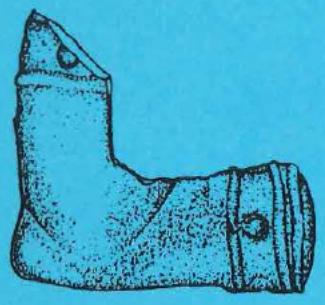
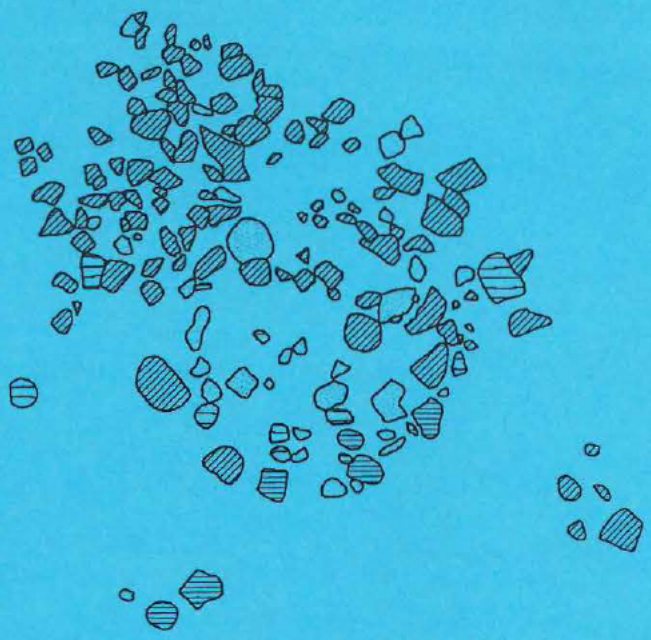
Archaeological Excavations at the Diefenbaugh Site (12-Hu-396): Prehistoric and Historic Occupations in the Upper Wabash Valley, Huntington County, Indiana.

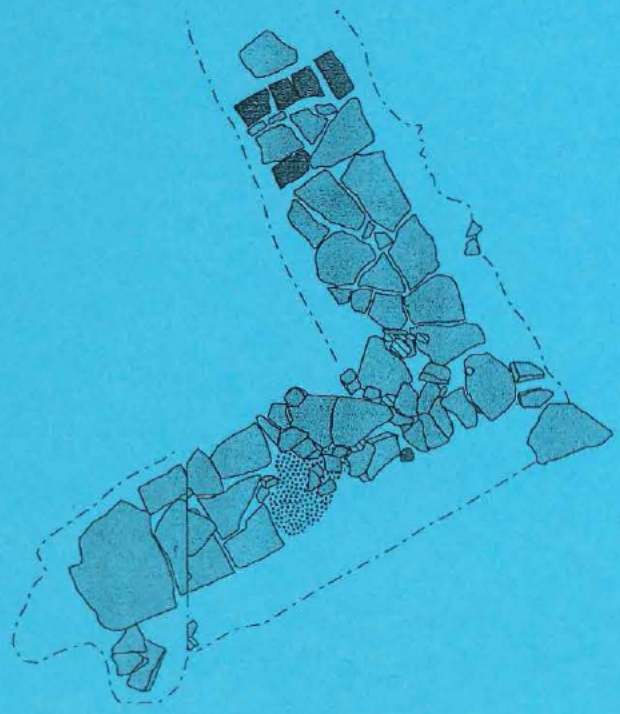
VOLUME 1

by
Susan E. Bamann and Susan E. Baldry

with contributions from
John Bassett,
Annette Ericksen
and Rex Garniewicz







August 1996 Report of Investigation 95IN0077-P3r01
LANDMARK Archaeological and Environmental Services, Inc.

Archaeological Excavations at the Diefenbaugh Site (12-Hu-396): Prehistoric and Historic Occupations in the Upper Wabash Valley, Huntington County, Indiana.

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Prepared For

Indiana Department of Transportation
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Prepared by

Landmark Archaeological and Environmental Services, Inc.
518 S. Main Street
Sheridan, Indiana 46069

Authors
Susan E. Bamann and Susan E. Baldry

Contributors
John L. Bassett, Annette Ericksen, PhD and Rex Garniewicz

Principal Investigator
Susan E. Bamann, PhD

Co-Investigator
Susan E. Baldry

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We would like to thank a number of individuals and groups for their contributions to this project, beginning with members of the Landmark staff. It is partially through their efforts that we have successfully mitigated 12-Hu-396. Rob Mann offered extensive and helpful commentary on the sections of this report dealing with historic occupations at the site. He also was gracious in providing access to his personal reference literature. Jeff Plunkett, David Sherman, and Leonard Van Zeeland contributed their experience to our identification of prehistoric points and chert types. Stacy Bennett was instrumental in the processing of the artifacts and flotation samples and also shared valuable references for the historic material. She is thanked along with the others who worked in the laboratory: Mary Trudeau, Marnie Hilton-Plunkett, Nancy Johnson, and Amy Hartman. Nancy Johnson spent several weeks on the computer preparing high quality site maps, plans and profiles for the report. She also illustrated several of the prehistoric points. The majority of the points were illustrated by Therese Miner, one of our field technicians for the project. Amy Hartman skillfully and accurately illustrated some difficult pieces from the historic assemblage. Another of our field technicians, Michele Lorenzini, offered her experience and guidance in the identification of glass beads from the site. We would also like to acknowledge the valuable support efforts of our former office manager Beth Leitz.

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Mr. and Mrs. Fred and Mary Diefenbaugh, the former property owners and nearby residents, shared information with us and graciously tolerated our rather dirty presence.

Charlie Milholland served as our very cooperative and insightful backhoe operator for the duration of the long field season. Volunteers from the Little Turtle Archaeological Research Society assisted in our excavations. We especially thank volunteer LouAnn Winterrod for her perseverance. Mrs. Luke J. Scheer generously allowed access to the Luke J. Scheer Collection of letters and papers on the history of Huntington County. We thank Jean Gernand of the Historic Forks of the Wabash, Inc. for introducing us to Mrs. Scheer and this collection. Librarians from the Indiana Room of the Huntington County Library and the Andrews Public Library are also thanked for their assistance. Many curious and interested citizens of Huntington who visited the site have also contributed to this project in an indirect way by reminding us of the value of the work reported here.

On a more personal note we would like to thank family and friends who have supported and tolerated us during this work. Our final thanks go to Landmark--Tom Beard in particular--for allowing us the do the fieldwork, research and writing for this project together. It has truly been an valuable experience for both of us.

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CHAPTER 1

INTRODUCTION

The Diefenbaugh Site (12-Hu-396) is significant as part of a growing regional data base pertaining to both prehistoric and historic cultural dynamics in the upper Wabash drainage. Evidence from this multi-component floodplain site sheds light on human occupation during the Early and Late Archaic Periods as well as the era of initial Euro-American settlement and canal construction in Indiana. The site is located in Dallas Township, Huntington County (REDACTED) approximately five miles west of the city of Huntington. The UTM coordinates for the site are Zone 16, 6185E 45262N. Figure 1.1 shows the location and context of the site on the U.S.G.S. 7.5' Bippus Quad.

During June through November of 1995, Landmark Archaeological and Environmental Services, Inc. conducted archaeological excavations at the Diefenbaugh Site. This work was carried out under contract with the Indiana Department of Transportation (INDOT) in order to mitigate potentially adverse effects stemming from planned reconstruction and realignment of U.S. Highway 24 (INDOT Project MAF-146-0). A permit, including an approved data recovery plan, was issued by the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology (September 18, 1991) for the mitigation of adverse effects on significant portions of the site within the INDOT project right-of-way in accordance with 36 CFR Sec. 800.9 (c)(1) [National Historic Preservation Act of 1966, as amended]. Phase II investigations by the Archaeological Resources Management Service (ARMS), Ball State University (Zoll et al. 1991) established the presence of intact subsurface remains within the right-of-way as well as the potential eligibility of the site for nomination to the National Register of Historic Places. In completing Phase III mitigation of the Diefenbaugh Site, Landmark Archaeological and Environmental Services, Inc. (hereupon referred to as Landmark) has complied with federal and state laws, regulations, and guidelines regarding the evaluation and protection of archaeological resources.

The project area for the mitigation of the Diefenbaugh Site was approximately 17,000 m^2 and consisted of a large rectangular section running roughly east-west along U.S. Highway 24 as well a northward extension along County Road 750W. Figure 1.2 shows the project area limits. The entire site, as established in previous surveys, is not contained with in the right-of-way/project area. The portion of the Diefenbaugh Site that does lies within the project area consists of multiple prehistoric occupation areas and two historic components. Portions of the site not included in the project area are located on the agricultural land of Mr. and Mrs. Fred and Mary Diefenbaugh. Figure 1.3 a-c shows several photographic views of the site prior to excavation.

REDACTED

Figure 1.1 Location of 12-Hu-396, the Diefenbaugh Site (U.S.G.S. 7.5'Bippus Quad).

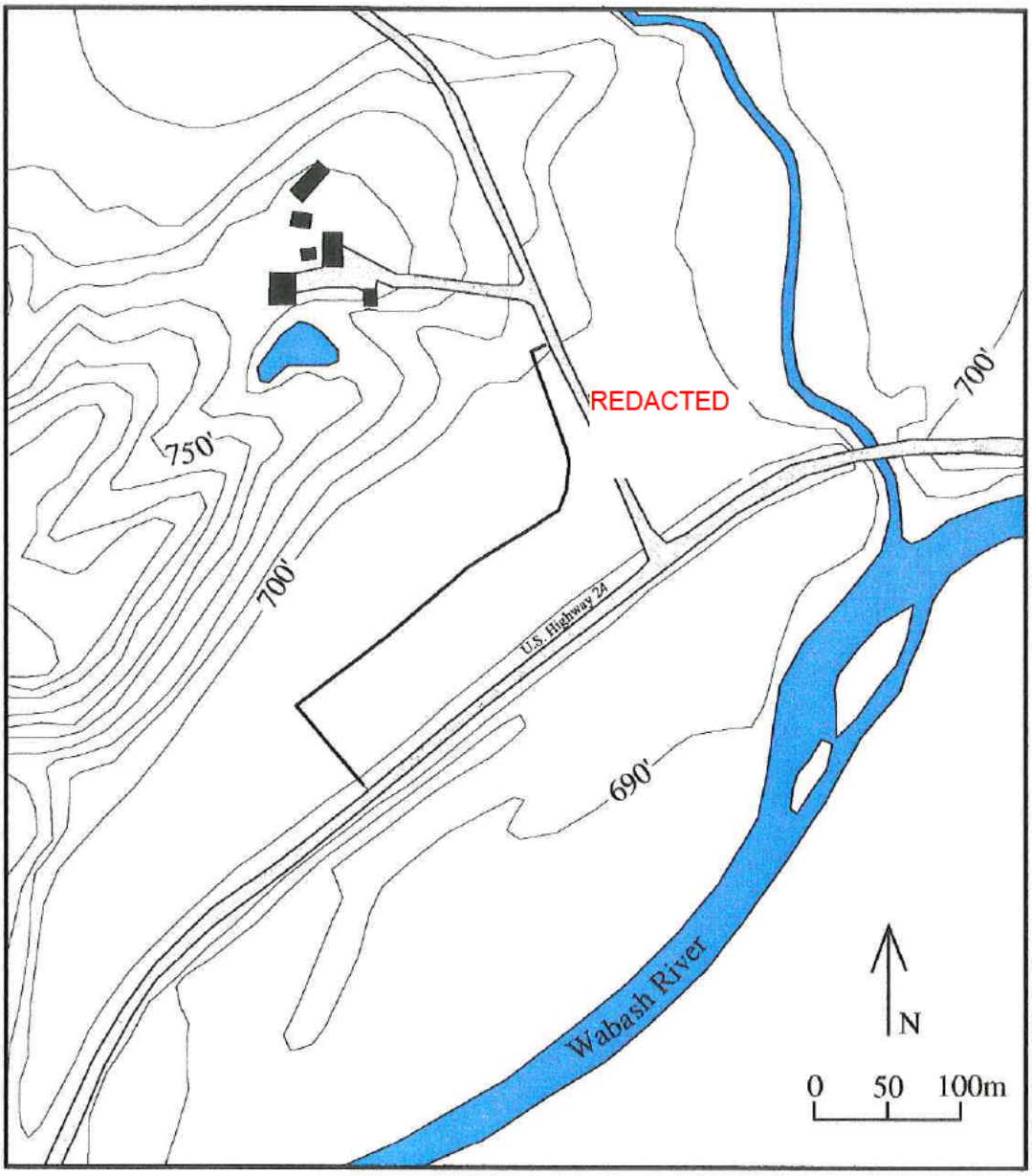


Figure 1.2 Project area for the mitigation of 12-Hu-396 (after Zoll et al. 1991).

Figure 1.3a 12-Hu-396 project area: looking southwest at the main portion of the project area from the intersection of U.S. Highway 24 REDACTED

Figure 1.3b 12-Hu-396 project area: looking southwest at the main portion of the project area and part of the northern extension of the right-of-way from the edge of REDACTED

Figure 1.3c 12-Hu-396 project area: looking north-northwest at the northern extension of the right-of-way from the intersection of U.S. Highway 24 REDACTED

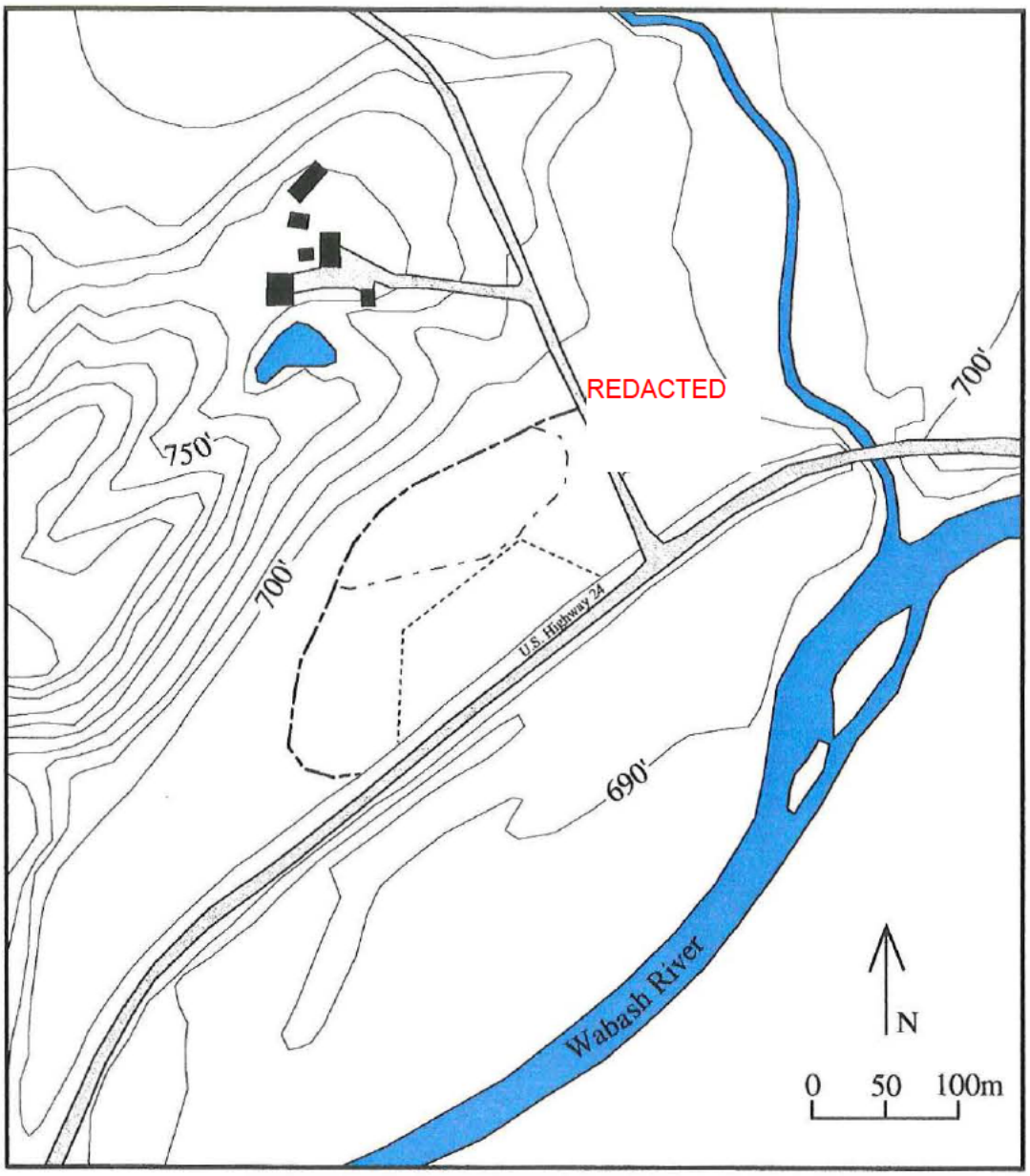
Previous Investigations

The Diefenbaugh site was surveyed and officially reported by Tony DeRegnaucourt (1981). According to the Indiana Historic Sites and Structures Inventory/Archaeological Sites form submitted by ARMS in 1989, DeRegnaucourt collected 100% of the cultural material observed during pedestrian transects. Fifteen flakes, three cores, three utilized flakes, three retouched flakes and a Late Archaic Stemmed point were recovered. The site was reported to be atop an alluvial fan in the approximate area noted in Figure 1.4. The area noted is slightly north of the project area investigated for this report, and the former landowner, Mr. Fred Diefenbaugh, confirms that he has observed more prehistoric artifacts during agricultural activity there. No mention of historic components at thesite was made as of 1989. ARMS was unable to obtain landowner permission to resurvey the site during field reconnaissance for the initial right-of-way for the relocation of U.S. Highway 24, but on the basis of the prehistoric material reported by DeRegnaucourt, Phase II investigation was recommended (Zoll et al. 1991:31).

The Phase II archaeological intensive assessment for the Diefenbaugh site was carried out by ARMS in November of 1990 (Zoll et al. 1991). A non-systematic surface survey was conducted prior to mechanical trenching. Few artifacts were recovered despite good conditions. Fire-cracked rock (FCR) was reported to be distributed across the length of the field, but it is also reported that boundaries to the distribution were difficult to determine. It is not clear how much area was covered in this non-systematic survey, though there is some mention of fire-cracked rock on an alluvial fan at the far western end of the agricultural field, well outside the Phase III project area.

Phase II subsurface testing was carried out by the machine excavation of eight trenches to the base of the plow zone and six deeper trenches, as shown in Figure 1.5. Despite trenching in the eastern portion of the site, the historic component was again not reported. Fifteen prehistoric features in total were detected--fourteen at the base of the plow zone and one at 63 cm below surface (see Table 1.1 and Figure 1.5). Most of the features were fire-cracked rock concentrations or scatters. One fire-cracked rock filled basin from the base of the plow zone yielded a Late Archaic Period radiocarbon age, as noted in the Table 1.1. No buried soil surfaces were detected in the deeper trenches, though Feature 15 was detected in Deep Trench 5. In Deep Trench 4, three flakes and one piece of fire-cracked rock were detected at 60 cm below surface. In Deep Trench 6, three charcoal specimens and one piece of fire-cracked rock were found between 92 and 101 cm below surface. Further testing of the Deep Trench 4 deposit showed "a continuous horizontal deposit at the same level as the artifacts exposed in the trench wall" (Zoll at al. 1991:50). In the opinion of the ARMS researchers, these archaeological deposits were buried too rapidly for the development of a recognizable soil surface (Zoll et al. 1991:56).

A total of 134 prehistoric artifacts were recovered from Phase II investigations (see Table 1.2). Of these, 76 were recovered from below the plow zone. The surface and subsurface site boundaries inferred from Phase II investigations are shown in Figure 1.4. The subsurface extent of the site was reported as ranging from the base of the plow zone to 101 cm below surface in an area covering roughly 13,500 m^2.



- - - - De Regnaucourt 1981
site boundary based on surface survey

——— ARMS (Cochran et al. 1991)
site boundary based on nonsystematic surface survey

--------- ARMS (Zoll et al. 1991)
site boundary based on subsurface recovery

Figure 1.4 Map of site boundaries reported by previous investigators.

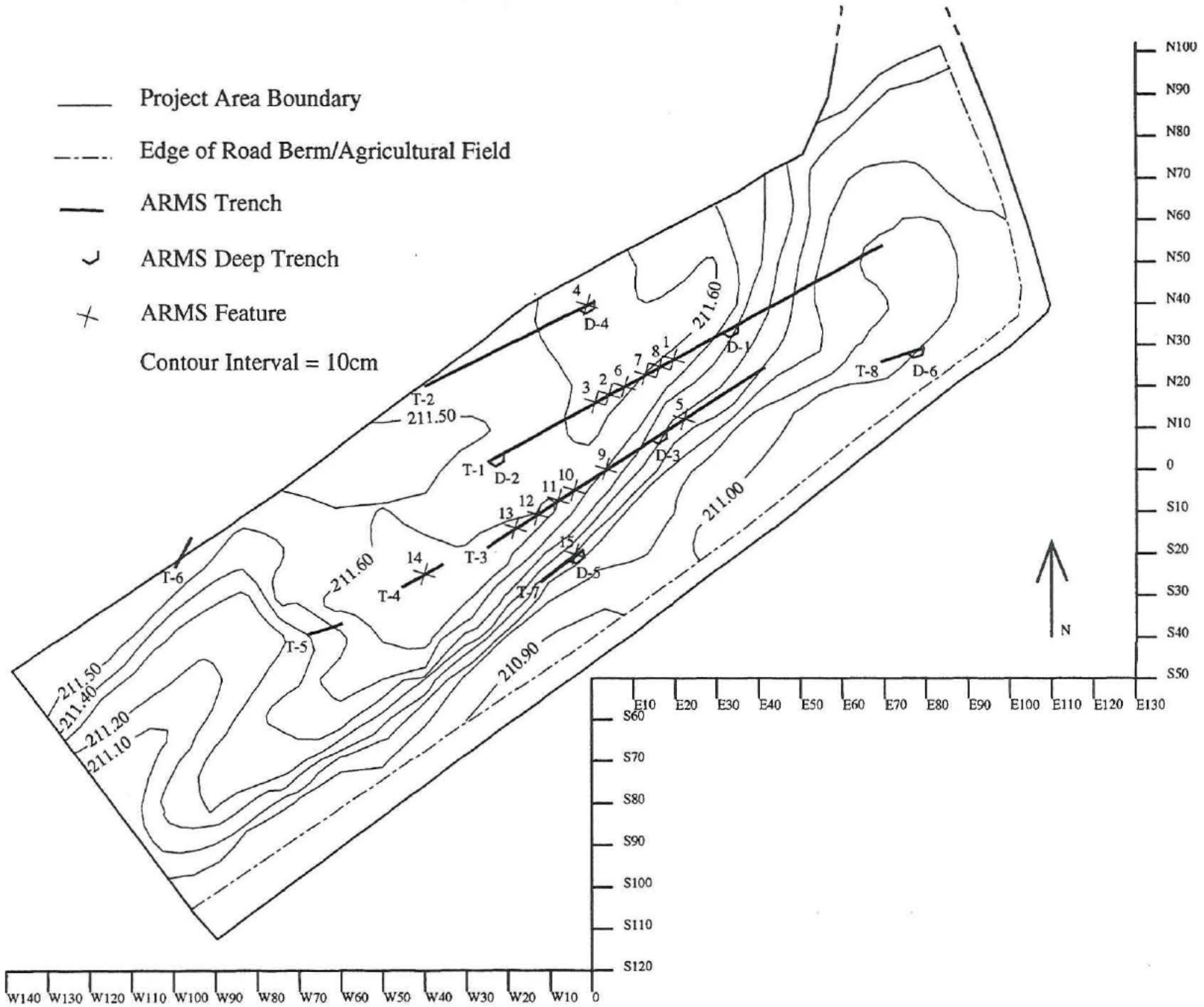


Figure 1.5 Trenches and features from 1990 ARMS Phase II investigations (grid system shown is from 1995 Landmark excavations only).

Table 1.1 Summary of Features from ARMS 1990 Phase II Archaeological Intensive Assessment (Zoll et al. 1991:42-50).

#	DIMENSIONS	DEPTH	TYPE	ASSOCIATIONS
1	108x67 cm	BOPZ (base of plow zone)	FCR (fire-cracked rock) filled basin	charcoal, chert flake, nutshell, no *in situ* burning evident Radiocarbon age: 3670 +/-90 (1720BC) Beta-42314
2	150x80 cm	BOPZ	FCR scatter	no *in situ* burning evident
3	52x100 cm	BOPZ	artifact scatter	chert flakes, FCR, charcoal
4	72x140 cm	BOPZ to 40 cmbs	artifact scatter	chert flakes, hammerstone, end scraper, charcoal
5	96x100 cm	BOPZ	FCR filled basin	chert flakes, charcoal, no *in situ* burning evident
6	133x69 cm	BOPZ	FCR scatter	no *in situ* burning evident
7	58x54 cm	BOPZ	FCR scatter	no *in situ* burning evident
8	137x62 cm	BOPZ	FCR scatter	no *in situ* burning evident
9	103x59 cm	BOPZ	FCR scatter	no *in situ* burning evident
10	57x22 cm	BOPZ	FCR scatter	no *in situ* burning evident
11	24x34 cm	BOPZ	FCR scatter	no *in situ* burning evident
12	22x21 cm	BOPZ	FCR scatter	no *in situ* burning evident
13	147x100 cm	BOPZ	FCR scatter	no *in situ* burning evident
14	47x45 cm	BOPZ	FCR scatter	no *in situ* burning evident
15	62x44 cm	63 cmbs	FCR scatter	chert flakes

Table 1.2 Prehistoric and Historic Artifacts Recovered by ARMS During Phase II Archaeological Intensive Assessment and Resurvey of the Expanded Right of Way (Zoll et al. 1991:43-44; Evans and Mann 1991).

PREHISTORIC, TOTAL = 180

#	MATERIAL	OBJECT	#	MATERIAL	OBJECT
1	chert	Late Archaic Stemmed Point	3	chert	gravers
			1	chert	endscraper
1	chert	point fragment	16	chert	modified flakes
2	chert	Stage 2 bifaces	133	chert	unmodified flakes
2	chert	Stage 3 bifaces	2	block	flakes
3	chert	biface fragments	1	stone	hammerstone
7	chert	cores	1	stone	anvil
4	chert	bipolar artifacts	3	chert	other

HISTORIC, TOTAL = 293

#	MATERIAL	OBJECT	#	MATERIAL	OBJECT
2	pearlware	blue painted	1	brick	fragment
1	pearlware	blue shell edge	29	flat glass	light blue
1	pearlware	mocha	3	flat glass	clear
20	whiteware	plain/undecorated	7	flat glass	aqua
12	whiteware	blue shell edge	3	bottle glass	olive green
18	whiteware	red transfer printed	9	vessel glass	aqua
5	whiteware	purple transfer printed	3	vessel glass	light blue
2	whiteware	brown transfer printed	7	vessel glass	clear
3	whiteware	green transfer printed	1	pressed glass	green (1825-1850)
28	whiteware	blue transfer printed	1	pressed glass	clear (tumbler?)
1	whiteware	polychrome transfer printed	1	milk glass	
			7	glass	burned or melted
7	whiteware	floral hand painted	2	mirror glass	
1	whiteware	blue and red hand painted	5	faunal	mussel shells
			2	faunal	pig teeth
4	whiteware	red sponge	2	faunal	unidentified teeth
3	whiteware	blue sponge	7	faunal	unidentified bone
2	whiteware	brown sponge	6	metal	square nails
11	whiteware	annular	2	metal	square spikes
1	whiteware	annular/wormy finger painted	1	metal	knife blade and handle fragment
2	whiteware	lightly embossed edgeware	1	metal	ox shoe fragment
			1	brass	button (South Type 18, 1800-1855)
2	whiteware	flow blue			
4	ironstone	plain	2	plaster/mortar	fragments
6	stoneware	yellow salt-glazed			
2	stoneware	slipped			
9	stoneware	salt-glazed			
3	stoneware	cobalt blue decorated			
23	redware				
1	earthenware	honey-colored glaze			
2	unident. ware	possible recent contaminant			
11	ceramic	burned			
1	clay	marble			
2	white clay	pipe stem fragments			

ARMS researchers concluded that the majority of the Diefenbaugh Site is situated on an unpronounced alluvial fan, which would have specific implications for the burial of prehistoric occupations. However, further testing during Phase III investigations has shown soil profiles more consistent with lateral and overbank floodplain deposits (see Holocene Geomorphology Section). A second reported alluvial fan at the west end of the agricultural field (outside the Phase III project area) was also investigated by ARMS with three deep trenches. No cultural material or buried soils were recovered there (Zoll et al. 1991:42).

The expansion of the right-of-way for the proposed relocation of the highway necessitated additional field reconnaissance for 12-Hu-396. This reconnaissance was conducted by systematic survey in March of 1991, again by ARMS, for the strip of new right-of-way extending REDACTED As a result of this survey, the historic component in the southeast corner of the field (Historic Component #1) was defined. The component appeared as high surface quantities of structural and domestic refuse including square nails, flat glass, brick, kitchen ceramics, vessel glass, and faunal remains (see Table 1.2). Ceramics listed in Table 1.2 were used to obtain a Mean Ceramic Date of 1845.4. Examination of the property abstract and an 1866 plat map of Dallas Township indicated that the property was purchased from the United States by William G. Campbell in 1832 but not used as a habitation site after 1866 (Evans and Mann 1991:14). This systematic survey also resulted in a new estimate for the overall size of 12-Hu-396 at 95,000 m^2 (Evans and Mann 1991:5). However, a later investigation of an accidental discovery in the vicinity of the site (Cochran 1991) resulted in the verification of the considerably smaller maximum site size noted in Figure 1.4 (Cochran, Cree and Zoll 1991:1).

Research Design

Landmark's mitigation of the Diefenbaugh Site has been guided by several overarching research priorities. Various aspects of fieldwork, laboratory analysis, and report preparation have been directed toward these priorities.

Geomorphology. An early concern was to develop an understanding of the geomorphic context of cultural deposits at the site. This was addressed through literature review, selective deep trenching, and consultation with a professional geologist. An understanding of the geomorphic context has provided a basis for relating cultural deposits to natural Holocene events. It has also added to the interpretation of cultural stratigraphy.

Dating and Chronology. A high priority has been placed on establishing dates and chronological relationships for cultural deposits at the site. Charcoal samples were collected for the radiocarbon dating of prehistoric features and stratigraphic relationships were noted. The relative lack of absolute dates for prehistoric deposits in the region underscored this concern. Diagnostic projectile points from established contexts have

also been important to chronological interpretation. For deposits from historic times, analysis of a combination of historic documents and dateable objects has been pursued.

Settlement and Subsistence. We set out to understand settlement and subsistence from both a site and regional perspective. Artifact and feature interpretations have shed light on site size and function during various occupations. Recovery and analysis of food remains has been pursued to shed light on diet and seasonality. Some of our background research has focused on the relationship of Diefenbuagh site occupations to regional dynamics and general settlement models.

Interaction. A final explicit priority for the mitigation has been to identify suggestions or patterns of interaction, including trade, commerce, and exchange of ideas. Artifacts have been analyzed with this in mind. Prehistoric artifacts have been examined for non-local cherts. Historic artifacts have been examined for maker's marks and other clues to their place of manufacture. Food remains have also been examined for evidence pertaining to the level of self-sufficiency of historic inhabitants. Special attention was paid to the possibility of historic period interaction with Native Americans of the Wabash Valley frontier.

CHAPTER 2

NATURAL SETTING

The Diefenbaugh Site is situated on the floodplain of the upper Wabash River near its confluence with Silver Creek (see Figure 1.2). The elevation of the site is approximately 212 meters above mean sea level. Both Silver Creek and the Wabash flow within 200 meters. The upper Wabash, here defined as that portion of the stream above its confluence with the Eel River, flows through the physiographic unit known as the Tipton (central Indiana) Till Plain (See Figure 2.1). The general topography of the region is flat to gently rolling except where it is crossed by recessional moraines (Hall 1989:48) and where glacial meltwaters discharging along the upper Wabash carved conspicuous topographic features (Thornbury 1958:449). The till plain extends far south of the site. Immediately north one enters the more varied Northern Lake and Moraine Region. The Diefenbaugh Site lies near a continental drainage divide. Within forty kilometers of the site a divide between the Little and Maumee Rivers separates drainage towards the Mississippi River from drainage into the Great Lakes (Lake Erie) (Hale 1966:92; Hall 1989:52). A route known as the the Long Portage crossed this divide and was extremely significant during the period of European contact and fur trade (Glenn 1992:61; Mann 1996:12). One might guess that this portage followed pre-contact transportation patterns.

Bedrock Geology

The bedrock of the upper Wabash drainage consists mainly of Silurian and Devonian aged limestones and dolomites that are bordered to the north by Devonian black shales (see Figure 2.2) (Gray et al. 1987). The Wabash flows directly over a Silurian rock sill at Huntington. This sill represents a section of the pre-glacial Lafayette Bedrock Valley system (formerly termed Teays Valley) (Bleuer 1989). Bedrock in the immediate vicinity of the Diefenbaugh Site consists of silty limestone, dolomite and/or shale of Silurian age (Burger et al. 1971). While the site itself is consists of glacial and alluvial deposits, bedrock is exposed within .5 km to the west. Examination of a portion of this area by field technicians indicated no chert outcrops or limestone quarries that might have been exploited by prehistoric or historic inhabitants. Elsewhere there are abundant sources for building stone (see historic background section) as well as moderate quality chert associated with the Early Silurian Liston Creek Limestone Member (Cumings and Shrock 1928:89-91; Burger et al. 1971). Liston Creek limestone is continuously exposed along the Wabash near Lagro and continues intermittently as far as Huntington. Outcrops also occur along the Salamonie River. Over two meters of Liston Creek cherty limestone can be found at the dam on the Little River in the city of Huntington (Cumings and Shrock 1928:91). Sherman (1996) has identified several outcrops of Liston Creek chert of variable quality within a few miles of the Diefenbaugh Site.

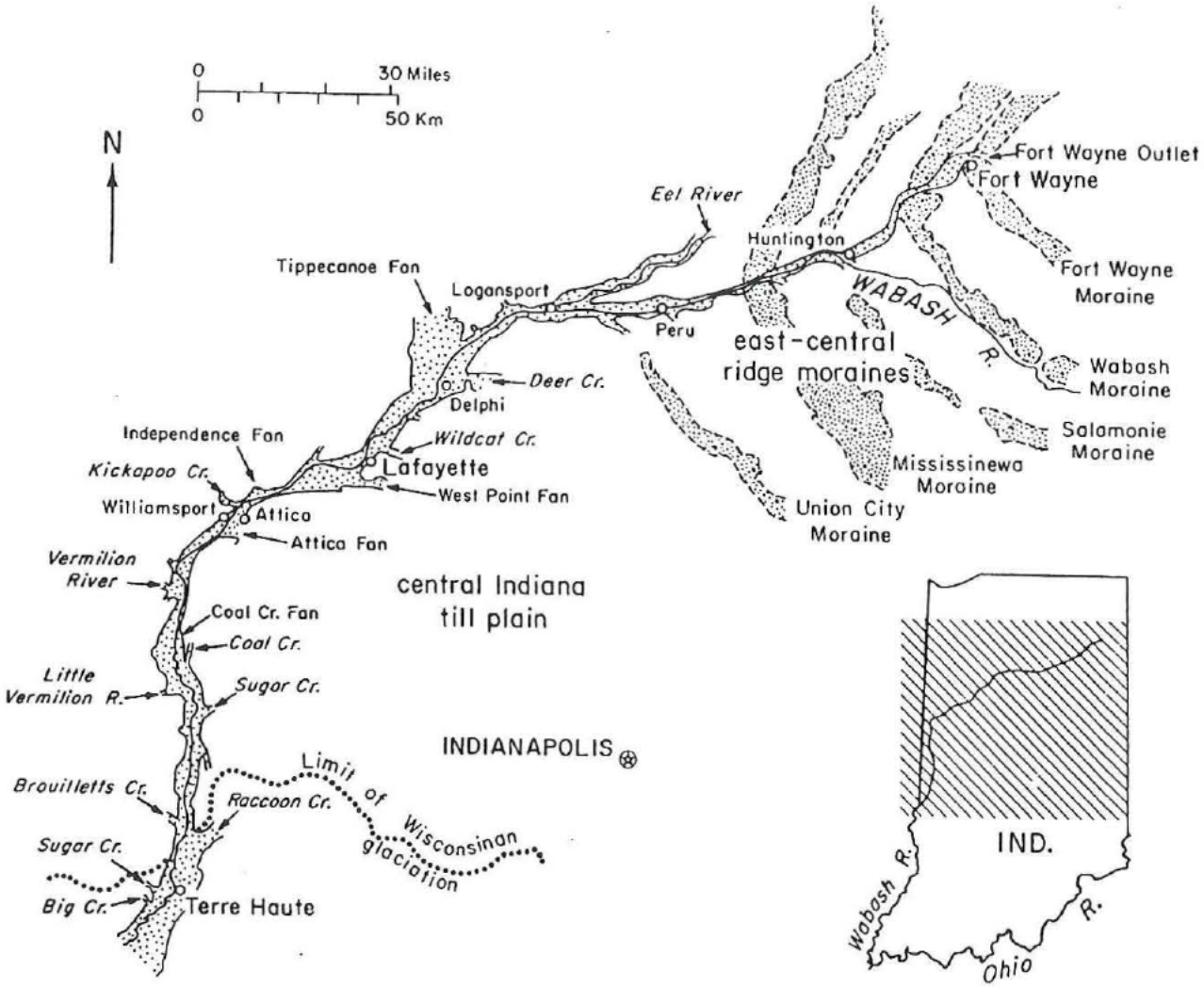


Figure 2.1 Map showing the upper and middle Wabash flowing through the central Indiana (Tipton) till plain with associated Pleistocene moraines (from Fraser, Bleuer and Smith 1983:198).

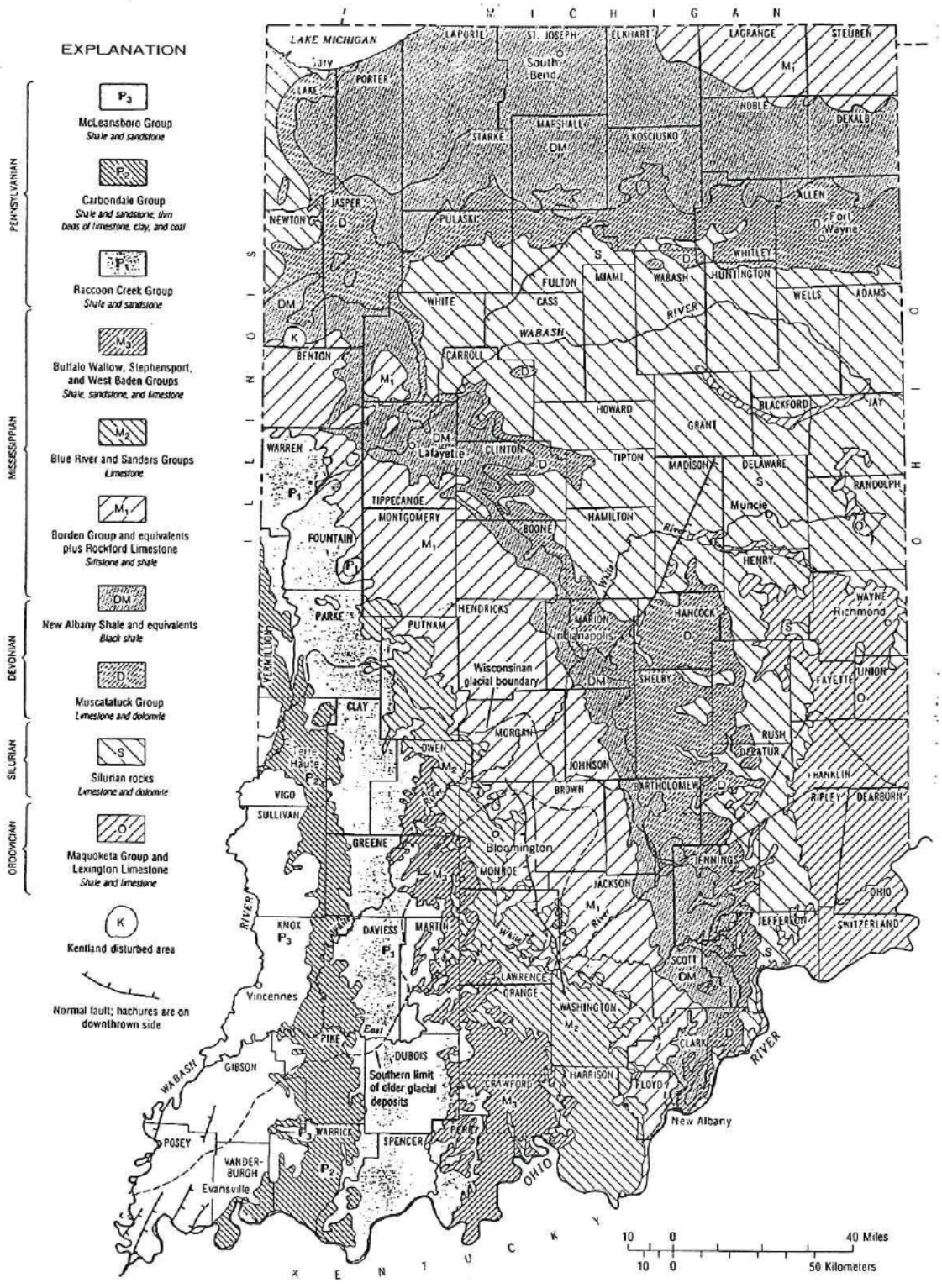


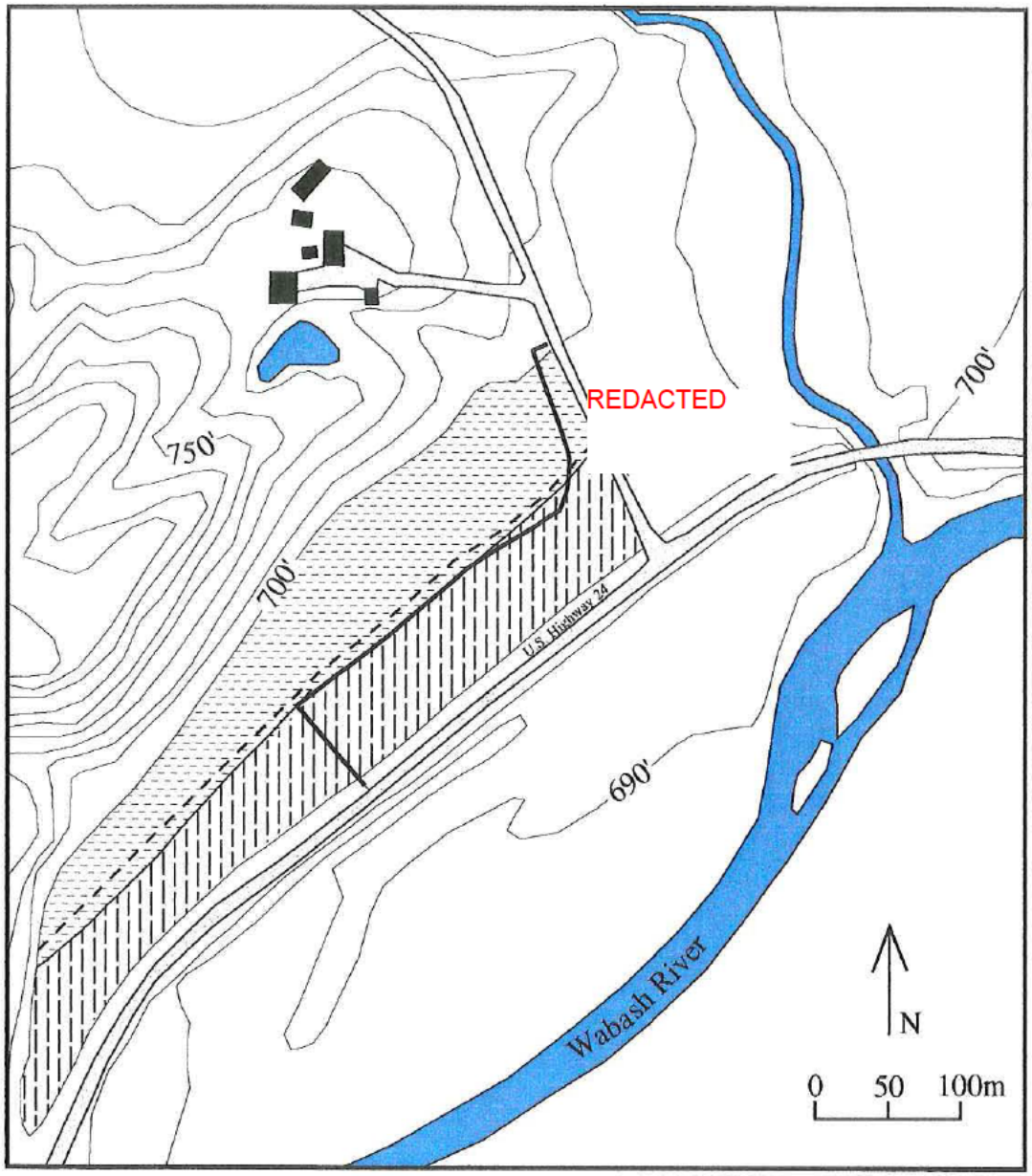
Figure 2.2 Map of Indiana bedrock geology showing Silurian age limestone and dolomite in the upper Wabash area (modified by Indiana Geological Survey from Indiana Geological Survey Map 49).

Pleistocene Geomorphology

The Wabash River of present times is one of the twenty largest streams in the United States and drains two-thirds of Indiana as it flows south into the Ohio River (Fraser et al. 1983:199; Hale 1966:92). This extent, however, was not reached until glacial meltwaters carved a new valley into Pleistocene deposits of central Indiana. During the Tertiary Era the Wabash was considerably shorter, possibly originating in Hancock County, east-central Indiana (Thornbury 1958:453). Central Indiana drainage was controlled by the Lafayette Bedrock Valley System (Bleuer 1989). Burial of this system began during the early Pleistocene (after 500,000 B.P.) and the modern Wabash from Huntington to the Ohio River became the drainageway for glacial meltwaters. Though it follows the same general course, the Wabash widens into the drift-filled Lafayette Bedrock Valley System in only two places--at Lafayette (Tippecanoe Co.) and Rich Valley (Wabash Co.) (Thornbury 1958:458).

