya* shell fragments make up the bulk of the identifiable subsistence remains. Fabaceae (legume), Euphorbiaceae (spurge), goosefoot (*Chenopodium*), sorrel (*Oxalis*), and juniper seeds were also identified, although most of these are uncharred and are probably of modern origin. Some of the *Chenopodium* seeds were charred and it is possible that they represent economic usage by the prehistoric occupants of site 41TT670 but, given the ubiquity of this taxon, the amount of seeds recovered is too small to unequivocally indicate this was the case.

Thus, an examination of the artifact samples from both sites reveals some striking similarities in the types of raw materials used to produce both lithic and ceramic artifacts, in the technological methods employed to create them, in the frequencies and types of lithic tool types employed, and even in the types of occupations detected at both sites. Subsistence was also similar at both sites — hickory or pecan nuts were important wild foods, as were deer, rabbit, squirrel, and riverine species (particularly turtles). The same species of shellfish were also consumed. Differences between the sites may relate to the density of faunal materials recovered, to the frequencies of some lithic material types used, to site size, and the like. Some of these attributes, however, are functions of resource accessibility, landform type, varying levels of organic preservation within the middens, the limited database collected during the excavations, and quite probably the nonrandom methods used in the excavations of both sites. The sites are by no means identical, but they are very similar, and we believe reflective of a cohesive sociocultural milieu which incorporated the White Oak Creek region at least, and most likely extended to elsewhere in the Great Bend area as well as to Caddoan regions outside the state of Texas.

Table 53
Comparison of Subsistence Data from Midden Contexts, Sites 41BW553 and 41TT670

Subsistence Data	41BW553[1] Late Caddoan (A.D. 1400-1680)	41TT670[2] Early-Middle Caddoan (A.D. 1000-1300)
Molluscan Faunal Remains (number of fragments)		
Amblema plicata	5	7
Lampsilis teres	10	5
Potamilus purpuratus	0	4
Quadrula quadrula	3	5
Subtotal	**18**	**21**
Vertebrate Faunal Remains (number of fragments)		
Vertebrate	1,324	626
Small bony fishes	8	2
Medium bony fishes	1	2
Gar	5	0
Drum	1	0
Bowfin	1	0
Turtle	59	27
Mud/musk turtle	5	4
Large Bird	1	0
Turkey	1	0
Indeterminate mammal	2	0
Small/medium mammal	2	0
Medium/large mammal	64	20
Medium rodents	0	1
Pocket gopher	0	1
Squirrel	2	0
Rabbits/hares	6	0
Medium artiodactyla	2	0
Deer	0	1
Subtotal	**1,484**	**684**
Macrobotanical Remains		
Carya nutshell (g)	7.2	9.0
Juniperus seed	1	7
Oxalis seed	1	0
Fabaceae seed	2	2
Chenopodium seed	0	34

Footnotes:
[1] Includes contents of midden levels of Units 30, 67, 75, 76, 79, 80, and 84, plus flotation samples from a 30-x-30 cm column adjacent to Unit 67; excavated volume of Feature 6 = .556 m^3.
[2] Includes contents of Units 52, 53, 77, 120-122, as well as flotation sample from Unit 121; excavated volume of Feature 3 = .972 m^3.

ASSESSMENT OF SITE SIGNIFICANCE AND RECOMMENDATIONS

As discussed in Chapter 4, assessment of the significance of cultural resource properties in general is determined by the criteria for eligibility for nomination to the National Register of Historic Places (NRHP) that are set forth in 36 CFR §60.4. Sites 41BW553 and 41TT670 can be evaluated only under the fourth criterion for eligibility for nomination to the NRHP. Any consideration of a property under this criterion must address whether the property contains information that may contribute to our understanding of history or prehistory, and whether that information is important. In this regard, a series of research problems specific to the White Oak Creek WMA, and five historic contexts, and associated study units, for East Texas were also discussed (see Table 2).

The testing program conducted at sites 41BW553 and 41TT670 was designed to provide a full assessment of:

(1) the *content* of the cultural deposits at each site (i.e., the range of artifactual and feature information available);
(2) the *integrity* of the deposits at each site (i.e., the degree of disturbance, mixing, bioturbation, deflation, etc.); and, finally,
(3) the *context* of the cultural deposits at each site, in relation to both the natural and cultural environment of the appropriate time period.

The fundamental data derived from the testing program can be used to evaluate each of the sites and its potential for increasing our knowledge of past lifeways, contributing to the resolution of regionally pertinent research questions, or containing information relevant to any of the historic contexts, and their associated study units, for East Texas. Based on the results of the testing, sites 41BW553 and 41TT670 appear to contain data relevant to three of the five, defined historic contexts for East Texas (Table 54). Both sites are most relevant to the context, *The Development of Agriculture in Northeast Texas before A.D. 1600*, and have the potential for yielding data relevant to most of the study units presently listed under this context. In regard to the other two defined contexts, *Changes in Hunter-Gatherer Mobility in Northeast Texas* and *The Emergence of Sedentism in Northeast Texas, ca. 500 B.C. to A.D. 1000*, both sites have the potential for yielding relatively pure artifact samples which would relate to some, but not all, of the study units defined for these contexts (see Table 54).

In regard to the criteria for research potential, and by extension National Register eligibility, discussed previously, the results of the testing program indicate that both of the prehistoric sites reported upon here have good contextual integrity, although not every portion of each site is equally intact. In regard to the presence of isolable components, whether vertical or horizontal in nature, data have been presented in the applicable site descriptions that site 41BW553 was most intensively occupied during the Late Caddoan period, with less intensive Archaic (possibly Early Archaic), Terminal Archaic/Early Ceramic, Early Caddoan, and possibly Middle Caddoan components. Site 41BW553 appears to be characterized by both horizontal and vertical separation of material. Site 41TT670, particularly the heavily occupied southern end, yielded evidence of a strong Early-Middle Caddoan occupation, with an earlier Late Archaic or Early Ceramic component in the eastern and northern portion of the site.

In regard to the necessity of such components yielding datable materials or diagnostic artifacts that will permit the assignment of the component to particular time periods, both sites contain sizable ceramic and lithic assemblages as well as macrobotanical remains that can be used for radiometric dating. Furthermore, the moderately successful application of OCR dating to features and midden deposits at both sites adds an additional dating technique not available previously.

Finally, the presence of middens and features with preserved faunal and macrobotanical remains has been confirmed for both sites. At site 41BW553, Feature 6 is a midden that has been dated to the Late Caddoan period; while an Early-Middle Caddoan midden has been identified as Feature 3 at site 41TT670. In addition, two possible prehistoric postholes (Features 1 and 5) were identified at site 41BW553, as was a trash dump containing faunal, lithic, and ceramic material (Feature 3), as well as a possible human burial complete with a ceramic vessel (Feature 7). Finally, beneath the midden at 41TT670 an apparent hearth of Early Caddoan age (Feature 2) was identified. Both of the middens have proved to contain calcined bone and macrobotanical remains, as have the postholes and trash dump feature at site 41BW553.

Table 54
Historic Contexts and Associated Study Units for Northeast Texas for Which Sites 41BW553 and 41TT670 May Yield Relevant Data

Historic Context and Relevant Study Units	Relevant Data Sets from 41BW553 and 41TT670
Changes in Hunter-Gatherer Mobility in Northeast Texas (Fields and Tomka 1993)	
(1) Chronology and Typology	Stratified Soil Samples for OCR Dating
(2) Settlement Systems and Site Planning	Site Location and Site Plan
(3) Trade and Exchange	Local and Nonlocal Lithic Raw Materials
(4) Technological Change/Material Culture	Lithic Tools and Debitage
The Emergence of Sedentism in Northeast Texas, ca. 500 B.C. to A.D. 1000 (Perttula et al. 1993)	
(1) Settlement Systems	Stratified Soil Samples for OCR Dating
(2) Intra- and Interregional Exchange and Interaction	Site Location and Site Plan
(3) Material Culture Characterizations	Local and Nonlocal Lithic Raw Materials
(4) Technological Change	Lithic Tools and Debitage
The Development of Agriculture in Northeast Texas before A.D. 1600 (Perttula. 1993a)	
(1) Chronology and Typology	Features for Radiocarbon Dating
(2) Settlement Systems	Stratified Soil Samples for OCR Dating
(3) Subsistence Systems	Site Location and Site Plan
(4) Demographic Change	Faunal and Macrobotanical Remains
(5) Mortuary Practices	Mortuary and Osteological Remains
(6) Local and Extra-local Trade and Exchange	Local and Nonlocal Lithic Raw Materials
(7) Technological Change	Ceramics for Petrographic Analysis
(8) Material Culture	Ceramics for Typological Analysis
	Lithic Tools and Debitage

Prior to testing, Site 41BW553 was believed to contain data relevant to both the Formative Caddoan and Late Caddoan periods in Northeast Texas, while site 41TT670 contained data indicating a strong Formative-Early Caddoan occupation along with a minor Middle-Late Caddoan occupation. As a result of the current research, it is now clear that the primary occupation at 41BW553 was Late Caddoan, while the primary occupation at 41TT670 was Early-Middle Caddoan. In addition, both sites also contain evidence of minor occupations during the Archaic and/or Early Ceramic, and other Caddoan periods. Given the data collected thus far, it is clear that both sites have the potential for producing a large amount of data relating to subsistence and economic patterns during these periods, and for increasing our understanding of Caddoan history in the White Oak Creek area.

Thus, on the basis of the testing operations conducted at sites 41BW553 and 41TT670, it is felt that both sites definitely have a high research potential and it is recommended that both be nominated for inclusion in National Register of Historic Places (NRHP). Both sites exhibit relatively intensive Caddoan components, with high-density midden areas and buried Archaic and/or Early Ceramic components of unknown derivation. Furthermore, site 41BW553 contains what appears to be a human burial, and may contain additional burials which should not be disturbed if at all possible. Fortunately, neither site is located in an area of proposed construction or development, so site preservation may easily be accomplished through avoidance.

In light of the recommended NRHP status of these sites, if any future development or construction is proposed which will adversely these sites, steps should be taken to preserve and protect them, or to mitigate the loss of data should protection not prove to be feasible. In particular, it is recommended that, in the very least, the immediate vicinities of the middens on both sites (41BW553's Feature 6 and 41TT670's Feature 3) be preserved and protected from any potential impacts, and that monitoring be conducted during any proposed construction, timbering, or other development.

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APPENDIX A

SELECTED PROFILE DESCRIPTIONS FROM SITES 41BW553 AND 41TT670

by
Debra L. Beene, Floyd B. Largent, Jr., and Whitney J. Autin

SELECTED PROFILE DESCRIPTIONS FROM SITES 41BW553 AND 41TT670

All soil colors were derived from a Munsell Color Chart, using moist samples unless otherwise indicated.

41BW553

Depth (cm)	Zone	Soil Horizon	Description
Auger Test 1: N499/E500			
0-15	1	A	Brown (10YR 5/3) slightly loamy sand; abundant rootlets; gradual boundary.
15-60	2	B	Yellowish brown (10YR 5/6) sandy loam; common rootlets; abrupt boundary.
60-70	3	C	Light yellowish brown (10YR 6/4) loam; abrupt boundary.
70-90	4	2Bt	Mottled light gray (10YR 7/2) and red (2.5YR 5/8) clay; blocky; peds coated with white (10YR 8/1) silt.
Auger Test 2: N560/E490			
0-5	1	O	Very dark grayish brown (10YR 3/2) slightly loamy sand; abundant organics and rootlets; common krotovina; gradual boundary.
5-50	2	A	Mottled brown (10YR 5/3) and dark yellowish brown (10YR 4/4) loamy sand; loosely compacted; abundant rootlets; gradual boundary.
50-65	3	E	Mottled light yellowish brown (10YR 6/4) and brownish yellow (10YR 6/8) loam; common rootlets; lower contact abrupt.
65-85	4	2Cg	Light brownish gray (10YR 6/2) clay, mottled with red (2.5YR 5/8) inclusions which increase with depth; firm; peds coated with white (10YR 8/1) silt.
Auger Test 3: N680/E505			
0-3	1	O	Dark brown (10YR 3/3) sand, abundant organics; abundant rootlets and krotovina; gradual boundary.
3-63	2	A	Dark yellowish brown (10YR 4/4) slightly loamy sand; common rootlets and krotovina; gradual boundary.
63-90	3	Bt	Yellowish brown (10YR 5/4) slightly clayey loam; weak blocky; common white (10YR 8/1) silt skins on peds; lower contact abrupt; ceramic sherd collected 60-80 cm bs.
90-110	4	2Cg	Light brownish gray (10YR 6/2) clay, mottled with red (2.5YR 5/8) inclusions which increase with depth; firm; peds coated with white (10YR 8/1) silt.

Depth (cm)	Zone	Soil Horizon	Description
Auger Test 4: N720/E565			
0-40	1	A1	Dark yellowish brown (10YR 4/4) slightly loamy sand; abundant rootlets and krotovina; gradual boundary.
40-85	2	A2	Yellowish brown (10YR 5/4) loamy sand; common rootlets; gradual boundary.
85-103	3	Bt	Light yellowish brown (10YR 6/4) clay loam; few rootlets; boundary uncertain.
103-110	4	Cg	Light yellowish brown clay; sandy in part; mottled with light gray (10YR 7/2) and brownish yellow (10YR 6/8); few rootlets.
Auger Test 5: to northeast of site, on levee overlooking Pine Lake			
0-20	1	Ap	Brown (10YR 5/2) sandy loam; friable; some very dark brown staining (10YR 2/2); common roots; gradual boundary.
20-50	2	C1	Yellowish brown (10YR 5/4) sandy loam; friable; some very dark brown staining (10YR 2/2) few roots; gradual boundary.
50-100	3	C2	Brownish yellow (10YR 6/4) sandy loam; very friable; some very dark brown (10YR 2/2) staining; gradual boundary.
100-130	4	C3	Light yellowish brown (10YR 6/4) loamy sand; common, medium, distinct light gray (10YR 7/2) mottles; very friable; some dark brown (10YR 2/2) staining; abrupt boundary.
130-200	5	2Btg	Gray (10YR 5/1) clay with common, coarse, distinct yellowish brown (10YR 6/2) mottling; some iron oxide (5YR 5/8) and manganese oxide (10YR 2/2) staining; hard; goes to base of profile.
Auger Test 6: N435/E500			
0-20	1	Apg	Grayish brown (10YR 5/2) loam; friable; occasional charcoal fragments present; gradual boundary.
20-50	2	C1	Light yellowish brown (10YR 6/4) sandy loam; very friable; few roots; gradual boundary.
50-100	3	C2	Light yellowish brown (10YR 6/4) loamy sand; few coarse, distinct light brownish gray (10YR 6/2) mottles; very friable; some very dark brown (10YR 2/2) staining; gradual boundary.
100-130	4	C/2B	Very pale brown (10YR 7/3) sandy loam; common, coarse, distinct light yellowish brown (10YR 6/4) mottles; very friable; some dark brown (10YR 2/2) staining; clear boundary.

Depth (cm)	Zone	Soil Horizon	Description
130-200	5	2Bw	Brownish yellow (10YR 6/6) sandy clay loam with light brownish gray (10YR 6/2) mottling; friable; gradual boundary.
200-250	6	2C	Yellowish brown (10YR 5/4) loamy sand with very pale brown (10YR 7/2) mottling; very friable; wet; goes to base of profile.

Auger Test 7: N525/E450

0-10	1	Apg	Very dark grayish brown (10YR 3/2) silty clay; friable; common roots and charcoal fragments; gradual boundary.
10-40	2	Bwg	Light gray (10YR 7/2) sandy loam with common, coarse, distinct brownish yellow (10YR 6/6) mottles; very friable; few roots; clear boundary.
40-90	3	2Bwg	Gray (10YR 5/1) silty loam mottled with common, medium, prominent red (7.5R 5/8) mottles; platy; gradual boundary.
90-130	4	2C	Light brownish gray (10YR 6/2) clay with common, coarse, prominent light brownish gray (2.5Y 6/2) mottles; hard; clear boundary.
130-180	5	3Bt	Light brownish gray (10YR 6/2) silty loam with common, medium, prominent red (5YR 5/8) mottles; hard; some strong brown (7.5YR 5/8) and yellowish brown (10YR 5/8) iron oxide staining; gradual boundary.
180-230	6	3C1	Light gray (10YR 7/2) silty clay with common, coarse, prominent strong brown (7.5YR 5/8) mottles; some red (5YR 5/8) and very dark brown (10YR 2/2) staining; hard; gradual boundary.
230-320	7	3C2	Light gray (10YR 7/2) silty loam with common, coarse, distinct brownish yellow (10YR 5/6) mottles; slightly plastic; common sandy loam and sandy clay interbeds; gradual boundary.
320-400	8	3C3	Light gray (10YR 7/2) sandy clay; slightly plastic; some red (5YR 5/8) and strong brown (7.5YR 7/8) staining; few silty clay interbeds; clear boundary.
400-430	9	4C	Light gray (10YR 7/2) sandy loam; loose; some red (10YR 5/8) staining; goes to bottom of profile.

Backhoe Trench 1: N465/E566

0-10	1	Ap	Grayish brown (10YR 5/2) loam; granular; friable; common roots; gradual boundary.
10-40	2	Bw1	Brown (10YR 5/3) sandy loam; granular; very friable; abundant woody roots; clear boundary.
40-60	3	Bw2	Yellowish brown (10YR 5/4) loam; granular; friable; few woody roots; gradual boundary.

Depth (cm)	Zone	Soil Horizon	Description
60-100	4	Bt	Dark yellowish brown (10YR 4/4) loam with common, medium, faint pale brown (10YR 6/3) mottles; subangular blocky; friable; few roots; clear boundary.
100-120	5	2Btg1	Light brownish gray (10YR 6/2) silty loam with common, medium, distinct brownish yellow (10YR 6/6) mottles; weak angular blocky; friable; gradual boundary.
120-140	6	2Btg2	Light brownish gray (10YR 6/2) loam with common, medium, distinct brownish yellow (10YR 6/6) mottles; weak angular blocky; friable; gradual boundary.
140-200	7	2Btg3	Brownish yellow (10YR 6/6) loam with few medium, distinct light brownish yellow (10YR 6/6) mottles; weak angular blocky; friable; gradual boundary.
200-300	8	3C	Light yellowish brown (10YR 6/4) loamy sand; few, coarse, distinct light brownish gray (10YR 6/2) mottles; friable; goes to base of profile.

<u>Backhoe Trench 2: N510/E500</u>

0-20	1	Ap	Yellowish brown (10YR 5/4) sandy loam; granular; friable; abundant roots; gradual boundary.
20-40	2	Bw	Yellowish brown (10YR 5/4) sandy loam; granular; very friable; abundant roots; gradual boundary.
40-70	3	Bt	Yellowish brown (10YR 5/4) loam with few, coarse, faint light grayish brown (10YR 6/2) mottles; weak angular blocky; friable; few roots; gradual boundary.
70-80	4	Bt/2Bt	Light yellowish brown (10YR 6/4) silty loam with few, coarse, distinct light grayish brown (10YR 6/3) mottles; angular blocky; friable; few roots; clear boundary.
80-110	5	2Bt	Light gray (10YR 6/1) silty clay with common, medium, prominent dark red (2.5YR 4/6) mottles; angular blocky; friable; common roots; gradual boundary.
110-160	6	3Btg1	Light gray (10YR 6/1) silty loam with common, medium, prominent yellowish red (5YR 5/6) mottles; angular blocky; hard; common roots; gradual boundary.
160-210	7	3Btg2	Light yellowish brown (10YR 6/4) loam with common, fine, distinct light gray (10YR 7/2) mottles; white (10YR 8/1) silt skins on peds; weak angular blocky; hard; gradual boundary.
210-250	8	3C	Light yellowish brown (10YR 6/4) sandy loam; hard; goes to base of profile.

<u>Backhoe Trench 3: N520/E550</u>

0-20	1	Apg	Gray (10YR 6/1) silty loam with common, medium, distinct dark yellowish brown (10YR 4/4) mottles; granular; friable; common roots; gradual boundary.

Depth (cm)	Zone	Soil Horizon	Description
20-60	2	Bwg	Light gray (10YR 7/1) silty loam with common, fine, distinct brownish yellow (10YR 6/6) mottles; very friable; common roots; gradual boundary.
60-140	3	2Bt1g	Gray (10YR 5/1) silty loam with common, medium, distinct, very pale brown (10YR 7/3) mottles; some strong brown (7.5YR 5/6) and very dark brown (10YR 2/2) staining; subangular blocky; hard; gradual boundary.
140-170	4	2Bt2g	Gray (10YR 5/1) silty loam with common, fine, distinct brownish yellow (10YR 6/6) mottles; krotovina filled with white (10YR 8/1) loamy sand; some yellowish red (5YR 5/8) and very dark brown (10YR 2/2) staining; subangular blocky; hard; gradual boundary.
170-210	5	2Btg1	Gray (10YR 6/1) silty loam with common, medium, prominent strong brown (7.5YR 5/8) mottles; krotovina filled with white (10YR 8/1) loamy sand; some yellowish red (5YR 5/8) and very dark brown (10YR 2/2) staining; subangular blocky; hard; gradual boundary.
210-250	6	2C	Light gray (10YR 7/1) loam; massive; hard; some yellowish red (10YR 5/8) and very dark brown (10YR 2/2) staining; goes to base of profile.

Test Unit 11: N575/E500. 50 x 50 cm unit extended with bucket auger

0-4	1	O	Black (10YR 2/1) humic layer; abundant roots.
4-20	2	AB	Brown (10YR 5/3) silt to silt loam; few roots; moist; loosely compacted.
20-40	3	B1t	Light yellowish brown (10YR5/4) silt loam; moist; loosely compacted; few small ferruginous gravels (<0.5 cm); one prehistoric artifact; few roots.
40-50	4	B2t	Light yellowish brown (10YR 6/4) silt loam; moist; clay increasing with depth; few roots; few small ferruginous pebbles (<0.5 cm); loosely compacted.
50-70	5	B3tg	Mottled light yellowish brown (10YR 6/4) and brownish yellow (10YR 6/6) silt loam; clay increases with depth.
70-90	6	B4t	Mottled light gray (10YR 7/2) and red (2.5YR 5/8) silty clay; loosely to moderately compacted; very few roots. **NOTE: Depth extended with bucket auger past 80 cm bs.**
90-110	7	C	Hard, mottled grayish brown (10YR 5/2) and strong brown (7.5YR 5/8) clay.
110-140	8	2C1g	Mottled very pale brown (10YR 8/3) and yellow (10YR 8/6) loam; moderately compacted.
140-160	9	2C2g	Mottled white (10YR 8/2) and very pale brown (10YR 7/4) loam; moderate compacted.
160-200	10	2C3gk	Mottled white (10YR 8/2) and very pale brown loam; moderately compacted; few CaCO3 flecks.

Depth (cm)	Zone	Soil Horizon	Description
Test Unit 12: N600/E500. 50 x 50 cm unit extended with bucket auger			
0-5	1	O	Dark brown (10YR 3/3) humic sand. Boundary abrupt.
5-48	2	A1	Dark yellowish brown (10YR 4/4) to brown (10YR 4/3) sandy silt; common prehistoric artifacts; common roots; occasional charcoal fragments; gradual boundary.
48-65	3	A2	Yellowish brown (10YR 5/4) silty sand; few prehistoric artifacts.
65-70	4	AB1	Very pale brown (10YR 7/3) loam mottled with yellowish brown (10YR 5/6) loam.
70-80	5	Bg	White (10YR 8/1) silty loam mottled with yellowish red (5YR 5/6) loam. **NOTE: Depth extended with bucket auger past 80 cm bs.**
80-115	6	Cg	Light brownish gray (10YR 6/2) clay mottled with red (2.5YR 4/8) clay.
115-130	7	2Btg	Light gray (10YR 7/1) clay loam mottled with yellowish red (5YR 5/6) clay.
130-146	8	2Cg	White (7.5YR 8/1) silt mottled with reddish yellow (7.5YR 7/8) loam.
146-170	9	3Btg	Light gray (10YR 7/2) clay loam mottled with yellowish brown (10YR 5/4) clay loam.
170-180	10	3C	Yellow (10YR 7/6) silt loam.
Test Unit 13: N625/E500. 50 x 50 cm unit extended with bucket auger			
0-11	1	A1	Dark grayish brown (10YR 4/2) silty loam; few prehistoric artifacts.
11-18	2	A2g	Grayish brown (10YR 5/2) silty loam mottled with dark yellowish brown (10YR 4/4) silty loam; common prehistoric artifacts; scattered charcoal flecks present; possibly disturbed.
18-22	3	A3	Dark grayish brown (10YR 4/2) silty loam; identical with Zone 1 except for presence of occasional charcoal flecks; common prehistoric artifacts.
22-27	4	A4	Dark grayish brown (10YR 4/3) silty loam.
27-40	5	A5	Brown (10YR 5/3) silty loam.
40-50	6	Bt	Grayish brown (10YR 5/2) silty clay loam mottled with yellowish brown (10YR 5/4) clay.
50-100	7	C1g	Light brownish gray (10YR 6/2) silty clay, mottled with brownish yellow (10YR 6/6) clay. **NOTE: Depth extended with bucket auger past 80 cm bs.**
100-130	8	C2	Gray (10YR 6/1) clay.
130-135	9	2C1	Light yellowish brown (10YR 6/4) clay.
135-150	10	2C2	Very pale brown (10YR 7/4) slightly silty clay.
150-170	11	2C3	Pale olive (5YR 6/3) silty clay.
170-180	12	2C4	Light yellowish brown (2.5Y6/4) silty clay.

Depth (cm)	Zone	Soil Horizon	Description
Test Unit 14: N650/E500. 50 x 50 cm unit extended with bucket auger			
0-4	1	A1	Brown (10YR 5/3) sandy loam; abundant rootlets; loosely compacted; gradual contact.
4-10	2	A2	Yellowish brown (10YR 5/6) sandy loam; loosely compacted; massive; moist; abundant rootlets; gradual contact.
10-20	3	B1t	Brown (10YR 5/3) sandy loam mottled with very pale brown (10YR 7/3) silt and dark yellowish brown (10YR 3/6) clayey inclusions; blocky; abundant rootlets; few prehistoric artifacts; gradual contact.
20-30	4	B2t	Yellowish brown (10YR 5/6) silty sand, some mottling with very pale brown (10YR 7/3) silt and dark yellowish brown (10YR 3/6) (decreasing from previous horizon); abundant roots; loosely compacted; massive; moist; few prehistoric artifacts.
30-40	5	C1	Brownish yellow (10YR 6/6) sandy loam; few roots; massive; loosely compacted.
40-50	6	C2	Light yellowish brown (10YR 6/4) silty loam mottled with yellowish brown (10YR 4/6) inclusions; massive; loosely compacted; few roots.
50-60	7	2B1t	Yellowish brown (10YR 5/6) silty clay loam mottled with brownish yellow (10YR 6/6) loosely to moderately compacted; weak blocky; few roots; moist.
60-75	8	2B2t	White (10YR 8/1) silt mottled with yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) sandy loam and red (2.5YR 4/1) clay nodules; blocky; moderate compaction; few roots. **NOTE: Depth extended with bucket auger past 75 cm bs.**
75-110	9	3B1t	Very pale brown (10YR 7/3) and yellowish brown (10YR 5/6) silty loam mottled with red (2.5YR 4/8) modules and grayish brown (2.5Y 5/2) clay; blocky; heavily compacted; gradual boundary.
110-175	10	3B2t	Yellowish brown (10YR 5/8) and very pale brown (10YR 7/3) silty loam mottled with frequent grayish brown (2.5Y 5/2) clayey peds coated with white (10YR 8/1) silt and occasional red (2.5YR 4/8) clay inclusions.
Test Unit 15: N675/E500. 50 x 50 cm unit extended with bucket auger			
0-3	1	O	Dark brown (10YR 3/3) loam; abrupt boundary.
3-55	2	A	Dark yellowish brown (10YR 4/4) sand; common roots; occasional prehistoric artifacts and ecofacts.
55-70	3	B	Brownish yellow (10YR 6/6) sand; few roots; few prehistoric artifacts.
70-85	4	C1	Brownish yellow (10YR 6/6) clay; **NOTE: Depth extended with bucket auger past 80 cm bs.**

Depth (cm)	Zone	Soil Horizon	Description
85-155	5	C2	Brownish yellow (10YR 6/8) clay mottled with white (7.5YR 8/1) silt and reddish yellow (7.5YR 6/8) clay.
155-175	6	2C1	Mixture of light olive brown (2.5Y 5/6) clay and silt.
175-180	7	2C2	Olive yellow (2.5Y 6/6) silty clay.

Test Unit 21: N675/E525. 50 x 50 cm unit extended with bucket auger

0-22	1	A1g	Light yellowish brown (10YR 6/4) sandy loam mottled with brownish yellow (10YR 6/6) and dark yellowish brown (10YR 4/6); massive; loosely compacted; moist; occasional rootlets; common prehistoric artifacts; gradual boundary.
22-50	2	B1t	Yellowish brown (10YR 5/4 to 5/6) clayey to sandy loam; massive; loosely compacted; occasional rootlets and krotovina; common prehistoric artifacts; few ironstone pebbles; gradual boundary.
50-64	3	B2tg	Yellowish brown (10YR 5/6) clayey, sandy loam mottled with light gray (10YR 7/2) silt loam; massive; loosely compacted; gradual boundary.
64-70	4	B3tg	Yellowish brown (10YR 5/6) clay loam mottled with yellowish brown (10YR 5/4) sandy loam and red (2.5YR 4/8) clay; blocky; peds coated with very pale brown (10YR 8/3) silt; moderately compacted; few roots.
70-80	5	B4C1g	Mottled very pale brown (10YR 7/3), yellowish brown (10YR 5/4) and brown (10YR 4/3) sandy clay loam, with dark yellowish brown (10YR 4/6) and red (2.5YR 4/8) inclusions; moderately compacted. **NOTE: Depth extended with bucket auger past 80 cm bs.**
80-115	6	C1g	Gray (2.5Y 6/1) clay; mottled with yellowish brown (10YR 5/6) clay; some peds coated with white (10YR 8/1) silt; abrupt contact.
115-180	7	C2g	Very pale brown (10YR 7/3) and yellowish brown (10YR 5/6) clayey silt loam mottled with yellowish brown (10YR 5/6) clay inclusions with skins of white (10YR 8/1) silt; highly compacted; clay inclusions and compaction decrease with depth.

Test Unit 22: N675/E550. 50 x 50 cm unit extended with bucket auger

0-20	1	A	Brown (10YR 5/3) silty loam; mottled with dark brown (10YR 3/3) in lower 10 cm; few prehistoric artifacts.
20-40	2	B1tg	Grayish brown (10YR 5/2) to light grayish brown (10YR 6/2) silty loam mottled with yellowish brown (10YR 5/6) silty clay; occasional charcoal flecks within the clayey inclusions; occasional krotovina; few prehistoric artifacts.

Depth (cm)	Zone	Soil Horizon	Description
40-60	3	B2tg	Light gray (10YR 7/2) silty loam mottled and mixed with yellowish brown (10YR 5/8) silty clay; linear feature present along north wall (root cast?) filled with brown (10YR 5/3) silt loam.
60-70	4	C1	Light gray (10YR 7/2) clay.
70-130	5	C2g	Grayish brown (10YR 5/2) clay mottled with brownish yellow (10YR 6/6).
130-170	6	C3g	Grayish brown (10YR 5/2) clay mottled with yellowish brown (10YR 5/8).

Test Unit 23: N675/E475, 50 x 50 cm unit extended with bucket auger

0-4	1	O	Dark brown (10YR 3/3) sand; abrupt boundary.
4-17	2	A1g	Yellowish brown (10YR 5/4) sand with occasional dark yellowish brown (10YR 3/4) mottles; mottling increases with depth; common roots..
17-40	3	A2g	Light gray (10YR 7/2) silty to loamy sand with common dark brown (10YR 3/3) mottling; moderately compacted; becomes increasingly mottled, loamy and compact with depth; occasional prehistoric artifacts; common roots.
40-50	4	B1tg	Light gray (10YR 7/2) loam with abundant brown (10YR 3/3) mottles.
50-60	5	B2tg	Mixed light gray (10YR 7/2) and dark brown (10YR 3/3) loam, increasingly clayey with depth.
60-68	6	C1g	Mixed light gray (10YR 7/2) and dark brown (10YR 3/3) clay loam, increasingly clayey with depth.
68-87	7	C2g	Mixed light gray (10YR 7/2) and dark brown (10YR 3/3) clay loam with occasional yellowish brown (10YR 5/8) mottles.
87-100	8	C3g	Light gray (10YR 7/2) clay with yellowish brown (10YR 5/8) and red (2.5YR 5/8) mottles.
100-140	9	C4g	Light brownish gray (10YR 6/2) clay with red (2.5YR 5/8) mottles.
140-180	10	C5g	Light brownish gray (10YR 6/2) clay with strong brown (7.5YR 5/8) mottles and light gray (10YR 7/2) silt inclusions; silt increases with depth until the stratum is almost pure silt.

Depth (cm)	Zone	Soil Horizon	Description
<u>Test Unit 24: N675/E450, 50 x 50 cm unit extended with bucket auger</u>			
0-5	1	O	Very dark grayish brown (10YR 3/2) clay loam; common organics; abrupt boundary.
5-60	2	A	Yellowish brown (10YR 5/6) sandy silt; occasional prehistoric artifacts; few charcoal fragments; apparent posthole feature present, 30-40 cm bs, filled with brown (10YR 5/3) sandy silt.
60-70	3	ABg	Light brownish gray (10YR 6/2) sandy loam mottled with yellowish brown (10YR 5/6) loam; common roots.
70-80	4	Btg	Light gray (10YR 7/2) loam mottled with strong brown (7.5YR 5/6) clay loam.
80-110	5	C1g	Light gray (10YR 7/2) silty clay mottled with red (2.5YR 4/8) clay.
110-125	6	C2g	Light gray (10YR 7/2) loam mottled with brownish yellow (10YR 6/8) sandy clay.
125-135	7	C3g	Gray (10YR 6/1) silty clay mottled with brownish yellow (10YR 6/8) loam.
135-150	8	C4g	Gray (10YR 6/1) clay loam mottled with brownish yellow (10YR 6/6).
150-170	9	C5g	Light gray (10YR 7/1) sandy silt.
170-180+	10	C6g	Very pale brown (10YR 8/2) silty sand.
<u>Test Unit 66: N450/E566, 1 x 1m unit</u>			
0-10	1	A1	Brown (10YR 5/3) sandy silt loam mottled with yellowish brown (10YR 5/4); loosely compacted; massive; abundant roots and krotovina; occasional historic and prehistoric artifacts.
10-50	2	EB	Yellowish brown (10YR 5/4) sandy loam; clay generally increases with depth; loosely compacted; massive; common roots and krotovina; common prehistoric artifacts; one historic artifact in upper 10 cm.
50-80	3	Btg	Brown (7.5YR 5/4 to yellowish brown (10YR 5/4 to 5/6) clay silt; clay content generally increases with depth; rare light gray (10YR 7/2) inclusions in lower 10 cm; loosely to heavily compacted; occasional prehistoric artifacts; few roots.
<u>Test Unit 67: N614/E450, 1 x 1m unit</u>			
0-25	1	A1	Very dark grayish brown (10YR 3/2) sandy silt; midden deposit (Feature 6); culturally enriched; abundant prehistoric artifacts, charcoal, and ecofacts; occasional roots; gradual boundary.

Depth (cm)	Zone	Soil Horizon	Description
25-40	2	A2	Dark yellowish brown (10YR 3/4) sandy silt; occasional roots and rodent burrows; abundant prehistoric artifacts, charcoal, and artifacts.
40-67	3	A3	Dark yellowish brown (10YR 4/4) silty sand to sandy silt; abundant prehistoric artifacts, charcoal, and artifacts, although the density decreases with depth; possible burial including an intact ceramic vessel (Feature 7) found at base of unit, causing the unit to be abandoned.

Test Unit 69: N623/E498, 1 x 1m unit

Depth (cm)	Zone	Soil Horizon	Description
0-15	1	Aeg	Mottled yellowish brown (10YR 5/4) and pale brown (10YR 6/3) loam; loosely compacted; massive; common roots; common prehistoric artifacts; moist; occasional small ironstone gravels to 0.5 cm.
15-36	2	2Ag	Mottled brown (10YR 4/3) and very dark grayish brown (10YR 3/2) clayey silt to silty loam; loosely compacted; massive; possible house floor or midden (culturally altered; organically stained); abundant prehistoric artifacts; common roots; common small ironstone gravels; occasional charcoal flecks; gradual boundary.
36-58	3	2B1tg	Pale brown (10YR 6/3) silty loam mottled with white (10YR 8/1) silt and yellowish brown (10YR 5/8) clay; loosely compacted; massive; occasional roots, krotovina, and prehistoric artifacts; very few ironstone pebbles; possible posthole (Feature 5) visible in south wall.
58-61	4	2B2tg	Pale brown (10YR 6/3) silt loam mottled with yellowish brown (10YR 5/8) clay, reddish brown (7.5YR 4/6) clay, and gray (10YR 7/1) clay loam; few roots; moderately to heavily compacted; culturally sterile.

Test Unit 72: N670/E525, 1 x 1m unit

Depth (cm)	Zone	Soil Horizon	Description
0-4	1	A	Brown (10YR 4/3) loam; common prehistoric artifacts.
4-28	2	ABg	Pale brown (10YR 6/3) silty loam mottled with dark yellowish brown (10YR 4/4) silty clay; common prehistoric artifacts.
28-48	3	C1g	Yellowish brown (10YR 5/4) to light yellowish brown (10YR 6/4) silty clay mottled with brownish yellow (10YR 6/6-6/8) clay.
48-60	4	C2g	Very pale brown (10YR 7/3) silty clay mottled with brownish yellow (10YR 6/6-6/8 clay.

Depth (cm)	Zone	Soil Horizon	Description
Midden (Area A)			
Test Unit 77: N500/E725. 50 x 50 cm unit			
0-25	1		Very dark brown (10YR 2/2) sandy loam midden deposits with many roots; intrusive very dark brown (10YR 2/2) loamy sand with 10YR 4/4 mottling, probably root casts, found near base of level.
25-60	2		Dark brown (7.5YR 3/4) loamy sand with some 10YR 4/4 and 10YR 5/4 mottling; large, intrusive rodent run consisting of mixed very dark brown (10YR 2/2) sandy loam, yellowish brown (10YR 5/4) loamy sand, and dark brown (7.5YR 4/3) loamy sand found from 42 to 79 cm below surface.
60-83	3		Brown (7.5YR 4/4) loamy sand with many roots.
83-105	4		Yellowish brown (10YR 5/5) silty loam with heavy brown (7.5YR 4/4) loamy sand mottling.
Test Unit 120: N499/E726.: 1 x 0.5m unit			
0-28	1		Very dark brown (10YR2/2) sandy loam; friable, midden deposit (Feature 3); culturally enriched; abundant prehistoric artifacts, charcoal flecking, and ecofacts; abundant roots; gradual boundary.
28-30	2		Dark yellowish brown (10YR5/6) sandy loam; midden deposit; abrupt boundary. Dark brown (7.5Y/R3/2) sandy loam with lens of previous designation (10Y/R5/6) between 23-35 cm throughout units east of Feature 2.
30-42	3		Gray silt/ash lens (10YR 5/1); midden deposit; hearth (Feature 2); moderate charcoal flecking, abundant mussel shell and faunal fragments; abrupt boundary.
42-45	4		Strong brown (7.5YR6/5) loamy sand; base of midden and Feature 2; oxidized; abrupt boundary.
45-113	5		Yellowish brown (7.5YR4/4) loamy sand with frequent 10YR5/4 silt loam mottling; occasional roots and rodent burrows.
113+	6		Reddish yellow (7.5YR6/6) sandy clay loam with mottles of pink (7.5YR7/3) sandy clay loam.

Depth (cm)	Zone	Soil Horizon	Description
Test Unit 121: N499/E726, 1 x 0.5m unit			
0-30	1		Very dark brown (10YR 2/2) loam midden deposits with many roots and occasional flecks of charcoal.
30-40	2		Discontinuous pockets of dark brown (7.5YR 3/3) loam cover about half of the south profile.
30-82	3		Brown (7.5YR 4/4) silt loam with frequent yellowish brown (10YR 5/4) silt loam mottling (B horizon).
82-108	4		Yellowish brown (10YR 5/4) silt loam with frequent dark yellowish brown (10YR 4/4) mottling; an area of light yellowish brown (10YR 6/4) loam was found in the eastern half of the profile between 92 and 112 cm.
108-125	5		Strong brown (7.5YR 4/6) silty clay loam with frequent 10YR 5/4 silt loam mottling in western half of profile.
Test Unit 122: N499/E725, 1 x 1 m unit			
0-25	1		Very dark brown (10YR 2/2) sandy loam midden deposits with many roots.
25-58	2		Dark brown (7.5YR 3/4) loamy sand with some 7.5YR 4/4 and 10YR 5/4 mottling found in northern edge of profile.
25-92	3		Brown (7.5YR 4/4) loamy sand with many roots; some very dark brown (10YR 2/2) loamy sand root casts with some 10YR 4/4 mottling; krotovina holes.
92-108	4		Yellowish brown (10YR 5/4) loamy sand with heavy 7.5YR 4/4 mottling.
Westernmost Knoll (Area B)			
Test Unit 125: N524/E600, 1 x 1 m unit			
0-6	1		Very dark grayish brown (10YR 3/2) silt with many small rootlets.
6-43	2		Brown (10YR 4/3) silt with a few 10YR 3/2 and 10YR 5/4 silt mottles and a few roots.
43-ca. 67	3		Brown (10YR 4/3) sandy loam and strong brown (10YR 5/4) sandy loam mixed in approximately equal proportions; found across only 3/4 of the profile; an intrusion of this soil in the center of the profile extends nearly to the base of excavation.
43-78	4		Strong brown (10YR 5/4) sandy loam with a few 10YR 4/3 and 7.5YR 5/6 mottles; zone begins at the base of the brown (10YR 4/3) silt horizon in the eastern 1/4 of the profile.

Depth (cm)	Zone	Soil Horizon	Description
78-80	5		Strong brown (7.5YR 5/6) sandy clay loam with a few 10YR 5/4 mottles.

East/West Baseline

<u>Test Unit 64: N500/E575, 50 x 50 cm unit</u>

0-24	1		Grayish brown (10YR 5/4) sandy loam with moderate quantities of roots and little gravel content; loose to moderate compaction.
24-30	2		Yellowish brown (10YR 5/6) sandy clay loam with few roots and gravels; moderately compact.

<u>Test Unit 65: N500/E600, 50 x 50 cm unit</u>

0-15	1		Dark brown (10YR 3/3) soft, fine sandy loam.
15-29	2		Yellowish brown (10YR 5/4) sandy clay loam.
29-40	3		Yellowish brown (10YR 5/8) soft fine sandy clay.

<u>Test Unit 66: N500/E625, 50 x 50 cm</u>

0-9	1		Very dark grayish brown (10YR 3/2) sandy loam; high organic content; common rootlets.
9-16	2		Very dark grayish brown (10YR 3/2) sandy loam; decreased organic content; roots still present.
16-30	3		Dark yellowish brown (10YR 4/4) sandy clay loam with common roots and pea-sized gravel.
30-42	4		Yellowish brown (10YR 5/4) sandy clay with fewer roots and no gravel; yellowish brown (10YR 5/6) sandy clay mottling present in bottom 2 cm.
42-59	5		Dark yellowish brown (10YR 4/6) compact clay with few medium mottles of yellowish brown (10YR 5/6) sandy clay and light gray (10YR 7/1) sandy clay.

<u>Test Unit 68: N500/E650, 50 x 50 cm unit</u>

0-36	1		Dark brown (10YR 3/3) sandy loam.
36-76	2		Strong brown (7.5YR 5/6) silty clay; light to moderate compaction.
76-108	3		Strong brown (7.5YR 5/6) clay; heavily compacted.

<u>Test Unit 71: N500/E675, 50 x 50 cm unit</u>

0-10	1		Very dark gray (10YR 2/2) silt.

Depth (cm)	Zone	Soil Horizon	Description
10-39	2		Dark yellowish brown (10YR 4/4) silt loam.
39-48	3		Dark yellowish brown (10YR 5/4) silt loam.
48-70	4		Dark yellowish brown (10YR 5/4) silt loam with strong brown (7.5YR 5/6) mottling.
70-76	5		Yellowish red (5YR 6/4) silty clay.

Test Unit 72: N500/E700, 50 x 50 cm unit

0-72	1		Brown (10YR 4/3) soft, fine sandy loam with dark yellowish brown (10YR 4/4) mottling.
72-92	2		Dark yellowish brown (10YR 4/6) silty/fine sandy loam; soft to slightly hard.
92-100	3		Yellowish brown (10YR 5/4 to 10YR 5/6) silty/fine sandy loam; slightly hard.

Test Unit 77: N500/E725, 50 x 50 cm unit

see above (described with midden—Area A)

Test Unit 85: N500/E800, 50 x 50 cm unit

0-16	1		Dark brown (10YR 3/3) silt loam.
16-43	2		Dark yellowish brown (10YR 4/4) silt loam.
43-80	3		Yellowish brown (10YR 5/4) silt loam, heavily mottled with dark yellowish brown (10YR 4/4) silt loam.
80-90	4		Strong brown (7.5YR 5/6) silty clay loam with heavy yellowish brown (10YR 5/5) mottling.

Test Unit 86: N500/E825, 50 x 50 cm unit

0-9	1		Brown (10YR 4/3) sandy loam.
9-45	2		Dark yellowish brown (10YR 4/4) sandy loam.
45-75	3		Yellowish brown (10YR 5/4) silt.
75-93	4		Yellowish red (5YR 4/6) clay.

Test Unit 89: N500/E850, 50 x 50 cm unit

0-39	1		Dark yellowish brown (10YR 4/4) sandy loam.
39-59	2		Yellowish brown (10YR 5/6) sandy loam.
59-77	3		Strong brown (7/5YR 4/6) silty clay loam.

Test Unit 119: N499/E850, 100 x 50 cm unit

0-8	1		Brown (10YR 4/3) sandy loam with many small roots.
8-43	2		Yellowish brown (10YR 5/6) loamy sand with many small and moderate sized roots; two large rodent burrows near base of level.

Depth (cm)	Zone	Soil Horizon	Description
43-60	3		Strong brown (7.5YR 5/6) sandy loam with heavy yellowish brown (10YR 5/4) sandy loam mottling and a few roots; rodent burrows intrude into this horizon.

North/South Line

<u>Test Unit 93: N525/E800, 50 x 50 cm unit</u>

0-9	1		Very dark grayish brown (10YR 3/2) silt loam.
9-90	2		Brown (10YR 4/3) silt with yellowish brown (10YR 5/4) and dark yellowish brown (10YR 3/4) mottling and intrusions.
90-100	3		Yellowish brown (10YR 5/4) silt.

<u>Test Unit 94: N550/E800, 50 x 50 cm unit</u>

0-8	1		Very dark grayish brown (10YR 3/2) silt with many roots.
8-18	2		Very dark brown (10YR 2/2) loam.
18-72	3		Dark yellowish brown (10YR 4/4) silt with some yellowish red (5YR 5/6) and brown (10YR 5/3) mottling.
72-80	4		Strong brown (7.5YR 5/6) silty clay loam.

<u>Test Unit 104: N600/E791, 50 x 50 cm unit</u>

0-13	1		Brown (10YR 3/3) loam with many roots.
13-40	2		Dark yellowish brown (10YR 4/6) loam with many dark yellowish brown (10YR 4/4) mottles and intrusions.
40-95	3		Yellowish brown (10YR 5/6) loam with light yellowish brown (10YR 6/4) mottling.
95-100	4		Light yellowish brown (10YR 6/4) sandy loam.

<u>Test Unit 105: N624/E800, 50 x 50 cm unit</u>

0-10	1		Very dark grayish brown (10YR 3/2) silt loam with a few dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) mottles and intrusions.
10-40	2		Dark yellowish brown (10YR 4/4) silt with yellowish brown (10YR 5/4) mottles and intrusions and very dark grayish brown (10YR 3/2) mottles and intrusion in the upper portion of the horizon.
40-72	3		Brown (10YR 5/3) silt with dark yellowish brown (10YR 4/4) mottles and intrusions, as well as strong brown (7.5YR 4/6) mottles in the bottom 5-10 cm.
72-80	4		Strong brown (7.5YR 4/6) silty clay loam with yellowish brown (10YR 5/4) mottling.