The final glaciation of the Pleistocene, the Wisconsinan, began over 50,000 years ago and reached its southern limit in south-central Indiana by 21,000 B.P. (Hall 1989:45). The final phases of the Wisconsinan began prior to 14,000 B.P. The Lake Erie Lobe, which had retreated into the Lake Erie basin, readvanced as far south as Peru, Indiana, as indicated by the Union City Moraine (see Figure 2.1) (Fraser et al. 1983:210). The retreat of this lobe left till known as the Lagro Formation and a final, curved recessional moraine at Fort Wayne. The Fort Wayne Moraine acted as a dam for meltwaters and post-glacial Lake Maumee rose until an outlet was reached (Fraser et al. 1983:210). When an outlet at Fort Wayne was obtained, the "Maumee Torrent" flowed down the Wabash-Maumee Trough (now occupied by the Little River) into the Wabash proper at Huntington. The flow trenched into till and previous valley train sediments. Numerous erosional and depositional features, such as the scoured Silurian bedrock sill at Huntington, attest to the sometimes catastrophic force of the flow (Cumings and Shrock 1928:91; Fraser et al. 1983:210). Unsorted cobble gravel was deposited along the valley floor in a braided stream environment (Fraser et al. 1983:211).

Later floodplain processes appear to have left parts of the late Pleistocene erosional/depostional surface as terrace remnants rising up to five meters above the present floodplain (Thornbury 1958:465-466). Such a feature is present at the Diefenbaugh Site. The northern portion of the project area extends onto a terrace toeslope (Bassett 1995) that gently rises over a meter above the floodplain surface (see Figure 2.3). Test excavation on this terrace revealed profiles with unsorted cobbles, pebbles, and gravels as well as sands and clays (see Figures 2.4 and 2.5). The clay rich subsoil encountered in these profiles is congruent with the Martinsville soil mapped at the location, which develops on terraces and glacial outwash plains (Lockridge and Jensen 1982). The terrace toeslope feature is important to the interpretation of the site in two ways. First, deeply buried deposits are not expected due to the age of the feature. Second, as was mentioned in the previous chapter, earlier surface surveys recovered significant prehistoric materials on that portion of the terrace lying north of the main body of the project area.



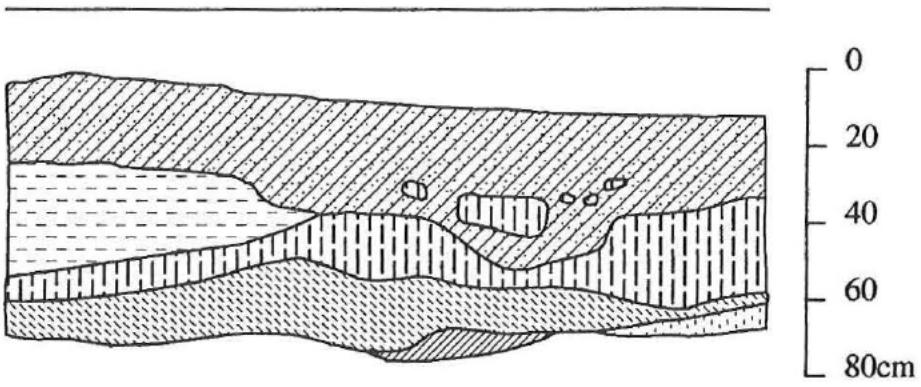
Martinsville Silt Loam, 0-2% slopes

Genesee Silt Loam, occassionally flooded

approximate edge of terrace toeslope

Phase III project area boundary

Figure 2.3 Map indicating the approximate location of the terrace toeslope at 12-Hu-395.



Plow zone- Dark grayish brown (10 YR 4/2) clay loam with pebbles, gravel, and large cobbles

Brown (7.5 YR 4/4) loamy sand with gravel

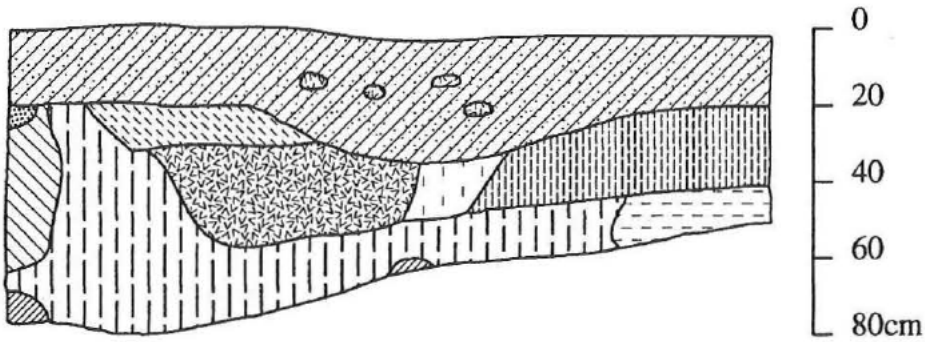
Yellowish brown (10 YR 5/4) clay

Light grayish brown (10 YR 6/2) clay laminated with 1 cm thick bands (at ±7cm intervals) of yellow (10 YR 7/8) clay

Weak red (2.5 YR 6/2) fine sand with microbands of gray (10 YR 6/1) sand and strong brown (7.5 YR 5/6) sand

Mixed, cemented strong brown 7.5 YR 5/6, light brownish gray 10 YR 6/2, and pinkish white 2.5 YR 8/2 sandy clay with gravel

Figure 2.4 East Profile from Test Unit 1 from the northern extension of the right-of-way.



Plow zone- Dark grayish brown (10 YR 4/2) clay loam with pebbles, gravel, and cobbles

Brown (10 YR 5/3) sandy clay with gravel

Brown (7.5 YR 5/4) fine sand

Yellowish brown (10 YR 5/4) clay with gravel

Yellowish brown (10 YR 5/4), grayish brown (10 YR 5/2), light gray 2.5 Y 7/2 mixed clay and sand with fine gravel

Grayish brown (10 YR 5/2) loamy sand with gravel

Brown (10 YR 4/3) loamy sand with gravel

Brown (10 YR 4/3) sandy clay with gravel

Brown (7.5 YR 4/4) loamy sand with gravel

Cobble

Figure 2.5 North Profile from Test Unit 2 from the northern extension of the right-of-way.

Holocene Geomorphology

Throughout time Diefenbaugh Site inhabitants have lived on or at the edge of an active floodplain. The history and features of this floodplain are thus relevant to the study of chronology and cultural dynamics. Very generally, floodplains can be thought of as complex accumulations of a variety of sediments. The most important floodplain building processes include lateral deposition on inside stream curves and accumulation from overbank flows. Lateral deposits commonly take the form of point bars. These consist of sands, gravels or finer materials that may be indistinguishable from overbank silts and clays. Overbank flows typically occur every one to three years but are considered second to lateral point bar accretion in floodplain formation (Wolman and Leopold 1970:167; Ritter 1986:264).

In situations where overbank flows are primarily responsible for floodplain building it is common for 80 to 90% of floodplain formation to occur in the first fifty years. In general, a three meter deep floodplain might reflect several thousand years of formation, but this is highly dependent on the extent of lateral movement of the stream and the amount of scouring and redeposition of floodplain materials (Ritter 1986:265-264). Floodplains, though generally thought of as relatively smooth tracts bordering streams, may have considerable micro-relief (Wolman and Leopold 1970:167; Ritter 1986:257). Meander scrolls, chutes, natural levees, splays and backswamps may contribute to topographic relief as well as variation in the coarseness of sediments (Ritter 1986:257-258).

Deep backhoe cuts made during the course of archaeological investigations have contributed to our understanding of specific floodplain processes at the Diefenbaugh site. Geologist John Bassett of Earth Tech, Inc. examined two of the deep cuts as well as several open archaeological trenches and has offered observations on the geomorphologic context of the site. Bassett's discussion, below, is followed by additional interpretations of additional backhoe cuts made after his visit.

Soil Geomorphological Observations (by John Bassett). During a site visit on September 25, 1995, archaeological excavations were examined and described for the purposes of providing a geomorphological interpretation of the exposed soil materials. Two deep section trenches that exposed soils to a depth of about three meters were examined and described. These trenches were located along a line roughly normal to the topographic contour, and these provided exposed soil profiles from relatively high to relatively low portions of the floodplain tract. Each profile was described using standard United States Department of Agriculture nomenclature. The highest deep trench profile was located along the east edge of the 10 x 10 m block 40N10E at site coordinate 48N20E. The ground surface elevation at this point was 211.55 m (694 ft.) msl elevation. The lower deep profile was located along the eastern edge of 10 x 10 m block 10N40E at site coordinate 16N50E. The ground surface elevation at this point was 210.96 m (692 ft.) msl elevation. Soil profile descriptions are provided in Tables 2.1 and 2.2.

Soils materials exposed at both trench locations generally consisted of downward coarsening sequences of silt loam to sand textured materials. The upper 155 to 158 cm

Table 2.1 40N10E Block, East Profile at 48N20E, Surface Elevation 211.55 m (694 ft) msl.

Depth (cm)	Description
0	Silt loam, dark brown (10YR 4/3) dry, hard, structureless, (Ap), abrupt contact to,
34	Silt loam, dark brown (10YR4/3) dry, hard, moderate, medium subangular blocky structure, (B2), clear contact to,
79	Silt loam, dark brown, (10YR 4/3), dry, hard, weak moderate, medium subangular blocky structure, clay skins and organic stains throughout, (B3), clear contact to,
158	Sandy clay loam, dark brown (10YR 4/3) moist, firm, structureless, distinctly coarser than above, slightly clacareous in lower part, gradual contact to,
259	Silt loam, clayey, brown (10YR 5/3) moist to wet, slightly plastic, slightly sticky, abundant gastropod fragments throughout, calcareous
274	Base of trench. Commence soil probe. Silt loam, as 259 cm above,
311	Sand, very coarse and gravel, granular, wet, saturated.

Table 2.2 N10E40 Block, East Profile at 16N50E, Surface Elevation 210.96 m (692 ft) msl.

Depth (cm)	Description
0	Silt loam, brown (10YR 4/3) moist to dry, hard, coarse, blocky structure, roots and plant fragments throughout, (Ap), abrupt contact to
43	Silt loam, dark yellowish brown (10YR 4/4) moist to dry, hard, moderate medium subangular structure, (B2), clear contact to
82	Silt loam, dark yellowish brown (10YR 4/4) moist to dry, hard, weak medium subangular blocky structure, unit has numerous clay skins and organic coatings on ped surfaces, (B3), unit is massive and non-stratified, clear contact to
155	Sandy loam, dark yellowish brown (10YR 4/4) moist, friable, structureless, disinctly coarser texture than above, gradual contact to
201	Sand, medium, dark yellowish brown (10YR 5/4) moist, loose, massive, non-stratified, very weakly calcareous to
229	sand, coarse and gravel, granular, moist, loose, yellowish brown, calcareous to
283	Bottom of trench (ground water encountered at this point)

of the profile consisted of non-stratified silt loam that contained the modern soil profile. Based on the color, texture and lack of an argillic (clay rich) horizon, both profiles appear to relate to the Genesee series. Below 158 cm depth the soil materials became coarser, first grading into non-stratified sandy loam or sandy clay, and then into well stratified sand and gravel. A fine grained unit of clayey silt loam was evident in the 48N20E profile from 259 to 311 cm depth. This unit was underlain by stratified sand and gravel.

Figure 2.6 shows a cross-section relating the depths of prominent stratigraphic contacts observed in the two described soil profiles and at two other locations where contacts could be observed. Four soil units are recognized. Unit 1, at the base of the sequence, consists of calcareous sand and gravel. This unit is interpreted to be glacial outwash of late Wisconsinan age, probably related to the most recent phase of Pleistocene drainage in the Wabash Valley. The latest significant Pleistocene event in the valley was the drainage of the Late Woodfordian glacial Lake Maumee. Fraser and Bleuer (1983) and others cite evidence to suggest that this was, at times, a catastrophic event. The so-called "Maumee Torrent" sent surges of melt water down the Wabash Valley. This was accompanied by considerable scouring of older outwash sediments, downcutting of the valley, the formation of valley flanking terraces, and the construction of large scale bars in the valley floor area. This event, or events, occurred after about 14,000 B.P., when glacial ice of the Erie Lobe had retreated beyond the Ft. Wayne moraine, but prior to about 13,000 B.P. when northward drainage from the Erie Basin was apparently established (Wayne and Zumberge 1965).

Unit 2 consists of a calcareous clayey silt loam which occurs above the outwash sand and gravel at 48N20E. The unit appears to be associated with a low area on the former surface of Unit 1. This area may represent a shallow backwater or braided stream channel on the post-glacial floodplain surface, as suggested by the fine grained nature of the sediment and the presence of an aquatic molluscan fauna.

A sample of the clayey silt loam from 48N20E was dispersed in an Alconox solution. The dispersed soil material was gently washed through nested No. 10 (2.00 mm) and No. 16 (1.17 mm) sieves. Larger shell fragments recovered on the screens were badly fragmented, and could not be identified. Smaller (1-2 mm) long gastropods, probably comprising two species, were recovered intact. The shells were too small to be examined for species identification, but both were vertically spiraled forms characteristic of certain aquatic species. In addition, two fingernail clam shells (Sphaeriidae) were recovered. These fragments were too fragmented for species identification.

Examination of this assemblage suggests that the asscoiated soil material had accumulated in a subaqueous environment such as a backwater channel or oxbow. Overall the presence of the molluscan fauna and the clayey silt loam unit is suggestive of a wet, low relief environment that existed on the floodplain tract soon after the cessation of glacial meltwater discharge. The presence of such conditions may help to explain the lack of cultural materials in the deeper alluvial materials at the site. Human usage of the floodplain area may not have occurred until vertical accretion during the Holocene built the floodplain surface to a higher, and dryer level.

Units 3 and 4 comprise a typical upward fining floodplain overbank sequence. The lower portion of the sequence could be as old as 13,000 B.P. The sequence has

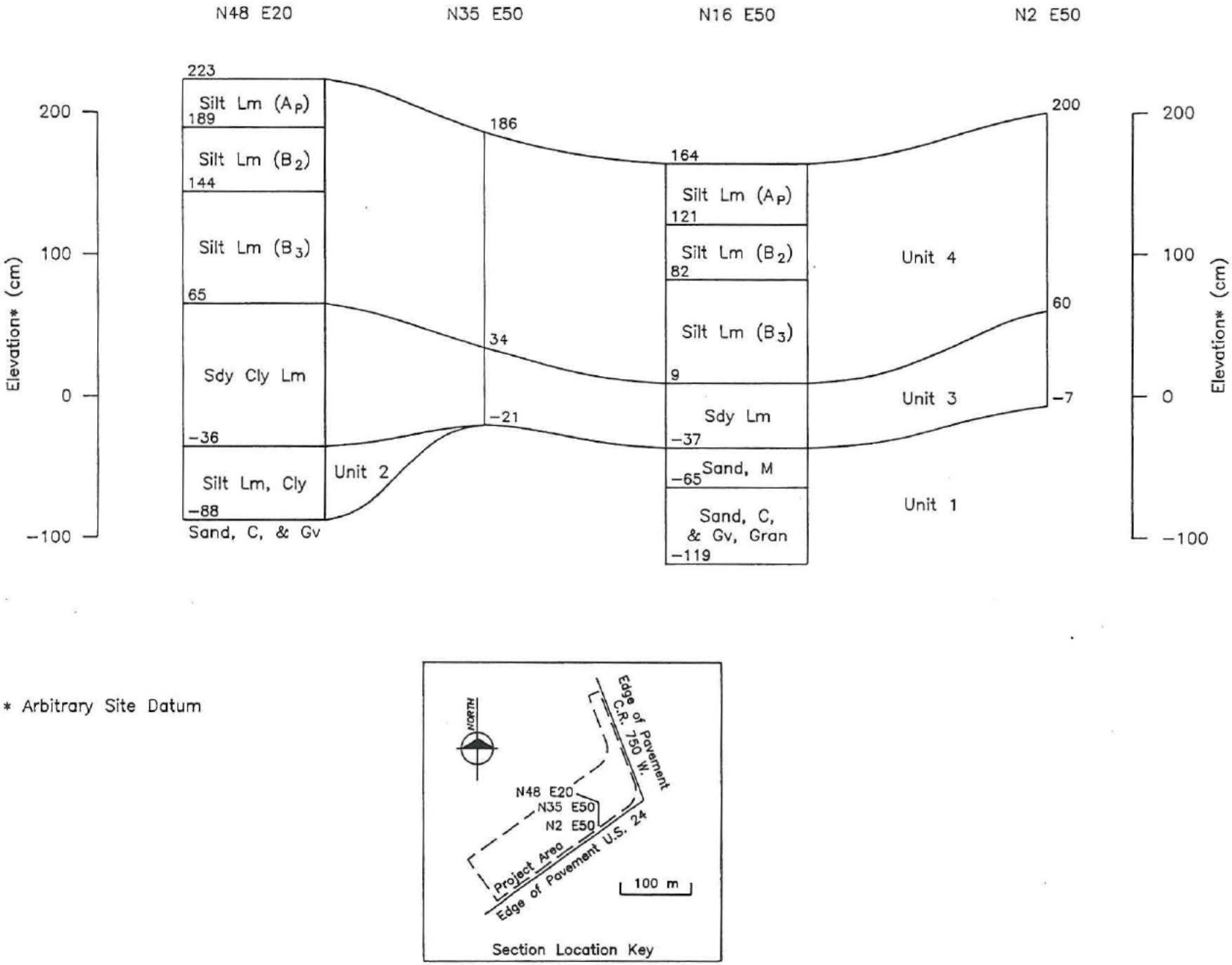


Figure 2.6 Cross section showing correlation of soil units revealed in deep backhoe cuts (prepared by John Bassett).

probably been deposited slowly through Holocene time. Typically, floodplain overbank sequences are built relatively rapidly to some equilibrium level, and subsequent sedimentation is minimal.

Additional Geomorphological Interpretations. Three additional cuts of gemorphological interest were made at the site after the time of consultation with the geologist. At the eastern end of the site, in the course of exploring the depth of the well from Historic Component #1, an approximately three meter deep profile (32N87E) was exposed. Description of this cut (Table 2.3) commenced rather quickly due to the seepage of water and a black odorous substance into gravel and sand at its base. The cut was immediately backfilled to avoid any hazards. A sample of the odorous substance has been analyzed as a professional courtesy of Indiana University's Biogeochemical Laboratories and has been tentatively identified as crude oil (Volker Bruchert, personal communication 1996). The gravel and sand at the base of the cut would seem to correspond to Soil Unit 1, as described above. Stratified silty clay loam and gravel lying above this unit may reflect the low elevation and history of more severe flooding of this portion of the site. A second approximately three meter deep profile was cut at the west end of the site at 65S90W. The soil profile description (see Table 2.4) reveals a sequence very similar to that seen in the cuts described by Bassett. Thus the general pattern of downward coarsening from silt loam to sand is repeated.

The third profile of interest was exposed in a routine backhoe trench along the western edge of the 10 x 10 m block 30S100W. Numerous cobbles and boulders were encountered during the excavation of this trench, indicating high energy transport. The profile shows a number of sandy lenses in silty clay loam as well as a large and complex sandy intrusion that suggests an ancient channel or chute that cut into established alluvial deposits (see Figure 2.7). The intrusion can be seen in the opposite trench wall, but was not picked up in any of the nearby trenches. The inclination of the sandy lenses suggests that flow was roughly parallel to the river course. This channel may therefore date to a post-glacial braided stream environment. This was the only such deposit encountered at the site.

Climate, Soils, Flora and Fauna

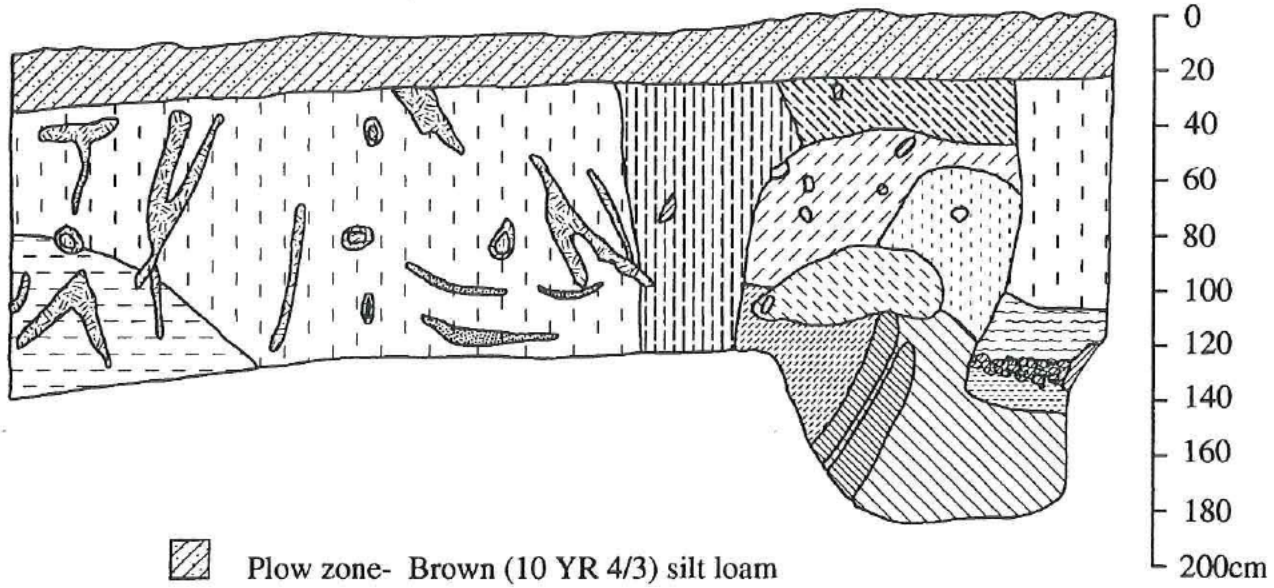
Between approximately 11,000 and 10,000 B.P. (the Early Holocene) rapid warming of the midwest led to the northward retreat of boreal spruce-dominated vegetation. Prairie or cool-temperate, mixed mesic forest came to dominate the midwest by 8000-9000 B.P. (Webb et al. 1983:147; Stoltman and Barreis 1983:253). By the Middle Holocene, approximately 7000 B.P., a period of maximum warmth and dryness known as the Hypsithermal was accompanied by the predominance of grasslands and the xeric oak-hickory forest type (Brown and Vierra 1983:167; Wilkins et al. 1991:224). Deterioration of upland vegetation at this time may have made river valleys more attractive for human settlement (Brown and Vierra 1983:167). The end of the Hypsithermal, approximately 4000 B.P, was marked by a return to cooler and wetter conditions and essentially modern vegetation (Wilkins et al. 1991:224; Wright

Table 2.3 Exploratory Trench for Well (F-15), Northwest Profile at 32N87E, Surface Elevation 211.10 m (692 ft) msl.

Depth (cmbs)	Description
0	silt loam, dark brown (10YR 4/3) to
30	silty clay loam, dark brown (10YR 4/3) to
85	gravel (1-2 cm diameter) to
135	silty clay loam, dark brown (10YR 4/3) to
210	coarse sand and gravel, brown (10YR 5/3), some yellowish sandstone angular fragments to
275+	gravelly sand, very dark grey (10YR 3/1), crude oil??

Table 2.4 S70W90 Block, West Profile at S65W90, Surface Elevation 211.37 cm (693 ft) msl.

Depth (cmbs)	Soil Description
0	silt loam, dark brown (10YR 4/3), coarse angular blocky, clear contact to
38	silty loam, dark brown (10YR 4/3), fine subangular blocky, clear contact to
98	silty clay loam, dark brown, (10YR 4/3), gradual contact to
188	sandy clay loam, dark brown (10YR4/3), gradual contact to
238	loamy sand, dark grayish brown (10YR 4/2) abupt contact to
308	coarse sand with rounded, tabular, and platy gravel (16-35% gravel), predominant color grayish brown (10YR 5/2), continues to
338	bottom of trench



Plow zone- Brown (10 YR 4/3) silt loam

Dark yellowish brown (10 YR 4/4) slightly sandy clay loam

Brown (10 YR 4/3) silty clay loam

Brown (10 YR 5/4) medium-fine sand lens

Brown (7.5 YR 4/4) slightly sandy clay loam

Brown (7.5 YR 4/4) slightly sandy clay loam and strong brown (7.5 YR 5/6) medium-fine sand

Strong brown (7.5 YR 5/6) medium-fine sand

Strong brown (7.5 YR 5/6) medium-fine sand and pale brown (10 YR 6/3) corse sand

Strong brown (7.5 YR 5/6) loosely packed medium-fine sand possible rodent disturbance

Strong brown (7.5 YR 5/6) compact loamy sand

Pale brown (10 YR 6/3) coarse sand with lamination parallel to long axis of deposit

Pale brown (10 YR 6/3) coarse sand

Brown (7.5 YR 5/4) loamy sand

Strong brown (7.5 YR 5/6) sandy clay loam

Cherty limestone fragment (not culturally modified)

Cobble/pebble

Root cast

Figure 2.7 West profile (10 x 10 block 30S100W, West Trench) showing possible channel cut.

1976:581,589). Subsequent warming during the Secondary Optimum (A.D. 1000 to 1200) and cooling during the Little Ice Age (A.D. 1430-1850) (Gribben and Lamb 1978:69-70) may have impacted human settlement through increases in short-term climatic extremes (Lamb 1977).

Williams (1974) has summarized specific climate change since glacial times in northeastern Indiana using a pollen sequence from Pretty Lake in LaGrange County. For 14,300 to 10,600 B.P. pollen types indicate alternation between tundra-like conditions and a boreal landscape (spruce, fir and tamarack). After 10,600 B.P., northern Indiana gradually became warmer and drier than present. Vegetation shifted from a birch-pine mixed forest to an alternating pattern of beech-basswood and mixed mesophytic forest (beech, maple, oak, and hickory). After 4000 B.P. the warming trend resulted in a shift to an oak-hickory forest type. A shift to a beech-maple forest by 1500 B.P. indicates another decrease in temperatures. 600 B.P. marked a return to slightly warmer and drier conditions and a return of the oak-hickory forest found locally in historic times (Williams 1974:B20-B22).

Temperatures recorded at Huntington between 1951 and 1974 reveal an average daily temperature minimum range of 17.8° to 62° Fahrenheit and an average daily maximum range of 33.6° to 85.2° Fahrenheit. Huntington County receives an average of 37.3 inches annual rainfall and normally has a growing season of over 160 days, which is adequate for modern crop cultivation (Lockridge and Jensen 1982:86-87). Soils throughout the county are rated suitable or well suited for crop, woodland, and pasture.

The Genesee Silt Loam and Martinsville Silt Loam soils at the Diefenbaugh Site are each well-suited for crops, woodland and pasture. Genesee series soils form in stratified alluvial sediments while Martinsville soils form on terraces and outwash plains (Lockridge and Jensen 1982:60-63). Only the northern extension of the project right-of way includes the well-drained Martinsville Silt Loam. The Genesee Silt Loam, which dominates the site, is associated with slight to severe limitation for campsites or dwellings. This is due to brief flooding that is common from October to June (Lockridge and Jensen 1982:88-110). Various local residents can recall Wabash flood events that have left standing water on the site. A map drafted by Department of Transportation Engineers in 1934 (1928) indicates that 1913 flooding reached an elevation of over 212 meters msl. This would have resulted in much of the site being flooded by several feet of water.

The modern forest cover for the central and north-eastern Indiana is classified as a beech-maple association (Petty and Jackson 1966), though beech is not commonly found in Huntington County today (see Figure 2.7). Typical trees, shrubs and vines that might be found in the area are listed in Table 2.5. Lindsey at al. (1965) have correlated General Land Office Survey records of early vegetation (1799-1834) with soil-survey maps. Their reconstruction of forest types for ca. 1820 indicates that the Genesee silt loam floodplain soil at the Diefenbaugh Site would have supported beech and maple along with oak, hickory, sycamore, buckeye, hackberry, and elm. The Martinsville silt loam and adjacent upland soils surrounding the site are predominately correlated with less diverse beech-maple and oak-hickory forest types (Lindsey et al. 1965:158-159).

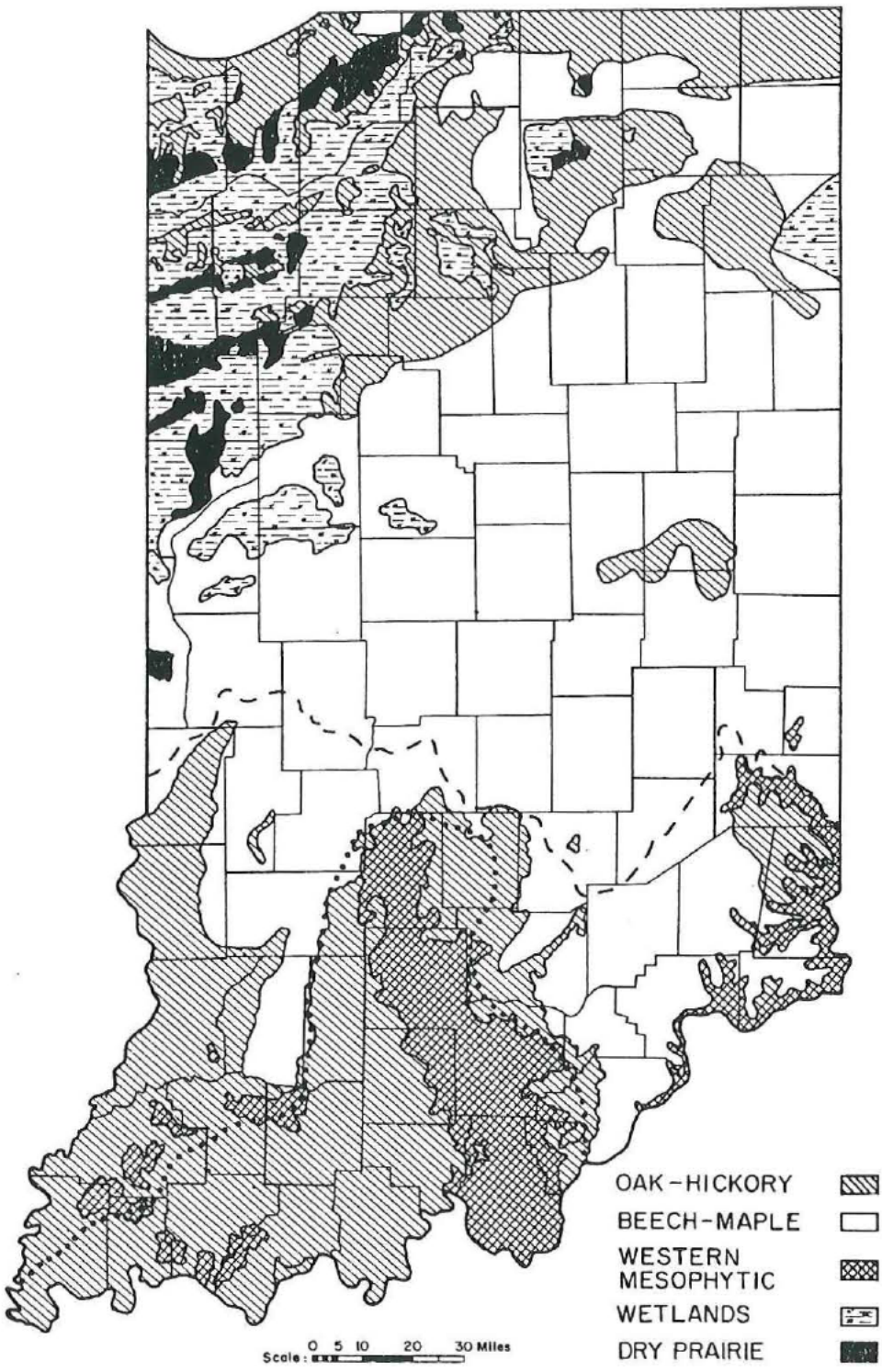


Figure 2.8 Generalized map of vegetation in Indiana, ca. 1816 (from Petty and Jackson 1966:280).

Table 2.5 Common Trees of Huntington County (from Lockridge and Jensen 1982.

Black Cherry	Black Oak
Bur Oak	Northern Red Oak
Pin Oak	Swamp White Oak
White Oak	Black Walnut
Black Willow	Eastern Cottonwood
Eastern White Pine	Jack Pine
Red Pine	Virginia Pine
Green Ash	Quaking Aspen
Red Maple	Shagbark Hickory
Silver Maple	Sugar Maple
White Ash	Yellow Poplar

During the Pleistocene glaciation fish species such as trout and whitefish would have been present in the waters of southern Indiana. Post-glacial times saw the spread of species from warmer southern waters into northern Indiana lakes, rivers and streams. Today approximately 177 species of fish are identifiable in the state (Gammon and Gerking 1966:402). Fish species listed in Table 2.6 might be found today in the upper Wabash and its tributaries.

The 336 bird species recorded in the state over the last 150 years include numerous songbirds as well as larger species including common loons, great blue herons, Canada geese, mallards, black ducks, turkey vultures, red-tailed hawks, great-horned owls, woodcocks, passenger pigeons, and wild turkeys (Webster 1966:456-458). The 50 to 60 species of mammals present in the state include opossum, eastern cottontail, woodchuck, beaver, muskrat, coyote, red fox, gray fox, raccoon, long-tailed weasel, striped skunk and white-tailed deer (Mumford 1966:475).

Table 2.6 Fish Species of Central and Northern Indiana (Gammon and Gerking 1966:419-422).

Bluntnose Minnows	Golden Redhorse
Carpsucker	Common White Sucker
Spotted Sucker	Creek Chubsucker
Hog Sucker	Carp
Brook Lamprey	Black Bullhead
Log Perch	Channel Catfish
Smallmouth Bass	Largemouth Bass
Rock Bass	White Crappie
Longear Sunfish	Perch
Spotted Bass	Sauger
White Bass	Gizzard Shad

CHAPTER 3

OVERVIEW OF REGIONAL AND LOCAL PREHISTORY

Paleo-Indian (prior to 8000 B.C.)

The evidence for Paleo-Indian peoples in eastern North America includes several types of lanceolate fluted and unfluted points as well as a diverse assemblage of chipped stone tools (Griffin 1967:176; Justice 1987). During late glacial and early post-glacial times these tools were used to exploit large game such as caribou, musk-oxen, mammoth, and mastadon as well as scarce edible plants. Small sites with no evidence for permanent structures and low artifact densities imply high mobility and band-level social organization (Stoltman and Baerreis 1983:253-254).

Over 400 fluted points have been found in Indiana, the majority in the southern half of the state from floodplain or terrace contexts. Three fluted points have been reported for Huntington County, though the upper Wabash drainage overall has yielded quite a few examples (Tankersley 1992:8-9). Anuszczyk and Cochran's (1984) upper Wabash Valley survey results indicate Paleo-Indian point types in floodplain contexts only. Later unfluted Paleo-Indian points are more common in the upper Wabash and indicate increased use of lake and marsh settings (Hicks 1990:13). These later points correspond to a climatic warming trend that marks the gradual transition into the Early Archaic period.

Though many accept the makers of Clovis type fluted points (ca. 10,000 B.C.) as the first inhabitants of North America, the possibility remains that earlier Asian migrations may have resulted in population of parts of the continent. Geological evidence indicates that gradual migrations across Berengia and through an ice free corridor in North America could have occurred between 33,000 and 17,000 B.C. as well as between the more traditionally recognized interval 12,000 - 10,000 B.C. Early migrants using boats may not have needed a land corridor at all to enter the continent throughout this timeframe (Meltzer 1989:474). Despite a lack of totally convincing archaeological evidence for pre-Clovis occupations at this time, some may eventually be forthcoming.

Early Archaic (ca. 8000 - 6000 B.C.)

The hunting and foraging people of later Paleo-Indian and Early Archaic times slowly adjusted to the extinction of large game brought on by the changing landscapes of an increasingly warmer and drier climate. The distinction implied by the term Early Archaic is thus a blurred one, marking a time of transition from specialized hunting and limited foraging toward more regionally focused deer and small game hunting (Stoltman 1978:714; Hicks 1992:13). Tool assemblages indicate continued primary emphasis on hunting and animal processing (Griffin 1983:244), though the gathering of newly

available plants and aquatic resources undoubtedly increased during this time. An increase in the number of sites encountered suggests population growth or aggregation as well as an increasingly diversified subsistence/settlement system (Mohow 1992:21).

Early Archaic sites in Indiana have been found in the uplands and valleys as well as adjacent to lakes and wetlands. The Swan's Landing site along the Ohio River in Harrison County is an example of a deeply buried Early Archaic site (Smith 1995). The site has produced fire-reddened soil lenses, charcoal concentrations, small artifact concentrations, and points from the Kirk Corner Notched Cluster. Smith infers that the site served primarily as a station for the reduction of locally obtained Wyandotte chert (1995:209). Curtis Tomak has investigated an Early Archaic cemetery in the West Fork of the White River Valley in southwestern Indiana. The cemetery consisted of grave pits with cremated bone and grave offerings. Exotic marine shell is present, which suggests widespread interaction (Tomak 1983:70-71).

Though no intact sites have been found in east-central Indiana, the Early Archaic is well represented by surface point finds (Mohow 1992:17). Wepler and Cochran report the presence of the Thebes, Palmer/Kirk and Bifurcate point traditions in the upper Wabash drainage itself (1983a:23). Anuszczyk and Cochran's Wabash Valley survey project report indicates eight Early Archaic sites on terraces or floodplains (1984:80). Points are frequently made of the locally available Liston Creek chert, though high percentages of Thebes and Bifurcate types are made from non-local cherts such as Attica and Upper Mercer. This suggests a certain level of interaction between local groups (Mohow 1992:17).

Middle Archaic (ca. 6000 - 4000 B.C.)

Middle Archaic people of the Midwest adapted to a time of maximum warmth and dryness that was accompanied by the spread of grasslands and oak-hickory forests. A reduction in hunting and gathering mobility brought on by resulting resource patchiness probably fostered population growth and logistically organized collector strategies (Brown and Vierra 1983:168; Stafford 1994:219-221). An increase in rough and ground stone tools, such as grinding stones, pestles, bannerstones, and grooved axes, marks a time of increased subsistence diversity (Griffin 1967:178), but deer, hickory nuts, and at some locations aquatic resources probably dominated the diet (Stafford 1994:223). Middle Archaic horizons from the Koster site in the lower Illinois Valley contain chipped, rough and ground stone tools, diverse antler and bone tools, hearths, roasting pits, mussel steaming pits, shell dumps, shallow storage pits and evidence for rectangular structures (Brown and Vierra 1983:183-184). High quantities of fire-cracked or fire-burned rock at Middle Archaic base camps suggests intensive food processing, probably the extraction of hickory nutmeats and oil (Stafford 1994:221).

Numerous side-notched diagnostic points of the Middle Archaic were recovered during surface survey in and adjacent to the lower Wabash drainage in southwestern Indiana (Stafford 1994:227-229). Elsewhere in Indiana the Middle Archaic seems to be poorly represented. For example, few sites have been encountered in the northeastern part of the state, perhaps due to the expansion of dry grasslands and a corresponding

population decline (Hicks 1992:23). Wepler and Cochran note that the Middle Archaic has been "elusive" in the upper Wabash and "most likely reflects a problem of recognition rather than a depopulation of the area" (1983b:24). Hicks cites Matanzas points as diagnostic of the Middle Archaic (1992:23), though Justice lists these as diagnostic of the Late Archaic (1987:119-120)

Late Archaic (4000 - 1000 B.C.)

The Late Archaic in the midwest is widely known as a period of increasing complexity and diversity and as a time of transition between established Archaic patterns and new Woodland patterns featuring ceramics, food production, and mound building (Griffin 1983:249; Stoltman 1978:715). Larger sites with recurrent habitations suggest considerable population growth (Griffin 1983:249), which may be linked to the gradual return of cooler and wetter conditions and the spread of modern mixed-deciduous forests. Other general trends include increasing use of plant foods, increasing numbers of grinding stones, a greater variety of preserved faunal remains, evidence for structures, the appearance of shell midden sites, increasing evidence for long distance exchange of raw materials and finished objects, and inclusion of exchange objects in burials (Griffin 1967:178-180; Griffin 1983:249; Kellar 1983:29). Early fiber-tempered ceramics appear in the southeast by about 2000 B.C. (Griffin 1967:180), but ceramics do not appear in the midwest until the end of the Late Archaic (Griffin 1983:249). Evidence for the cultivation of native plants as well as squash and gourd imports from the southeast is evident at the end of the Late Archaic (Ford 1974:401).

There are a number of named regional Late Archaic manifestations throughout the midwest. One of the best known is the Helton phase, which is known from the Koster site in the lower Illinois Valley. Helton phase artifacts include Matanzas, Godar, Helton, Karnak Stemmed and Table Rock Stemmed points, T-shaped drills, full and three-quarter grooved axes, plummets, bannerstones, metates, and chevron-incised bone pins. A variety of hearths and roasting pits are found at Helton phase sites along with evidence for a rectangular house pattern. Some differences in burial treatment suggest the marking of status and in some cases Helton phase burials contain exotic materials such as marine shell or copper (Griffin 1983:250; Brown and Vierra 1983:185; Munson and Cook 1980:734-736). By 2000 B.C. the Helton phase is replaced at Koster by the Titterington phase, which is defined by Wadlow, Etley, Sedalia, Merom, and Kampsville points (Brown and Vierra 1983:186). Titterington people are cited as having a well-adjusted economy that made equal use of floodplains, uplands, and areas between (Griffin 1983:250). The French Lick phase (3000-1500 B.C.) has been defined for south-central and southwestern Indiana by Munson and Cook (1980). The phase incorporates riverine shell midden and non-shell midden sites with Matanzas, Big Sandy II, Karnak, and straight to expanding stemmed points. The subsistence/settlement system is characterized by summer and fall base camps along large creeks and tributary confluences, fall and winter camps along tributaries, and summer shell middens sites along large rivers (Munson and Cook 1980:723-730). Riverton culture sites (2000-1000 B.C.) have been identified along the middle Wabash River by Winters (1969) . Sites

range from shell middens along the river to terrace top settlements with houses and prepared clay floors (Winters 1969:137). Robeson Constricted Stem, Merom Expanding Stem, and Trimble Side Notched points are diagnostic of the Riverton Culture along with the cooccurence of Robeson gouges, grooved sinkers, limonite axes, "cloudblower" pipes, and Indian Knoll rattles. Winters looks south for Riverton antecendents, arguing against connections to the earlier "Wabash Valley Archaic" (Winters 1969:103-108). Ford (1974:395) includes the various Late Archaic manifestations discussed here in a larger mid-continent tradition called the Riverine Archaic.

While the Riverine tradition clearly defines southern portions of Indiana, the Late Archaic in the northern half of the state is not as well understood. A complex known as Glacial Kame is known from burials in gravel mounds with distinctive marine shell, gorgets, and native copper grave goods. Red ochre and "birdstones" were often included as well (Griffin 1983:253; Kellar 1983:34). In the western portion of the state a related mortuary complex known as Red Ocher is defined by red ochre-covered burials in low artificial mounds. Distinctive Fulton Turkey-tail points are associated with Red Ochre manifestations, often occurring in large caches (Kellar 1983:34). These burial complexes appear ancestral to the burial ceremonialism that became so widespread during Early and Middle Woodland times.

Numerous Late Archaic sites are known in the upper Wabash Valley from surface point finds. Point types include Matanzas, Matanzas Stemmed, Laurentian Corner Notched, Brewerton Side-Notched, Brewerton Corner Notched, Table Rock Stemmed, Genesee, Stone Square Stemmed, Feeheley, Lamoka, Raddatz, Karnak Stemmed, McWhinney, Motley (like), Riverton, and Kramer (Wepler and Cochran 1983a, 1983b; Anuszczyk and Cochran 1984). Most chipped stone artifacts are made of local Liston Creek chert, though artifacts of Attica chert are present (Hicks 1992:24). Late Archaic sites are the largest reported in the upper Wabash drainage and are most often found on terraces overlooking the river near secondary stream confluences (Wepler and Cochran 1983b:24). Conversely, Anuszczyk and Cochran report more Late Archaic sites on floodplains for their upper Wabash survey (1984:78).

The All Season's Site (12-Mi-225), located within the upper Wabash drainage near Peru, Indiana, contained a fire-cracked rock and charcoal concentration with a radiocarbon age of 3570 +/-105 BP (Beta-13373). The feature, the oldest dated at the site, probably represents a Late Archaic or Early Woodland occupation (Cochran and James 1986:15,47). A stream adjacent to the site was responsible for the burial of this feature under over 150 cm of alluvium. A slightly older radiocarbon age, 3670 +/- 90 BP (Beta-42314), was obtained for a fire-cracked rock concentration at the Diefenbaugh site during Phase II investigations (Zoll et al. 1991:42).

Phase II investigations carried out by ARMS (Zoll et al. 1991) for the U.S. Highway 24 improvement project involved the testing of 18 potentially significant sites, all within five kilometers of the Diefenbaugh site (see Figure 1.1). Of the 18, four were identified as Late Archaic in age based on Matanzas (12-Hu-389, 12-Hu-390) and Brewerton (12-Hu-935, 12-Hu-944) points. 12-Hu-390 and 12-Hu-389 occur on the floodplain while the other two are on terraces. 12-Hu-944 lies near the Diefenbaugh site on the east side of the Silver Creek /Wabash confluence. 12-Hu-935 was mitigated by

Landmark and yielded diagnostic material from Late Paleo-Indian through Late Archaic times (Sherman 1996).

Early and Middle Woodland (1000 B.C.- A.D. 500)

Roughly simultaneous occurrence of ceramic manufacture, food cultivation, and artificial earth constructions characterizes the Early and Middle Woodland periods in the midwest. Following developments in the Middle Atlantic area, cord-marked ceramics such as Marion or Schultz Thick spread rapidly. More complicated indigenous ceramics with rocker and dentate stamped decoration appeared during the Middle Woodland along with trade vessels from the southeast (Griffin 1967:184; Griffin 1983:254). Intensive hunting and gathering appears to have been supplemented by cultivation of squash and gourd and the indigenous cultigens sunflower, sumpweed, and goosefoot (Stoltman 1978:718; Ford 1974:401). Corn was adopted from the southwest much later, and became a regular (though not staple) part of Middle Woodland subsistence (Ford 1974:402).

Early Woodland peoples constructed earthen mounds for the dead throughout many parts of eastern North America. The most extensive form of this practice by Adena peoples took place in the Ohio Valley area (Griffin 1983:254). Cremation and inhumation burials have been found in village cemeteries and in accretional mounds built over the locations of circular "ritual" structures (Griffin 1983:258; Clay 1986:581). The distribution of Adena mortuary goods among adult males suggests the presence of graded, achieved statuses (Mainfort 1989:173). Mortuary goods include cut mica, copper beads and bracelets, stone gorgets, tubular stone pipes, stone effigy pipes, engraved stone tablets, atlatl weights, marine shell, chert blades, and plain and decorated ceramics (Griffin 1983:258-259). Other Early Woodland complexes, such as Black Sand in western Illinois, are characterized by small domestic sites with strategic locations between valleys and uplands (Griffin 1983:257).

After approximately 100 B.C. the midwest was dominated by Middle Woodland Hopewellian regional complexes. Hopewell sites in Ohio include large and complex geometric earthworks and burial mound clusters (Griffin 1983:262-262). Mortuary goods reflect a wide sphere of interaction for Hopewell peoples. Copper, silver, galena, meteoric iron, quartz crystal, mica, obsidian, Ohio pipestone, and marine shell commonly appear in burials as raw materials or artifacts. Human and animal effigies in clay, on carved platform pipes or in cut mica are among the broad array of elaborate Hopewell artifact forms (Griffin 1967:184). Greber (1979) has identified some social divisions and "high ranking" individuals using mortuary data, but the structure of Hopewell society can not be reliably inferred from the data (Griffin 1983:263). Havana Hopewell in western Illinois includes smaller mound burials and similar types of mortuary goods, though no geometric earthworks are present (Griffin 1983:268). A similar Hopewellian complex is known in western Michigan (Fitting 1978:47-49). Other mound building, stamped ceramic cultural complexes have been indentified in the Great Lakes area, such as Laurel in Minnesota, northern Wisconsin, Michigan, southeastern Manitoba and western Ontario (Griffin 1983:271). Elsewhere, such as in northern Indiana , southeastern Michigan, and

northern Ohio, poorly understood Middle Woodland complexes await further clarification (Fitting 1978:47).

At a limited number of terrace and floodplain habitation sites throughout Indiana, Early Woodland Marion Thick ceramics occur in association with pits and thick midden deposits. In a similar setting, ceramics of Middle Woodland age are associated with living floors and hearths (Kellar 1983:36,43; Hicks 1992:25). Aspects of Adena and Hopewell ceremonialism have been observed in southern and east-central Indiana. The Nowlin Mound site in southeastern Indiana contained seven log tombs within a single mound and small amounts of typical Adena mortuary goods (Kellar 1983:38). Crab Orchard Tradition Hopewell burial mounds are situated on high terraces and bluffs in southwestern Indiana, and a village/ceremonial complex has been identified in Posey county (Kellar 1983:45-46). Mounds and earth enclosures in east-central Indiana were constructed from late Adena through Hopewell times (Cochran 1992:26). Diagnostic artifact types for Adena sites in Indiana include Montgomery Incised ceramics, copper bracelets, and Adena points and cache blades. Hopewell diagnostics include various types of stamped ceramics, copper earspools, stone effigy pipes, Hopewell Cache blades, Snyders points, and Lowe Flared Base points (Kellar 1983:41-45).

Buried charcoal concentrations and artifacts from the All Seasons site in the upper Wabash indicate Early to Middle Woodland occupations (Cochran and James 1986). Anuszczyk and Cochran's survey of the upper Wabash shows a limited number of Adena, Schultz-like, and Snyders points from terrace and floodplain contexts. The presence of Burlington chert Snyders points in the upper Wabash attests to interaction with Illinois groups (Wepler and Cochran 1983a:105). Overall, Early and Middle Woodland sites are poorly represented and occur mainly as single point finds (Anuszczyk and Cochran 1984:74-80).

Late Woodland and Mississippian (A.D. 500 - 1650)

The transition to the Late Woodland period is marked by the abrupt decline of fluorescent Hopewellian complexes, though in many areas no decline from established regional Middle Woodland patterns is seen (Stoltman 1978:721-22). The early Late Woodland in central and southern Illinois is characterized by cord-marked ceramics and small, scattered sites typical of a generalized economy. Similar cord-marked ceramics are also noted for western Michigan (Fitting 1978:54). The Newtown complex in southern Ohio and southeastern Indiana includes large villages with circular house plans. Lowe Flared Base points, Chesser Stemmed points, and cord-marked ceramics are characteristic (Griffin 1983:272-273). Villages of the Allison-La Motte and Albee complexes are found in the middle to lower Wabash Valley. Allision La-Motte is characterized by oval dwellings, Lowe Flared Base points, stamped ceramics, and increasing evidence for plant cultivation (Kellar 1983:50). Excavation of an Albee cemetery revealed tools, beads, gorgets, and cord-marked ceramics with distinctive wedge-shaped rims (Kellar 1983:50). Botanical remains from the Albee complex Morell-Sheets site (12 My 87) in west central Indiana suggest roughly equal use of maize and wild plants at a spring through summer occupation (Bush 1994:7).

Inhabitants of the midwest became more intensely horticultural after A.D. 900 and established larger, more sedentary villages characterized by house clusters, storage pits, and stockades (Stoltman 1978:723-724). Such changes may be associated with the improved subsistence during the warming of the Secondary Optimum (A.D. 1000-1200), but the trend towards larger settlements is one that began earlier. In the American Bottom the Cahokia site represents Mississippian cultural fluorescence. During Cahokia's apogee (A.D. 950-1300) people engaged in the construction of enormous platform mounds and further evidence for social complexity is seen in elaborate mound burials (Griffin 1983:278-280). Cahokia was linked through cultural similarity and interaction to a number of independently derived expressions throughout the midwest and southeast. As the largest Mississippain center, Cahokia is thought to have exerted considerable influence throughout this area and at its margins (Stoltman 1978:725; Griffin 1983:280-282). Mississippian cultural patterns are represented in southern Indiana by the Angel, Murphy, and Vincennes Complexes. The forty hectare Angel Mounds site and associated villages, hamlets, and camps are located in the southwestern tip of the state along the Ohio and Wabash Rivers. The Angel Mounds site represents a palisaded town with platform mounds, plazas, rectangular house remains, and a main occupation date between 1200 and 1400 A.D. (Griffin 1983:283). Diagnostic artifacts include typically Mississippian ceramic bowls, bottles, plates and jars and small triangular arrow points. Some Angel vessels feature negative painted motifs and effigies (Griffin 1983:286-288). Distinctly less complex Mississippian sites of the Murphy and Vincennes complexes are located along the lower Wabash River in Illinois and Indiana (Griffin 1978:550). The Caborn-Welborn phase of Mississippian, with more dispersed and unfortified settlements, replaces earlier Mississippian occupations in the Ohio/Wabash area after A.D. 1450 and continues until the time of European exploration of eastern North America (Griffin 1983:288).

In central Indiana Late Woodland sites of the Oliver Phase (A.D. 950-1300) dominate. McCullough notes that the term Oliver has been used broadly to describe a range of sites with grit-tempered and often decorated ceramics with both local Late Woodland attributes and Ft. Ancient attributes from central Ohio River Valley (1992:43-44). Oliver phase settlements ranged from nucleated/stockaded villages to seasonal encampments (Redmond 1994:1). Some Oliver Phase ceramics show similarities to Springwells Phase material from the Western Basin Tradition. Springwells Phase sites are found in the upper Maumee drainage and Springwells influence on local Late Woodland is seen in the upper Wabash in the form of collared and uncollared ceramics with cord, linear tool, and reed punctates (McCullough 1992:53).

Late Woodland sites, though mainly small, are more common than earlier Woodland sites in the upper Wabash drainage. Triangular points, Jack's Reef Corner Notched points, and thin, grit tempered ceramics are present, and sites are most often located along rivers and valley margins (Wepler and Cochran 1983b:25). Late Woodland radiocarbon dates were obtained for the All Season's site, though only an early Late Woodland date was associated with diagnostic material in the form of Chesser Notched and Madison triangular points and cordmarked ceramics (Cochran and James 1986:47).

Whereas most of the Late Woodland Period for the northeastern portion of Indiana provides a general image of cultural continuity, the region became relatively

depopulated during the centuries before direct European contact (Hicks 1992:42). Population movements probably resulted from indigenous social and ecological factors as well as indirect impacts from European presence on the continent. It is thus difficult to make connections between earlier prehistoric cultural traditions and the historic Miami who played such an important role during the Contact Period. Detailed information on the historic Miami can be found in the recent report by Mann (1996).

CHAPTER 4

OVERVIEW OF NINETEENTH CENTURY HUNTINGTON COUNTY HISTORY

Historic Component #2

A very limited surface scatter of late nineteenth century historic artifacts was detected at the west end of the project area. There are no structures indicated at this location on the1866 plat map (Figure 4.1). This portion of the property was included in the 79.5 acres West ½ North East ¼ Section 14, Township 28, Range 8 East purchased by William G. Campbell from the United States in 1832 and sold to Thomas Moore in 1861.

Historic Component # 1

The Diefenbaugh Site contains one archaeological component that dates to the early to mid-nineteenth century. It is referred to in this report as Historic Component # 1 or the Campbell component. There is no structure recorded at the Diefenbaugh Site on the Huntington County Plat Map of 1866 and there are no earlier maps for Huntington County available (see Figure 4.1). The documentary evidence discussed in the sections below establishes the historical context for this archaeological component.

Local Historic Resources

Three structures in Huntington County are listed on the National Register of Historic Places. These are: the Madame Margaret LaFolia House-late 1830s, the La Fontaine Hotel-1925 and the Taylor-Zent House-1898. One structure, the Chief Richardville House-1833, is listed on the Historic American Building Survey (Roberson 1982:24). The structure is listed in the Interim Report as "Outstanding", meaning it has potential for nomination to the National Register of Historic Places (Roberson 1982:24, xiv). The Chief Richardville House belonged to the civil chiefs of the local Miami in the 1830s-1840s and was relocated to the site of a local museum, Historic Forks of the Wabash, Inc. in 1990-1991 (Gernand 1987:168).

No nationally registered historic places are recorded within a three mile radius of the Campbell component of the Diefenbaugh Site. The Huntington County Interim Report (Roberson 1982) registered seven significant buildings or structures within one mile of the Diefenbaugh Site. One of these structures, the Silver Creek aqueduct (1832), dates to the period of occupation of the Diefenbaugh Site. Its significance is discussed later in this text. The Huntington County Interim Report was being updated during the summer of 1995 and the resurvey data was unavailable at the time of report preparation. The Diefenbaugh Site is also very near the Andrews Multiple Resource Area, a district of

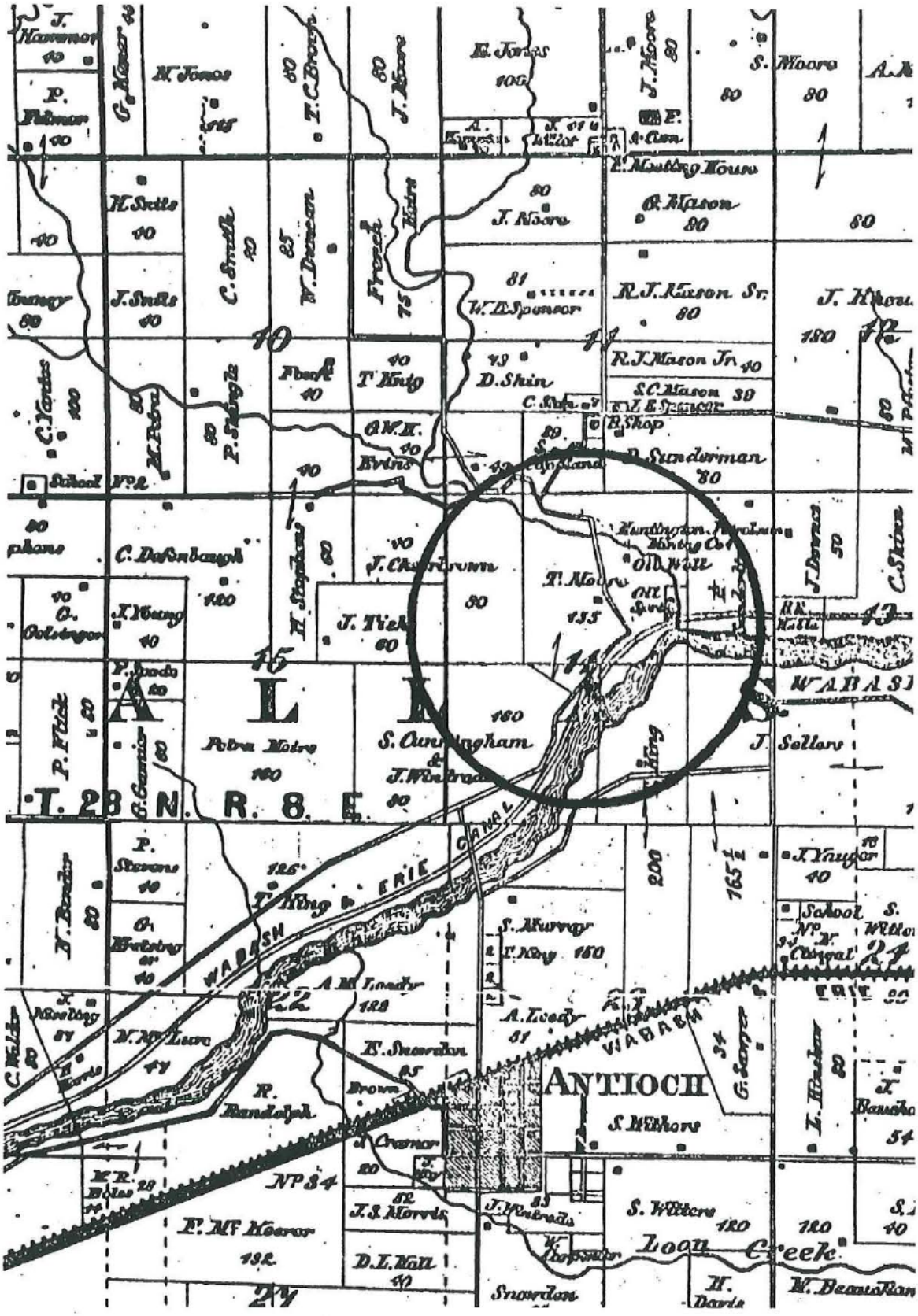


Figure 4.1 Huntington County 1866 Atlas

the town of Andrews with many surviving late nineteenth century structures (Roberson 1982:17).

Huntington County History 1813-1827

Huntington County and Miami history prior to 1813 is discussed in Mann (1996). Between 1813 and 1827, Huntington County was beyond the western border of Euro-American settlement. French-Canadian influence was beginning to wane, the Native American armed resistance was over and the interactions between Native Americans and Euro-Americans were characterized by exploitation, assimilation and eradication. Officials of the United States government began the process of claiming the land owned by the Miami for the purposes of settlement. Potential settlers were eager to harvest the resources of the upper Wabash Valley. The land had long been recognized as beautiful and plentiful (Glenn 1991). After the armed resistance was over and the land cession treaty process had begun, speculation for Native American land began in earnest. The issues included the location of the canal route, who would benefit from the sale of canal lands and how speculators could get control over lands with so much profit potential. The main obstructions to development were the presence of the Miami and their reluctance to surrender their lands and be removed. Persons of influence began a campaign to remove the Miami as quickly as possible. An excellent example of the intense desire to obtain Miami land and to further personal goals is illustrated by the text of the letter provided in Appendix 1.

The following timeline illustrates how quickly changes in settlement and transportation in Huntington County took place. In rapid succession, the county went from an unbounded forest to a disputed borderland to a prominent canal and rail corridor tied to a national system of transportation and consumption.

Table 4.1 Timeline of Huntington County Development 1816-1874

1816	Indiana achieves statehood.
1826, Oct. 23	Treaty of Paradise Springs provides for canal route through Miami lands.
1827, Mar. 2	Land for Wabash and Erie Canal granted by Congress.
1828, Feb.11	Treaty of Sugar Creek provides for further cession of Miami lands and relocation to reserves near the forks of the Wabash and along the Eel River.
1828	Route of Wabash and Erie Canal proposed.
1830	Federal Removal Act becomes policy in land cession arrangements
1832, Feb. 22	Wabash and Erie Canal construction begins in Fort Wayne.
1834, Oct. 23	Treaty of 1834 signed at the forks of the Wabash, provides for elimination of tribal debt, and ten years of annuity payments, lands to chiefs - ratified Dec. 22, 1837.
1834	Huntington County was formed and Huntington named the county seat.
1835, July 3	Wabash and Erie Canal opens from Ft. Wayne to Huntington

1838, Nov. 6	Treaty of 1838 signed at the forks of the Wabash, further reduction of Miami land holdings, U.S. agrees to provide land in the West when tribe decides to move.
1840	Treaty of 1840 signed at the forks of the Wabash; removal from Huntington County within five years, 500,000 acres of western land to Miami, majority of chiefs permitted to stay and own land.
1841	Wabash and Erie Canal opens from Fort Wayne to Logansport.
1843	Wabash and Erie Canal operational from Ohio to Lafayette.
1846	Removal of the Miami to Oklahoma via Wabash and Erie Canal.
1853	Wabash and Erie Canal completed from Toledo, OH to Evansville, IN. Wabash and Erie Railroad operational through Huntington County.
1874	Wabash and Erie Canal abandoned.

Huntington County History 1828-1850s

> Huntington had its origin in the land speculation that arose from the Miami land cession treaties from 1818 to 1840 and in the potential of economic development foreseen with the Wabash and Erie Canal (Glenn 1991:71).

Beginning with Artemus Woodworth, the first Huntington County settler who bought lands from the United States government in 1828, Huntington County began to experience an increase in population associated with United States land sales and the construction of the Wabash and Erie Canal. While some early settlers came first to construct the canal, thousands of later settlers traveled to Huntington County to exploit the new lands opened for farming. The first completed section of the Wabash and Erie Canal stretched from Fort Wayne, Indiana to Huntington, Indiana. It was 32 miles long and was completed on July 3, 1835. Construction progress after that time was sluggish and characterized by intermittent delays and spurts of activity (Fatout 1972). After 1843, when the canal was opened from Toledo, Ohio to Lafayette, Indiana, the character of Huntington and Huntington County changed even further. The farmers and businessmen could finally ship their goods all the way to eastern markets, improving their cash flow and encouraging further development. Some of the common exports from Huntington County included lumber, pork and limestone (Anon 1978[1887]).

The town of Huntington was platted in 1833 by Captain Elias Murray and incorporated in 1848 (Anon 1978 [1887]:402-403). At the time of canal construction, Fort Wayne had approximately 300 persons.

Table 4.2 Population of Huntington County 1840-1910 (Bash 1914)

1840	1,579
1850	7,850
1860	14,867
1870	19,036
1880	21,805
1890	27,644
1900	28,901
1910	28,932

The Canal Era 1832-1853 and The Railroad Era 1853-present

The Wabash and Erie Canal developed in 1827-29 as a joint project between Ohio and Indiana to connect their markets with the eastern seaboard by providing access to the Great Lakes and Erie Canal system to the north and to the Ohio river to the south (Allen 1952:1). The project goal was to connect Toledo, Ohio to Evansville, Indiana by way of the Maumee and Wabash river systems. It was expected that sales of lands appropriated along the canal route would fund the cost of construction, but initially lands sales were not as successful as predicted (Castaldi 1991:146). In the early 1830s, the State of Indiana embarked on a huge program of internal improvements that drained the Treasury and inspired disparagement amongst the citizenry (Castaldi 1991). Loans and guarantees were taken out by the State of Indiana to continue canal construction. The national Panic of 1837 and the subsequent bankruptcy of Indiana in 1839 resulted in skepticism on the part of the general population regarding the completion of the canal system in Indiana (Gray 1982:127). One contributing delay was the reluctance of the Ohio government to complete the canal in their state, a goal which was not achieved until 1843. Insufficient revenue continued to present problems and the state treasury could not pay the interest or principal on the loans. In 1847, the legislature voted to have Indiana relinquish half of her rights to the canal to bondholders, just about the time the canal became more successful (Fatout 1972:123). In 1850, near the height of canal revenue intake, the legislature voted to prevent Indiana from ever going into debt for the purpose of constructing internal improvements again.

The construction techniques employed while building canals in the nineteenth century required mostly hand labor. Construction along sections of the canal awarded to contractors, many of whom bid low and built substandard structures (Fatout 1972:55-57). The contractors solved their local labor shortages by importing a mostly Irish work force, many of whom had just helped complete the Erie Canal in the Northeast (Allen Co, 1952:10; Castaldi 1991:148). The large tracts of arable land and virgin forest appealed to some of the men who worked on the canal. Many Irish workers settled in Huntington with their families after the construction of the canal (Castaldi 1991:149).

As sections of the canal became operable, it proved capable of stimulating, but not maintaining, commercial activity. One nineteenth century Huntington resident stated that between "1847 and 1856 was the best period of the canal's history" (Castaldi 1991:158). As canal traffic increased, the number of farmers migrating into the county increased (Castaldi 1991:152). In "1845 the United States government was able to use the Wabash-Erie Canal... to transport soldiers to Cincinnati for service in the Mexican War" (Allen Co. 1952:15). After 1849, the canal provided a fast packet service that brought "passengers and daily mail to the communities along the Canal" (Allen Co. 1952:15). "In 1853 the Canal was open from Toledo to Evansville - a total distance of 452 miles" (Allen Co. 1952:16).

Representatives of the canal were stationed at intervals to maintain its structural integrity, collect tolls and monitor locks and the associated boat traffic (Fatout 1971:7). Two types of canal boat were active along the Wabash and Erie Canal. Packets were passenger boats on which the cost of the trip included onboard lodgings and meals. Packets could travel up to seven miles an hour (Castaldi 1991:151). Freight boats traveled more slowly, and accommodations onboard were minimal (Castaldi 1991:153). Both types of boat were propelled by horse power connected via a towline attached to the canal boat. One or more horses attached to this line walked along the towpath, pulling the canal boats. Horse changes were typically made every ten miles (Allen Co. 1952:18). Migrating farmers and commodity procurers were not the only traffic on the canal. Traveling shows, floating saloons and local interurban traffic also clogged the "Old Ditch". The influx of hard currency was noted by one early resident. "Money was dreadful scarce and didn't begin to circulate freely until the canal began operating from Lafayette [1843]" (Welches 1991:137). In 1843, prior to the opening of the canal from Lafayette, Indiana to Toledo, Ohio, 5622 bushels of corn were exported from the Upper Maumee and Wabash Valleys. In 1848, the same area exported 2,755,149 bushels of corn, a 490% increase in five years (Bash 1914:220).

The canal system had numerous imperfections that were accentuated by the speed and efficiency of the railroad system. The navigable season on the canal was limited to less than eight months. Repairs cost more money than toll revenues generated (Allen Co. 1952:24). During 1854 numerous breaks on the southern section caused by what some believed to be substandard construction techniques delayed traffic for up to four moths (Fatout 1972:157-158). Bad weather and outright vandalism in the following two years continued to decrease canal revenues and creditors began to worry about the terms of repayment (Fatout 1972:161). The trustees who managed the canal were desperate for repair money and the international creditors were petitioning the State of Indiana to buy back the failing canal and settle the debt. The state refused to consider subsidizing the failed enterprise (Fatout 1972:163-164). The compromise reached involved leasing certain sections to private citizens (Castaldi 1991). After 1874, when the canal was declared unfit, the right-of-way was sold to farmers and developers who reclaimed the land for a variety of purposes (Castaldi 1991:158).

The first railroad in Huntington County was established in 1853 (Roberson 1982:17). Near the Diefenbaugh Site, the Wabash Railroad was located on the south side of the Wabash River through the town of Andrews, then known as Antioch (Anon 1866).

The influence of the Wabash and Erie Canal on local history, settlement patterning and population cannot be underestimated. The preserved sections of the canal channel, the standing canal structures and buildings and sites associated with canal period life are of significance in Indiana history. The oldest sections of a canal of national importance were constructed in the Huntington-Fort Wayne area, initiating an important period for the upper Wabash Valley.

Miami History 1813-1846

"On October 6, 1846, three canal boats departed from Peru, Indiana ... for Kansas" (Castaldi 1995:31). The passengers were the Miami removed from Huntington County.

Despite the burning of the village at the forks of the Wabash in 1812 by American forces, the Miami resettled the location soon afterward (Mann 1996, Sherman 1996). Travel accounts from 1814, 1819 and 1822 refer to a "large Indian village" of Miamis at the forks (Glenn 1991:70-71). It contained substantial log homes with cultivated fields. Prior to 1812, this village had stretched for "three or four miles" along the Wabash (Mann 1996:188). The location's importance as a destination at the southern end of the Long Portage was still in place due to the area's expected development through the Wabash and Erie Canal in the 1830s (Leonard 1991:77,93). It also enjoyed elevated status through association with the rule and influence of the Miami civil chiefs Richardville and LaFontaine. Richardville established a trading post there in 1833 that served as a center for Miami politics and cultural exchange (Glenn 1991:71-74). As the Native Americans experienced land cessions, they consolidated onto reserves. Miami reserves and towns, including Black Loon village near the Diefenbaugh Site, likely served as smaller centers for Miami interaction and bastions of traditional Miami lifeways (Mann, personal communication 1996).

The multiple treaties of 1826 through 1840 were negotiated such that the Miami in Huntington County, with the exception of a few high-status families, consistently lost land and rights in favor of land speculation and Euro-American economic development. The Miami economy had shifted from a lifeway of procuring furs for French trading interests to one based on the yearly annuity payments. This economic situation, combined with the aggressiveness of the Euro-American merchants who sought to exploit the purchasing power and naivte of the Miami, resulted in the loss of much of the annuity payments on the day of receipt. Many Miami who could afford to buy property were untrained in administering and succeeding on Euro-American farmsteads. For the most part, the Miami that remained in Huntington County either were unable to "make the necessary cultural adaptations and lost their lands" or became assimilated into Euro-American cultural norms and adopted (Leonard 1991:88). The traditions brought to the area by the increasing numbers of Euro-American settlers were based on farming and local resource exploitation. The Miami were coping with continuing land cession, legal disenfranchisement and changing local needs for their goods and services. Leonard points out that the Miami began to act less as an entity and more on an individual basis during

Chief Richardville's time as civil chief. "The value of establishing Indian land titles in terms recognized by the Americans" was apparently a point not lost on Richardville, whose "activity could also be seen as his recognition that only through individual ownership could the Indians hope to retain any of their lands" (Leonard 1991:82,84). As some Miami began to adjust their lives to these new rhythms, their opportunity to do so was cut short by the removal of approximately half of the local Miami to Kansas in 1846.

The Miami not associated with the forks area found themselves "treatied" onto reserves along the Wabash River. The closest of these to the Diefenbaugh Site was the Black Loon Reserve east of Andrews[Antioch]. It contained Black Loon Village. It is likely that the Miami located on Black Loon reserve participated in the development of the area as the route of the Wabash and Erie Canal, although the reserve and the town were on the opposite side of the Wabash River (Figure 4.2).

Today the Miami in Huntington County are petitioning the U.S. government for formal recognition. The group has been petitioning for tribal status since 1909 (Rafert 1990:90). The Western Miami of Kansas were granted tribal recognition in 1846 (Rafert 1990:82). The Eastern Miamis' most recent petition for status was denied in 1990 and litigation is expected to continue (Rafert 1990:90).

Dallas Township History

For a visual representation of nineteenth century Dallas Township and the following settlements and structures, please consult Figure 4.2. This map was developed from the Huntington County Combination Atlas (1879: Kingman Bros. Publishing). Until 1847, Dallas Township was part of Huntington Township (Chambers 1971:48). Artemus D. Woodworth was the first settler in the county and the township. In August of 1828 Woodworth settled in the Northwest ¼ of Section 14 near the eventual site of the Wabash and Erie Canal (Chambers 1971:42). Although the details are sketchy, a small settlement seems to have grown around Woodworth's home. The town of Woodworth Station had "a store, a station, a trading post" (Chambers 1971:42). One Samuel Moore was reported to have traded with canal workers at Woodworth Station from 1832-1845 (Chambers 1971:42). Woodworth Station no longer exists.

In 1832, Joseph Chesebro (also Cheeseboro, Cheseborough, etc.) settled in Dallas Township for the purpose of building the lock on the Wabash and Erie Canal known by his name (Anon 1978[1887]:601-602). His was the first marriage recorded for the township, in 1835 to Susan C. Woodworth (Anon 1978[1887]:604). At one time, Joseph Chesebro represented Huntington County in the Legislature of Indiana (Anon 1978[1887]:602). A settlement grew up around Chesebro Lock and eventually a veneering and shingle factory was located there (Anon 1978 [1887]:604). In 1847, Dallas Township was organized and the first local officers were elected in a cabin near Chesebro's Lock (Anon 1978[1887]:603).

Another notable early Dallas township resident was Capt. Elias Murray. In 1830, Murray settled at the "bluff's near Woodworth's (Bash 1914:1)." Another source lists the property as the Northwest ½ of Section 13 (Bash 1914:601). Murray was the attorney and

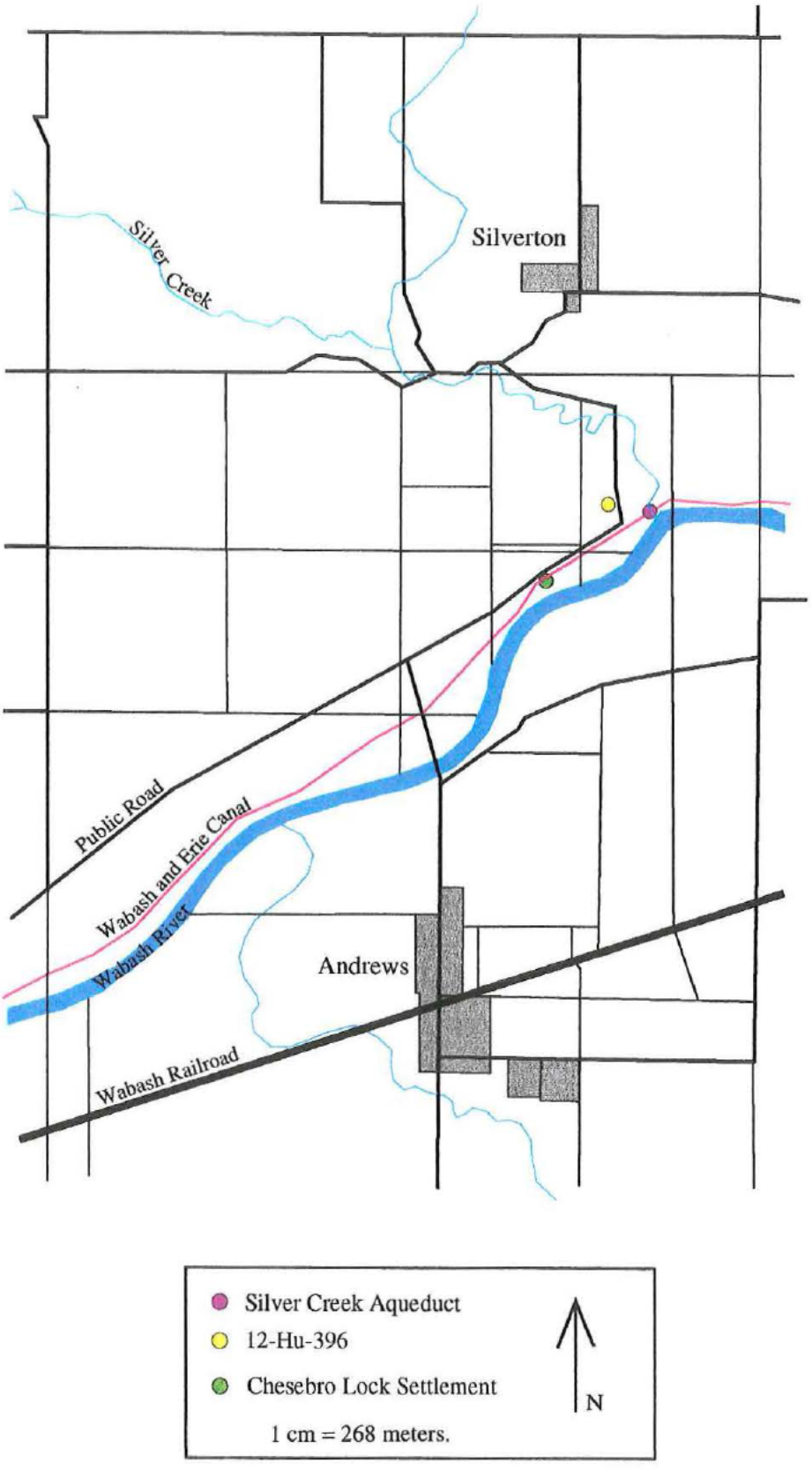


Figure 4.2 Dallas Township in the nineteenth century.

business representative of General John Tipton, the influential Indian Agent from Logansport, Indiana. Capt. Murray also platted the town of Huntington, naming it for his uncle, Samuel Huntington, a signer of the Declaration of Independence (Bash 1914:402).

The extinct settlement of Silverton was located near the Diefenbaugh Site. It was founded by Quakers who built a church with a cemetery at the intersection of Maple Grove Road and C.R. 750 W, less than one mile north of the Diefenbaugh Site (Chambers 1971:43). The first school in the area was taught at the Society of Friend's meeting house in Silverton in 1844 (Chambers 1971:45). The town had a store, a village post office, a justice of the peace and a small tile mill, but was never platted (Chambers 1971:46-47).

The town of Andrews is less than two kilometers to the southwest of the Diefenbaugh Site. It was platted near the location of Black Loon Village on the Black Loon Reserve in 1853 (Anon 1978[1887]:605). The town was originally known as Antioch and was founded for the express purpose of creating a railroad station (Anon 1978[1887]:605). In the mid to late 1850s, Andrews [Antioch] had numerous business interests, including a saw mill, blacksmith, several merchants and a hotel (Anon 1978[1887]:606). The period of intense growth of the town began in 1861, after the occupation of the Diefenbaugh Site.

The area immediately around the Diefenbaugh Site could not have been described as a wilderness during the historic occupation of the site. Although Huntington County did not experience a significant population increase until 1843, the area around the Diefenbaugh Site contained several settlements associated with the canal. The nearby settlements of Silverton, Woodworth's Station, Andrews and the Chesebro lock would have contributed to the relatively concentrated population immediately after the construction of the Wabash and Erie Canal. The following description of the impact of canal construction indicates that a similar impact would have been felt near the Diefenbaugh Site. Canal workers were "paid off at Huntington at stated times, and a large part of the money spent here, making times easy and money plenty, and the population and business of the town increased rapidly" (Anon 1978[1887]:406). Not only land speculators who anticipated a profit from sales to early settlers, but merchants and other businessmen who anticipated profits from supplying the "big machine" of canal construction might have moved to Section 14 of Dallas Township. One source suggests that Huntington County may have experienced faster economic growth due to the presence of ready cash in the form of annuities to the Miami (Anon 1978[1887]:406-407). The proximity of two Miami reserves to the Diefenbaugh Site must be also considered significant to the settlement choices made by site residents. The profits available during the annuity payments probably drew many traders seeking to exploit the Miami naiveté.

Canal Structures Near the Diefenbaugh Site

Please consult Figure 4.3 for the locations of canal structures. This map was developed from the 1928 (1934) Department of Transportation maps for the improvement of U.S. Highway 24. The Silver Creek aqueduct (originally known as

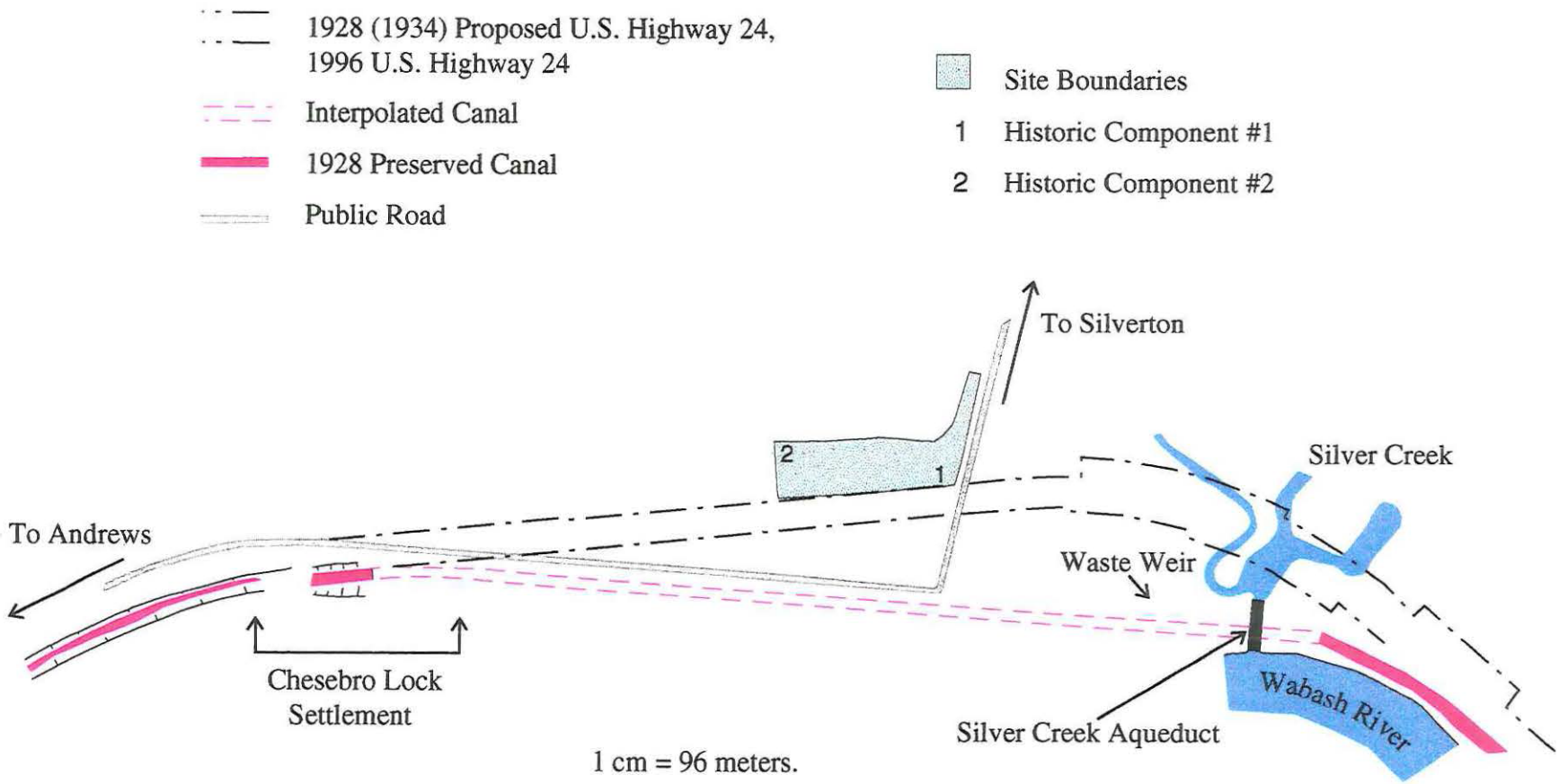


Figure 4.3 Wabash and Erie Canal structures near 12-Hu-396.

Culvert No. 45 over Woodword's Creek) is the most notable surviving canal structure in the township (Castaldi, 1995:57). The aqueduct was initially constructed of timber and carried the canal and the towpath across Silver Creek. In Chief Canal Engineer Jesse William's report of 1847, he suggested that the aqueduct be rebuilt of cut stone within three to four years (Castaldi 1995:58). The surviving structure is built of cut stone and is in fair condition. According to the 1991 ARMS Addendum, the proposed current changes to U.S. Highway 24 are 20 feet (6.1 meters) away from the Silver Creek aqueduct and it will not be impacted (Evans and Mann 1991).

There is no surviving evidence of another canal structure near the Diefenbaugh Site. "Not far to the west of the [Silver Creek] arch, a waste weir, or flood gate, was constructed to help control the level of water in the canal" (Castaldi 1987:165). A waste weir located where the Wabash and Erie Canal crossed Marais Du Perches in Allen County was described as being 150 feet (ca. 46 meters) long with 10 sliding gates which were hoisted in times of floods or surplus water (Castaldi 1995:25). Waste weirs were usually made of wood. Although it no longer exists, this waste weir may be significant to the interpretation of the Diefenbaugh Site in light of the sale of land by William G. Campbell to the Canal Commissioners in 1834. The sale of land by William G. Campbell occurred on April 20, 1834 (Huntington County Deed Book A). On that date, Campbell sold to the Canal Commissioners for $20.00 a 4.1 acre parcel of land to the west of Silver Creek and to the north and south of the canal. This land sale may be related to the construction of the waste weir described above. From the chain of title in possession of Mr. Fred Diefenbaugh, the sale of land to the canal commissioners is listed as being reserved for the use of water power for the Wabash and Erie Canal.

"A few rods west" of the Silver Creek arch was the Chesebro Lock (Castaldi 1995:58). Using topographic information and maps of canal structures in Huntington County, it is estimated that the maximum distance from the Silver Creek aqueduct to the Chesebro Lock was ca. 805 meters (2640 feet) (Castaldi 1995:34, Anon 1978[1887]:602). There are no surviving signs of the Chesebro lock. Timber-built locks, although not a desirable structure, were all that canal revenues would allow at times (Castaldi 1995:11). Within a distance of 805 meters, three canal structures and one small settlement existed at the time the Diefenbaugh Site was occupied.

Although the canal bed has been reclaimed for farming in the Ness field south of Highway 24, using the Silver Creek aqueduct, Huntington County Historical Atlas maps and the 1928 (1934) Department of Transportation Improvement of U.S. Highway 24, the path of the canal near the Diefenbaugh Site was interpolated (Figure 4.3).

The Campbell Ownership 1832-1858

The property on which the Diefenbaugh Site and Historic Component # 1 are located was originally owned by William G. Campbell. As discussed later in this section, no written evidence was found showing signs of habitation at Historic Component # 1 or William G. Campbell's residence.

The following tables show the land transactions that took place during the period that structures may have been constructed on the Diefenbaugh Site.

Table 4.3 Title for West ½ North East ¼ Section 14, Township 28, Range 8 East

October 4, 1832	From United States	To William G. Campbell
March 6, 1858	From William G. Campbell and Harriet Amelia Campbell	To George W. Helms
n.d.	(From George W. Helms)	(To William G. Campbell and Harriet Amelia Campbell)
February 28, 1861	From William G. Campbell and Harriet Amelia Campbell	To Thomas Moore

The property remained in Thomas Moore's possession until his death except for a brief, one month period in 1874 when it was owned by John and Frances Zeigler. It is unknown under what circumstances or when George W. Helms returned ownership to the Campbell's. By 1866, George W. Helms is not listed as owning any land within Section 14 of Dallas Township. By 1866, Thomas Moore was in residence on the site of the current home occupied by Mr.and Mrs. Fred and Mary Diefenbaugh.

Efforts surrounding the construction of the Wabash and Erie Canal are probably connected to William G. Campbell's purchase of the property on which the Diefenbaugh Site lies. Thousands of acres were offered along the canal route after the treaties under which the Native Americans agreed to give up ownership of the land. The first surveys of potential canal routes were approved in 1824 and by 1827 Indiana had been granted a five mile wide swath of land alternating on either side of the proposed canal route (Castaldi 1995:2). The revenue from the sale of this land to settlers was expected to cover the cost of constructing the canal (Castaldi 1995:2).

The first surveys were conducted in 1828 by the Canal Commissioners and "the first sale of canal lands was held at Logansport, Indiana, in October 1830, and later at Fort Wayne in October 1832" (Castaldi 1995:4-5). William G. Campbell's land purchases in 1830 and 1832 are listed in the Huntington County Deed Entry Book A in the following manner. Please note that his purchases both occurred in October of 1830 and 1832, the same dates as the first offerings of canal lands.

Table 4.4 William G. Campbell Property Purchases 1830 and 1832

Oct. 12, 1830	W ½ SW ¼	79.21 (acres)	se H	22 (H=Huntington Township)
	Fr SW ¼	60.90	nw H	17
Oct. 4, 1832	W ½ NE ¼	75.90	ne D	14 (D=Dallas Township)
	W ½ SE ¼	80.00	nw D	10

Ownership vs. Occupation

No evidence exists in primary documents to firmly establish that William G. Campbell occupied the Diefenbaugh Site during any period of his ownership. His name is absent from Huntington County census, death, birth, marriage and tax records for the period. He is not listed in the county histories as having held any offices, owned any businesses (with one exception), or attended any churches. Campbell also owned land in Section 10 of Dallas Township, near the location reported for the Campbell-Woodworth mill and his family may have resided on that property. All sources checked for reference to William G. Campbell or any descendants are listed in the bibliography. The few sources which illuminate W. G. Campbell and his activities in Huntington County are summarized below.

William Campbell purchased the property in Dallas Township Section 14 in 1832. In 1833, Campbell and Artemus D. Woodworth built a "saw and lath mill... located on the west branch of Silver Creek" (Chambers, 1971:47). A more precise description states that the mill was "approximately one and a half miles from its [Silver Creek's] junction with the Wabash" and was the first saw mill in the township (Anon. 1970[1877]:16). Project requirements prevented a controlled survey for the Campbell mill. Local oral accounts maintain that the remains of an old mill are visible under the abutments of the bridge on which Maple Grove Road crosses Silver Creek. Upon informal survey beneath the Maple Grove bridge crossing Silver Creek one half mile from the junction of Silver Creek and the Wabash River, limestone blocks and wooden beams were located at the base of the concrete bridge structure. It is unlikely, though, that these are the remains of the Campbell-Woodworth mill, according to historic references. They are more likely the remains of an older bridge.

In the November 25, 1857 edition of *The Indiana Herald*, William G. Campbell is listed amongst those owing back taxes for that year. He is listed as owing $7.00 in tax on 79 acres in W S W Huntington Township Section 22. Campbell purchased this property in 1830.

In the January 6, 1858 edition of the *Herald* is the following statement:

> Notice is hereby given that the County Surveyor will on the 23rd day of January 1858 at 8 o'clock, A.M. commence the Survey and location of corners in Section 14, township 28, range 8, beginning at the South East corner on the Wabash River, of said Section,
>
> WM. G. Campbell
> January 6, 1858 3w15

This property was soon sold on March 6, 1858 to George W. Helms and is the property on which the Diefenbaugh Site lies.

In the December 23, 1868 edition of the *Herald*, is a letter referring to a trip made by the letter's author, "FWG."

> In November, 1838, I paid my first visit to this country and came down from Fort Wayne to Huntington, there being then four or five log houses in the city.
>
> I went down to Silver Creek to where Wm. G. Campbell was then living. As Everybody supposed this a wilderness, it was nevertheless alive with human beings. There was an Indian Payment on Hand and there were people here from all parts of the earth, trading and groceries and goods and wares of every description, and trinkets and ornaments of all kinds to be afterwards used in trading with the Indians.

The letter to the *Herald* does not specifically indicate whether the "Indian Payments" were taking place on Campbell's land and this seems unlikely due to the location of two known payment grounds between Huntington and the Diefenbaugh Site (Chambers, 1952:49; Mann 1996).

In Deed Entry Book A, in addition to his land purchases, Campbell appears to have been serving as a Justice of the Peace in 1833. This position predates Dallas Township's incorporation. No mention of Campbell holding this office appears in county histories.

The residents of the Diefenbaugh Site lived in Huntington County during a turbulent time in local history. During their occupation, the Wabash and Erie Canal was constructed, utilized and grew defunct in their neighborhood. The first railroad was built and used. The Miami treatied their lands to Euro-Americans and were removed. The period of the decline of the Wabash and Erie Canal may have coincided with the relocation of the redsidents to another state. In addition, the realignment of transportation routes may have contributed to the abandonment of the Diefenbaugh Site. The anonymous history written in 1887 suggests that the veneering factory near the Chesebro Lock was long since abandoned and that the strength and congregation population of the Quaker church in nearby Silverton was declining at the time (Anon 1978[1887]:603).