APPENDIX B

SUMMARY OF PREHISTORIC CERAMICS AND BURNED CLAY RECOVERED FROM SITES 41BW553 AND 41TT670

compiled by
Rebecca S. Procter, Ph.D.

Date: 04/23/97

Geo-Marine Inc.
#3035-001 WOCMA Testing
41BW553 Ceramic Data

Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name/Comments	Qty.
BHT	2	Lev:									
551	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
FEAT	3	Lev:	8								
146	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
146	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
146	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
FEAT	4	Lev:	6								
489	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
489	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
499	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
HAUG	3	Lev:									
4	1	Sherd	Body	Sherd/Grog		Smoothed			indet.		1
UNIT	1	Lev:	3								
382	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	2	Lev:	1								
378	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	12	Lev:	1								
397	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
397	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
397	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	12	Lev:	3								
395	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	13	Lev:	1								
33	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT 13 Lev: 2											
34	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	indet.		1
34	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	8	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
34	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	10	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
34	12	Sherd	Body	Sherd/Grog	n/a	Smoothed	Engraving	Body	indet.	HOLLY/HICKORY? FINE ENGRAVED	1
34	13	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	15	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	16	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	17	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
34	18	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
UNIT 13 Lev: 3											
35	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
35	2	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
35	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
35	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 13 Lev: 4											
36	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 15 Lev: 2											

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name/Comments	Qty.
19	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	16	Lev:	1								
394	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	16	Lev:	2								
28	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
28	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
28	3	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
28	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
28	5	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
UNIT	16	Lev:	3								
29	1	Pipe	Pipe bowl	n/a	n/a	Burnished	n/a	n/a	n/a		1
29	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
29	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	16	Lev:	4								
387	1	Sherd	Body	Sherd/Grog	n/a	Unsmoothed	Fine engraving	Body	Jar	HOLLY/HICKORY FINE ENGRAVED?	1
387	2	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.	PEASE-BRUSHED INCISED	1
387	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		3
UNIT	16	Lev:	5								
31	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
31	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar	PEASE-BRUSHED INCISED	3
31	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
31	4	Sherd	Rim	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
31	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar	PENNINGTON PUNCTATED INCISED	1
31	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
31	7	Sherd	Body	Sherd/Grog	n/a	indet.	n/a	n/a	Jar		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name/Comments	Qty.
UNIT 16		Lev: 6									
47	1	Sherd	Body	Sherd/Grog	n/a	indet.	Incising	Body	indet.		1
UNIT 17		Lev: 1									
40	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
UNIT 19		Lev: 1									
402	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 19		Lev: 2									
59	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
59	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	indet.		1
59	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
59	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 21		Lev: 1									
385	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 21		Lev: 2									
398	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
398	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
398	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT 21		Lev: 3									
286	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 21		Lev: 4									
271	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 22		Lev: 1									
384	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name/Comments	Qty.
UNIT	22	Lev:	2								
74	1	Sherd	Body	Sherd/Grog	n/a	indet.	n/a	n/a	indet.		1
UNIT	23	Lev:	2								
44	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT	23	Lev:	4								
46	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	24	Lev:	4								
65	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
UNIT	25	Lev:	1								
48	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Tool Punctating	Body	indet.		1
48	2	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
48	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	25	Lev:	3								
49	1	Sherd	Shoulder	Sherd/Grog	n/a	Smoothed	Applique bands	Shoulder	Jar	MCKINNEY PLAIN?	1
UNIT	25	Lev:	4								
50	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	25	Lev:	8								
52	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
UNIT	27	Lev:	1								
76	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
76	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name/Comments	Qty.
UNIT 27		Lev: 2									
77	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	Body	indet.		1
77	2	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
77	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Engraving	Body	indet.		1
77	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
77	5	Sherd	Body	Shell	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 27		Lev: 3									
78	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
78	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 27		Lev: 4									
306	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 27		Lev: 6									
80	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
80	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 27		Lev: 7									
81	1	Sherd	Shoulder	Sherd/Grog	n/a	Smoothed	Incising	Shoulder	Jar		1
81	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
81	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
81	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 27		Lev: 8									
82	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
UNIT 30		Lev: 1									
138	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
138	8	Sherd	Body	Bone	n/a	Smoothed	n/a	n/a	indet.		1
138	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
138	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
138	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
138	6	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
138	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Tool Punctating	Body	Jar		1
138	3	Sherd	Rim	None visible	n/a	Smoothed	Tool Punctating	Neck	Jar		1
138	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 30 Lev: 2											
139	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
139	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
139	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
139	4	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
139	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
139	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 30 Lev: 3											
140	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
140	2	Sherd	Rim	Bone	n/a	Smoothed	Engraving	Rim & Neck	Jar	SIMILAR TO BARKMAN ENGRAVED	1
140	3	Sherd	Body	Sherd/Grog	Hematite	Unsmoothed	Brushing	Body	Jar	BULLARD BRUSHED	1
140	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
140	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
140	6	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
140	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
140	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	Applique nodes	Body	indet.		1
140	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
140	10	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
140	11	Sherd	Body	Bone	n/a	Smoothed	n/a	n/a	indet.		1
140	12	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
140	13	Sherd	Shoulder	Sherd/Grog	n/a	Smoothed	Finger pinching	Body	Jar	LA RUE NECK-BANDED OR NASH NECK-BANDED?	1
140	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
140	15	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
140	16	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT 30		Lev: 5									
412	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 30		Lev: 7									
144	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
144	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
144	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
UNIT 32		Lev: 1									
268	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 32		Lev: 2									
85	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
85	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
85	3	Sherd	Base	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
85	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
85	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
85	6	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
85	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 32		Lev: 3									
422	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 32		Lev: 4									
87	1	Sherd	Rim	Bone	Sherd/Grog	Smoothed	Incising	Neck	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT 33 Lev: 4											
91	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 33 Lev: 5											
417	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
UNIT 33 Lev: 6											
94	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
94	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 34 Lev: 1											
115	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 35 Lev: 4											
135	1	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
135	2	Sherd	Rim	Bone	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 37 Lev: 2											
104	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
UNIT 37 Lev: 3											
105	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
105	2	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Fine engraving	Rim & Body	indet.	HOLLY/HICKORY FINE ENGRAVED	1
105	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 37 Lev: 4											
106	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
106	2	Sherd	Base	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
106	3	Sherd	Body	Sherd/Grog	Shell	Smoothed	Incising	Body	indet.		1
106	4	Sherd	Shoulder	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name/Comments	Qty.
UNIT 37		Lev: 5									
107	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
107	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
107	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
107	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
107	5	Sherd	Body	Sherd/Grog	Bone	Smoothed	Incising	Body	indet.		1
107	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 37		Lev: 6									
108	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 38		Lev: 2									
408	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 38		Lev: 3									
430	1	Sherd	Base	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 43		Lev: 2									
118	1	Sherd	Body	Sherd/Grog	Shell	Smoothed	n/a	n/a	indet.		4
UNIT 43		Lev: 4									
120	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 44		Lev: 5									
298	1	Sherd	Shoulder	Rock/grit	Bone	indet.	n/a	n/a	indet.		1
298	2	Sherd	Body	Sand	n/a	indet.	n/a	n/a	indet.		1
UNIT 56		Lev: 1									
413	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT 56		Lev: 2									
171	1	Sherd	Body	Sherd/Grog	n/a	indet.	Incising	Body	Jar		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
171	2	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
171	3	Sherd	Body	Bone	n/a	Smoothed	n/a	n/a	indet.		1
171	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 65		Lev: 2									
185	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
185	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 66		Lev: 2									
330	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT 67		Lev:									
194	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 67		Lev: 1									
195	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	3	Sherd	Body	Sherd/Grog	n/a	Slipped	n/a	n/a	indet.		1
195	10	Sherd	Rim	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
195	5	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
195	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	6	Sherd	Body	Sherd/Grog	n/a	Slipped	n/a	n/a	indet.		1
195	11	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
195	12	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	13	Sherd	Body	Sherd/Grog	n/a	Slipped	n/a	n/a	indet.		1
195	14	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Punctating	Rim & Body	Jar		1
195	15	Sherd	Shoulder	Sherd/Grog	Bone	Smoothed	Incising	Shoulder	indet.		1
195	16	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
534	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Fine	Body	indet.	HOLLY/HICKORY FINE	1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
							engraving			ENGRAVED	
195	24	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	18	Sherd	Body	Bone	Hematite	Smoothed	n/a	n/a	indet.		1
195	25	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
195	20	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	22	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	23	Sherd	Body	Sherd/Grog	n/a	Smoothed	Fine engraving	Body	indet.	HOLLY HICKORY? FINE ENGRAVED	1
195	19	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	21	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Tool Punctating	Body	indet.		1
195	26	Sherd	Shoulder	Bone	n/a	Smoothed	n/a	n/a	indet.		1
195	27	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
534	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
534	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
195	17	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 67	Lev: 2										
365	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	2	Sherd	Body	Sherd/Grog	n/a	Slipped	n/a	n/a	Bowl		1
365	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	10	Sherd	Body	Sherd/Grog	n/a	Smoothed	Applique	Body	Jar		1
365	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	12	Sherd	Body	Sherd/Grog	n/a	indet.	n/a	n/a	indet.		1
365	13	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
365	14	Sherd	Body	Bone	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
519	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	15	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
519	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	17	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
519	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	19	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
519	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	21	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
365	23	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	24	Sherd	Body	Sherd/Grog	n/a	indet.	n/a	n/a	indet.		1
365	25	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	26	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	27	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
365	16	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	18	Sherd	Body	Bone	n/a	Smoothed	n/a	n/a	indet.		1
365	20	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
365	22	Sherd	Shoulder	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
UNIT 67	Lev: 3										
227	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
333	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
333	2	Sherd	Neck	Sherd/Grog	n/a	Smoothed	Applique bands	Neck	Jar	LA RUE NECK BANDED OR NASH NECK BANDED	1
333	3	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
333	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
333	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
333	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
333	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
333	8	Sherd	Rim	Bone	Sherd/Grog	Smoothed	Incising	Neck	Jar		1
333	9	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
333	10	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
333	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name/Comments	Qty.
333	12	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
543	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.	MAYDELLE INCISED?	1
543	2	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
543	3	Sherd	Body	Shell	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 67	Lev: 4										
453	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Neck & Body	Jar	MAYDELLE INCISED?	2
453	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
453	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
453	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
453	5	Sherd	Body	Sherd/Grog	Sand	Slipped	n/a	n/a	indet.		1
453	6	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
453	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
524	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 67	Lev: 5										
373	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
373	8	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Fine engraving	Neck	indet.	HICKORY/HOLLY FINE ENGRAVED	1
373	2	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar	MAYDELLE INCISED?	1
373	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
373	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
373	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
373	7	Sherd	Body	Sherd/Grog	n/a	Burnished	n/a	n/a	indet.		1
373	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
373	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT 67	Lev: 6										
327	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
327	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
327	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
327	4	Sherd	Body	Sherd/Grog	Sand	Smoothed	n/a	n/a	indet.		1
UNIT 69	Lev: 1										
202	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
202	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
202	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 69	Lev: 2										
203	1	Sherd	Body	Bone	n/a	Smoothed	n/a	n/a	indet.		1
203	2	Sherd	Rim	Sherd/Grog	Sand	Smoothed	Punctating	Body	Jar		1
203	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	7	Sherd	Body	Rock/grit	n/a	indet.	n/a	n/a	indet.		1
203	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	10	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	12	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	13	Sherd	Body	Sherd/Grog	Rock/grit	indet.	n/a	n/a	indet.		1
203	20	Sherd	Shoulder	Sherd/Grog	n/a	Smoothed	Incising	Shoulder	indet.		1
203	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	16	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	17	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	18	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	19	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
203	15	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 69	Lev: 3										
204	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		4
204	2	Sherd	Body	Shell	Sherd/Grog	Slipped	n/a	n/a	Jar		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name/Comments	Qty.
204	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
204	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
204	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
204	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
204	7	Sherd	Body	Sherd/Grog	Sand	Smoothed	n/a	n/a	indet.		1
204	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	69	Lev:	4								
205	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
205	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
205	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	70	Lev:	2								
207	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	71	Lev:	1								
440	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	71	Lev:	2								
443	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	71	Lev:	6								
212	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	72	Lev:	1								
237	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	72	Lev:	2								
351	1	Sherd	Body	Sherd/Grog	n/a	indet.	n/a	n/a	indet.		2
UNIT	72	Lev:	3								
370	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT 74		Lev: 1									
221	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
221	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT 75		Lev: 1									
222	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
222	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 76		Lev: 1									
223	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
223	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 77		Lev: 1									
224	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
224	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
224	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	indet.		1
UNIT 79		Lev: 1									
348	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 82		Lev: 1									
240	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 83		Lev: 1									
246	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
246	2	Sherd	Body	Sherd/Grog	n/a	indet.	n/a	n/a	indet.		1
246	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 84		Lev: 1									
241	1	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
241	2	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Geo-Marine Inc.
#3035-001 WOCMA Testing
41BW553 Ceramic Data

Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT 85		Lev: 1									
242	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
242	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
242	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT 87		Lev: 2									
244	1	Sherd	Body	Sherd/Grog	indet.	Smoothed	n/a	n/a	indet.		1
244	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 87		Lev: 4									
245	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT 89		Lev: 1									
435	1	Sherd	Body	Sherd/Grog	n/a	indet.	n/a	n/a	indet.		1
UNIT 90		Lev: 2									
250	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 90		Lev: 3									
251	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 90		Lev: 4									
252	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
252	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 90		Lev: 5									
253	2	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
253	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
253	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
253	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
253	6	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1

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Geo-Marine Inc.
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41BW553 Ceramic Data

Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
253	1	Sherd	Body	Sherd/Grog	n/a	indet.	Incising	Body	indet.		2
UNIT 90	Lev: 7										
349	1	Sherd	Body	Bone	Sand	Smoothed	n/a	n/a	indet.		1
UNIT 90	Lev: 8										
255	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
UNIT 93	Lev: 1										
258	1	Sherd	Rim	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1

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Geo-Marine Inc.
WOCMA Testing #3035-001
41BW553 Burned Clay

	Rec No.	Bag No.	Type	Qty.	Weight (grams)
UNIT	13	Lev:	4		
	6	392	Baked clay	1	0.6
UNIT	17	Lev:	3		
	26	41	Baked clay	50	43.7
UNIT	21	Lev:	3		
	18	285	Baked clay	2	1.0
UNIT	24	Lev:	3		
	17	64	Baked clay	2	0.5
UNIT	27	Lev:	8		
	19	420	Baked clay	1	0.9
UNIT	32	Lev:	1		
	7	487	Baked clay	1	4.0
UNIT	35	Lev:	5		
	23	485	Baked clay	1	1.4
UNIT	37	Lev:	5		
	22	484	Baked clay	1	10.0
UNIT	48	Lev:	3		
	1	293	Baked clay	2	5.5
UNIT	67	Lev:	1		
	21	320	Baked clay	7	5.3
UNIT	67	Lev:	3		
	16	335	Baked clay	3	16.9
UNIT	67	Lev:	4		
	4	450	Impressed daub	3	9.0
	5	450	Baked clay	6	13.1
UNIT	67	Lev:	5		
	25	199	Baked clay	18	16.7
	9	459	Baked clay	1	0.4
UNIT	67	Lev:	6		
	13	328	Baked clay	3	8.6
	24	486	Baked clay	1	7.3

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Geo-Marine Inc.
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41BW553 Burned Clay

Rec No.	Bag No.	Type	Qty.	Weight (grams)
UNIT 67	Lev:	7		
20	304	Baked clay	1	1.3
UNIT 71	Lev:	1		
15	439	Baked clay	1	0.1
UNIT 71	Lev:	4		
14	441	Baked clay	1	1.3
UNIT 72	Lev:	1		
11	358	Baked clay	6	2.5
UNIT 72	Lev:	2		
10	350	Baked clay	5	1.5
UNIT 75	Lev:	1		
3	311	Baked clay	1	0.5
UNIT 79	Lev:	1		
2	347	Baked clay	3	4.1
UNIT 82	Lev:	1		
8	357	Baked clay	3	1.6
UNIT 87	Lev:	4		
12	446	Baked clay	2	3.1

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Geo-Marine Inc.
#3035-001 WOCMA Testing
41TT670 Ceramic Data

Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT 122		Lev:	4								
779	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
BHT 127		Lev:	2								
768	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		2
BHT 130		Lev:	4								
775	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
FEAT 2		Lev:	5								
322	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
322	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
701	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
701	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
S.T. 50		Lev:	2								
248	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
S.T. 52		Lev:	2								
494	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
S.T. 53		Lev:	1								
362	1	Sherd	Body	Sherd/Grog	Hematite	Smoothed	n/a	n/a	indet.		1
362	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
S.T. 53		Lev:	2								
338	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
S.T. 57		Lev:	2								
356	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
S.T. 58		Lev:	2								

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41TT670 Ceramic Data

Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
357	1	Sherd	Body	Sherd/Grog	n/a	Burnished	Incising	Body	Jar		1
UNIT	61	Lev:	2								
645	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	61	Lev:	3								
58	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	61	Lev:	5								
566	1	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
UNIT	61	Lev:	6								
61	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
61	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
61	3	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Neck & Body	Jar		3
61	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	Jar		2
UNIT	61	Lev:	7								
62	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	62	Lev:	5								
431	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
UNIT	62	Lev:	6								
439	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	63	Lev:	4								
48	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	71	Lev:	2								
436	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
436	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 71	Lev: 3										
23	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
UNIT 71	Lev: 4										
24	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
24	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
24	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
24	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
24	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
24	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
24	7	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Rim & Neck	Jar		1
24	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 71	Lev: 5										
25	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
25	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
25	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
25	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
25	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
25	6	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Punctating	Rim & Neck	indet.		1
25	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	indet.		1
25	8	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 71	Lev: 6										
442	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	Incising	Body	indet.		1
UNIT 72	Lev: 1										
8	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
8	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT	72	Lev:	3								
435	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
435	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	72	Lev:	4								
11	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	Jar		3
11	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
11	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
11	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT	72	Lev:	5								
12	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	72	Lev:	7								
426	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	72	Lev:	8								
728	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
728	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT	73	Lev:	4								
72	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	Jar		1
UNIT	74	Lev:	3								
198	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	77	Lev:	4								
396	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
396	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
396	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT	78	Lev:	1								

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
633	1	Sherd	Body	Sherd/Grog	Rock/grit	Smoothed	n/a	n/a	indet.		1
UNIT 78		Lev: 3									
628	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
628	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
628	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
628	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 78		Lev: 4									
634	1	Sherd	Body	Sherd/Grog	Hematite	Smoothed	Incising	Body	indet.		1
634	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 78		Lev: 5									
464	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 78		Lev: 6									
642	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
642	2	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
UNIT 79		Lev: 1									
655	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	Punctating	Body	Jar		1
UNIT 79		Lev: 5									
657	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
657	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		4
UNIT 79		Lev: 6									
647	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 80		Lev: 1									
1	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT 80	Lev: 2										
2	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
2	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
2	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 80	Lev: 3										
3	1	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
3	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 80	Lev: 4										
440	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
UNIT 80	Lev: 6										
6	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Fine engraving	Rim, Neck, Shoulder	Globular, Neckless jar	HICKORY FINE ENGRAVED	2
6	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	Fine engraving	Neck & Shoulder	Globular, Neckless jar	HOLLY/HICKORY FINE ENGRAVED	2
6	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	n/a		1
6	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	n/a		1
6	5	Sherd	Shoulder	Sherd/Grog	Bone	Smoothed	Incising	Shoulder	n/a		1
UNIT 81	Lev: 1										
103	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
103	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
103	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 81	Lev: 2										
104	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
104	2	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
104	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
104	4	Sherd	Body	Sherd/Grog	n/a	Slipped	n/a	n/a	Bowl		1
104	5	Sherd	Body	Sherd/Grog	n/a	indet.	Punctating	Body	indet.		1
UNIT 81	Lev: 3										
467	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	n/a		1
467	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	n/a		1
UNIT 82	Lev: 1										
186	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
UNIT 82	Lev: 3										
465	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	n/a		1
UNIT 82	Lev: 4										
189	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Neck & Shoulder	n/a		1
189	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	n/a		1
189	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	n/a		1
189	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	n/a		1
UNIT 82	Lev: 5										
375	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	n/a		1
375	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	n/a		1
375	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 82	Lev: 6										
191	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
191	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
191	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	Jar		1
191	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
191	5	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
191	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
191	7	Sherd	Body	Sherd/Grog	Hematite	Smoothed	Incising	Body	indet.		1
191	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
191	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
191	10	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
191	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
191	12	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Neck	indet.		1
191	13	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
191	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 82	Lev: 7										
192	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Fingernail Punctating	Body	Jar	EARLY CADDO	2
192	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
192	3	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
192	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	indet.		1
192	5	Sherd	Body	Sherd/Grog	Bone	Smoothed	Punctating	Body	indet.		1
UNIT 84	Lev: 2										
466	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Bowl		1
UNIT 84	Lev: 3										
130	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
130	2	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
130	3	Sherd	Body	Sherd/Grog	n/a	indet.	Punctating	Body	indet.		1
UNIT 84	Lev: 4										
537	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Fine engraving	Body	indet.	HOLLY/HICKORY FINE ENGRAVED?	1
UNIT 84	Lev: 5										
132	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
132	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1

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132	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
132	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
132	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 84		Lev: 6									
486	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 84		Lev: 7									
578	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar	WILLIAMS INCISED?	1
UNIT 84		Lev: 8									
408	1	Sherd	Body	Sherd/Grog	Bone	Burnished	n/a	n/a	Jar		1
408	2	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
408	3	Sherd	Body	Sherd/Grog	indet.	Smoothed	n/a	n/a	indet.		1
408	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 86		Lev: 6									
635	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	Fine engraving	Body	Jar	HOLLY/HICKORY FINE ENGRAVED?	1
UNIT 88		Lev: 6									
371	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
371	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 89		Lev: 4									
457	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 91		Lev: 4									
666	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 91		Lev: 6									
627	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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UNIT 93		Lev: 6									
367	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 95		Lev: 5									
520	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 95		Lev: 6									
515	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 97		Lev: 6									
123	1	Sherd	Body	Sherd/Grog	Rock/grit	Smoothed	Incising	n/a	Jar		2
123	2	Sherd	Body	Sherd/Grog	Rock/grit	Smoothed	Punctating	Body	Jar	PENNINGTON PUNCTATED INCISED?	1
123	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	indet.		1
123	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
123	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 98		Lev: 5									
637	1	Sherd	Body	Sherd/Grog	Rock/grit	Smoothed	Incising	Body	indet.		1
637	2	Sherd	Body	Sherd/Grog	Rock/grit	Smoothed	n/a	n/a	indet.		1
UNIT 98		Lev: 6									
648	1	Sherd	Body	Sherd/Grog	Rock/grit	indet.	n/a	n/a	indet.		1
UNIT 100		Lev: 7									
373	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	indet.	n/a	indet.		1
UNIT 101		Lev: 6									
153	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
153	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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UNIT 102		Lev:	4								
649	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
649	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
UNIT 103		Lev:	4								
238	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 106		Lev:	1								
158	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 106		Lev:	4								
523	1	Sherd	Body	Sherd/Grog	n/a	Unsmoothed	n/a	n/a	indet.		1
523	2	Sherd	Body	Sherd/Grog	n/a	Unsmoothed	n/a	n/a	indet.		1
UNIT 118		Lev:	5								
220	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
220	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 119		Lev:	3								
659	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
UNIT 119		Lev:	5								
613	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		2
613	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
613	3	Sherd	Base	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 120		Lev:	2								
506	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
506	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
507	1	Pipe	Pipe stem	Bone	Sherd/Grog	Smoothed	n/a	n/a	n/a		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT 120		Lev:	3								
532	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
532	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
532	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 120		Lev:	4								
526	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
526	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
526	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
526	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
526	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 120		Lev:	7								
335	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	Bowl		1
UNIT 121		Lev:	2								
347	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
681	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
681	2	Sherd	Body	Sherd/Grog	n/a	indet.	Punctating	Body	indet.		1
681	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 121		Lev:	4								
468	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	Jar		2
468	2	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
468	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 121		Lev:	7								
406	1	Sherd	Rim	Sherd/Grog	n/a	Slipped	n/a	n/a	Bowl		1
UNIT 121		Lev:	8								
349	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
349	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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349	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		3
UNIT 122		Lev: 2									
377	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 122		Lev: 3									
401	1	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Neck	Globular, Neckless jar	POSSIBLE PENNINGTON PUNCTATED INCISED	1
401	2	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
401	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
401	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
401	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
401	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
401	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
401	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
401	9	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
401	10	Sherd	Body	Sherd/Grog	Bone	Smoothed	indet.	n/a	indet.		1
401	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
401	12	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Rim & Neck	indet.	EARLY PLAIN?, WILLIAMS PLAIN?, LEFLORE?, MCKINNEY?	1
401	13	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	Jar		6
401	14	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	Jar		1
401	15	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
401	16	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	Jar		1
401	17	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
401	18	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	Jar		1
401	19	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
401	20	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	Jar		1

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UNIT 122		Lev:	4								
393	1	Sherd	Base	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
393	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
393	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
393	4	Sherd	Base	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
393	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
393	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
393	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 122		Lev:	5								
402	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 123		Lev:									
262	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
262	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 123		Lev:	1								
487	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
487	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 123		Lev:	2								
582	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
582	2	Sherd	Body	Sand	n/a	Smoothed	indet.	n/a	indet.		1
582	3	Sherd	Body	Sherd/Grog	Sand	Smoothed	n/a	n/a	indet.		1
UNIT 123		Lev:	3								
575	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
575	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
575	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
575	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
575	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	Jar		1
575	6	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1

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UNIT 123		Lev:	4								
266	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
266	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
266	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
266	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
266	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
266	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
266	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
266	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
266	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
266	10	Sherd	Base	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
266	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
266	12	Sherd	Body	Sherd/Grog	Limestone	Smoothed	n/a	n/a	indet.		1
266	13	Sherd	Body	Sherd/Grog	Bone	Smoothed	Incising	Body	indet.		1
266	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 123		Lev:	5								
541	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		3
541	2	Sherd	Body	Sherd/Grog	n/a	indet.	Punctating	Body	Jar		1
541	3	Sherd	Rim	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
541	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
541	5	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
541	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	Fine engraving	Body	indet.	HOLLY/HICKORY FINE ENGRAVED	1
541	7	Sherd	Base	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
541	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
541	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
541	10	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
541	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
541	12	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
541	13	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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541	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
541	15	Sherd	Base	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
541	16	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
541	17	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Bowl		1
UNIT 123	Lev: 6										
544	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		3
544	2	Sherd	Base	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.	WILLIAMS PLAIN	1
544	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
544	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	n/a		1
544	5	Sherd	Rim	None visible	n/a	indet.	n/a	n/a	indet.		1
544	6	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
544	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	Jar		1
544	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
544	9	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Fine engraving	Body	Jar	HOLLY/HICKORY FINE ENGRAVED	1
544	10	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
544	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
544	12	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 123	Lev: 7										
547	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
547	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	indet.	PEASE BRUSHED-INCISED	1
547	5	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
547	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	indet.		1
UNIT 123	Lev: 8										
558	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 124	Lev: 1										
670	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	Jar		1
670	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT 124	Lev: 2										
504	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
504	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
504	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
504	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
504	5	Sherd	Rim	Sherd/Grog	Hematite	Smoothed	Punctating	Neck & Shoulder	indet.		1
504	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
504	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
504	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 124	Lev: 3										
555	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
555	2	Sherd	Base	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
555	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
555	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
555	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
555	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
555	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
555	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
555	9	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
555	10	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
555	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
555	12	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
555	13	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
555	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Bowl		1
555	15	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 124	Lev: 4										
503	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT 124		Lev: 5									
308	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar	EARLY PLAIN?	1
308	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
308	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
308	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
308	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
308	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
308	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
308	8	Sherd	Shoulder	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
308	9	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Neck & Shoulder	indet.		1
308	10	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
308	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
308	12	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
308	13	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
308	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
308	15	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	indet.		1
UNIT 125		Lev: 1									
255	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	indet.		1
255	2	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
255	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 125		Lev: 2									
256	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Bowl		1
256	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Bowl		1
256	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	Jar		1
256	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
256	5	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
256	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
UNIT 125	Lev: 3										
257	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
257	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
257	3	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Neck	indet.		1
257	4	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Neck	indet.		1
257	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
257	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
257	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
257	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
257	9	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
257	10	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
257	11	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		1
257	12	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
257	13	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
257	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1
UNIT 125	Lev: 4										
258	1	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	Jar		1
258	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
258	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
258	4	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
258	5	Sherd	Shoulder	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
258	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
258	7	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
258	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
258	9	Sherd	Rim	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
258	10	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
258	11	Sherd	Shoulder	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
258	12	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
258	13	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
258	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
258	15	Sherd	Body	Sherd/Grog	n/a	Smoothed	indet.	n/a	indet.		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
258	16	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	Jar		1
258	17	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
258	18	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 125	Lev: 5										
259	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	Tool Punctating	Body	Jar	SINNER LINEAR PUNCTATED	2
259	2	Sherd	Body	Sherd/Grog	n/a	Smoothed	Tool Punctating	Body	indet.		1
259	3	Sherd	Body	Sherd/Grog	Bone	Smoothed	n/a	n/a	indet.		2
259	4	Sherd	Body	Sherd/Grog	Hematite	Smoothed	n/a	n/a	indet.		1
259	5	Sherd	Rim	Sherd/Grog	Bone	Smoothed	Incising	Neck & Shoulder	Jar	DAVIS INCISED?	1
259	6	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
259	7	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Neck	indet.		1
259	8	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
259	9	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
259	10	Sherd	Body	Sherd/Grog	Hematite	Smoothed	Fine engraving	Body	Jar	HOLLY/HICKORY FINE ENGRAVED	1
259	11	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
259	12	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
259	14	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
259	15	Sherd	Body	Sherd/Grog	n/a	Smoothed	Incising	Body	indet.		1
259	16	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
259	17	Sherd	Body	Bone	Sherd/Grog	Smoothed	n/a	n/a	indet.		1
259	18	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
259	19	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
UNIT 125	Lev: 6										
260	1	Sherd	Body	Sherd/Grog	Bone	Smoothed	Punctating	Body	Jar		1
260	2	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Neck	Jar		1
260	3	Sherd	Body	Sherd/Grog	n/a	Smoothed	Punctating	Body	Jar		1

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Bag No.	Art No.	Type	Other	Primary Inclusions	Secondary Inclusions	Exterior Surface	Primary Decoration	Decoration Location	Vessel Form	Type Name	Qty.
260	4	Sherd	Rim	Sherd/Grog	n/a	Smoothed	Incising	Neck	indet.		1
260	5	Sherd	Body	Sherd/Grog	n/a	Smoothed	n/a	n/a	indet.		1
260	6	Sherd	Body	Bone	n/a	Smoothed	n/a	n/a	indet.		1

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Geo-Marine Inc.
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41TT670 Burned Clay

	Rec No.	Bag No.	Type	Qty.	Weight (grams)
FEAT	2	Lev:	5		
	69	704	Baked clay	17	1.7
S.T.	51	Lev:	3		
	117	374	Baked clay	3	7.6
S.T.	55	Lev:	1		
	119	355	Baked clay	1	0.3
S.T.	56	Lev:	1		
	120	358	Baked clay	1	0.4
S.T.	57	Lev:	1		
	121	353	Baked clay	1	0.8
UNIT	61	Lev:	3		
	107	665	Impressed daub	1	0.3
UNIT	61	Lev:	4		
	108	572	Impressed daub	4	5.0
UNIT	61	Lev:	5		
	109	565	Baked clay	2	7.6
UNIT	61	Lev:	6		
	110	662	Baked clay	2	2.4
UNIT	61	Lev:	7		
	111	586	Baked clay	2	2.6
UNIT	68	Lev:	4		
	97	432	Baked clay	3	1.3
UNIT	71	Lev:	1		
	98	736	Baked clay	1	0.6
UNIT	71	Lev:	4		
	99	448	Baked clay	1	3.0
UNIT	71	Lev:	6		
	100	443	Baked clay	2	2.6
UNIT	74	Lev:	2		
	112	363	Baked clay	1	0.9
UNIT	77	Lev:	1		

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Geo-Marine Inc.
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Rec No.	Bag No.	Type	Qty.	Weight (grams)
94	365	Baked clay	5	2.4
UNIT 77	Lev:	2		
95	366	Baked clay	1	1.8
UNIT 77	Lev:	3		
96	414	Baked clay	2	1.7
UNIT 84	Lev:	3		
50	595	Impressed daub	1	2.4
UNIT 84	Lev:	4		
51	536	Baked clay	3	7.2
UNIT 84	Lev:	5		
52	604	Impressed daub	1	0.4
53	604	Baked clay	3	2.3
UNIT 84	Lev:	9		
54	476	Baked clay	2	1.7
UNIT 84	Lev:	10		
55	389	Baked clay	1	1.4
UNIT 89	Lev:	2		
101	459	Baked clay	2	2.5
UNIT 89	Lev:	3		
102	451	Impressed daub	2	3.0
UNIT 89	Lev:	4		
103	456	Baked clay	3	2.2
UNIT 89	Lev:	6		
104	480	Baked clay	2	4.3
UNIT 95	Lev:	6		
113	514	Baked clay	2	2.4
UNIT 101	Lev:	4		
114	639	Baked clay	2	1.8
UNIT 101	Lev:	6		
115	610	Baked clay	3	1.4
UNIT 103	Lev:	4		

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Geo-Marine Inc.
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41TT670 Burned Clay

Rec No.	Bag No.	Type	Qty.	Weight (grams)
116	594	Baked clay	1	1.2
UNIT 119	Lev:	2		
86	656	Baked clay	1	1.1
UNIT 119	Lev:	3		
87	660	Baked clay	1	1.9
UNIT 119	Lev:	4		
88	591	Baked clay	5	27.5
UNIT 119	Lev:	5		
90	612	Impressed daub	2	11.0
91	612	Baked clay	12	27.5
UNIT 119	Lev:	6		
89	673	Baked clay	2	3.1
UNIT 120	Lev:	3		
65	530	Impressed daub	2	5.9
66	530	Baked clay	5	17.6
UNIT 120	Lev:	4		
67	527	Baked clay	19	69.0
68	527	Impressed daub	9	16.5
UNIT 120	Lev:	6		
70	496	Baked clay	4	2.2
71	496	Impressed daub	2	2.7
UNIT 120	Lev:	7		
72	517	Baked clay	2	3.6
UNIT 121	Lev:	3		
78	386	Baked clay	3	3.5
79	386	Impressed daub	3	1.4
UNIT 121	Lev:	5		
92	489	Baked clay	1	1.0
UNIT 121	Lev:	6		
80	492	Baked clay	4	17.3
UNIT 121	Lev:	7		
81	405	Baked clay	1	3.5

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Geo-Marine Inc.
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Rec No.	Bag No.	Type	Qty.	Weight (grams)
UNIT 121	Lev:	8		
82	348	Baked clay	1	2.4
UNIT 122	Lev:	3		
73	400	Impressed daub	1	4.1
74	400	Impressed daub	8	8.2
75	400	Baked clay	3	1.7
UNIT 123	Lev:			
56	482	Baked clay	1	9.4
UNIT 123	Lev:	1		
93	488	Baked clay	4	3.2
UNIT 123	Lev:	2		
57	580	Baked clay	11	4.5
UNIT 123	Lev:	3		
58	573	Baked clay	23	10.9
UNIT 123	Lev:	4		
59	470	Baked clay	14	9.0
UNIT 123	Lev:	5		
60	538	Baked clay	23	30.7
61	538	Impressed daub	2	5.3
UNIT 123	Lev:	6		
76	545	Baked clay	10	20.0
77	545	Impressed daub	1	1.4
UNIT 123	Lev:	7		
62	550	Baked clay	14	28.4
UNIT 123	Lev:	8		
63	561	Baked clay	18	51.6
UNIT 123	Lev:	9		
64	603	Baked clay	1	10.1
UNIT 124	Lev:	3		
83	556	Baked clay	4	11.2
UNIT 124	Lev:	4		
84	500	Baked clay	8	17.5

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Geo-Marine Inc.
WOCMA Testing #3035-001
41TT670 Burned Clay

	Rec No.	Bag No.	Type	Qty.	Weight (grams)
UNIT 124		Lev: 5			
	85	381	Baked clay	2	5.0
UNIT 125		Lev: 4			
	105	617	Baked clay	1	1.5
UNIT 125		Lev: 6			
	106	623	Baked clay	2	9.0

APPENDIX C

SUMMARY OF PREHISTORIC LITHIC ARTIFACTS RECOVERED FROM SITES 41BW553 AND 41TT670

by
Sharlene Allday, Floyd B. Largent, Jr., and Marianne Marek

DEFINITIONS OF PREHISTORIC LITHIC ARTIFACT CLASSES

by
Sharlene Allday and Floyd B. Largent, Jr.

FINISHED BIFACIAL TOOLS

Finished bifacial tools are those finely worked pieces in which the manufacturing process has been apparently brought to completion, as evidenced by secondary retouch, edge straightening, hafting preparation, notching, and similar characteristics. Ten categories are recognized: (1) Dart point; (2) Arrow point; (3) Indeterminate point; (4) Axe; (5) Thinned biface (knife); (6) Chopper; (7) Drill; (8) Adze/Gouge; (9) Marginal Biface Retouch; and (10) Indeterminate Biface. These tools are further divided into a number of subcategories: (1) Complete; (2) Tip; (3) Mid-section; (4) Base/stem; (5) Longitudinal fracture; (6) Tang; and (7) Blade.

Dart Points, Arrow Points, and Indeterminate Points

Dart points, arrow points, and indeterminate points are all varieties of projectile points, bifacial tools formed by fine secondary retouch with basal modification in the form of notching, stemming, or thinning of the proximal end for purposes of hafting. Dart points are those employed to tip hand-held darts or spears; arrow points are used to tip arrows; and indeterminate points are, as the name implies, of uncertain usage. All projectile points are assigned to recognized types whenever possible.

Axe

Axes are bifacially worked, generally rectangular to subrectangular tools which exhibit modification along all edges. The modification has produced relatively straight to convex ends. Indications of hafting are present.

Thinned Biface

Thinned bifaces are sufficiently whole, bifacially worked blanks which exhibit biconvex symmetry, the presence of at least one edge formed by fine secondary retouch, and an absence of cortex except for the proximal end. These artifacts are commonly recognized as knives in the literature.

Chopper

Choppers are cobbles which have been modified, usually bifacially, into a teardrop shape by the removal of several flakes from one end. The opposite cortical, rounded end is unmodified, providing a handgrip during utilization.

Drill

A long, tapered, bifacially flaked bit resulting in a diamond-shaped cross-section is the distinguishing characteristic for this tool. During the Archaic period, the distal ends of projectile points were often reworked to produce this form. Drills from later periods often were fashioned from flakes.

Adze/Gouge

These chisel-like woodworking tools, which may be either bifacial or unifacial, are triangular in shape and are worked along the wider end to produce a steep, beveled straight bit. The opposite end, at the point of the triangle, was the hafted end; the tool itself was generally hafted perpendicular to the handle. In cross section, these tools appear to be plano-convex to pyramidal.

Marginal Bifacial Retouch

These specimens, usually modified flakes, are those that exhibit limited modification on both faces along a portion of an edge or edges.

Indeterminate Biface

An indeterminate biface is a finished bifacial tool whose original function remains uncertain.

UNFINISHED BIFACES

Unfinished bifaces are those in which the manufacturing process has not been brought to completion. These artifacts tend to be somewhat crude, lacking the fine workmanship of finished tools. Five categories are recognized: (1) Aborted, Early; (2) Aborted, Late; (3) arrow point preform; (4) dart point preform; and (5) unidentified fragment. Incomplete bifaces are further subdivided into the categories of complete and fragment.

Aborted, Early

Aborted bifaces are bifacially worked artifacts that appear to have been rejected prior to the completion of the bifacial reduction process. The Early Aborted biface specimens usually lack symmetry and exhibit sinuous edges formed by the removal of large, thick flakes. Cortex is usually present on at least one surface and areas of step or hinge fracturing may be evident.

Aborted, Late

These specimens usually exhibit biconvex symmetry and straight edges. Generally, all cortex will have been removed, but the fine, pressure retouch characteristic of a thinned biface is not present.

Arrow Point and Dart Point Preforms

These specimens are bifacially worked blanks with indications of fine edge retouch from pressure flaking along both lateral edges. The proximal ends of the blanks lack the necessary modification that would facilitate hafting. Some specimens retain portions of the original striking platform. The specimens are subjectively placed into the dart or arrow point subclasses based on overall dimensions.

Unidentified Fragment

These specimens are bifacially worked pieces that cannot be placed in a more specific class because of their fragmentary nature.

UNIFACES

Unifaces are those tools that exhibit flake scars on one face only. Eleven basic types have been identified: (1) Marginal Modified/retouched uniface; (2) Borer; (3) Burin; (4) Denticulate; (5) End scraper; (6) Side scraper; (7) Scraper with Graver Spur; (8) Graver; (9) Notch; (10) Burin spall; and (11) Adze/gouge. These categories are further distinguished by whether the specimen is complete or fragmentary.

Marginal Modified/Retouched Unifaces

These are minimally altered pieces, usually flakes, that are characterized by a single row of relatively small flake scars (less than 2 mm in width) forming a working edge with an acute angle (less than 50°). One or more edges may have been modified.

Borer

Borers are small, drill-like unifacial tools that are characterized by alternating edge retouch. These pieces are further distinguished by two adjacent concavities formed along an edge through the removal of small flakes, resulting in a sharp, prominent protrusion that was used for perforating.

Burin

A burin is a tool on which a wedge-shaped, chisel-like edge has been produced by the removal of a long, narrow sliver or spall, often perpendicular to the axis of the specimen.

Denticulate

This type of tool is formed by the removal of small flakes along one lateral edge of a piece in order to form a working edge that is multiply notched or serrated.

End scraper

These are pieces with retouch restricted to either the distal or proximal end of the blank, generally producing a convex working edge. Marginal retouch may appear along the lateral edges of the blank. The opposing end of the piece may bear some minimal retouch, that was performed in order to facilitate hafting the piece.

Side scraper

These are pieces with retouch present on one or both lateral edges of the blank. The working edge may be straight to convex or concave.

Scraper with Graver Spur

These specimens are scrapers with an additional carefully flaked, prominent, sharp protrusion formed by the creation of adjacent shallow concavities.

Graver

Gravers are similar to borers, except that the protrusion is retouched from one side only, for the purposes of scoring and engraving.

Notch

This type of tool is formed when small flakes are removed along one lateral edge of a piece in order to form a working edge along a single, relatively deep concave area.

Burin Spall

A burin spall is the small piece that is removed to produce a chisel-like edge, thus forming a burin. Burin spalls often retain minimal retouch along one edge, and in some cases may have been used for graving purposes.

Adze/Gouge

These pieces are identical to bifacial gouges, except that they have been modified unifacially.

UNMODIFIED DEBRIS

Unmodified debris is the unused debris resulting from lithic reduction practices; it usually takes the form of flakes, that must exhibit a platform and a bulb of percussion, and nondiagnostic shatter. Debris may be further distinguished by the amount of cortex remaining on the piece. A total of six categories is recognized: (1) Primary Decortication Flake, 75 percent cortex; (2) Secondary Decortication Flake, less than 75 percent cortex; (3) Tertiary Flake, no cortex; (4) Bifacial thinning flake; (5) Angular shatter; and (6) Not applicable. These categories are subdivided into type classes: (1) Size 1 (1 inch or 25 mm sieve); (2) Size 2 (3/4 inch or 19 mm sieve); (3) Size 3 (½ inch or 12.5 mm sieve; (4) Size 4 (3/8 inch or 9.5 mm sieve); (5) Size 5 (1/4 inch or 6.3 mm sieve); (6) Size 6 (less than 1/4 inch or 6.3 mm sieve); and (7) Not applicable.

Primary Decortication Flake, 75 percent cortex

These are flakes that retain a minimum of 75 percent cortex on their dorsal surfaces.

Secondary Decortication Flake, less than 75 percent cortex

These flakes retain less than 75 percent cortex on their dorsal surfaces.

Tertiary Flakes, no cortex

Tertiary (interior) flakes lack cortex, having derived entirely from the interior of a core.

Bifacial Thinning Flakes

Bifacial thinning flakes are those distinctive flakes that are produced by softhammer reduction or pressure flaking. They are often small, and are usually characterized by diffuse bulbs of percussion and lipped striking platforms.

Angular Shatter

The term "angular shatter" refers to those irregular fragments that do not express the characteristics of a typical flake. Many are flake fragments, while others are simply lithic chunks that were unintentionally produced during the lithic reduction process, as for example when a flake removal failed catastrophically or the striking platform was crushed by an ill-placed blow.

Not Applicable

This term refers to those bits of lithic debris that do not fit into a recognizable category.

UTILIZED FLAKES

Utilized flakes are those that exhibit discontinuous retouch or very abrupt retouch of a thin edge, which likely reflects use wear, rather than intentional modification. Utilized flakes often functioned as expediency tools. Seven varieties are recognized: (1) Primary decortication flake, 75 percent cortex; (2) Secondary decortication flake, less than 75 percent cortex; (3) Tertiary flake, no cortex; (4) Bifacial thinning flake; (5) Angular shatter; (6) Platform-bearing remnant; and (7) Not applicable. Because most of these categories are identical to those recognized for unmodified debris, only Type 6, Platform-bearing remnant, will be defined here. As before, all seven categories are subdivided into type classes: (1) Size 1 (1 inch or 25 mm sieve); (2) Size 2 (3/4 inch or 19 mm sieve); (3) Size 3 (½ inch or 12.5 mm sieve; (4) Size 4 (3/8 inch or 9.5 mm sieve); (5) Size 5 (1/4 inch or 6.3 mm sieve); (6) Size 6 (less than 1/4 inch or 6.3 mm sieve); and (7) Not applicable.

Platform-bearing Remnant

A Platform-bearing remnant is a utilized flake fragment retaining the platform. All other utilized flake fragments fall into the category of angular shatter.

CORES

A core is a cobble or mass of lithic material exhibiting scars that are the result of the systematic removal of flakes by human activity. Three subclasses of cores are recognized: (1) Tested pebble/nodule; (2) Complete core; and (3) Fragment/indeterminate. Cores are further subdivided into morphological and technological categories: (1) Bipolar; (2) Discoidal; (3) Blade; and (4) Not applicable.

Tested nodule/pebble

These pieces are pebbles or cobbles with one or very few flakes removed. These specimens represent discards from an early material selection stage of the bifacial reduction process.

Complete Core

As the name implies, this consists of a core that appears to be complete.

Fragment/indeterminate

This category includes all core fragments (including core tablets, which are large flakes that have been removed from a core in order to prepare a new platform) as well as those pieces that may be either core fragments or complete cores.

GROUND/PECKED/BATTERED STONE

This artifact class includes those specimens that have been modified by grinding, pecking, or battering. Fifteen categories, divided further into complete and fragmentary pieces, are recognized: (1) Abrader; (2) Anvil; (3) Celt; (4) Hammerstone; (5) Incised Stone; (6) Mano; (7) Mano/hammerstone; (8) Metate/grinding slab; (9) Pendant/gorget; (10) Polished Stone; (11) Smoothed Stone; (12) Sinker (fishing weight); (13) Bead; (14) Multi-purpose; and (15) Atlatl weight/bannerstone.

Abrader

These specimens are usually limestone or sandstone fragments that exhibit longitudinal, V-shaped grooves resulting from use as a polishing, smoothing, and/or sharpening stone employed in the production of bone or lithic tools.

Anvil

Anvils are cobbles with a small circular indention in the center of one face, which were presumably used as a base in the processing of nuts and/or grains.

Celt

These pieces are axe-like tools, round or oval in cross section, that are produced by extensive pecking and grinding. These tools may be grooved or ungrooved. Like adze/gouges, they have a steeply angled bit on one end.

Hammerstone

A hammerstone is a hard nodule of lithic material, usually quartzite, used for direct fracturing of the tool stone during lithic reduction. These pieces exhibit battering on one or more ends, resulting from utilization during the lithic reduction process.

Incised Stone

Incised stones are plano-convex cobbles, usually of limestone, that exhibit a series of three or more incised parallel lines near the center of the specimen. These pieces often exhibit the characteristics of having been thermally altered and apparently were used in the straightening process of shafts for darts or arrows.

Mano

A mano is an ovate-shaped nodule of quartzite or sandstone with one or more surfaces smoothed through grinding.