CHAPTER 5

FIELD AND LABORATORY PROCEDURES

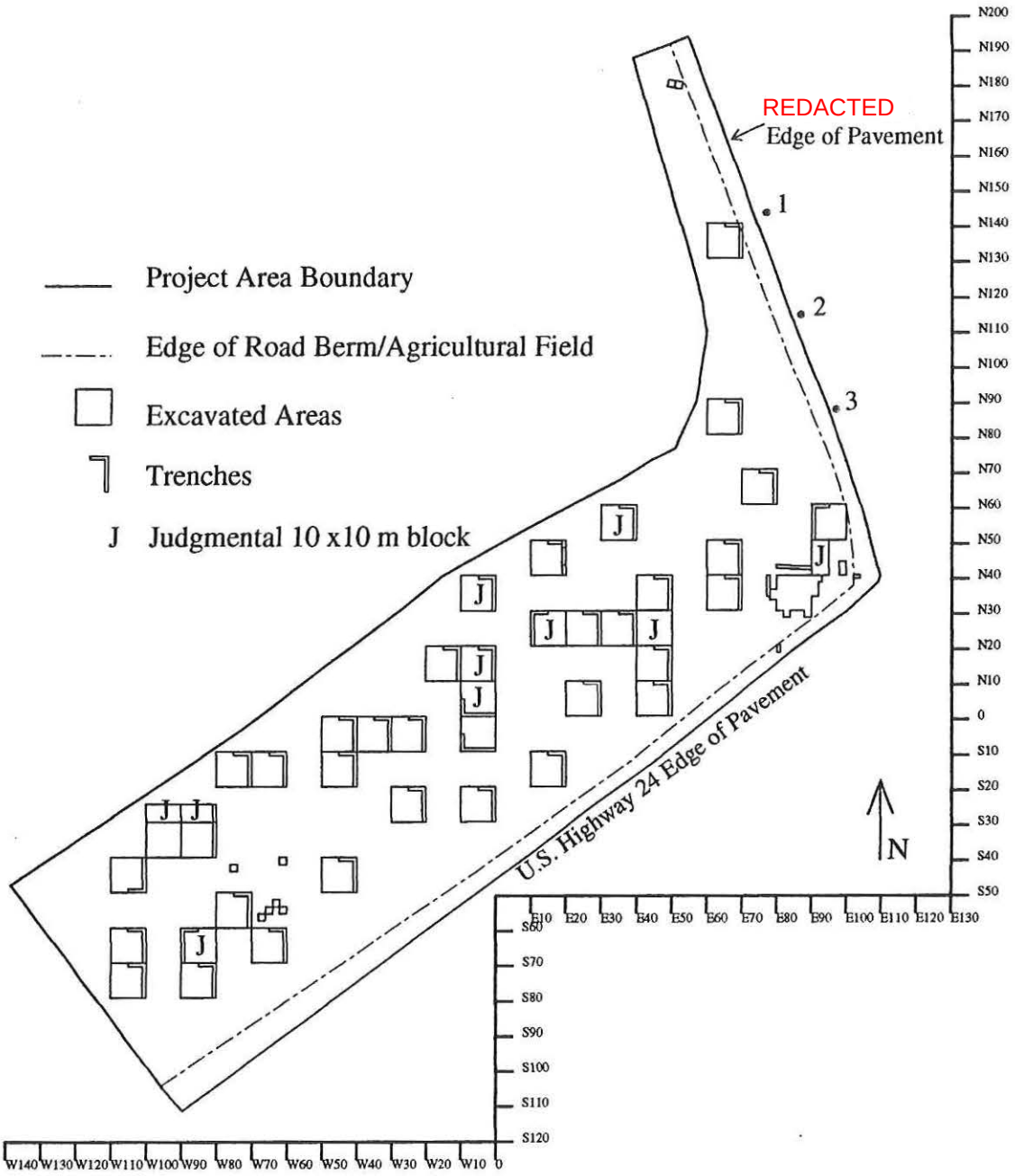
The Site Grid and Base Map

Archaeological fieldwork at the Diefenbaugh Site commenced in June of 1995. The 17,000 m^2 project area was initially divided into 20 x 20 meter grid squares (designated by the coordinate of the southwest corner, as with all subsequent excavation squares). This was accomplished with an engineer's transit, fiberglass tapes, and wooden stakes. The site grid was tied to three sunken rod centerline markers REDACTED as is indicated in Figure 5.1. The twenty meter grid points were used as instrument positions for all transit measurements. A transit and stadia rod were used to read surface elevations at ten meter intervals across the site. This process was very difficult for portions of the site due to the growth of extremely tall agricultural weeds. Machetes and scythes occasionally had to be used to clear lines of sight or prepare overgrown areas for excavation. Once obtained, the elevation data was used to interpolate contour lines (ten cm interval) on the project area base map.

Surface Collection

Several factors prompted us to conduct a systematic surface collection before commencing excavation. First, the western portion of the project area and the extension of the project area along CR 750W had not been previously tested in a systematic manner. We anticipated the need for systematic surface data in later selection of 8.5 non-random 10 x 10 meter excavation blocks. Second, it was necessary to pinpoint the probable location of buried features from the small historic component in the southeast corner of the site. Surface data greatly increased the efficiency of our excavations in this area. Third, we felt that a body of systematic surface data would complement the extensive subsurface data we were about to obtain.

Separate surface collections were conducted for the suspected historic and prehistoric portions of the site. Small, 5 x 5 meter collection units were used for the historic occupation area. The following 20 x 20 meter grid units were subdivided in such a manner: 20N40E, 20N60E, 20N80E, 40N60E, 40N80E. For the remaining (prehistoric) portion of the site, 20 x 20 meter collection units were used. In each area the surface collection was made by walking at 3 meter intervals, which resulted in 100% visual coverage. All artifacts were collected in a bag labeled with provenience data and environmental conditions. Fire-cracked rock and limestone fragments were tallied on the collection bags but not collected. Areas of concentrated cultural material were also sketched on the bags.



1 - C.R. 750W Centerline Marker
from 140N60E, Angle = 79°14' East of North, Distance = 17 m

2 - C.R. 750 W Centerline Marker
from 140N60E, Angle = 133°28' East of North, Distance = 37 m

3 - C.R. 750 W Centerline Marker
from 80N80E, Angle = 69°35' East of North, Distance = 18 m

Figure 5.1 Map of the 12-Hu-396 project area showing the locations of machine stripped 10 x 10 blocks, machine excavated trenches, and additional hand excavated 2 x 2 m units. Judgmental 10 x 10 blocks are marked by J's. Distance and angles to centerline markers REDACTED are also shown.

Geophysical Survey

In July 1995, a geophysical survey of the southeastern portion of the project area was conducted by IMA Consulting, Inc. A small area at the western end of the project area was also surveyed at that time. Two different instruments--a resistivity meter and a fluxgate gradiometer--were used to intensively survey a total of eight 20 x 20 meter grid units. A resistivity meter measures the resistance an electrical current encounters as it is transmitted through the soil. Patterns of variation in resistance can indicate anomalous buried features, such as foundations or trash pits. Low resistivity readings often indicate organically-filled features such as refuse pits. Conversely, high resistivity readings often indicate dense buried features such as stone walls. A gradiometer measures soil magnetics. Patterns of variation in soil magnetic readings can indicate buried ferrous metal (iron) artifacts, areas that have been subjected to high temperatures or burning (i.e., hearths), or organically enriched sediments (i.e., refuse pits).

The Diefenbaugh Site resistivity survey employed a zig-zag traverse across each 20 x 20 meter unit with one meter logging intervals. For the gradiometer survey, four readings per meter were taken along a tighter (one-half meter) zig-zag traverse. Conditions for the survey were not optimal due to high weeds and continuous magnetic background disturbance from U.S. Highway 24 traffic. The systematic readings from the surveys were transformed using an analytic software package that produces a contour display (Mathys and Dobbs 1995:4-5).

The primary objective of the survey was to locate any buried features associated with the historic component. A secondary objective was to locate prehistoric features. Prehistoric features were especially hoped for in the western test area, which was found to be rich in fire-cracked rock during the surface collection. A complete report on the results of the survey was submitted prior to excavation (Mathys and Dobbs 1995). Landmark personnel used a 1" (2.5 cm) diameter soil coring device and/or 2 x 2 meter test units to investigate potentially significant magnetic or resistivity anomalies that were not within areas slated for excavation. This helped us to determine the general location of some significant buried historic features, though we had little luck with prehistoric features. Specific successes in the historic area for the 20 x 20 m grid units 20N80E and 40N80E ("Grids" 7 and 8) are discussed in Chapter 8.

Excavation

Sampling Strategy (see Figure 5.1). In accordance with a strategy approved by the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology, a 25% sample of the 17,000 m^2 project area was selected for machine excavation to the base of the plow zone. In addition, it was stipulated that no less than 15% of that portion of site within the project area would be hand excavated. Placement of the first 20% of the machine excavated sample was accomplished by random selection of 34 10 x 10 meter excavation blocks. The remaining 5% of the sample (8.5 10 x 10 meter blocks) was selected on a non-random ("judgmental") basis. This allowed critical flexibility in 1) increasing coverage for areas not included in the random sample, and 2)

following up on those parts of the project area with cultural components. We eventually split one of the judgmental blocks into two half-blocks to investigate a significant but narrow area near the project boundary. One of the random blocks fell in the exact area pinpointed by surface and remote sensing surveys for mitigation of the historic component. This gave us additional freedom with the judgmental slated for this area. Ten isolated 2 x 2 meter units, in excess of the 25% sample, were eventually used to test geophysical survey anomalies or under-represented areas, including the extreme tip of the northern extension of the project area.

Mitigation below the base of the plow zone was initiated by the placement of two machine excavated exploratory trenches along two edges of each 10 x 10 meter block. The normal procedure was to excavate five meters along the north edge of the block and ten meters along the east edge. When the positioning of adjacent blocks, backdirt, or features made this too difficult, the trenches were placed along another edge. Each 0.9 m wide trench was excavated to well over 101 cm below surface, the maximum depth at which probable cultural material (charcoal) was detected in previous ARMS investigations (Zoll et al. 1991:38). We added four deep cuts (ca. 3 m deep) in selected areas to further our cultural and/or geomorphologic interpretations. One of the cuts served the dual purpose of exploring the limestone-lined well from Historic Component #1.

Backhoe Operations. All backhoe excavation at the Diefenbaugh site was skillfully carried out by Charlie's Excavating (C. Milholland) of Huntington, IN under the supervision of the Principal Investigator. Stripping and trenching was accomplished over several months as we progressed from east to west across the project area. The first phase was to remove the plow zone from the 10 x 10 meter block with a three foot wide ditching (smooth bladed) bucket. An archaeologist (usually the Principal Investigator or the Co-Investigator) observed each blade pass and flagged all potentially significant items as they were uncovered. Field technicians would then shovel scrape the area and map exposed artifacts, covering partially exposed features for later hand excavation and detailed mapping. It was occasionally difficult to detect the base of the plow zone due to limited soil color and texture changes, but on the whole the difference was made clear by the depths of intact features. The stripped units dried out very quickly due to hot weather, making it unwise to clear more than three to four blocks in a session. All hand excavation of features at the base of the plow zone was completed before the excavation of exploratory trenches along the block edges. The three-foot wide ditching bucket was also used for trench excavation. The backhoe was also used selectively to strip limited areas to within 10 cm of buried cultural deposits observed in trench profiles.

Provenience Control and Hand Excavation. Non-feature related cultural materials from the base of the plow zone were piece plotted on plan maps using tapes and plumb bobs. A 2 x 2 meter grid was used for the hand excavation of those areas with possible features, which were initially avoided by the backhoe and shovel scrapers. The 2 m grid was also used as the basis for all excavation proceeding below the base of the plow zone. Excavators normally proceeded in 10 cm arbitrary levels and screened the soil through 1/4" hardware cloth. Cultural levels were followed in appropriate cases.

Figure 5.2 and 5.3. Backhoe stripping and hand excavation at 12-Hu-396.

Excavators were occasionally asked to remove ten centimeter levels without screening, primarily to work through undesired overburden in areas inappropriate for heavy machinery. Within cultural deposits, *in situ* diagnostics were photographed and piece plotted. Other material was collected by feature provenience and/or 10 cm arbitrary level. Fire-cracked rock from features was collected while that from other contexts was counted, weighed, and discarded. Samples of large limestone blocks and bricks from the historic area were collected while the rest were mapped and left in place or counted, weighed and discarded. Plan views, profiles, and photographs were used to record anomalies, disturbances, features, concentrations and strata. Vertical control was maintained through a combination of individual unit datums and the transit and stadia rod. All elevations noted for the project area are tied into mean sea level, as estimated for the project datum using information from the USGS 7.5' series topographic map.

All features were cleared, mapped and photographed. When appropriate, they were bisected and profiled. It was not productive to bisect many of the undefined, non-intrusive fire-cracked rock scatters and concentrations encountered at the site. Similarly, some of the historic features were not appropriate for bisection. Regardless, one or more flotation samples of up to 15 liters were obtained for each feature area or level. Excess soil from Feature 14 in the historic area was collected for water screening due to the richness of the feature and the presence of very small artifacts (i.e., pins). This procedure was conducted at the project field house using 1/16" (1.6 millimeters) hardware cloth and water from a garden hose. Water screening significantly increased the recovery of small items such as pins and fish scales. Additional flotation samples were taken from many non-feature levels. Charcoal samples, if present and adequate, were collected for radiocarbon analysis.

The walls of each of the exploratory trenches were inspected for the presence of cultural material. If cultural material was present, the relevant profile was mapped and photographed. Substantial deposits (i.e., more than one or two isolated flakes, fire-cracked rock or charcoal flecks) were further investigated with hand excavated units. If no cultural material was present, a representative two meter section from each 5 or 10 meter trench segment was drawn and described.

A total of 140 units were hand-excavated at the Diefenbaugh Site (see Figure 5.4). Of these, 108 were full 2 x 2 meter units, 25 were 1 x 2 meter units, and 7 were 1 x 1 meter units. The result is a total hand excavated area of 489 m^2.

Laboratory Procedures

Artifacts. Washing and rough sorting of artifacts was conducted by archaeological technicians at the Landmark laboratory in Sheridan, IN. The authors conducted the analysis and final classification of all non-floral/faunal artifacts and created a complete database for the assemblage using Microsoft Access. Susan Bamann was responsible for the prehistoric artifact analysis while Susan Baldry handled the analysis of the historic period artifacts. Complete descriptions or references for most of the classificatory terms that were utilized appear within this report.

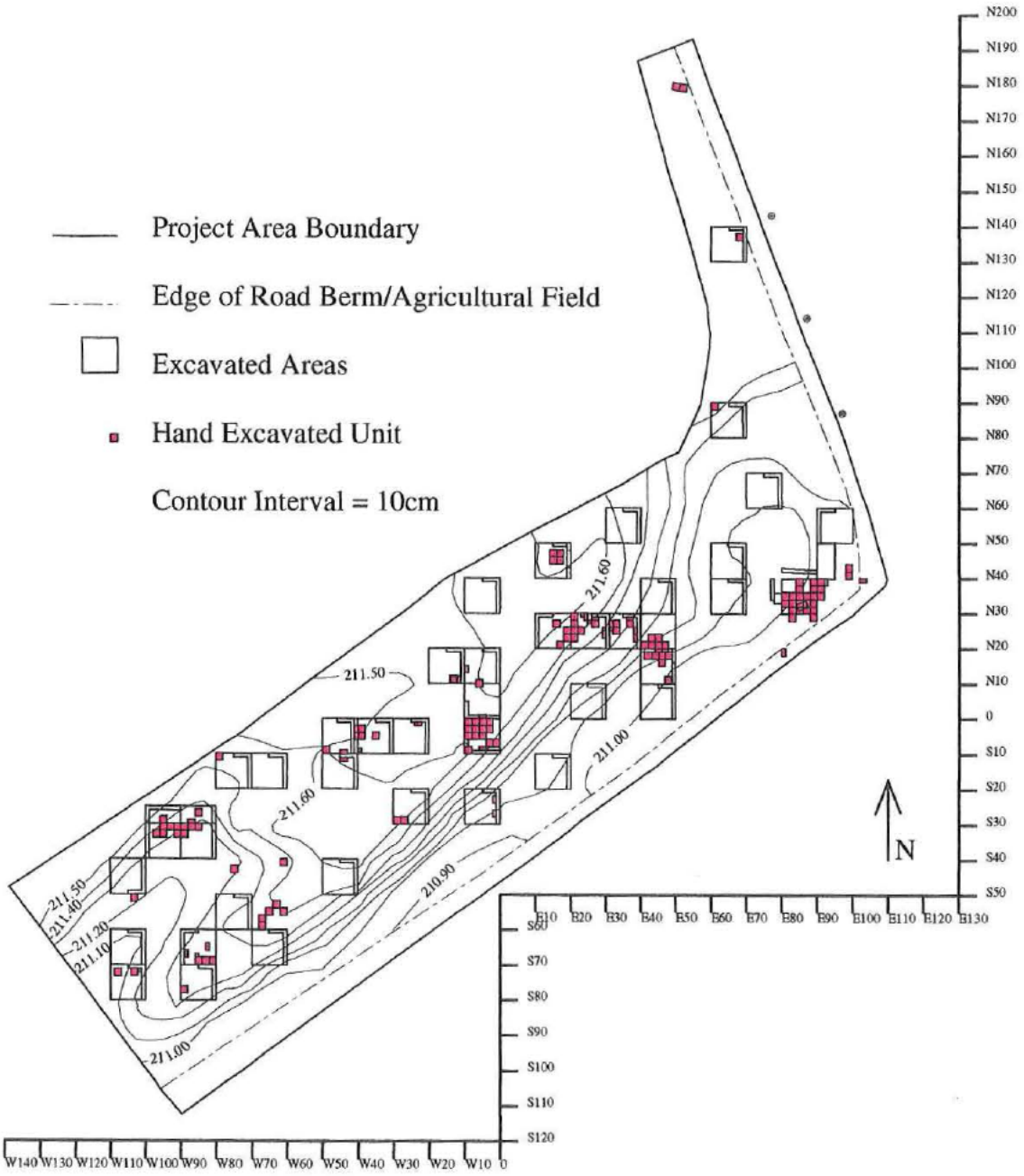


Figure 5.4 Map showing the locations of hand excavated units.

Analysis of Faunal Remains. Identifiable faunal remains, almost exclusively from the historic component of the site, were sent to Rex Garniewicz of the Glenn A. Black Laboratory of Archaeology, Indiana University. Faunal remains from surface and generalized contexts and samples considered too small to be diagnostic were not included. Each specimen was examined for the following information: element, genus, species, age, cultural modification, and natural modification. The minimum number of individuals for a species was calculated whenever possible.

Flotation and Analysis of Heavy Fractions. The flotation samples were processed at the laboratory using a 30 gallon drum flotation device with the capacity to separate light and heavy fractions. The heavy fractions were separated and sorted by technicians at the Landmark laboratory using two sets of nested geologic sieves. The fractions from the 1.83, 0.76, 2.00 and 0.71 millimeter sieves were sorted for cultural material and the rest of the sample was weighed and rebagged.

Analysis of Light Flotation Fractions. The light fractions were sent to Dr. Annette Eriksen of Archaeological Data Services/ Paleoethnobotanical Laboratory, Columbus, Ohio for sorting and identification. Before sorting, the samples were sifted through a series of nested geologic sieves to simplify identification and to organize the samples by size. Three size categories were created: 1) 2.00 mm; 2) 1.00 mm; and 3) less than 1.00 mm. The sorting and identification of botanical materials was completed through the use of an Olympus VMZ stereo microscope with a magnification range of 10 to 40X.

Carbonized botanical remains were initially sorted into broad categories, i.e., nutshells, seeds, and wood charcoal. After initial sorting, these generalized categories were reexamined and identification into generic levels was made whenever possible. Wood identification was limited to those samples that contained specimens large enough to maintain observable diagnostic features. Thus, identification was limited by preservation and overall conditions of the specimens within the sample. Wood identification was conducted for samples that contained specimens of at least 4.00 mm in size. These samples were identified by sifting the wood charcoal through a 4.00 mm geologic sieve. Identification was made through the combined use of several identification manuals and a comparative collection on file at the Archaeological Data Services Laboratory (Core, Cote and Day 1979; Martin and Barkley 1961; Panshin and de Zeeuw 1970).

All botanical materials removed from the 2.00 mm fraction were identified, counted and weighed. Materials from the two smaller fractions (1.00 mm and <1 .00 mm) were designated present or absent due to the small fragmentary nature of specimens in these categories. Seeds were identified and counted in all fractions.

Curation. The assemblage from the Diefenbaugh Site is presently stored at the Landmark laboratory in Sheridan, IN. Arrangements will be made by the Indiana Department of Transportation for curation of the material, along with a copy of all site documentation, at a qualified repository.

CHAPTER 6

RESULTS OF INVESTIGATIONS: PREHISTORIC OCCUPATIONS

Results of Surface Collection

Surface collection results are shown as distribution maps of fire-cracked rock and debitage in Figures 6.1 and 6.2. The totals used to create the maps are presented in Table 6.1. It should be noted that isolines that appear outside the boundaries of the project area do not represent the extension of material into these unsurveyed areas. This effect is purely the result of the program SURFER®, which was used to create the maps. the program also centers the isolines on the coordinate used for the survey unit (southwest coordinate), which slightly displaces the information. The distribution of fire-cracked rock was overall a very good indicator of occupation areas within the site. High concentrations in the central site area eventually corresponded to two Late Archaic occupation areas comprised of numerous fire-cracked rock features. The highest area of fire-cracked rock concentration in the southwest corner of the site prompted the excavation of an additional (judgmental) 10 x 10 m block (70S90W) in the peak area. Relatively few subsurface features, however, were encountered in the general area. The concentration of fire-cracked rock in this area might have been due to post-depositional processes related to flooding or agriculture. The distribution of chert debitage roughly corresponded to that of the fire-cracked rock with the exception of an area of high concentration in the west corner of the project area. Upon subsurface excavation, this area yielded a Late Archaic occupation area that was particularly rich in debitage in comparison to other Late Archaic areas at the site. A judgmental 5 x 20 block was added to the random blocks in this area to thoroughly explore the concentration. A small concentration of debitage was noted along the northern extension of the project area. To address this we placed two 2 x 2 m test units in this area. They yielded almost no subsurface cultural material.

Results of Plow Zone Stripping

The plow zone at the Diefenbaugh Site was found to be brown to dark brown (10YR 4/3 to 10YR 3/3) silt loam with a coarse, subangular to angular blocky structure and a maximum depth of 40-43 cm below surface. The depth of the plow zone was somewhat uneven across the site and difficult to detect in some cases. The issue was complicated by the fact that part the project area remains in the active floodplain. Local residents have indicated that lower sections of the project area are occasionally inundated. The highest flood on record for the Wabash occurred in March of 1913 and reached an elevation of approximately 212 m msl. This indicates that all but the highest terrace portions of the project area would have been flooded at that time (Basset 1996). Knowing this, we attempted to find the base of the oldest plow zone for each block.

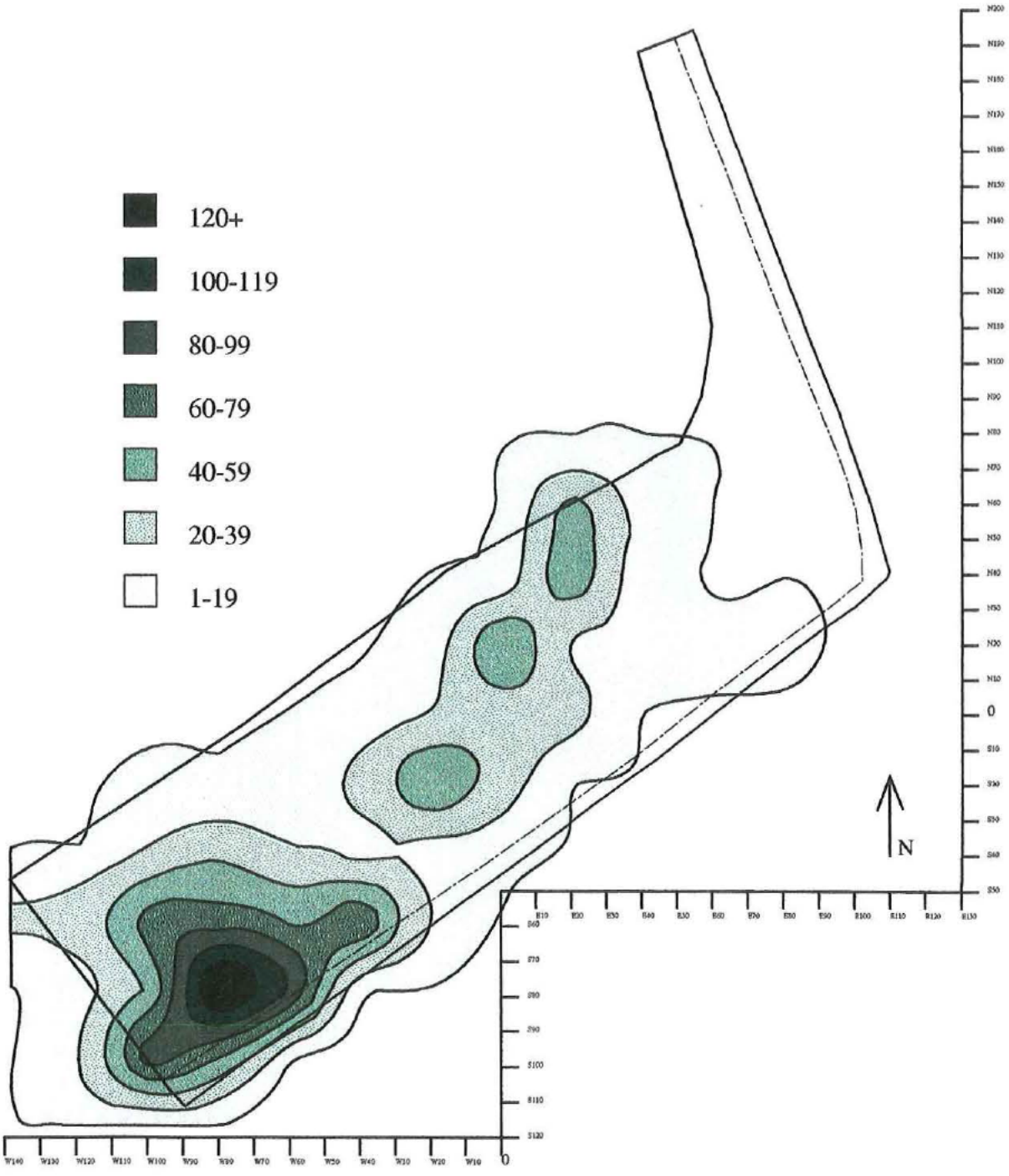


Figure 6.1 Frequency per 20 x20 meter collection unit of surface fire-cracked rock.

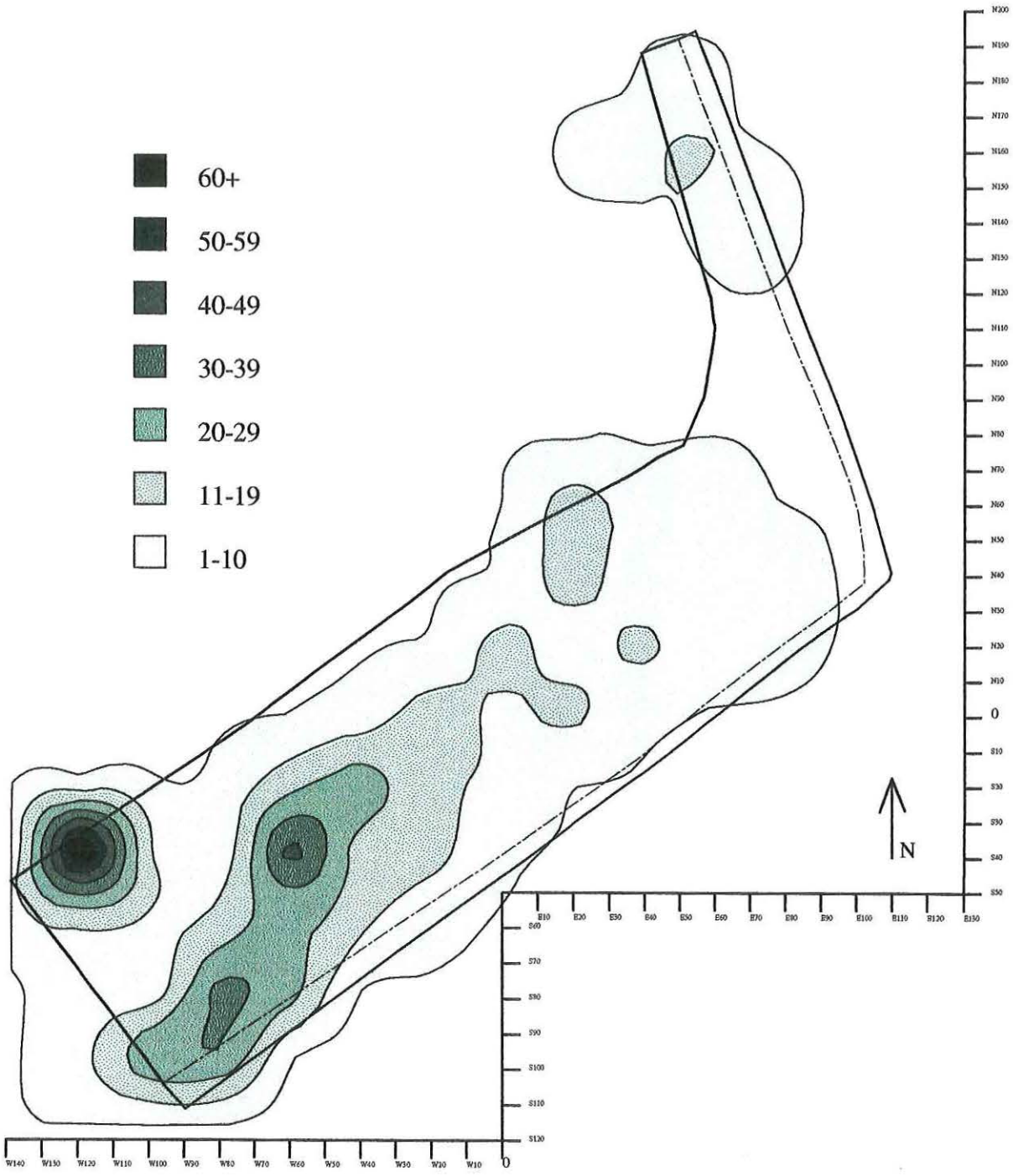


Figure 6.2 Frequency per 20 x 20 meter collection unit of surface debitage.

Table 6.1 Fire-Cracked Rock and Debitage from Surface Collection.

20 x 20 m Block	Fire-Cracked Rock	Debitage	
		#	g
0N0E	33	9	23.2
0N20E	31	14	21.2
0N40E		3	2.9
0N20W	19	16	58.6
0N40W	6	4	4.1
0N60W	1		
20N0E	64	15	92.5
20N20E	16	5	7.2
20N40E	13	14	13.2
20N60E	3	7	12.1
20N80E	3	4	7.7
20N20W	10	1	.7
40N0E	3	1	0.5
40N20E	56	16	118.4
40N40E	8	3	2.7
40N60E		2	2.3
40N80E	1	5	14.7
40N20W	1		
60N20E	51	17	31.8
60N40E	14	7	15.1
60N60E	1	3	17.5
60N80E		1	9.1
80N40E			
80N60E	1	1	.3
100N60E		1	7.9
120N60E		1	1.9
140N40E		4	14.6
140N60E		1	3.3
160N20E		4	25.2
180N40E		4	6.0
20S20E		1	4.1
20S0E	33	9	19.2
20S20W	65	13	33.0
20S40W	29	27	51.9
20S60W	9	16	3.1
20S80W	3	3	16.5
20S100W	4	1	0.1
40S0E	6	3	15.7
40S20W	12	15	12.7
40S40W	11	15	23.7
40S60W	21	48	91.6
40S80W	37	2	13.0
40S100W	22	9	29.0
40S120W		79	103.1
40S140W		1	4.9
60S40W	82	13	72.2
60S60W	54	24	34.4

60S80W	69	13	25.7
60S100W	71	9	42.4
60S120W	34	14	55.4
60S140W	26	6	10.4
80S60W	102	26	72.5
80S80W	156	35	77.3
80S100W	42	2	5.6
80S120W	9	4	4.2
100S80W	58	31	158.0
100 S100W	96	32	58.4
100S120W	22	9	21.0
120S120W	7	2	5.6

Removal of the plow zone in the 10 x 10 m blocks revealed 17 prehistoric and 2 indeterminate features and varying quantities of scattered cultural material. Full descriptions of each of these features appears below. The majority of the prehistoric features were found in the central part of the project area as shown in Figure 6.3. Figures 6.4 and 6.5 show the distribution of fire-cracked rock and debitage, the primary type of prehistoric material found at the site. The totals for each 10 x 10 m block, which can be seen in Table 6.2, include material recovered from features. The distribution of fire-cracked rock corresponds to three Late Archaic occupations areas described below. The distribution of debitage followed essentially the same pattern. Both show that the prehistoric portion of the Diefenbaugh Site does not extend west of the E60 grid line.

Results of Exploratory Trenching

A total of 47 of 81 exploratory trenches placed along the edges of the 10 x 10 m blocks exhibited cultural material in their profiles (see Table 6.3). The cultural material was generally sparse and isolated, and often occurred in association with root casts or other signs of disturbance. In fact, 11 of the 47 trenches (23%) contained less than one item and only ten (21%) contained more than five items. The deepest items were charcoal fragments at 110 cm below surface (10N20W East Trench, 30S10W North Trench), fire-cracked rock at 100 cm below surface (10N40E, East Trench), and flakes at 90-100 cm below surface (10S30W North Trench, 70S90W West Trench). Only four profiles exhibited unusual natural or cultural stratigraphy. One (30S100W West Trench) contained evidence for an ancient chute or channel (see Holocene Geomorphology section) but no cultural material. A burned root system left oxidized soil and charcoal in the profile and floor of another (60N70E East Trench)). Near REDACTED one profile (130N60E East Trench) showed fill level from road building. In a trench adjacent to the historic component (30N80E North Trench), the historic midden level was visible.

Figures 6.6 through 6.21 show selected exploratory profiles with prehistoric cultural material. Based on these profiles, units were initiated in the following 10 x 10 m blocks: 10N40E; 10N10W, 20N20E, 20N30E, 20N40E, 10S10W, 10S30W, 10S40W, 10S50W, 20S50W, 30S10W, and 70S90W. Significant cultural deposits were revealed in four cases, which are discussed below.

10N40E, 20N40E. Units in 10N40E revealed only limited deposits of debitage and fire-cracked rock between approximately 67 and 97 cm below surface. A point base from 87-97 cm below surface appears to be Late Archaic in age, possibly from the Table Rock Cluster (Justice 1987:124-125). Expansion of the excavations into the 20N40E Block, however, exposed Features 26 and 29 at 52-78 cm below surface. The age or cultural affiliation for these features is undetermined, but they probably date to the Late Archaic Period based on their stratigraphic position.

10S40W. Units were initiated in 10S40W because of an obvious concentration of flakes in the 10S50W East Trench profile. A small area of concentrated flakes along with hammerstones and diagnostic points was uncovered. Expansion of excavations led

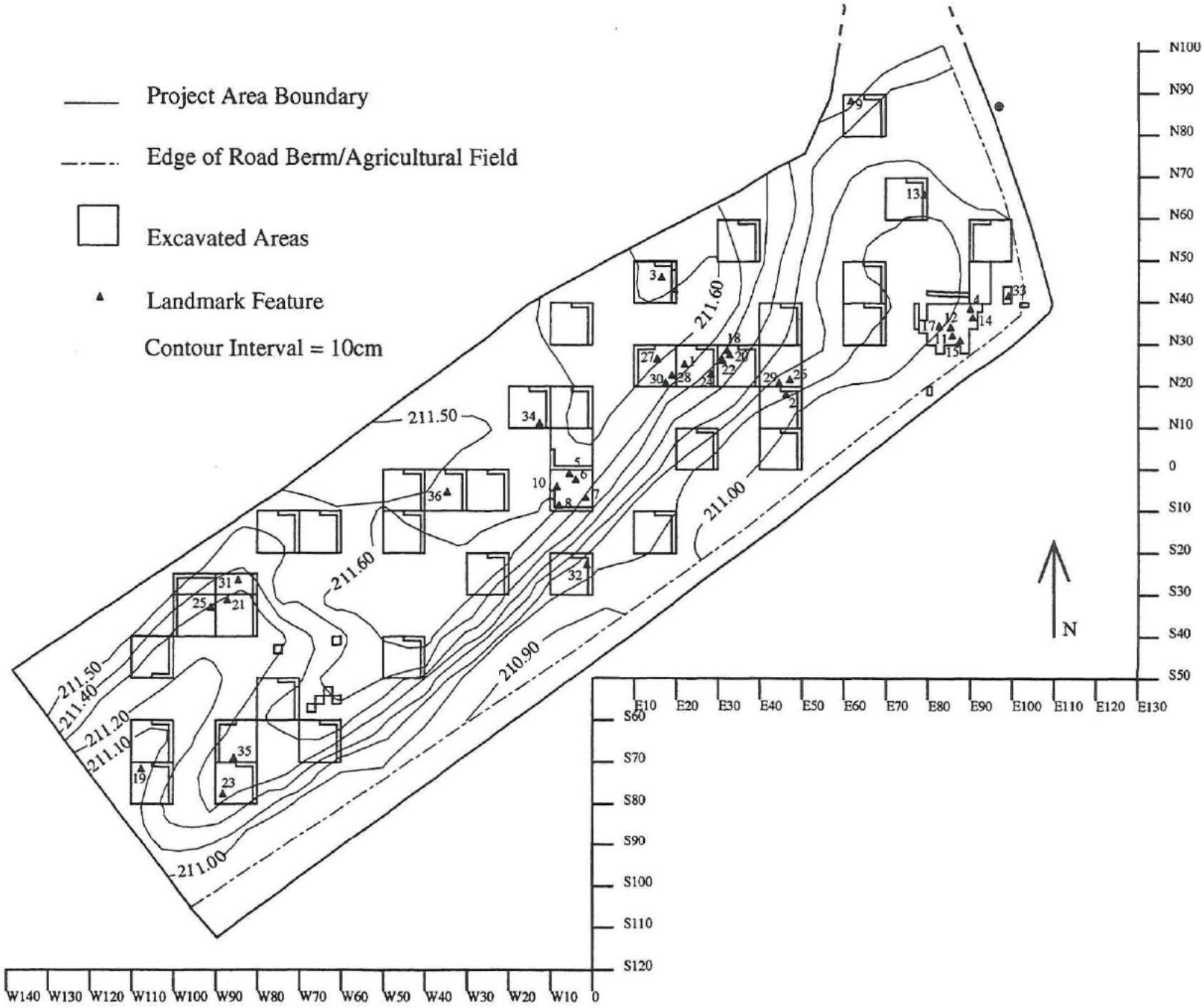


Figure 6.3 Features from Landmark mitigation of 12-Hu-396. Features 1-3, 5-8, 10, 16, 18, 19, 21, 23, 25, 27, 28, 30, 31, and 34 are prehistoric features from the base of the plow zone. Features 20, 22, 24, 26, 29, 32, 35, and 36 are prehistoric features from below the base of the plow zone. Features 4, 11, 12, 14, 15, 17, and 33 are from Historic Component #1.

Typical trench profiles. TOP: 130N60E North Trench, no cultural material; BOTTOM: 20N30E East Trench, fire-cracked rock visible.

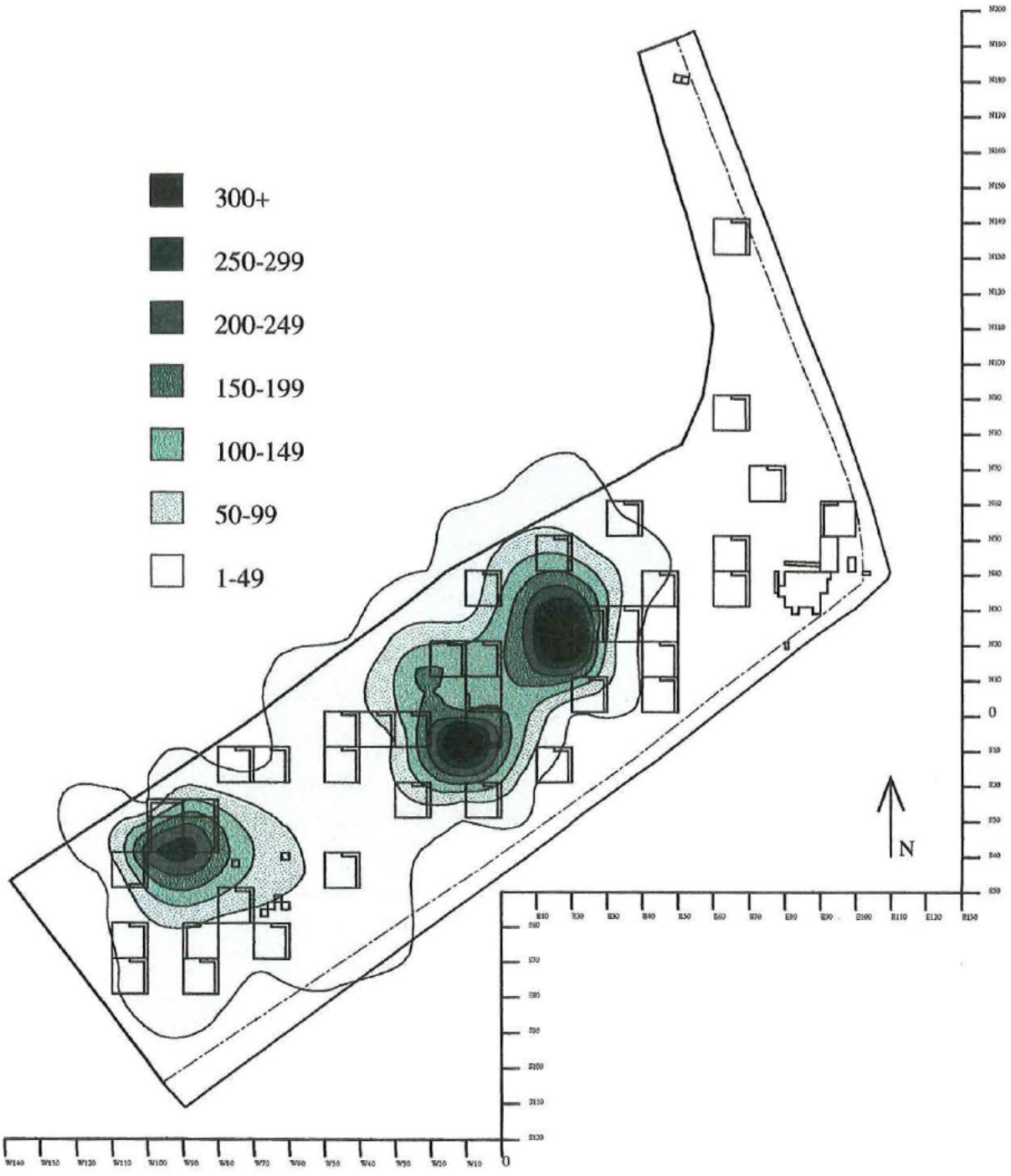


Figure 6.4 Frequency of fire-cracked rock at the base of the plow zone.

Figure 6.5 Frequency of debitage at the base of the plow zone.

Table 6.2 Fire-Cracked Rock and Debitage from the Base of the Plow Zone, by 10 x 10 m Block.*

$10m^2$ Block	Fire-Cracked Rock		Debitage	
	#	g	#	g
0N20E	1	<500.0		
0N40E	1	<500.0		
0N10W	79	7718.0	42	33.0
10N40E	1	<500.0	1	0.4
10N10W	127	15663.0	40	92.0
10N20W	184	14744.0	52	47.0
20N10E	218	15934.0	77	65.0
20N20E	558	26467.0	135	253.0
20N30E	75	6971.0	4	20.0
20N40E	1	<500.0	1	1.0
30N40E				
30N40E	13	1800.0		
30N60E				
30N80E			1	0.3
30N10W	5	908.0		
40N10E	133	8402.0	287	252.0
40N60E	1	<500.0		
40N90E (5x10)	1	<500.0		
50N30E	13	1362.0		
50N90E			1	0.3
60N70E				
80N60E				
130N60E				
10S10W	407	27753.0	114	166.0
10S30W	42	4086.0	5	9.0
10S40W	30	3178.0	22	26.0
10S50W	31	3178.0	11	16.0
20S10E	1	<500.0		
20S50W	13	1350.0	10	81.0
20S70W				
20S80W	1	<500.0	1	1.0
30S10W	4	<500.0	1	0.1
30S30W	19	2270.0	5	9.0
30S90W (5x10)	150	19749.0	6	14.0
30S100W (5x10)	4	681.0		
40S90W	296	18815.0	122	76.0
40S100W	261	22437.0	543	387.0
50S50W	44	4540.0	40	64.0
50S110W				
60S80W	48	11350.0	1	0.5
70S70W	5	<500.0		
70S90W	20	3178.0	1	0.2
70S110W				
80S90W	10	3180.0	6	27.0
80S110W	1	<500.0		

*totals include material recovered from base of plow zone features.

to the uncovering of Feature 36. The block has been designated as Early Archaic Occupation Area #2 (see below).

30S10W. Trenching of the 30S10W block resulted in the near bisection of Feature 32 at 56-68 cm below surface. The feature yielded a radiocarbon age indicating Late Archaic occupation. The profile for this section of the trench is the actual feature profile. An additional unit following material shown in the 30S10W East Trench revealed only scattered fire-cracked rock at 50-60 cm below surface.

70S90W. The north profile for North Trench segment of 80S90W contained a high number of flakes as well as calcined bone fragments. Excavation of units along this profile revealed cultural material from just below the base of the plow zone to 103 cmbs. Feature 35 was eventually revealed. A diagnostic point base and radiocarbon age have led to the designation of the lower levels of these units as Early Archaic Occupation Area #1. The West Trench profile from 70S90W also contained flakes. Excavation of a unit along this trench revealed a drop in cultural material compared to the earlier units.