Mano/hammerstone

These multi-use tools exhibit at least one flattened, ground face and one end that has been battered as the result of use as a hammerstone.

Metate/Grinding Slab

These specimens are large, thick slabs, usually of sandstone, that have been ground smooth on one or both surfaces. These surfaces may be flat or basin-shaped.

Pendant/Gorget

These pieces are ground, smoothed and polished stones, often of an exotic, nonlocal material, that exhibit one or two drilled perforations. They were presumably worn or utilized as decorative ornaments.

Polished Stone

Polished stones are small pebbles that have been ground and smoothed through purposeful modification, as opposed to modification through utilization.

Smoothed Stone

These are small pebbles, such as ochre or limestone, that have been modified and shaped entirely through utilization.

Sinker (fishing weight)

These are medium-sized, usually water-worn pebbles with notches worked into opposite ends; they appear to have been used as net sinkers, although they may have been used as bola stones.

Bead

Beads are small cylindrical or round pieces through which a hole has been bored. They were presumably strung with similar pieces and worn for decorative purposes.

Multipurpose

Multipurpose tools are those, such as mano/hammerstones, that were modified and/or utilized for a variety of tasks, such as grinding, polishing, abrading, etc.

Atlatl weight/bannerstone

The function of these rare artifacts remains a matter of debate, but they appear to be atlatl weights, tools used to obtain greater range and accuracy from atlatl darts. Most of these artifacts are winged, hourglass-shaped (similar in shape to a double-bladed executioner's axe), and drilled through the center in order to facilitate their attachment to an atlatl shaft.

UNWORKED STONE

Unworked stone refers to those materials at a site that, though they have not been formally or directly utilized or modified, have nevertheless been impacted by human activity. Two formal classes are recognized: (1) Cobble (manuport); and (2) Burned rock. An additional category, *not applicable*, is included for those materials that do not fit into these two categories.

Cobble (manuport)

Included in this artifact class are those nodules or cobbles that are not a natural part of the site context and that have not been altered by human activity.

Burned Rock

Burned rock includes those cobbles or rock fragments that exhibit angular fractures, crazing, pot lid fractures, or discoloration as a result of being heated. These rocks may have been used as boiling stones, griddles, or linings for earth ovens. The raw material may be limestone, sandstone, or quartzite. The term "Fire-cracked rock" or the acronym "FCR" is also used for describing burned rock.

Geo-Marine Inc.
#3035-001 WOCMA Testing
Debitage and Burned Rock Coding Format
30 May 1996

Compiled by Marianne Marek

Group: (LIT) Lithics

Class: (4) Unmodified Debitage

Type:
(1) Primary Decortication Flake, 75% cortex
(2) Secondary Decortication Flake, less than 75% cortex
(3) Tertiary Flake, no cortex
(4) Shatter - undifferentiated
(5) Bifacial Thinning flake
(6) Platform Bearing Remnant
(7) Thin Flake frags
(8) Flake fragment 75-100% cortex
(9) Flake fragment 1-75% cortex
(10) Flake fragment - no cortex
(11) Shatter 75-100% cortex
(12) Shatter 1-75% cortex
(13) Shatter - no cortex
(99) Not applicable

Class: (8) Unworked stone and Minerals

Type:
(1) Manuports (NAT)
(2) Burned rock (includes FCR)

MAT Material Type Codes

(1) Chert
(2) Quartzite
(3) Basalt
(4) Silicified wood
(5) Petrified wood
(6) Siltstone
(7) Quartz
(8) Limestone
(9) Sandstone
(10) Steatite
(11) Hematite
(12) Limonite
(13) Andesite
(14) Rhyolite
(15) Schist
(16) Obsidian
(17) Silicified breccia
(18) Scoria/vesicular Basalt
(19) Metasediment
(20) Jasper
(21) Novaculite
(22) Dolomite
(23) Bowie Chert
(24) Woodford Chert
(25) Tecovas Chert
(26) Alibates
(27) Ogallala Quartzite
(28) Chalcedony
(29) Arkansas Novaculite
(30) Granite
(31) Coastal Plain Chert
(32) Tallahatta Quartzite
(33) Coastal Plain Agate
(34) Ferruginous Sandstone
(35) Conglomerate
(36) Mudstone
(37) Iron Concretion
(38) Quartzitic Sandstone
(39) Palmwood
(40) Edwards Chert
(41) Frisco Chert
(42) Arbuckle Mts. OK
(43) Potters Quartzite
(44) Quachita Mts. Chert
(45) Reeds Spring Chert
(46) Red River Yellow Siltstone
(47) Battiest Chert
(48) Penters Chert
(49) Woodford Chert
(50) Pinetop Chert
(51) Black Knob Ridge Chert (Green)
(52) Bay Bottom Chert
(53) Chalcedonic Chert
(54) Fossiliferous "Type 4" Chert - many Peneropolids
(55) Silicified Coral
(56) Tampa Limestone Chert (Hillsborough River)
(57) Suwanee Formation Chert
(58) Arkansas Novaculite Formation "Green" Chert
(59) Red River Siltstone
(60) Silicified Wood
(61) Cortex, cf. Johns Valley Shale Formation Chert
(62) Johns Valley Shale Formation Chert
(63) Red River Siltstone
(64)Woodford or Big Fork Chert
(65) Quartzite, Unidentified Formation
(66) Unidentified Quartzite
(67) Lowrance Chert (Oil Creek or Joins Valley Formations)
(68) Quartzite, Unidentified Formation
(69) Potter Chert
(70) Ogallala Quartzite
(71) Ogallala Quartzite
(72) cf. Lowrance Chert
(73) Arkansas Novaculite
(80) Igneous, other
(81) Metamorphic, other
(98) Unidentifiable
(99) Not applicable

HCDE Heat treatment

(1) Yes
(2) No
(3) Burned (pot lidded)
(98) Indeterminate
(99) Not applicable

QTY: Number of items.

SIZE Size code for debitage or actual measurements (L x W x T)

(1) > 25 mm (1 inch or 25 mm sieve)
(2) 19 mm to 25 mm (3/4 inch or 19 mm sieve)
(3) 12.5 mm to 19 mm (½ inch or 12.5 mm sieve)
(4) 9.5 mm to 12.5 mm (3/8 inch or 9.5 mm sieve)
(5) 6.3 mm to 9.5 mm (1/4 inch or 6.3 mm sieve)
(6) < 6.3 mm (less than 1/4 inch or 6.3 mm sieve)

WEIGHT: Weight

Geo-Marine, Inc.
Lithic Tools Coding Format
#3035-001 WOCMA
30 May 1996

Coding Format for Prehistoric Finished Bifacial Tools

Compile By Marianne Marek

GROUP: (LIT) Lithics

CLASS: (1) Finished Bifacial Tools

TYPE: (1) Dart point
(2) Arrow point
(3) Indeterminate point
(4) Axe
(5) Thinned biface (knife)
(6) Chopper
(7) Drill
(8) Adze/Gouge
(9) Marginal Bifacial Retouch

(98) Indeterminate

OTHER: (99) not applicable

COND: Condition

(1) Complete
(2) Tip
(3) Mid-section
(4) Base/stem
(5) Longitudinal fracture
(6) Tang
(7) Blade
(8) Proximal/Medial (all but tip)

(98) Indeterminate

MAT: Material type (codes attached)

COLOR: (estimation of primary color present, using Munsell Color Codes)

HEAT: (Heat Treatment):

(1) Yes
(2) No (or indeterminate)
(3) Burned

LENGTH: (measured in mm along the axis from tip to base)

LENG2: Stem Length (if applicable, measured from the shoulders to the base)

WIDTH: (measured at the widest point which is perpendicular to the length)

THICK: Thickness (measured at the thickest point)

MNSW: Minimum stem width (if applicable, measured at the narrowest point on the stem)

MXSW: Maximum stem width (if applicable, measured at the widest point on the stem, but below the shoulders)

WEIGHT: Weight

COMMENT: Enter specific name of stone tool type, and variety name as applicable (i.e., Gary Point, Gary var.)

Coding Format for Prehistoric Unfinished Bifaces

GROUP: (LIT) Lithics

CLASS: (2) Unfinished Bifaces

TYPE:
(1) Aborted, Early
(2) Aborted, Late
(3) Arrow point preform
(4) Dart point preform

(98) Indeterminate

OTHER: Reason For Rejection

(1) Lateral snap
(2) Basal thinning failure
(3) Perverse snap
(4) Overshot
(5) Haft snap
(6) Flaw in material
(7) Impact fracture
(8) hinge termination
(9) Thermal fracture
(10) Failure to thin
(11) Edge collapse
(12) Knot, tabular facet
(13) Modern fracture

(98) Indeterminate

COND: Condition

(1) Complete
(2) Fragment

(98) Indeterminate

MAT: Material Type (codes attached)

COLOR: (estimation of primary color present, using Munsell Color Codes)

HEAT: (Heat Treatment):

(1) Yes
(2) No (or indeterminate)
(3) Burned

LENGTH: (measured in mm along the axis from tip to base)

LENG2: Stem length (if applicable, measured from the shoulders to the base)

WIDTH: (measured at the widest point which is perpendicular to the length)

THICK: Thickness (measured at the thickest point)

MNSW: Minimum Stem Width (if applicable, measured at the narrowest point on the stem)

MXSW: Maximum stem width (if applicable, measured at the widest point on the stem, but below the shoulders)

WEIGHT: Weight

Coding Format for Prehistoric Unifaces

GROUP: (LIT) Lithics

CLASS: (3) Unifaces

TYPE:
(1) Marginally Modified/Retouched
(2) Borer (has alternating edge retouch)
(3) Burin
(4) Denticulate
(5) End scraper
(6) Side scraper
(7) Scraper with graver spur
(8) Graver (retouch from one side only)
(9) Notch
(10) Burin spall
(11) Adze/gouge
(12) Backed flake/blade

(98) Indeterminate

OTHER: Blank Form.

(1) Primary Decortication Flake, 75% cortex
(2) Secondary Decortication Flake, less than 75% cortex
(3) Tertiary Flake, no cortex
(4) Bifacial Thinning Flake
(5) Angular Shatter
(6) Platform remnant bearing
(7) Recycled bifacial tool
(8) Recycled unifacial tool
(9) Recycled aborted biface
(10) Recycled core

(98) Indeterminate

COND:
(1) Complete
(2) Fragment

(98) Indeterminate

MAT: Material type (codes attached)

COLOR: (estimation of primary color present, using Munsell Color Codes)

HEAT: (Heat Treatment)

(1) Yes
(2) No (or indeterminate)
(3) Burned

LENGTH: (measured in mm along the longest axis or from proximal to distal end of flake)

LENG2: N/A

WIDTH: (measured at the widest point which is perpendicular to the length)

THICK: Thickness (measured at the thickest point)

WEIGHT: Weight

Coding Format for Prehistoric Utilized Flakes

GROUP: (LIT) Lithics

CLASS: (5) Utilized Flakes

TYPE:
(1) Unifacial, dorsal
(2) Unifacial, ventral
(3) Dorsal/Ventral
(4) Bifacial
(5) Bifacial/Unifacial

(98) Indeterminate

OTHER: Blank Form

(1) Primary Decortication Flake, 75% cortex
(2) Secondary Decortication Flake, less than 75% cortex
(3) Tertiary Flake, no cortex
(4) Bifacial Thinning Flake
(5) Angular Shatter
(6) Platform remnant bearing
(7) Recycled bifacial tool
(8) Recycled unifacial tool
(9) Recycled aborted biface
(10) Recycled core

(98) Indeterminate

COND: Condition

(1) Complete
(2) Fragment

(98) Indeterminate

MAT: Material type (codes attached)

COLOR: (estimation of primary color present, using Munsell Color Codes)

HEAT: (Heat Treatment)

(1) Yes
(2) No (or indeterminate)
(3) Burned

LENGTH: (measured in mm along the longest axis or from proximal to distal end of flake)

LENG2: Length of utilized edge

WIDTH: (measured at the widest point which is perpendicular to the length)

THICK: Thickness (measured at the thickest point)

WEIGHT: Weight

ALACK: Location of utilized edge.

(1) Lateral
(2) Distal
(3) Distal transverse
(4) Proximal
(5) Multiple

(6) Lateral/Distal
(7) Lateral/Distal transverse
(8) Multiple Lateral
(9) Proximal/Distal
(10) Proximal/Distal transverse

(98) Indeterminate

AFFIRM: Form of utilized edge.

(1) Straight
(2) Convex
(3) Concave
(4) Notch
(5) Denticulated
(6) Irregular

(98) Indeterminate

Coding Format for Prehistoric Cores

GROUP: (LIT) Lithics

CLASS: (6) Cores

TYPE:
(1) Tested nodule/pebble
(2) Unidirectional
(3) Bidirectional
(4) Multidirectional
(5) Discoidal

(98) Indeterminate

OTHER: Platform type

(1) Cortex platform, single
(2) Cortex platform, double opposed
(3) Cortex platform, double perpendicular
(4) Cortex platform, multiple
(5) Prepared platform
(6) Bifacial platform
(7) Multiple platform

(98) Indeterminate

COND:
(1) Complete
(2) Fragment

(98) Indeterminate

MAT: Material type (codes attached)

COLOR: (estimation of primary color present, using Munsell Color Codes)

HEAT: (Heat Treatment)

(1) Yes
(2) No (or indeterminate)
(3) Burned

LENGTH: (measured in mm along the longest axis or from proximal to distal end of flake)

LENG2: N/A

WIDTH: (measured at the widest point which is perpendicular to the length)

THICK: Thickness (measured at the thickest point)

WEIGHT: Weight

Coding Format for Prehistoric Ground/Pecked/Battered Stone

GROUP: **(LIT) Lithics**

CLASS: **(7) Ground/Pecked/Battered stone**

TYPE: (1) Abrader
(2) Anvil
(3) Celt
(4) Hammerstone
(5) Incised Stone
(6) Mano
(7) Mano/hammerstone
(8) Metate/grinding slab
(9) Pendant/Gorget
(10) Polished stone
(11) Smoothed stone
(12) Sinker (fishing weight)
(13) Bead
(20) Multi purpose
(21) Atlatl weight/banner stone

OTHER: (99) n/a

COND: (1) Complete
(2) Fragment

MAT: Material type (codes attached)

COLOR: (estimation of primary color present, using Munsell Color Codes)

HEAT: (Heat Treatment)

(1) Yes
(2) No (or indeterminate)
(3) Burned

LENGTH: (measured in mm along the longest axis or from proximal to distal end of flake)

LENG2: N/A

WIDTH: (measured at the widest point which is perpendicular to the length)

THICK: Thickness (measured at the thickest point)

WEIGHT: Weight

MAT Material Type Codes

(1) Chert
(2) Quartzite
(3) Basalt
(4) Silicified wood
(5) Petrified wood
(6) Siltstone
(7) Quartz
(8) Limestone
(9) Sandstone
(10) Steatite
(11) Hematite
(12) Limonite
(13) Andesite
(14) Rhyolite
(15) Schist
(16) Obsidian
(17) Silicified breccia
(18) Scoria/vesicular Basalt
(19) Metasediment
(20) Jasper
(21) Novaculite
(22) Dolomite
(23) Bowie Chert
(24) Woodford Chert
(25) Tecovas Chert
(26) Alibates
(27) Ogallala Quartzite
(28) Chalcedony
(29) Arkansas Novaculite
(30) Granite
(31) Coastal Plain Chert
(32) Tallahatta Quartzite
(33) Coastal Plain Agate
(34) Ferruginous Sandstone
(35) Conglomerate
(36) Mudstone
(37) Iron Concretion
(38) Quartzitic Sandstone
(39) Palmwood
(40) Edwards Chert
(41) Frisco Chert
(42) Arbuckle Mts. OK
(43) Potters Quartzite
(44) Quachita Mts. Chert
(45) Reeds Spring Chert
(46) Red River Yellow Siltstone
(47) Battiest Chert
(48) Penters Chert
(49) Woodford Chert
(50) Pinetop Chert
(51) Black Knob Ridge Chert (Green)
(52) Bay Bottom Chert
(53) Chalcedonic Chert
(54) Fossiliferous "Type 4" Chert - many Peneropolids
(55) Silicified Coral
(56) Tampa Limestone Chert (Hillsborough River)
(57) Suwanee Formation Chert
(58) Arkansas Novaculite Formation "Green" Chert
(59) Red River Siltstone
(60) Silicified Wood
(61) Cortex, cf. Johns Valley Shale Formation Chert
(62) Johns Valley Shale Formation Chert
(63) Red River Siltstone
(64) Woodford or Big Fork Chert
(65) Quartzite, Unidentified Formation
(66) Unidentified Quartzite
(67) Lowrance Chert (Oil Creek or Joins Valley Formations)
(68) Quartzite, Unidentified Formation
(69) Potter Chert
(70) Ogallala Quartzite
(71) Ogallala Quartzite
(72) cf. Lowrance Chert
(73) Arkansas Novaculite
(80) Igneous, other
(81) Metamorphic, other
(98) Unidentifiable
(99) Not applicable

Date: 04/17/97

Geo-Marine Inc.
#3035-001 WOCMA Testing
41Bw553 Bifaces

Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
BHT	2	Lev:															
545	1	1	Finished Bifacial Tool	Drill	n/a	Complete	Bowie Chert	5YR4/3	yes	26	11	1	0.6				"CADDO" DRILL MADE ON FLAKE
549	1	1	Finished Bifacial Tool	Dart Point	n/a	Base/stem	Red River yellow siltstone	10YR5/8	no	26	33	7	6.2	14	16	12	MARSHALL-LIKE
FEAT	3	Lev: 8															
470	1	1	Unfinished Biface	Aborted, Early	Failure to thin	Complete	Ogallala Quartzite	7.5YR6/2	no	42	36	15	20.3				
UNIT	4	Lev: 1															
512	1	1	Finished Bifacial Tool	indet.	n/a	indet.	Arkansas Novaculite	N4	no	9	1	5	0.2				POINT BASE OR BARB
UNIT	12	Lev: 4															
513	1	1	Finished Bifacial Tool	Arrow Point	n/a	Tip	Red River yellow siltstone	7.5YR5/4	no	19	11	2	0.4				
UNIT	16	Lev: 5															
32	1	1	Finished Bifacial Tool	Dart Point	n/a	Base/stem	Arkansas Novaculite	N5	no	15	17	7	1.7				GARY POINT BASE, VAR. COLFAX
UNIT	87	Lev: 2															
362	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Ogallala Quartzite	10YR5/2	no	42	22	6	5.0	5	14	14	GARY POINT, VAR. KAUFMAN
UNIT	25	Lev: 7															
51	1	1	Finished	Dart Point	n/a	Proximal/	Ogallala	5YR3/3	no	39	24	8	6.8	11	17	19	GARY POINT

Geo-Marine Inc.
#3035-001 WOCMA Testing
41Bw553 Bifaces

Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
			Bifacial Tool			medial	Quartzite										BASE, VAR. COLFAX
UNIT 30			Lev: 2														
281	1	1	Finished Bifacial Tool	Arrow Point	n/a	Complete	Ogallala Quartzite	10YR10/3	no	15	8	3	0.3	6	8	5	AGEE-LIKE
469	1	1	Unfinished Biface	indet.	Lateral snap	Fragment	Red River yellow siltstone	10YR4/4	no	20	14	4	0.7				
UNIT 32			Lev: 6														
463	1	1	Unfinished Biface	Aborted, Late	Lateral snap	Fragment	Ogallala Quartzite	7.5YR5/3	no	34	24	10	10.2				
UNIT 34			Lev: 3														
472	1	1	Finished Bifacial Tool	indet. Point	n/a	indet.	Woodford or Big Fork Chert	7.5YR3/2	no	12	10	3	0.4				
UNIT 38			Lev: 1														
471	1	1	Finished Bifacial Tool	indet.	n/a	indet.	Arkansas Novaculite	N8	no	18	9	7	0.6				PROJECTILE POINT BARB?
UNIT 43			Lev: 5														
468	1	1	Unfinished Biface	Aborted, Early	Lateral snap	Fragment	cf. Lowrance Chert	10YR3/2	no	28	32	10	8.6				
UNIT 44			Lev: 1														
516	1	1	Finished Bifacial Tool	indet.	n/a	Base/stem	Ogallala Quartzite	2.5YR4/2	no	11	17	4	1.0				

Date: 04/17/97

Geo-Marine Inc.
#3035-001 WOCMA Testing
41Bw553 Bifaces

Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
UNIT 44		Lev: 3															
466	2	1	Unfinished Biface	Aborted, Early	indet.	Complete	Ogallala Quartzite	10YR6/3	burned	50	40	12	19.8				
UNIT 44		Lev: 5															
477	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Woodford or Big Fork Chert	10YR3/1	no	42	24	8	6.6	14	17	17	WELLS-LIKE
477	2	1	Unfinished Biface	Aborted, Late	Lateral snap	Fragment	Ogallala Quartzite	10R4/4	no	48	24	13	12.9				
477	3	1	Unfinished Biface	Dart point preform	Failure to thin	Complete	silicified wood	10R3/3	no	33	25	16	10.5				PROB. GARY PREFORM
UNIT 44		Lev: 8															
474	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Woodford or Big Fork Chert	10YR4/1	no	35	18	6	3.8	16	17	9	POSS. PALEO/EARLY ARCHAIC
UNIT 48		Lev: 3															
475	1	1	Finished Bifacial Tool	Dart Point	n/a	Longitudinal fract.	Arkansas Novaculite	N7	no	14	19	7	2.5				
UNIT 50		Lev: 2															
123	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	cf. Lowrance Chert	10YR5/1	no	62	25	11	14.5	6	21	20	GARY POINT, VAR. PANNA MARIA
UNIT 63		Lev: 4															
478	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Bowie Chert	10R5/3	no	31	17	6	2.7	9	13	10	GARY POINT, VAR. KEMP/EMORY
478	2	1	Unfinished	Aborted,	Perverse	Fragment	Ogallala	2.5YR4/3	yes	32	23	8	6.6				

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41Bw553 Bifaces

Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
			Biface	Late	snap		Quartzite										
UNIT 63		Lev: 6															
473	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Red River yellow siltstone	10YR3/2	yes	30	21	8	4.5				GARY POINT, VAR. UNIDENTIFIED
473	2	1	Unfinished Biface	Dart point preform	n/a	Complete	Ogallala Quartzite	10R5/2	no	57	30	11	16.6				
UNIT 63		Lev: 7															
183	1	1	Finished Bifacial Tool	Dart Point	n/a	Base/stem	Ogallala Quartzite	5YR3/2	no	12	18	5	1.0				POINT BASE (?)
UNIT 66		Lev: 4															
476	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Ogallala Quartzite	2.5YR5/3	no	30	16	5	2.2	6	14	14	GARY POINT, VAR. KAUFMAN
UNIT 67		Lev: 5															
371	1	1	Finished Bifacial Tool	Arrow Point	n/a	Complete	Ogallala Quartzite	10YR6/2	yes	16	14	3	0.3	7	8	4	SCALLORN
UNIT 67		Lev: 6															
510	1	1	Unfinished Biface	Aborted, Early	n/a	Fragment	Red River yellow siltstone	10YR5/6	no	18	18	9	3.1				

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41Bw553 Unifaces, Cores, and Ground Stone

Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Util Edge Leng	Utilized Edge Location	Utilized Edge Form
UNIT 13		Lev: 2														
388	1	1	Uniface	Marginally modified/ retouched	Secondary Flake	Complete	Bowie Chert	10YR6/6	no	27	17	4	2.0		n/a	n/a
UNIT 37		Lev: 2														
419	1	1	Uniface	Scraper w/graver spur	Tertiary Flake	Complete	Bowie Chert	10YR6/6	no	25	18	4	1.8		n/a	n/a
UNIT 44		Lev: 2														
509	1	1	Uniface	Marginally modified/ retouched	Secondary Flake	Complete	Red River yellow siltstone	2.5YR4/3	yes	25	14	3	1.0		n/a	n/a
UNIT 44		Lev: 3														
466	1	1	Uniface	indet.	Secondary Flake	Complete	Bowie Chert	10YR4/6	no	39	19	15	11.4		n/a	n/a
UNIT 67		Lev: 2														
514	1	1	Uniface	indet.	indet.	Fragment	Ogallala Quartzite	2.5YR4/3	yes	33	35	8	8.0		n/a	n/a
UNIT 16		Lev: 5														
515	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Bowie Chert	7.5YR6/6	burned	24	13	5	1.2	18	Lateral	Irregular
UNIT 33		Lev: 5														
465	1	1	Utilized Flake	indet.	Tertiary Flake	Fragment	silicified wood	7.5YR3/4	no	36	16	6	2.6	36	Lateral	Convex
UNIT 44		Lev: 8														

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41Bw553 Unifaces, Cores, and Ground Stone

Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Util Edge Leng	Utilized Edge Location	Utilized Edge Form
131	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Arkansas Novaculite	N8/	no	22	13	2	0.5	10	Lateral	Concave
UNIT 67		Lev: 2														
508	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Ogallala Quartzite	2.5YR5/3	no	24	32	7	3.2	18	Lateral	Straight
UNIT 80		Lev: 1														
511	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Ogallala Quartzite	2.5Y6/4	no	29	20	8	4.6	16	Lateral	Straight
UNIT 29		Lev: 4														
83	1	1	Core	Tested nodule/ pebble	Cortex platform, single	Complete	Red River yellow siltstone	7.5YR5/3	no	50	28	20	29.3		n/a	n/a
UNIT 35		Lev: 3														
462	1	1	Core	Tested nodule/ pebble	Cortex platform, single	Complete	petrified wood	2.5YR4/4	no	79	39	25	100.8		n/a	n/a
UNIT 44		Lev: 2														
509	2	1	Core	Multidirectional	Multiple platform	Complete	siltstone	10YR5/8	yes	40	30	19	26.7		n/a	n/a
UNIT 75		Lev: 1														
464	1	1	Core	Multidirectional	Bifacial platform	Complete	Ogallala Quartzite	2.5YR6/2	no	33	52	22	41.5		n/a	n/a
UNIT 67		Lev: 6														
553	1	1	Ground/Pecked/	Smoothed stone	n/a	Complete	limonite	5YR7/6	no	26	26	5	2.9		n/a	n/a

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41BW553 Unifaces, Cores, and Ground Stone

Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Util Edge Leng	Utilized Edge Location	Utilized Edge Form
			Battered													
UNIT 27			Lev: 7													
279	1	1	Ground/Pecked/ Battered	Incised Stone	n/a	Complete	Ferruginous Sandstone	10R3/1	no	31	25	13	17.5		n/a	n/a
UNIT 44			Lev: 4													
267	1	1	Ground/Pecked/ Battered	Smoothed stone	n/a	Complete	Ferruginous Sandstone	2.5YR4/3	no	22	12	10	4.9		n/a	n/a
UNIT 66			Lev: 3													
338	1	1	Ground/Pecked/ Battered	Smoothed stone	n/a	Complete	Ferruginous Sandstone	2.5YR3/3	no	20	16	7	2.5		n/a	n/a
UNIT 67			Lev: 3													
336	1	1	Ground/Pecked/ Battered	Metate/ grinding slab	n/a	Complete	Ferruginous Sandstone	5YR3/4	no	90	43	23	76.1		n/a	n/a

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Geo-Marine Inc.
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41BW553 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
BHT 1 Lev:						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	1.50
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	burned	9.5-12.5mm	1	1.50
BHT 2 Lev:						
Unmodified debitage	Primary flake	Palmwood	no	9.5-12.5mm	1	0.40
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Siltstone	no	12.5-19mm	1	1.90
FEAT 1 Lev: 4						
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	< 6.3mm	1	0.01
FEAT 2 Lev: 5						
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.05
FEAT 3 Lev: 8						
Unmodified debitage	Primary flake	Bowie Chert	no	19-25mm	1	6.90
Unmodified debitage	Secondary flake	Ark. Novaculite	burned	12.5-19mm	1	4.80
Unmodified debitage	Tertiary flake	Bowie Chert	no	19-25mm	1	6.20
Unmodified debitage	Tertiary flake	Unidentifiable	yes	9.5-12.5mm	1	1.20
Unworked stone	Burned Rock	Quartzite	yes		1	24.10
FEAT 4 Lev: 5						
Unworked stone	Burned Rock	Quartzite	yes		2	108.20
Unworked stone	Burned Rock	Petrified Wood	yes		1	10.70
Unworked stone	Burned Rock	Ferruginous Sandstone	yes		3	8.20
FEAT 4 Lev: 6						
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	1	0.01
UNIT 1 Lev: 1						
Unmodified debitage	Flake frag, no cortex	Chert	burned	6.3-9.5mm	1	0.60
UNIT 1 Lev: 3						
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 2 Lev: 1						
Unmodified debitage	Secondary flake	Bowie Chert	no	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	cf. Johns Valley Shale Chert	no	9.5-12.5mm	1	0.70
UNIT 2 Lev: 2						
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 2 Lev: 4						
Unmodified debitage	Secondary flake	Bowie Chert	yes	< 6.3mm	1	0.20
UNIT 4 Lev: 1						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Bifacial thinning	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
UNIT 4 Lev: 2						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.05
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.05
UNIT 7 Lev: 3						
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	1.40
UNIT 8 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.30
UNIT 8 Lev: 4						
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
UNIT 9 Lev: 2						
Unmodified debitage	Secondary flake	Siltstone	no	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.40
UNIT 9 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.30
UNIT 11 Lev: 3						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
UNIT 12 Lev: 1						
Unmodified debitage	Primary flake	Chert	burned	12.5-19mm	1	3.30

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Primary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, >75% cortex	Chert	burned	9.5-12.5mm	1	1.20
Unmodified debitage	Shatter, no cortex	Chert	yes	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	19-25mm	1	0.10
UNIT 12 Lev: 2						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
UNIT 12 Lev: 3						
Unmodified debitage	Primary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.40
Unmodified debitage	Primary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Secondary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.40
Unmodified debitage	Secondary flake	RR Yellow Siltstone	indet.	6.3-9.5mm	1	0.60
Unmodified debitage	Secondary flake	Siltstone	no	6.3-9.5mm	1	6.00
Unmodified debitage	Secondary flake	Lowrance Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Bifacial thinning	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	< 6.3mm	1	0.10
Unmodified debitage	Shatter, >75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	burned	6.3-9.5mm	1	0.60
UNIT 12 Lev: 4						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
UNIT 12 Lev: 5						
Unmodified debitage	Primary flake	Chert	burned	6.3-9.5mm	1	0.20
UNIT 12 Lev: 6						
Unmodified debitage	Primary flake	Bowie Chert	no	6.3-9.5mm	1	0.50
UNIT 13 Lev: 3						
Unmodified debitage	Tertiary flake	Unidentifiable	yes	9.5-12.5mm	1	0.50

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 13 Lev: 5						
Unmodified debitage	Primary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.50
UNIT 14 Lev: 2						
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
UNIT 14 Lev: 3						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
UNIT 15 Lev: 7						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.40
UNIT 16 Lev: 1						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.60
UNIT 16 Lev: 2						
Unmodified debitage	Secondary flake	Woodford or Big Fork Chert	no	12.5-19mm	1	2.20
UNIT 16 Lev: 3						
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	12.5-19mm	1	2.70
UNIT 16 Lev: 4						
Unmodified debitage	Tertiary flake	Bowie Chert	no	12.5-19mm	1	0.70
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Unidentifiable	burned	9.5-12.5mm	1	0.60
UNIT 16 Lev: 5						
Unmodified debitage	Shatter, >75% cortex	Bowie Chert	yes	12.5-19mm	1	4.10
UNIT 17 Lev: 1						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.90
UNIT 19 Lev: 1						
Unmodified debitage	Secondary flake	unidentified	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	yes	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.30
Unmodified debitage	Tertiary flake	cf. Johns Valley Shale Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Johns Valley Shale Chert	no	9.5-12.5mm	1	0.50
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	yes	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	< 6.3mm	1	0.05
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	yes	6.3-9.5mm	1	1.00

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 19 Lev: 5						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
UNIT 19 Lev: 6						
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	unidentified	no	9.5-12.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Bowie Chert	burned	9.5-12.5mm	1	0.30
UNIT 20 Lev: 1						
Unmodified debitage	Tertiary flake	Unidentifiable	yes	6.3-9.5mm	1	0.50
UNIT 20 Lev: 2						
Unmodified debitage	Tertiary flake	Unidentifiable	yes	9.5-12.5mm	1	1.20
UNIT 20 Lev: 5						
Unmodified debitage	Tertiary flake	Silicified Wood	no	9.5-12.5mm	1	0.90
UNIT 21 Lev: 1						
Unmodified debitage	Primary flake	Quartzite	no	19-25mm	1	13.20
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.40
UNIT 21 Lev: 2						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	1.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	4.30
Unmodified debitage	Tertiary flake	Ark. Novaculite "Green" chert	no	12.5-19mm	1	1.00
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, >75% cortex	Chert	yes	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
UNIT 21 Lev: 3						
Unmodified debitage	Primary flake	Unidentifiable	yes	6.3-9.5mm	1	1.20
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	1.60
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	6.3-9.5mm	1	1.50
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.70
UNIT 21 Lev: 4						
Unmodified debitage	Tertiary flake	Bowie Chert	no	12.5-19mm	1	1.00
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	yes	12.5-19mm	1	4.30
UNIT 21 Lev: 5						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.90
Unmodified debitage	Secondary flake	RR Yellow Siltstone	indet.	6.3-9.5mm	1	0.50

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Secondary flake	Silicified Wood	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	Silicified Wood	no	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Silicified Wood	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Silicified Wood	no	6.3-9.5mm	1	0.10
Unworked stone	Burned Rock	Unidentifiable	yes		1	10.70
UNIT 22 Lev: 1						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	indet.	6.3-9.5mm	1	0.50
UNIT 22 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 22 Lev: 4						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	< 6.3mm	1	0.05
UNIT 23 Lev: 2						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.70
UNIT 23 Lev: 3						
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Siltstone	no	6.3-9.5mm	1	0.30
UNIT 24 Lev: 1						
Unmodified debitage	Secondary flake	Siltstone	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Shatter, 1-75% cortex	Siltstone	no	12.5-19mm	1	5.20
UNIT 24 Lev: 2						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	1.50
UNIT 24 Lev: 3						
Unworked stone	Burned Rock	Ferruginous Sandstone	yes		1	1.30
UNIT 24 Lev: 6						
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
UNIT 25 Lev: 1						
Unmodified debitage	Tertiary flake	Bowie Chert	yes	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
UNIT 25 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	2	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01

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41BW553 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 26 Lev: 1						
Unmodified debitage	Secondary flake	Battiest Chert	no	9.5-12.5mm	1	2.00
Unmodified debitage	Secondary flake	Siltstone	no	6.3-9.5mm	1	0.90
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
UNIT 27 Lev: 2						
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.40
UNIT 27 Lev: 4						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.10
Unworked stone	Burned Rock	Quartzite	yes		1	36.50
UNIT 27 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
UNIT 27 Lev: 7						
Unworked stone	Burned Rock	Quartzite	yes		1	7.70
UNIT 30 Lev: 1						
Unmodified debitage	Primary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	1.00
Unmodified debitage	Secondary flake	Chert	yes	6.3-9.5mm	1	1.10
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.10
UNIT 30 Lev: 3						
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	< 6.3mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	indet.	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	yes	6.3-9.5mm	1	0.10
UNIT 30 Lev: 5						
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	burned	9.5-12.5mm	1	2.40
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.20
UNIT 30 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 30 Lev: 8						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	2.20

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 30 Lev: 9						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
UNIT 32 Lev: 1						
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	12.5-19mm	1	2.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.20
Unmodified debitage	Shatter, >75% cortex	Unidentifiable	yes	12.5-19mm	1	4.80
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	< 6.3mm	1	0.05
UNIT 32 Lev: 2						
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.70
Unmodified debitage	Flake frag, no cortex	cf. Johns Valley Shale Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Quartzite	no	6.3-9.5mm	1	0.10
UNIT 32 Lev: 3						
Unmodified debitage	Primary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Johns Valley Shale Chert	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.05
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
UNIT 32 Lev: 4						
Unmodified debitage	Primary flake	Battiest Chert	no	12.5-19mm	1	3.10
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.00
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 32 Lev: 5						
Unmodified debitage	Primary flake	Bowie Chert	no	12.5-19mm	1	6.20
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	1.70
UNIT 32 Lev: 6						
Unmodified debitage	Primary flake	Silicified Wood	no	12.5-19mm	1	1.90
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ferruginous Sandstone	indet.	19-25mm	1	12.40
Unmodified debitage	Shatter, >75% cortex	RR Yellow Siltstone	no	19-25mm	1	11.10
Unmodified debitage	Shatter, >75% cortex	Unidentifiable	yes	12.5-19mm	1	5.80

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 33 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	yes	12.5-19mm	1	4.80
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	yes	9.5-12.5mm	1	0.70
UNIT 33 Lev: 4						
Unmodified debitage	Secondary flake	Siltstone	no	12.5-19mm	1	1.10
Unmodified debitage	Secondary flake	Unidentifiable	yes	12.5-19mm	1	1.60
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Unidentifiable	yes	9.5-12.5mm	1	0.40
UNIT 33 Lev: 5						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	Unidentifiable	indet.	12.5-19mm	1	2.50
Unmodified debitage	Tertiary flake	cf. Johns Valley Shale Chert	no	9.5-12.5mm	1	0.90
UNIT 33 Lev: 7						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	12.5-19mm	1	2.90
UNIT 34 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
UNIT 34 Lev: 3						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
UNIT 35 Lev: 1						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Bowie Chert	yes	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	burned	9.5-12.5mm	1	1.30
Unmodified debitage	Shatter, no cortex	Bowie Chert	burned	6.3-9.5mm	1	0.10
UNIT 35 Lev: 2						
Unmodified debitage	Tertiary flake	Unidentifiable	burned	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Quartzite	yes	< 6.3mm	1	0.05
Unmodified debitage	Shatter, no cortex	Chert	yes	< 6.3mm	1	0.10
Unworked stone	Burned Rock	Ferruginous Sandstone	yes		1	1.70
Unworked stone	Burned Rock	Unidentifiable	yes		1	45.20

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 35 Lev: 3						
Unmodified debitage	Primary flake	Unidentifiable	burned	9.5-12.5mm	1	0.50
Unmodified debitage	Secondary flake	Ferruginous Sandstone	burned	> 25mm	1	24.30
Unmodified debitage	Tertiary flake	Bowie Chert	yes	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.90
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.10
UNIT 35 Lev: 4						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
Unmodified debitage	Shatter, >75% cortex	Quartzite	no	9.5-12.5mm	1	1.20
UNIT 35 Lev: 5						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	cf. Johns Valley Shale Chert	no	9.5-12.5mm	1	0.80
UNIT 35 Lev: 6						
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	burned	12.5-19mm	1	2.60
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.30
UNIT 37 Lev: 3						
Unmodified debitage	Secondary flake	Chert	yes	9.5-12.5mm	1	0.90
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	1.60
Unworked stone	Burned Rock	Ferruginous Sandstone	yes		1	54.30
UNIT 37 Lev: 4						
Unmodified debitage	Secondary flake	Bowie Chert	no	12.5-19mm	1	4.70
Unmodified debitage	Secondary flake	Unidentifiable	yes	6.3-9.5mm	1	0.60
UNIT 37 Lev: 5						
Unmodified debitage	Secondary flake	Bowie Chert	no	12.5-19mm	1	1.50
Unmodified debitage	Secondary flake	Ark. Novaculite	no	9.5-12.5mm	1	0.60
Unworked stone	Burned Rock	Quartzite	yes		1	57.60
UNIT 37 Lev: 6						
Unmodified debitage	Secondary flake	Siltstone	burned	6.3-9.5mm	1	1.20
Unworked stone	Burned Rock	Ferruginous Sandstone	yes		1	2.80

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 37 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.50
UNIT 38 Lev: 1						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Flake frag, no cortex	Petrified Wood	no	12.5-19mm	1	1.00
UNIT 38 Lev: 2						
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	6.3-9.5mm	1	0.20
UNIT 38 Lev: 3						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
UNIT 38 Lev: 4						
Unmodified debitage	Secondary flake	Unidentifiable	yes	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Johns Valley Shale Chert	no	19-25mm	1	3.30
UNIT 38 Lev: 6						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	12.5-19mm	1	1.60
UNIT 39 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.90
UNIT 40 Lev: 1						
Unmodified debitage	Tertiary flake	Petrified Wood	no	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	indet.	12.5-19mm	1	1.20
UNIT 40 Lev: 2						
Unmodified debitage	Primary flake	Siltstone	no	9.5-12.5mm	1	1.20
UNIT 43 Lev: 2						
Unmodified debitage	Primary flake	Bowie Chert	no	12.5-19mm	1	3.10
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	12.5-19mm	1	1.20
UNIT 43 Lev: 3						
Unmodified debitage	Secondary flake	Ogallala Quartzite	indet.	19-25mm	1	7.60
UNIT 43 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.80
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	9.5-12.5mm	1	1.00
UNIT 43 Lev: 6						
Unmodified debitage	Secondary flake	Chert	no	12.5-19mm	1	1.20

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 44 Lev: 1						
Unmodified debitage	Primary flake	Unidentifiable	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	1.60
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 44 Lev: 2						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.90
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	Unidentifiable	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	2.00
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.30
UNIT 44 Lev: 3						
Unmodified debitage	Shatter, >75% cortex	Bowie Chert	no	12.5-19mm	1	6.50
UNIT 44 Lev: 4						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	12.5-19mm	1	1.60
UNIT 44 Lev: 5						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	4.70
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.10
Unmodified debitage	Secondary flake	Bowie Chert	yes	12.5-19mm	1	2.50
Unmodified debitage	Secondary flake	Unidentifiable	yes	12.5-19mm	1	3.50
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	0.20
Unmodified debitage	Shatter, >75% cortex	Bowie Chert	no	12.5-19mm	1	1.70
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	indet.	19-25mm	1	17.90
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	12.5-19mm	1	2.10
Unworked stone	Burned Rock	Quartzite	yes		1	16.80
UNIT 44 Lev: 6						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	12.5-19mm	1	1.80
Unmodified debitage	Secondary flake	Bowie Chert	yes	12.5-19mm	1	2.00
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	4.20
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Bowie Chert	no	12.5-19mm	1	2.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Flake frag, no cortex	Limestone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	yes	12.5-19mm	1	2.60
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	12.5-19mm	1	2.50
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	9.5-12.5mm	1	1.50

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 44 Lev: 7						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	12.5-19mm	1	3.60
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	6.3-9.5mm	1	0.05
Unmodified debitage	Shatter, no cortex	Petrified Wood	burned	9.5-12.5mm	1	0.60
UNIT 48 Lev: 1						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	12.5-19mm	1	2.90
Unmodified debitage	Secondary flake	Silicified Wood	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ark. Novaculite	no	12.5-19mm	1	3.00
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.30
Unworked stone	Burned Rock	Unidentifiable	yes		1	20.20
UNIT 48 Lev: 2						
Unmodified debitage	Primary flake	Bowie Chert	no	9.5-12.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Bifacial thinning	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 48 Lev: 3						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	12.5-19mm	1	1.00
Unmodified debitage	Shatter, >75% cortex	Bowie Chert	yes	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	yes	19-25mm	1	12.20
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
UNIT 48 Lev: 4						
Unworked stone	Burned Rock	Ferruginous Sandstone	yes		1	25.50
Unworked stone	Burned Rock	Unidentifiable	yes		3	28.50
UNIT 48 Lev: 5						
Unmodified debitage	Primary flake	Chert	burned	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.60
Unmodified debitage	Shatter, 1-75% cortex	Chert	burned	12.5-19mm	1	1.80
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	9.5-12.5mm	1	1.10
UNIT 53 Lev: 5						
Unmodified debitage	Secondary flake	Ogallala Quartzite	indet.	9.5-12.5mm	1	1.80
Unmodified debitage	Secondary flake	Ark. Novaculite	no	9.5-12.5mm	1	1.00
UNIT 56 Lev: 1						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 56 Lev: 2						
Unmodified debitage	Shatter, >75% cortex	Bowie Chert	no	6.3-9.5mm	1	1.20
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	yes	6.3-9.5mm	1	0.20
UNIT 57 Lev: 2						
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	indet.	9.5-12.5mm	1	0.80
UNIT 57 Lev: 5						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.10
Unmodified debitage	Secondary flake	Ogallala Quartzite	indet.	12.5-19mm	1	3.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
UNIT 59 Lev: 2						
Unmodified debitage	Secondary flake	Chert	yes	9.5-12.5mm	1	1.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
UNIT 59 Lev: 3						
Unmodified debitage	Shatter, no cortex	Chert	burned	< 6.3mm	1	0.05
UNIT 59 Lev: 7						
Unmodified debitage	Tertiary flake	Silicified Wood	no	< 6.3mm	1	0.10
UNIT 60 Lev: 1						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.60
UNIT 60 Lev: 3						
Unmodified debitage	Tertiary flake	Silicified Wood	no	6.3-9.5mm	1	0.20
UNIT 60 Lev: 4						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.20
UNIT 60 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.30
UNIT 61 Lev: 2						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 63 Lev: 1						
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	12.5-19mm	1	0.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	12.5-19mm	1	2.90
Unmodified debitage	Secondary flake	Siltstone	no	9.5-12.5mm	1	0.20

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 63 Lev: 4						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Secondary flake	cf. Johns Valley Shale Chert	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.30
Unmodified debitage	Tertiary flake	Siltstone	no	6.3-9.5mm	1	0.50
UNIT 63 Lev: 5						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	5.40
UNIT 63 Lev: 6						
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	indet.	12.5-19mm	1	3.80
UNIT 63 Lev: 9						
Unmodified debitage	Tertiary flake	Bowie Chert	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Petrified Wood	indet.	12.5-19mm	1	4.50
UNIT 65 Lev: 4						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.70
UNIT 65 Lev: 5						
Unmodified debitage	Bifacial thinning	Chert	yes	< 6.3mm	1	0.05
UNIT 66 Lev: 1						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
Unmodified debitage	Flake frag, no cortex	Unidentifiable	indet.	< 6.3mm	1	0.05
UNIT 66 Lev: 2						
Unmodified debitage	Secondary flake	Ogallala Quartzite	indet.	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Battiest Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	0.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ark. Novaculite "Green" chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	burned	9.5-12.5mm	1	0.80
UNIT 66 Lev: 3						
Unmodified debitage	Primary flake	Bowie Chert	yes	< 6.3mm	1	0.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Chert	burned	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Petrified Wood	yes	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.70
UNIT 66 Lev: 4						
Unmodified debitage	Secondary flake	Battiest Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Bifacial thinning	Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
UNIT 66 Lev: 5						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Chert	yes	6.3-9.5mm	1	0.60
UNIT 66 Lev: 6						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 67 Lev: 1						
Unmodified debitage	Primary flake	Bowie Chert	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Primary flake	Bowie Chert	yes	9.5-12.5mm	1	0.40
Unmodified debitage	Primary flake	Unidentifiable	burned	9.5-12.5mm	1	0.60
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Battiest Chert	no	9.5-12.5mm	1	0.60
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Chert	yes	9.5-12.5mm	1	0.40

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	12.5-19mm	1	1.00
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	12.5-19mm	1	1.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Unidentifiable	burned	9.5-12.5mm	1	0.90
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	27	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	12	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	14	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	13	0.01
Unmodified debitage	Flake frag, no cortex	Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Shatter, >75% cortex	Chert	yes	12.5-19mm	1	1.30
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	burned	< 6.3mm	1	0.20
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	yes	9.5-12.5mm	1	0.70
UNIT 67 Lev: 2						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	RR Yellow Siltstone	yes	12.5-19mm	1	2.40
Unmodified debitage	Secondary flake	Unidentifiable	burned	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	20	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	2	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	18	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	2	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	indet.	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	22	0.01
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	< 6.3mm	4	0.01
Unmodified debitage	Shatter, 1-75% cortex	Chert	yes	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	0.80

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 67 Lev: 3						
Unmodified debitage	Primary flake	Bowie Chert	yes	12.5-19mm	1	3.60
Unmodified debitage	Primary flake	Unidentifiable	burned	6.3-9.5mm	1	0.60
Unmodified debitage	Secondary flake	Chert	yes	12.5-19mm	1	3.90
Unmodified debitage	Secondary flake	Chert	yes	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	Chert	burned	9.5-12.5mm	1	1.40
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	12.5-19mm	1	2.60
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Chert	yes	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Bowie Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	12.5-19mm	1	1.00
Unmodified debitage	Tertiary flake	Siltstone	no	6.3-9.5mm	1	0.05
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	9.5-12.5mm	1	0.80
Unmodified debitage	Bifacial thinning	Johns Valley Shale Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	15	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	6.3-9.5mm	1	0.80
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	5	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	6	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	3	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	15	0.01
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	< 6.3mm	2	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, >75% cortex	RR Yellow Siltstone	no	9.5-12.5mm	1	1.20
Unmodified debitage	Shatter, 1-75% cortex	Chert	yes	9.5-12.5mm	1	2.70
Unmodified debitage	Shatter, 1-75% cortex	Chert	burned	9.5-12.5mm	1	3.70
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.30
UNIT 67 Lev: 4						
Unmodified debitage	Primary flake	Chert	burned	12.5-19mm	1	2.40

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Primary flake	Bowie Chert	yes	6.3-9.5mm	1	1.00
Unmodified debitage	Secondary flake	Bowie Chert	yes	12.5-19mm	1	2.10
Unmodified debitage	Secondary flake	Bowie Chert	yes	12.5-19mm	1	1.20
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Battiest Chert	no	6.3-9.5mm	1	0.40
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Secondary flake	Unidentifiable	burned	12.5-19mm	1	1.20
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Unidentifiable	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	13	0.01
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	< 6.3mm	3	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	4	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	2	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	7	0.01
Unmodified debitage	Shatter, no cortex	Petrified Wood	yes	9.5-12.5mm	1	1.30
Unmodified debitage	Shatter, no cortex	Petrified Wood	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	cf. Johns Valley Shale Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	< 6.3mm	1	0.10
UNIT 67 Lev: 5						
Unmodified debitage	Primary flake	Chert	yes	12.5-19mm	1	2.70
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	1.70
Unmodified debitage	Primary flake	Quartzite	burned	6.3-9.5mm	1	0.60
Unmodified debitage	Primary flake	Unidentifiable	burned	12.5-19mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Unidentifiable	burned	12.5-19mm	1	2.00
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	6	0.01

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Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	3	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	5	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	4	0.01
Unmodified debitage	Flake frag, no cortex	Siltstone	no	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	no	12.5-19mm	1	7.50
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	12.5-19mm	1	5.20
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	19-25mm	1	6.30
Unmodified debitage	Shatter, no cortex	Chert	burned	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Petrified Wood	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.60
Unworked stone	Burned Rock	Petrified Wood	yes		1	3.00
UNIT 67 Lev: 6						
Unmodified debitage	Primary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.40
Unmodified debitage	Secondary flake	Bowie Chert	no	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	Siltstone	no	12.5-19mm	1	1.60
Unmodified debitage	Secondary flake	Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	9.5-12.5mm	1	0.70
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Bifacial thinning	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	11	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	3	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	burned	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	4	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	6.3-9.5mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	5	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	4	0.01
Unmodified debitage	Shatter, >75% cortex	Bowie Chert	yes	9.5-12.5mm	1	2.50
Unmodified debitage	Shatter, >75% cortex	RR Yellow Siltstone	no	12.5-19mm	1	11.70
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	9.5-12.5mm	1	0.40
Unmodified debitage	Shatter, no cortex	Bowie Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	9.5-12.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	12.5-19mm	1	3.80
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.60
Unworked stone	Burned Rock	Ferruginous	burned		4	25.40

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41BW553 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
		Sandstone				
UNIT 67 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	6.3-9.5mm	1	1.30
Unmodified debitage	Tertiary flake	Silicified Wood	no	6.3-9.5mm	1	0.30
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.10
UNIT 69 Lev: 1						
Unmodified debitage	Tertiary flake	Unidentifiable	burned	9.5-12.5mm	1	0.70
Unworked stone	Burned Rock	Unidentifiable	yes		1	135.10
UNIT 69 Lev: 2						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	12.5-19mm	1	1.30
Unmodified debitage	Secondary flake	cf. Johns Valley Shale Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	9.5-12.5mm	1.	1.70
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.20
UNIT 69 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	Unidentifiable	burned	< 6.3mm	1	0.10
UNIT 69 Lev: 4						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.50
UNIT 70 Lev: 1						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 71 Lev: 1						
Unmodified debitage	Secondary flake	Ark. Novaculite "Green" chert	no	9.5-12.5mm	1	1.50
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	burned	9.5-12.5mm	1	2.00
UNIT 71 Lev: 2						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Battiest Chert	no	6.3-9.5mm	1	0.40
UNIT 71 Lev: 3						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.20
UNIT 71 Lev: 4						
Unmodified debitage	Tertiary flake	Battiest Chert	no	9.5-12.5mm	1	1.00

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41BW553 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	burned	6.3-9.5mm	1	0.50
UNIT 71 Lev: 6						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
UNIT 71 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Bifacial thinning	Bowie Chert	no	6.3-9.5mm	1	0.20
UNIT 72 Lev: 1						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Bowie Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	6.3-9.5mm	1	0.20
UNIT 72 Lev: 2						
Unmodified debitage	Primary flake	Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Silicified Wood	no	9.5-12.5mm	1	1.80
Unmodified debitage	Tertiary flake	Unidentifiable	burned	9.5-12.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Chert	burned	6.3-9.5mm	1	0.50
UNIT 72 Lev: 3						
Unmodified debitage	Primary flake	Quartzite	no	12.5-19mm	1	5.00
Unmodified debitage	Secondary flake	Bowie Chert	no	12.5-19mm	1	1.30
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	yes	< 6.3mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.20
UNIT 72 Lev: 4						
Unmodified debitage	Tertiary flake	Bowie Chert	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	0.80
UNIT 72 Lev: 5						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	burned	6.3-9.5mm	1	0.10
UNIT 75 Lev: 1						
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.10

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41BW553 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 79 Lev: 1						
Unmodified debitage	Primary flake	Quartzite	no	12.5-19mm	1	4.80
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.10
UNIT 80 Lev: 1						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Unidentifiable	burned	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	6.3-9.5mm	1	0.20
UNIT 81 Lev: 1						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.60
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.10
UNIT 82 Lev: 1						
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	19-25mm	1	8.70
UNIT 83 Lev: 1						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.40
UNIT 83 Lev: 2						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.20
UNIT 84 Lev: 1						
Unmodified debitage	Primary flake	Ogallala Quartzite	burned	6.3-9.5mm	1	0.40
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	0.50
Unworked stone	Burned Rock	Petrified Wood	yes		1	10.00
UNIT 85 Lev: 1						
Unmodified debitage	Shatter, no cortex	Petrified Wood	indet.	6.3-9.5mm	1	0.05
UNIT 89 Lev: 1						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.40
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.30
UNIT 89 Lev: 2						
Unmodified debitage	Tertiary flake	cf. Johns Valley Shale Chert	burned	9.5-12.5mm	1	1.20
UNIT 90 Lev: 2						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.70

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 90 Lev: 7						
Unmodified debitage	Tertiary flake	Bowie Chert	no	12.5-19mm	1	0.90
UNIT 93 Lev: 2						
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.10
UNIT 93 Lev: 4						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
UNIT 93 Lev: 5						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
BHT 127 Lev: 6																	
770	1	1	Finished Bifacial Tool	Dart Point	n/a	Base/stem	unident.	5Y3/1	burned			6	1.5	13	14	14	DART POINT BASE
UNIT 61 Lev: 7																	
585	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Ogallala Quartzite	5YR5/3	yes	54	26	10	9.5	9	14	16	GARY, VAR. UNIDENTIFIED
UNIT 68 Lev: 9																	
40	1	1	Unfinished Biface	Aborted, Early	Perverse snap	Fragment	Ogallala Quartzite	2.5YR5/3	yes	37	29	14	19.8				
UNIT 74 Lev: 6																	
743	1	1	Unfinished Biface	Aborted, Late	Perverse snap	Fragment	chert	2.5YR2/2	burned	31	15	7	2.3				
UNIT 76 Lev: 7																	
761	1	1	Finished Bifacial Tool	Dart Point	n/a	Tip	Bowie Chert	7.5YR4/4	no	21	20	7	2.8				
UNIT 77 Lev: 9																	
411	1	1	Unfinished Biface	Aborted, Late	Lateral snap	Fragment	Ogallala Quartzite	5YR4/2	yes	28	26	9	9.0				
UNIT 79 Lev: 2																	
650	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Red River yellow siltstone	10YR4/4	yes	46	27	6	5.2	7	20	16	REWORKED GARY PT., V. KAUFMAN
UNIT 81 Lev: 1																	
583	1	1	Finished	Arrow	n/a	Proximal/	Bowie Chert	10R4/3	yes	13	12	3	0.4	2	6	5	BONHAM POINT

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
			Bifacial Tool	Point		medial											
UNIT 81		Lev: 2															
554	1	1	Unfinished Biface	Aborted, Early	indet.	Complete	Ogallala Quartzite	2.5YR4/3	yes	34	19	9	5.8				
UNIT 84		Lev: 7															
576	2	1	Unfinished Biface	Arrow point preform	Edge collapse	Complete	siltstone	10YR4/4	yes	36	17	8	5.2				
UNIT 86		Lev: 8															
636	2	1	Finished Bifacial Tool	Dart Point	n/a	Complete	quartz	2.5YR4/2	yes	38	21	8	4.9	7	14	14	GARY POINT, VAR. EMERY
UNIT 88		Lev: 3															
750	1	1	Unfinished Biface	Aborted, Late	Lateral snap	Fragment	Ogallala Quartzite	10R3/3	burned	21	17	5	2.7				
750	2	1	Finished Bifacial Tool	indet.	n/a	Tip	Arkansas Novaculite	10YR5/1	no	14	15	4	0.5				
UNIT 89		Lev: 5															
453	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Ogallala Quartzite	10YR6/4	no	37	21	6	4.0	9	16	18	GARY, VAR. RUNGE
UNIT 89		Lev: 6															
478	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Ogallala Quartzite	10YR5/6	no	67	22	7	11.6	9	17	18	REWORKED GARY
UNIT 91		Lev: 5															
118	1	1	Finished	Dart Point	n/a	indet.	Ogallala	10YR6/4	no	13	16	7	1.5				PROB. GARY

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
			Bifacial Tool				Quartzite										POINT BASE
UNIT 97		Lev: 5															
631	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Red River yellow siltstone	10YR5/4	no	37	20	5	2.8	5	16	16	GARY, VAR. HOLSON
UNIT 108		Lev: 8															
182	1	1	Finished Bifacial Tool	Dart Point	n/a	Mid-section	Red River yellow siltstone	7.5YR5/4	yes	29	24	7	4.1	8	17	14	GARY, VAR. KAUFMAN
S.T. 47		Lev: 7															
212	1	1	Finished Bifacial Tool	indet. Point	n/a	Mid-section	Red River yellow siltstone	10YR6/3	no	26	15	5	2.0				
UNIT 119		Lev: 4															
590	1	1	Unfinished Biface	Arrow point preform	Lateral snap	Fragment	cf. Lowrance Chert	5Y7/1	no	22	15	5	1.6				
590	2	1	Unfinished Biface	Aborted, Early	Lateral snap	Fragment	Arkansas Novaculite	2.5Y8/1	no	28	26	12	10.8				
UNIT 119		Lev: 5															
616	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Ogallala Quartzite	7.5YR5/3	no	40	31	7	6.5	3	20	14	GARY, VAR. GARY/KAUFMAN
UNIT 120		Lev: 4															
759	1	1	Unfinished Biface	Aborted, Early	Lateral snap	Fragment	Bowie Chert	10R3/3	burned	21	35	12	9.3				

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
UNIT 121		Lev: 4															
755	1	1	Unfinished Biface	Aborted, Late	Lateral snap	Fragment	Johns Valley Shale Chert	10YR4/2	no	13	23	5	1.4				
UNIT 121		Lev: 7															
694	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	siltstone	10YR5/6	no	41	24	7	6.1	13	15	12	GARY, VAR. HOLSON/COLFAX
UNIT 121		Lev: 8															
752	1	1	Finished Bifacial Tool	indet.	n/a	Base/stem	Potters quartzite	2.5YR5/4	yes	14	4	14	0.7				ARROW POINT OR PREFORM BASE?
UNIT 121		Lev: 9															
481	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Edwards chert	10YR7/2	no	23	17	6	13.6	2	17	11	V. REWORKED EDGEWOOD
UNIT 121		Lev: 10															
370	1	1	Unfinished Biface	Aborted, Early	Lateral snap	Fragment	Ogallala Quartzite	7.5YR6/4	no	29	20	10	4.8				
UNIT 121		Lev: 11															
303	1	1	Unfinished Biface	Dart point preform	Lateral snap	Fragment	Ogallala Quartzite	2.5YR4/1	no	26	28	9	6.1				BASE OF GARY PREFORM?
UNIT 122		Lev: 2															
751	1	1	Finished Bifacial Tool	indet. Point	n/a	Tip	Arkansas Novaculite	10YR7/1	no	18	13	6	1.0				
751	2	1	Finished Bifacial Tool	Arrow Point	n/a	Tip	Red River yellow siltstone	10R4/4	yes	14	12	3	0.5				

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
UNIT 122		Lev: 3															
727	1	1	Finished Bifacial Tool	Dart Point	n/a	Base/stem	Ogallala Quartzite	7.5YR5/3	no	32	27	9	6.2	3	17	18	GARY POINT, VAR. KAUFMAN?
727	2	1	Unfinished Biface	indet.	indet.	Fragment	Ogallala Quartzite	2.5Y5/3	no	4	14	8	1.4				
UNIT 122		Lev: 4															
394	1	1	Finished Bifacial Tool	Dart Point	n/a	Proximal/ medial	petrified wood	10YR4/1	no	58	39	8	16.8	12	24	19	POSS. FRACT. BULVERDE POINT
UNIT 122		Lev: 5															
745	1	1	Finished Bifacial Tool	indet.	n/a	indet.	Bowie Chert	10R3/4	yes	6	12	4	0.2				
UNIT 122		Lev: 7															
739	1	1	Unfinished Biface	Aborted, Early	Failure to thin	Fragment	Ogallala Quartzite	10YR5/4	no	37	25	14	12.8				
UNIT 122		Lev: 10															
282	1	1	Finished Bifacial Tool	Dart Point	n/a	Base/stem	Arkansas Novaculite	5Y4/1	no	16	14	7	1.9				POINT BASE
UNIT 123		Lev: 6															
542	1	1	Finished Bifacial Tool	Dart Point	n/a	Tip	Arkansas Novaculite	2.5Y8/1	yes	33	26	5	4.6				
UNIT 123		Lev: 7															
548	1	1	Finished Bifacial Tool	Dart Point	n/a	Longitudinal fract.	Bowie Chert	10R3/4	yes	29	16	6	2.6	4	13	16	GARY POINT, PROB. VAR. KEMP
548	2	1	Unfinished	indet.	indet.	Fragment	Bowie Chert	10R5/2	no	13	18	5	1.1				

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
			Biface														
UNIT 123		Lev: 8															
559	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	cf. Johns Valley Shale Chert	2.5Y6/1	no	63	29	12	17.2	15	18	18	PALMILLAS POINT
559	2	1	Unfinished Biface	Dart point preform	Lateral snap	Fragment	Ogallala Quartzite	2.5YR5/2	no	26	23	6	4.9	10	16	10	PROB. GARY PREFORM
559	3	1	Unfinished Biface	Aborted, Late	indet.	Complete	unident.	2.5Y4/1	burned	29	22	8	4.5				PREFORM?
UNIT 123		Lev: 9															
602	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Ogallala Quartzite	10YR6/4	no	36	19	7	4.5	3	12	12	GARY, VAR. UNIDENTIFIED
602	2	1	Finished Bifacial Tool	Dart Point	n/a	Complete	Ogallala Quartzite	5YR5/6	no	37	23	7	5.5	9	16	12	GARY, VAR. KEMP
602	3	1	Unfinished Biface	Dart point preform	indet.	Complete	Red River yellow siltstone	10YR5/8	no	41	23	8	6.2				PROB. GARY POINT PREFORM
UNIT 124		Lev: 2															
740	1	1	Unfinished Biface	indet.	indet.	Fragment	Woodford or Big Fork Chert	10YR3/1	burned	10	17	6	0.8				
UNIT 124		Lev: 4															
502	1	1	Finished Bifacial Tool	indet.	n/a	Complete	cf. Lowrance Chert	10YR4/3	no	6	16	6	0.4				POINT BASE?
UNIT 125		Lev: 3															
570	1	1	Finished	Drill	n/a	Complete	Ogallala	2.5YR5/4	yes	26	8	3	0.7	5	6	4	REWORKED ARROW

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Min. Stem Wid.	Max. Stem Wid.	Stem Leng.	Analysis Comment
			Bifacial Tool				Quartzite										POINT
UNIT 125			Lev: 4														
762	1	1	Unfinished Biface	Aborted, Late	Lateral snap	Fragment	cf. Lowrance Chert	N8	yes	11	28	5	2.4				
UNIT 125			Lev: 5														
748	1	1	Unfinished Biface	Aborted, Early	Failure to thin	Complete	silicified wood	7.5YR3/2	no	58	24	14	16.4				
UNIT 125			Lev: 6														
621	1	1	Finished Bifacial Tool	Dart Point	n/a	Complete	cf. Lowrance Chert	N7	yes	33	18	8	4.6	15	18	10	REWORKED EDGEWOOD

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Geo-Marine Inc.
#3035-001 WOCMA Testing
41TT670 Unifaces, Cores, and Ground Stone

Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Util Edge Leng	Utilized Edge Location	Utilized Edge Form
UNIT 77 Lev: 4																
737	1	1	Uniface	Marginally modified/ retouched	Tertiary Flake	Complete	Arkansas Novaculite	2.5Y7/1	no	25	20	3	1.1	13		
UNIT 86 Lev: 8																
636	1	1	Uniface	Marginally modified/ retouched	Secondary Flake	Complete	Ogallala Quartzite	10YR5/4	no	21	29	4	1.8		n/a	n/a
UNIT 98 Lev: 6																
749	1	1	Uniface	Marginally modified/ retouched	Secondary Flake	Complete	Ogallala Quartzite	5YR5/4	yes	28	21	4	2.0		n/a	n/a
UNIT 110 Lev: 10																
208	1	1	Uniface	Marginally modified/ retouched	Primary Flake	Complete	chert	2.5YR7/2	no	16	13	4	0.7		n/a	n/a
UNIT 119 Lev: 2																
760	1	1	Uniface	indet.	Primary Flake	Complete	Red River yellow siltstone	10YR5/6	no	32	24	14	8.2		n/a	n/a
UNIT 124 Lev: 3																
756	1	1	Uniface	Marginally modified/ retouched	Secondary Flake	Complete	Red River yellow siltstone	10YR5/6	no	27	14	5	1.8		n/a	n/a
BHT 122 Lev: 1																

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Util Edge Leng	Utilized Edge Location	Utilized Edge Form
778	1	1	Utilized Flake	Unifacial, dorsal	Primary Flake	Complete	Bowie Chert	2.5Y6/1	no	22	27	4	2.5	10	Distal	Convex
S.T. 55		Lev: 1														
747	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Red River yellow siltstone	10YR4/6	no	23	14	4	0.6	28	Multiple Lateral	Straight
UNIT 69		Lev: 2														
757	1	1	Utilized Flake	Unifacial, dorsal	Secondary Flake	Complete	Ogallala Quartzite	2.5YR6/2	no	32	14	1	2.3	28	Lateral	Convex
UNIT 74		Lev: 8														
351	1	1	Utilized Flake	Unifacial, dorsal	Secondary Flake	Complete	Ogallala Quartzite	10R5/4	yes	22	29	5	3.7	11	Lateral	Straight
UNIT 82		Lev: 3														
764	1	1	Utilized Flake	Unifacial, ventral	Tertiary Flake	Complete	Ark Novaculite "green" chert	2.5Y4/3	no	26	17	5	1.6	14	Lateral	Irregular
UNIT 84		Lev: 7														
576	1	1	Utilized Flake	Unifacial, dorsal	Secondary Flake	Complete	Bowie Chert	10YR6/6	no	32	23	12	6.6	7	Lateral	Straight
UNIT 86		Lev: 2														
758	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Ark Novaculite "green" chert	2.5Y5/3	no	21	13	3	0.8	20	Lateral	Concave

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Util Edge Leng	Utilized Edge Location	Utilized Edge Form
UNIT 105		Lev: 6														
217	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Ogallala Quartzite	7.5YR6/2	no	20	24	5	2.5	7	Distal	Straight
UNIT 107		Lev: 8														
742	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Johns Valley Shale Chert	10YR4/1	no	42	20	5	4.1	28	Multiple Lateral	Irregular
UNIT 121		Lev: 2														
746	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Ogallala Quartzite	10R4/4	yes	21	27	4	1.8	9	Lateral	Straight
UNIT 121		Lev: 3														
741	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Ogallala Quartzite	2.5YR4/4	no	32	21	5	2.3	12	Lateral	Convex
UNIT 122		Lev: 6														
738	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Bowie Chert	10R4/4	no	22	14	3	0.6	23	Lateral/ Distal	Irregular
UNIT 122		Lev: 9														
744	1	1	Utilized Flake	Unifacial, dorsal	Secondary Flake	Complete	Red River yellow siltstone	7.5YR4/4	no	20	17	5	1.4	16	Distal/ transverse	Straight
UNIT 123		Lev: 2														
763	1	1	Utilized Flake	Unifacial, dorsal	Secondary Flake	Complete	Ogallala Quartzite	10YR5/3	no	34	25	5	2.6	16	Multiple Lateral	Straight

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Util Edge Leng	Utilized Edge Location	Utilized Edge Form
UNIT 123		Lev: 4														
754	1	1	Utilized Flake	Unifacial, dorsal	Secondary Flake	Complete	Ogallala Quartzite	10R4/3	yes	20	29	6	3.3	19	Lateral	Convex
UNIT 123		Lev: 7														
765	1	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	quartzite	10YR4/2	no	21	10	2	0.5	13	Lateral	Straight
UNIT 124		Lev: 3														
756	2	1	Utilized Flake	Unifacial, dorsal	Secondary Flake	Complete	Bowie Chert	2.5YR3/4	no	24	17	9	2.0	10	Lateral	Straight
UNIT 125		Lev: 4														
753	1	1	Utilized Flake	Unifacial, dorsal	Secondary Flake	Complete	quartzite	5YR4/3	no	30	23	5	3.3	33	Lateral/ Distal	Straight
753	2	1	Utilized Flake	Unifacial, dorsal	Tertiary Flake	Complete	Woodford or Big Fork Chert	10YR4/2	no	25	14	3	1.0	8	Lateral	Irregular
UNIT 71		Lev: 6														
788	1	1	Core	Unidirectional	Multiple platform	Complete	Potters quartzite	2.5YR5/2	burned	58	28	21	50.4		n/a	n/a
UNIT 72		Lev: 7														
785	1	1	Core	Multidirectional	Multiple platform	Complete	Potters quartzite	10YR6/3	no	45	33	28	42.7		n/a	n/a
UNIT 105		Lev: 7														
786	1	1	Core	Unidirectional	Multiple platform	Fragment	Red River yellow siltstone	2.5YR6/6	no	30	18	19	16.8		n/a	n/a

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Bag No.	Art No.	Qty	Class	Type	Other	Condition	Material	Color	Heat Treat	Leng	Width	Thick	Weight	Util Edge Leng	Utilized Edge Location	Utilized Edge Form
UNIT 106		Lev: 8														
787	1	1	Core	Unidirectional	Multiple platform	Fragment	Red River yellow siltstone	7.5YR5/6	no	29	26	13	13.4		n/a	n/a
UNIT 116		Lev: 5														
195	1	1	Core	Multidirectional	Multiple platform	Complete	Red River yellow siltstone	10YR5/8	yes	50	28	19	28.1		n/a	n/a
UNIT 123		Lev: 7														
765	2	1	Core	Multidirectional	Multiple platform	Complete	Red River yellow siltstone	10YR6/6	no	25	27	17	8.6		n/a	n/a
765	3	1	Core	Multidirectional	Multiple platform	Complete	Bowie Chert	7.5YR5/6	yes	47	23	13	26.3		n/a	n/a
765	4	1	Core	Unidirectional	Multiple platform	Complete	Ogallala Quartzite	10R4/2	no	41	26	12	19.7		n/a	n/a
765	5	1	Core	Unidirectional	Multiple platform	Complete	Potters quartzite	10YR6/2	no	48	23	16	21.2		n/a	n/a
UNIT 123		Lev: 3														
789	1	1	Ground/Pecked/ Battered	Hammerstone	n/a	Complete	Ogallala Quartzite	10YR6/4	no	51	41	38	117.5		n/a	n/a

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Geo-Marine Inc.
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41TT670 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
BHT 1 Lev:						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, >75% cortex	Ferruginous Sandstone	yes		1	82.60
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	yes	9.5-12.5mm	1	4.60
FEAT 2 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	burned	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	burned	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	< 6.3mm	1	0.01
S.T. 48 Lev: 1						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	indet.	9.5-12.5mm	1	1.30
S.T. 48 Lev: 2						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Bowie Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Bifacial thinning	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Bifacial thinning	Johns Valley Shale Chert	no	6.3-9.5mm	1	0.20
S.T. 48 Lev: 3						
Unmodified debitage	Shatter, >75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.70
S.T. 51 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	19-25mm	1	7.10
S.T. 51 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
S.T. 51 Lev: 1						
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.20
S.T. 52 Lev: 1						
Unmodified debitage	Tertiary flake	Johns Valley Shale Chert	no	9.5-12.5mm	1	1.30
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	1	0.10

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41TT670 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unworked stone	Burned Rock	Sandstone	burned		1	1.00
S.T. 52 Lev: 2						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
S.T. 52 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Silicified Wood	no	< 6.3mm	1	0.40
S.T. 53 Lev: 1						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	2.80
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
S.T. 53 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
S.T. 54 Lev: 1						
Unmodified debitage	Primary flake	Unidentifiable	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	< 6.3mm	1	0.10
S.T. 54 Lev: 2						
Unmodified debitage	Tertiary flake	Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	9.5-12.5mm	1	1.20
S.T. 55 Lev: 1						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	< 6.3mm	1	0.10
S.T. 55 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
S.T. 56 Lev: 1						
Unmodified debitage	Secondary flake	unidentified	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Woodford or Big Fork	no	6.3-9.5mm	1	0.50

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
		Chert				
S.T. 57 Lev: 1						
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
S.T. 57 Lev: 2						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	1.20
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ark. Novaculite	no	6.3-9.5mm	1	1.10
S.T. 58 Lev: 2						
Unmodified debitage	Secondary flake	Quartzite	no	12.5-19mm	1	4.10
UNIT 61 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.40
UNIT 61 Lev: 3						
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	1.30
UNIT 61 Lev: 5						
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	12.5-19mm	1	4.80
Unmodified debitage	Shatter, no cortex	Petrified Wood	no	9.5-12.5mm	1	1.60
UNIT 61 Lev: 6						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Bowie Chert	burned	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Bowie Chert	burned	9.5-12.5mm	1	1.30
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Shatter, 1-75% cortex	Petrified Wood	yes	6.3-9.5mm	1	0.70
Unworked stone	Burned Rock	Ogallala Quartzite	burned		2	46.30
UNIT 61 Lev: 7						
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		2	22.00
UNIT 62 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	1.20
UNIT 62 Lev: 5						
Unmodified debitage	Tertiary flake	unidentified	no	< 6.3mm	1	0.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 62 Lev: 6						
Unmodified debitage	Tertiary flake	Quartzite	no	6.3-9.5mm	1	0.30
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	4.70
UNIT 62 Lev: 8						
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Quartzite	no	6.3-9.5mm	1	0.40
UNIT 62 Lev: 9						
Unmodified debitage	Primary flake	Bowie Chert	no	9.5-12.5mm	1	0.90
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	27.20
UNIT 62 Lev: 10						
Unmodified debitage	Bifacial thinning	Ark. Novaculite	no	< 6.3mm	1	0.10
UNIT 63 Lev: 1						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.80
UNIT 63 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.40
UNIT 63 Lev: 3						
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.30
UNIT 65 Lev: 3						
Unmodified debitage	Tertiary flake	Petrified Wood	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 66 Lev: 2						
Unmodified debitage	Tertiary flake	Bowie Chert	burned	6.3-9.5mm	1	0.30
UNIT 66 Lev: 4						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	2.00
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	< 6.3mm	1	0.05
UNIT 67 Lev: 4						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
UNIT 68 Lev: 3						
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	9.5-12.5mm	1	0.30

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 68 Lev: 4						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Siltstone	no	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, 1-75% cortex	Chert	burned	9.5-12.5mm	1	2.20
UNIT 68 Lev: 5						
Unmodified debitage	Shatter, >75% cortex	Chert	burned	< 6.3mm	1	0.30
Unmodified debitage	Shatter, 1-75% cortex	Petrified Wood	no	6.3-9.5mm	1	0.40
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	unidentified	no	6.3-9.5mm	1	0.30
UNIT 68 Lev: 6						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	burned	6.3-9.5mm	1	1.20
UNIT 68 Lev: 7						
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	9.5-12.5mm	1	1.20
UNIT 69 Lev: 1						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	0.60
UNIT 69 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
UNIT 69 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Silicified Wood	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.20
UNIT 71 Lev: 1						
Unmodified debitage	Primary flake	Petrified Wood	no	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.40
UNIT 71 Lev: 2						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.70

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 71 Lev: 3						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 71 Lev: 4						
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.05
UNIT 71 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Chert	burned	9.5-12.5mm	1	1.80
UNIT 71 Lev: 6						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	2.80
Unmodified debitage	Primary flake	Ogallala Quartzite	burned	9.5-12.5mm	1	2.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	3.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	2.70
UNIT 72 Lev: 1						
Unmodified debitage	Secondary flake	Bowie Chert	yes	< 6.3mm	1	0.20
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	yes	6.3-9.5mm	1	1.10
UNIT 72 Lev: 2						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.60
UNIT 72 Lev: 3						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Chert	yes	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	1.00
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	1.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
UNIT 72 Lev: 4						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.10
UNIT 72 Lev: 5						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.80

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	9.5-12.5mm	1	0.20
UNIT 72 Lev: 6						
Unmodified debitage	Tertiary flake	Petrified Wood	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Bowie Chert	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	cf. Johns Valley Shale Chert	no	9.5-12.5mm	1	0.20
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.05
UNIT 72 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
UNIT 72 Lev: 8						
Unmodified debitage	Secondary flake	Silicified Wood	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	unidentified	no	12.5-19mm	1	1.70
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	yes	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, 1-75% cortex	unidentified	no	9.5-12.5mm	1	2.20
UNIT 72 Lev: 9						
Unmodified debitage	Secondary flake	Petrified Wood	no	< 6.3mm	1	0.30
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 72 Lev: 10						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
UNIT 72 Lev: 11						
Unmodified debitage	Primary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.80
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 73 Lev: 1						

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 73 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	6.3-9.5mm	1	0.20
UNIT 73 Lev: 3						
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.20
Unworked stone	Burned Rock	Sandstone	burned		1	92.20
UNIT 73 Lev: 4						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
UNIT 73 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
UNIT 73 Lev: 8						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 74 Lev: 1						
Unmodified debitage	Secondary flake	Bowie Chert	burned	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
UNIT 74 Lev: 2						
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	9.5-12.5mm	1	0.50
UNIT 74 Lev: 6						
Unmodified debitage	Shatter, >75% cortex	Tecovas Chert	no	12.5-19mm	1	7.30
UNIT 74 Lev: 8						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	2.90
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.40
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Johns Valley Shale Chert	no	6.3-9.5mm	1	0.80
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	86.10
UNIT 75 Lev: 5						
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
UNIT 75 Lev: 7						
Unmodified debitage	Secondary flake	Bowie Chert	burned	< 6.3mm	1	0.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Bifacial thinning	Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Johns Valley Shale Chert	no	< 6.3mm	1	0.10
UNIT 76 Lev: 4						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Bifacial thinning	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
UNIT 76 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 76 Lev: 6						
Unmodified debitage	Secondary flake	Chert	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	Quartzite	no	9.5-12.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	unidentified	no	6.3-9.5mm	1	0.10
UNIT 76 Lev: 7						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	yes	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
UNIT 76 Lev: 9						
Unmodified debitage	Tertiary flake	Bowie Chert	no	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
UNIT 76 Lev: 10						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
UNIT 76 Lev: 12						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Bifacial thinning	Ark. Novaculite	no	< 6.3mm	1	0.05
UNIT 77 Lev: 1						
Unmodified debitage	Primary flake	RR Yellow Siltstone	indet.	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	1.00
Unmodified debitage	Shatter, >75% cortex	RR Yellow Siltstone	no	9.5-12.5mm	1	0.60

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 77 Lev: 2						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ark. Novaculite "Green" chert	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
UNIT 77 Lev: 3						
Unmodified debitage	Tertiary flake	Petrified Wood	yes	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
UNIT 77 Lev: 4						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Chert	burned	6.3-9.5mm	1	1.50
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	< 6.3mm	1	0.20
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	152.00
UNIT 77 Lev: 5						
Unmodified debitage	Primary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Bifacial thinning	Ark. Novaculite	no	< 6.3mm	1	0.10
Unmodified debitage	Bifacial thinning	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	burned	19-25mm	1	13.60
UNIT 77 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	3.70

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Silicified Wood	no	6.3-9.5mm	1	0.60
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 77 Lev: 7						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
UNIT 77 Lev: 8						
Unmodified debitage	Primary flake	Siltstone	no	12.5-19mm	1	2.20
Unmodified debitage	Tertiary flake	Ferruginous Sandstone	burned	12.5-19mm	1	3.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	4.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	2.50
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.20
UNIT 77 Lev: 9						
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	12.5-19mm	1	2.20
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	6.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.60
Unmodified debitage	Tertiary flake	Unidentifiable	burned	9.5-12.5mm	1	1.70
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		1	5.60
UNIT 78 Lev: 1						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.70
UNIT 78 Lev: 2						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.40
UNIT 78 Lev: 3						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Petrified Wood	no	12.5-19mm	1	3.30
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	cf. Johns Valley Shale Chert	no	6.3-9.5mm	1	0.40

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Shatter, no cortex	Petrified Wood	no	12.5-19mm	1	2.30
UNIT 78 Lev: 4						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	9.5-12.5mm	1	1.20
Unmodified debitage	Shatter, no cortex	Chert	burned	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.05
UNIT 78 Lev: 5						
Unmodified debitage	Primary flake	Chert	burned	9.5-12.5mm	1	1.20
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Petrified Wood	no	9.5-12.5mm	1	2.00
Unmodified debitage	Tertiary flake	Bowie Chert	yes	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Bowie Chert	yes	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Bowie Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	< 6.3mm	1	0.05
UNIT 78 Lev: 6						
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Bowie Chert	burned	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.30
UNIT 79 Lev: 1						
Unmodified debitage	Tertiary flake	Bowie Chert	yes	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	no	6.3-9.5mm	1	0.60
UNIT 79 Lev: 2						
Unmodified debitage	Primary flake	Chert	burned	9.5-12.5mm	1	1.00
Unmodified debitage	Secondary flake	Siltstone	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.50
Unmodified debitage	Tertiary flake	Silicified Wood	no	9.5-12.5mm	1	1.00
Unmodified debitage	Flake frag, no cortex	Chert	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Flake frag, no cortex	Bowie Chert	burned	< 6.3mm	1	0.05
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 79 Lev: 3						
Unmodified debitage	Primary flake	Chert	burned	6.3-9.5mm	1	0.40
Unmodified debitage	Secondary flake	Chert	burned	6.3-9.5mm	1	0.40
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Siltstone	no	< 6.3mm	1	0.05
Unmodified debitage	Bifacial thinning	cf. Johns Valley Shale Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, no cortex	Bowie Chert	no	12.5-19mm	1	5.60
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	12.5-19mm	1	2.30
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.10
UNIT 79 Lev: 4						
Unmodified debitage	Tertiary flake	Chert	burned	9.5-12.5mm	1	1.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Lowrance Chert	no	9.5-12.5mm	1	0.70
UNIT 79 Lev: 5						
Unmodified debitage	Primary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	1.40
Unmodified debitage	Primary flake	Siltstone	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Bifacial thinning	Bowie Chert	yes	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	9.5-12.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	< 6.3mm	1	0.05
UNIT 79 Lev: 6						
Unmodified debitage	Tertiary flake	Limestone	no	6.3-9.5mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	19-25mm	1	4.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, >75% cortex	Ark. Novaculite "Green" chert	no	9.5-12.5mm	1	2.40
UNIT 79 Lev: 7						
Unmodified debitage	Secondary flake	Chert	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.50

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.10
UNIT 79 Lev: 8						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
UNIT 79 Lev: 9						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.20
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
UNIT 79 Lev: 10						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
UNIT 80 Lev: 1						
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.30
UNIT 80 Lev: 2						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Bowie Chert	no	6.3-9.5mm	1	0.40
UNIT 80 Lev: 3						
Unmodified debitage	Tertiary flake	Bowie Chert	yes	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	9.5-12.5mm	1	0.30
Unmodified debitage	Flake frag, no cortex	unidentified	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Bowie Chert	burned	9.5-12.5mm	1	1.30
UNIT 80 Lev: 4						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.40
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.20
UNIT 80 Lev: 5						
Unmodified debitage	Primary flake	Chert	burned	9.5-12.5mm	1	0.50
Unmodified debitage	Primary flake	unidentified	no	6.3-9.5mm	1	0.30

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Secondary flake	cf. Johns Valley Shale Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
UNIT 80 Lev: 6						
Unmodified debitage	Primary flake	Bowie Chert	no	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, >75% cortex	Bowie Chert	no	6.3-9.5mm	1	0.60
UNIT 80 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.60
UNIT 81 Lev: 1						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	6.3-9.5mm	1	0.10
UNIT 81 Lev: 2						
Unmodified debitage	Primary flake	Siltstone	no	9.5-12.5mm	1	1.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	4.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
UNIT 81 Lev: 3						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Flake frag, no cortex	unidentified	no	6.3-9.5mm	1	0.10
UNIT 81 Lev: 4						
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
UNIT 81 Lev: 5						
Unmodified debitage	Primary flake	Bowie Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.05

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
UNIT 82 Lev: 2						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	< 6.3mm	1	0.10
UNIT 82 Lev: 3						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	< 6.3mm	1	0.05
UNIT 82 Lev: 4						
Unmodified debitage	Secondary flake	Chert	burned	9.5-12.5mm	1	1.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	1.30
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
UNIT 82 Lev: 5						
Unmodified debitage	Primary flake	Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Johns Valley Shale Chert	no	> 25mm	1	0.50
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	yes	6.3-9.5mm	1	1.80
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
UNIT 82 Lev: 6						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	2.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
UNIT 82 Lev: 7						
Unmodified debitage	Secondary flake	cf. Lowrance Chert	no	12.5-19mm	1	3.00
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Silicified Wood	no	< 6.3mm	1	0.10
UNIT 83 Lev: 2						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
UNIT 83 Lev: 4						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
UNIT 84 Lev: 1						

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	no	12.5-19mm	1	4.10
UNIT 84 Lev: 2						
Unmodified debitage	Tertiary flake	Chert	burned	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.20
Unmodified debitage	Shatter, 1-75% cortex	Chert	burned	6.3-9.5mm	1	1.70
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 84 Lev: 3						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	2.00
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, 1-75% cortex	Johns Valley Shale Chert	no	12.5-19mm	1	5.50
Unworked stone	Burned Rock	Sandstone	burned		2	17.90
UNIT 84 Lev: 4						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Bowie Chert	no	< 6.3mm	1	0.20
Unmodified debitage	Shatter, no cortex	Siltstone	no	< 6.3mm	1	0.10
Unworked stone	Burned Rock	Sandstone	burned		1	4.10
UNIT 84 Lev: 5						
Unmodified debitage	Primary flake	Chert	burned	6.3-9.5mm	1	0.90
Unmodified debitage	Secondary flake	unidentified	no	< 6.3mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	6.70
UNIT 84 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	3.50
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	9.5-12.5mm	1	0.20
Unmodified debitage	Shatter, >75% cortex	Battiest Chert	no	12.5-19mm	1	3.90
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	9.5-12.5mm	1	0.50
Unmodified debitage	Shatter, 1-75% cortex	Quartzite	no	9.5-12.5mm	1	0.70
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	burned	9.5-12.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unworked stone	Burned Rock	Limestone	burned		1	25.40
UNIT 84 Lev: 7						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Quartzite	no	6.3-9.5mm	1	0.10
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		2	104.80
UNIT 84 Lev: 8						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Secondary flake	unidentified	no	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	19-25mm	1	8.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	19-25mm	1	7.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	unidentified	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Potters Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.20
Unmodified debitage	Flake frag, no cortex	cf. Lowrance Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, 1-75% cortex	Chert	burned	12.5-19mm	1	6.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unworked stone	Burned Rock	Sandstone	burned		1	16.10
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	79.10
UNIT 84 Lev: 9						
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	12.5-19mm	1	0.90
Unmodified debitage	Tertiary flake	Lowrance Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Chert	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Silicified Wood	no	9.5-12.5mm	1	1.60
Unworked stone	Burned Rock	Ogallala Quartzite	burned		3	109.30
UNIT 84 Lev: 10						
Unmodified debitage	Primary flake	RR Yellow Siltstone	yes	9.5-12.5mm	1	0.50
Unmodified debitage	Secondary flake	cf. Johns Valley Shale Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.80

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	1.00
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	52.10
UNIT 84 Lev: 11						
Unmodified debitage	Secondary flake	Petrified Wood	no	9.5-12.5mm	1	1.30
Unmodified debitage	Secondary flake	Petrified Wood	no	9.5-12.5mm	1	1.50
Unmodified debitage	Tertiary flake	Quartzite	no	12.5-19mm	1	4.20
UNIT 85 Lev: 4						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.20
UNIT 85 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
UNIT 85 Lev: 6						
Unmodified debitage	Bifacial thinning	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	12.5-19mm	1	4.50
UNIT 85 Lev: 8						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	12.5-19mm	1	6.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	12.5-19mm	1	7.60
UNIT 86 Lev: 2						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
UNIT 86 Lev: 5						
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.40
Unmodified debitage	Secondary flake	Ogallala Quartzite	burned	12.5-19mm	1	2.20
Unmodified debitage	Tertiary flake	Potters Quartzite	no	12.5-19mm	1	2.50
UNIT 86 Lev: 6						
Unmodified debitage	Primary flake	Siltstone	no	12.5-19mm	1	1.30
Unmodified debitage	Shatter, >75% cortex	Ark. Novaculite	no	6.3-9.5mm	1	3.70
UNIT 86 Lev: 8						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	6.20
UNIT 87 Lev: 2						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 87 Lev: 3						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, >75% cortex	Chert	burned	9.5-12.5mm	1	1.10
UNIT 87 Lev: 4						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
UNIT 88 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	< 6.3mm	1	0.05
UNIT 88 Lev: 4						
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	< 6.3mm	1	0.20
Unmodified debitage	Bifacial thinning	Bowie Chert	no	6.3-9.5mm	1	0.10
UNIT 88 Lev: 5						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
UNIT 88 Lev: 6						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	1.80
Unmodified debitage	Tertiary flake	Chert	burned	12.5-19mm	1	1.40
Unmodified debitage	Shatter, no cortex	Chert	burned	< 6.3mm	1	0.05
UNIT 88 Lev: 7						
Unmodified debitage	Secondary flake	Bowie Chert	no	12.5-19mm	1	4.90
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 89 Lev: 1						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
UNIT 89 Lev: 2						
Unmodified debitage	Shatter, no cortex	Petrified Wood	yes	9.5-12.5mm	1	1.10
UNIT 89 Lev: 3						
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	6.3-9.5mm	1	0.50

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 89 Lev: 4						
Unmodified debitage	Secondary flake	Bowie Chert	burned	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.50
Unmodified debitage	Tertiary flake	Siltstone	no	9.5-12.5mm	1	0.60
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	yes	6.3-9.5mm	1	0.30
UNIT 89 Lev: 5						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.00
Unmodified debitage	Secondary flake	Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	yes	12.5-19mm	1	7.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.60
UNIT 89 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.10
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	14.70
UNIT 91 Lev: 3						
Unmodified debitage	Tertiary flake	Ferruginous Sandstone	indet.	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.30
UNIT 91 Lev: 4						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	5.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	9.5-12.5mm	1	2.80
Unworked stone	Burned Rock	Sandstone	burned		1	33.20
UNIT 91 Lev: 6						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 91 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 91 Lev: 8						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	19-25mm	1	6.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.90
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.70
Unmodified debitage	Shatter, no cortex	Chert	burned	6.3-9.5mm	1	0.20
Unworked stone	Burned Rock	Sandstone	burned		2	32.40

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		1	3.60
Unworked stone	Burned Rock	Unidentifiable	burned		1	4.40
UNIT 93 Lev: 1						
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.20
UNIT 93 Lev: 3						
Unmodified debitage	Secondary flake	Chert	yes	6.3-9.5mm	1	0.30
UNIT 93 Lev: 4						
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
UNIT 93 Lev: 5						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	2.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.10
Unmodified debitage	Bifacial thinning	Johns Valley Shale Chert	no	6.3-9.5mm	1	0.10
UNIT 93 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.80
Unmodified debitage	Bifacial thinning	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, >75% cortex	Ferruginous Sandstone	no	6.3-9.5mm	1	0.20
UNIT 93 Lev: 8						
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.40
UNIT 93 Lev: 9						
Unmodified debitage	Primary flake	Potters Quartzite	no	19-25mm	1	12.90
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		1	25.80
UNIT 94 Lev: 2						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.60
UNIT 94 Lev: 5						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.30
UNIT 94 Lev: 6						
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	6.3-9.5mm	1	0.05

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 95 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
UNIT 95 Lev: 4						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.10
UNIT 95 Lev: 5						
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	no	6.3-9.5mm	1	1.00
UNIT 95 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
Unworked stone	Burned Rock	Ogallala Quartzite	burned		2	9.30
UNIT 95 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	4.10
UNIT 97 Lev: 5						
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.60
UNIT 98 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	indet.	9.5-12.5mm	1	0.40
UNIT 98 Lev: 4						
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
UNIT 98 Lev: 5						
Unmodified debitage	Tertiary flake	Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 98 Lev: 6						
Unmodified debitage	Secondary flake	Quartzite	no	9.5-12.5mm	1	1.80
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	yes	12.5-19mm	1	5.70
UNIT 99 Lev: 3						

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
UNIT 99 Lev: 7						
Unmodified debitage	Tertiary flake	Silicified Wood	no	6.3-9.5mm	1	0.10
UNIT 99 Lev: 8						
Unmodified debitage	Secondary flake	Quartzite	no	12.5-19mm	1	4.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	cf. Johns Valley Shale Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 99 Lev: 9						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.50
UNIT 100 Lev: 3						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Bifacial thinning	Woodford or Big Fork Chert	no	< 6.3mm	1	0.20
UNIT 100 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.10
UNIT 100 Lev: 6						
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	cf. Johns Valley Shale Chert	yes	9.5-12.5mm	1	0.20
UNIT 100 Lev: 7						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 101 Lev: 2						
Unmodified debitage	Shatter, no cortex	Silicified Wood	no	6.3-9.5mm	1	0.20
UNIT 101 Lev: 4						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.50
UNIT 101 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 101 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
UNIT 101 Lev: 7						
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	yes	12.5-19mm	1	6.70
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 101 Lev: 8						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 101 Lev: 9						
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	burned	12.5-19mm	1	1.80
UNIT 101 Lev: 10						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	< 6.3mm	1	0.30
Unmodified debitage	Tertiary flake	Petrified Wood	no	6.3-9.5mm	1	0.80
UNIT 102 Lev: 4						
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	12.5-19mm	1	2.00
UNIT 103 Lev: 3						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	2.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
UNIT 103 Lev: 4						
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.20
UNIT 103 Lev: 5						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	2.80
UNIT 104 Lev: 1						
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.05
UNIT 104 Lev: 2						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 104 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.60
UNIT 104 Lev: 4						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unworked stone	Burned Rock	Sandstone	burned		4	91.20
UNIT 104 Lev: 6						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.05
UNIT 104 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	2.00
Unmodified debitage	Tertiary flake	cf. Johns Valley Shale Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	6.3-9.5mm	1	0.50
Unworked stone	Burned Rock	Sandstone	burned		1	21.10
UNIT 104 Lev: 8						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unworked stone	Burned Rock	Sandstone	burned		1	49.70
UNIT 105 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Bifacial thinning	Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
UNIT 105 Lev: 4						
Unmodified debitage	Tertiary flake	Ferruginous Sandstone	burned	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
UNIT 105 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.30
UNIT 105 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	3.00
Unworked stone	Burned Rock	Sandstone	burned		1	8.50
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		1	7.10
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	16.00
UNIT 106 Lev: 2						
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 106 Lev: 3						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20