Table 6.3 Summary of Exploratory Trench Profiles with Cultural Material

10m² Block	Trench	Profile	Flakes	Shatter	Biface	FCR	Charcoal	Other
0N20E	East	East				5	3	
0N40E	North	North	2			1		
10N40E	East	West				4		
10N40E	North	North	1					
10N10W	North	North				3		
10N10W	East	East				1		
10N20W	East	East	3	1			2	1 core
10N20W	North	North				1		
20N10E	West	West	1					
20N20E	North	South	3				11	
20N30E	North	North	1					
20N30E	East	West				4	1	
20N30E	East	East				2	1	
30N10W	North	North	1					
30N10W	East	East				1		
50N30E	North	North	2					
130N60E	East	West					4	
10S10W	South	South	1	2				
10S10W	South	North	4					
10S10W	West	East					4	
10S30W	North	South	7					
10S30W	East	East	3			1		
10S30W	North	North	5	1				
10S40W	North	North	1					
10S40W	East	East	5		1			
10S50W	East	East	17					
20S50W	North	South			1	2		
20S10E	East	East					1	
20S10E	North	North	1				1	1 shell frag
20S50W	East	East				1		
20S70W	East	East	1			1		
20S70W	North	North				1	1	
20S80W	North	North	1			2		
20S80W	East	East				1		
30S10W	North	North					5	
30S10W	East	West				7	2	
30S30W	North	North	1			1		
30S30W	North	South	2					
30S30W	East	East	1					
50S50W	North	North	4			1		
60S80W	East	East					1	
70S90W	West	West	13	3		1		1 core frag
70S90W	North	South				2		
70S90W	West	East						1 core
70S110W	East	East				1		
80S90W	North	North	8				4	3 bone frags
80S90W	East	East					3	
TOTALS			**91**	**7**	**2**	**44**	**44**	**7**

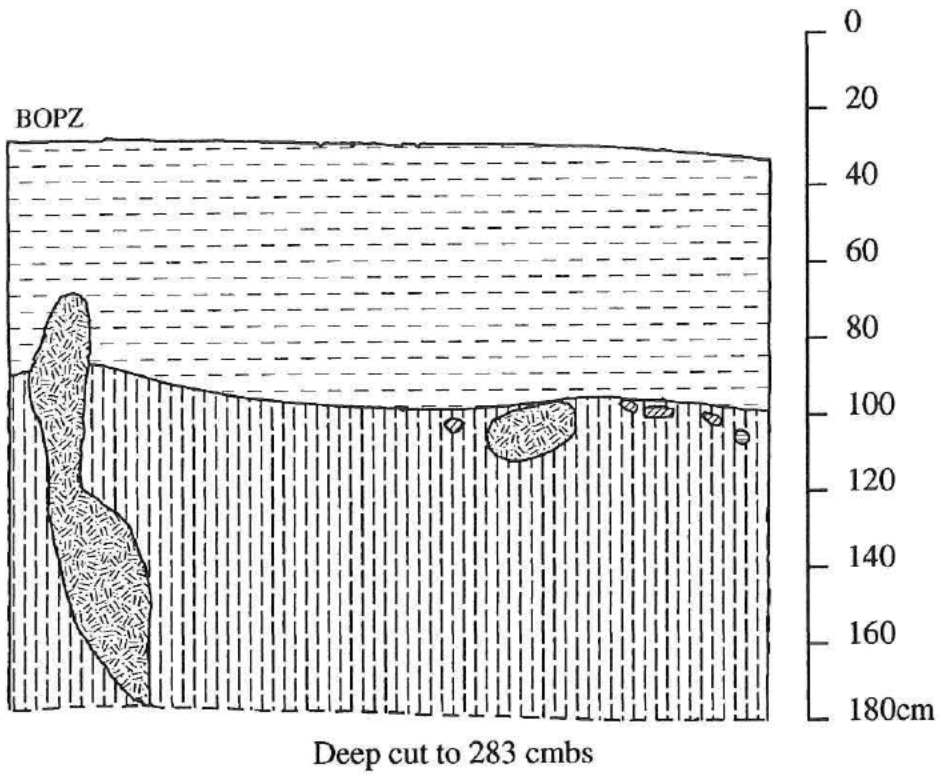


Figure 6.6 10N40E East Trench, west profile (18-20N49E).

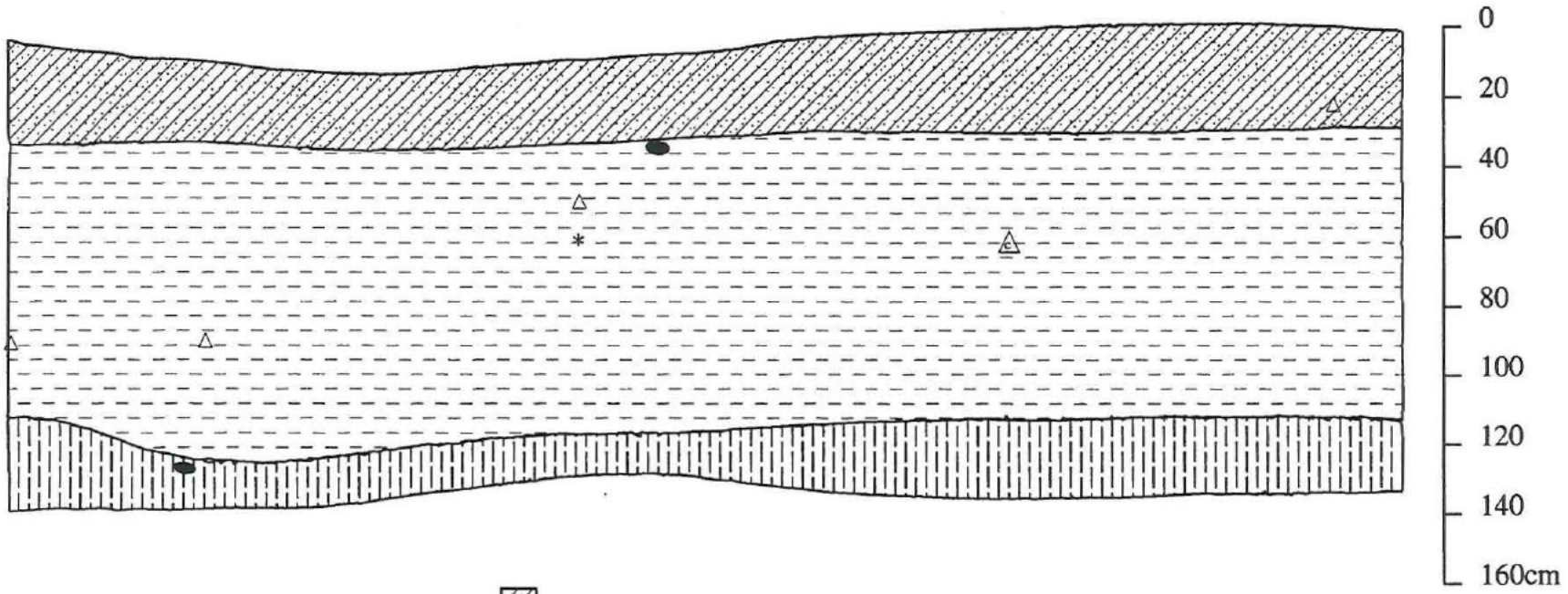


Figure 6.7 10N20W East Trench, east profile (18-14N10W).

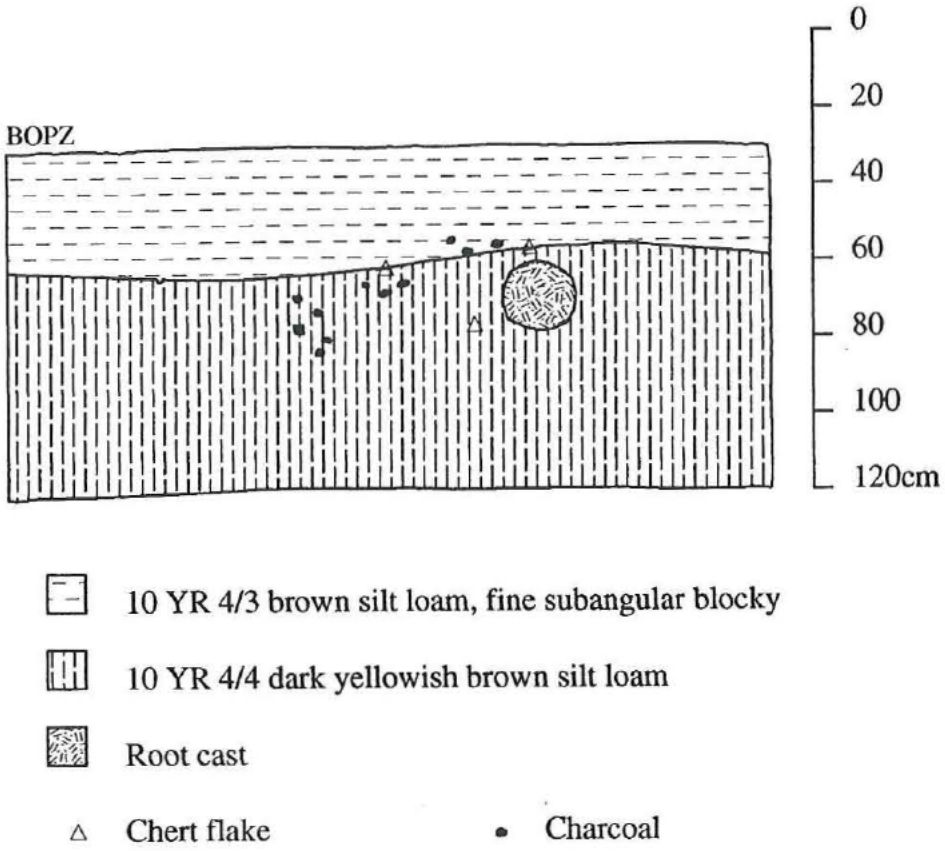
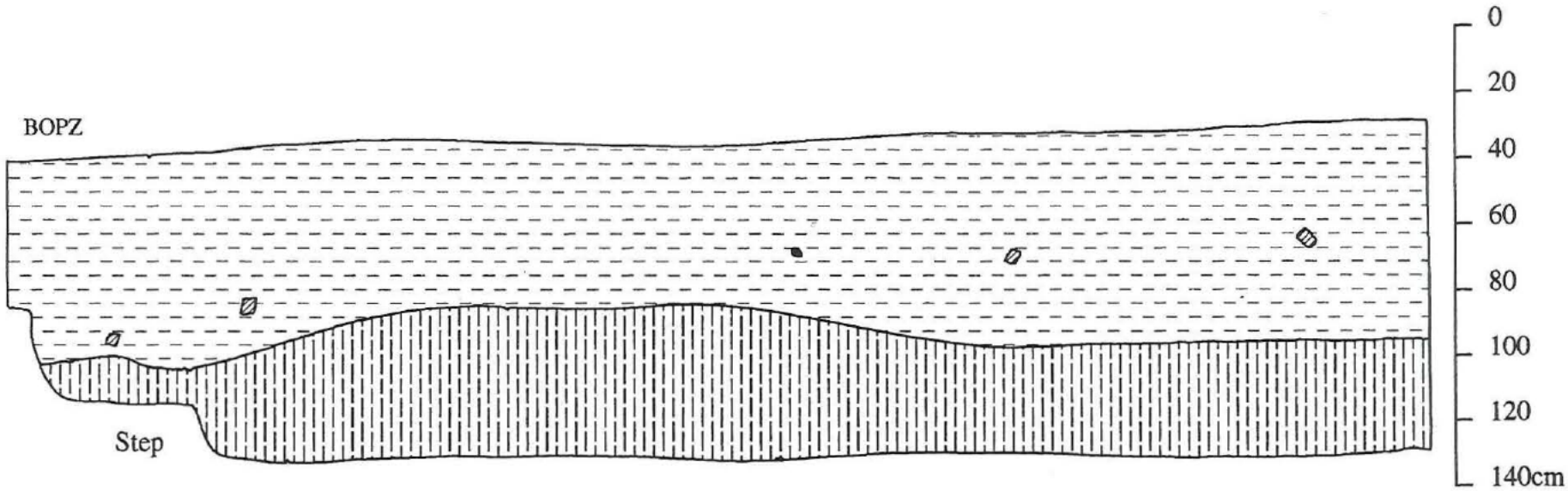


Figure 6.8 20N20E North Trench, south profile (29N28-26E).



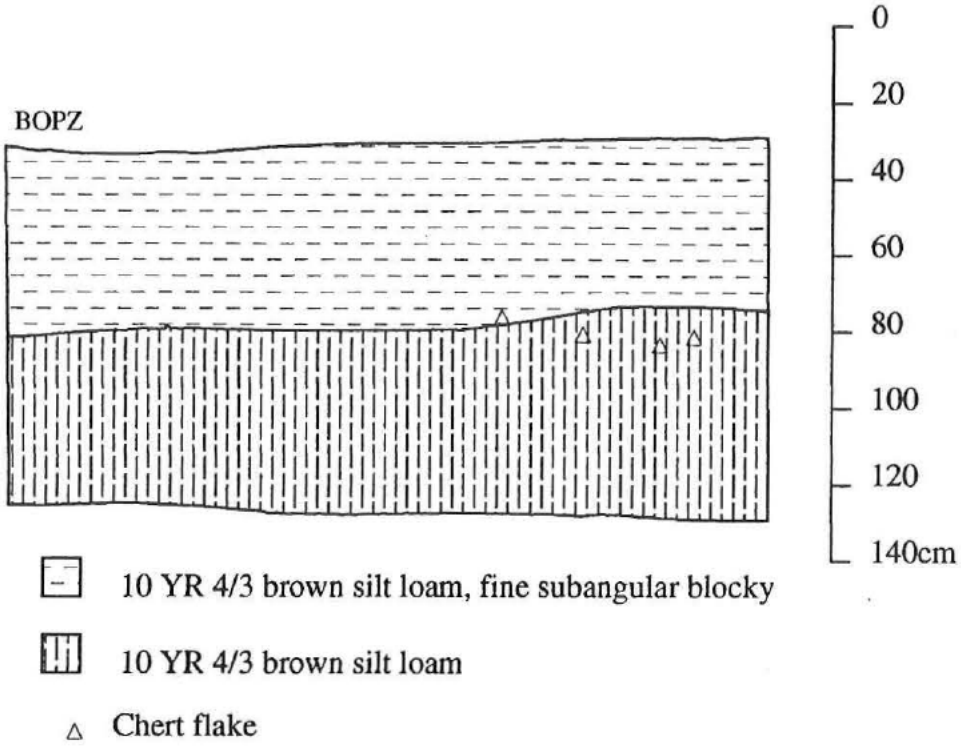
10 YR 4/3 brown silt loam, fine subangular blocky

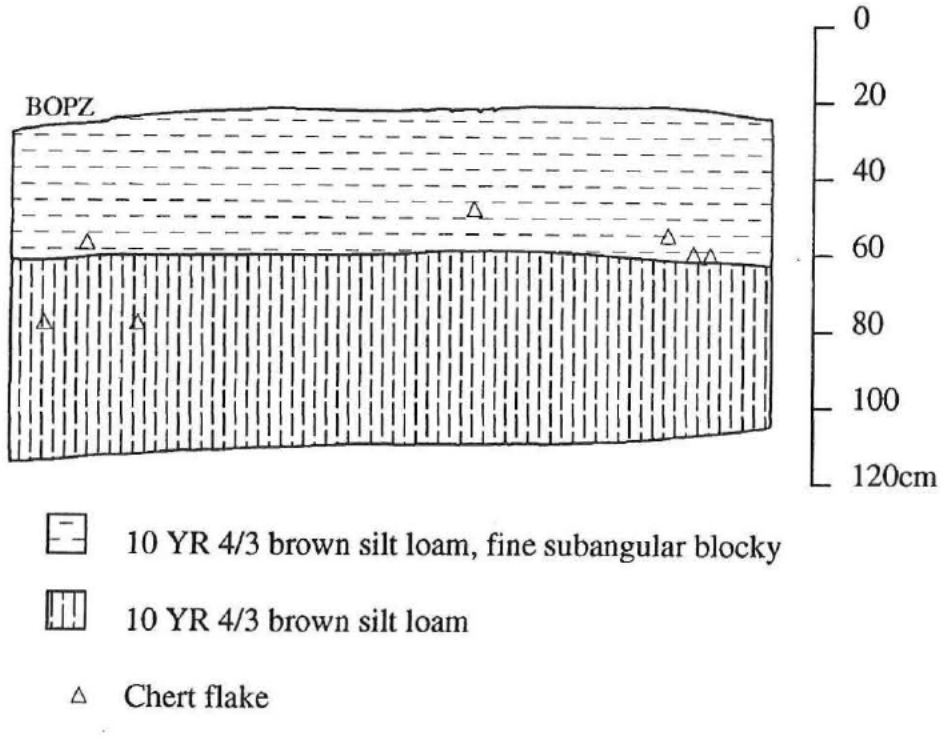
10 YR 4/3 brown silt loam

Fire-cracked rock

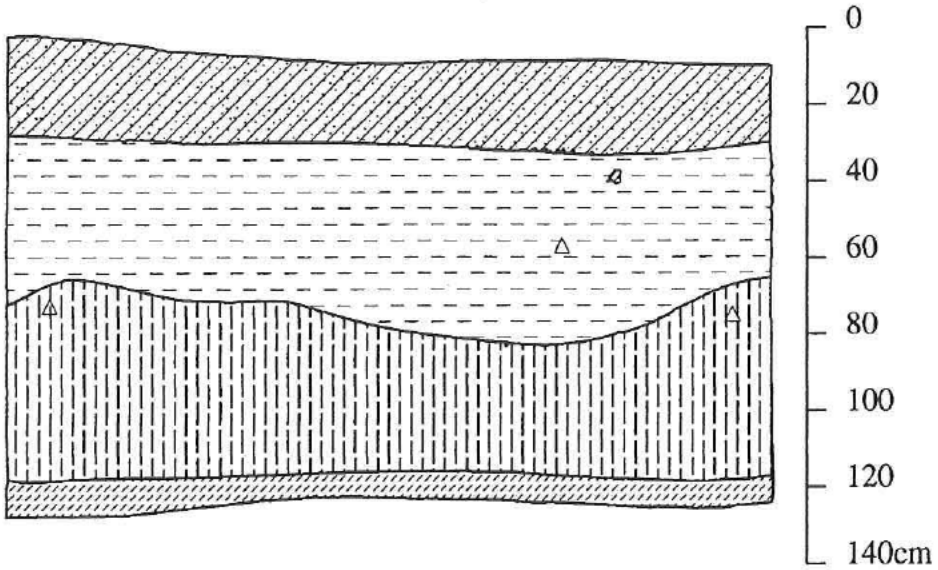
Charcoal

Figure 6.9 20N30E East Trench, west profile (22-26.35N40E).





TOP: Figure 6.10 10S10W South Trench, north profile (9S8-6W).
BOTTOM: Figure 6.11 10S30W North Trench, south profile (1S22-24W).



Plow zone

10 YR 4/3 brown silt loam, fine subangular blocky

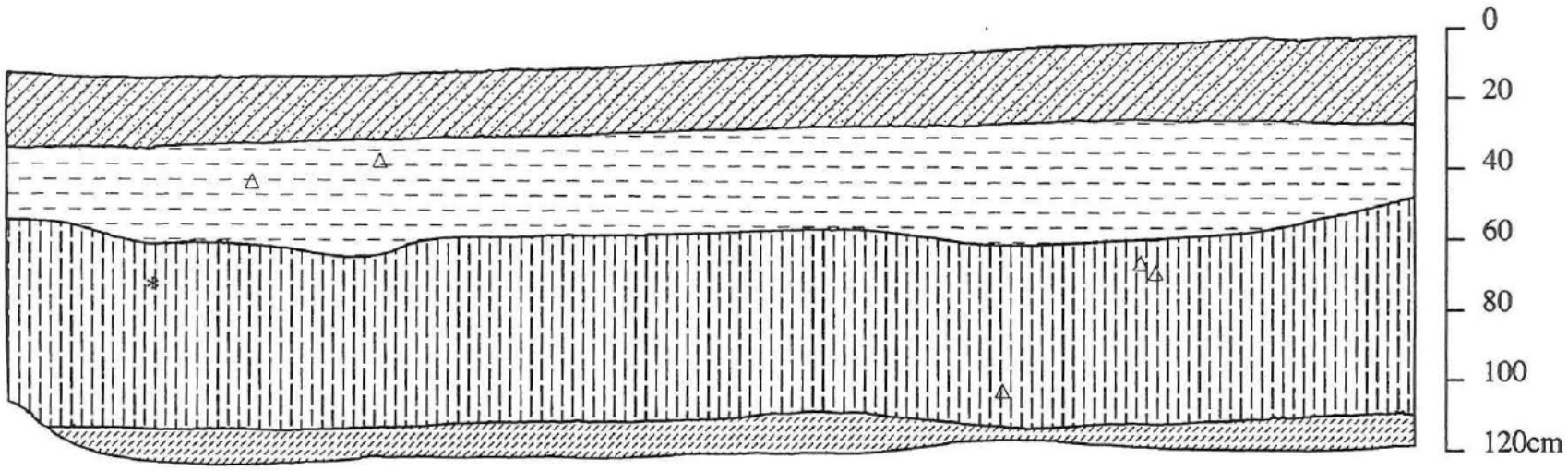
10 YR 4/3 brown silt loam

10 YR 4/3 brown sandy clay loam

△ Chert flake

Fire-cracked rock

Figure 6.12 10S30W East Trench, east profile (0-2S20W).



Plow zone

10 YR 4/4 brown silt loam, fine subangular blocky

10 YR 4/4 brown silt loam

10 YR 4/4 brown sandy clay loam

△ Chert flake

* Shatter

Figure 6.13 10S30W North Trench, north profile (0N24-20W).

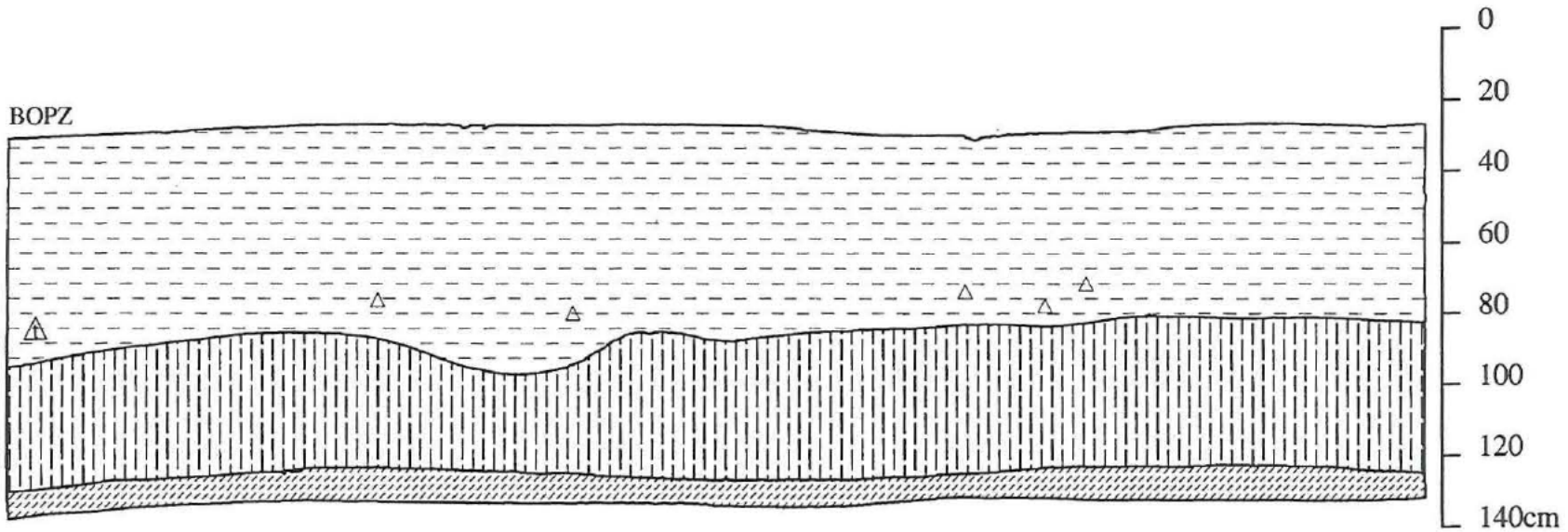
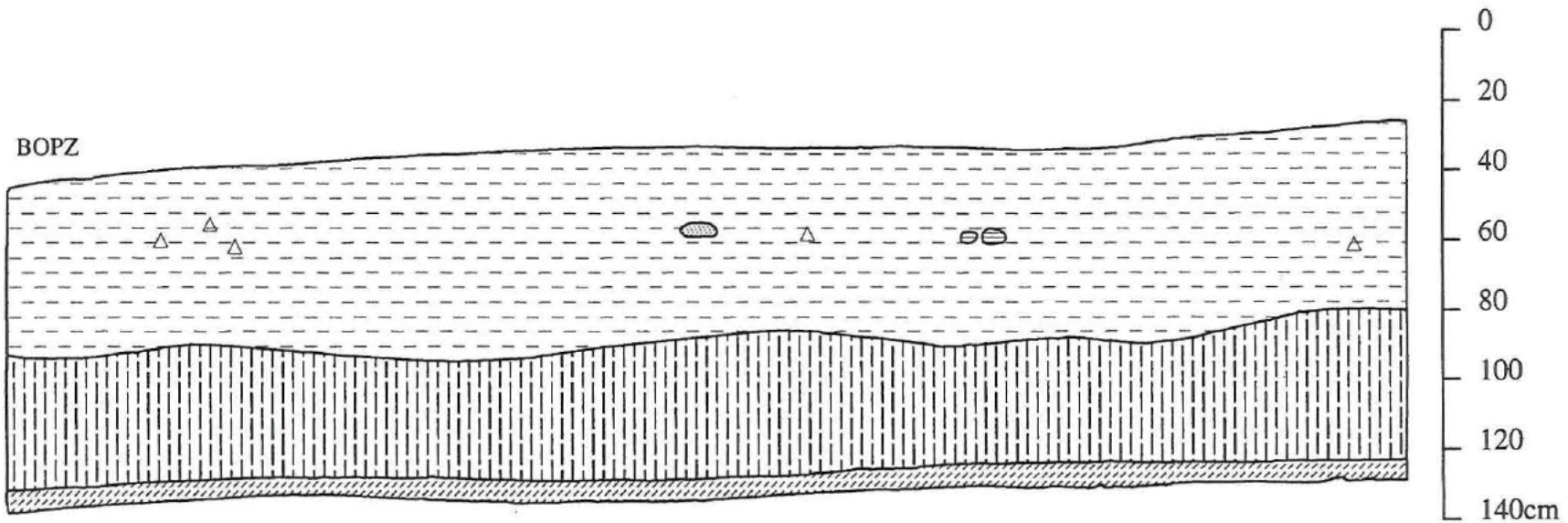


Figure 6.14 10S40W East Trench, east profile (2-6S30W).



10 YR 4/3 brown silt loam, subangular blocky

10 YR 4/3 brown silt loam

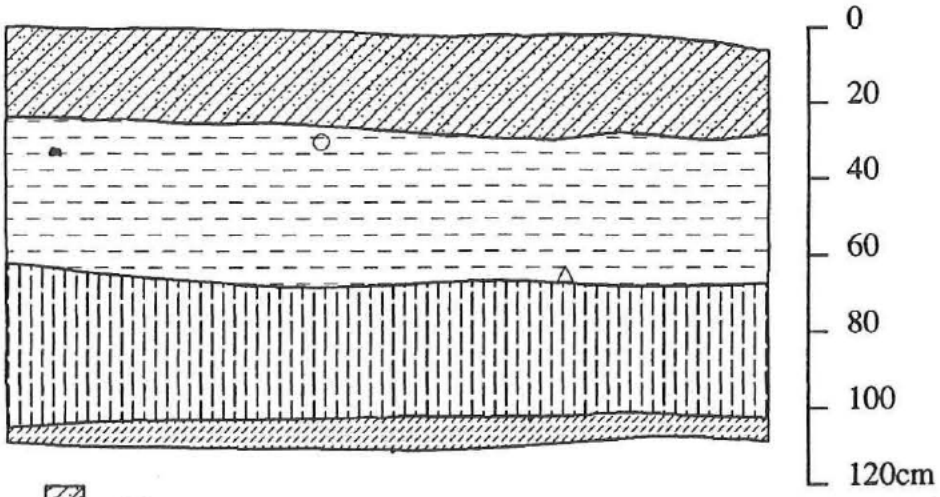
10 YR 4/3 brown sandy clay loam

Chert flake concentration (11 Chert flakes)

Chert flake

Rock

Figure 6.15 10S50W East Trench, east profile (3-7S40W).



Plow zone

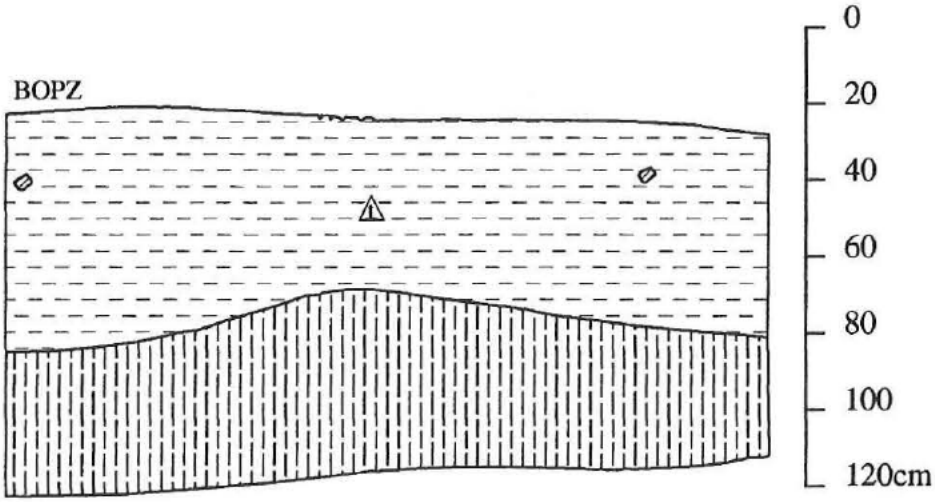
10 YR 4/3 brown silt loam, fine subangular blocky

10 YR 4/4 dark yellowish brown silt loam

10 YR 4/4 dark yellowish brown sandy loam

△ Chert flake ○ Shell Fragment (bivalve)

Charcoal



10 YR 4/3 brown silt loam, fine subangular blocky

10 YR 4/3 brown silt loam

Fire-cracked rock ⚠ Stage 3 biface

TOP: Figure 6.16 20S10E North Trench, north profile (10S16-18E).
BOTTOM: Figure 6.17 20S50W North Trench, south profile (10S42-44W).

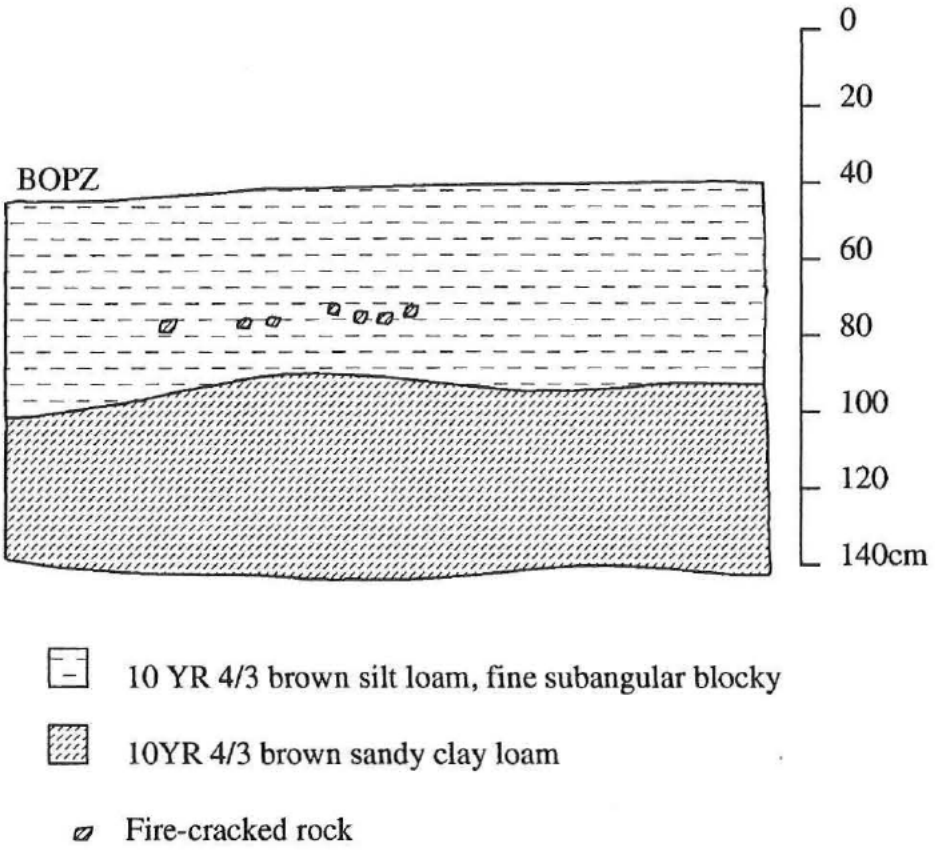


Figure 6.18 30S10W East Trench, west profile (28-26S1W).

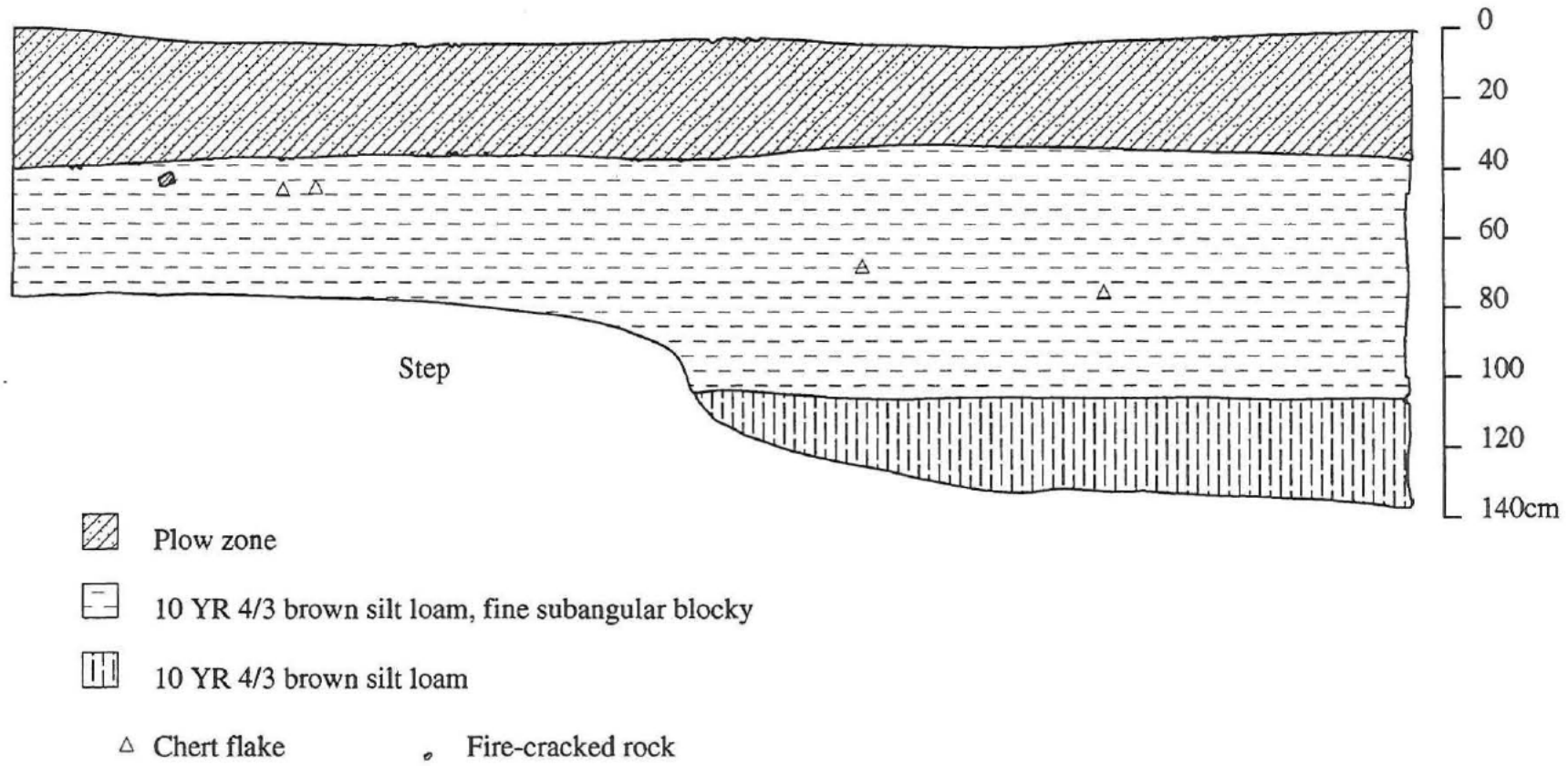
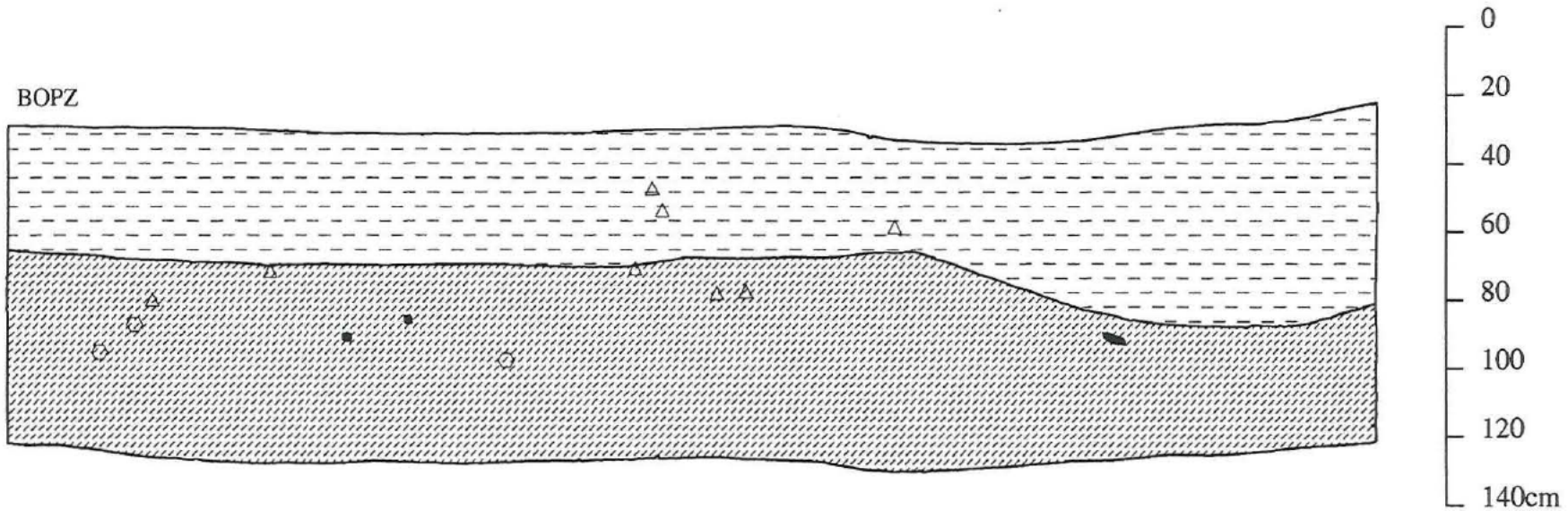


Figure 6.19 50S50W North Trench, north profile (40S47-43W).



10 YR 4/3 brown silt loam, fine subangular blocky

10 YR 4/3 brown silty clay loam

○ Calcined bone fragment

△ Chert flake . Charcoal

Figure 6.20 80S90W North Trench, north profile (70S80-84W).

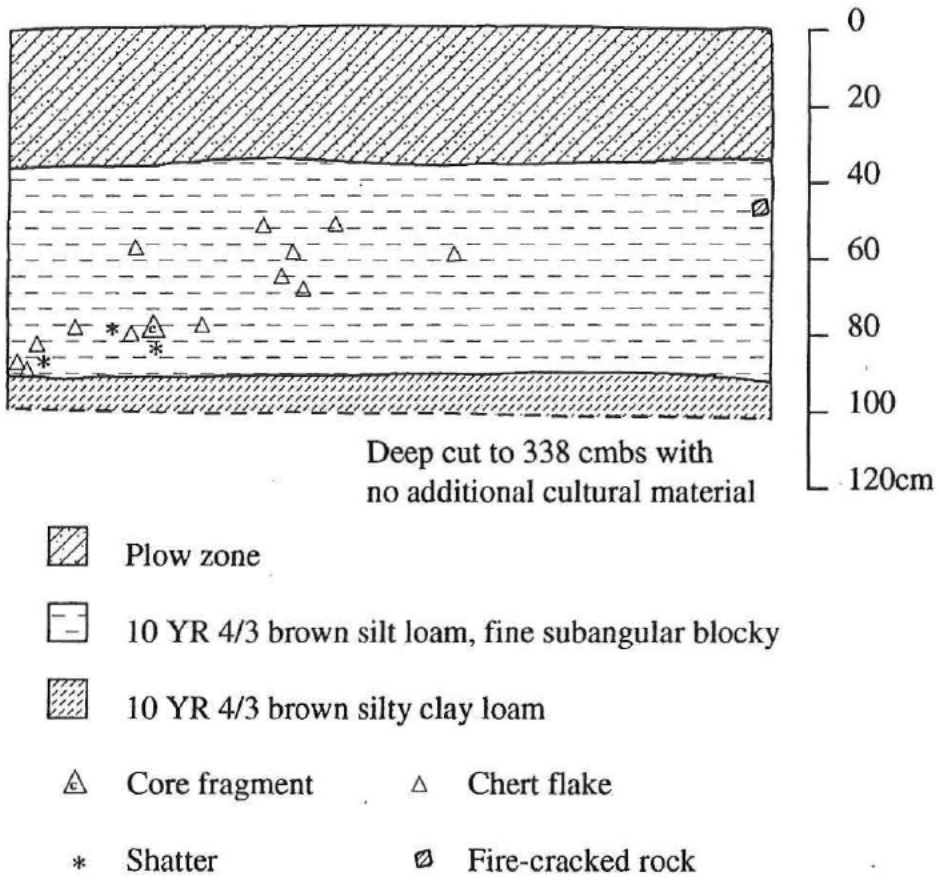


Figure 6.21 70S90W West Trench, west profile (68-66S70W).

Table 6.4 Summary of Prehistoric Features.

F#	LOCATION*	FEATURE TYPE	DFS**	DIMENSIONS	ASSOCIATIONS	DATES	PERIOD***
1	24N20E,26N20E 24N18E	FCR concentration in shallow basin	26-39	145 x 85 cm	charcoal concentration, flakes, shatter, utilized flake, shell, bone, 2 Late Archaic points, 2 nutshells	3740 +/- 70 BP Beta 86520	Late Archaic
2	18N44E,18N46E	lens with reddish brown soil mottling and charcoal	33-35	30 x 13 cm			
3	44N14E,46N14E 44N16E,46N16E	FCR and chert flake concentration	21-34	335 x 225 cm	charcoal flecks, flakes, shatter, utilized flakes, biface, Bottleneck Stemmed point		Late Archaic
5	2S6W	FCR concentration in shallow basin	23-34	60 x 60 cm	charcoal flecks, flakes, shatter		Late Archaic
6	4S4W,4S6W 2S4W,2S6W	FCR concentration	18-27	117 x 96 cm	charcoal flecks, flakes, shatter, hammerstone		Late Archaic
7	8S4W,8S2W	FCR scatter	26-37	110 x 70 cm	charcoal flecks, flake		Late Archaic
8	10S10W	FCR concentration in shallow basin	34-46	80 x 87 cm	flakes, shatter, nutshell		Late Archaic
9	88N60E	yellowish red soil lens with charcoal	31-35	26 x 17 cm	flake, iron fragments		
10	6S10W,4S10W	FCR concentration	28-34	103 x 100 cm	charcoal fragments, flakes	3920 +/-110 BP Beta 86522	Late Archaic
16	28N22E	FCR concentration [formerly ARMS F-1 (Zoll et al. 1991) basin shaped pit with FCR]	38-52	70 x 60 cm	charcoal flecks, flakes, core, biface, nutshell	3670 +/-90 BP Beta 42314 (from Zoll et al. 1991)	Late Archaic
18	26N30E,26N32E	FCR concentration	36-47	180 x 100 cm	charcoal fragments, flakes		Late Archaic
19	73S109W	charcoal lens with small clumps of orange yellow soil	39-46	30 x 16 cm		2750 +/-80 BP Beta 88702	Late Archaic/ Early Woodland

Table 6.4 Summary of Prehistoric Features (con't.).

F#	LOCATION	FEATURE TYPE	DFS	DIMENSIONS	ASSOCIATIONS	DATES	PERIOD
20	26N32E,26N30E	FCR concentration	45-66	100 x 75 cm	charcoal concentration, core fragment, flakes, shatter, nutshell	3710 +/-70 BP Beta 88703	Late Archaic
21	32S88W	FCR concentration	29-42	160 x 112 cm	flakes, shatter, hammerstone, Merom Cluster point base, bone		Late Archaic
22	24N30E, NE Quad	FCR concentration	52-67	85 x 80 cm	charcoal fragments and flecks, flakes, shatter	3810 +/-70 BP Beta 88704	Late Archaic
23	78S90W	charcoal and ash lens	42-47	10 x 10 cm			
24	23N29E	FCR concentration	43-53	70 x 66 cm	charcoal flecks, flakes, shatter, core, hammerstone		Late Archaic
25	34S92W	FCR concentration	30-43	77 x 57 cm	charcoal fragments, flakes	3810 +/-70 BP Beta 88705	Late Archaic
26	20N44E	FCR, chert block, core, and flake concentration	62-78	280 x 160 cm	shatter, utilized flake, core, core fragments, bifaces, pieces esquillees, chert blocks, bone		Late Archaic?
27	26N15E	FCR concentration	41-49	80 x 60 cm	charcoal flecks, flakes, shatter, nutshells		Late Archaic
28	22N18E	FCR concentration	38-45	80 x 75 cm	charcoal flecks, flakes, shatter, bone, nutshells, nutmeats, seed		Late Archaic
29	20N42E	chert block, flake, shatter and core concentration	52-66	120 x 115 cm	flakes, shatter, cores, core fragments, chert blocks, pebbles		Late Archaic?

Table 6.4 Summary of Prehistoric Features (con't.).