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Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
UNIT 106 Lev: 4						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.60
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 106 Lev: 5						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	4.00
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	2.40
Unmodified debitage	Tertiary flake	unidentified	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
UNIT 106 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
UNIT 106 Lev: 7						
Unmodified debitage	Tertiary flake	Silicified Wood	no	6.3-9.5mm	1	0.30
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.20
UNIT 106 Lev: 8						
Unmodified debitage	Primary flake	Chert	burned	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
UNIT 107 Lev: 3						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.30
UNIT 107 Lev: 4						
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Johns Valley Shale Chert	no	< 6.3mm	1	0.10
UNIT 107 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	0.80
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	12.5-19mm	1	2.50
Unmodified debitage	Shatter, no cortex	Potters Quartzite	no	12.5-19mm	1	3.60
UNIT 107 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	2.00
UNIT 107 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unworked stone	Burned Rock	Quartzite	burned		1	102.60
UNIT 107 Lev: 8						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
UNIT 108 Lev: 5						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.70
UNIT 108 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	12.60
UNIT 110 Lev: 3						
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
UNIT 110 Lev: 5						
Unmodified debitage	Tertiary flake	Arkansas Novaculite	no	6.3-9.5mm	1	0.10
UNIT 110 Lev: 6						
Unmodified debitage	Tertiary flake	Siltstone	no	< 6.3mm	1	0.10
UNIT 110 Lev: 8						
Unmodified debitage	Secondary flake	Siltstone	no	9.5-12.5mm	1	0.80
UNIT 110 Lev: 9						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.50
UNIT 111 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
UNIT 111 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
UNIT 111 Lev: 8						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
UNIT 113 Lev: 4						
Unmodified debitage	Secondary flake	Bowie Chert	burned	9.5-12.5mm	1	0.70
Unmodified debitage	Bifacial thinning	Bowie Chert	no	< 6.3mm	1	0.05
UNIT 113 Lev: 5						
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 114 Lev: 6						
Unmodified debitage	Secondary flake	Bowie Chert	burned	12.5-19mm	1	4.70
Unmodified debitage	Tertiary flake	Petrified Wood	no	6.3-9.5mm	1	0.60
UNIT 114 Lev: 7						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Johns Valley Shale Chert	no	6.3-9.5mm	1	0.10
S.T. 47 Lev: 5						
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
UNIT 119 Lev: 2						
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	unidentified	no	12.5-19mm	1	0.70
UNIT 119 Lev: 3						
Unmodified debitage	Secondary flake	Bowie Chert	no	9.5-12.5mm	1	0.70
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.30
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	4.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Quartzite	no	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	< 6.3mm	1	0.10
UNIT 119 Lev: 4						
Unmodified debitage	Primary flake	Ark. Novaculite "Green" chert	no	12.5-19mm	1	1.60
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	1.90
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	4.00
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	< 6.3mm	1	0.05

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Shatter, no cortex	Unidentifiable	no	9.5-12.5mm	1	2.90
UNIT 119 Lev: 5						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	19-25mm	1	6.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	12.5-19mm	1	4.20
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	1.00
Unmodified debitage	Tertiary flake	Bowie Chert	burned	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Bowie Chert	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.40
Unworked stone	Burned Rock	Sandstone	burned		3	59.10
UNIT 119 Lev: 6						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	19-25mm	1	11.20
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	12.5-19mm	1	3.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	burned	6.3-9.5mm	1	0.20
UNIT 120 Lev: 2						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ferruginous Sandstone	burned	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
UNIT 120 Lev: 3						
Unmodified debitage	Primary flake	Bowie Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Bifacial thinning	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	< 6.3mm	1	0.05
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	3.70
UNIT 120 Lev: 4						
Unmodified debitage	Primary flake	RR Yellow Siltstone	yes	9.5-12.5mm	1	2.20
Unmodified debitage	Secondary flake	Chert	burned	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Chert	burned	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Limestone	yes	9.5-12.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	6.3-9.5mm	1	0.40
Unworked stone	Burned Rock	Sandstone	burned		1	16.40
UNIT 120 Lev: 5						
Unmodified debitage	Tertiary flake	Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	6.3-9.5mm	1	0.30
Unworked stone	Burned Rock	Sandstone	burned		1	7.10
UNIT 120 Lev: 6						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.60
Unmodified debitage	Secondary flake	Ogallala Quartzite	burned	9.5-12.5mm	1	1.00
Unmodified debitage	Secondary flake	Lowrance Chert	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Quartzite	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.30
UNIT 120 Lev: 7						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	19-25mm	1	7.30
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Chert	burned	9.5-12.5mm	1	1.30
Unmodified debitage	Tertiary flake	Chert	burned	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.80

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.10
Unworked stone	Burned Rock	Sandstone	burned		1	26.00
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	4.00
UNIT 121 Lev: 1						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.70
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ark. Novaculite "Green" chert	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	28	0.01
Unmodified debitage	Flake frag, no cortex	Limestone	no	< 6.3mm	2	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	6	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	13	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	3	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite "Green" chert	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	12	0.01
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	< 6.3mm	6	0.01
Unmodified debitage	Flake frag, no cortex	cf. Lowrance Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, 1-75% cortex	Petrified Wood	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, 1-75% cortex	Petrified Wood	no	6.3-9.5mm	1	1.00
Unmodified debitage	Shatter, 1-75% cortex	Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	burned	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	burned	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	12.5-19mm	1	3.90
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		2	0.70
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		3	2.20
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	2.00
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	25.90
UNIT 121 Lev: 2						
Unmodified debitage	Secondary flake	Chert	burned	9.5-12.5mm	1	1.70

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Secondary flake	cf. Lowrance Chert	no	9.5-12.5mm	1	1.40
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	burned	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	burned	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	burned	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	Potters Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Bifacial thinning	Bowie Chert	yes	< 6.3mm	1	0.01
Unmodified debitage	Bifacial thinning	Bowie Chert	yes	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Petrified Wood	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	yes	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	burned	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite "Green" chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	< 6.3mm	1	0.01
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	yes	6.3-9.5mm	1	0.40
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	no	9.5-12.5mm	1	1.80
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	burned	< 6.3mm	1	0.20
Unmodified debitage	Shatter, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Shatter, no cortex	unidentified	burned	< 6.3mm	1	0.20
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.30

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 121 Lev: 3						
Unmodified debitage	Primary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Arkansas Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Bifacial thinning	Arkansas Novaculite	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	10	0.01
Unmodified debitage	Flake frag, no cortex	Limestone	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	6	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite "Green" chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	6	0.01
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
UNIT 121 Lev: 4						
Unmodified debitage	Secondary flake	Unidentifiable	burned	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	6.3-9.5mm	1	0.80
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	< 6.3mm	1	0.01

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 121 Lev: 5						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.00
Unmodified debitage	Tertiary flake	Chert	burned	< 6.3mm	1	0.40
Unmodified debitage	Tertiary flake	Bowie Chert	yes	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	indet.	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.30
Unmodified debitage	Tertiary flake	Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	2	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	3	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	4	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	3	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	3	0.01
Unmodified debitage	Flake frag, no cortex	Johns Valley Shale Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	yes	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	burned	6.3-9.5mm	1	0.90
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	no	9.5-12.5mm	1	1.30
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		1	6.30
UNIT 121 Lev: 6						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	3.10
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	3.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	12	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	15	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	2	0.01
Unmodified debitage	Flake frag, no cortex	Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	cf. Lowrance Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Shatter, 1-75% cortex	Petrified Wood	burned	12.5-19mm	1	13.90
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	< 6.3mm	1	0.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 121 Lev: 7						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.70
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	< 6.3mm	1	3.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Quartzite	no	12.5-19mm	1	2.10
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.40
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	4	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	5	0.01
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	< 6.3mm	2	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.01
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	9.5-12.5mm	1	2.30
Unmodified debitage	Shatter, no cortex	unidentified	no	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	< 6.3mm	1	0.10
Unworked stone	Burned Rock	Sandstone	burned		1	9.80
UNIT 121 Lev: 8						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	2.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Chert	burned	< 6.3mm	5	0.01
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	2	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	7	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	5	0.01
Unmodified debitage	Flake frag, no cortex	Arkansas Novaculite	no	< 6.3mm	1	0.01
UNIT 121 Lev: 9						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	6.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.00
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	9.5-12.5mm	1	0.40
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	2	0.01

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 121 Lev: 10						
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	< 6.3mm	1	0.01
UNIT 122 Lev: 1						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	1.70
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	1.10
Unmodified debitage	Secondary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Lowrance Chert	no	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Chert	burned	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Quartzite	no	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	no	12.5-19mm	1	2.30
Unmodified debitage	Shatter, no cortex	Chert	yes	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Chert	burned	6.3-9.5mm	1	0.10
UNIT 122 Lev: 2						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Secondary flake	Arkansas Novaculite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Unidentifiable	burned	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Unidentifiable	burned	< 6.3mm	1	0.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	9.5-12.5mm	1	0.70
UNIT 122 Lev: 3						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	1.50
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Primary flake	RR Yellow Siltstone	yes	9.5-12.5mm	1	1.20
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Secondary flake	Ogallala Quartzite	burned	6.3-9.5mm	1	0.70
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Chert	burned	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.40
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Unidentifiable	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.40
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, >75% cortex	Quartz	no	9.5-12.5mm	1	1.90
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	yes	12.5-19mm	1	5.40
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.40
Unmodified debitage	Shatter, no cortex	Chert	burned	< 6.3mm	1	0.30
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	burned	12.5-19mm	1	3.40
UNIT 122 Lev: 4						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	2.50
Unmodified debitage	Tertiary flake	Petrified Wood	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Petrified Wood	indet.	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Potters Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	burned	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Unidentifiable	burned	< 6.3mm	1	0.01
UNIT 122 Lev: 5						
Unmodified debitage	Secondary flake	Bowie Chert	yes	< 6.3mm	1	0.10
Unmodified debitage	Secondary flake	Bowie Chert	yes	< 6.3mm	1	0.20
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.40
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	6.3-9.5mm	1	0.40
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.10
UNIT 122 Lev: 6						
Unmodified debitage	Primary flake	Bowie Chert	yes	9.5-12.5mm	1	2.20
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	3.10
Unmodified debitage	Secondary flake	Siltstone	yes	12.5-19mm	1	1.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	3.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	12.5-19mm	1	4.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	yes	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Bifacial thinning	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	1.30
UNIT 122 Lev: 7						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	2.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	11.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	2.00
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Flake frag, no cortex	Ark. Novaculite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	no	< 6.3mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	1.00
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	1.20
UNIT 122 Lev: 8						
Unmodified debitage	Primary flake	Quartzite	no	6.3-9.5mm	1	1.50
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	1.20
Unmodified debitage	Secondary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Potters Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Siltstone	no	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	Unidentifiable	no	6.3-9.5mm	1	0.50
UNIT 122 Lev: 9						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	5.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unmodified debitage	Flake frag, no cortex	RR Yellow Siltstone	no	< 6.3mm	1	0.01

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
UNIT 122 Lev: 10						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	1.50
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	12.5-19mm	1	3.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.60
UNIT 123 Lev:						
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.30
UNIT 123 Lev: 1						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.20
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.30
Unmodified debitage	Tertiary flake	Chert	yes	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Bowie Chert	no	< 6.3mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.90
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	6.3-9.5mm	1	0.40
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Silicified Wood	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.70
UNIT 123 Lev: 2						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.60
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Chert	burned	< 6.3mm	1	0.01
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	3.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	12.5-19mm	1	1.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Lowrance Chert	no	6.3-9.5mm	1	1.10
Unmodified debitage	Tertiary flake	Lowrance Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	cf. Lowrance Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Flake frag, no cortex	cf. Lowrance Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	no	9.5-12.5mm	1	2.20
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Siltstone	no	9.5-12.5mm	1	0.50
UNIT 123 Lev: 3						
Unmodified debitage	Primary flake	Chert	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Primary flake	Bowie Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	12.5-19mm	1	6.10
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Chert	burned	9.5-12.5mm	1	0.10
Unmodified debitage	Tertiary flake	Limestone	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	burned	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	burned	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Lowrance Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Lowrance Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Lowrance Chert	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Quartzite	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	unidentified	yes	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.10
UNIT 123 Lev: 4						
Unmodified debitage	Primary flake	Chert	burned	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	3.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	unidentified	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Bifacial thinning	Ark. Novaculite	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	cf. Lowrance Chert	no	6.3-9.5mm	1	0.10
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	< 6.3mm	1	0.50
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	10.10
UNIT 123 Lev: 5						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.70
Unmodified debitage	Primary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	< 6.3mm	1	0.30
Unmodified debitage	Secondary flake	RR Yellow Siltstone	yes	6.3-9.5mm	1	0.80
Unmodified debitage	Secondary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Secondary flake	Unidentifiable	burned	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Bowie Chert	yes	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Silicified Wood	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Petrified Wood	no	19-25mm	1	7.00
Unmodified debitage	Shatter, no cortex	Petrified Wood	burned	6.3-9.5mm	1	1.60
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	no	< 6.3mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	12.5-19mm	1	2.80
Unworked stone	Burned Rock	Sandstone	burned		8	15.80
UNIT 123 Lev: 6						
Unmodified debitage	Primary flake	Bowie Chert	yes	9.5-12.5mm	1	1.10
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.60
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Chert	burned	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Bowie Chert	no	12.5-19mm	1	1.10
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Potters Quartzite	yes	9.5-12.5mm	1	1.30
Unmodified debitage	Tertiary flake	Potters Quartzite	no	12.5-19mm	1	2.70
Unmodified debitage	Bifacial thinning	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, >75% cortex	Petrified Wood	no	6.3-9.5mm	1	0.90
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	no	12.5-19mm	1	6.50
Unmodified debitage	Shatter, no cortex	Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unworked stone	Burned Rock	Sandstone	burned		11	94.00

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 123 Lev: 7						
Unmodified debitage	Primary flake	Petrified Wood	no	12.5-19mm	1	4.60
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.60
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	1.50
Unmodified debitage	Primary flake	Lowrance Chert	no	9.5-12.5mm	1	2.50
Unmodified debitage	Primary flake	Lowrance Chert	no	9.5-12.5mm	1	1.30
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	19-25mm	1	2.90
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	19-25mm	1	2.90
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.00
Unmodified debitage	Secondary flake	Ogallala Quartzite	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	2.30
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	2.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Johns Valley Shale Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Quartzite	no	19-25mm	1	1.50
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	cf. Lowrance Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Bifacial thinning	unidentified	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	Bowie Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Flake frag, no cortex	cf. Lowrance Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	no	19-25mm	1	8.70
Unmodified debitage	Shatter, 1-75% cortex	Petrified Wood	burned	9.5-12.5mm	1	2.80
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	no	6.3-9.5mm	1	1.20
Unmodified debitage	Shatter, no cortex	Petrified Wood	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	12.5-19mm	1	2.80
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Potters Quartzite	no	12.5-19mm	1	2.10
Unmodified debitage	Shatter, no cortex	Potters Quartzite	no	9.5-12.5mm	1	1.40
Unworked stone	Burned Rock	Quartzite	burned		1	2.50
Unworked stone	Burned Rock	Petrified Wood	burned		1	2.30

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Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unworked stone	Burned Rock	Sandstone	burned		7	112.40
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		6	31.10
UNIT 123 Lev: 8						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	1.70
Unmodified debitage	Primary flake	Siltstone	no	12.5-19mm	1	1.20
Unmodified debitage	Secondary flake	Bowie Chert	yes	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	1.40
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Bowie Chert	no	9.5-12.5mm	1	1.60
Unmodified debitage	Tertiary flake	Bowie Chert	no	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	5.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	1.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	burned	19-25mm	1	7.80
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	unidentified	no	9.5-12.5mm	1	1.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	yes	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	12.5-19mm	1	3.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
Unworked stone	Burned Rock	Quartz	burned		1	6.80
Unworked stone	Burned Rock	Sandstone	burned		12	13.50
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		13	173.60
Unworked stone	Burned Rock	Unidentifiable	burned		1	4.90
UNIT 123 Lev: 9						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	5.30
Unmodified debitage	Primary flake	Ogallala Quartzite	no	12.5-19mm	1	3.50
Unmodified debitage	Primary flake	Ogallala Quartzite	no	> 25mm	1	24.30
Unmodified debitage	Secondary flake	Chert	burned	12.5-19mm	1	3.60
Unmodified debitage	Secondary flake	Petrified Wood	no	12.5-19mm	1	2.50
Unmodified debitage	Secondary flake	Bowie Chert	no	9.5-12.5mm	1	1.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	4.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	3.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	19-25mm	1	9.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10

Date: 04/17/97

Geo-Marine Inc.
#3035-001 WOCMA Testing
41TT670 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	burned	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Lowrance Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, >75% cortex	Petrified Wood	burned	12.5-19mm	1	6.10
Unmodified debitage	Shatter, 1-75% cortex	Chert	burned	9.5-12.5mm	1	1.10
Unmodified debitage	Shatter, no cortex	Ferruginous Sandstone	no	12.5-19mm	1	2.70
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	19-25mm	1	8.10
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	12.80
UNIT 124 Lev:						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.60
UNIT 124 Lev: 1						
Unmodified debitage	Primary flake	Chert	burned	6.3-9.5mm	1	0.70
Unmodified debitage	Secondary flake	Chert	burned	9.5-12.5mm	1	1.50
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	RR Yellow Siltstone	yes	9.5-12.5mm	1	0.40
Unmodified debitage	Secondary flake	Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Secondary flake	Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Siltstone	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
UNIT 124 Lev: 2						
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Secondary flake	Siltstone	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	1.30
Unmodified debitage	Bifacial thinning	Ark. Novaculite	no	< 6.3mm	1	0.05
Unmodified debitage	Shatter, >75% cortex	Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Chert	burned	6.3-9.5mm	1	0.40
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	RR Yellow Siltstone	no	6.3-9.5mm	1	0.70

Date: 04/17/97

Geo-Marine Inc.
#3035-001 WOCMA Testing
41TT670 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
UNIT 124 Lev: 3						
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	0.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.80
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.70
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.30
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Bowie Chert	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Bowie Chert	burned	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	Bowie Chert	burned	9.5-12.5mm	1	1.80
Unmodified debitage	Tertiary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	0.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	7.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.70
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	2.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Siltstone	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	unidentified	no	6.3-9.5mm	1	0.50
Unmodified debitage	Shatter, >75% cortex	cf. Lowrance Chert	no	6.3-9.5mm	1	0.80
Unmodified debitage	Shatter, 1-75% cortex	Ferruginous Sandstone	burned	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, 1-75% cortex	Ogallala Quartzite	burned	6.3-9.5mm	1	1.60
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	burned	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	cf. Johns Valley Shale Chert	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	6.3-9.5mm	1	0.80
UNIT 124 Lev: 4						
Unmodified debitage	Primary flake	Bowie Chert	yes	12.5-19mm	1	4.10
Unmodified debitage	Primary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.10
Unmodified debitage	Secondary flake	Chert	burned	6.3-9.5mm	1	0.20
Unmodified debitage	Secondary flake	Petrified Wood	burned	6.3-9.5mm	1	0.60
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	1.70
Unmodified debitage	Tertiary flake	Bowie Chert	burned	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Bowie Chert	burned	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	9.5-12.5mm	1	0.70
Unmodified debitage	Tertiary flake	unidentified	no	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Quartzite	no	< 6.3mm	1	0.05
Unmodified debitage	Bifacial thinning	unidentified	no	6.3-9.5mm	1	0.60
Unmodified debitage	Flake frag, no cortex	Woodford or Big Fork	no	6.3-9.5mm	1	0.50

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Geo-Marine Inc.
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41TT670 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
		Chert				
Unmodified debitage	Shatter, >75% cortex	Bowie Chert	no	9.5-12.5mm	1	2.80
Unmodified debitage	Shatter, 1-75% cortex	Bowie Chert	burned	6.3-9.5mm	1	0.80
Unmodified debitage	Shatter, 1-75% cortex	Unidentifiable	burned	12.5-19mm	1	1.00
Unmodified debitage	Shatter, no cortex	Silicified Wood	no	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	cf. Johns Valley Shale Chert	no	6.3-9.5mm	1	0.70
Unmodified debitage	Shatter, no cortex	Unidentifiable	burned	< 6.3mm	1	0.20
Unworked stone	Burned Rock	Ferruginous Sandstone	burned		1	2.10
UNIT 124 Lev: 5						
Unmodified debitage	Tertiary flake	Bowie Chert	yes	< 6.3mm	1	0.20
Unmodified debitage	Tertiary flake	Bowie Chert	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	2.30
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	0.60
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.20
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.20
UNIT 124 Lev: 6						
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Tertiary flake	Siltstone	no	9.5-12.5mm	1	0.40
Unmodified debitage	Shatter, 1-75% cortex	RR Yellow Siltstone	no	12.5-19mm	1	3.40
UNIT 125 Lev: 2						
Unmodified debitage	Primary flake	Bowie Chert	yes	19-25mm	1	16.90
Unmodified debitage	Secondary flake	Bowie Chert	yes	9.5-12.5mm	1	1.80
Unmodified debitage	Secondary flake	RR Yellow Siltstone	indet.	< 6.3mm	1	0.05
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Chert	burned	< 6.3mm	1	0.05
UNIT 125 Lev: 3						
Unmodified debitage	Primary flake	Bowie Chert	yes	9.5-12.5mm	1	0.80
Unmodified debitage	Primary flake	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Primary flake	RR Yellow Siltstone	no	19-25mm	1	5.80
Unmodified debitage	Secondary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.90
Unmodified debitage	Secondary flake	Siltstone	no	12.5-19mm	1	1.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.70
Unmodified debitage	Tertiary flake	Lowrance Chert	no	12.5-19mm	1	1.90

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Geo-Marine Inc.
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41TT670 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Lowrance Chert	no	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Quartzite	no	< 6.3mm	1	0.05
Unworked stone	Burned Rock	Ogallala Quartzite	burned		1	35.80
UNIT 125 Lev: 4						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	2.00
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	< 6.3mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	12.5-19mm	1	6.70
UNIT 125 Lev: 5						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.40
Unmodified debitage	Primary flake	Ogallala Quartzite	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	12.5-19mm	1	4.60
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.20
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	1.00
Unmodified debitage	Flake frag, no cortex	Bowie Chert	burned	< 6.3mm	1	0.05
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unworked stone	Burned Rock	Sandstone	burned		2	51.30
UNIT 125 Lev: 6						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	Chert	burned	6.3-9.5mm	1	0.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	12.5-19mm	1	1.50
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10
Unmodified debitage	Tertiary flake	RR Yellow Siltstone	no	9.5-12.5mm	1	1.00
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	< 6.3mm	1	0.01
Unworked stone	Burned Rock	Sandstone	burned		5	113.40
UNIT 125 Lev: 7						
Unmodified debitage	Secondary flake	Chert	burned	6.3-9.5mm	1	0.20
BT 130 Lev: 2						
Unmodified debitage	Secondary flake	Bowie Chert	yes	6.3-9.5mm	1	0.20
S.T. 126 Lev: 2						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.50
BT 130 Lev: 2						
Unmodified debitage	Tertiary flake	Woodford or Big Fork Chert	no	19-25mm	1	2.00
BT 130 Lev: 3						
Unmodified debitage	Primary flake	Bowie Chert	yes	9.5-12.5mm	1	0.90
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.10

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Geo-Marine Inc.
#3035-001 WOCMA Testing
41TT670 Debitage and Burned Rock

Class	Type	Material	Heat Treat.	Size	Qty.	Weight (grams)
Unmodified debitage	Tertiary flake	Ark. Novaculite	no	6.3-9.5mm	1	0.60
Unmodified debitage	Shatter, no cortex	Bowie Chert	no	6.3-9.5mm	1	0.30
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	yes	< 6.3mm	1	0.10
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	9.5-12.5mm	1	1.00
BT 130 Lev: 4						
Unmodified debitage	Secondary flake	Siltstone	no	12.5-19mm	1	2.90
Unmodified debitage	Tertiary flake	Bowie Chert	no	9.5-12.5mm	1	2.40
BT 130 Lev: 12						
Unmodified debitage	Secondary flake	Ogallala Quartzite	no	9.5-12.5mm	1	1.30
BT 127 Lev: 4						
Unworked stone	Burned Rock	Ogallala Quartzite	yes		4	21.00
BT 127 Lev: 5						
Unmodified debitage	Primary flake	Ogallala Quartzite	yes	6.3-9.5mm	1	1.00
Unmodified debitage	Tertiary flake	Ogallala Quartzite	no	< 6.3mm	1	0.10
Unmodified debitage	Angular shatter	Ogallala Quartzite	no	9.5-12.5mm	1	1.90
Unworked stone	Burned Rock	Ogallala Quartzite	yes		1	2.70
BT 127 Lev: 6						
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.30
Unmodified debitage	Primary flake	Ogallala Quartzite	no	6.3-9.5mm	1	0.70
Unmodified debitage	Secondary flake	Bowie Chert	yes	19-25mm	1	3.40
Unmodified debitage	Shatter, >75% cortex	Ogallala Quartzite	yes	> 25mm	1	27.70
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.80
BT 128 Lev: 3						
Unmodified debitage	Secondary flake	Bowie Chert	no	6.3-9.5mm	1	0.70
Unmodified debitage	Flake frag, no cortex	Ogallala Quartzite	no	6.3-9.5mm	1	0.05
Unmodified debitage	Shatter, no cortex	Bowie Chert	yes	6.3-9.5mm	1	0.20
Unmodified debitage	Shatter, no cortex	Ogallala Quartzite	yes	6.3-9.5mm	1	0.20
BT 128 Lev: 5						
Unmodified debitage	Secondary flake	Unidentifiable	burned	6.3-9.5mm	1	0.40
Unmodified debitage	Tertiary flake	Novaculite	no	6.3-9.5mm	1	0.20

APPENDIX D

SUMMARY OF HISTORIC ARTIFACTS RECOVERED FROM SITES 41BW553 AND 41TT670

by
Steven M. Hunt and Marianne Marek

FRAMEWORK FOR ANALYSIS OF THE HISTORICAL ARCHEOLOGICAL MATERIALS

by
Steven M. Hunt

The analysis of small amounts of historic material collected from sites 41BW553 and 41TT670 made use of five major analytical categories or classes of artifacts, consisting of:

(1) Domestic;
(2) Furnishing;
(3) Architectural;
(4) Personal; and
(5) Activities.

Unidentified metal fragments and ceramic or glass sherds which were unclassifiable as to category were placed in a separate, indeterminate category. Although the use of these artifact categories may perpetuate ideas about functional classifications, it is felt that at the survey level of research, such an analytical framework is the most efficient way to handle the artifactual data.

Major artifact categories were sorted into various subcategories, including animal bone, shell, ceramic, glass, metal, plastic, building materials, and natural materials. These were then sorted into various classes, types, and subtypes, depending on the type of subcategory. In the case of ceramics and glass, when these subtypes could be associated with manufacture or use dates, they were used to compute Mean Ceramic Dates (MCD) or Mean Glass Dates (MGD). The general nature of each of the major artifact categories is discussed below.

Domestic Artifacts

The domestic category was applied to artifacts related to food service (i.e., tableware), food storage (including food preparation), and household furnishings. The tableware subcategory subsumes some ceramic, glass, and metal artifact types. Ceramic tablewares include stoneware, refined earthenware, coarse earthenware, and porcelain types. Particular items were identified as to types and subtypes, based on temporally sensitive technological (e.g., white/whiteware, light blue tint whiteware, blue tint whiteware, blue tint ironstone, high-fired ironstone, ironstone/whiteware, transitional whiteware), decorative (e.g., decalcomania, flow blue, blue shell edge), and/or other attributes (e.g., nonvitrified, vitrified, molded), and assigned dates of production on this basis.

Food storage items or storagewares also were subdivided as to whether they were ceramic (stoneware), glass, or metal. The stoneware items were further subdivided into types and subtypes using technological and decorative attributes, such as paste (e.g., colored) and various combinations of exterior treatment (e.g., gray bodied, bristol, cobalt, slipped, Albany slip, natural slip) and interior treatment (e.g., blue gray, Bristol, slipped, Albany slip, unglazed). These attributes then formed the basis for assigning production dates to individual specimens.

Glass storageware was subdivided on the basis of color (e.g., clear, manganese solarized, ash tint, amber, light amber, brown/amber, opaque, cobalt blue, blue, aqua, light green, ruby); form (generally bottle); and either decorative characteristics (e.g., etched, embossed, stippled base), manufacturing attributes (e.g., mold made, machine made, press molded), or sometimes function (e.g., soda, beer/liquor, canning seal, depression glass, extract bottle). Individual items were then given artifact-specific dates based on the production dates for each of its various attributes, in combination.

Finally, an unidentified domestic category absorbed the remainder of the food-related items (such as bone and shell), and this material was not analyzed further. It should be noted that not all ceramics or glass artifacts fall within the domestic category. In some cases, artifacts of these materials belong within the architectural or activities categories.

Furnishings

The furnishings category includes all nonfood service or food storage-related household items, such as furniture, stoves, and lamp glass. The furnishings subcategory often comprises only a small proportion of the total identifiable historic artifact assemblage from rural sites and the actual recovered items may vary greatly. In many cases, the majority of the artifacts classified as furnishings consist of fragments of lamp glass.

Architectural Artifacts

The architectural category includes all items which could be related to buildings or structures. Subcategories of architectural items include such things as window glass, nails, brick, mortar and/or plaster, ceramic tile or pipe, and electrical items. Nails were further subdivided as to whether they were wrought, cut, or wire; while the brick was distinguished as to whether it was handmade, machine made, or high fired.

Personal Artifacts

The category of personal items was created to contain items of individual use, such as clothing, buttons, shoes, doll parts, cosmetic bottles, snuff bottles (identified on the basis of characteristics such as glass color, bottle shape, and lip shape), musical instruments, and smoking pipes. Usually, artifacts which can be classified in this category are rare, making this category the least frequently represented at most archeological sites.

Activities Artifacts

The final analytical category relates to what have been called activities items. This category includes all nonhousehold items, such as those associated with transportation activities and farm-related equipment. As with personal items, this category often makes up only a small proportion of the overall assemblage of identifiable historic artifacts from a site. Activity category items which may occur include truck or tractor parts, harness buckles, fence staples, fence wire, horseshoes or horseshoe nails, and firearms cartridges. Subcategories for activities items include tools, harness and equipment, transportation, machinery, farm-related, weapons, and coal.

Geo-Marine, Inc.
Historic Artifact Analysis Codebook
24 June 1996

Compiled by Marianne Marek

PROJNO Geo-Marine Project Number

RECNO Record Number, consecutive for each line of data

BAGNO Field Bag number

ARTNO Artifact Number. Identification number for individual artifacts or groups of similar artifacts.

GROUP Analysis Group

HST	Historic Artifacts (all historic artifacts - ceramics, building materials, etc.)
FAU	Fauna, Animal Bone (see prehistoric codebook)
VEG	Charcoal and other plant remains (see prehistoric codebook)
NAT	Natural
SHL	Shell

CLASS Artifact Class

CCDE	English Translation
10	Animal Bone
11	Shell
13	Ceramic
14	Glass
15	Metal
16	Plastic
17	Other/miscellaneous materials
18	Building materials (brick, mortar, tile, stone, etc.)
19	Natural materials (coal, manuports, etc.)

Composite artifacts (artifacts made from a combination of the above classes) are classified under either the most diagnostic or the most predominant of the class types.

TYPE Subdivision of class (see codes following pages)

	TCDE	English Translation
For All Classes:	98.	Indeterminate
	99.	Not Applicable

Class: (13) Ceramic	1. Stoneware 2. Whiteware 3. Ironstone 4. Ref. Earth 5. Coarse 6. Porcelain 7. Buffware 8. British Brown Ware 9. Yellowware
Class: (14) Glass	1. Aqua 2. Manganese/solarized 3. Lt. Tint 4. Ash tint 5. Clear 6. Milk glass (subclass = translucent or opaque) 7. Olive 8. Amber/Brown 9. Green 10. Cobalt blue 11. Emerald Green 12. Red 13. Colored Milk Glass 14. Depression era colors (other = specific color, i.e., yellow, pink, green, etc.) 15. Flash/Overlay (clear glass dipped and coated with another color)
Class: (15) Metal	1. Iron 2. Brass 4. Alloy 5. Iron/Brass 6. Tin 7. Zinc 8. Copper 9. Brass/Copper 10. Aluminum 11. Lead
Class: (16) Plastic	1. Bakelite 2. Modern Plastic (1942-present)
Class: (17) Other/Misc.	1. Slag 2. Graphite 3. Rubber
Class: (18) Building Materials	1. Mortar 2. Brick (subclass = handmade or machine made) 3. Stone 4. Tile 6. Concrete/Cement

OTHER	Formerly SUBTYPE. Additional descriptive information either written or coded as applicable.
DATES	Diagnostic dates for the classified group (entered under type name in computer).
QTY	Quantity of artifacts within the classified group.
FAMILY	Functional grouping for classified artifacts.

Code	English Translation
DOM	Domestic
FUR	Furnishing
ARC	Architectural
PER	Personal
ACT	Activities
IND	Indeterminate
N/A	Not Applicable

COMMENT	Any other comments about the classified artifact or group.

TYPE CODES DIVIDED BY GROUP AND CLASS
(note: these groups are normally analyzed by the prehistoric analyst or other specialists)

GROUP: (NAT) Natural

Class: (19) Natural
1. Coal
2. Slate
3. Stone

GROUP: (FAU) Fauna (specific species identifications are entered under TYPE NAME as applicable).

Class: (10) Animal Bone

Type:
(1) Unworked
(2) Worked
(3) Fossilized
(4) Burned

Other:
(1) Bead
(2) Awl
(3) Cutmarks
(4) Sawn

Class: (11) Shell

Type:
(1) Unworked
(2) Worked
(3) Fossilized
(4) Burned

Other: (99) Not applicable

GROUP: (VEG) Vegetal

Class: (12) Vegetal

Type:
(1) Charcoal
(2) Seeds
(3) Peach Pits
(4) shells/hulls
(98) Indeterminate plant remains

Other: (99) Not applicable

Date: 07/16/96

Geo-Marine, Inc.
#3035-001 WOCMA Testing
Historic Artifact Data

Rec No.	Bag No.	Art No.	Class	Type	Other	Dates	Group	Qty.	Analysis Comment
41BW553	UNIT 9			N 450 E 500	Lev: 1				
2	7	1	METAL	Iron	FENCE STAPLE	N/A	Activities	1	
3	7	2	METAL	Iron	BARBED WIRE	N/A	Activities	1	
41BW553	UNIT 39			N 450 E 525	Lev: 1				
4	102	1	METAL	Iron	BOLT	N/A	Activities	1	EQUIPMENT BOLT; 19 CM LONG
41BW553	UNIT 53			N 450 E 625	Lev:				
27	162	1	METAL	Iron	CAST	N/A	Activities	1	LOGGING OR AGRICULTURE RELATED; FLAT, OVAL PIECE
28	162	2	METAL	Iron	CAST	N/A	Activities	1	LOGGING OR AGRICULTURE RELATED; BEVELED ON ONE EDGE
26	163	3	METAL	Iron	STRAP	N/A	Activities	1	LOGGING OR AGRICULTURE RELATED; SLIGHTLY CURVED; WORN THIN ON ONE END
29	164	4	METAL	Iron	CAST	N/A	Activities	1	LOGGING OR AGRICULTURE RELATED; LONG FLAT WAGON/TRACTOR HITCH
25	165	5	METAL	Iron	CHAIN	N/A	Activities	1	11 OVAL, INTERTWINED LINKS
41BW553	UNIT 53			N 450 E 625	Lev: 1				
13	158	1	METAL	Iron	WIRE	N/A	Activities	1	
14	158	2	METAL	Iron	N/A	N/A	Indeterminate	1	LOOP HINGE AT ONE END
15	158	3	GLASS	Aqua	BOTTLE	1910 - 1940S	Domestic	1	FRUIT JAR; ABM
16	158	4	GLASS	Mang/Solar	BOTTLE	1910 - 1920	Domestic	1	SLIGHTLY SOLARIZED; ABM
41BW553	UNIT 53			N 450 E 625	Lev: 2				
17	159	1	METAL	Iron	WIRE	N/A	Activities	2	1 PIECE IS DOUBLE STRAND
18	159	2	METAL	Iron	WIRE NAIL	POST 1880	Architectural	1	
19	159	3	GLASS	Amber/Brown	BOTTLE	POST 1910	Domestic	1	ABM
20	159	4	GLASS	Clear	BOTTLE	POST 1910	Domestic	2	ABM
21	159	5	GLASS	Mang/Solar	BOTTLE	1910 - 1920	Domestic	1	SLIGHTLY SOLARIZED; ABM
22	159	6	GLASS	Mang/Solar	TABLE	1880 - 1920	Domestic	1	THICK PEDESTAL BASE

Date: 07/16/96

Geo-Marine, Inc.
#3035-001 WOCMA Testing
Historic Artifact Data

Rec No.	Bag No.	Art No.	Class	Type	Other	Dates	Group	Qty.	Analysis Comment
41BW553			UNIT 53	N 450 E 625 Lev: 3					
23	160	1	GLASS	Mang/Solar	BOTTLE	1910 - 1920	Domestic	1	SLIGHTLY SOLARIZED; ABM
24	160	2	GLASS	Lt. Tint	BOTTLE	1915 - 1930	Domestic	1	SELENIUM TINTED; SLIGHTLY YELLOW
41BW553			UNIT 55	N 475 E 575 Lev: 2					
9	157	1	METAL	Iron	WIRE	N/A	Activities	2	
41BW553			UNIT 63	N 450 E 650 Lev: 1					
10	179	1	GLASS	Clear	BOTTLE	POST 1910	Domestic	3	ABM
11	179	2	CERAMIC	Stoneware	SALT GLAZED EXTERIOR/NAT. CLAY INTERIOR	1865 - 1900	Domestic	1	BASE SHERD
12	179	3	METAL	Iron	TAG	N/A	Activities	1	FLAT THIN METAL WIRE TAG
41BW553			UNIT 66	N 450 E 666 Lev: 1					
6	318	1	GLASS	Amber/Brown	BOTTLE	POST 1910	Domestic	1	ABM
7	318	2	GLASS	Mang/Solar	BOTTLE	1910 - 1920	Domestic	1	SLIGHTLY SOLARIZED; SBM
41BW553			UNIT 66	N 450 E 666 Lev: 2					
8	329	1	GLASS	Mang/Solar	BOTTLE	1910 - 1920	Domestic	1	SLIGHTLY SOLARIZED; SBM
41BW553			UNIT 72	N 670 E 525 Lev: 2					
5	352	1	METAL	Iron	BOLT/PIN	N/A	Activities	1	BROKEN
41TT670			UNIT	N 500 E 675 Lev: 1					
1	437	1	METAL	Brass/Copper	CENTERFIRE SHOTGUN SHELL	1910 - 1960	Activities	1	HEADSTAMP "REM-UMC/NO 12/NITRO CLUB"; PAPER WADDING; "REMINGTON-UMC"

APPENDIX E

ANALYSIS OF PREHISTORIC FAUNAL MATERIAL RECOVERED FROM SITES 41BW553 AND 41TT670

by
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DESCRIPTION OF THE VERTEBRATE REMAINS FROM 41BW553 AND 41TT670

by
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Purpose and Methods

Vertebrate remains recovered from site 41BW553 and 41TT670 were analyzed for the purpose of identifying the taxa present and cultural modification of the material. Data collected on the samples were entered into a database program (Shaffer and Baker 1992) for manipulation. Faunal attributes recorded included taxon, element, portion of element, side, and basic taphonomic information. The taphonomic information included weathering, breakage, and burning. Unique or culturally modified specimens were observed under magnification, using either a 10x hand lens, or a light microscope up to 30x. Specimens were quantified using the Number of Identified Specimens (NISP). The minimum number of individuals (MNI) for any identified taxon did not total more than one individual. For example, at site 41TT670, one bowfin, one mud turtle, one gopher, and one deer were identified. There was no duplication of elements to suggest that more than one individual was represented, although MNI only presents minimal estimates.

Description of Taxa Recovered

The small size of most of the specimens indicated that many of the samples were derived from flotation collection techniques. These small specimens were mostly derived from larger elements and hence were unidentifiable below the level of Vertebrata. As such, only a limited amount of information could be extracted from the samples.

Vertebrate remains from both sites included fish, turtle, mammalian remains, and bone fragments which could only be identified as vertebrata (Table E-1). Bird remains were also identifiable in 41BW553. Of the fish remains, bowfin is the only fish identified at both sites, with drum and gar also present at 41BW553. Turtle remains are represented by shell portions, but were too fragmented for further identification with the exception of some carapace peripheral fragments which were identified as Kinosternidae, and one possible box turtle carapace fragment. Of the identifiable mammal remains, site 41BW553 had the widest variety of taxa with leporids (rabbits and hares), rodents (of which squirrel was identified), raccoon, deer, and medium-sized (i.e., deer-sized) artiodactyl fragments that were likely deer remains as well but were too fragmented for specific identification. Site 41TT670 had rodent (of which only one gopher tooth was identified), deer, and medium-sized artiodactyl remains.

Taphonomy

A taphonomic discussion of the faunal remains from the two sites is not wholly representational in that the quantities are more reflective of the amount of degradation and recovery methods. General trends are probably a better indicator, more so than actual frequencies for this sample. In sum, most of the recovered remains were burned at both sites, and nearly every specimen was fragmented (Table E-2).

At 41BW553, 1,699 of the 1,703 specimens were broken, of which 22 exhibited spiral or fresh bone fractures. All of the specimens except two exhibited light weathering, although the small size and fragmentary nature of most of the sample made assessment of marked deterioration through weathering

Table E-1
Quantification and Description of Vertebrate Remains by Site

Taxon	Common Name	NISP
Site 41BW553		
Vertebrata	Vertebrates	1465
Osteichthyes	Small bony fish	9
cf. Osteichthyes	Small bony fish	2
cf. Osteichthyes	Medium bony fish	1
Lepisosteidae	Gars	5
Amia calva	Bowfin	1
Sciaenidae	Drums, croakers, etc.	3
Testudinata	Turtles	64
Kinosternidae	Mud and musk turtles	5
Aves (Large)	Large birds	2
Meleagris gallopavo	Turkey	1
cf. *Meleagris gallopavo*	Turkey	1
Mammalia (Small/medium)	Rabbit/canid-sized mammals	2
Mammalia (Medium/large)	Canid/deer-sized mammals	115
Mammalia	Mammals	2
Leporidae	Rabbits and hares	2
Lepus sp.	Jackrabbits	6
Rodentia (Medium)	Rat-sized rodent	3
Sciuridae	Squirrels and chipmunks	2
Procyon lotor	Raccoon	1
Artiodactyla (Medium)	Deer/pronghorn-sized ungulates	8
Odocoileus sp.	Deer	3
	Subtotal	**1703**
Site 41TT670		
Vertebrata	Vertebrates	651
Osteichthyes	Small bony fish	2
Osteichthyes	Medium bony fish	1
cf. Osteichthyes	Medium bony fish	4
Amia calva	Bowfin	1
Testudinata	Turtles	30
Kinosternidae	Mud and musk turtles	2
cf. *Terrapene* sp.	Box turtles	2
Mammalia (Medium/large)	Canid/deer-sized mammals	29
Mammalia	Mammals	1
Rodentia (Medium)	Rat-sized rodent	1
Geomys sp.	Pocket gophers	1
Artiodactyla (Medium)	Deer/pronghorn-sized ungulates	1
Odocoileus sp.	Deer	1
	Subtotal	**727**
	Total	**2430**

Table E-2
Results of Analysis of Faunal Remains from Sites 41TT670 and 41BW553

Bag No.	Unit/ Feature	No.	Lev	Top Elev	Bottom Elev	Qty	Taxon	Element	Portion	Side	Comments
Site 41BW553											
18	Unit	15	1	0	10	2	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
18	Unit	15	1	0	10	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, spiral break, unburned
156	Feat	3	8	70	80	2	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
196	Unit	67	2	10	20	10	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
196	Unit	67	2	10	20	26	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
196	Unit	67	2	10	20	19	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
196	Unit	67	2	10	20	1	Testudinata	Shell	Fragment		Light weathering, angular break, unburned
196	Unit	67	2	10	20	1	Testudinata	Shell	Fragment		Light weathering, angular break, calcined
196	Unit	67	2	10	20	1	Kinosternidae	Peripheral	Fragment		Light weathering, angular break, unburned
196	Unit	67	2	10	20	4	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
196	Unit	67	2	10	20	3	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, charred
196	Unit	67	2	10	20	6	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
196	Unit	67	2	10	20	3	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, spiral break, unburned
196	Unit	67	2	10	20	1	*Lepus* sp.	Ulna	Fragment		Light weathering, angular break, charred
197	Unit	67	3	20	30	36	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
197	Unit	67	3	20	30	33	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
197	Unit	67	3	20	30	20	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
197	Unit	67	3	20	30	2	Lepisosteidae	Cranium	Fragment		Light weathering, angular break, unburned
197	Unit	67	3	20	30	4	Testudinata	Shell	Fragment		Light weathering, angular break, unburned
197	Unit	67	3	20	30	2	Testudinata	Shell	Fragment		Light weathering, angular break, charred
197	Unit	67	3	20	30	1	Kinosternidae	Peripheral	Fragment		Light weathering, angular break, charred
197	Unit	67	3	20	30	1	Kinosternidae	Peripheral	Fragment		Light weathering, angular break, calcined
197	Unit	67	3	20	30	7	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
197	Unit	67	3	20	30	3	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, spiral break, unburned
197	Unit	67	3	20	30	1	*Lepus* sp.	Humerus	Distal end		Light weathering, angular break, calcined
198	Unit	67	4	30	40	19	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
198	Unit	67	4	30	40	20	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
198	Unit	67	4	30	40	9	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined

Table E-2 (cont'd)

Bag No.	Unit/ Feature	No.	Lev	Top Elev	Bottom Elev	Qty	Taxon	Element	Portion	Side	Comments
198	Unit	67	4	30	40	6	Testudinata	Shell	Fragment		Light weathering, angular break, unburned
198	Unit	67	4	30	40	5	Testudinata	Shell	Fragment		Light weathering, angular break, charred
198	Unit	67	4	30	40	1	Kinosternidae	Peripheral	Fragment		Light weathering, angular break, unburned
198	Unit	67	4	30	40	1	Aves (Large)	Scapula	Glenoid fossa	Right	Duck-sized, light weathering, angular break, calcined & incomplete. blade
198	Unit	67	4	30	40	1	*Meleagris gallopavo*	Carpal	Fragment		Light weathering, unbroken
198	Unit	67	4	30	40	1	Mammalia (Small/medium)	Scapula	Glenoid fossa		Light weathering, angular break, unburned & incomplete blade
198	Unit	67	4	30	40	1	Mammalia (Small/medium)	Calcaneus	Fragment		Light weathering, angular break, unburned
198	Unit	67	4	30	40	6	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
198	Unit	67	4	30	40	2	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned, gnawed
198	Unit	67	4	30	40	4	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, charred
198	Unit	67	4	30	40	3	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
198	Unit	67	4	30	40	1	Mammalia (Medium/large)	Indeterminate	Fragment		Worked, probably artiodactyl, light weathering, spiral break, unburned metatarsal
198	Unit	67	4	30	40	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, spiral break, calcined
198	Unit	67	4	30	40	1	Mammalia (Medium/large)	Vertebra	Neural area only	Axial	Light weathering, angular break, charred
198	Unit	67	4	30	40	1	*Lepus* sp.	Tibia	Proximal posterior end	Left	Light weathering, angular break, unburned
198	Unit	67	4	30	40	1	*Lepus* sp.	Astragalus	Complete	Left	Light weathering, unbroken, unburned
264	Unit	30	1	0	10	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
274	Unit	30	3	20	30	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
274	Unit	30	3	20	30	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
274	Unit	30	3	20	30	2	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
282	Unit	30	2	10	20	3	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
309	Unit	27	4	30	40	3	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
310	Unit	75	1	0	10	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
310	Unit	75	1	0	10	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
317	Unit	84	1	0	10	3	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
317	Unit	84	1	0	10	1	Testudinata	Shell	Fragment		Light weathering, angular break, calcined
317	Unit	84	1	0	10	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
321	Unit	67	1	0	10	8	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
321	Unit	67	1	0	10	10	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
321	Unit	67	1	0	10	16	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
321	Unit	67	1	0	10	3	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
325	Unit	67	6	50	60	4	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned

Table E-2 (cont'd)

Bag No.	Unit/ Feature	No.	Lev	Top Elev	Bottom Elev	Qty	Taxon	Element	Portion	Side	Comments
325	Unit	67	6	50	60	6	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
325	Unit	67	6	50	60	9	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
325	Unit	67	6	50	60	1	Testudinata	Shell	Fragment		Light weathering, angular break, unburned
325	Unit	67	6	50	60	1	Testudinata	Shell	Fragment		Light weathering, angular break, charred
325	Unit	67	6	50	60	1	Aves (Large)	Longbone	Fragment		Light weathering, angular break, calcined
325	Unit	67	6	50	60	1	cf. *Meleagris gallopavo*	Tibiotarsus	Diaphyseal fragment	Left	Light weathering, spiral break, unburned
325	Unit	67	6	50	60	8	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
325	Unit	67	6	50	60	2	Rodentia (Medium)	Ulna	Semi-lunar notch only		Light weathering, angular break, unburned
325	Unit	67	6	50	60	1	*Procyon lotor*	Femur	Proximal medial end	Right	Light weathering, angular break, unburned
325	Unit	67	6	50	60	1	Artiodactyla (Medium)	Fused 3rd & 4th metacarpal	Fragment		Chemical etched, light weathering, spiral break, unburned
325	Unit	67	6	50	60	1	*Odocoileus* sp.	Proximal phlange	Complete		Light weathering, unbroken, unburned
340	Unit	80	1	0	10	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
340	Unit	80	1	0	10	1	Mammalia	Indeterminate	Fragment		Light weathering, spiral break, unburned
346	Unit	79	1	0	10	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
346	Unit	79	1	0	10	1	Testudinata	Shell	Fragment		Light weathering, angular break, unburned
346	Unit	79	1	0	10	1	Testudinata	Peripheral	Fragment		Light weathering, angular break, charred
346	Unit	79	1	0	10	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, spiral break, charred
355	Unit	76	1	0	10	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
361	Unit	72	1	0	10	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
375	Unit	67	5	40	50	4	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
375	Unit	67	5	40	50	2	Testudinata	Carapace	Fragment		Light weathering, angular break, unburned
375	Unit	67	5	40	50	4	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
375	Unit	67	5	40	50	12	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, charred
375	Unit	67	5	40	50	3	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
375	Unit	67	5	40	50	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, spiral break, unburned
375	Unit	67	5	40	50	3	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, spiral break, charred
375	Unit	67	5	40	50	1	Mammalia (Medium/large)	Indeterminate	Fragment		Possibly modified, heavy weathering, angular break, unburned
375	Unit	67	5	40	50	1	*Lepus* sp.	Scapula	Glenoid fossa	Left	Light weathering, spiral break, unburned & incomplete blade
375	Unit	67	5	40	50	1	Rodentia (Medium)	Cranium	Zygomatic	Left	Light weathering, angular break, unburned
375	Unit	67	5	40	50	1	Artiodactyla (Medium)	Cranium	Occipital condyle	Left	Light weathering, angular break, unburned
375	Unit	67	5	40	50	1	Artiodactyla (Medium)	Ulna	Proximal medial end	Right	Light weathering, angular break, calcined
375	Unit	67	5	40	50	1	Artiodactyla (Medium)	Fused 3rd & 4th metacarpal	Diaphyseal fragment		Light weathering, spiral break, unburned
375	Unit	67	5	40	50	1	*Odocoileus* sp.	Antler	Fragment		Light weathering, angular break, calcined, gnawed

Table E-2 (cont'd)

Bag No.	Unit/ Feature	No.	Lev	Top Elev	Bottom Elev	Qty	Taxon	Element	Portion	Side	Comments
425	Feat	3	8	70	80	20	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
425	Feat	3	8	70	80	1	Artiodactyla (Medium)	Metapodial	Proximal end		Light weathering, angular break, unburned
425	Feat	3	8	70	80	1	*Odocoileus* sp.	Permanent tooth	Upper Molar	Left	Moderate wear, adult, light weathering, angular break, unburned
437	Unit	13	3	20	30	1	Mammalia	Indeterminate	Fragment		Light weathering, angular break, calcined
444	Unit	71	2	10	20	1	Artiodactyla (Medium)	Humerus	Distal end	Right	Heavy weathering, angular break, unburned
454	Unit	67	4	30	40	1	Mammalia (Medium/large)	Indeterminate	Fragment		Worked, bipointed, light weathering, angular break, unburned, cross striae gnawed
492	Feat	3	8	70	80	22	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
520	Unit	67	2	10	20	232	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
520	Unit	67	2	10	20	120	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
520	Unit	67	2	10	20	2	Osteichthyes (Small)	Vertebra	Centrum	Axial	Light weathering, angular break, unburned
520	Unit	67	2	10	20	1	cf. Osteichthyes (Small)	Dorsal spine	Proximal aspect	Axial	Light weathering, angular break, unburned
520	Unit	67	2	10	20	1	cf. Osteichthyes (Small)	Dorsal spine	Proximal aspect	Axial	Light weathering, angular break, charred
520	Unit	67	2	10	20	1	Lepisosteidae	Vertebra	Centrum	Axial	Light weathering, angular break, unburned
520	Unit	67	2	10	20	1	*Amia calva*	Vertebra	Centrum	Axial	Light weathering, angular break, charred
520	Unit	67	2	10	20	1	Sciaenidae	Tooth	Fragment		Light weathering, angular break, unburned
520	Unit	67	2	10	20	1	Testudinata	Shell	Fragment		Light weathering, angular break, unburned
520	Unit	67	2	10	20	3	Testudinata	Shell	Fragment		Light weathering, angular break, charred
520	Unit	67	2	10	20	2	Testudinata	Shell	Fragment		Light weathering, angular break, calcined
520	Unit	67	2	10	20	4	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
520	Unit	67	2	10	20	2	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
522	Unit	67	4	30	40	40	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
522	Unit	67	4	30	40	26	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
522	Unit	67	4	30	40	17	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
522	Unit	67	4	30	40	1	Osteichthyes (Small)	Vertebra	Centrum	Axial	Light weathering, angular break, unburned
522	Unit	67	4	30	40	1	Osteichthyes (Small)	Vertebra	Centrum	Axial	Light weathering, angular break, charred
522	Unit	67	4	30	40	4	Testudinata	Shell	Fragment		Light weathering, angular break, charred
522	Unit	67	4	30	40	3	Testudinata	Shell	Fragment		Light weathering, angular break, calcined
522	Unit	67	4	30	40	1	Kinosternidae	Peripheral	Fragment		Light weathering, angular break, calcined
522	Unit	67	4	30	40	1	Artiodactyla (Medium)	Fused 3rd & 4th metatarsal	Fragment		Light weathering, spiral break, charred
522	Unit	67	4	30	40	1	Artiodactyla (Medium)	Proximal phlange	Distal end		Light weathering, angular break, unburned
529	Unit	67	5	40	50	23	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
529	Unit	67	5	40	50	15	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
529	Unit	67	5	40	50	4	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
529	Unit	67	5	40	50	1	Sciaenidae	Tooth	Fragment		Light weathering, angular break, unburned

Table E-2 (cont'd)

Bag No.	Unit/ Feature	No.	Lev	Top Elev	Bottom Elev	Qty	Taxon	Element	Portion	Side	Comments
529	Unit	67	5	40	50	3	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
529	Unit	67	5	40	50	1	*Lepus* sp.	Metatarsal 2	Proximal end	Right	Light weathering, angular break, unburned
531	Unit	67	6	50	60	18	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
531	Unit	67	6	50	60	5	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
531	Unit	67	6	50	60	4	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
531	Unit	67	6	50	60	1	Osteichthyes (Small)	Vertebra	Centrum	Axial	Light weathering, angular break, unburned
531	Unit	67	6	50	60	1	Osteichthyes (Small)	Vertebra	Centrum	Axial	Light weathering, angular break, charred
531	Unit	67	6	50	60	1	Osteichthyes (Small)	Vertebra	Centrum	Axial	Light weathering, angular break, calcined
531	Unit	67	6	50	60	1	Sciaenidae	Tooth	Fragment		Light weathering, angular break, unburned
531	Unit	67	6	50	60	1	Testudinata	Shell	Fragment		Light weathering, angular break, unburned
535	Unit	67	1	0	10	160	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
535	Unit	67	1	0	10	100	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
535	Unit	67	1	0	10	1	cf.Osteichthyes (Medium)	Cranium	Fragment		Light weathering, angular break, unburned
535	Unit	67	1	0	10	1	Testudinata	Shell	Fragment		Light weathering, angular break, unburned
535	Unit	67	1	0	10	2	Testudinata	Shell	Fragment		Light weathering, angular break, charred
535	Unit	67	1	0	10	4	Testudinata	Shell	Fragment		Light weathering, angular break, calcined
535	Unit	67	1	0	10	2	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
535	Unit	67	1	0	10	2	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, charred
535	Unit	67	1	0	10	3	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
542	Unit	67	3	20	30	194	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
542	Unit	67	3	20	30	75	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
542	Unit	67	3	20	30	121	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
542	Unit	67	3	20	30	1	Osteichthyes (Small)	Vertebra	Centrum	Axial	Light weathering, angular break, charred
542	Unit	67	3	20	30	1	Osteichthyes (Small)	Vertebra	Centrum	Axial	Light weathering, angular break, calcined
542	Unit	67	3	20	30	2	Lepisosteidae	Vertebra	Centrum	Axial	Light weathering, angular break, charred
542	Unit	67	3	20	30	1	Testudinata	Shell	Fragment		Light weathering, angular break, unburned
542	Unit	67	3	20	30	8	Testudinata	Shell	Fragment		Light weathering, angular break, charred
542	Unit	67	3	20	30	8	Testudinata	Shell	Fragment		Light weathering, angular break, calcined
542	Unit	67	3	20	30	4	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
542	Unit	67	3	20	30	2	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, charred
542	Unit	67	3	20	30	2	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, spiral break, charred
542	Unit	67	3	20	30	1	Leporidae	Cranium	Fragment		Light weathering, angular break, unburned
542	Unit	67	3	20	30	1	Leporidae	Humerus	Distal end		Light weathering, angular break, unburned
542	Unit	67	3	20	30	1	Sciuridae	Tibia	Distal end	Left	Light weathering, angular break, unburned
542	Unit	67	3	20	30	1	Sciuridae	Astragalus	Complete	Left	Light weathering, unbroken, unburned

Table E-2 (cont'd)

Bag No.	Unit/ Feature	No.	Lev	Top Elev	Bottom Elev	Qty	Taxon	Element	Portion	Side	Comments
Site 41TT670											
383	Unit	77	7	60	70	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
391	Unit	122	4	30	40	4	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
391	Unit	122	4	30	40	8	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
391	Unit	122	4	30	40	1	Testudinata	Shell	Fragment		Light weathering, angular break, calcined
391	Unit	122	4	30	40	1	Testudinata	Peripheral	Fragment		Light weathering, angular break, calcined
391	Unit	122	4	30	40	2	*cf. Terrapene* sp.	Peripheral	Fragment		Light weathering, angular break, calcined
391	Unit	122	4	30	40	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, charred
391	Unit	122	4	30	40	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, spiral break, calcined
397	Unit	77	4	30	40	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
398	Unit	122	3	20	30	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
398	Unit	122	3	20	30	4	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
417	Unit	77	5	40	50	6	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
417	Unit	77	5	40	50	1	Mammalia (Medium/large)	Tooth	Enamel fragment		Light weathering, angular break, unburned
421	Unit	77	6	50	60	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
421	Unit	77	6	50	60	2	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
441	Unit	80	4	30	40	18	Vertebrata	Indeterminate	Fragment		Probably artiodactyl, light weathering, angular break, unburned tibia fragments
441	Unit	80	4	30	40	1	Mammalia (Medium/large)	Indeterminate	Fragment		Probably artiodactyl, light weathering, angular break, unburned tibia fragments
441	Unit	80	4	30	40	1	Artiodactyla (Medium)	Tibia	Diaphyseal fragment		Light weathering, spiral break, unburned
445	Unit	71	5	40	50	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, unburned
446	Unit	71	3	20	30	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
475	Unit	84	9	80	90	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, calcined
669	Unit	124	1	0	10	1	*Amia calva*	Cranium	Fragment		Light weathering, angular break, unburned
676	Unit	121	3	20	30	40	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
676	Unit	121	3	20	30	38	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
676	Unit	121	3	20	30	45	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
676	Unit	121	3	20	30	1	Vertebrata	Longbone	Fragment		Light weathering, angular break, unburned
676	Unit	121	3	20	30	1	Osteichthyes (Small)	Vertebra	Centrum	Axial	Light weathering, angular break, charred
676	Unit	121	3	20	30	1	Testudinata	Shell	Fragment		Light weathering, angular break, calcined
679	Unit	121	2	10	20	50	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
679	Unit	121	2	10	20	37	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
679	Unit	121	2	10	20	1	Osteichthyes (Medium)	Vertebra	Centrum	Axial	Light weathering, angular break, calcined
679	Unit	121	2	10	20	1	Testudinata	Shell	Fragment		Light weathering, angular break, charred
679	Unit	121	2	10	20	5	Testudinata	Shell	Fragment		Light weathering, angular break, calcined
679	Unit	121	2	10	20	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, charred
688	Unit	121	9	80	90	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned

Table E-2 (cont'd)

Bag No.	Unit/ Feature	No.	Lev	Top Elev	Bottom Elev	Qty	Taxon	Element	Portion	Side	Comments
688	Unit	121	9	80	90	6	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
688	Unit	121	9	80	90	3	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
692	Unit	121	7	60	70	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
692	Unit	121	7	60	70	12	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
695	Unit	121	6	50	60	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
695	Unit	121	6	50	60	6	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
695	Unit	121	6	50	60	1	Testudinata	Peripheral	Fragment		Light weathering, angular break, calcined
698	Unit	121	10	90	100	3	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
698	Unit	121	10	90	100	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
703	Feat	2	5	40	50	30	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
703	Feat	2	5	40	50	36	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
703	Feat	2	5	40	50	93	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
703	Feat	2	5	40	50	1	Osteichthyes (Small)	Vertebra	Centrum	Axial	Light weathering, angular break, calcined
703	Feat	2	5	40	50	1	Testudinata	Shell	Fragment		Light weathering, angular break, charred
703	Feat	2	5	40	50	6	Testudinata	Shell	Fragment		Light weathering, angular break, calcined
703	Feat	2	5	40	50	1	Rodentia (Medium)	Calcaneus	Proximal aspect		Light weathering, angular break, calcined
703	Feat	2	5	40	50	1	*Geomys* sp.	Permanent tooth	Cheek tooth		Light weathering, angular break, unburned
709	Unit	122	9	80	90	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
709	Unit	122	9	80	90	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
710	Unit	122	4	44	53	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
710	Unit	122	4	44	53	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
710	Unit	122	4	44	53	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
715	Unit	122	1	100	110	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
715	Unit	122	11	100	110	4	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
718	Unit	121	4	30	40	21	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
718	Unit	121	4	30	40	2	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
718	Unit	121	4	30	40	19	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
718	Unit	121	4	30	40	1	cf.Osteichthyes (Medium)	Spine	Fragment		Light weathering, angular break, calcined
718	Unit	121	4	30	40	1	Mammalia (Medium/large)	Indeterminate	Fragment		Light weathering, angular break, charred
719	Unit	121	5	40	50	10	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
719	Unit	121	5	40	50	5	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
719	Unit	121	5	40	50	15	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
722	Unit	121	8	70	80	3	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
722	Unit	121	8	70	80	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
733	Unit	121	1	0	10	19	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, unburned
733	Unit	121	1	0	10	30	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred
733	Unit	121	1	0	10	33	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, calcined
735	Unit	122	2	10	20	1	Vertebrata	Indeterminate	Fragment		Light weathering, angular break, charred

difficult. Burning was identified on 1,187 specimens, of which 675 were charred and 512 calcined. Four specimens exhibited rodent gnawing.

At 41TT670, all specimens were broken, of which eight exhibited spiral fractures. All of the specimens were lightly weathered. Burning was identified on 542 specimens, of which 197 were charred and 345 were calcined. No specimens exhibited rodent gnawing.

No specimens were identified with cut marks. This is probably due to the small size and the fragmented condition of most of the remains.

Discussion

More than 2,400 osseous remains were recovered from sites 41BW553 and 41TT670. Due to the size of most of the specimens recovered (apparently from flotation), and the low frequency of identified taxa, little dietary, cultural, or ecological information can be gleaned from the data. The presence of fish and kinosternid turtles at the sites indicates exploitation of riverine or wetland resources. The presence of box turtle, turkey, deer, squirrel, and rabbit indicates terrestrial exploitation with deer, squirrel, and turkey likely forest or forest edge habitat species and the jackrabbit being a prairie or grassland habitat species.

Aside from burning and spiral fracturing, no specific and diagnostic cultural modification was noted on any of the faunal material. Thus, the patterns of cultural exploitation, butchering, or use of these taxa by humans cannot be realistically assessed with this sample.

MOLLUSCAN DATA FROM SITES 41BW553 AND 41TT670

by
Dr. Richard Fullington

Methods And Materials

Freshwater bivalve units from each field sack were examined by hand. Only those units that could be determined to represent an individual specimen (umbos or large segments of valves) were counted. Generally, each field sack contained numerous unidentifiable valve fragments. Coloration of the identifiable units and fragments were examined for evidence of heating. Data was entered on Microsoft Access database and Microsoft Word software programs.

Summary

Site 41BW553

A total of 18 freshwater bivalve units were identified from this site, representing three species (Tables E-3 and E-4). Five of the identified units were burned. The predominant species was *Lampsilis teres,* which generally inhabits shallow streams, although this species will occur in deeper water which must be fairly clear and flowing. Another species present, *Quadrula quadrula,* inhabits similar aquatic areas, particularly gravelly riffle zones. The water regime near this site must have been characterized by a relatively narrow, shallow stream with a very limited amount of deeper, pooled areas, the preferred environment for *Amblema plicata.*

Site 41TT670

Twenty-one freshwater bivalve units, representing four species, were identified from this site (see Tables E-3 and E-4). Twelve of the identified units were burned. *Amblema plicata* was the dominant species; it inhabits pooled areas of streams where the water is 3 to 5 feet deep. Another species present, *Potamilus purpuratus,* occupies a similar habitat. The other two species present *(Lampsilis teres* and *Quadrula quadrula)* inhabit shallow and riffle areas of streams. The water regime near this site must have included relatively small, pooled deep water areas alternating with shallow, riffle zones.

Results

Site 41BW553

Unit 30: One specimen of the bivalve species *Lampsilis teres* was identified from this unit.

Unit 67: The three bivalve species identified from this unit *(Amblema plicata, Lampsilis teres, Quadrula quadrula)* were uniformly distributed through all levels (2-6). Burned specimens were also uniformly distributed throughout the levels.

Table E-3
Identified Freshwater Bivalvia from Sites 41BW553 and 41TT670

Taxa	Number of Specimens
Site 41BW553	
Family Unionidae	
Amblema plicata (Say)	5
Lampsilis teres (Rafinesque)	10
Quadrula quadrula (Rafinesque)	3
Total	***18***
Site 41TT670	
Family Unionidae	
Amblema plicata (Say)	7
Lampsilis teres (Rafinesque)	5
Potamilus purpuratus (Lamarck)	4
Quadrula quadrula (Rafinesque)	5
Total	***21***

Table E-4
Analysis Data for Bivalve Specimens from Sites 41BW553 and 41TT670

Unit	Level	Depth (cm)	Species	Number	Taphonomy
Site 41BW553					
30	3	20-30	*L. teres*	1	Valve fragment
67	2	10-20	*L. teres*	1	Valve fragment
67	3	20-30	*L. teres*	2	Umbos; burned
67	3	20-30	*A. plicata*	1	Whole valve
67	3	20-30	Unionid valve fragments	23	Many small fragments
67	3	20-30	*Q. quadrula*	2	one umbo, one valve fragment
67	3	20-30	Unionid valve fragments	28	Most are burned
67	4	30-40	*Q. quadrula*	1	Valve
67	4	30-40	*A. plicata*	1	Immature umbo
67	4	30-40	*L. teres*	2	Umbos; burned
67	4	30-40	Unionid valve fragments	19	Many small fragments
67	4	30-40	Unionid valve fragments	26	Many small fragments
67	5	40-50	*A. plicata*	1	Umbo
67	5	40-50	Unionid valve fragments	21	Many small fragments
67	5	40-50	*L. teres*	1	Umbo
67	5	40-50	*A. plicata*	1	Immature valve
67	5	40-50	Unionid valve fragments	13	Five are burned
67	5	40-50	*L. teres*	1	Valve fragment
67	6	50-60	*A. plicata*	1	Umbo; burned
67	6	50-60	*L. teres*	2	Valve fragments
67	6	50-60	Unionid valve fragments	14	Many small fragments

Table E-4 (cont'd)

Unit	Level	Depth (cm)	Species	Number	Taphonomy
Site 41TT670					
53	1	0-20	Unionid valve fragments	2	Very small
53	1	0-20	*P. purpuratus*	1	Umbo fragment
89	6	50-60	Unionid valve fragments	3	Very small
120	3	20-30	Unionid valve fragments	2	Very small
120	3	20-30	Unionid valve fragments	26	Very small, most burned
120	3	20-30	*Q. quadrula*	2	one umbo, one valve, both burned
120	3	20-30	*P. purpuratus*	3	one umbo, two valve fragments
120	3	20-30	*A. plicata*	2	Umbos, both burned
120	3	20-30	*L. teres*	2	Valves, burned
120	3	20-30	*A. plicata*	1	Valve fragment, burned
120	5	40-50	*Q. quadrula*	1	Umbo, burned
120	5	40-50	*A. plicata*	1	Umbo, burned
120	5	40-50	Unionid valve fragments	23	Very small, mostly burned
120	5	40-50	*L. teres*	1	Umbo
120	5	40-50	Unionid valve fragments	5	Very small
120	6	50-60	*P. purpuratus*	1	Valve fragment
121	1	0-10	Unionid valve fragments	29	Very small, all burned
121	1	0-10	*A. plicata*	1	Umbo, burned
121	1	0-10	*Q. quadrula*	1	Umbo, burned
121	1	0-10	Unionid valve fragments	2	Very small
121	1	0-10	*L. teres*	1	Umbo fragment
121	1	0-10	*L. teres*	1	Umbo fragment
121	3	20-30	Unionid valve fragments	2	Very small
122	2	10-20	Unionid valve fragment	1	Very small
122	3	20-30	Unionid valve fragments	2	Valve fragments
122	3	20-30	*A. plicata*	2	Valve fragments
122	6	50-60	*Q. quadrula*	1	Whole, immature

Site 41TT670

Unit 53: One specimen of the bivalve species *Potamilus purpuratus* was identified from this unit and there was no evidence of burning.

Unit 89: No freshwater bivalve species were identifiable from the three valve fragments recovered from this unit. There also was no evidence of burning.

Unit 120: The four freshwater bivalve species (*Amblema plicata, Lampsilis teres, Quadrula quadrula, Potamilus purpuratus)* identified from this unit were uniformly distributed throughout Levels 3-5. In Level 6, only *Potamilus purpuratus* was found. Burned specimens followed the same pattern.

Unit 121: Three freshwater bivalve species *(Amblema plicata, Lampsilis teres, Quadrula quadrula)* were identified from this unit (Level 1) and all three species showed burned specimens. In Level 3, only unidentifiable valve fragments were recovered.

Unit 122: Only *Amblema plicata* (Level 3) and *Quadrula quadrula* (Level 6) were identified from this unit. One burned valve fragment was observed in Level 3 only.

REFERENCES CITED

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1992 *A Vertebrate Faunal Analysis Coding System: With North American Taxonomy and dBase Support Programs and Procedures (Version 3.3).* Museum of Anthropology Technical Report 23. University of Michigan, Ann Arbor.

APPENDIX F

ANALYSIS OF PREHISTORIC MACROBOTANICAL REMAINS RECOVERED FROM SITES 41BW553 AND 41TT670

by
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INTRODUCTION

A total of 16 flotation samples and 41 charcoal samples were analyzed from site 41BW553. Site 41BW553 is located along the Sulphur River, in Bowie County Texas. A total of 16 flotation samples and 30 charcoal samples were analyzed from site 41TT670. This site is located along White Oak Creek, in Titus County, Texas.

Most of the charcoal material from 41BW553 dated to the Caddoan period, between A.D. 800 and 1680. At the time of the analysis, no dates were available from site 41TT670 although it was assumed that this site reflected the same period.

METHODS AND MATERIALS

The flotation samples submitted for analysis was treated using water separation by personnel of Geo-Marine Inc. The initial volume of material was measured and recorded and then screened to remove the larger particles. The screened material was examined separately but was not subject to water separation. The material passing through this screen was placed in a modified flotation device for the physical flotation. The light fraction was collected and dried separately. After drying completely, the material was placed in labelled zip-loc bags prior to analysis. The heavy fraction was also collected, air dried, and placed in labelled zip-loc bags. These samples were then sent to Quaternary Services for analysis. All materials were returned to Geo-Marine Inc. at the conclusion of the project.

Upon receipt of the materials, the contents of the light fraction flotation samples were measured (volume) and then examined using a Meiji stereoscopic zoom microscope (7X-45X magnification). The heavy fractions of the flotation samples were examined for botanical remains but were not measured. Wood charcoal specimens were examined using a modification of the snap method of Leney and Casteel (1975) in order to expose fresh transverse surfaces. These are necessary since often soil particles fill the vessel elements of the wood charcoal, obscuring the characteristics necessary for identification. Identifications of wood charcoal and seed materials were based on published reference materials (Martin and Barkley 1961; Montgomery 1977; Panshin and de Zeeuw 1980; Schopmeyer 1974), as well as comparisons with modern reference specimens.

The charcoal specimens were not measured for volume. In many cases only a few items were present. Nut fragments were separated and identified when possible. The wood charcoal material was examined using the above method (Leney and Casteel 1975) although in many cases the specimens were too small for identification beyond the level of hardwood type. It is generally necessary to have at least one years growth for identification purposes and many of the fragments were just too small.

RESULTS

The percentage recovery based on initial volumes for the flotation samples from each site are presented in Table F-1. The identifications for both flotation and charcoal samples are provided in Table F-2 for site 41BW553, and Table F-3 for site 41TT670. The individual results are presented below by site.

Table F-1
Percentage Recovery of Flotation Samples from Sites 41BW553 and 41TT670

Sample No.	Provenience	Cultural Interpretation	Volume (l)	Light Fraction (ml)	Percent Recovery
41BW553					
FS-67	Feature 1; Unit 24, Level 4 (30-40 cm)	Posthole	.5	<1	<.2
FS-68	Feature 1; Unit 24, Level 4 (30-40 cm)	Posthole	.5	<1	<.2
FS-148	Feature 3; Unit 30, Level 8 (70-80 cm)	Trash Pit (?)	1	1	.1
FS-149	Feature 3; Unit 30, Level 8 (70-80 cm)	Trash Pit (?)	.5	1	.2
FS-150	Feature 3; Unit 30, Level 8 (70-80 cm)	Trash Pit (?)	.5	<1	<.2
FS-230	Feature 6; Unit 67, Level. 1 (0-10 cm)	Midden	14	250	1.79
FS-231	Feature 6; Unit 67, Level 2 (10-20 cm)	Midden	10	30	.3
FS-232	Feature 6; Unit 67, Level 3 (20-30 cm)	Midden	11	35	.32
FS-233	Feature 6; Unit 67, Level 4 (30-40 cm)	Midden	10	25	.25
FS-69	Unit 22, Level 5 (50-60 cm)	Disturbance	.5	1	.2
FS-70	Unit 22, Level 5 (50-60 cm)	Disturbance	1	<1	<.1
FS-71	Unit 22, Level 5 (50-60 cm)	Disturbance	1	1	.1
FS-111	Unit 35, Level 6 (50-60 cm)	Burned Rock Scatter	2	<3	<.15
FS-112	Unit 35, Level 6 (50-60 cm)	Burned Rock Scatter	3	<3	<.1
FS-234	Unit 67, Level 5 (40-50 cm)	Below Midden	9	10	.11
FS-235	Unit 67, Level 6 (50-60 cm)	Below Midden	14	10	.07
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FS-284	Feature 1; Unit 122, Level 4 (44-53 cm)	Posthole	.5	10	<.2
FS-322	Feature 2; Unit 120, Level 5 (40-50 cm)	Hearth	7	15	1.79
FS-318	Feature 3; Unit 121, Level 1 (0-10 cm)	Midden	14	400	.1
FS-314	Feature 3; Unit 121, Level 2 (10-20 cm)	Midden	12	80	.2
FS-320	Feature 3; Unit 121, Level 3 (20-30 cm)	Midden	11	20	<.2
FS-317	Feature 3; Unit 121, Level 4 (30-40 cm)	Midden	7	15	<.15
FS-316	Feature 3; Unit 121, Level 5 (40-50 cm)	Base of Midden	7	5	<.1
FS-312	Unit 121, Level 6 (50-60 cm)	Below Midden	10	5	.3
FS-313	Unit 121, Level 7 (60-70 cm)	Below Midden	11	5	.32
FS-315	Unit 121, Level 8 (70-80 cm)	Below Midden	13	5	.25
FS-321	Unit 121, Level 9 (80-90 cm)	Below Midden	12	5	.11
FS-319	Unit 121, Level 10 (90-100 cm)	Below Midden	8	10	.07
FS-285	Unit 122, Level 9 (88-90 cm)	Below Midden	2	5	<.2
FS-286	Unit 122, Level 10 (90-100 cm)	Below Midden	2	<3	.2
FS-287	Unit 122, Level 11 (100-118 cm)	Below Midden	3	<1	<.1
FS-288	Unit 122, Level 11 (100-118 cm)	Below Midden	2	<1	.1

Table F-2
Macrobotanical Remains Recovered from Site 41BW553[1]

Sample No.	Provenience	Cultural Interpretation	Charcoal	Wood	Seeds	Contaminants	Notes
Flotation Samples							
FS-67	Feature 1; Unit 24, Level 4 (30-40 cm)	Posthole	CF-hardwoods	—	—	ucpd	CF-rare; very tiny; too small to id; small circular resin? drops
FS-68	Feature 1; Unit 24, Level 4 (30-40 cm)	Posthole	—	—	—	upcd	virtually no remains
FS-148	Feature 3; Unit 30, Level 8 (70-80 cm)	Trash Pit (?)	CF	—	—	upcd	CF-2 very small; hardwood
FS-149	Feature 3; Unit 30, Level 8 (70-80 cm)	Trash Pit (?)	—	uc	—	upcd	no carbonized remains
FS-150	Feature 3; Unit 30, Level 8 (70-80 cm)	Trash Pit (?)	—	—	—	upcd	no carbonized remains
FS-230	Feature 6; Unit 67, Level. 1 (0-10 cm)	Midden	CF	—	*Carya* shell fragments; *Juniperus*; unknown	ucpd, I; S	>90% uc
FS-231	Feature 6; Unit 67, Level 2 (10-20 cm)	Midden	CF; *Carya*	—	*Carya* shell fragments; unknown nut fragment	ucpd, I; S	unknown nut-shell, very thin but curvature too small for *Quercus*
FS-232	Feature 6; Unit 67, Level 3 (20-30 cm)	Midden	CF; *Carya*	—	shell fragment	ucpd	shell fragment, very small
FS-233	Feature 6; Unit 67, Level 4 (30-40 cm)	Midden	CF	—	*Oxalis* uc	ucpd, S; I	—
FS-69	Unit 22, Level 5 (50-60 cm)	Disturbance	CF-1	—	—	upcd; I	—
FS-70	Unit 22, Level 5 (50-60 cm)	Disturbance	—	—	—	ucpd	100 % uc
FS-71	Unit 22, Level 5 (50-60 cm)	Disturbance	CF-1 hardwoods	—	—	ucpd	>99% uc
FS-111	Unit 35, Level 6 (50-60 cm)	Burned Rock Scatter	CF	—	*Oxalis*-1 uc	ucpd, I	CF very small - hardwood
FS-112	Unit 35, Level 6 (50-60 cm)	Burned Rock Scatter	—	—	tiny nut fragment	ucpd	>99% uc
FS-234	Unit 67, Level 5 (40-50 cm)	Below Midden	CF	—	—	ucpd; S	>95% uc
FS-235	Unit 67, Level 6 (50-60 cm)	Below Midden	CF	—	—	ucpd, I; S	>90% uc; CF very small - hardwood
Charcoal Samples							
FS-495	Feature 1; Unit 24, Level 4 (30-40 cm)	Posthole	CF; *Quercus*	—	*Carya* shell frags	—	CF too small to identify
FS-497	Feature 1; Unit 24, Level 4 (30-40 cm)	Posthole	—	—	cf. *Carya* shell frags	—	very tiny fragments
FS-300	Feature 3; Unit 30, Level 8 (70-80 cm)	Trash Pit (?)	—	—	*Carya* shell fragments; shell fragments	—	—
FS-493	Feature 3; Unit 30, Level 8 (70-80 cm)	Trash Pit (?)	CF	—	*Carya* shell fragments	—	CF too small to identify
FS-505	Feature 3; Unit 30, Level 8 (70-80 cm)	Trash Pit (?)	CF	—	—	—	CF too small to identify
FS-506	Feature 3; Unit 30, Level 8 (70-80 cm)	Trash Pit (?)	CF	—	—	—	CF too small to identify

Table F-2 (cont'd)

Sample No.	Provenience	Cultural Interpretation	Charcoal	Wood	Seeds	Contaminants	Notes
FS-447	Feature 6; Unit 30, Level 2 (10-20 cm)	Midden	*Carya*	—	—	—	—
FS-275	Feature 6; Unit 30, Level 3 (20-30 cm)	Midden	*Carya*/*Salix*	—	*Carya* shell fragments; shell fragments	—	—
FS-536	Feature 6; Unit 67, Level 1 (0-10 cm)	Midden	CF	—	unk cf. Fabaceae - 2; *Carya* shell frags	—	—
FS-322	Feature 6; Unit 67, Level 1 (0-10 cm)	Midden	—	—	*Carya* shell fragments; shell fragments	—	—
FS-538	Feature 6; Unit 67, Level 1 (0-10 cm)	Midden	unknown	—	unknown - 1	—	CF - too small to identify
FS-367	Feature 6; Unit 67, Level 2 (10-20 cm)	Midden	*Carya*	—	*Carya* shell fragments; shell fragments	—	—
FS-517	Feature 6; Unit 67, Level 2 (10-20 cm)	Midden	CF	—	cf. *Carya* shell frags	—	CF too small to identify; shell fragments very small
FS-334	Feature 6; Unit 67, Level 3 (20-30 cm)	Midden	hardwood	—	*Carya* shell fragments; shell fragments	—	charcoal very small
FS-539	Feature 6; Unit 67, Level 3 (20-30 cm)	Midden	—	—	*Carya* shell fragments	—	—
FS-449	Unit 3, Level 8 (70-80 cm)	General fill	*Carya*	—	—	—	—
FS-436	Unit 13, Level 3 (20-30 cm)	House floor (?)	conifer	—	—	—	young stem, 1 yr or less, charred but not completely, no resin canals
FS-391	Unit 13, Level 4, (30-40 cm)	House floor (?)	*Carya*	—	—	—	—
FS-433	Unit 19, Level 2 (10-20 cm)	General fill	hardwood	—	—	—	too small to id, <1 yrs growth
FS-488	Unit 22, Level 5 (50-60 cm)	Disturbance	CF	—	—	—	too small to identify
FS-502	Unit 22, Level 5 (50-60 cm)	Disturbance	CF	—	—	—	CF too small to identify
FS-503	Unit 22, Level 5 (50-60 cm)	Disturbance	—	—	cf. *Carya* shell frags	—	very tiny fragments
FS-308	Unit 27, Level 4 (30-40 cm)	General fill	*Carya*	—	—	—	—
FS-456	Unit 32, Level 4 (30-40 cm)	General fill	cf. *Carya*	—	*Carya* shell fragments	—	—
FS-92	Unit 33, Level 4 (30-40 cm)	General fill	CF	—	*Chenopod* - 5 uc	ucpd	>99% uc
FS-491	Unit 35, Level 6 (50-60 cm)	Burned Rock Scatter	CF	—	—	—	CF too small to identify
FS-501	Unit 35, Level 6 (50-60 cm)	Burned Rock Scatter	—	—	cf. *Carya* shell frags	—	very tiny fragments
FS-448	Unit 35, Level 6, (50-60 cm)	General fill	hardwood	—	—	—	caramelized, anatomy distorted, possibly bone but probably wood
FS-403	Unit 44, Level 2 (10-20 cm)	General fill	*Salix*	—	—	—	—

Table F-2 (cont'd)

Sample No.	Provenience	Cultural Interpretation	Charcoal	Wood	Seeds	Contaminants	Notes
FS-266	Unit 44, Level 4 (30-40 cm)	General fill	*Salix*/*Ulmus*	—	—	—	—
FS-297	Unit 44, Level 5 (40-50 cm)	General fill	hardwood	—	—	—	specimens too small to id; <1 yrs growth/knot area
FS-414	Unit 44, Level 5 (40-50 cm)	General fill	*Salix*	—	—	—	—
FS-507	Unit 44, Level 6 (50-60 cm)	General fill	*Carya*	—	—	—	—
FS-294	Unit 48, Level 3 (20-30 cm)	General fill	—	—	*Carya* shell fragments; shell fragments	—	—
FS-521	Unit 67, Level 4 (30-40 cm)	Below Midden	—	—	*Carya* shell fragments	—	—
FS-528	Unit 67, Level 5 (40-50 cm)	Below Midden	CF	—	*Carya* shell fragments	—	CF too small to id - very rare
FS-372	Unit 67, Level 5 (40-50 cm)	Below Midden	—	—	*Carya* shell fragments; shell fragments	—	—
FS-533	Unit 67, Level 6 (50-60 cm)	Below Midden	CF	—	*Carya* shell fragments	—	CF too small to identify
FS-323	Unit 67, Level 6 (50-60 cm)	Below Midden	*Quercus*; *Carya*	—	—	—	—
FS-305	Unit 67, Level 7 (60-70 cm)	Below Midden	*Ulmus*; hardwood	—	—	—	no clear surface on hardwood
FS-434	Unit 89, Level 1 (0-10 cm)	General fill	*Carya*	—	*Carya* shell fragments; shell fragments	—	—

[1] Key:

CF	Charcoal Fragments too small to identify	ucpd	uncharred plant debris
uc	uncharred fragments	I	Insect
unk	unknown	S	Snail

Table F-3
Macrobotanical Remains Recovered from Site 41TT670

Sample No.	Provenience	Cultural Interpretation	Charcoal	Wood	Seeds	Contaminants	Notes
Flotation Samples							
FS-284	Feature 1; Unit 122, Level 4 (44-53 cm)	Posthole	CF; *Carya*	—	—	ucpd, I	—
FS-322	Feature 2; Unit 120, Level 5 (40-50 cm)	Hearth	CF-hardwood; cf. *Carya*	—	cf. *Carya* shell frags	ucpd, S, I	—
FS-318	Feature 3; Unit 121, Level 1 (0-10 cm)	Midden	CF-hardwood	—	*Juniperus*-6; shell frags	ucpd, I, S	—
FS-314	Feature 3; Unit 121, Level 2 (10-20 cm)	Midden	CF; *Carya*	—	*Cheno*-3; shell frags	ucpd, I	—
FS-320	Feature 3; Unit 121, Level 3 (20-30 cm)	Midden	CF; *Carya*	—	shell frags-cf. *Carya*; *Cheno*-17; *Juniperus*-1; unknown flat-1	ucpd, I	—
FS-317	Feature 3; Unit 121, Level 4 (30-40 cm)	Midden	CF; *Carya*	—	*Chenopod*-10	ucpd	—
FS-316	Feature 3; Unit 121, Level 5 (40-50 cm)	Base of Midden	CF; *Carya*	—	*Chenopod*-4	ucpd, I	>95% uc
FS-312	Unit 121, Level 6 (50-60 cm)	Below Midden	CF-few	—	shell fragments	ucpd, I	—
FS-313	Unit 121, Level 7 (60-70 cm)	Below Midden	CF-few	—	unk-7	ucpd	>99% uc
FS-315	Unit 121, Level 8 (70-80 cm)	Below Midden	CF-few	—	unk-6	ucpd	>95% uc
FS-321	Unit 121, Level 9 (80-90 cm)	Below Midden	CF-few	—	*Chenopod*-4	ucpd	cf. resin drops
FS-319	Unit 121, Level 10 (90-100 cm)	Below Midden	—	—	—	ucpd	>99% uc
FS-285	Unit 122, Level 9 (88-90 cm)	Below Midden	CF-hardwood	—	—	ucpd, I	>95% uc
FS-286	Unit 122, Level 10 (90-100 cm)	Below Midden	CF-few	—	—	ucpd	—
FS-287	Unit 122, Level 11 (100-118 cm)	Below Midden	CF-few	—	—	ucpd	>99% uc
FS-288	Unit 122, Level 11 (100-118 cm)	Below Midden	—	—	—	ucpd	100% uc; no carbonized remains
Charcoal Samples							
FS-713	Feature 1; Unit 122, Level 4 (44-53 cm)	Posthole	hardwood	—	cf. *Carya* shell frags	—	charcoal too small to identify
FS-702	Feature 2; Unit 120, Level 5 (40-50 cm)	Hearth	CF	—	*Carya* shell fragments	—	CF too small to identify
FS-412	Feature 3; Unit 52, Level 1 (0-10 cm)	Midden	hardwood	—	—	—	too small to identify
FS-510	Feature 3; Unit 120, Level 5 (40-50 cm)	Midden next to Feature 2	cf. *Celtis*	—	—	—	—
FS-511	Feature 3; Unit 120, Level 5 (40-50 cm)	Midden next to Feature 2	*Carya*	—	—	—	—
FS-495	Feature 3; Unit 120, Level 6 (50-60 cm)	Base of Midden	—	—	*Carya* shell fragments	—	—
FS-730	Feature 3; Unit 121, Level 1 (0-10 cm)	Midden	—	—	*Carya* shell frags; unk-4	—	—

Table F-3 (cont'd)

Sample No.	Provenience	Cultural Interpretation	Charcoal	Wood	Seeds	Contaminants	Notes
FS-731	Feature 3; Unit 121, Level 1 (0-10 cm)	Midden	—	—	Fabaceae - cf. *Lupinus*	—	uncharred
FS-678	Feature 3; Unit 121, Level 2 (10-20 cm)	Midden	*Carya*	—	*Carya* shell fragments	I	—
FS-683	Feature 3; Unit 121, Level 2 (10-20 cm)	Midden	—	—	Fabaceae	—	uc-? modern
FS-677	Feature 3; Unit 121, Level 3 (20-30 cm)	Midden	CF	—	*Carya* shell fragments	—	—
FS-716	Feature 3; Unit 121, Level 4 (30-40 cm)	Base of Midden	CF; *Carya*	—	*Carya* shell fragments	—	—
FS-571	Unit 61, Level 4 (30-40 cm)	General fill	*Ulmus*	—	—	—	—
FS-668	Unit 91, Level 4 (30-40 cm)	General fill	hardwood	—	—	—	knot area; anatomy distorted due to eruption of vascular traces
FS-641	Unit 91, Level 5 (40-50 cm)	General fill	*Carya*	—	—	—	—
FS-462	Unit 114, Level 6 (50-60 cm)	General fill	hardwood	—	—	—	traumatic heat vessels
FS-658	Unit 119, Level 3 (20-30 cm)	General fill	*Carya*	—	—	—	—
FS-721	Unit 121, Level 5 (40-50 cm)	Below Midden	—	—	cf. *Carya* shell frags	—	—
FS-697	Unit 121, Level 6 (50-60 cm)	Below Midden	—	—	*Carya* shell fragments	—	—
FS-691	Unit 121, Level 7 (60-70 cm)	Below Midden	CF	—	*Carya* shell frags; cf. Euphorbiaceae - 1	—	CF too small to identify
FS-726	Unit 121, Level 8 (70-80 cm)	Below Midden	CF	—	*Carya* shell fragments	—	CF - rare; almost all shell frags
FS-689	Unit 121, Level 9 (80-90 cm)	Below Midden	CF	—	*Carya* shell fragments	—	—
FS-699	Unit 121, Level 10 (90-100 cm)	Below Midden	CF	—	*Carya* shell fragments	—	—
FS-707	Unit 122, Level 9 (80-90 cm)	Below Midden	—	—	*Carya* shell fragments	—	—
FS-685	Unit 122, Level 10 (90-100 cm)	Below Midden	*Carya*	—	*Carya* shell fragments	—	—
FS-686	Unit 122, Level 11 (100-118 cm)	Below Midden	—	—	*Carya* shell fragments	—	—
FS-714	Unit 122, Level 11 (100-118 cm)	Below Midden	—	—	*Carya* shell fragments	—	nut fragments
FS-472	Unit 123, Level 4 (30-40 cm)	Trash Dump (?)	*Celtis*	—	—	—	—
FS-619	Unit 125, Level 4 (30-40 cm)	General fill	—	cf. *Carya* charred	—	—	—
FS-780	Unit 127, Level 6 (75-90 cm)	Backhoe Trench	hardwood	—	—	—	incomplete growth ring

[1] Key:

CF	Charcoal Fragments too small to identify	ucpd	uncharred plant debris
uc	uncharred fragments	I	Insect
unk	unknown	S	Snail

Feature 1

Two flotation samples (FS-67 and FS-68) were taken from this posthole feature. The charcoal fragments were small and identified only as hardwood charcoal. Two charcoal samples (FS-495 and FS-497) were taken from this same feature. *Quercus* charcoal, and several *Carya* shell fragments were present.

Feature 3

Three flotation samples (FS-148, FS-149, and FS-150) were taken from this artifact concentration. The flotation samples contained very little material, with two (FS-149 and FS-150) containing no carbonized material at all. Only charcoal fragments were present. Four charcoal samples (FS-300, FS-493, FS-505, and FS-506) were from this feature. The majority were identified only as charcoal fragments and one (FS-493) contained *Carya* shell fragments.

Feature 6

Two charcoal samples (FS-447 and FS-275) taken from the midden (Feature 6) in Unit 30 contained *Carya* and *Salix* charcoal along with *Carya* shell fragments. Six flotation samples (FS-230, FS-231, FS-232, FS-233, FS-234, and FS-235) and nine charcoal samples (FS-536, FS-322, FS-538, FS-367, FS-517, FS-334, FS-539, FS-521, FS-528, FS-372, FS- 323, FS-533, and FS-305) were taken from Unit 67, and represent Levels 1 through 7. Levels 1 through 4 are from the midden (Feature 6), and contain *Carya* charcoal and shell fragments fairly consistently. The lower levels contain the same types of materials but more sporadically. Interestingly, an uncharred *Oxalis* seed is also present from Level 4. While the levels below the midden generally contain charcoal fragments only, specimens of *Quercus*, *Carya*, and *Ulmus* are also present.

General Fill

Three flotation samples (FS-69, FS-70, and FS-71) were taken from what was thought to be a feature in Unit 22, but which is now believed likely to have been a rodent disturbance. These samples contained very little material with hardwood charcoal fragments. Three charcoal samples (FS-488, FS-502, and FS-503) were from this feature. These samples consisted of charcoal fragments too small to identify and one (FS-503) did contain shell fragments very closely resembling those of *Carya*.

Two flotation samples (FS-111 and FS-112) were taken from a burned rock scatter, initially thought to be a hearth remnant, in Unit 35. Very little material was present. Charcoal fragments, very tiny nut fragments, and an uncharred *Oxalis* seed were present. Two charcoal samples (FS-491 and FS-501) were taken from this same area. Charcoal fragments and shell fragments similar to *Carya* were recovered.

Two charcoal samples (FS-436 and FS-391) were taken from a suspected house floor in Unit 13. These samples contained *Carya* and conifer charcoal. The conifer charcoal was from a very young stem, less than one year's growth and contained no resin canals. Thus, this could be either *Pinus* or *Juniperus*.

One charcoal sample (FS-433) was taken from Unit 19 and contained only hardwood charcoal fragments. A charcoal sample (FS-427) from Unit 26 contained charred bone fragments and is not included on Table F-2. Another charcoal sample (FS-308) from Unit 27 contained *Carya* charcoal. One charcoal sample (FS-

456) from Unit 32 contained *Carya* charcoal and shell fragments. A charcoal sample (FS-92) from Unit 33 contained over 99 percent uncharred material. A small number (five) of uncharred *Chenopodium* seeds were present. A charcoal sample (FS-448) from Unit 35 contained hardwood charcoal fragments. Five charcoal samples (FS-403, FS-266, FS-297, FS-414, and FS-507) were all taken from Unit 44. *Carya, Salix*, and *Ulmus* charcoal were present. Generally, the specimens were small. One charcoal sample (FS-294) from Unit 48 contained *Carya* shell fragments. Finally, a charcoal sample (FS-434) from Unit 89 contained *Carya* charcoal and shell fragments.