F#	LOCATION	FEATURE TYPE	DFS	DIMENSIONS	ASSOCIATIONS	DATES	PERIOD
30	20N16E	FCR scatter	44-52	67 x 42 cm	charcoal flecks, flakes, shatter, core, core fragment		Late Archaic
31	28S86W	FCR concentration	31-42	80 x 50 cm	flakes, shatter		Late Archaic
32	24S2W	FCR concentration in shallow basin	56-68	120 cm x ? (feature damaged by backhoe)	charcoal concentration, flakes, shatter, bone, squash rinds	3820 +/-80 BP Beta 88707	Late Archaic
34	10N14W	FCR concentration	37-52	85 x 75 cm	flakes		Late Archaic
35	70S86W, 68S86W	FCR, cobble and shattered chert concentration	95-103	192 x 150 cm	charcoal flecks, flakes, core, shatter, (heat ?) shattered chert, cobbles	6800 +/-40 BP Beta 88708	Early Archaic
36	6S36W	FCR scatter	55-65	110 x 40 cm	charcoal flecks, flakes, shatter		Early Archaic

*location by 2 x 2 meter square

** DFS is depth from surface, a range from first encounter during excavation to the feature base

***see individual feature descriptions for explanations of period designations

Note: F-13 was determined to be a burned tree root, so is not described here

Description of Base of Plow Zone Features

Feature 1 (Figures 6.22 through 6.25). Feature 1 consisted of fire-cracked rock, two charcoal concentrations and various artifacts in a shallow basin. The basin fill was slightly mottled and contained charcoal flecks. The fire-cracked rock was removed in two levels, the second revealing the charcoal concentrations. The base of the feature was inferred from a gradual decrease in mottling and charcoal flecking. The second half of the feature was excavated after profiling, but no further inferences could be drawn. Two points were encountered *in situ* in the feature fill (See Figure 6.24, #299, #300). The points were at the base of the feature but not directly under the concentrated fire-cracked rock. While not specifically typeable, the points can probably be grouped with the Brewerton Corner Notched Cluster (Justice 1987:115-118). Point #299 is made from Liston Creek chert, possibly heat-treated, while point #300 is made from heat treated Attica chert. A sample from one of the charcoal concentrations yielded a radiocarbon age of 3740 +/-70 B.P. (Beta 86520). The two sigma calibrated range is 2335-1935 B.C., placing this feature in the Late Archaic. The following is a complete list of material found in association with Feature 1:

Excavation and 1/4" Screening	**Flotation (27 liters)**
106 fire-cracked rock	19 fire-cracked rock
2 chert points (Brewerton C.N. Cluster)	
1 chert utilized flake	
50 chert primary flakes	
78 chert secondary flakes	5 chert secondary flakes
3 chert retouch flakes	67 chert retouch flakes
1 chert shatter	
	6 nutshells (*Juglans nigra*, black walnut)
	2 nutshells (Juglandaceae, hickory/walnut)
	1 nutshell (*Corylus americana*., hazelnut)
4 shell fragments	
	2 calcined bone fragments

Feature 2 (see Figure 6.26). Feature 2 was a very small and shallow lens (maximum thickness 2 cm) of reddish brown soil and charcoal mottles. It may have represented the base of a hearth since destroyed by plowing. No associated cultural materials were recovered. The age and cultural affiliation for this feature is unknown.

Feature 3 (see Figure 6.27). Feature 3 was a large circular concentration of fire-cracked rock and chert flakes with no associated soil staining. All materials were found at the same approximate depth. A few charcoal flecks were noted amongst the rock in Feature 3, but were insufficient for sampling. No profile was obtainable for this "positive" feature (i.e., without intrusive shape or fill). A flotation sample was omitted due to initial confusion over how to handle excavation of this feature type. This is the first example of numerous fire-cracked rock concentrations found at the site, which in many cases suggest the dumping of hearth or boiling pit contents. Feature 3 departs from the typical pattern due to its size and relative dispersal as well as the inclusion of

numerous flakes a Stage 2 biface within the fire-cracked rock zone or around its edges. A Bottleneck Stemmed point was recovered from the northwest quadrant of the feature during screening of soil surrounding the rocks. The point is diagnostic of the Late Archaic period and has been found in a dated context (ca. 3770-3000 B.C.) at the Koster site in Illinois (Justice 1987:126). Below is a complete list of material found in association with Feature 3:

Excavation and 1/4" Screening
62 fire-cracked rock
1 chert point (Bottleneck Stemmed)
1 chert Stage 2 biface
3 chert utilized flakes
22 chert primary flakes
226 chert secondary flakes
13 chert retouch flakes
3 chert shatter

Feature 5 (see Figure 6.28, 6.29). Feature 5 consisted of fire-cracked rock in a shallow basin. The basin fill was slightly darker than the surrounding subsoil and contained flecks of charcoal. Fire-cracked rock was also found outside the feature, presumably from plow disturbance. No diagnostic materials were associated with this feature, but a Late Archaic cultural affiliation is likely due to the proximity of a dated feature (see Feature 10, below). The following material was found in association with Feature 5:

Excavation and 1/4" Screening (E 1/2)	**Flotation (20 liters)**
9 fire-cracked rock	4 fire-cracked-rock
	1 chert primary flake
	1 chert secondary flake
	2 chert shatter
	14 chert retouch flakes
	1 seed (*Chenopodium*, goosefoot)

Feature 6 (see Figure 6.28). Feature 6 appeared as a fire-cracked rock cluster associated with slightly darker soil and some charcoal flecking. The darker soil or charcoal had no depth and could not be seen in profile after bisection. The feature appeared to be part of a continuos occupation area including Feature 5 and other scattered materials. The following material was found in association with Feature 5:

Excavation and 1/4" Screening (N 1/2)	**Flotation (4 liters)**
23 fire-cracked rock	
1 hammerstone	
	4 chert retouch flakes
	1 chert shatter
	1 nutshell (Juglandaceae, hickory/walnut)

Feature 7 (see Figure 6.30). Feature 7 consisted of a light fire-cracked rock scatter with some charcoal flecking in the surrounding matrix. Bisection revealed no depth to the charcoal. The feature was interpreted as a secondary scatter associated with nearby features, and no flotation sample was taken. The following items were recovered from the feature:

Excavation and 1/4" Screening (including excavation of SW 1/2)
5 fire-cracked rock
1 secondary flake

Feature 8 (see Figure 6.31). Feature 8 consisted of fire-cracked rock in a shallow basin. The basin fill was slightly darker than the surrounding matrix, but no charcoal flecking was detected. This feature is again of probable Late Archaic affiliation due to its proximity to Feature 10. The following material was found in association with Feature 8:

Excavation and 1/4" Screening (S1/2)	**Flotation (14 liters)**
37 fire-cracked rock	3 fire-cracked rock
	4 chert retouch flakes
	3 chert shatter
	1 nutshell (Juglandaceae, hickory/walnut)

Feature 9 (see Figure 6.32, 6.33). Feature 9 was a small and shallow lens of fire-reddened soil and charcoal. Two small iron fragments and one chert retouch flake were obtained from the flotation sample. Therefore it is unclear whether this feature was part a prehistoric hearth or was the result of activities associated with the historic component.

Flotation (2.5 liters)
2 iron fragments
1 chert retouch flake

Feature 10 (see Figure 6.34, 6.35). Feature 10 consisted of a fire-cracked rock concentration with charcoal fragments and carbonized nutshells at its center. No stained soil was associated with this feature and bisection revealed no depth to the deposit. This 'positive' feature may represent the cleaning and dumping of hearth contents, given the amount of charcoal and nutshells present. A radiocarbon age of 3920 +/-110 BP was obtained from some of the charcoal. Due to the nature of the calibration curve there are several possible two sigma calibrated ranges for this radiocarbon age: 2855-2820 B.C., 2665-2110 B.C. and 2090-2040 B.C. These ranges each indicate a Late Archaic

affiliation for this feature. The following material was found in association with Feature 10:

Excavation and 1/4" Screening (including excavation of E 1/2)	Flotation (15 liters)
55 fire-cracked rock	3 fire-cracked rock
	4 chert secondary flakes
1 bone fragment (*Odocoileus virginianus*, white-tailed deer)	
	14 nutshells (*Carya spp.*, hickory)
	2 nutshells (*Juglans nigra*, black walnut)
	104 nutshells (Juglandaceae, hickory/walnut)

Feature 16 (see Figures 6.36, 6.37). Feature 16 appeared as a concentration of fire-cracked rock with associated charcoal flecking in the surrounding soil. Initial excavation of the feature was confused by more loosely concentrated rock at the plow zone interface. Slightly deeper excavation revealed the intact concentration, including an etched soda can marking this feature as Feature 1 from November 1990 ARMS Phase II investigations. The ARMS Feature 1 was described as a basin shaped pit filled with fire-cracked rock measuring 108 x 67 cm (see Figure 6.37). Wood charcoal, a flake, and a nutshell were recovered from the feature at that time. A radiocarbon age of 3670+/-90 (Beta 42314) was obtained from the charcoal (Zoll et al. 1991:42). Feature 16, which does not conform to the ARMS Feature 1 description, appears to be a disturbed post-excavation deposit (70 x 60 cm) rather than an intact prehistoric feature. Bisection of the feature revealed no depth to the deposit or any pit outlines. Our discovery of the Feature 1 location marker offered a useful key to finding the exact locations of previous ARMS backhoe trenches, which were not otherwise detectable based on soil characteristics. The following items were found in association with the fire-cracked rock concentration comprising Feature 16:

Excavation and 1/4" Screening (including excavation of S 1/2)	Flotation (3 liters)
74 fire-cracked rock	8 fire-cracked rock
1 chert core	
1 Stage 3 biface	
10 chert secondary flakes	
	2 chert retouch flakes
	1 nutshell (*Carya spp.*, hickory)

Feature 18 (see Figure 6.38). Feature 18 was a fire-cracked rock concentration with some charcoal fragments in the surrounding subsoil. The fire-cracked rock in the eastern portion of the feature was more dispersed, possibly from plow disturbance. No date was obtained for this feature, but a second fire-cracked rock concentration (Feature 20) was detected in the next two excavation levels. Feature 20 yielded a radiocarbon age of 3710+/-70 B.P. (Beta 88703) and a calibrated two sigma range of 2300-1900 B.C. The location of Feature 18 in relation to Feature 20 and Feature 16 indicates a probable Late

Archaic cultural affiliation. The following materials were recovered in association with Feature 18:

Excavation and 1/4" Screening	Flotation (15 liters)
59 fire-cracked rock	
	1 chert retouch flake

Feature 19 (see Figures 6.39, 6.40). Feature 19 was comprised of a small and shallow lens of charcoal with small compact clumps of fine-grained orange-yellow soil. These small clumps resembled ochre in their consistency, but less in their color. The clumps may represent fire-reddened soil from a hearth or may indeed be ochre. A sample of the charcoal yielded a radiocarbon age of 2750+/-80 B.P. (Beta 88702) and a two sigma calibrated range of 1065-795 B.C. This suggests a Late Archaic/Early Woodland cultural affiliation. No other cultural material was associated with this feature.

Feature 21 (see Figure 6.41). Feature 21 was another example of a fire-cracked rock concentration with no depth or associated feature fill. A relatively large number of artifacts, mostly debitage, was recovered from this concentration. A diagnostic point fragment (base and shoulder) was also recovered during screening. It fits into the Merom Cluster (Trimble Side Notched?) and is made of heat treated Liston Creek chert. Merom Cluster points are diagnostic of the Late Archaic Riverton culture (1600-1000 B.C.) in the middle Wabash Valley and along the West Fork of the White River (Justice 1987:130; Tomak 1983:73). This feature lies in close proximity to Feature 25, which yielded a radiocarbon date indicating Late Archaic Period occupation (3810+/-70 B.P. (Beta 88705)). The following materials were found in association with Feature 21:

Excavation and 1/4" Screening	Flotation (15 liters)
278 fire-cracked rock	4 fire-cracked rock
1 chert point base (Merom Cluster)	
1 chert primary flake	
1 chert secondary flake	5 chert secondary flakes
15 chert retouch flakes	21 chert retouch flakes
	2 chert shatter
1 hammerstone	
16 calcined bone fragments	

Feature 23. Feature 23 was a small, circular charcoal and ash lens with no associated artifacts. The diameter of the lens was less than ten cm and extended to a maximum depth of five centimeters in profile. The age or cultural affiliation is completely unclear. Some fire-cracked rock and debitage was found at the base of the plow zone in the associated 10 x 10 m block. The feature was too small for illustration in this report.

Feature 25 (see Figure 6.42). Feature 25 was another concentration of fire-cracked rock with associated charcoal fragments. This particular feature was part of a much larger scatter of fire-cracked rock that probably related to a continuous occupation

area including Feature 21. A radiocarbon age of 3810+/-70 (Beta 88705) was obtained from a charcoal sample. The two sigma calibrated range for date is 2460-2025 B.C., dating this feature to the Late Archaic Period. This date is slightly early when compared to the range for the Merom Cluster point fragment in nearby Feature 21. The following items were found in association with Feature 25:

Excavation and 1/4" Screening	Flotation (12 liters)
97 fire-cracked rock	14 fire-cracked rock
1 chert secondary flake	
	7 chert retouch flakes

Feature 27 (see Figure 6.43). Feature 27 was a fire-cracked rock concentration with no associated soil staining and a few flecks of charcoal in surrounding soil. The age and cultural affiliation of this feature can be inferred from the proximity of other Late Archaic concentrations (i.e., Feature 1). Some debitage as well as carbonized nut shells were recovered from the feature. The following is a complete list of items in association with the feature:

Excavation and 1/4" Screening	Flotation (10 liters)
58 fire-cracked rock	2 fire-cracked rock
	6 chert retouch flakes
	3 chert shatter
	1 nutshell (*Carya spp.*, hickory)
	1 nutshell (*Juglans sp.*, walnut)
	3 nutshells (*Juglans nigra*, black walnut)
	2 nutshells (*Quercus spp.*, oak)
	2 nutshells (Juglandaceae, hickory/walnut)

Feature 28 (see Figure 6.44). Feature 28 was another fire-cracked rock concentration and was found in close proximity to Features 1, 27 and 30. This feature is probably another example of Late Archaic activity. The soil around the concentration was flecked with charcoal and initially suggested a small basin or pit. The feature, however, revealed no depth upon further excavation. Carbonized floral remains were found in association with the feature along with the other materials listed here:

Excavation and 1/4" Screening	Flotation (16 liters)
96 fire-cracked rock	51 fire-cracked rock
1 secondary chert flake	
	15 chert retouch flakes
	19 chert shatter
1 tooth (large mammal)	
	1 calcined bone fragment
1 nut meat fragment (*Quercus spp.*, oak)	2 nut meat fragments (*Quercus spp.*, oak)
	1 nutshell (*Quercus spp.*, oak)
	1 seed (*Polygonum erectum*, erect knotweed)

Feature 30 (see Figure 6.45). Feature 30 was a small scatter of fire-cracked rock with light charcoal flecking in the surrounding subsoil. Fairly heavy root staining was detected amidst this scatter. This feature was in close proximity to Features 1, 27 and 28, and was probably also of Late Archaic cultural affiliation. Feature 30 may actually be rock scatter from the concentration comprising Feature 28 rather than a discrete feature. The following materials were found in loose association with the scattered fire-cracked rock comprising Feature 30:

Excavation and 1/4" Screening	Flotation (15 liters)
19 fire-cracked rock	1 fire-cracked rock
1 chert core	
1 chert core fragment	
5 chert primary flakes	
5 chert secondary flakes	
	9 chert retouch flakes
8 chert shatter	3 chert shatter

Feature 31 (see Figure 6.46). Feature 31 was comprised of a small concentration of fire-cracked rock similar to those previously described. The soil around the rock was stained from decayed roots. Some charcoal within the feature area was within the intrusive roots stains. This feature was in close proximity to Features 21 and 25, and was probably of Late Archaic Period affiliation. The following items were found in association with Feature 31:

Excavation and 1/4" Screening	Flotation (14 liters)
108 fire-cracked rock	8 fire-cracked rock
1 chert secondary flake	
1 chert retouch flake	
	1 chert shatter
	1 nutshell (*Corylus americana*., hazelnut)
	6 rinds (*Cucurbita foetidissima*, buffalo gourd)

Feature 34 (see Figure 6.47). Feature 34 was a fire-cracked rock concentration with no associated soil staining or feature fill. The feature was associated with Features 21 and 25, and would therefore probably date to the Late Archaic Period. The following items were found in association with Feature 34:

Excavation and 1/4" Screening	Flotation (13 liters)
82 fire-cracked rock	
	5 chert secondary flakes
	18 chert retouch flakes
	1 nutshell (Juglandaceae, hickory/walnut)

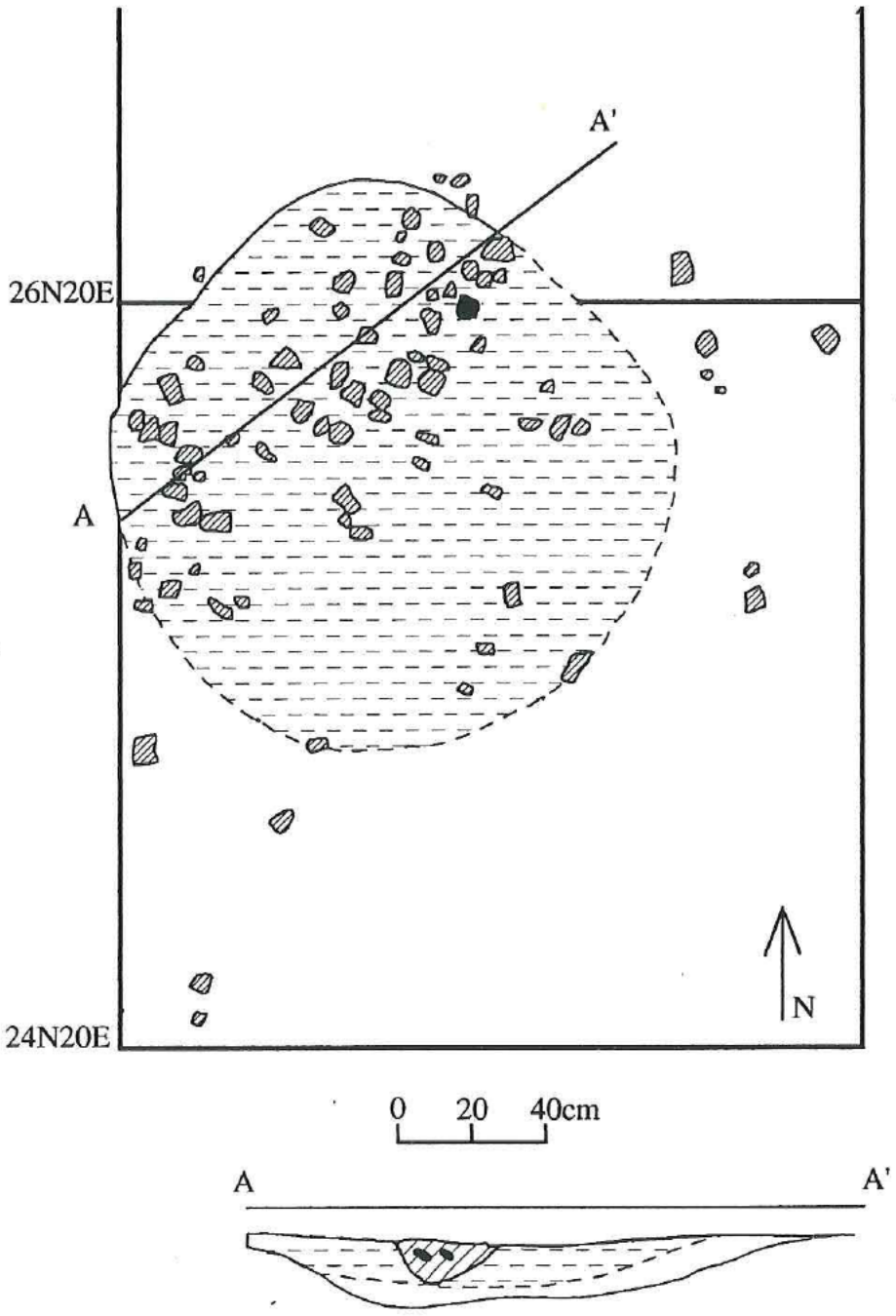


Figure 6.22 Feature 1 plan view.

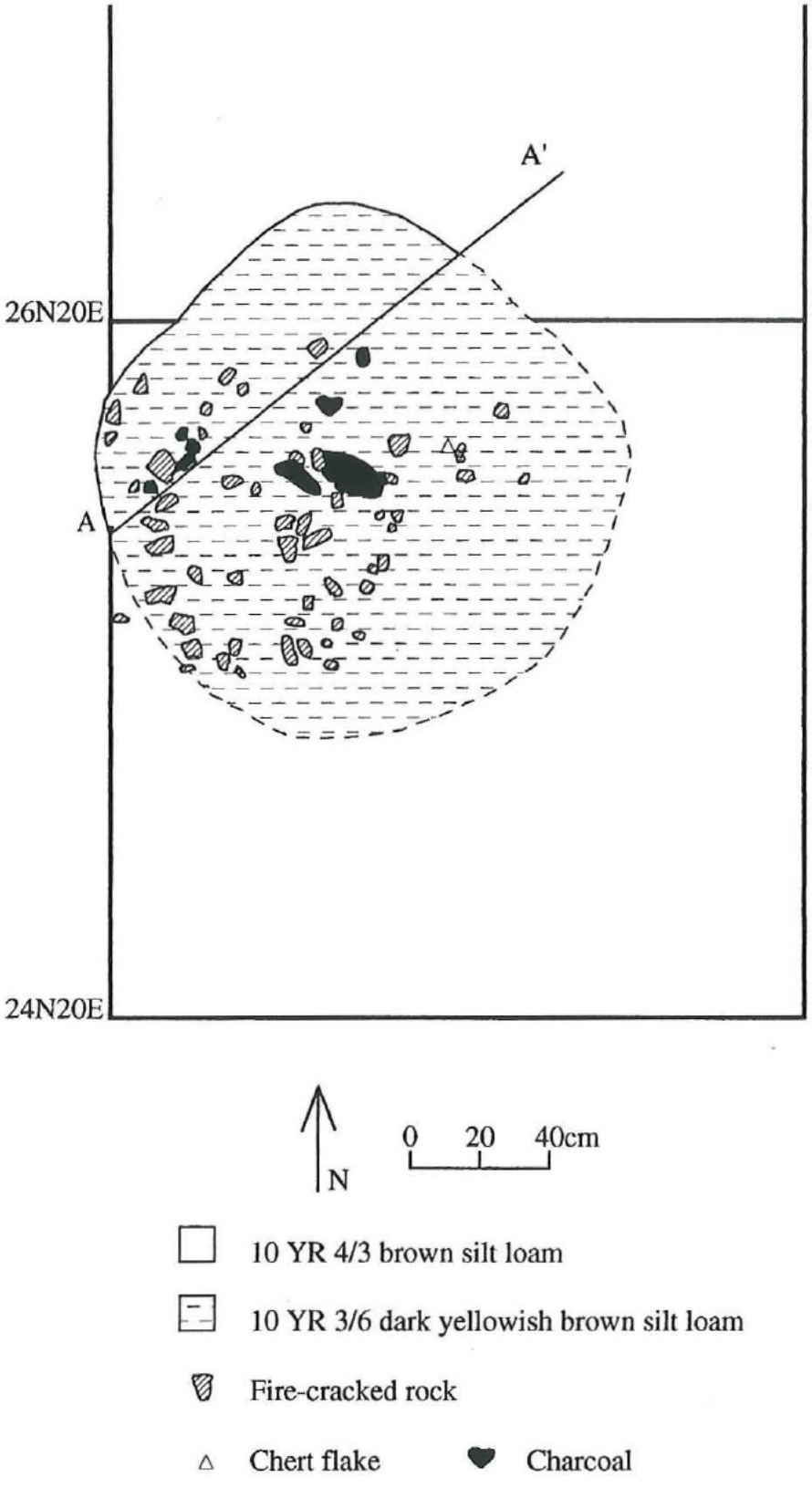


Figure 6.23 Feature 1 plan view, mid excavation.

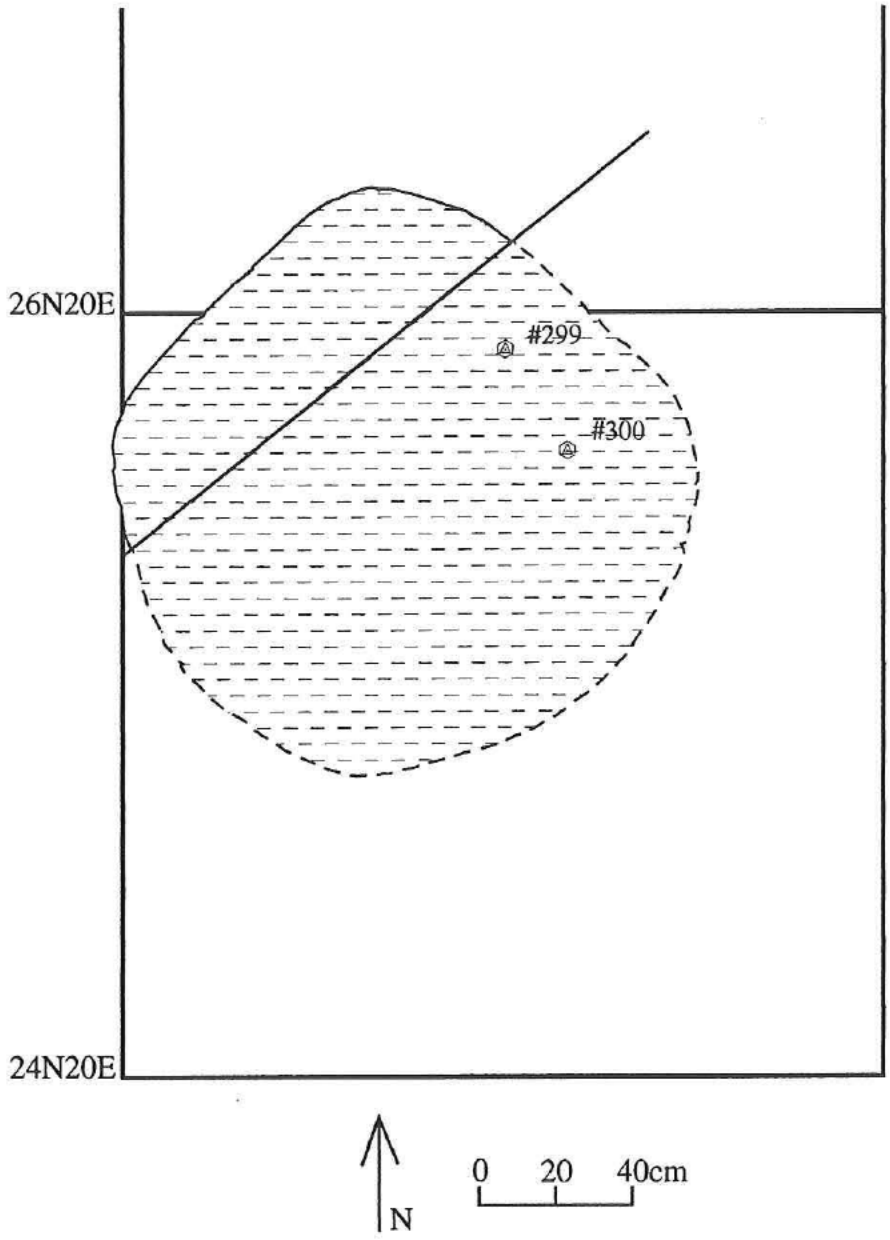


Figure 6.24 Feature 1 plan view, base.

Figure 6.25 Feature 1 mid excavation photo (after removal of charcoal).

Figure 6.26 Feature 2.

Figure 6.27 Feature 3 photo.

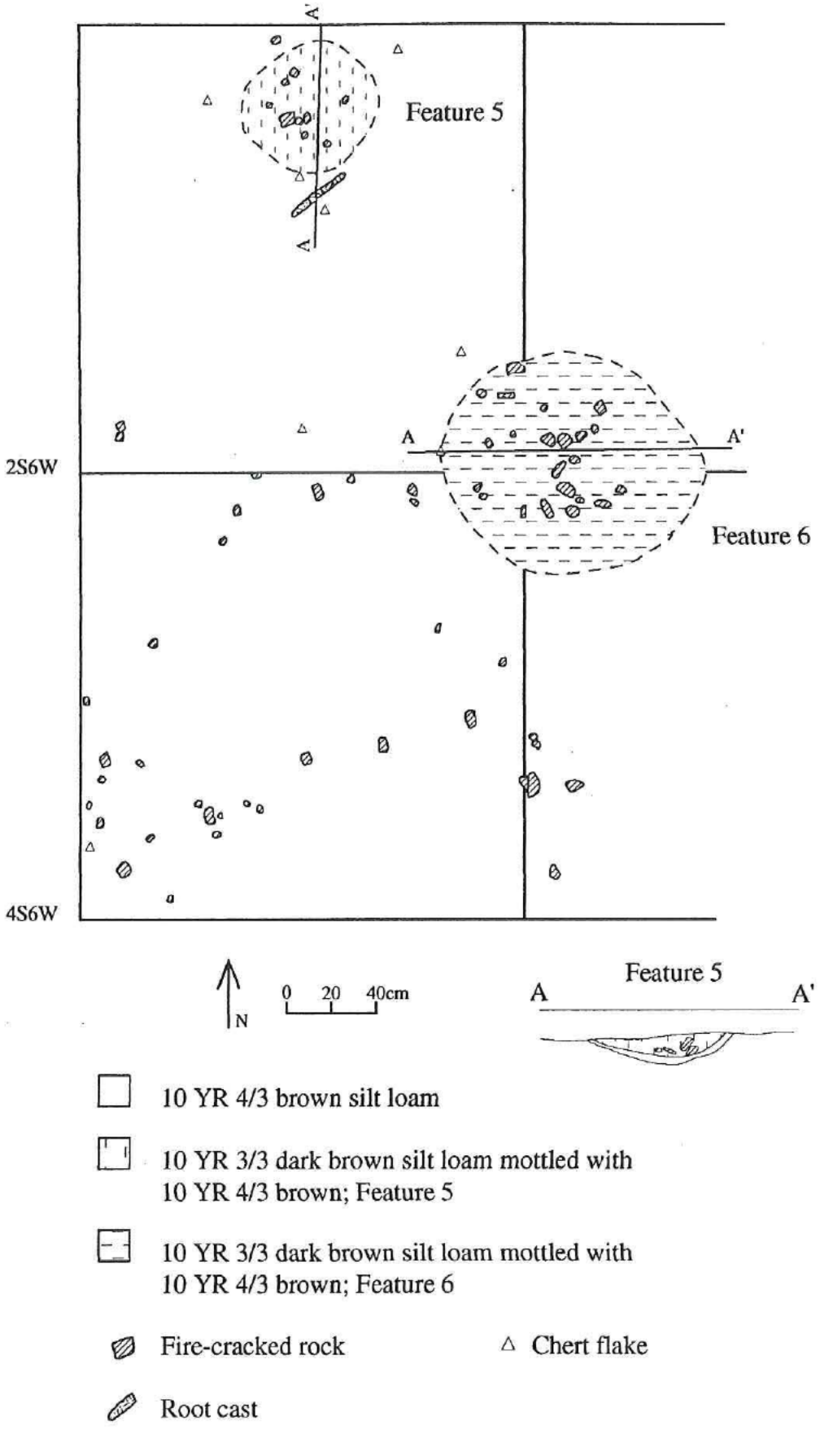


Figure 6.28 Features 5 and 6 plan view and Feature 5 profile.

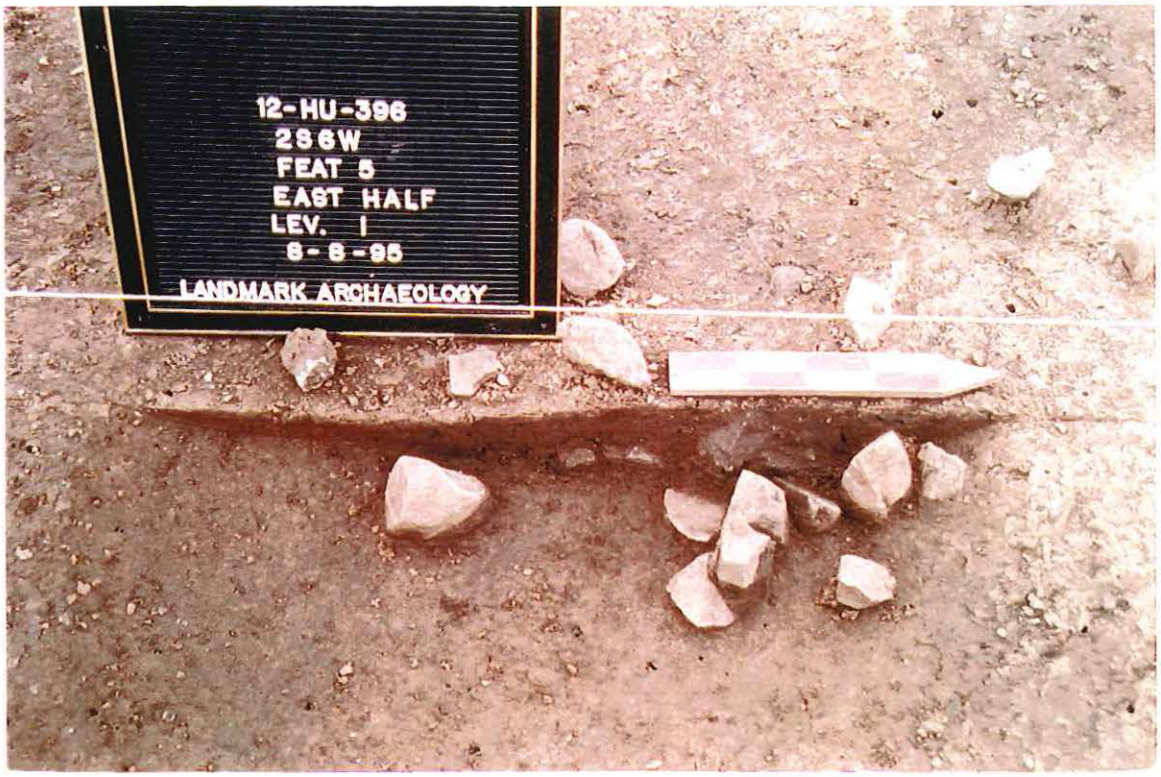


Figure 6.29 Feature 5 profile photo.

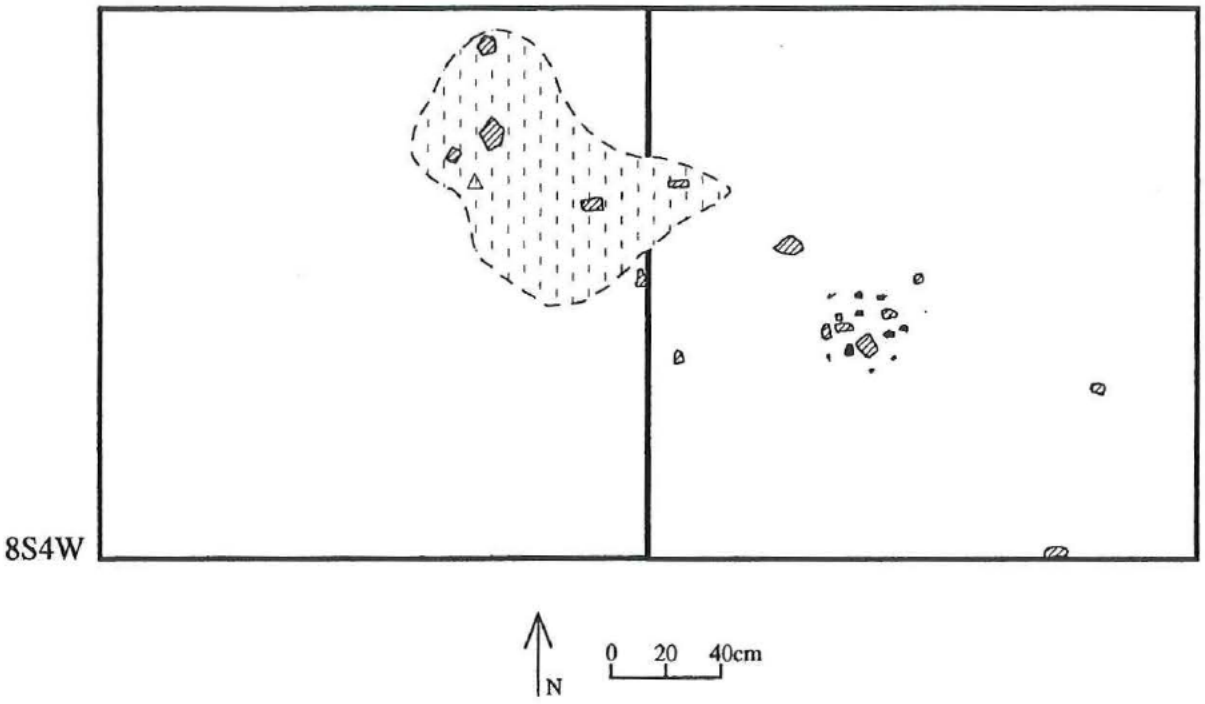


Figure 6.30 Feature 7 plan view.

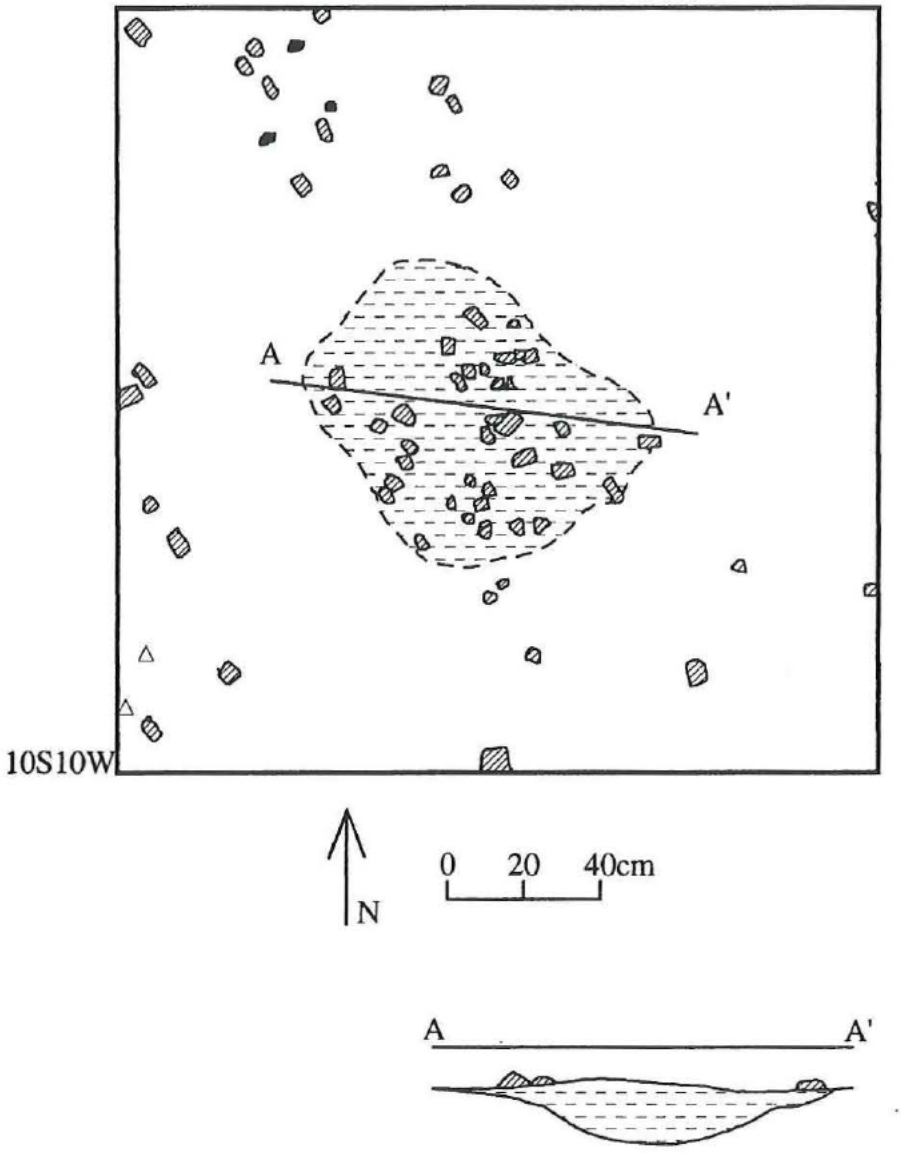


Figure 6.31 Feature 8 plan view and profile.

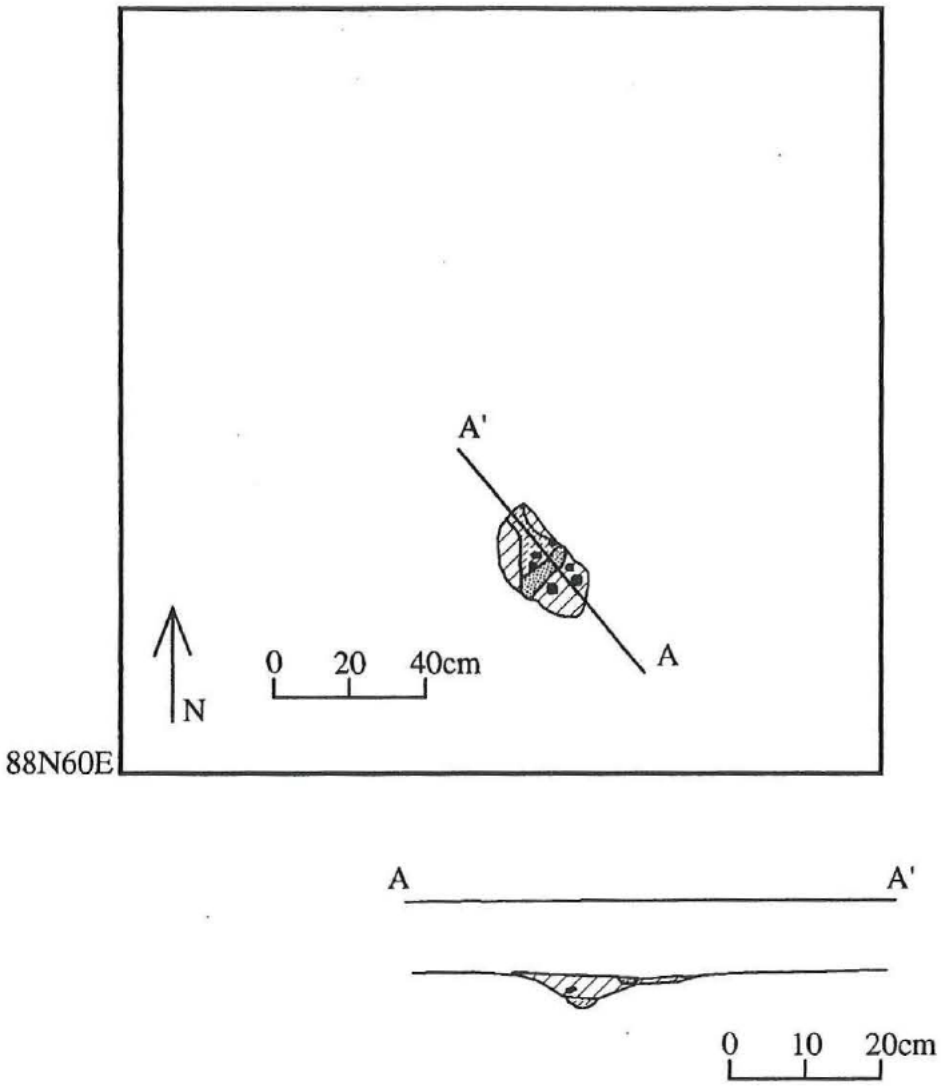


Figure 6.32 Feature 9 plan view and profile.

Figure 6.33 Feature 9 plan view photo.

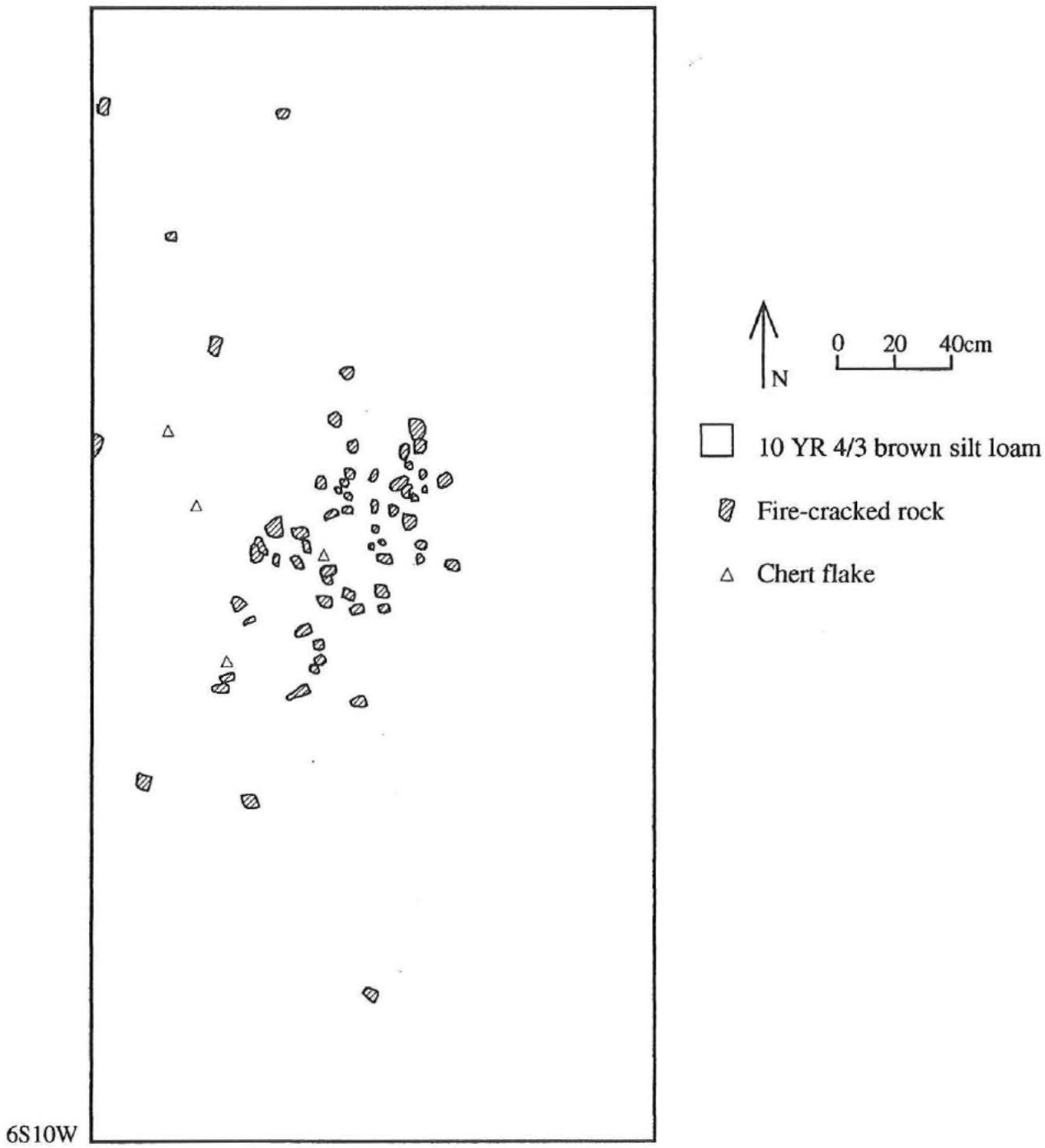


Figure 6.34 Feature 10 plan view.