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Feature 1

Feature 1 was identified as a possible posthole in Unit 122. One flotation sample (FS-284) was taken from the fill of this feature and contained *Carya* charcoal and charcoal fragments too small for identification. One charcoal sample (FS-713) was taken from Feature 1. This sample contained hardwood charcoal and *Carya* shell fragments.

Feature 2

Feature 2 was identified as a hearth at the base of the midden (Feature 3) in Unit 120. One flotation sample (FS-322) was taken from the fill of this feature. This sample contained cf. *Carya* charcoal, hardwood charcoal, and charcoal fragments. Two pieces of bone were present in addition to cf. *Carya* shell fragments. A charcoal sample (FS-702) was taken from the same feature fill and contained several bone fragments, *Carya* shell fragments, and charcoal fragments.

Feature 3

Most of the flotation samples were taken from Unit 121 and consisted of samples from within the midden (Feature 3), as well as from below it. Four flotation samples (FS-318, FS-314, FS-320, and FS-317) were from Levels 1 through 4, from the midden, and all contained *Carya* charcoal in addition to charcoal fragments. The levels also contained *Juniperus* seeds, a few *Carya* shell fragments, and *Chenopodium* seeds. One flotation sample (FS-316) was the boundary between the midden and nonmidden levels underneath and contained *Carya* charcoal and several *Chenopodium* seeds.

The flotation samples taken from Levels 6 through 10 of Unit 121 (FS-312, FS-313, FS-315, FS-321, and FS-319) all contained charcoal fragments. The samples contained shell fragments, some of which were identified as cf. *Carya,* and a number of an unknown seed type. Level 9 also contained what was thought to be resin drops which might indicate the presence of *Juniperus.*

Four flotation samples were also taken from below the midden in Unit 122, from an area of possible rodent disturbance. These samples (FS-285, FS-286, FS-287, and FS-288) were located in Levels 9 through 11. Level 9 contained hardwood charcoal fragments but the remaining samples contained only isolated charcoal fragments. One sample (FS-288) contained no carbonized remains at all.

Almost all of the charcoal samples from Unit 121 contained *Carya* shell fragments. The upper levels, from the midden (FS-730, FS-731, FS-678, FS-683, FS-677, and FS-716), generally contained *Carya* charcoal as well. The lower Levels 5 through 11 (FS-721, FS-697, FS-691, FS-726, FS-689, and FS-699) generally contained charcoal fragments but no *Carya* charcoal. Bone fragments were intermittently present between Levels 2 through 7 and higher in the upper levels.

Three charcoal samples were taken from the base of the midden, adjacent to Feature 2, in Unit 120 (FS-510, FS-511, and FS-495). These samples contained *Carya* and cf. *Celtis* charcoal and *Carya* shell fragments. Four charcoal samples (FS-707, FS-685, FS-686, and FS-714) were taken from below the midden in Unit 122, from Levels 9, 10, and 11. All samples contained *Carya* shell fragments, and one (FS-685) contained *Carya* charcoal.

One charcoal sample (FS-412) was taken from the midden (Feature 3) in Unit 52 and contained hardwood charcoal.

General Fill

One charcoal sample (FS-571) was taken from the westernmost knoll on the site (Area B) and contained *Ulmus* charcoal. Two charcoal sample (FS-668 and FS-641) were taken from Unit 91 in the eastern portion of the site (Area C). These samples contained hardwood and *Carya* charcoal. Another charcoal sample (FS-658) was taken from Unit 119 in this same area and contained only *Carya* charcoal. A charcoal sample (FS-462) taken from Unit 114 in the northern area of the site contained only hardwood charcoal. *Celtis* charcoal was present in a sample from Unit 123 (FS-472) from the southeastern edge of Area A.

DISCUSSION

The majority of the wood charcoal material recovered consisted of *Carya.* This is consistent with the availability of this taxon from the northeast Texas vegetation. Given the recovery of large amounts of *Carya* shell fragments, this is not unexpected. While large numbers of the shell fragments were present and were identified as belonging to the genus *Carya,* the species could not be determined. Both sites are located within the Post Oak Savannah vegetational area (Gould 1975), and secondarily, the Pineywoods vegetational community is in close proximity.

Other hardwood taxa, including *Quercus, Salix*, and *Ulmus*, were also present from these sites. These taxa are commonly present in the area today, although none were common from the archeological record. Generally, these taxa were present from the midden areas or in those levels below the middens. Their occurrence was so limited that no pattern of their distribution was determined. Interestingly, *Ulmus* charcoal was recovered from below the midden at site 41BW553, from the level of the apparent burial. Whether this infers a preferential use of *Ulmus* in association with the burial or rather indicates the natural presence of this taxon cannot be determined based on the small number of specimens.

Conifer charcoal was extremely rare from these sites and was recovered only from the suspected house floor at site 41BW553. Both *Pinus* and *Juniperus* are present within the area at present. While few *Juniperus* seeds were recovered, this taxon was present in Unit 67, in the midden area at site 41BW553. The particular specimen was rather small and contained less than one year's growth. The wood anatomy of both *Pinus* and *Juniperus* are very similar and differ only in the presence of longitudinal resin canals in *Pinus*. The resin canals are not uniformly distributed within the wood and are often randomly placed. Thus, the absence of resin canals from this specimen, especially given the young age of the specimen, cannot be used to infer the presence of *Juniperus*. Rather, the presence of either taxa is possible. Surprisingly, given this area of Texas, only this specimen of conifer charcoal was recovered. I generally would have expected higher amounts of this taxon.

Celtis (hackberry) charcoal was recovered only from 41TT670 and was found both in the midden as well as from the southeastern portion of Area A. I suspect that the presence of *Celtis* reflects actual fuel usage as one of the occurrences of this charcoal type was adjacent to a hearth area. *Celtis* is locally available (Correl and Johnson 1979; Fowells 1965) and thus its presence is not unexpected.

Carya shell fragments dominate the seed type remains from these sites. Unfortunately, no corn remains were recovered. Corn remains certainly have been recovered from this area previously and the temporal periods are consistent with those containing documented corn agriculture.

The remainder of the seed remains are quite sparse. *Chenopodium* seeds were recovered in both charred and uncharred condition. However, given the ubiquity of this taxon, the amount of seeds recovered is too small to infer an economic usage. The presence of these seed types could easily be explained by natural deposition. *Oxalis* seeds were also present from several proveniences but only in an uncharred condition. *Oxalis* is a constituent of the modern flora from this area (Correl and Johnson 1979) and these seeds most likely are modern contaminants. The vegetation from this area has not altered sufficiently from the archeological occupation, and thus, while no charred *Oxalis* seeds were recovered, this taxon was probably locally available. *Oxalis* has been utilized both medicinally as well as a food source (Moermann 1985).

There were also two types of unknown seeds which were subsequently identified as members of the Fabaceae and the Euphorbiaceae. However, both types were uncharred and thus probably represent modern contamination of these samples.

CONCLUSIONS

The charcoal and flotation analyses indicate a number of taxa consistent with the modern northeast Texas vegetation. Fuel sources were likely from locally available resources. Much of the botanical remains consisted of *Carya* shell fragments. These nuts were likely utilized as a staple resource. Since the majority of the wood charcoal was also from this taxon, it is suggestive that this wood was utilized perhaps as a by-product of nut procurement.

The main staple from these sites appears to be hickory or pecan nuts. Very little seed material was present and those present could easily have been incorporated into the sediments via noncultural means. This is particular relevant to the incorporation of *Chenopodium* seeds since the quantities of these seeds do not infer economic usage. Other seed types were uncharred indicating a possible modern contamination.

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APPENDIX G

PETROGRAPHIC ANALYSIS OF PREHISTORIC CERAMICS RECOVERED FROM SITES 41BW553 AND 41TT670

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INTRODUCTION

This appendix presents the comparative petrographic analysis of a sample set of 20 sherds from two sites (41BW553 and 41TT670) within the White Oak Creek Wildlife Management Area, Bowie and Titus counties, Texas. The study was undertaken with two research goals in mind. The first goal was to characterize the major tempering agents within the samples for the purpose of assessing variability in paste preparation techniques within and between the sample sets. Of particular interest in this regard is the degree to which paste preparation techniques vary temporally and/or geographically. The second goal was to evaluate and compare the mineralogical composition of the samples and ascertain the degree to which compositionally discrete groups could be recognized within and between the sample sets. These data sets can form a baseline from which hypotheses relating to raw materials procurement, and by extension, ceramic production and exchange, can be formulated and tested.

METHODOLOGY

Ten sherds each from sites 41BW553 and 41TT670 were thin-sectioned in preparation for analysis with the petrographic microscope. Analysis was conducted generally following the methodology advocated by Stoltman (1989, 1991). The initial or qualitative phase involved "scanning" each thin section in order to identify the types of nonplastics present. In addition, the shapes and sizes of these inclusions were noted. Once familiarized with each thin section, a point-count analysis was conducted. This procedure involved making a series of observations at regular intervals across the area of the sample. Usually, observations are made at points in the thin section that intersect with the ocular cross hair of the polarizing microscope. Once a point has been characterized, the thin section is moved at a predetermined interval. Another point is then characterized. The procedure is repeated until a total point-count goal is reached.

In this analysis, observations were made at an interval of .66 mm (at 100X) until a maximum of 300 individual observations per thin section were made. The selection of this interval was a compromise between the desire to ensure the independence of observations and the surface area required to reach the total point count goal. In cases where the surface area of the thin section was insufficient to reach the goal of 300 individual observations at this counting interval, the maximum number of points the surface of the sample would allow were counted.

Within each sample, points that intersected with the ocular cross hair were recorded as either a nonplastic grain, a void, or matrix (i.e., paste). All nonplastic grains were identified and measured along the long dimension. These data were then used to generate summary statistics across these occurrences or attributes for each thin section. In addition, grain shapes were characterized by comparison to visual charts (Powers 1958; Rittenhouse 1953). Intersections with voids or paste were simply recorded.

For the purposes of this analysis, distinctions were made between what are referred to as primary and secondary inclusions. Primary inclusions are those that are suspected of having been added as temper during paste preparation. These are typically the most prominent inclusions within a given paste and may have been essentially nongeological in origin (e.g., bone or sherd) or exhibit angular shapes indicative of behavioral alteration (e.g., grinding or crushing). Secondary inclusions are defined as those that are suspected of having been a naturally-occurring constituent within a given clay. These are commonly small, well-rounded mineral or clastic grains that exist in all clay deposits.

RESULTS — 41BW553 SAMPLE SET

The sample set from site 41BW553 consists of one sherd identified as Pease Brushed-Incised (Sample No. 31-2) and one as Pennington Punctated-Incised (Sample No. 31-5). The remainder of the sample set is typologically indeterminate with either smoothed (n=6), incised (n=1), or slipped (n=1) exterior surfaces. Based on both horizontal and vertical stratification of the site area, it is estimated that three of the samples date to the Early Caddoan period (Sample Nos. 4-1, 107-5, and 146-1), four to the Middle Caddoan period (Sample Nos. 31-2, 31-5, 48-2, and 271-1), and three to the Late Caddoan period (Sample Nos. 77-5, 204-2, and 543-3).

General Characteristics

The analysis of the 41BW553 sample set led to the recognition of four discrete primary inclusion groups. A primary inclusion group is defined as those samples that have the same primary inclusion(s). A discrete primary inclusion group includes those samples that differ qualitatively from other groups. As seen in Table G-1, three samples contained ground sherd (Sample Nos. 31-5, 146-1, and 271-1) as the primary inclusion, three of the samples (Sample Nos. 77-5, 204-2, and 543-3) contained crushed shell, two samples exhibited a mixture of ground sherd and bone (Sample Nos. 31-2 and 107-5), one sample contained bone exclusively (Sample No. 48-2), and the final sample exhibited crushed siltstone as the primary inclusion type (Sample No. 4-1). Within and between these primary inclusion groups, a total of five discrete secondary inclusion or compositional groups were identified. Like the primary inclusion groups, a secondary or compositional group is defined as those samples that have the same suite of rocks and minerals contained within them. A discrete compositional group consists of those samples that differ qualitatively from other compositional or secondary inclusion groups. The percentages of primary and secondary inclusions, paste, voids, and mean overall inclusion size for the sample set is presented in Table G-2. The next step in the analysis involved the comparison of the frequency (as measured by the percentage of total points counted), size, and shape of inclusions within each primary and secondary inclusion group.

Table G-1
Thin Section Sample Set from Site 41BW553

Sample Number	Provenience	Estimated Age of Deposit	Type or Exterior Treatment	Vessel Form	Primary Inclusion(s)
4-1	Auger Test 3 60-80 cm	Early Caddoan	smoothed	indeterminate	crushed siltstone
31-2	Test Unit 16 40-50 cm	Middle Caddoan	Pease Brushed-Incised	jar	sherd/bone
31-5	Test Unit 16 40-50 cm	Middle Caddoan	Pennington Punctated-Incised	jar	sherd
48-2	Test Unit 25 0-10 cm	Middle Caddoan	smoothed	indeterminate	bone
77-5	Test Unit 27 10-20 cm	Late Caddoan	smoothed	indeterminate	crushed shell
107-5	Test Unit 37 40-50 cm	Early Caddoan	incised	indeterminate	sherd/bone
146-1	Feature 3 Test Unit 30 70-80 cm	Early Caddoan	smoothed	indeterminate	sherd
204-2	Test Unit 69 20-30 cm	Late Caddoan	red slipped	jar	crushed shell
271-1	Test Unit 21 30-40 cm	Middle Caddoan	smoothed	indeterminate	sherd
543-3	Test Unit 67 20-30 cm	Late Caddoan	smoothed	indeterminate	crushed shell

Table G-2
Percentages of Inclusions, Paste, Voids, and Mean Inclusion Size for Site 41BW553 Sample Set

Inclusion	Sample Number									
	4-1	31-2	31-5	48-2	77-5	107-5	146-1	204-2	271-1	543-3
Sherd	—	13.0	12.9	—	—	6.3	16.0	—	19.0	—
Bone	—	1.3	—	18.8	—	4.7	—	—	—	—
Shell	—	—	—	—	12.2	—	—	—	—	21.2
Siltstone	16.6	—	—	—	—	—	—	—	—	—
Quartz	10.9	10.0	14.9	15.8	8.3	17.3	9.0	4.7	8.2	7.9
Quartzite	1.4	1.3	2.4	trace[1]	1.2	1.0	1.3	trace[1]	1.7	—
Epidote	trace[1]	trace[1]	—	trace[1]	—	1.5	trace[1]	—	trace[1]	—
Plagioclase Feldspar	—	—	trace[1]	—	—	—	—	1.0	—	trace[1]
Potassium Feldspar	—	—	trace[1]	—	—	—	—	—	—	—
Hematite	1.0	—	5.7	—	—	—	—	2.5	—	—
Paste	62.4	57.3	52.3	62.3	51.1	61.0	55.6	60.5	51.0	58.4
Voids	7.1	16.6	10.5	1.4	25.8	7.8	17.6	30.4	19.4	11.5
Mean inclusion size (mm)	.392	.243	.214	.234	.168	.268	.246	.186	.446	.431

Footnote:
[1] Trace = <1 percent.

Analysis of Primary Inclusions

The Sherd Primary Inclusion Group

A comparison of the frequency of inclusions between samples in the Sherd Primary Inclusion Group indicates that sherd particles constitute between 12.5 and 19.0 percent of the total points counted. As indicated in Table G-3, Sample Nos. 31-5 and 146-1 exhibited mean particle sizes of .459 and .421 mm, respectively, or what can be referred to as medium sand-sized. In contrast to the similarities between these samples, mean sherd particle size for Sample No. 271-1 was .650, or what is classified as coarse sand-sized. In addition to the larger mean particle size, Sample No. 271-1 contained the highest frequency of sherd particles within the group (19 percent). The higher frequency and mean particle size of Sample No. 271-1 may relate to a larger vessel size and/or functional differences between this vessel and the others constituting the Sherd Primary Inclusion Group.

A comparison of porosity (as measured by the percentage of voids) suggests a relationship between the frequency of primary inclusions and the frequency of voids. Sample No. 31-5, with a primary inclusion frequency of 12.5 percent, exhibited a void frequency of 10.5 percent; Sample No. 146-1, with a primary inclusion frequency of 16.0 percent, exhibited a void frequency of 17.6 percent; and Sample No. 271-4, with a primary inclusion frequency of 19.0 percent, had a void frequency of 19.4 percent. In other words, the higher the frequency of sherd inclusions, the more porous the ceramic. Whether the variability evident in the porosity of these samples relates to the size and/or function of these vessels is, at present, unknown. These variations may also simply relate to the amount of organic material in raw clay that would oxidize during the firing process.

Table G-3
Statistics Relating to the Frequency and Size of Inclusions for the Primary Inclusion Groups Identified in the Sample Set from Site 41BW553

Sample Number	Percent of Total Points Counted	Mean size (mm)	ρ	Median	Mode	Range
Sherd Primary Inclusion Group						
31-5	12.5	.459	.236	.570	.280	.14-1.00
146-1	16.0	.421	.243	.680	.350	.02-1.34
271-1	19.0	.650	.399	1.05	.680	.10-2.00
Crushed Shell Primary Inclusion Group						
77-5	12.2	.258	.128	.330	.290	.10-.56
204-2[1]	*	*	*	*	*	*
543-3	21.2	.590	.543	1.16	.360	.06-2.25
Sherd/Bone Primary Inclusion Group						
31-2	13.0 - sherd	.395	.190	.405	.420	.09-.72
	1.3 - bone	.330	.149	.295	.470	.12-.47
107-5	6.3 - sherd	.478	.271	.600	.410	.10-1.10
	4.7 - bone	.891	.566	1.21	1.10	.28-2.13
Bone Primary Inclusion Group						
48-2	18.8	.385	.244	.555	.470	.06-1.05
Crushed Siltstone Primary Inclusion Group						
4-1	16.6	.621	.421	1.06	.350	.12-2.00

Footnote:
[1] Sample 204-2 contained no shell, although numerous long, slender voids were evident.

The shapes of sherd particles within the group proved to be quite consistent. In all samples, the majority of particles exhibited high roundness and either high or intermediate sphericity. While these shapes are not typical of materials that have been crushed or ground, they are consistent with the shapes of sherd particles in other archaeological contexts (Ennes 1996). It is probable that relative softness of sherds contributes to the rounded, spherical shapes.

The Crushed Shell Primary Inclusion Group

The frequency of inclusions for these samples range between 12.2 and 21.2 percent of the total points counted. The apparent differences between these samples is somewhat misleading, however. Sample No. 77-5 contained crushed shell inclusions only in the central interior wall or core area. Nearer the interior and exterior surfaces, numerous long slender voids were evident. It seems clear that these voids represent crushed shell inclusions that may have oxidized as the interior and exterior surfaces would have experienced somewhat higher temperatures during firing than the core area of the sample. Oxidation during the firing process may also explain the complete absence of crushed shell in Sample No. 204-2. In this sample, numerous long slender voids were also evident. It is possible that the vessel represented by this sample was fired at a sufficiently high temperature to oxidize all the crushed shell inclusions contained within the sample (i.e., above 550 degrees C). Interestingly, few long slender voids were evident in Sample No. 543-3. It is probable that this sample was fired at a temperature that was insufficient to oxidize the shell inclusions.

Samples Nos. 77-5 and 543-3 exhibited mean primary inclusion sizes of .258 and .590, respectively (see Table G-3). This seemingly large difference in mean primary inclusion size does not appear to be related to differences in firing temperature. Instead, it seems to represent the inclusion of larger shell fragments in Sample No. 543-3. While the reason for the variation is unknown, it is possible that it may relate to size and/or functional differences between the vessels represented by these samples.

Not surprisingly, a high degree of variation in porosity was evident between these samples. Sample No. 543-3 exhibited a void frequency of 11.5 percent, Sample No. 77-5 exhibited a void frequency of 25.8 percent, and Sample No. 204-2 had a void frequency of 30.4 percent. Again, these differences are probably related to variations in firing temperature between the samples. Whether firing temperature was altered to intentionally manipulate the porosity of these vessels is unknown.

Relatively little variation in inclusion shape was evident within or between the samples analyzed. As is typical of crushed shell inclusions, virtually all exhibited high roundness and low sphericity (i.e., they were long and slender with rounded corners).

The Sherd/Bone Primary Inclusion Group

A comparison of the frequency of inclusions between the two samples constituting the Sherd/Bone Primary Inclusion Group indicates that similar percentages of inclusions (sherd and bone considered together) were added during paste preparation. Sample No. 31-2 exhibited an overall inclusion frequency of 14.3 percent, while the frequency for Sample No. 107-5 was 14.0 percent. However, there were wide differences in the proportions of sherd to bone inclusions between the samples. As indicated in Table G-3, Sample No. 31-2 contained 13 percent sherd and 1.3 percent bone inclusions, while Sample No. 107-5 contained roughly equal percentages of sherd and bone (6.3 and 4.7 percent, respectively). In addition, there appear to be rather large differences in mean inclusion size between the samples. Sample No. 31-2 contained more sherd inclusions of smaller mean size and less bone inclusions of smaller mean size than did Sample No. 107-5. These differences would appear to constitute a technological difference in the paste preparation techniques involved in the manufacture of the vessels from which these samples came.

Wide differences were also noted in the frequency of voids. Sample No. 31-2 had a frequency of 16.6 percent, while Sample No. 107-5 exhibited a frequency of only 7.8 percent. Variations in the amount of original organic materials aside, there appears to be a large difference in the porosity of the vessels represented by these samples. While the number of samples in this primary inclusion group is too small to make definitive statements, it is suggested that the manipulation of the proportion of sherd vs. bone may have been an attempt to control porosity.

The shape of sherd particles within and between the sample varied little. Like the sherd particles contained within the samples of the Sherd Primary Inclusion Group, the majority of sherd particles in this group exhibited high roundness and either high or intermediate sphericity. Bone inclusions, on the other hand, varied considerably within, but not between, samples. Shapes of bone inclusions ranged from those exhibiting intermediate roundness and low sphericity to those that were so irregular in shape that they could not be characterized by comparison to the visual chart employed. Many of the irregularly shaped bone inclusions appear to retain natural shapes as suggested by the parallel pattern of minute pores that functioned as "conduits" for the passage of blood cells.

The Bone Primary Inclusion Group

A single specimen, Sample No. 48-2, constitutes the Bone Primary Inclusion Group. As indicated in Table G-3, bone inclusions constituted 18.8 percent of the total points counted within this sample. Mean size of these inclusions was .385 mm.

This sample exhibited a void frequency of 1.4 percent, suggesting that the vessel represented by this sample had very little porosity. This lack of porosity, coupled with the differences evident in the Sherd/Bone Primary Inclusion Group, suggests that the inclusion of bone may tend to reduce the porosity of vessel walls.

Like the shape of bone inclusions evident in the Sherd/Bone Primary Inclusion Group, inclusion shape varied widely within the sample. Some of the bone fragments exhibited low or intermediate roundness and low sphericity, while others were quite irregular.

The Crushed Siltstone Primary Inclusion Group

This primary inclusion group is also represented by a single specimen, Sample No. 4-1. As indicated in Table G-3, crushed siltstone constitutes 16.6 percent of the total points counted within the sample. The mean size of these grains is .621 mm or what is classified as coarse sand-sized.

The frequency of voids in the sample was 7.1 percent suggesting that this sample was less porous than all other samples except the member of the Bone Primary Inclusion Group.

The majority of siltstone grains contained within the sample exhibit either intermediate or low roundness and intermediate sphericity. It is probable that these grain shapes are the result of crushing, as a more rounded shape would be expected from naturally-occurring siltstone inclusions.

Temporal Variation

In regard to temporal variation in the occurrence of these primary inclusion groups, samples exhibiting crushed shell as the primary inclusion are associated only with the Late Caddoan period. Samples exhibiting either ground sherd or sherd/bone combined as the primary inclusion are associated with both Early and Middle Caddoan contexts. Crushed siltstone is also associated with the Early Caddoan period, while the use of bone alone is associated with the Middle Caddoan period. On the basis of this data, it appears that the Early and Middle Caddoan periods were very similar in their use of tempering materials. The presence of crushed siltstone and bone temper alone in one period and not in the other may be the result of sampling error and not reflective of any actual difference in the use of these tempering materials through time. Likewise, the lack of any tempering material other than shell from Late Caddoan contexts is also due to sampling error, since other materials were undoubtedly used during the Late Caddoan period. What does seem to be real, is the lack of crushed shell inclusions from contexts earlier than the Late Caddoan period, a trend which has long been recognized in East Texas Caddoan ceramic technology (see, for example, Davis et al. (eds) 1971:28-32, Appendix I).

Analysis of Secondary Inclusions

Ordinarily, the analysis of primary inclusions like the types described above are not particularly useful for addressing issues of clay raw material procurement and the determination of production provenience. The analysis of secondary or naturally-occurring rock and mineral grains, on the other hand, can be a useful approach to differentiate clay sources and formulate statements as to the local vs. nonlocal status of a given vessel.

The 41BW553 sample set also exhibited a high degree of variation in the mineralogical composition of secondary inclusions. Of the 10 samples comprising the sample set, five qualitatively discrete compositional groups were recognized. Furthermore, these compositional groups crosscut three of the four primary inclusion groups defined above. Compositional Group A, composed of members of the Sherd, Bone, Sherd/Bone, and Crushed Siltstone Primary Inclusion Groups (n=6), consists of monocrystalline quartz with smaller percentages of quartzite, and trace epidote (Table G-4).

Table G-4
Percentages of Secondary Inclusions Present in Identified Compositional Groups in Sample Sets from Site 41BW553

Sample Number	Secondary Inclusion					
	Monocrystalline Quartz	Quartzite	Epidote	Hematite	Potassium Feldspar	Plagioclase Feldspar
Compositional Group A						
4-1 (siltstone)	10.9	1.4	trace[1]	—	—	—
31-2 (sherd/bone)	10.0	1.3	trace[1]	—	—	—
48-2 (bone)	15.8	trace[1]	trace[1]	—	—	—
107-5 (sherd/bone)	17.3	1.0	1.5	—	—	—
146-1 (sherd)	9.0	1.3	trace[1]	—	—	—
271-1 (sherd)	8.2	1.7	trace[1]	—	—	—
Compositional Group B						
31-5 (sherd)	14.9	2.4	—	5.7	trace[1]	trace[1]
Compositional Group C						
77-5 (shell)	8.3	1.2	—	—	—	—
Compositional Group D						
204-2 (shell)	4.7	trace[1]	—	2.5	—	1.0
Compositional Group E						
543-3 (shell)	7.9	—	—	—	—	trace[1]

Footnote:
[1] Trace = <1 percent.

The mean size of secondary inclusions ranged from .047 mm to .108 mm or what can be characterized as silt to very fine sand (Table G-5). Based on these means, it is suggested that the vessels represented by Sample Nos. 48-2 (bone), 107-5 (sherd/bone), and 271-1 (sherd) were manufactured from silty clays. The vessels represented by Sample Nos. 4-1 (siltstone) and 31-2 (sherd/bone) were manufactured from silty, very fine sandy clays, with the remaining Sample No. 146-1 (sherd) being manufactured from very fine sandy clay.

The shape of grains within and between these samples appear to vary slightly as a consequence of size. In general, silt-sized particles exhibited high roundness and high sphericity with slightly larger, very fine sand-sized grains exhibiting either high or intermediate roundness and high sphericity.

Table G-5
Statistics Relating to the Size of Secondary Inclusions Present in Identified Compositional Groups in Sample Set from Site 41BW553

Sample Number	Mean Size (mm)	ρ	Median	Mode	Range
Compositional Group A					
4-1 (siltstone)	.084	.044	.090	.080	.01-.17
31-2 (sherd/bone)	.098	.122	.265	.090	.01-.52
48-2 (bone)	.047	.027	.060	.030	.01-.11
107-5 (sherd/bone)	.054	.045	.105	.030	.01-.20
146-1 (sherd)	.108	.066	.155	.100	.01-.30
271-1 (sherd)	.055	.045	.105	.030	.01-.20
Compositional Group B					
31-5 (sherd)	.055	.045	.105	.030	.01-.20
Compositional Group C					
77-5 (shell)	.062	.048	.080	.060	.01-.15
Compositional Group D					
204-2 (shell)	.186	.268	.505	.110	.01-1.00
Compositional Group E					
543-3 (shell)	.049	.034	.075	.050	.02-.13

Taken together, these data would appear to suggest that the samples comprising Compositional Group A were manufactured from compositionally similar clays and these clays varied to some degree in texture. Whether or not the ceramics represented by Compositional Group A were manufactured locally cannot be said with certainty, but the fact that the majority (60 percent) of the sample set from site 41BW553 exhibit this composition suggests that this might be the case, based on the "criterion of abundance" (Bishop et al. 1982). However, a comparative analysis of locally-occurring raw materials is required to adequately test this hypothesis.

The remaining four samples within the 41BW553 sample set were divided into four discrete compositional groups. Compositional Group B, represented by Sample No. 31-5 (sherd), contained monocrystalline quartz and hematite with smaller percentages of quartzite and potassium and plagioclase feldspar (see Table G-4). The mean size of secondary inclusions in this group was .055 mm, or what is classified as silt (see Table G-5). Based on this mean, it is suggested that Sample No. 31-5 was manufactured from a silty clay. The overwhelming majority of grains within the sample exhibited highly round and highly spherical shapes. These shapes are typical of those associated with silts.

Compositional Group C, represented by Sample No. 77-5 (shell), contained monocrystalline quartz and quartzite exclusively (see Table G-4). Only 9.5 percent of the total points counted within the sample were classified as secondary inclusions. The mean size of secondary inclusions within the sample was .062 mm or what is classified as silt (see Table G-5). The low percentage of these inclusions, coupled with their mean size, suggests that although the clay from which the sample was manufactured can technically be classified as silty, very little silt was evident. Like Sample No. 31-5, the overwhelming majority of grains within the sample were highly round and highly spherical, characteristics typical of silts.

Compositional Group D, represented by Sample No. 204-2 (shell), consists of monocrystalline quartz, hematite, plagioclase feldspar and quartzite (see Table G-4). The mean size of these inclusions was .186 mm or what is classified as fine sand (see Table G-5). The high standard deviation in size evident in the sample is created by the existence of relatively few, large hematite nodules. Because of this, the clay is better characterized as silty with hematite nodules rather than as a fine sandy clay. Like Sample No. 77-5, very few secondary inclusions were evident in the sample (8.9 percent total). Like the other silty samples discussed, grain shapes were generally highly round and spherical (including the hematite nodules).

The final compositional group identified at site 41BW553, Compositional Group E, is represented by a single specimen, Sample No. 543-3 (shell). Compositionally, the sample contained monocrystalline quartz and trace plagioclase feldspar (see Table G-4). The mean size of these inclusions was .049 mm, suggesting that this ceramic sample was manufactured from a silty clay (see Table G-5). The percentage of secondary inclusions was again quite low (8.7 percent) indicating that this clay was very fine textured. Again, the majority of these inclusion exhibited highly round and spherical shapes typical of silt-sized grains.

Discussion

The petrographic analysis of the 41BW553 sample set revealed a high degree of technological and mineralogical variability. Of the ten total samples, five different types or combination of types of inclusions were added as tempering agents. These primary inclusion groups include sherd, bone, sherd/bone, shell, and crushed siltstone. Variations in the amounts and mean sizes of primary inclusions and the frequency of voids suggests that subtle technological variations exist within these groups.

A comparison of more general technological variability (as suggested by the recognition of primary inclusion groupings) with sample provenience indicates that the shell tempered ceramics date to the Late Caddoan period, while sherd tempering and sherd in combination with bone was predominant during the Early and Middle Caddoan periods. Additional tempering materials in use during the Late Caddoan period were not identified by this study but are undoubtedly present. In addition, while the presence of crushed siltstone temper from an Early Caddoan context and bone temper exclusive of shell from a Middle Caddoan context, indicate that these materials were in use during these respective periods, the small number of samples analyzed makes in unwise to conclude that these materials were confined solely to these periods.

The analysis of secondary inclusions identified what appear to be five discrete compositions that crosscut the primary inclusion groups. One of these, Compositional Group A, is represented by 60 percent of the total sample set, and includes samples identified as being from both Early (n=3) and Middle (n=3) Caddoan contexts. Because of the high percentage of ceramics in this group, it is suggested that these may have been locally manufactured. If Compositional Group A represents local manufacture during the Early and Middle Caddoan periods, then it is probable that ceramics with several production technologies were being produced contemporaneously during both periods. The choice of which temper type to use and the size and amount that should be added during paste preparation may have been mediated by functional and/or size considerations.

The remaining four thin sections in the sample set were divided into four discrete compositional groups, each containing only one sample. Interestingly, all of the shell-tempered samples (Late Caddoan) and one of the sherd-tempered thin sections (Middle Caddoan) exhibit compositions that are discrete from that suspected of representing local manufacture. In the case of the Middle Caddoan sample, it is possible that this represents a nonlocally manufactured vessel, while the three Late Caddoan samples could represent either nonlocal manufacture or the use of a new local clay sources with different secondary inclusions (the variability shown by the Late Caddoan sample would seem to argue against this latter interpretation). Mineralogical variability present in clay sources in the vicinity of site 41BW553 should be assessed in order to test these hypotheses. If these compositional groups do represent nonlocal manufacture then the exchange of shell- and sherd-tempered pottery may be indicated for the Middle and Late Caddoan periods at site 41BW553.

RESULTS — 41TT670 SAMPLE SET

The sample set from site 41TT670 consists of one sherd identified as Williams Plain (Sample No. 544-2) and one sherd identified as Holly/Hickory Fine Engraved (Sample No. 544-9). The remainder of the sample set is typologically indeterminate with smoothed (n=6), slipped (n=1), or punctated (n=1) exterior surfaces. All of this material probably comes from the same occupation, which spans the Early and Middle Caddoan periods, between about A.D. 1050 and A.D. 1280. However, in order to examine temporal change in the sample set from 41TT670, the sherds have been divided on the basis of whether they are believed to date to the earlier (Early Caddoan) or to the later (Middle Caddoan) half of this occupation. Thus, four samples have been placed in the Early Caddoan period (Sample Nos. 406-1, 544-2, 544-9, and 544-12) and six samples have been placed in the Middle Caddoan period (Sample Nos. 3-1, 58-1, 256-2, 256-3, 260-6, and 266-12).

General Characteristics

The analysis of the 41TT670 sample set led to the recognition of three discrete primary inclusion groups. As seen in Table G-6, five samples contained a mixture of ground sherd and bone (Sample Nos. 3-1, 58-1, 406-1, 544-2, and 544-9), four samples contained ground sherd exclusively (Sample Nos. 256-2, 256-3, 266-12, and 544-12), and one sample exhibited bone exclusively (Sample No. 260-6). Percentages of constituents, frequency of paste and voids, and overall mean inclusion sizes for these samples are provided in Table G-7.

Within and between these primary inclusion groups, a total of five discrete secondary or compositional groups were identified. As was the case with site 41BW553 sample set, these compositional groups appear to crosscut the primary inclusion groups (a more detailed discussion of secondary inclusion groups follows the discussion of the primary inclusion groups).

Analysis of Primary Inclusions

The Sherd/Bone Primary Inclusion Group

An examination of the five samples in the Sherd/Bone Primary Inclusion Group indicates that the total frequency of primary inclusions (i.e., sherd and bone considered together) was quite variable, ranging from 5.9 to 25.2 percent of the total points counted (Table G-8). Two of the samples in this group (Sample Nos. 58-1 and 406-1) exhibited relatively few primary inclusions, 9.0 and 5.9 percent respectively, while the remainder of the group (Sample Nos. 3-1, 544-2, and 544-9) exhibited much larger percentages (25.2, 15.6, and 19.9 percent, respectively).

Table G-6
Thin Section Sample Set from Site 41TT670

Sample Number	Provenience	Estimated Age of Deposit	Type or Exterior Treatment	Vessel Form	Primary Inclusion(s)
3-1	Test Unit 80 20-30 cm	Middle Caddoan	smoothed	indeterminate	sherd/bone
58-1	Test Unit 61 20-30 cm	Middle Caddoan	smoothed	indeterminate	sherd/bone
256-2	Test Unit 125 10-20 cm	Middle Caddoan	smoothed	bowl	sherd
256-3	Test Unit 125 10-20 cm	Middle Caddoan	punctated	jar	sherd
260-6	Test Unit 125 50-60 cm	Middle Caddoan	smoothed	indeterminate	bone
266-12	Test Unit 123 30-40 cm	Middle Caddoan	smoothed	indeterminate	sherd
406-1	Test Unit 121 60-70 cm	Early Caddoan	slipped	bowl	sherd/bone
544-2	Test Unit 123 50-60 cm	Early Caddoan	Williams Plain	indeterminate	sherd/bone
544-9	Test Unit 123 50-60 cm	Early Caddoan	Holly/Hickory Fine Engraved	jar	sherd/bone
544-12	Test Unit 123 50-60 cm	Early Caddoan	smoothed	indeterminate	sherd

In addition, large differences in the proportions of sherd to bone inclusions were recognized. Sample Nos. 58-1 and 406-1, with the lowest percentages of total inclusions, and Sample No. 544-2 contained roughly similar amounts of sherd and bone inclusions (ratios of 1 to 1, 3.5 to 1, and 1 to 1, respectively). Sample No. 3-1 contained much more bone than sherd inclusions (a ratio of 20 to 1), while Sample No. 544-9 contained much more sherd than bone (a ratio of 17 to 1). These differences are presumed to constitute technological variations in paste preparation techniques. It is possible that the perceived variability relates to vessel size and/or function, or simply to the personal preference of individual potters (Fontana et al. 1962; Hartman and Musial 1987; Stanislawski 1978).

Slightly less variability was evident in the percentages of voids between the samples. One of the samples (Sample No. 544-9) exhibited relatively few voids (6.4 percent), while another sample (Sample No. 544-2) contained a relatively high proportion of voids (25.3 percent). The remainder of the sample set ranged between 9.0 percent (Sample No. 406-1) and 10.4 percent (Sample No. 3-1). Unlike the 41BW553 sample set, these apparent differences in relative porosity do not appear to be related to percentage of total primary inclusions, percentage of sherd vs. bone, or mean inclusion size. It is possible that the variability evident in relative porosity is a consequence of the amount of organic material present in the raw clay exploited. In this group, there does not appear to be any evidence to suggest that the porosity of the ceramics was intentionally manipulated through the use of different amounts, types, or sizes of inclusions.

Table G-7
Percentages of Inclusions, Paste, Voids, and Mean Inclusion Size for Site 41TT670 Sample Set

Inclusion	Sample Number									
	3-1	58-1	256-2	256-3	260-6	266-12	406-1	544-2	544-9	544-12
Sherd	1.2	4.5	11.3	14.0	—	11.4	4.6	8.3	18.8	10.9
Bone	24.0	4.5	—	—	11.7	—	1.3	7.3	1.1	—
Quartz	4.8	7.1	13.8	10.6	14.3	13.1	5.0	8.6	7.6	11.8
Quartzite	trace[1]	1.2	trace[1]	1.3	2.6	1.6	trace[1]	2.0	trace[1]	trace[1]
Siltstone	trace[1]	—	—	—	—	4.0	10.8	—	—	—
Potassium Feldspar	—	1.2	1.6	4.0	3.4	3.2	1.3	1.3	—	1.8
Hematite	—	3.2	1.2	—	1.7	—	trace[1]	trace[1]	—	—
Paste	57.4	67.5	63.4	64.6	60.2	53.2	67.3	46.3	65.8	70.0
Voids	10.4	10.3	7.9	5.3	6.1	13.1	9.0	25.3	6.4	5.4
Mean inclusion size (mm)	.439	.244	.285	.390	.199	.227	.307	.390	.339	.174

Footnote:
[1] Trace = <1 percent.

Table G-8
Statistics Relating to the Frequency and Size of Inclusions for the Primary Inclusion Groups
Identified in the Sample Set from Site 41TT670

Sample Number	Percent of Total Points Counted	Mean Size (mm)	ρ	Median	Mode	Range
Sherd/Bone Primary Inclusion Group						
3-1	1.2 - sherd	.337	.117	.325	.440	.21-.44
	24.0 - bone	.552	.329	.800	.400	.10-1.50
58-1	4.5 - sherd	.636	.205	.595	.790	.32-.87
	4.5 - bone	.403	.335	.545	.200	.14-.95
406-1	4.6 - sherd	.408	.204	.440	.400	.12-.76
	1.3 - bone	.280	.113	.310	.220	.21-.41
544-2	8.3 - sherd	.806	.237	.755	.900	.26-1.25
	7.3 - bone	.454	.299	.610	.110	.07-1.15
544-9	18.8 - sherd	.439	.265	.545	.250	.11-.98
	1.1 - bone	.615	.021	.615	.600	.60-.63
Sherd Primary Inclusion Group						
256-2	11.3	.618	.193	.600	.630	.25-.95
256-3	14.0	.708	.399	1.36	.460	.22-2.50
266-12	11.4	.404	.219	.425	.560	.12-.73
544-12	10.9	.324	.123	.325	.330	.13-.52
Bone Primary Inclusion Group						
260-6	11.7	.392	.172	.430	.380	.16-.70

The shape of the primary inclusions in this group appears to vary within, but not between, individual samples. The majority of sherd inclusions within all samples exhibit high roundness and either high or intermediate sphericity—shapes typical of ground sherd inclusions. The bone inclusions within the group exhibited either intermediate roundness and low sphericity or very irregular shapes. As noted above, it appears that these shapes are representative of bone inclusions.

The Sherd Primary Inclusion Group

A comparison of frequency of inclusion between the four samples in the Sherd Primary Inclusion Group indicates a rather low degree of variability, ranging from 10.9 to 14.0 percent of the total points counted (see Table G-8). Comparison of mean size of primary inclusion between the samples indicates a substantially higher degree of variability, ranging from .324 (medium sand-sized) to .708 mm (coarse sand-sized). Like the Sherd Primary Inclusion Group from the site 41BW553 sample set, there appears to be a positive correlation between frequency of inclusion and mean size of inclusion. In general, as the mean size of the inclusions increase, the frequency of the inclusions also increase (Note: observations were independent so that individual sherd particles were characterized only once, regardless of size). The addition of more, and larger, sherd particles may be related to the size and/or the functional requirements of the vessels represented by these samples.

Variability was also noted in the estimated porosity of these samples. Three of the four samples in this group (Sample Nos. 256-2, 256-3, and 544-12) contained relatively few voids (7.9 percent, 5.3 percent, and 5.4 percent, respectively), and therefore, these samples are probably less porous than the fourth one in this group—Sample No. 266-12, with 13.1 percent voids. Unlike the sherd-tempered ceramics from site 41BW553, there appears to be no relationship between the frequency of inclusions and the estimated porosity of the samples in this group from site 41TT670.

The shape of the sherd inclusions varied little within and between the samples in this group. As is the case with other samples examined in this study, sherd particles tend to exhibit high roundness and either high or intermediate sphericity.

The Bone Primary Inclusion Group

A single specimen, Sample No. 260-6, constitutes the Bone Primary Inclusion Group for the 41TT670 sample set. As indicated in Table G-8, 11.7 percent of the total points counted within this sample were bone inclusions. Mean size of the bone inclusions in this sample was .392, or what is classified as medium sand-sized. Like the bone-tempered sample from site 41BW553, the vessel represented by Sample No. 260-6 probably was not very porous, as is suggested by a low percentage of voids (6.1 percent).

The shape of bone inclusions within this sample was similar to those in other sample with bone temper examined in this study. Some of the bone fragments exhibited intermediate roundness and low sphericity, while others were quite irregular in shape.

Temporal Variation

In regard to temporal variation in the occurrence of these primary inclusion groups, there seem to be some trends, but it is unclear if they are real or simply caused by the small size of the sample set. Of the five samples belonging to the Sherd/Bone Primary Inclusion Group, three (Sample Nos. 406-1, 544-2, and 544-9) have been judged to possibly be Early Caddoan in age (keeping in mind that this actually means that they may belong to the early facet of a single component which spans parts of the Early and Middle Caddoan periods), while the other two (Sample Nos. 3-1 and 58-1) are believed to be Middle Caddoan in age. In contrast, the Sherd Primary Inclusion Group consists of three samples dated to the Middle Caddoan period (Sample Nos. 256-2, 256-3, and 266-12) and one dated to the Early Caddoan period (Sample No. 544-12). Finally, the single representative of the Bone Primary Inclusion Group (Sample No. 260-6) is dated to the Middle Caddoan period. This suggests that combined sherd/bone temper was more frequent during the Early Caddoan period (75 percent) but decreased in frequency during the Middle Caddoan period (33.3 percent), giving way to the use of either sherd or bone temper, alone (50.0 and 16.7 percent, respectively).

A closer look at these differences suggests that, overall, a slightly greater amount of primary inclusions were added to the paste during the Middle Caddoan period (mean=13.8 percent) than during the Early Caddoan period (mean=13.1 percent). Likewise, the overall size of the primary inclusions appears to have been slightly larger during the Middle Caddoan (mean=.51 mm) than during the Early Caddoan (mean=.48 mm) period. These differences may be related to changes in vessel size and/or functional requirements through time. Of possibly more significance is the fact that the proportion of voids in the samples decreased from the Early Caddoan period (mean=11.5 percent) to the Middle Caddoan period (mean=8.5 percent), implying that the vessels represented by the Middle Caddoan samples were less porous, overall. Unfortunately, the question of whether or not these differences are actually due to changes in ceramic technology or in vessel size and/or function through time, or simply the result of sampling error, cannot presently be answered.

Analysis of Secondary Inclusions

The 41TT670 sample set also exhibited a high degree of variability in the mineralogical composition of secondary inclusions. Of the 10 samples comprising the sample set, five qualitatively discrete compositional groups were recognized. As was the case with the 41BW553 sample set, these compositional groups appear to crosscut the primary inclusion groups previously identified. Compositional Group F, which includes members of the Sherd/Bone, Bone, and Sherd Primary Inclusion Groups (n=4), consists of monocrystalline quartz and quartzite, with lesser percentages of potassium feldspar and hematite (Table G-9).

The mean size of secondary inclusions within this group ranged from .060 to .124 mm, or what can be described as silt to very fine sand (Table G-10). Based on these data, it is suggested that the vessels represented by Sample Nos. 58-1 (sherd/bone), 256-2 (sherd), and 544-2 (sherd/bone) were manufactured from silty clays, while Sample No. 260-6 was formed from a very fine sandy clay.

The shape of grains within and between these samples appear to vary slightly as a consequence of size. In general, silt-sized particles exhibited high roundness and high sphericity while slightly larger, very fine or fine sand-sized grains exhibited either high or intermediate roundness and either high or intermediate sphericity.

These data suggest that the samples represented by Compositional Group F were formed from compositionally similar clays that were texturally variable. Because this compositional group contains the most samples from the 41TT670 sample set (n=4) local manufacture may be indicated. However, well-founded statements regarding the local vs. nonlocal status of these samples awaits a comparative analysis of locally-occurring clays.

The second compositional group identified within the 41TT670 sample set, Compositional Group G, is represented by two specimens, Sample No. 3-1 (sherd/bone) and Sample No. 266-12 (sherd). As indicated in Table G-9, Compositional Group G is composed of monocrystalline quartz, naturally-occurring siltstone, potassium feldspar, and quartzite. The presence of naturally-occurring siltstone and the absence of hematite distinguish this group from Compositional Group F. The mean size of the secondary inclusions within this group ranged from .089 to .136 mm, or what can be classified as very fine to fine sand-sized particles (see Table G-10). The higher percentage of relatively large siltstone grains within Sample No. 266-12 explains the mean size difference between the samples.

Table G-9
Percentages of Secondary Inclusions Present in Identified Compositional Groups in Sample Set from Site 41TT670

Sample Number	Secondary Inclusion				
	Monocrystalline Quartz	Quartzite	Hematite	Potassium Feldspar	Siltstone
Compositional Group F					
58-1 (sherd/bone)	7.1	1.2	3.2	1.2	—
256-2 (sherd)	13.8	trace[1]	1.2	1.6	—
260-6 (bone)	14.5	2.6	1.7	3.4	—
544-2 (sherd/bone)	8.6	2.0	trace[1]	1.3	—
Compositional Group G					
3-1 (sherd/bone)	4.8	trace[1]	—	trace[1]	trace[1]
266-12 (sherd)	13.1	1.6	—	3.2	4.0
Compositional Group H					
406-1 (sherd/bone)	5.8	trace[1]	trace[1]	1.3	10.8
Compositional Group I					
256-3 (sherd)	10.6	1.3	—	4.0	—
544-12 (sherd)	11.8	trace[1]	—	1.8	—
Compositional Group J					
544-9 (sherd/bone)	7.6	trace[1]	—	—	—

Footnotes:
[1] Trace = <1 percent.