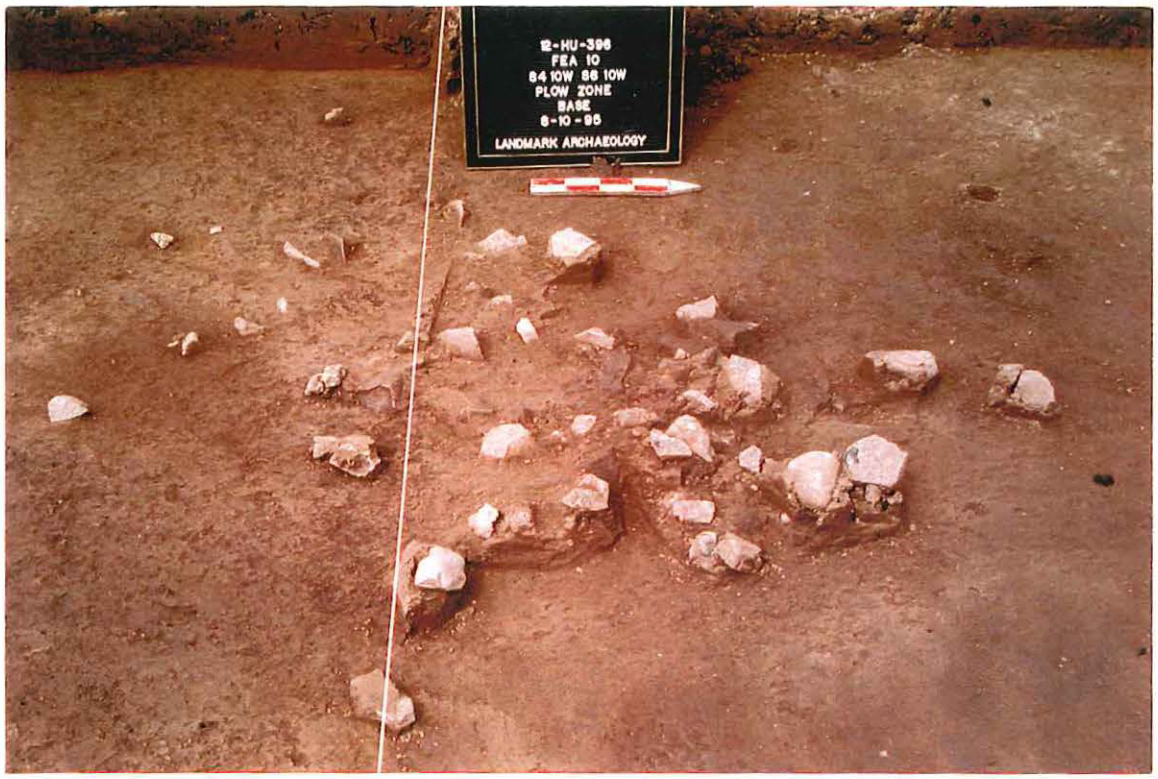


Figure 6.35 Feature 10 plan view photo.

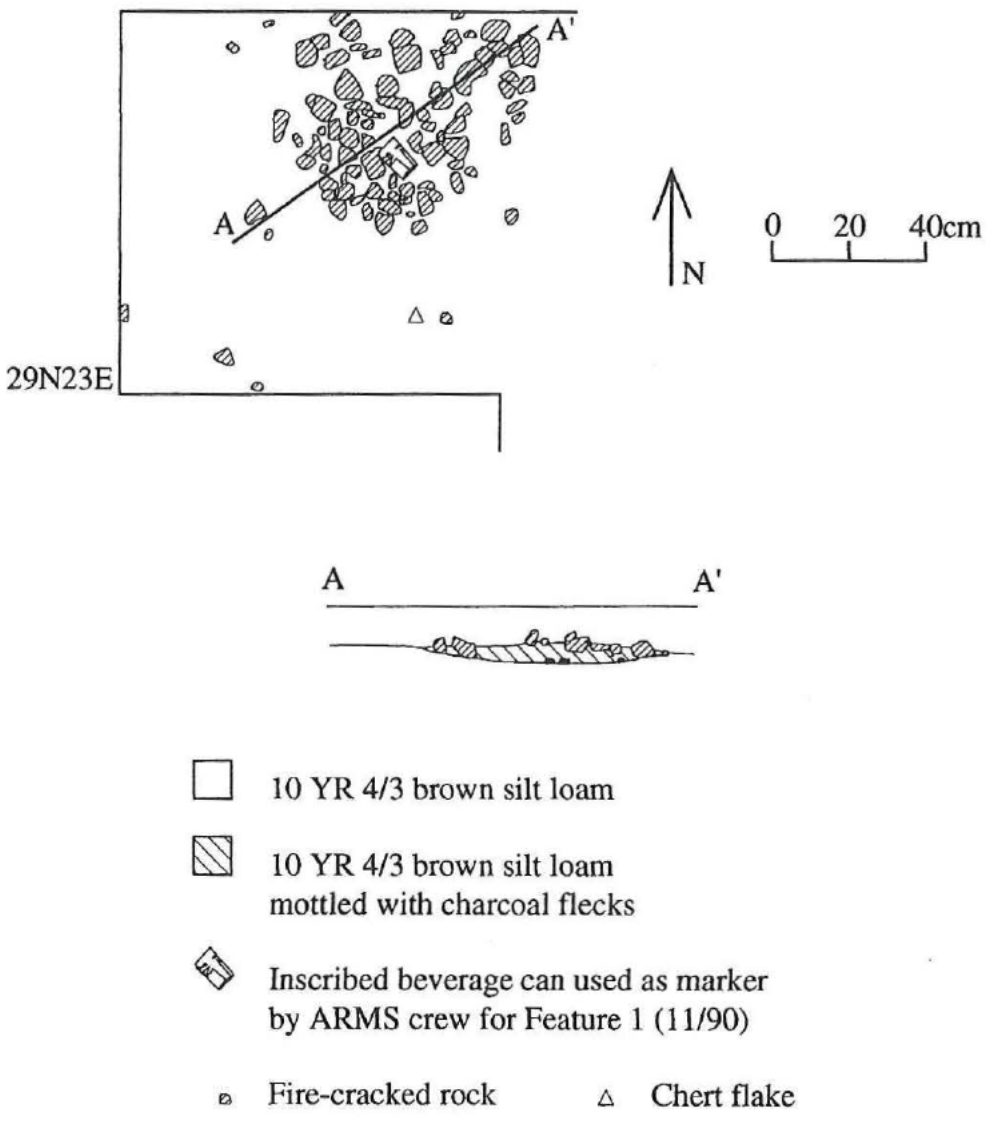


Figure 6.36 Feature 16 plan view and profile.

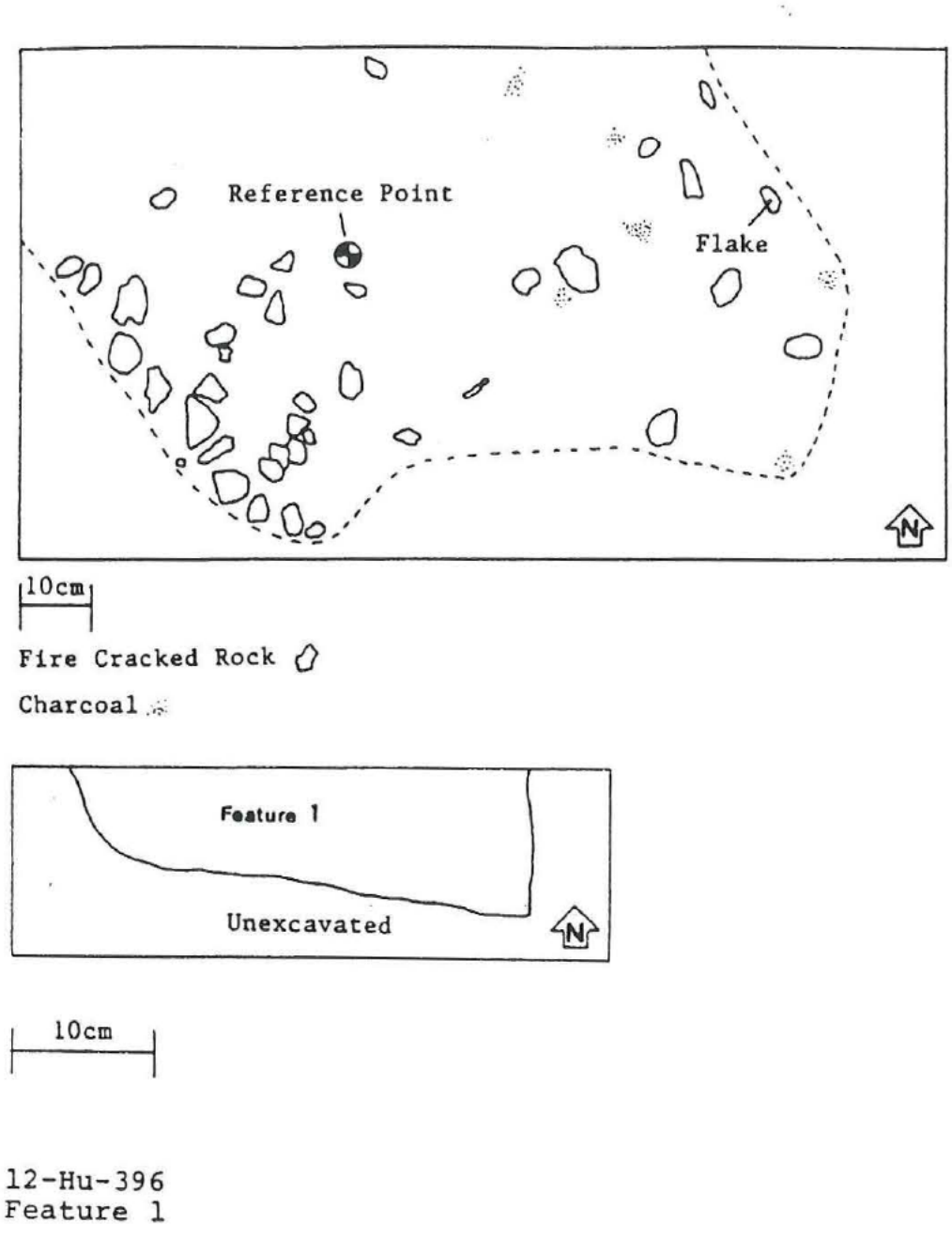


Figure 6.37 ARMS Feature 1 plan view and profile (from Zoll et al. 1991:49).

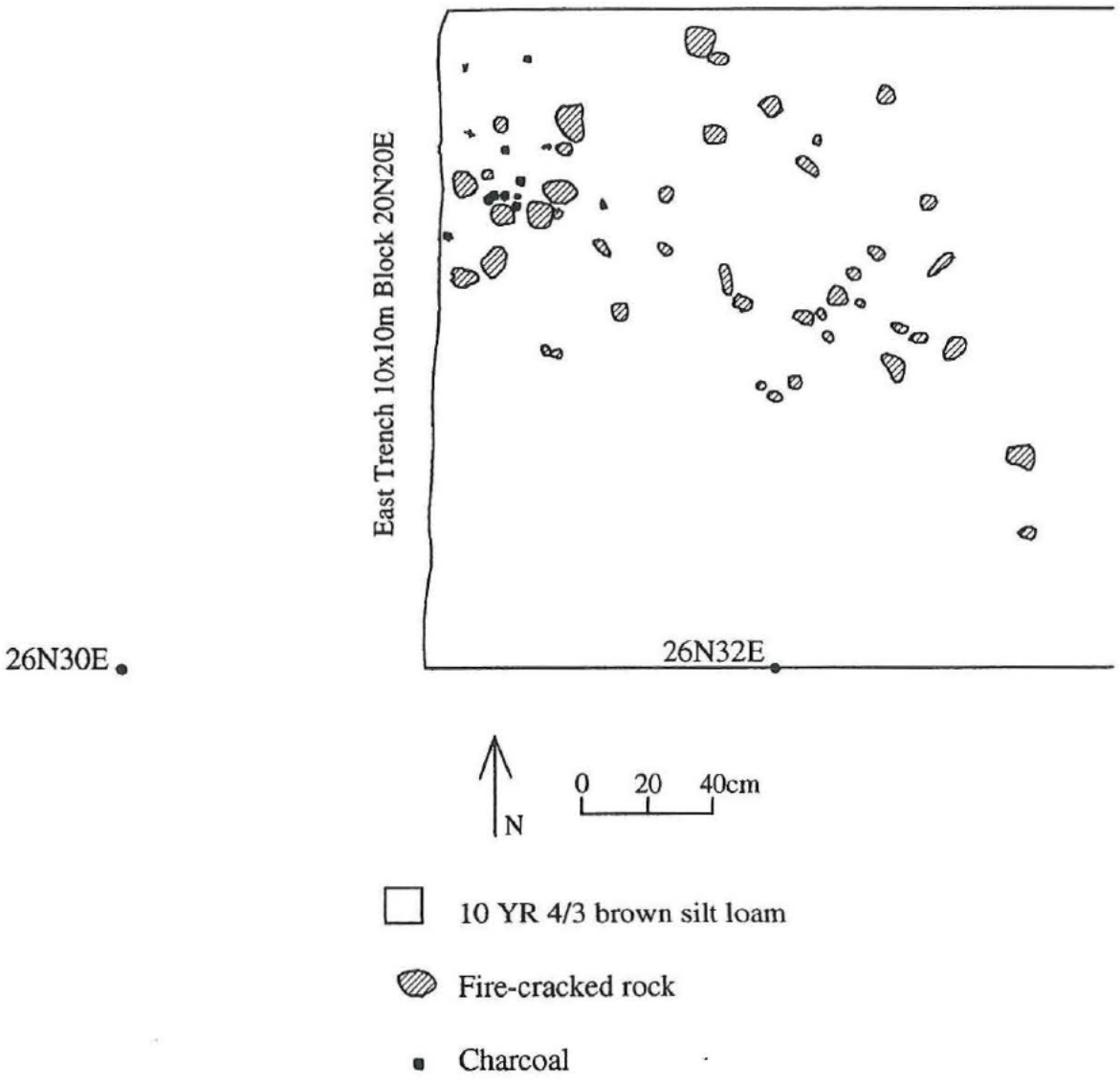


Figure 6.38 Feature 18 plan view.

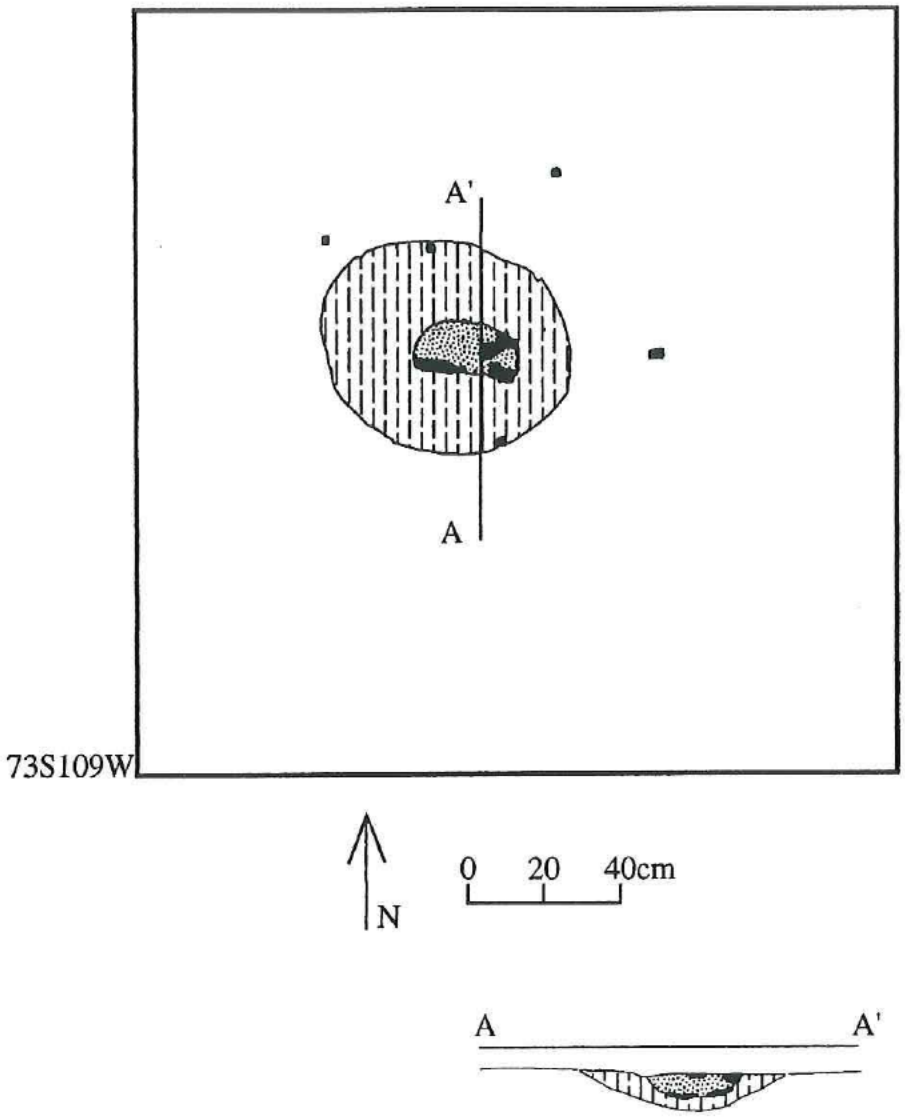


Figure 6.39 Feature 19 plan view and profile.

Figure 6.40 Feature 19 plan view photo.

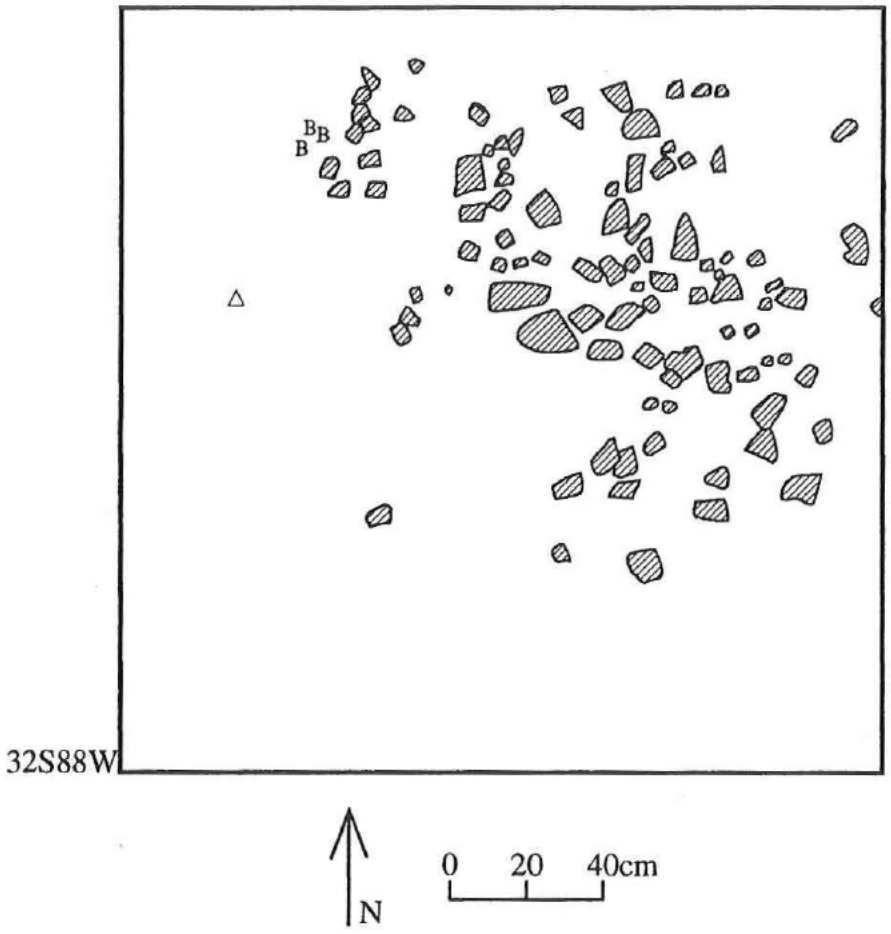


Figure 6.41 Feature 21 plan view .

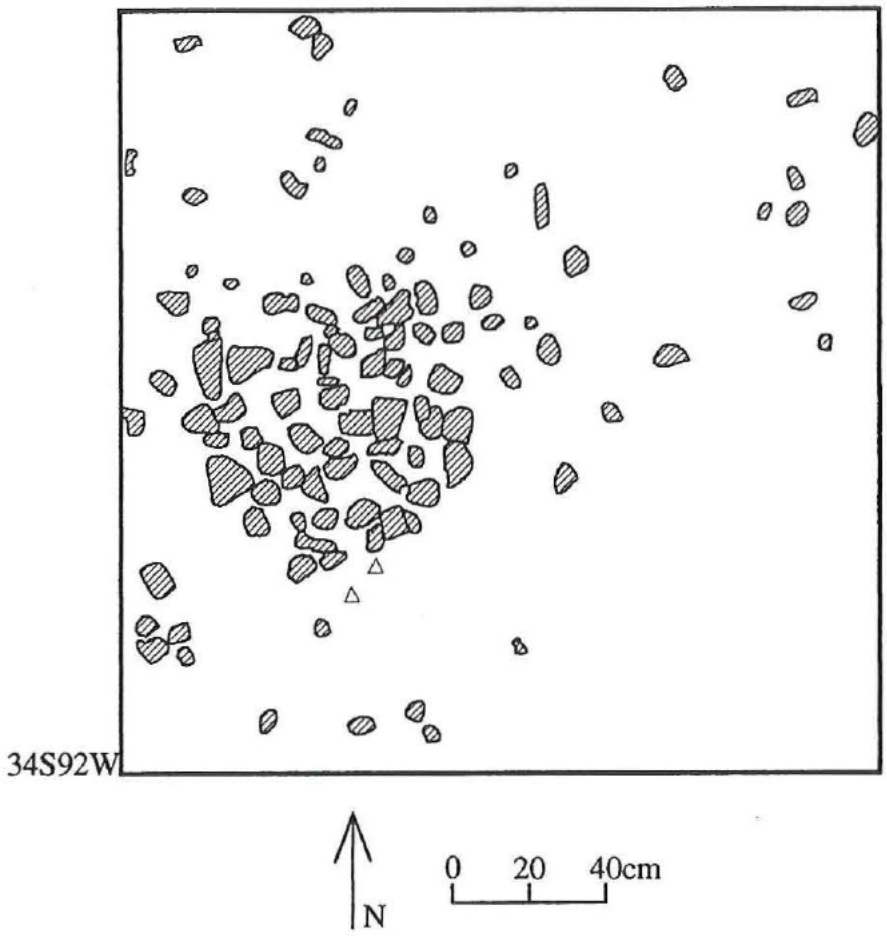


Figure 6.42 Feature 25 plan view.

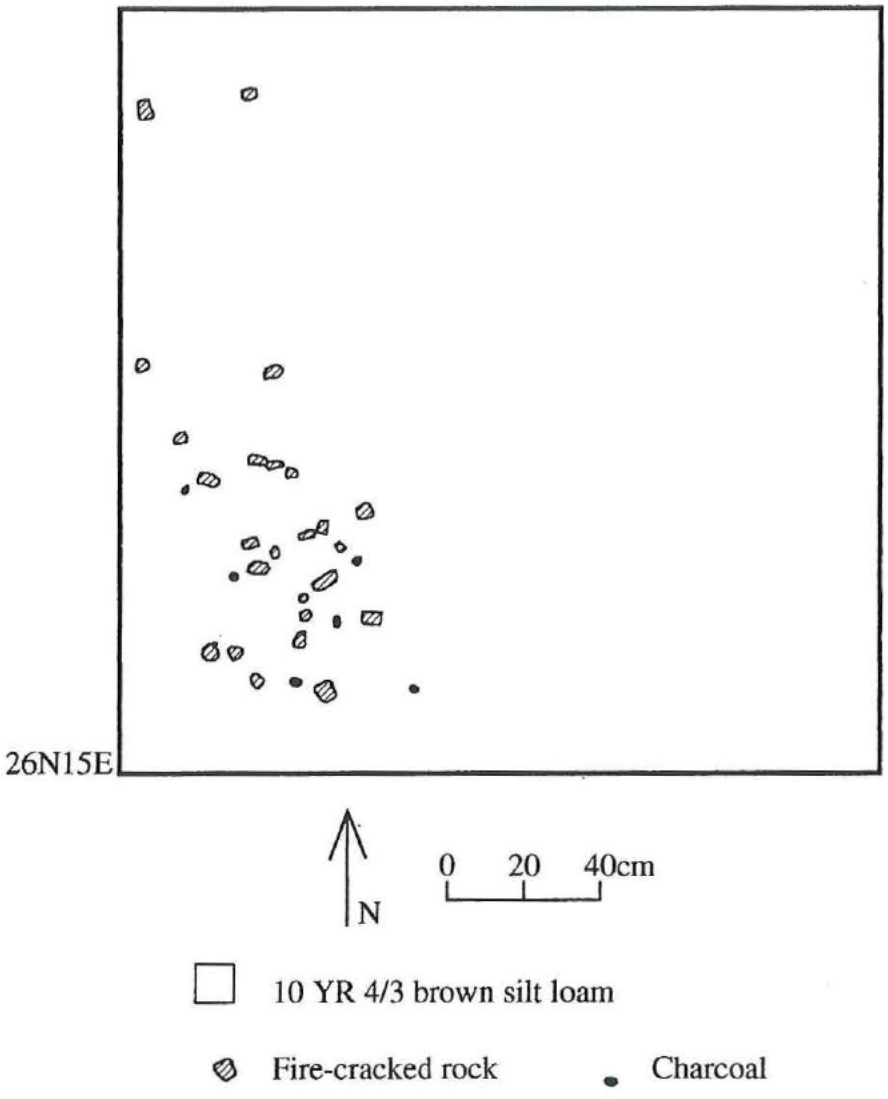


Figure 6.43 Feature 27 plan view.

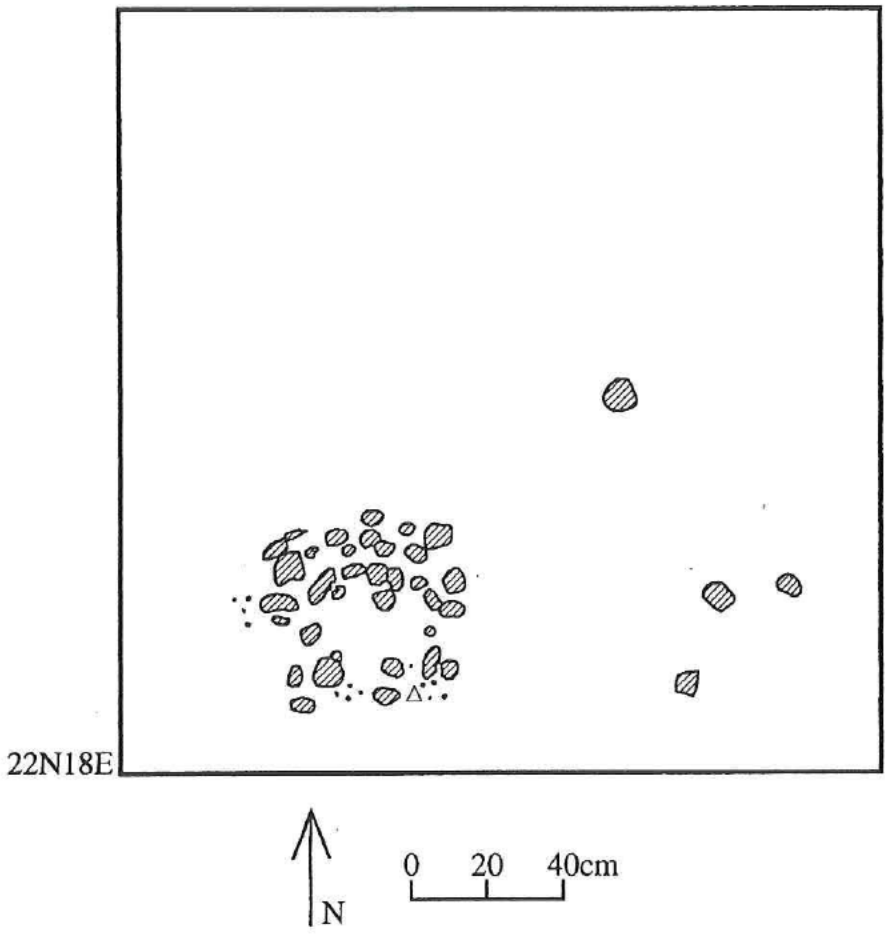


Figure 6.44 Feature 28 plan view.

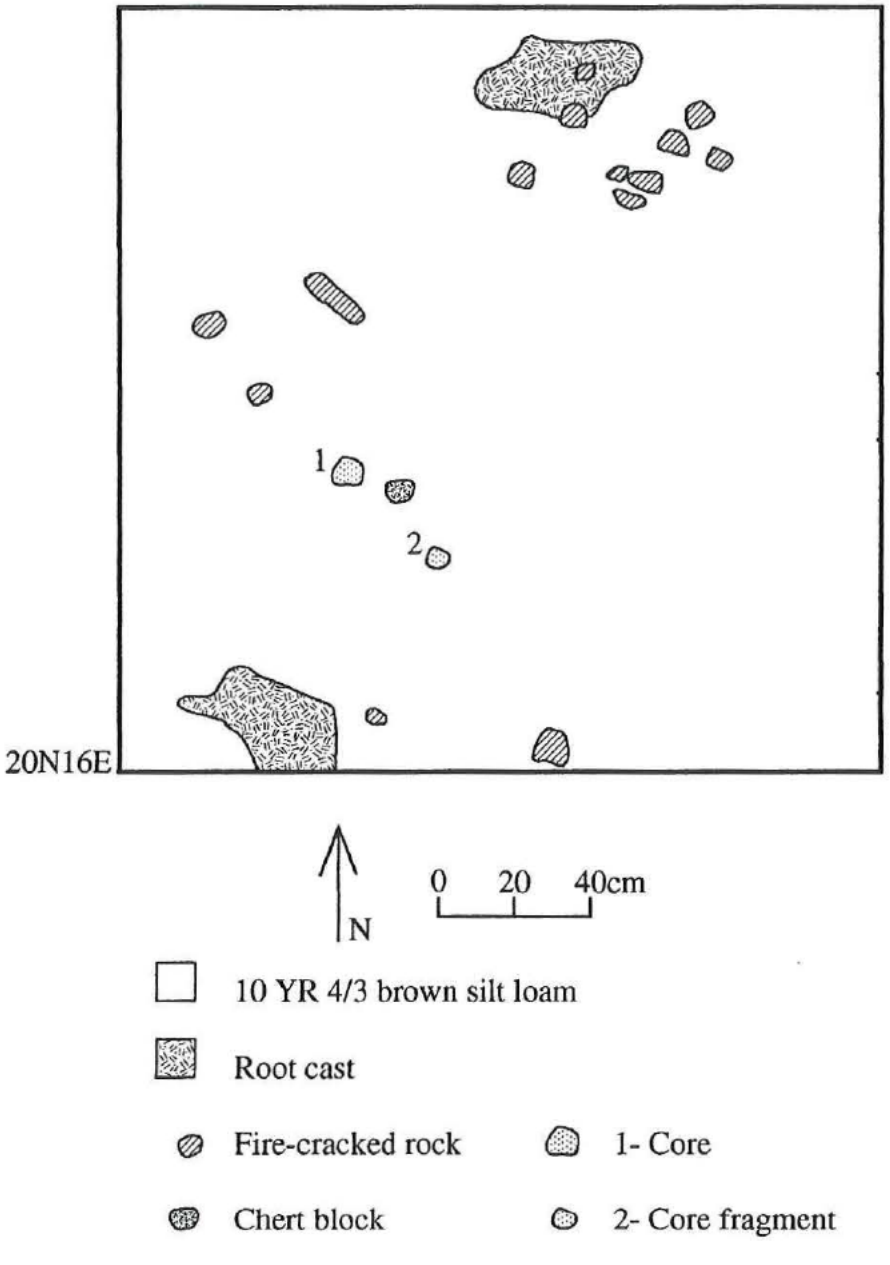


Figure 6.45 Feature 30 plan view.

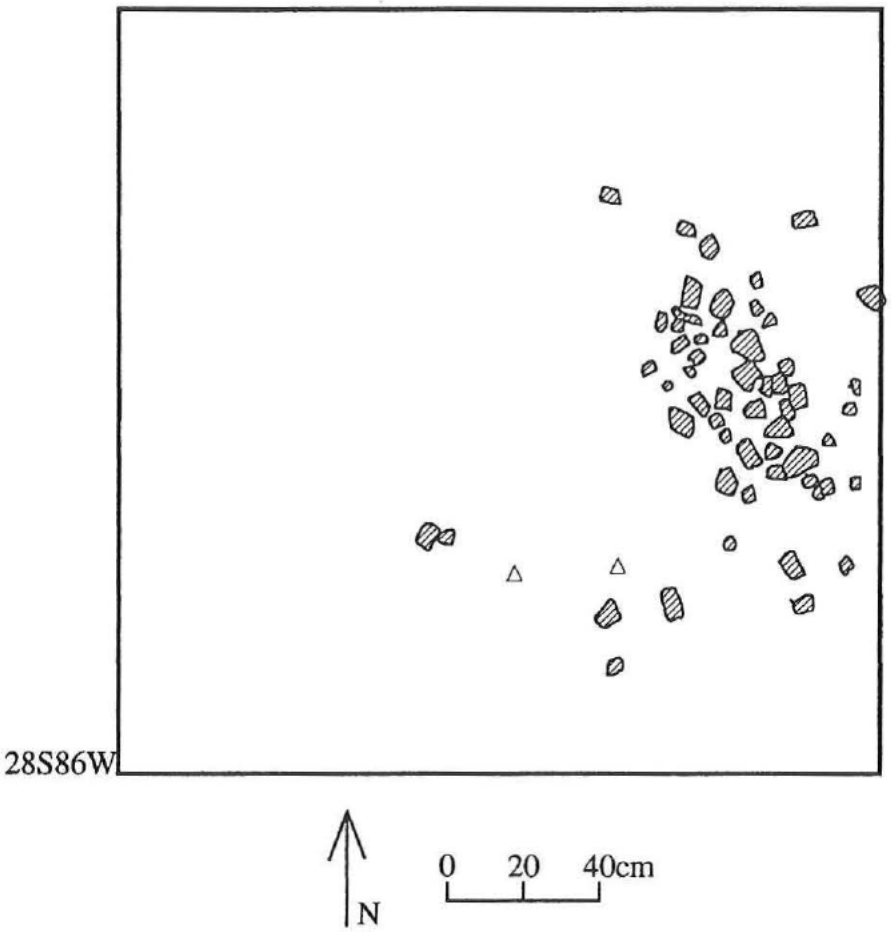


Figure 6.46 Feature 31 plan view.

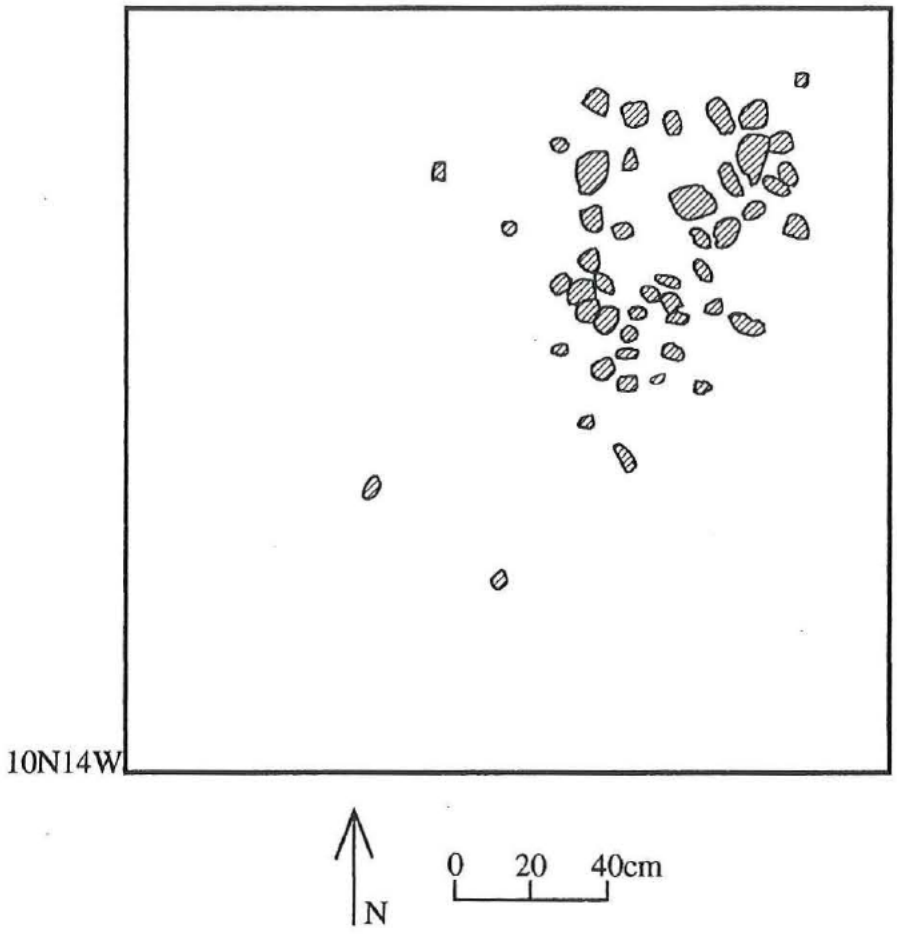


Figure 6.47 Feature 34 plan view.

Features from Below the Base of the Plow Zone

Feature 20 (see Figure 6.48). Feature 20 (45-66 cm below surface) was a fire-cracked rock concentration with a small charcoal concentration and associated charcoal flecks. The feature was vertically and horizontally distinct from Feature 18, which was uncovered at the previous level in the same units.. Fire-cracked rock from Feature 20 extended for two levels. The deposit was probably made in a slight depression or basin, given the fact that the diameter of the deposit was smaller in the deeper level The small charcoal concentration yielded a radiocarbon age of 3710+/-70 B.P. (Beta 88703). The two sigma calibrated range for this age is 2300-1900 B.C., placing this feature in the Late Archaic Period and providing an earliest possible date for Feature 18. The following materials were recovered in association with Feature 20:

Excavation and 1/4" Screening	**Flotation (26 liters)**
131 fire-cracked rock	10 fire-cracked rock
1 chert core fragment	
2 secondary flake	
	7 chert retouch flake
	3 chert shatter
1 nutshell (*Juglans nigra*, black walnut)	

Feature 22 (see Figure 6.49). Fire-cracked rock comprising part of Feature 22 (52-67 cm below surface) was noted in a trench profile. The feature was revealed to be a small fire-cracked rock concentration with associated charcoal fragments and flecks. There is a probable relationship to Feature 20, which occurs at the same level in adjacent units. A radiocarbon age of 3810+/-70 B.P. (Beta 88704) was obtained from a charcoal sample from Feature 22. This date is essentially the same as that obtained for Feature 20. The two sigma calibrated range for Feature 22 is 2460-2025 B.C., compared to 2300-1900 B.C. for Feature 20. The following materials were recovered from Feature 22:

Excavation and 1/4" Screening	**Flotation (13 liters)**
65 fire-cracked rock	4 fire-cracked rock
1 chert secondary flake	
2 chert shatter	
	1 nutshell (Juglandaceae, hickory/walnut)

Feature 24 (see Figure 6.50). Part of Feature 24 (43-53 cm below surface) was noted in a trench wall just below the base of the plow zone. Excavation revealed the feature to be a small fire-cracked rock concentration with some associated charcoal flecking. Some fire-cracked rock occurred in level below, probably due to obvious root disturbance. The following materials were recovered from Feature 24:

Excavation and 1/4" Screening	**Flotation (9 liters)**
109 fire-cracked rock	2 fire-cracked rock
1 chert primary flake	
	2 chert secondary flakes
	6 chert retouch flakes
2 chert shatter	5 chert shatter
1 chert block	
1 hammerstone	

Feature 26 (Figure 6.51). Material from Feature 26 (62-78 cm below surface) was noticed in a trench profile and further excavation revealed a large but loose concentration of fire-cracked rock, chert blocks, core fragments, flakes, other lithic artifacts (see below) and calcined bone fragments. The figure shows the top of the feature, which continued into the next excavation level. The feature was particularly rich in quantity and diversity of lithic artifacts. A level above the feature (46-59 cm below surface) included some historic ceramics and glass as well as prehistoric material and natural pebbles. No distinct soil change was noted. The presence of historic material is evidence for relatively recent flood deposition on the lower portions of the site. This corresponds with evidence for post-occupational flooding at the historic component. Unfortunately, no charcoal or diagnostic artifacts were recovered from the feature context. The following table shows material that was recovered in association with Feature 26:

Excavation and 1/4" Screening	**Flotation (15 liters)**
97 fire-cracked rock	22 fire-cracked rock
2 chert cores	
4 chert core fragments	
2 Stage 2 bifaces	
1 Stage 3 biface fragment	
2 chert pieces esquillees	
1 chert utilized flake	
64 chert primary flakes	4 chert primary flakes
108 chert secondary flakes	14 chert secondary flakes
	35 chert retouch flakes
12 chert shatter	5 chert shatter
9 chert blocks	
2 long bone fragments (large mammal)	
5 calcined bone fragments	219 calcined bone fragments

Feature 29 (see Figure 6.52, 6.53). Feature 29 (52-66 cm below surface) was detected 10 centimeters above the eastern edge of Feature 26 (62-78 cm below surface). The two features appear to be separate deposits based on their vertical and horizontal extents. Feature 29 was a concentration of unmodified chert blocks, with associated cores and debitage. Many of the cores featured a single flake scar, as might be expected when a number of blocks and cobbles are being tested for quality. No fire-cracked rock was associated with this feature, though a very small amount of charcoal flecking was present. Excavators noted a high number of small rounded pebbles within the concentration. The occurrence of these pebbles corresponds with the level of historic ceramics, glass, and pebbles above Feature 26. Feature 29 was therefore probably near the surface until inundation during historic times. The presence of the pebbles, which do not occur elsewhere on the site, implies higher energy inundation and potentially more disturbance to the feature. It is difficult to interpret the feature since some or all of the cultural material may in secondary context. The following is a complete list of materials associated with Feature 29:

Excavation and 1/4" Screening	**Flotation (15 liters)**
5 chert cores	
1 utilized flake	
51 chert primary flakes	1 primary chert flake
16 secondary flakes	21 secondary chert flakes
	10 chert retouch flakes
14 chert shatter	25 chert shatter
219 chert blocks	11 chert blocks
2 chert unidentified	

Feature 32 (see Figure 6.54, 6.55, 6.56). Feature 32 (56-68 cm below surface) was a fire-cracked rock concentration in and around the edges of a shallow basin with concentrated and scattered charcoal. The basin had a distinct fill that was noticeable due to heavy charcoal mottling. The fill was fairly rich in cultural material. Approximately half of the feature was removed by the backhoe blade during excavation of the East Trench for the 10 x 10 m block 30S10W. Backhoe excavation was ceased as soon as the feature was detected. No cultural material or feature traces were visible in the opposite trench wall or in the trench floor. The intact half of the feature was profiled and excavated, which led to the exposure of a very large *in situ* concentration of wood charcoal at its base. The charcoal was used to obtain a radiocarbon age of 3820+/-80 B.P. The two sigma calibrated range for this date is 2475-2015 B.C., indicating a Late Archaic Period affiliation. The following materials were recovered from the feature context:

Excavation and 1/4" Screening	**Flotation (15 liters)**
103 fire-cracked rock	37 fire-cracked rock
	6 chert retouch flakes
	1 chert shatter
	23 calcined bone fragments
	2 rinds (*Cucurbita foetidissima*, buffalo gourd)

Feature 35 (see Figure 6.57, 6.58). Feature 35 (95-103 cm below surface) was a large concentration of fire-cracked rock, natural cobbles, and shattered chert with no associated soil staining and a small amount of charcoal. Individual fragments of the shattered chert were fairly small and broke into even smaller fragments during removal and processing. The majority of the fragments appear to be of poor quality Liston Creek chert. The chert may have been shattered by heating, but it is unclear whether the feature was related to the deliberate thermal alteration of the chert. In fact, with the exception of the shattered chert appearing in the feature, it is much like any other fire-cracked rock concentration found at the site that may have been part of roasting or nut-processing activities. Some chert debitage was found in direct association with the feature and the area around the feature was fairly rich in debitage as well as chert tools. The feature described here appeared in Level 8 of a 2 x 2 m unit. At the base of Level 6 of the same unit, directly above Feature 35, there was a small concentration of chert flakes surrounded by charcoal flecks, two hammerstones, two cores, and a biface (see Figure 6.59). It was not until the base of Level 7 that fire-cracked from Feature 35 was detected (see Figure 6.60). Level 6 contained a greater quantity and diversity of material than Levels 7 and 8, but there was no clear break separating the deposits. A very small fragment of charcoal from amongst the rock and chert of Feature 35 yielded a radiocarbon age (using accelerator mass spectrometry) of 6800+/-40 B.P. (Beta 88708). The two sigma calibrated range for this age is 5705-5590 B.C., which suggests a late Early Archaic/early Middle Archaic affiliation. Unfortunately, no diagnostic artifacts were found in association with the feature. The presence of a probable early Archaic point base in Level 6 of the adjacent unit will be discussed below. The following is a list of those materials directly associated with Feature 35:

Excavation and 1/4" Screening	**Flotation (25 liters)**
326 fire-cracked rock	4 fire-cracked rock
1523 heat shattered (?) chert fragments	67 heat shattered (?) chert fragments
4 secondary chert flakes	4 chert secondary flakes
	37 chert retouch flakes
42 cobbles (many degraded sedimentary)	

Feature 36 (Figure 6.61). Feature 36 (55-65 cm below surface) was a scatter of large fire-cracked rocks and small charcoal flecks. An adjacent charcoal concentration was determined to be recent and intrusive--probably from a tree root--and may be the source of the charcoal flecks associated with the feature. No diagnostics were found in direct association with the feature, but a point tip from the level above the feature (Cat # 1736) has Early Archaic characteristics. Feature 36 may be related to a larger concentration of tools and debitage in the same 10 x 10 m block. The following is a list of material directly associated with Feature 36:

Excavation and 1/4" Screening	**Flotation (15 liters)**
12 fire-cracked rock	9 fire-cracked rock
	16 chert secondary flakes
	86 chert retouch flakes
	6 chert shatter
	Present: nutshell (Juglandaceae, hickory/walnut)

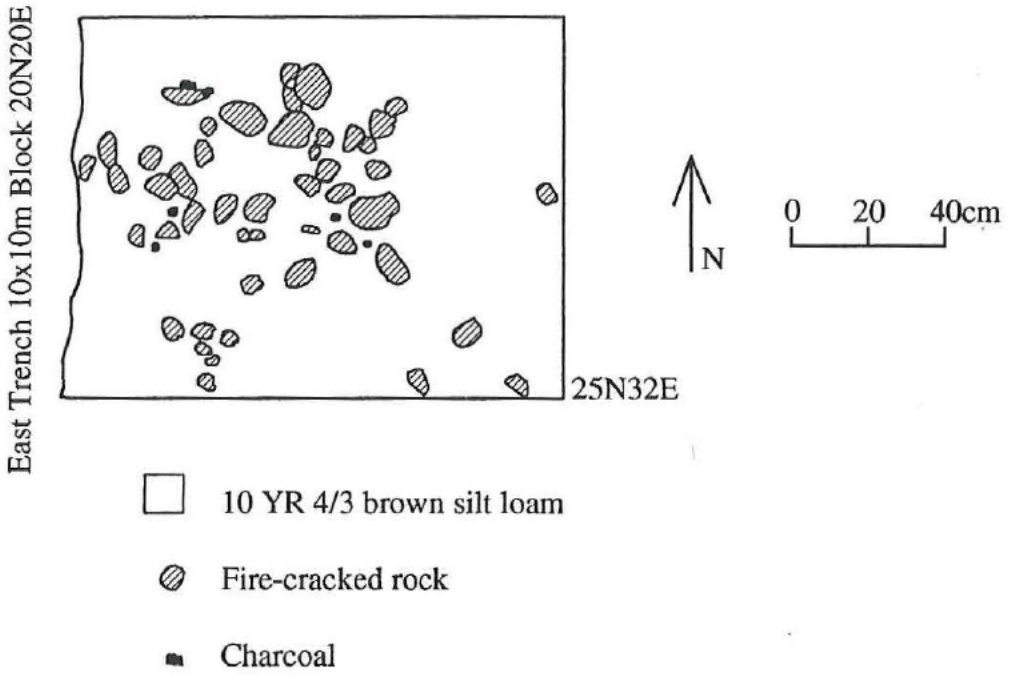


Figure 6.49 Feature 22 plan view.