The shape of grains varied somewhat within, but not between, samples. In general, silt-sized particles within these samples exhibited high roundness and high sphericity. Larger grains, mainly siltstone, exhibited slightly less round and, in general, slightly less spherical shapes than smaller, silt-sized particles. The generally round and spherical shapes of the siltstone grains suggests that they were probably naturally-occurring within these clays, since less round and spherical shapes would be expected from siltstones that were crushed and/or ground prior to addition as a tempering agent (see the Crushed Siltstone Primary Inclusion Group identified at site 41BW553).

The third compositional group identified at site 41TT670, Compositional Group H, is represented by a single specimen, Sample No. 406-1 (sherd/bone). This sample is characterized by the presence of siltstone, monocrystalline quartz, quartzite, potassium feldspar, and hematite (see Table G-9). The presence of siltstone distinguishes this sample from Compositional Group F, while the presence of hematite distinguishes it from Compositional Group G. The mean size of secondary inclusions within this sample was .277 mm, or what is referred to as medium sand (see Table G-10). It is apparent that the majority of larger grains within the sample are naturally-occurring siltstone. Based on this data, it is suggested that the vessel represented by this sample was probably manufactured from a medium sandy clay.

As is typical, the shape of the grains within this sample varied slightly as a consequence of size. The great majority of smaller, silt-sized grains exhibited high roundness and high sphericity, while the majority of the larger grains, particularly the siltstone, exhibited high roundness and intermediate sphericity. As is the case for Sample Nos. 3-1 and 266-12, the shape of the siltstone grains is interpreted as representing naturally-occurring inclusions.

Table G-10
Statistics Relating to the Size of Secondary Inclusions Present in Identified Compositional Groups in Sample Set from Site 41TT670

Sample Number	Mean Size (mm)	ρ	Median	Mode	Range
Compositional Group F					
58-1 (sherd/bone)	.060	.043	.095	.030	.01-.18
256-2 (sherd)	.065	.076	.190	.030	.01-.37
260-6 (bone)	.124	.078	.175	.060	.03-.32
544-2 (sherd/bone)	.082	.063	.180	.060	.01-.35
Compositional Group G					
3-1 (sherd/bone)	.089	.109	.215	.030	.01-.42
266-12 (sherd)	.136	.145	.325	.050	.01-.64
Compositional Group H					
406-1 (sherd/bone)	.277	.253	.455	.100	.01-.90
Compositional Group I					
256-3 (sherd)	.110	.064	.130	.110	.02-.24
544-12 (sherd)	.054	.040	.075	.020	.01-.14
Compositional Group J					
544-9 (sherd/bone)	.048	.036	.065	.050	.01-.12

Two specimens (Sample Nos. 256-3 and 544-12) are included within the next group, Compositional Group I. As indicated in Table G-9, this compositional group is composed of monocrystalline quartz, quartzite, and potassium feldspar. The absence of hematite and siltstone distinguish this compositional group. The mean size of secondary inclusions within this group ranged between .054 and .110 (see Table G-10). These data suggest that one of the samples (256-3) was probably formed from a very fine sandy clay, while the other (544-12) may have been manufactured from a silty clay.

The final compositional group identified in the 41TT670 sample set, Compositional Group J, is represented by Sample No. 544-9 (sherd/bone). This sample proved to have the least complex composition. As indicated in Table G-9, Compositional Group J is comprised of monocrystalline quartz, with a very small amount of quartzite. The mean size of the monocrystalline quartz grains within this sample was .048 mm, which falls within the range of silt (see Table G-10). As is typical of silt-sized grains, the secondary inclusions within this sample exhibited highly rounded and highly spherical shapes.

The relatively small percentage of samples present in Compositional Groups G (n=2), H (n=1), I (n=1), and J (n=1) may indicate nonlocal manufacture, although it is also possible that local clays occurring in proximity to site 41TT670 are mineralogically variable. Therefore, local manufacture of the vessels represented by these samples cannot be discounted at this time.

Discussion

The analysis of the 41TT670 sample set revealed a high degree of technological and compositional variability. Of the ten total samples, three different types or combinations of types of inclusions were added as tempering agents (i.e., sherd alone, bone alone, and sherd/bone in combination). Like the variation in the 41BW553 sample set, variability in the amount and mean size of primary inclusions, and in the frequency of voids, suggest that some degree of technological variation exists within these groups, which may be temporally related. A comparison of these primary inclusion groups with regard to the estimated ago of the samples suggests that sherd and bone used in combination may have been more prevalent during the Early Caddoan portion of the Caddoan occupation of site 41TT670, while sherd and bone used separately may have been more common during the later, Middle Caddoan, portion of the occupation.

The analysis of secondary inclusions identified what appear to be five discrete compositional groups that crosscut the primary inclusion groups. One of these, Compositional Group F, is the most common at the site (n=4) and may have been locally manufactured. The remaining six samples from 41TT670 were divided among four discrete compositional groups. It is possible that some of these represent nonlocally manufactured vessels, but again, this interpretation must be regarded as tentative. No patterning by primary inclusion type for these discrete groups was discerned.

The data suggest that only pottery of Compositional Group F and Compositional Group I were in use during both the Early and Middle Caddoan occupation of the site. This supports the idea that Compositional Group F is of local origin, and suggests that the same may be true of Compositional Group I. Compositional Groups H and J are associated only with samples dated to the Early Caddoan period, but since each group consists of only a single sample, it is possible that these associations are only the result of sampling error. Of possibly more significance is the association of Compositional Group G only with samples ascribed to the Middle Caddoan period. While this could also result from sampling error, it is possible that it indicates either (1) a nonlocal source of pottery only available during the Middle Caddoan period, or (2) a source of local clay which was not exploited prior to the Middle Caddoan period. Complete resolution of this problem must await a comparative analysis of locally-occurring clays.

CONCLUSION

A comparison of the technological and compositional variability in the thin sections from sites 41BW553 and 41TT670 revealed similarities and differences both within and between the two sample sets. Although a high degree of variation in primary inclusion type was evident *within* the two sample sets, less variation was evident *between* them. In both cases, potters appear to have added either sherd, bone, or a combination of sherd and bone to the majority of the ceramics they produced. Although subtle technological variations exist within and between the sample sets from the two sites, ceramics representing these different primary inclusion groups are essentially similar at both locations.

The identification of primary inclusions of shell and crushed siltstone in a small number of samples from site 41BW553 sample set constitutes what appears to be a significant difference. The samples containing primary inclusions of shell are believed to date to a Late Caddoan occupation at site 41BW553. The absence of this type of tempering at site 41TT670 is presumed to be a consequence of the earlier occupation of this site, since the available data indicates this site was occupied during the Early and Middle Caddoan periods, an occupational span predates the appearance of shell-tempered pottery in this region. Therefore, the representation of this pottery type constitutes a chronological difference between the two sites. Interestingly, the shell-tempered specimens from site 41BW553 exhibit compositions that seem to suggest nonlocal manufacture. If this is the case, then the circulation of a technologically discrete ceramic may be indicated. The single example of crushed siltstone-tempered pottery is more difficult to interpret. The sample is believed to date to the Early Caddoan occupation at site 41BW553, and may be of local manufacture based on its composition. It may be that this specimen represents a period of experimentation in local ceramic production.

The results of this study provide no indication that ceramics circulated between sites 41BW553 and 41TT670. A comparison of the type and proportion of secondary inclusions present in each sample reveals qualitative differences between the sample sets from the two sites. In neither case, was a compositional group identified at one site found to be present at the other. Despite this, the movement of ceramics into both sites from other areas or regions may be indicated by the identification of small numbers of compositionally discrete samples. However, a comparative analysis of clays occurring in proximity to these sites is required to better assess the evidence for local vs. nonlocal production of these samples.

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APPENDIX H

RESULTS OF OXIDIZABLE CARBON RATIO AND RADIOCARBON DATING AT SITES 41BW553 AND 41TT670

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REPORT OF RADIOCARBON DATING ANALYSES

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DATE RECEIVED: June 24, 1996

DATE REPORTED: August 21, 1996

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)
Beta-94626	920 +/- 80 BP	-27.4 o/oo	880 +/- 80 BP

SAMPLE #: 41BW553 FS 323, U. 67, L6
ANALYSIS: AMS(GNS)
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)
Beta-94627	930 +/- 70 BP	-27.1 o/oo	890 +/- 70 BP

SAMPLE #: 41BW553 FS 493, Feat. 3, L8
ANALYSIS: AMS(GNS)
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)
Beta-94628	450 +/- 70 BP	-26.0 o/oo	430 +/- 70 BP

SAMPLE #: 41BW553 FS 495, Feat. 1, L4
ANALYSIS: AMS(GNS)
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)
Beta-94629	580 +/- 90 BP	-26.9 o/oo	550 +/- 90 BP

SAMPLE #: 41BW553 FS 521, Unit 67, L4
ANALYSIS: AMS(GNS)
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)
Beta-94630	280 +/- 70 BP	-27.8 o/oo	240 +/- 70 BP

SAMPLE #: 41TT670/FS 678/499,726/L-2
ANALYSIS: AMS(GNS)
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

BETA ANALYTIC INC.

DR. J.J. STIPP and DR. M.A. TAMERS

UNIVERSITY BRANCH
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305/667-5167 FAX: 305/663-0964
E-mail: beta@analytic.win.net

REPORT OF RADIOCARBON DATING ANALYSES

FOR: Mr. Duane E. Peter

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)
Beta-94631	860 +/- 100 BP	-26.1 o/oo	840 +/- 100 BP

SAMPLE #: 41TT670/FS 702/499,724/L-5
ANALYSIS: AMS(GNS)
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

NOTE: It is important to read the calendar calibration information and to use the calendar calibrated results (reported separately) when interpreting these results in AD/BC terms.

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

BETA ANALYTIC INC.

RADIOCARBON DATING SERVICES

Dr. MURRY A. TAMERS
Mr. DARDEN G. HOOD
Directors

RONALD E. HATFIELD
Laboratory Manager

CHRISTOPHER PATRICK
TERESA A. ZILKO-MILLER
Associate Managers

August 21, 1996

Mr. Duane E. Peter
Geo-Marine, Inc.
Engineering and Environmental
Services
550 East Fifteenth Street
Plano, TX 75074

Dear Mr. Peter:

Please find enclosed the AMS radiocarbon dating results for six charcoal samples from sites 41TT670 and 41BW553. Pretreatment (full acid/alkali/acid), synthesis and counting went normally. As always, if you have any questions, don't hesitate to contact us.

Our invoice is enclosed. Please give it to the appropriate office for payment or send VISA charge authorization. Thank you.

Sincerely,

Darden Hood

4985 S.W. 74 COURT, MIAMI, FL 33155 U.S.A.
TELEPHONE: 305-667-5167 / FAX: 305-663-0964 / INTERNET: beta@analytic.win.net
WWW HOME PAGE: http://www.win.net/~analytic/

PRETREATMENT GLOSSARY

Pretreatment of submitted materials is required to eliminate secondary carbon components. These components, if not eliminated, could result in a radiocarbon date which is too young or too old. Pretreatment does not ensure that the radiocarbon date will represent the time event of interest. This is determined by the sample integrity. The old wood effect, burned intrusive roots, bioturbation, secondary deposition, secondary biogenic activity incorporating recent carbon (bacteria) and the analysis of multiple components of differing age are just some examples of potential problems. The pretreatment philosophy is to reduce the sample to a single component, where possible, to minimize the added subjectivity associated with these types of problems.

"acid/alkali/acid"

The sample was first gently crushed/dispersed in deionized water. It was then given hot HCl acid washes to eliminate carbonates and alkali washes (NaOH) to remove secondary organic acids. The alkali washes were followed by a final acid rinse to neutralize the solution prior to drying. Chemical concentrations, temperatures, exposure times, and number of repetitions, were applied accordingly with the uniqueness of the sample. Each chemical solution was neutralized prior to application of the next. During these serial rinses, mechanical contaminants such as associated sediments and rootlets were eliminated. This type of pretreatment is considered a "full pretreatment". On occasion the report will list the pretreatment as "acid/alkali/acid - insolubles" to specify which fraction of the sample was analyzed. This is done on occasion with sediments (See "acid/alkali/acid - solubles"

Typically applied to: charcoal, wood, some peats, some sediments, textiles

"acid washes"

Surface area was increased as much a possible. Solid chunks were crushed, fibrous materials were shredded, and sediments were dispersed. Acid (HCl) was applied repeatedly to ensure the absence of carbonates. Chemical concentrations, temperatures, exposure times, and number of repetitions, were applied accordingly with the uniqueness of each sample. The sample, for a number of reasons, could not be subjected to alkali washes to ensure the absence of secondary organic acids. The most common reason is that the primary carbon is soluble in the alkali. Dating results reflect the total organic content of the analyzed material. Their accuracy depends on the researcher's ability to subjectively eliminate potential contaminants based on contextual facts.

Typically applied to: organic sediments, some peats, small wood or charcoal, special cases

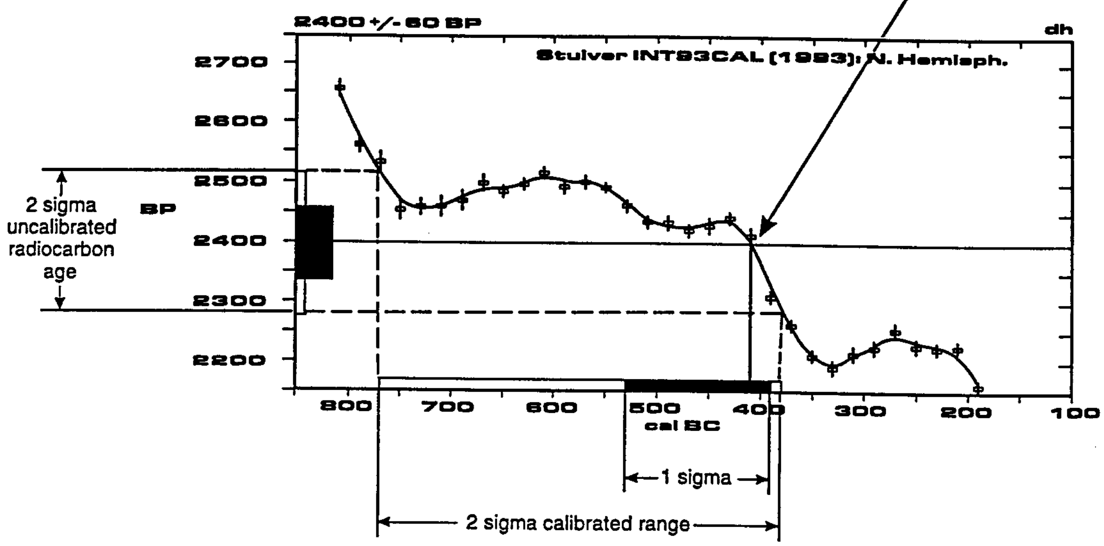
EXPLANATION OF THE BETA ANALYTIC DENDRO-CALIBRATION PRINTOUT

CALIBRATION OF RADICARBON AGE TO CALENDAR YEARS

Laboratory Number:	Beta-12345	
Radiocarbon age:	**2400 +/- 60 BP** ←	The uncalibrated radiocarbon age (± 1 sigma)
The recommended calibration age range to be used for interpretation → **Calibrated result: (2 sigma, 95% probability)**	**cal BC 770 to 380**	

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal BC 410 ←	The intercept between the radiocarbon age & the calibrated calendar time scale curve
The calibration result of the radiocarbon age ± 1 sigma → 1 sigma calibrated result: (68% probability)	cal BC 530 to 390	



References:

Vogel, J. C., Fuls, A., Visser, E. and Becker, B., 1993, Radiocarbon 33(1), p73-86
Talma, A. S. and Vogel, J. C., 1993, Radiocarbon 35(2), p317-322
Stuiver, M., Long, A., Kra, R. S. and Devine, J. M., 1993, Radiocarbon 35(1)

Results prepared by:

Beta Analytic, Inc., 4985 S.W. 74th Court, Miami, Florida 33155

Reporting results (recommended):

1. List the radiocarbon age with its associated 1 sigma standard deviation in a table and designate it as such.
2. Discussion of ages in the text should focus on the 2 sigma calibrated range.

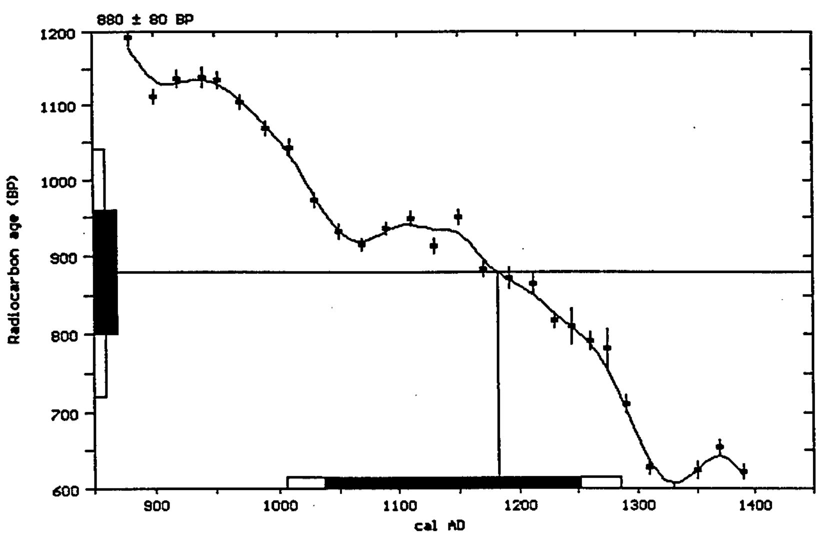
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables:C13/C12=-27.4:lab mult.=1)

Laboratory Number:	Beta-94626
Conventional radiocarbon age:	**880 ± 80 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 1005 to 1285**

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 1180
1 sigma calibrated results: (68% probability)	cal AD 1035 to 1250



References:

Pretoria Calibration Curve for Short Lived Samples
Vogel, J. C., Fuls, A., Visser, E. and Becker, B., 1993, Radiocarbon 35(1), p73-86
A Simplified Approach to Calibrating C14 Dates
Talma, A. S. and Vogel, J. C., 1993, Radiocarbon 35(2), p317-322
Calibration - 1993
Stuiver, M., Long, A., Kra, R. S. and Devine, J. M., 1993, Radiocarbon 35(1)

Beta Analytic Radiocarbon Dating Laboratory

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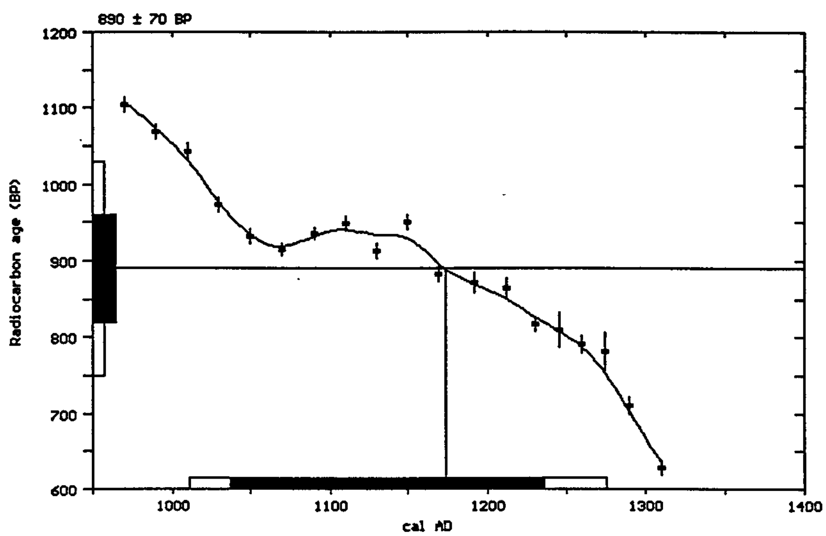
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables:C13/C12=-27.1:lab mult.=1)

Laboratory Number:	Beta-94627
Conventional radiocarbon age:	**890 ± 70 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 1010 to 1275**

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 1175
1 sigma calibrated results: (68% probability)	cal AD 1035 to 1235



References:

Pretoria Calibration Curve for Short Lived Samples
Vogel, J. C., Fuls, A., Visser, E. and Becker, B., 1993, Radiocarbon 35(1), p73-86
A Simplified Approach to Calibrating C14 Dates
Talma, A. S. and Vogel, J. C., 1993, Radiocarbon 35(2), p317-322
Calibration - 1993
Stuiver, M., Long, A., Kra, R. S. and Devine, J. M., 1993, Radiocarbon 35(1)

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables:C13/C12=-26:lab mult.=1)

Laboratory Number: Beta-94628

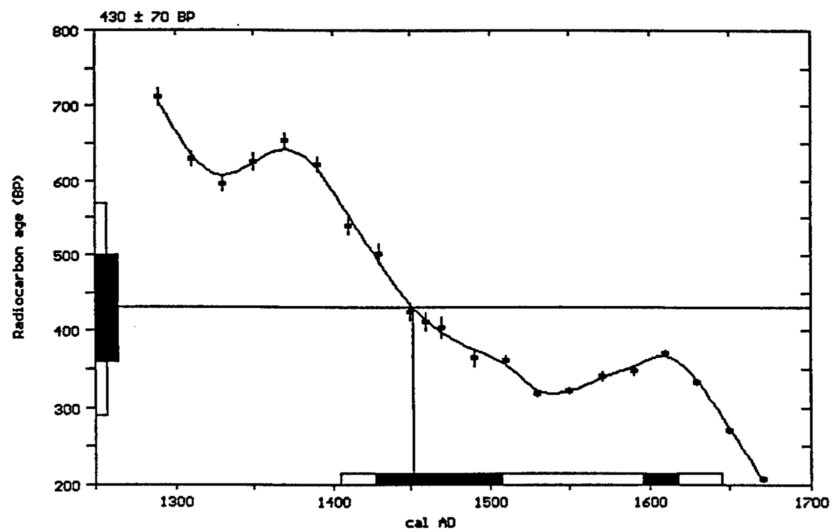
Conventional radiocarbon age: **430 ± 70 BP**

Calibrated results: **cal AD 1405 to 1645**
(2 sigma, 95% probability)

Intercept data:

Intercept of radiocarbon age with calibration curve: cal AD 1450

1 sigma calibrated results: (68% probability) cal AD 1425 to 1505 and cal AD 1595 to 1620



References:

Pretoria Calibration Curve for Short Lived Samples
Vogel, J. C., Fuls, A., Visser, E. and Becker, B., 1993, Radiocarbon 35(1), p73-86
A Simplified Approach to Calibrating C14 Dates
Talma, A. S. and Vogel, J. C., 1993, Radiocarbon 35(2), p317-322
Calibration - 1993
Stuiver, M., Long, A., Kra, R. S. and Devine, J. M., 1993, Radiocarbon 35(1)

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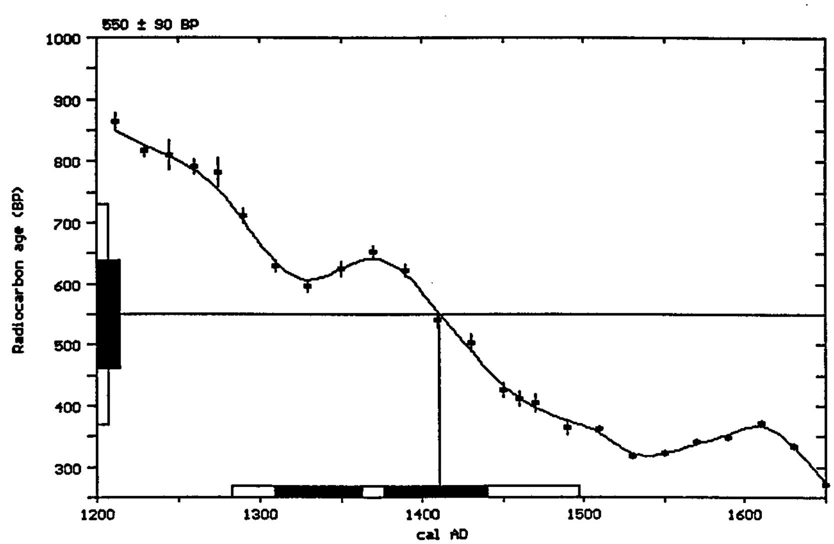
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables:C13/C12=-26.9:lab mult.=1)

Laboratory Number:	Beta-94629
Conventional radiocarbon age:	**550 ± 90 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 1285 to 1495**

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 1410
1 sigma calibrated results: (68% probability)	cal AD 1310 to 1365 and cal AD 1375 to 1440



References:

Pretoria Calibration Curve for Short Lived Samples
Vogel, J. C., Fuls, A., Visser, E. and Becker, B., 1993, Radiocarbon 35(1), p73-86
A Simplified Approach to Calibrating C14 Dates
Talma, A. S. and Vogel, J. C., 1993, Radiocarbon 35(2), p317-322
Calibration - 1993
Stuiver, M., Long, A., Kra, R. S. and Devine, J. M., 1993, Radiocarbon 35(1)

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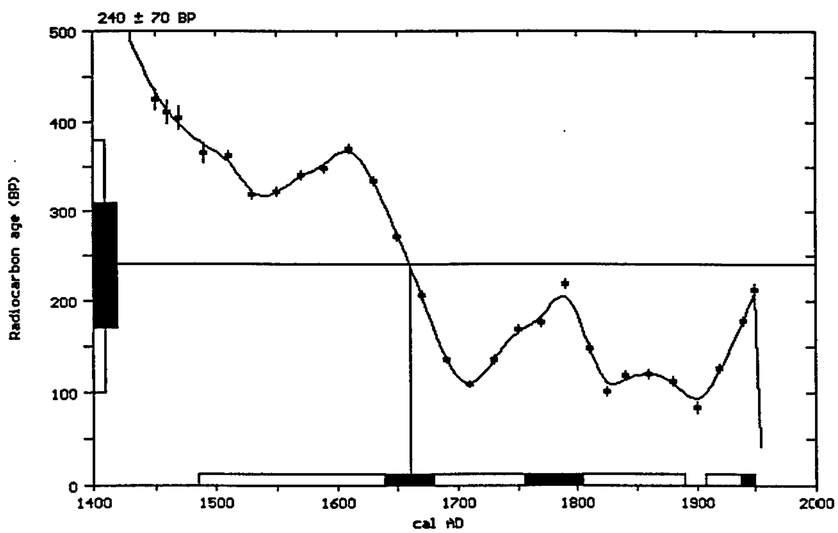
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-27.8:lab. mult=1)

Laboratory Number:	Beta-94630
Conventional radiocarbon age:	**240 ± 70 BP**
Calibrated results: **(2 sigma, 95% probability)**	**cal AD 1485 to 1890 and** **cal AD 1905 to 1950**

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 1660
1 sigma calibrated results: (68% probability)	cal AD 1640 to 1680 and cal AD 1755 to 1805 and cal AD 1940 to 1950



References:

Pretoria Calibration Curve for Short Lived Samples
Vogel, J. C., Fuls, A., Visser, E. and Becker, B., 1993, Radiocarbon 35(1), p73-86
A Simplified Approach to Calibrating C14 Dates
Talma, A. S. and Vogel, J. C., 1993, Radiocarbon 35(2), p317-322
Calibration - 1993
Stuiver, M., Long, A., Kra, R. S. and Devine, J. M., 1993, Radiocarbon 35(1)

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-26.1:lab. mult=1)

Laboratory Number: Beta-94631

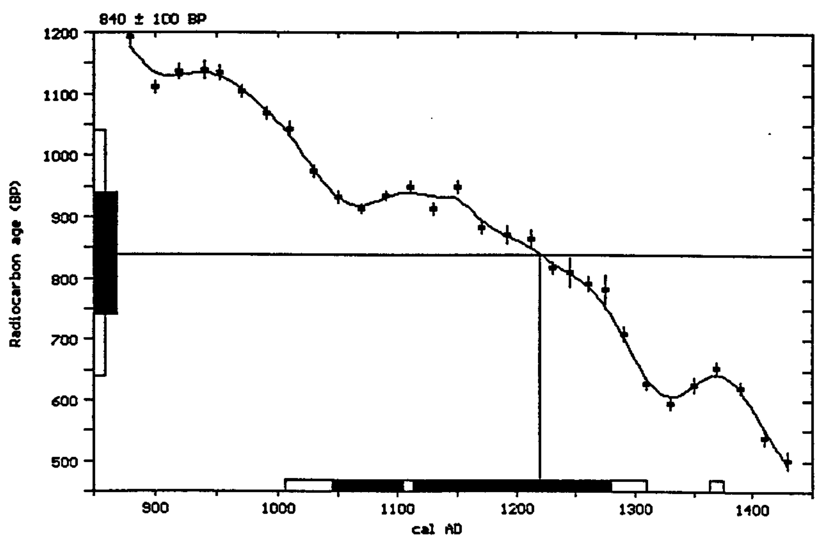
Conventional radiocarbon age: **840 ± 100 BP**

Calibrated results:
(2 sigma, 95% probability)
cal AD 1005 to 1310 and
cal AD 1365 to 1375

Intercept data:

Intercept of radiocarbon age with calibration curve: cal AD 1220

1 sigma calibrated results: (68% probability)
cal AD 1045 to 1105 and
cal AD 1115 to 1280



References:

Pretoria Calibration Curve for Short Lived Samples
Vogel, J. C., Fuls, A., Visser, E. and Becker, B., 1993, Radiocarbon 35(1), p73-86
A Simplified Approach to Calibrating C14 Dates
Talma, A. S. and Vogel, J. C., 1993, Radiocarbon 35(2), p317-322
Calibration - 1993
Stuiver, M., Long, A., Kra, R. S. and Devine, J. M., 1993, Radiocarbon 35(1)

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BETA ANALYTIC INC.
RADIOCARBON DATING LABORATORY
CALIBRATED C-14 DATING RESULTS

Calibrations of radiocarbon age determinations are applied to convert BP results to calendar years. The short term difference between the two is caused by fluctuations in the heliomagnetic modulation of the galactic cosmic radiation and, recently, large scale burning of fossil fuels and nuclear devices testing. Geomagnetic variations are the probable cause of longer term differences.

The parameters used for the corrections have been obtained through precise analyses of hundreds of samples taken from known-age tree rings of oak, sequoia, and fir up to 7,200 BP. The parameters for older samples, up to 22,000 BP, as well as for all marine samples, have been inferred from other evidence. Calibrations are presently provided for terrestrial samples to about 10,000 BP and marine samples to about 8,300 BP.

The Pretoria Calibration Procedure program has been chosen for these dendrocalibrations. It uses splines through the tree-ring data as calibration curves, which eliminates a large part of the statistical scatter of the actual data points. The spline calibration allows adjustment of the average curve by a quantified closeness-of-fit parameter to the measured data points. On the following calibration curves, the solid bars represent one sigma statistics (68% probability) and the hollow bars represent two sigma statistics (95% probability). Marine carbonate samples that have been corrected for $\delta^{13/12}C$, have also been corrected for both global and local geographic reservoir effects (as published in Radiocarbon, Volume 35, Number 1, 1993) prior to the calibration. Marine carbonates that have not been corrected for $\delta^{13/12}C$, have been adjusted by an assumed value of 0 ‰ in addition to the reservoir corrections. Reservoir corrections for fresh water carbonates are usually unknown and are generally not accounted for in those calibrations. In the absence of measured $\delta^{13/12}C$ ratios, a typical value of -5 ‰ was assumed for freshwater carbonates. There are separate calibration data for the Northern and Southern Hemisphere. Variables used in each calibration are listed below the title of each calibration page.

(Caveat: the calibrations assume that the material dated was living for exactly ten or twenty years (e.g. a collection of 10 or 20 individual tree rings taken from the outer portion of a tree that was cut down to produce the sample in the feature dated). For other materials, the maximum and minimum calibrated age ranges given by the computer program are uncertain. The possibility of an "old wood effect" must also be considered, as well as the potential inclusion of some younger material in the total sample. Since the vast majority of samples dated probably will not fulfill the ten/twenty-year-criterium and, in addition, an old wood effect or young carbon inclusion might not be excludable, these dendrocalibration results should be used only for illustrative purposes. In the case of carbonates, reservoir correction is theoretical and the local variations are real, highly variable and dependant on provenience. The age ranges and, especially, the intercept ages generated by the program must be considered as approximations.)

BETA ANALYTIC INC.

RADIOCARBON DATING SERVICES

Dr. MURRY A. TAMERS
Mr. DARDEN G. HOOD
Directors

RONALD E. HATFIELD
Laboratory Manager

CHRISTOPHER PATRICK
TERESA A. ZILKO-MILLER
Associate Managers

ANALYTICAL PROCEDURES AND FINAL REPORT

FINAL REPORT

This package includes the final date report, this statement outlining our analytical procedures, a glossary of pretreatment terms, calendar calibration information, billing documents (containing balance/credit information and the number of samples submitted within the yearly discount period), and peripheral items to use with future submittals. The final report includes the individual analysis method, the delivery basis, the material type and the individual pretreatments applied. Please recall any correspondences or communications we may have had regarding sample integrity, size, special considerations or conversions from one analytical technique to another (e.g. radiometric to AMS). The final report has also been sent by fax or e-mail, where available.

PRETREATMENT

Results were obtained on the portion of suitable carbon remaining after any necessary chemical and mechanical pretreatments of the submitted material. Pretreatments were applied, where necessary, to isolate ^{14}C which may best represent the time event of interest. Individual pretreatments are listed on the report next to each result and are defined in the enclosed glossary. When interpreting the results, it is important to consider the pretreatments. Some samples cannot be fully pretreated making their ^{14}C ages more subjective than samples which can be fully pretreated. Some materials receive no pretreatments. Please read the pretreatment glossary.

ANALYSIS

Materials measured by the radiometric technique were analyzed by synthesizing sample carbon to benzene (92% C), measuring for ^{14}C content in a scintillation spectrometer, and then calculating for radiocarbon age. If the Extended Counting Service was used, the ^{14}C content was measured for a greatly extended period of time. AMS results were derived from reduction of sample carbon to graphite (100 %C), along with standards and backgrounds. The graphite was then sent for ^{14}C measurement in an accelerator-mass-spectrometer located at one of three collaborating laboratories; Lawrence Livermore National Laboratory (CAMS) in California, Eidgenössische Technische Hochschule University (ETH) in Zürich, or Oxford University (Ox) in Oxford, England.

CALENDAR CALIBRATION

The "Conventional C14 Age (*)" is the result after applying C13/C12 corrections to the measured age and is the most appropriate radiocarbon age (the "*" is discussed at the bottom of the final report). Applicable calendar calibrations are included for organic materials and fresh water carbonates between 0 and 10,000 BP and for marine carbonates between 0 and 8,300 BP. If certain calibrations are not included with this report, the results were either too young, too old, or inappropriate for calibration. It is important to read the calibration explanation sheet before interpreting the results (especially for calcareous materials).

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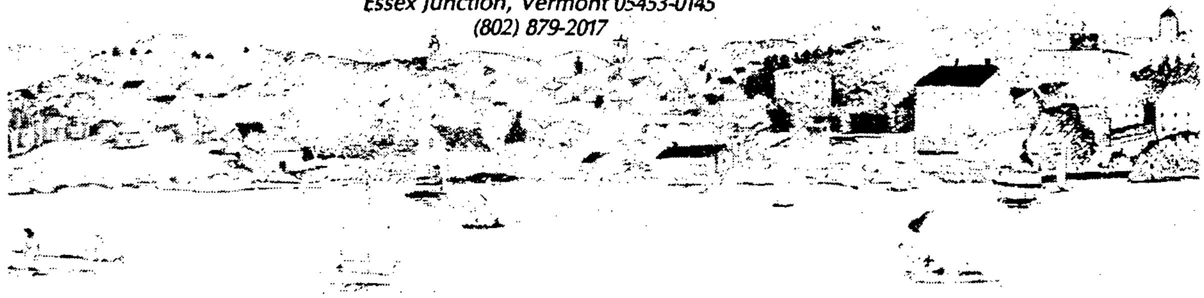
67 Lincoln Street
Essex Junction, Vermont 05453-0145
(802) 879-2017



June 27, 1996

Ms. Debra Beene
Geo-Marine, Inc.
550 East Fifteenth Street
Plano, TX 75074

Dear Ms. Beene:

Thank you for sending us the soil samples from the archaeological sites 41-BW-553 and 41-TT-670 for OCR_{DATE} analyses. These samples were received on May 23, 1996, in good condition. Prior to our analyses, we screened the samples through a 2mm-meshed screen to remove any cultural material. The coarse fraction (including some possible cultural material) is being returned to you for further study. The OCR_{DATE} analyses were conducted in accordance with the procedures outlined in:

Frink, D.
1992 *The Chemical Variability of Carbonized Organic Matter Through Time.* Archaeology of Eastern North America, Vol. 20:67-79.

using the data format and formula as presented in:

Frink, D.
1994 *The Oxidizable Carbon Ratio (OCR): A Proposed Solution to Some of the Problems Encountered with Radiocarbon Data.* North American Archaeologist. Vol.15 (#1).

The results of the OCR analyses for your samples are presented on the separate computer printouts. The bottom line OCR_{DATE} and the confidence interval have been rounded nearest year. Also, the expression of results has been adjusted to "years before present"—defined as 1950, to correspond with ^{14}C radiocarbon data. For example, your sample from TT-670, Caddoan hearth (N499 E724) (ACT #1977) should read OCR_{DATE}: 746 ± 22 YBP. Further rounding may be prudent (e.g., 750 ± 25 YBP).

I hope that the OCR_{DATE} data provided will be helpful in your evaluation of these two sites. If you have further questions on the OCR procedure, please don't hesitate to give us a call. To aid us in improving this dating technique, we would appreciate it if you would send us information on how the OCR_{DATE} corresponds to other data classes for these samples.

Sincerely,

Douglas S. Frink

A BRIEF INTRODUCTION TO THE OCR PROCEDURE FOR DATING ARCHAEOLOGICAL FEATURES

by
The Archaeology Consulting Team

The biological recycling cf organic carbon is fundamental to nearly all biological systems on this planet. While some forms of organic carbon, such as fresh organic matter, are quickly recycled, other more resistant forms, such as humic acids and charcoal, are recycled at a much slower rate. The Archaeology Consulting Team has been analyzing charcoal and soil humic material found in archaeological features and in buried soil profiles through out the United States, and in Somalia in East Africa. Our findings demonstrated that the recycling of these relatively stable forms of organic matter follows a linear progression through time, when considered within the context of those factors that influence biochemical oxidation. In other words, charcoal and soil humic material, once thought to be inert, are biologically recycled at a slow but measurable rate.

The effect of the biochemical degradation of charcoal and soil humic material is measured by a ratio of the total carbon to the readily oxidizable carbon in the sample. This ratio is called the Oxidizable Carbon Ratio, or OCR. The rate of biochemical degradation of the relatively stable forms of organic matter varies within the specific physical and environmental contexts of the sample. To determine an age for the carbon sample, a systems formula was designed to account for the biological influences of oxygen, moisture, temperature, and the media's (soil) reactivity. These variables are measured by soil texture and depth below the soil surface, the site specific mean annual temperature and rainfall, and the soil pH. Residual influences on this system are included through a statistically derived constant.

The sample used in the OCR procedure is principally the soil, consisting of mineral and carbon particles, infilling the archaeological feature. Large pieces of charcoal are normally removed prior to the OCR analysis.

The OCR procedure has many advantages over the conventional radiocarbon procedures. Unlike radiocarbon analysis where the errors are due to the random decay of beta-particles, the errors in the OCR procedure are primarily contextual. The spatial and environmental contexts of the charcoal sample are the principle factors affecting the accuracy and precision of the OCRDATE estimate. With tightly controlled stratigraphic excavation and rigorous environmental data recovery, a relatively precise OCRDATE estimate is expected.

The accuracy and precision of radiocarbon dates are the product of a number of identified effects: long term fluctuations in the strength of the earth's geomagnetic field, carbon reservoir effect, de Vries Effect, Suess Effect, and the Atomic Bomb Effect. Dendrochronological studies have shown that these effects are not constant through time, and exhibit varying degrees of influence on the ^{14}C concentration through time. For this reason, numerous calibration curves have been proposed to account for these effects. Recalibration of the OCRDATE results is not necessary.

The Suess and Atomic Bomb effects are recent phenomena. These effects, in combination with de Vries Effect which has been particularly pronounced since the mid-seventeenth century, have rendered radiocarbon dates on young carbon virtually meaningless. Statistically, radiocarbon dates during this time period are generally reported simply as modern. The OCRDATE results are accurate for samples as young as one year, and have a standard error of less than 3%. For a sample from a fire 100 years ago, the expected precision of the OCRDATE estimate is $\pm$ three years, whereas the confidence interval for a sample 1 0,000 years old is $\pm$ 300 years. The greater precision afforded by the OCRDATE estimate on recent samples makes the OCR procedure a more appropriate dating technique for use on late Native and early European American sites.

The archaeologist, in seeking a date for a feature, is interested in the specific event of human use. In the case of a cooking hearth, that event is the time of carbonization of the wood. Radiocarbon analysis measures the event of 14C absorption by a living organism, which in the case of wood represents the single year of cellular growth in the cambrian layer. Heartwood, composing the bulk of the tree, is not in active growth and no longer absorbs ~ 4C.'4C absorption (the measured sample in radiocarbon analysis) and the burning of the wood (the event for which an age is sought) is called the postsample-growth error. In the Northeast, archaeological features rarely contain single large pieces of charcoal. Thermal extremes and pedoturbations pulverize the fragile charcoal samples. Even under "ideal" conditions, the carbon sample submitted for 14C analysis is usually composed of many small pieces of charcoal representing different pieces of wood. The postsample-growth error is not likely to be the same for all of the pieces in the sample. The OCR procedure measures the change in the readily oxidizable portion of the charcoal from the time immediately after carbonization, when soil biochemical processes resume. With the OCR procedure, the relationship between the sample and the specific event being dated is clear.

The quantity of available charcoal found in archaeological features is another common problem faced by archaeologists in the Northeast. Recent advances in physics, specifically the development of Accelerator Mass Spectrometry (AMS), have provided a means of obtainhng accurate and precise radiocarbon date estimates from vary small samples. However, these procedures are expensive, generally costing more than twice the amount spent for the standard ^{14}C procedures. The budgets for studies conducted by archaeological societies, CRM archaeologists, and universities often lack the flexibility to absorb the additional expense of the AMS procedure.

The size of the charcoal is inconsequential, as the soil sample is ground to pass through a 2-mm meshed screen or smaller, prior to the chemical analyses. The OCR procedure has proven accurate and precise with soil samples containing as little as .5% total carbon. Unlike the AMS radiocarbon dating procedure, the cost of OCR analysis will not require major adjustments in research budgets. The cost per sample for the OCR procedure is roughly one-fifth that of the standard ^{14}C procedure and one-eleventh the cost of the AMS procedure.

Calculated OCR DATE Report

For Geo-Marine, Inc.

02-Jul-96

Sample Id:	ACT # 1974		
Site Id #:	41-TT-670		
Location:	Unit 120; N499, E724		
Feature Type:	Cultural		
Feature Designation:	Caddoan midden--OCR 1		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	687	YBP(1950)	+/- 20

Sample Id:	ACT # 1975		
Site Id #:	41-TT-670		
Location:	TP 120; N499, E724		
Feature Type:	Cultural		
Feature Designation:	Caddoan midden--OCR 2		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	713	YBP(1950)	+/- 21

Sample Id:	ACT # 1976		
Site Id #:	41-TT-670		
Location:	TP 120; N499, E724		
Feature Type:	Cultural		
Feature Designation:	Caddoan midden--OCR3		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	762	YBP(1950)	+/- 22

Sample Id:	ACT # 1977		
Site Id #:	41-TT-670		
Location:	TP 120; N 499, E 724		
Feature Type:	Cultural		
Feature Designation:	Caddoan hearth--OCR 4		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	746	YBP(1950)	+/- 22

Calculated OCR DATE Report

For Geo-Marine, Inc.

02-Jul-96

Sample Id:	ACT # 1978		
Site Id #:	41-TT-670		
Location:	TP 120; N 499, E 724		
Feature Type:	Cultural		
Feature Designation:	Caddoan hearth--OCR 5		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	788	YBP(1950)	+/- 23

Sample Id:	ACT # 1979		
Site Id #:	41-TT-670		
Location:	TP 120; N 499, E 724		
Feature Type:	Cultural		
Feature Designation:	Caddoan midden--OCR 6		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	1005	YBP(1950)	+/- 30

Sample Id:	ACT # 1980		
Site Id #:	41-TT-670		
Location:	TP 120; N 499, E 724		
Feature Type:	Cultural		
Feature Designation:	Caddoan midden--OCR 7		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	898	YBP(1950)	+/- 26

Sample Id:	ACT # 1981		
Site Id #:	41BW553		
Location:	TP 69; N623, E 498		
Feature Type:	Cultural		
Feature Designation:	Caddoan house floor--#214		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	411	YBP(1950)	+/- 12

Calculated OCR DATE Report

For Geo-Marine, Inc.

02-Jul-96

Sample Id:	ACT # 1982		
Site Id #:	41BW553		
Location:	TP 69- N 623, E 498		
Feature Type:	Cultural		
Feature Designation:	Caddoan post mold--#215		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	596	YBP(1950)	+/- 17

Sample Id:	ACT # 1983		
Site Id #:	41BW553		
Location:	TP 67- N 614, E 450		
Feature Type:	Cultural		
Feature Designation:	Caddoan midden--#216		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	276	YBP(1950)	+/- 8

Sample Id:	ACT # 1984		
Site Id #:	41BW553		
Location:	TP 67- N 614, E 450		
Feature Type:	Cultural		
Feature Designation:	Caddoan midden--#217		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	299	YBP(1950)	+/- 8

Sample Id:	ACT # 1985		
Site Id #:	41-BW-553		
Location:	TP 67- N 614, E 450		
Feature Type:	Cultural		
Feature Designation:	Caddoan midden--#218		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	383	YBP(1950)	+/- 11

Calculated OCR DATE Report

For Geo-Marine, Inc.

02-Jul-96

OXIDIZABLE CARBON RATIO

Sample Id:	ACT # 1986		
Site Id #:	41BW553		
Location:	TP 67- N 614, E 450		
Feature Type:	Cultural		
Feature Designation:	Caddoan midden--#219		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	537	YBP(1950)	+/- 16

Sample Id:	ACT # 1987		
Site Id #:	41BW553		
Location:	TP 67- N 614, E 450		
Feature Type:	Cultural		
Feature Designation:	Caddoan ceramic vessel--#		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	907	YBP(1950)	+/- 27

Sample Id:	ACT # 1988		
Site Id #:	41BW553		
Location:	TP 30; N625, E450		
Feature Type:	Cultural		
Feature Designation:	Feature 3--#460		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	1009	YBP(1950)	+/- 30

Sample Id:	ACT # 1989		
Site Id #:	41BW553		
Location:	TP 24; N675 E450		
Feature Type:	Cultural		
Feature Designation:	Feature 1 post mold--#198		
Sample Recieved:	5/23/96		
Calculated OCR DATE:	759	YBP(1950)	+/- 22

APPENDIX I

CURATED MATERIAL RESULTING FROM THE TEST EXCAVATIONS AT SITES 41BW553 AND 41TT670

The materials from this investigation are to be curated at the Texas Archeological Research Labaratory, Austin, Texas. The following list of items enumerates the materials to be curated at this facility under Contract No. DACA63-95-D-0020, Delivery Order No. 0026, with the U.S. Army Corps of Engineers, Fort Worth District:

1. One copy of the Scope of Work
2. One copy of the final report
3. All of the original field notes, maps and records
4. One copy of each site form
5. Black-and-white contact sheets, negatives and photo data sheets
6. Color slides and photo data sheets
7. The original artifact data sheets
8. Computer disk(s) containing the dBASE IV files for the artifact and analysis data
9. One printout of each dBASE IV file, and a codebook for deciphering each database
10. Laboratory and field inventories for all collected materials
11. All collected artifacts and samples