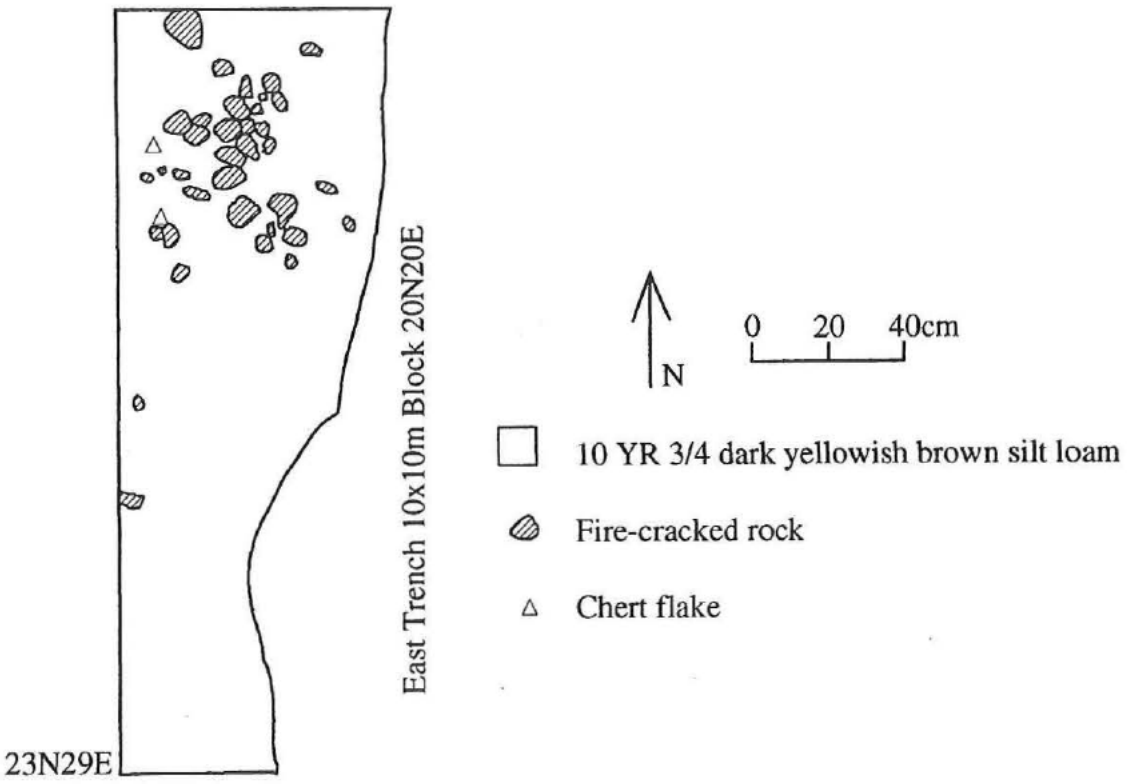


Figure 6.50 Feature 24 plan view.

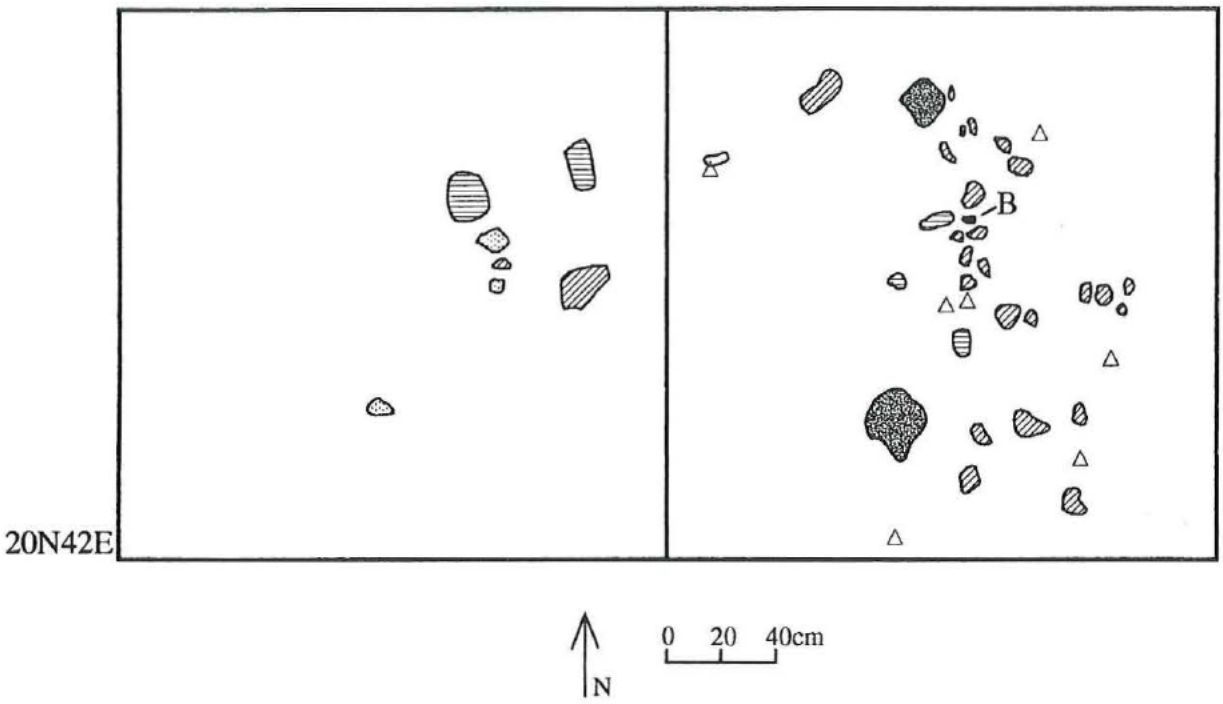


Figure 6.51 Feature 26 plan view.

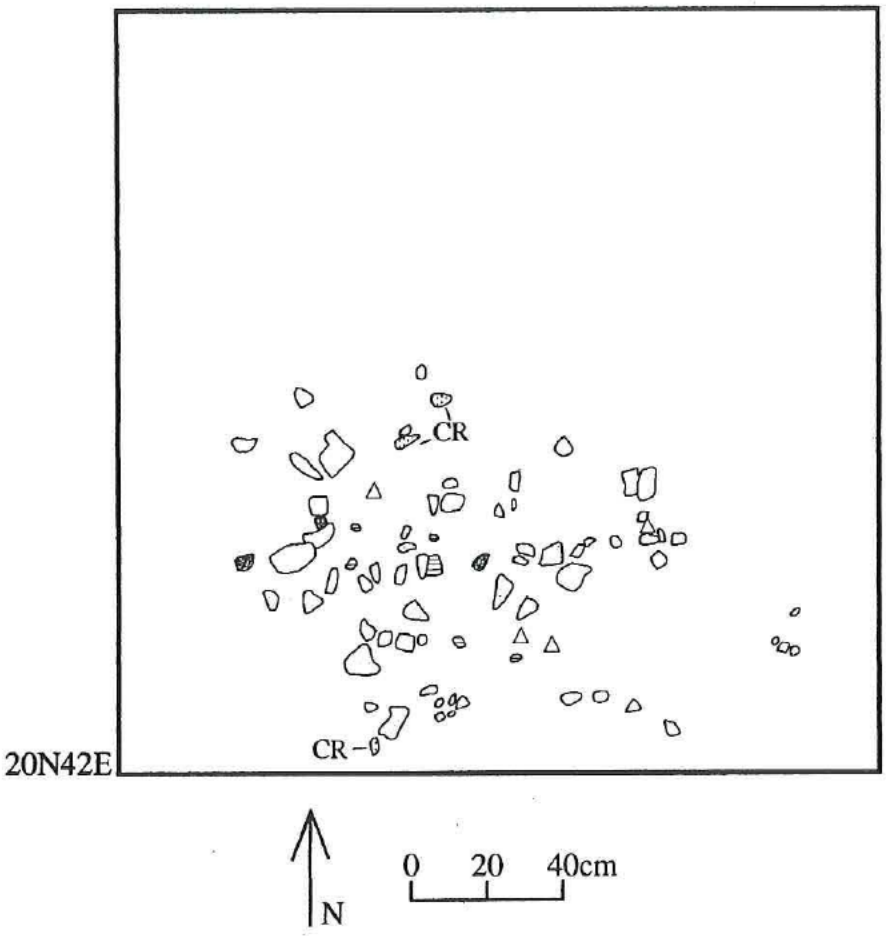


Figure 6.52 Feature 29, Level 2 plan view.

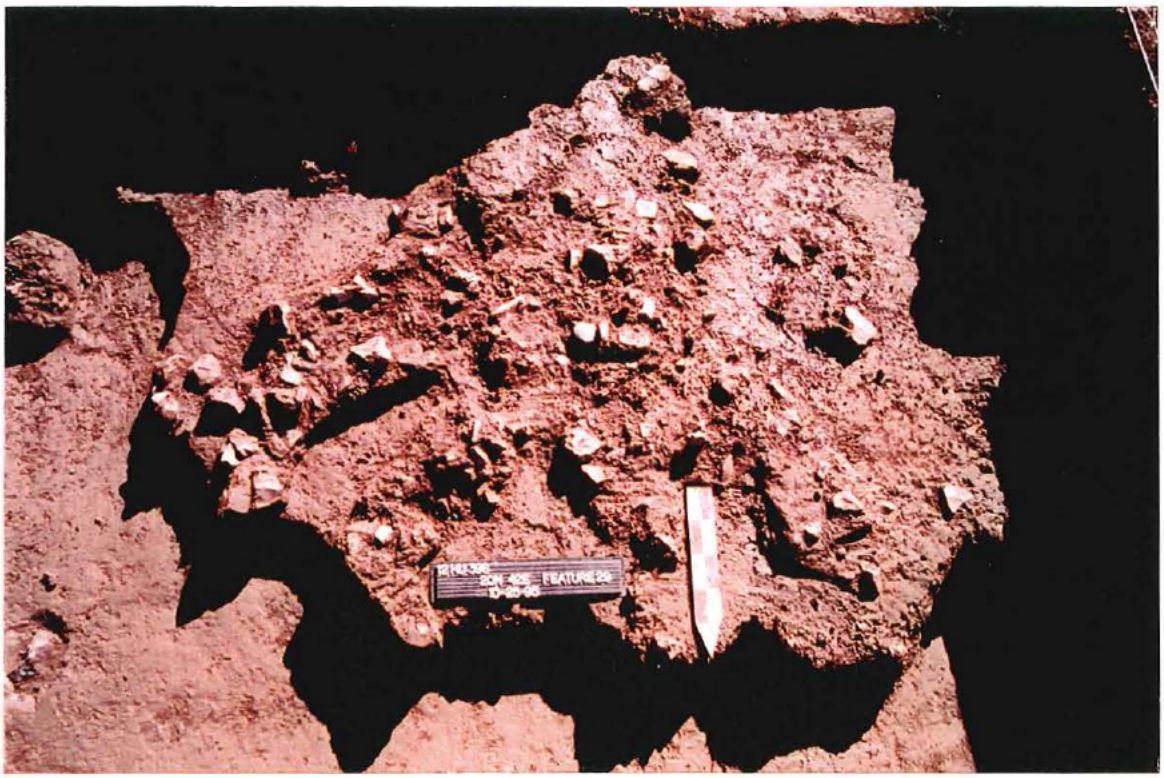


Figure 6.53 Feature 29, Level 3 plan view photo.

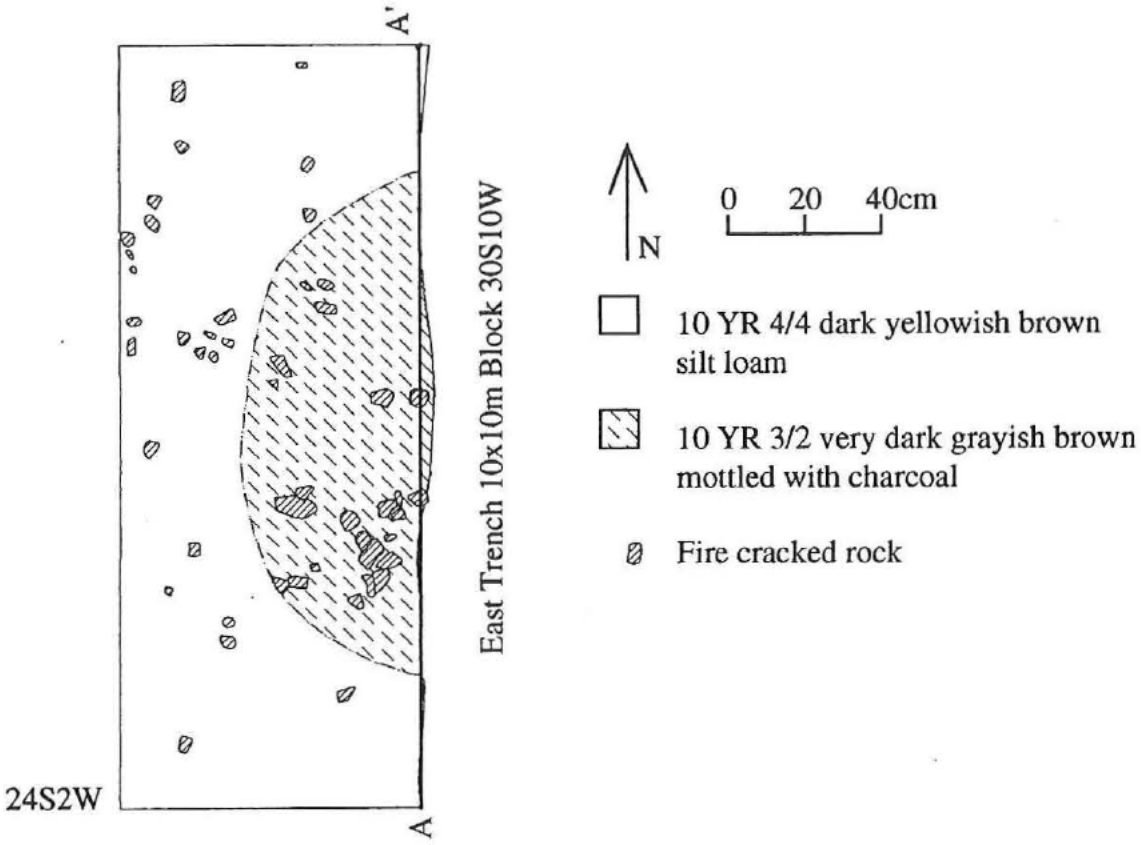


Figure 6.54 Feature 32 top, plan view.

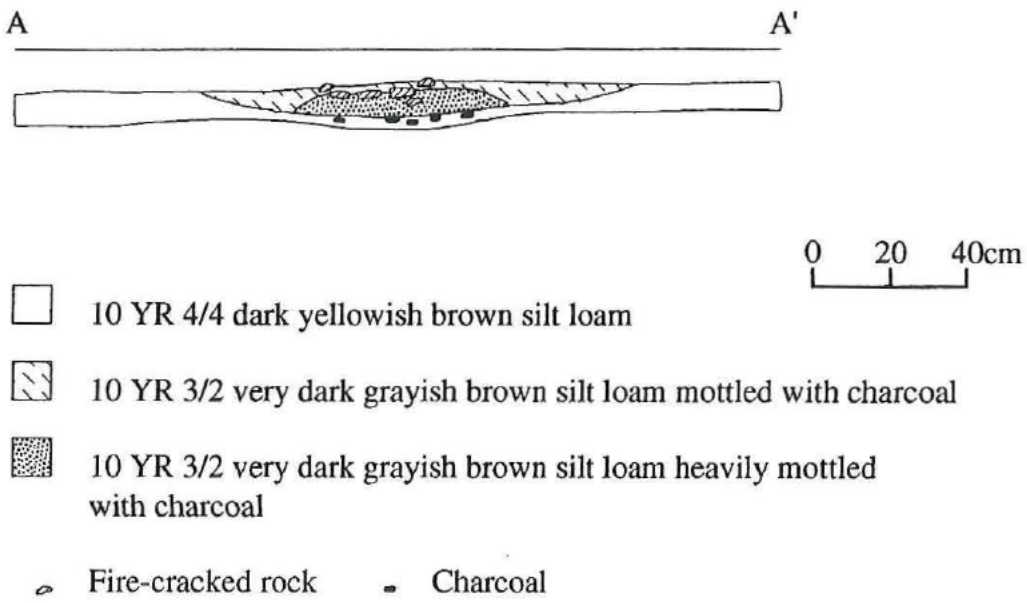


Figure 6.55 Feature 32 profile.

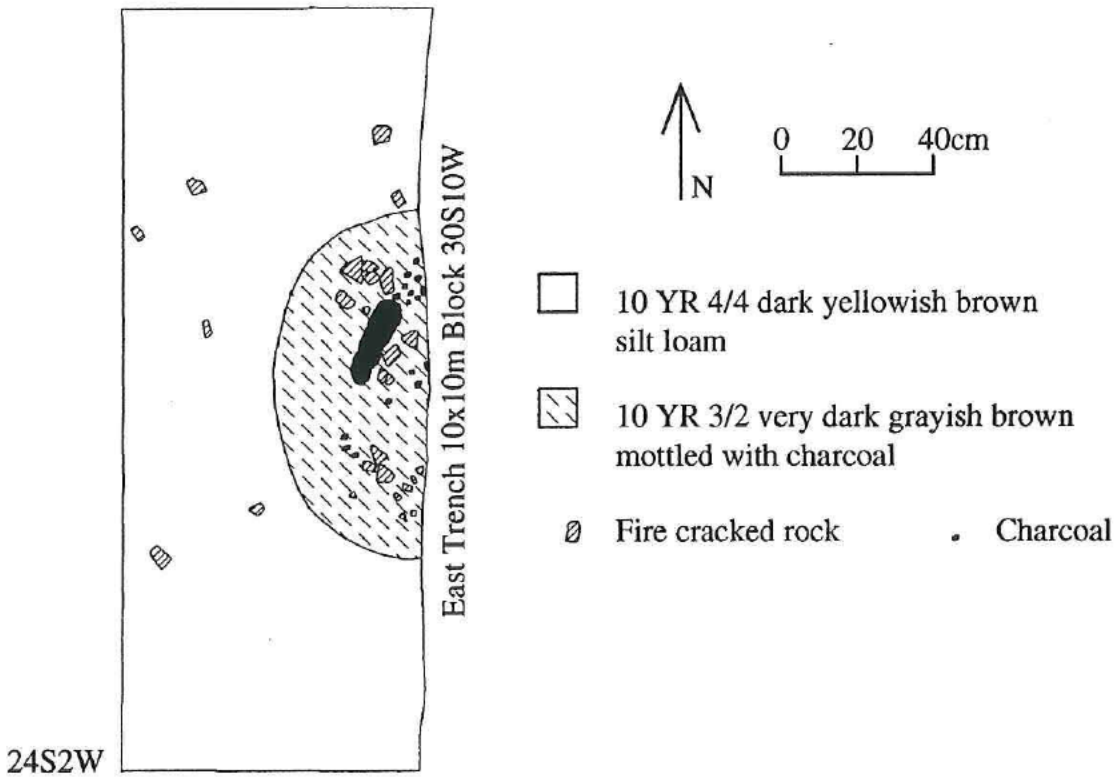


Figure 6.56 Feature 32 base, plan view.

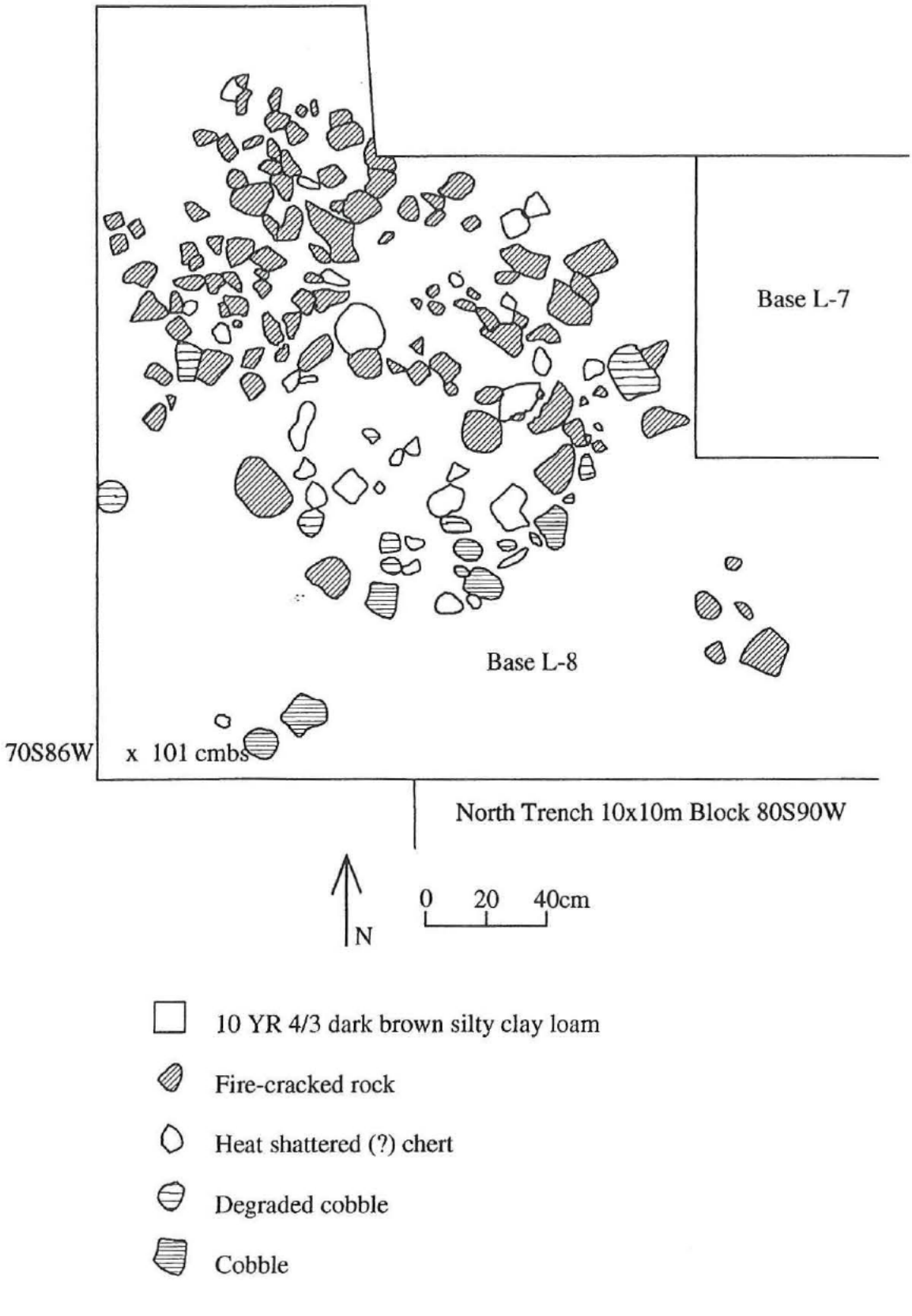
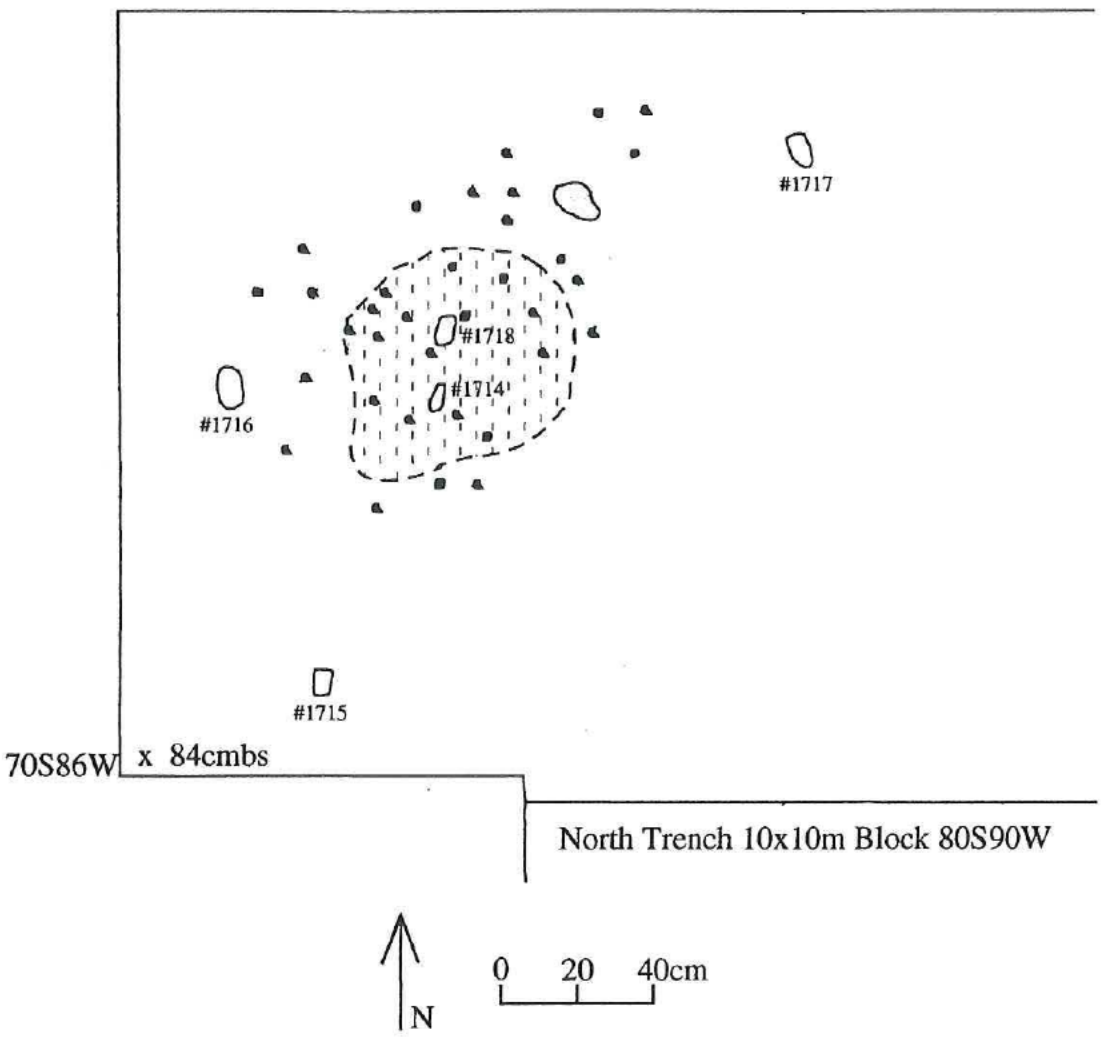


Figure 6.57 Feature 35 plan view.

Figure 6.58 Feature 35 plan view photos (top--Feature 35 in 68S86W, bottom--Feature 35 in 70S86W).



10 YR 4/3 brown silt loam

Chert flake concentration

Heat shattered (?) chert

#1714 Stage 2 biface

#1715 Core

#1716 Hammerstone

#1717 Hammerstone

#1718 Core

Charcoal fleck

Figure 6.59 Chert flake concentration in Level 6, 70S86W, above Feature 35.

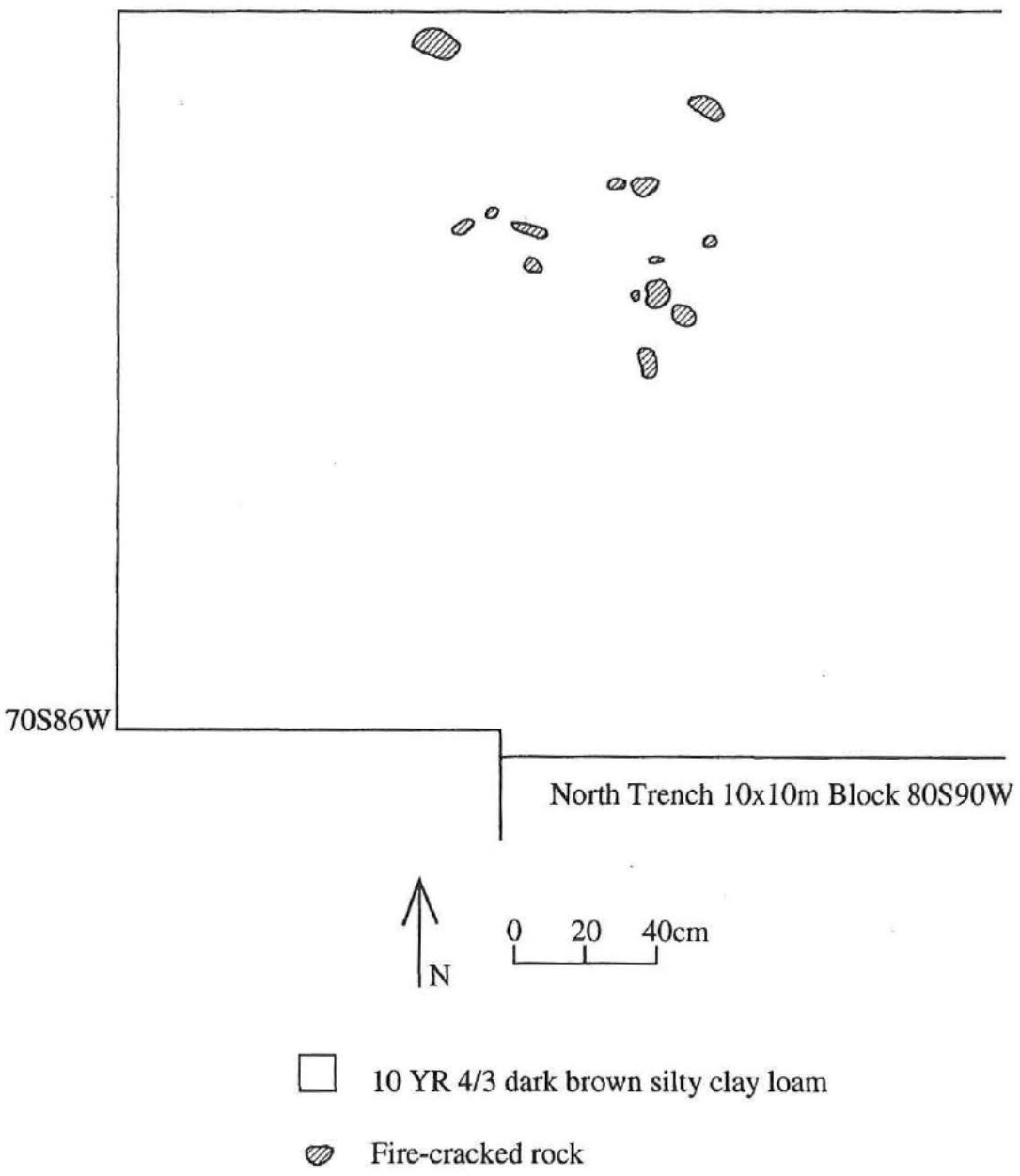


Figure 6.60 70S86W, Level 6.

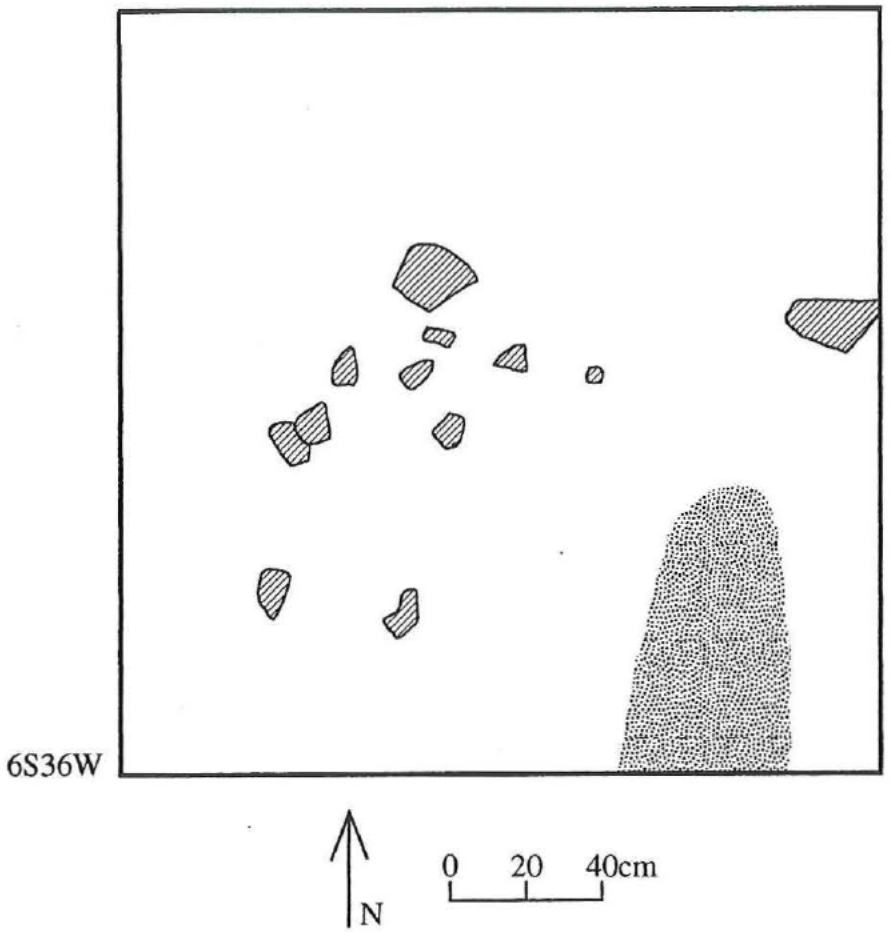


Figure 6.61 Feature 36 plan view.

Prehistoric Occupation Areas

The Diefenbaugh Site features appear to represent a series of small, sporadic occupations ranging from at least the Early Archaic Period to the Late Archaic/Early Woodland transition. Although it is not possible to draw associations between all of the features and deposits at the site, some areas of temporal and/or spatial clustering do stand out. In particular, five groups of features and artifacts suggest distinct Early and Late Archaic occupation areas (see Figure 6.62). These areas do not necessarily represent single episodes of occupation; in particular the Late Archaic Period occupation areas suggest repeated use of a locality. The specific occupation areas, as described below, are rather presented as a means for organizing and summarizing the body of data from the site as it relates to major temporal periods in prehistory.

Early Archaic Occupation Area #1. The first Early Archaic occupation area is defined by Feature 35 and cultural deposits from 74-103 cm below surface in units 70S82W, 70S84W, 70S86W and 68S90W(E1/2). These units fall near the 211.30 m contour, at the slightly sloping edge of the northeast-southwest trending ridge that subtly dominates the project area. Adjacent trench profiles and additional units placed at a distance of two meters did not show horizontal continuation of the deposits. Level 6 of 70S84W contained a point fragment that has the appearance of a base from a Kirk Corner Notched Cluster point (see #1541, Chapter 7). This cluster is generally dated to the Early Archaic at 7500-6900 B.C. (Justice 1987:71). Feature 35 itself was encountered in Level 8 (95 cm below surface) in 70S86W and has the Early Archaic/Early Middle Archaic two sigma calibrated radiocarbon age of 5705-5590 B.C. Table 6.5 shows the cultural material recovered from the three units, by level. Level 6, which contained the point base, was particularly rich in the three units. As mentioned in the Feature 35 description above, Level 6 in S70W86 contained a flake concentration with associated bifaces and hammerstones (see Figure 6.59).

It is not clear how the deposits in Level 6 are related to Feature 35/Level 8, especially given the slight drop in artifacts in Level 7 and the difference in dates assigned to the point base and the feature. One possibility is that the deposits are not directly related. A second possibility is that Feature 36 represents the bottom of a roasting or chert heating pit related to activities that took place on a former surface at Level 6. Continued activities at this surface after the filling in of the pit would explain the superimposition of the flake/biface/hammerstone concentration. Given the radiocarbon age obtained for Feature 35, an important implication of this scenario would be the extension of the temporal affiliation of the Kirk Corner Notched cluster into the early Middle Archaic period. This implication would also hold true in the case that the deposits were from separate occupational events. However, it must also be considered that the deposits described here were disturbed by natural processes. The Kirk base could have been transported to its position from an earlier context. This possibility is supported by field observations of root disturbances and partially deteriorated organic material in Level 8. Flakes were observed "on edge" in Level 5, which may be an indication of water transport. However, the primary context of Feature 35 in Level 8 and the flake/biface/hammerstone concentration in Level 6 seems fairly certain.

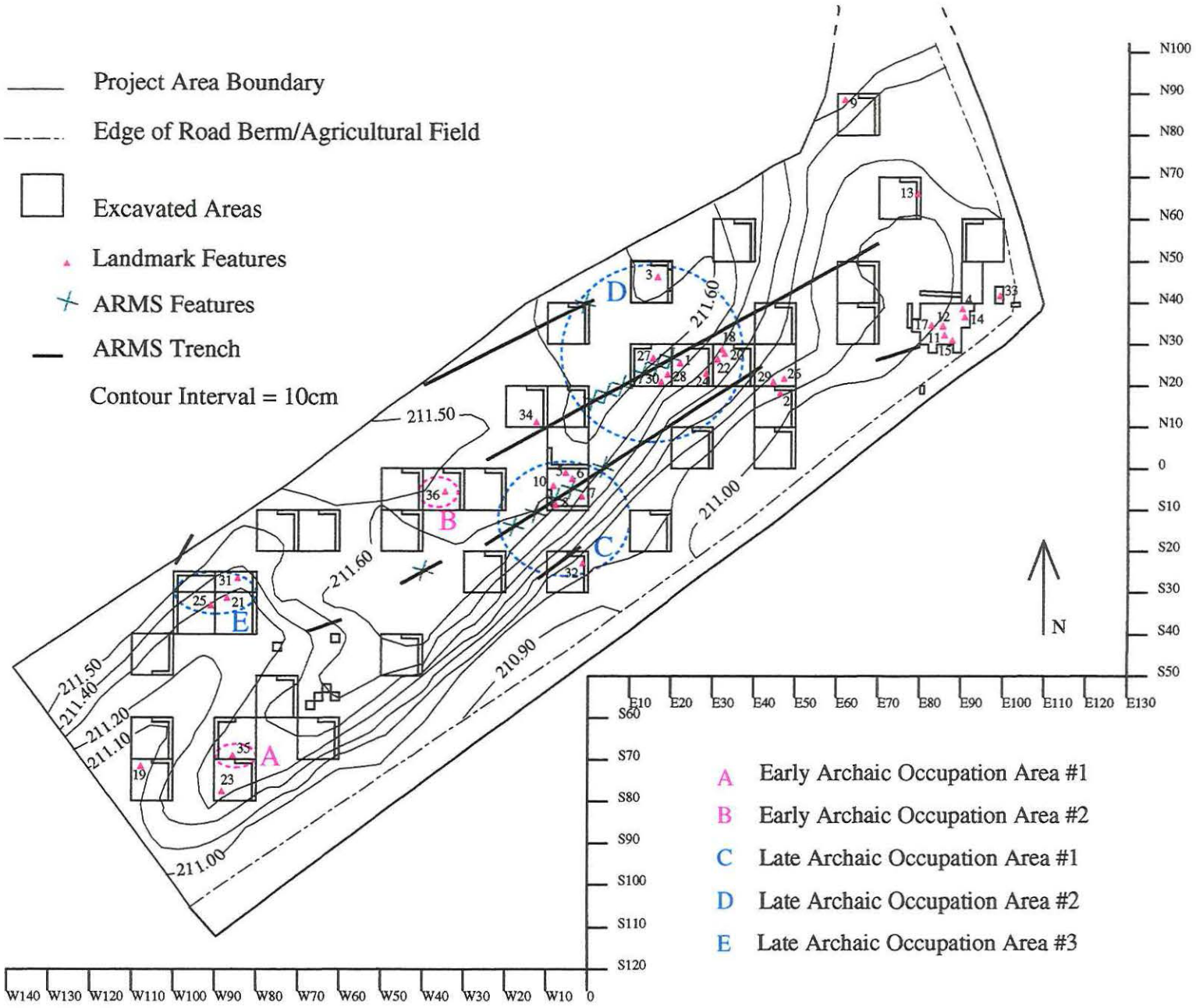


Figure 6.62 Map of 12-Hu-396 showing Landmark and ARMS features and the approximate boundaries of five prehistoric occupation areas.

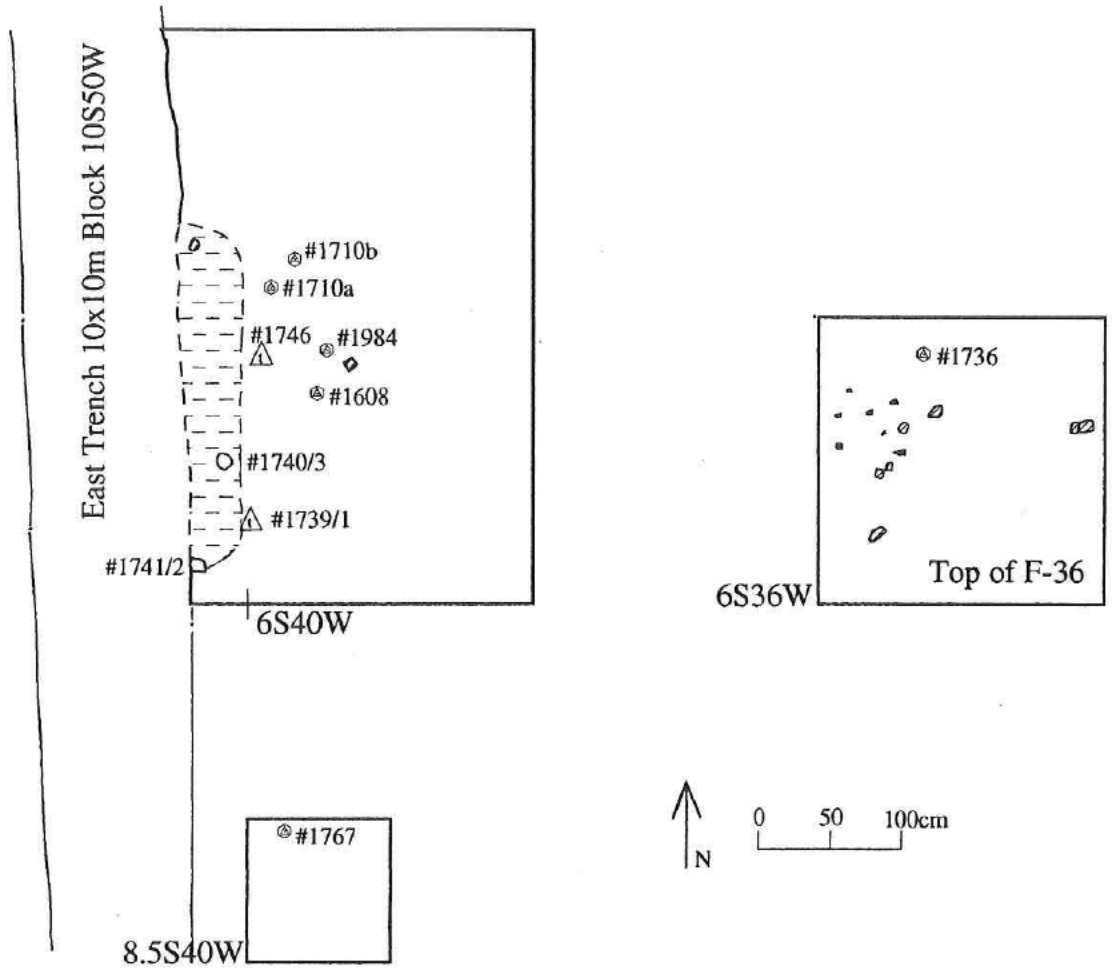
Table 6.5 Artifacts Recovered from Early Archaic Area #1, By Level.

LEVEL 5	NON-FEATURE		FEATURE		TOTAL	
OBJECT	#	%	#	%	#	%
Fire-Cracked Rock	1	0.2	0	0	1	0.2
Core	7	1.4	0	0	7	1.4
Bipolar Core	1	0.2	0	0	1	0.2
Stage 2 Biface	3	0.6	0	0	3	0.6
Biface Fragment	1	0.2	0	0	1	0.2
Retouched Flake	1	0.2	0	0	1	0.2
Primary Flake	123	24.0	0	0	123	24.0
Secondary Flake	301	58.7	0	0	301	58.7
Retouch Flake	13	2.5	0	0	13	2.5
Shatter	32	6.2	0	0	32	6.2
Chert Block	1	0.2	0	0	1	0.2
Calcined Bone Fragments	29	5.7	0	0	29	5.7
TOTALS	513	100.1	0	0	513	100.1
LEVEL 6	**NON-FEATURE**		**FEATURE**		**TOTAL**	
OBJECT	#	%	#	%	#	%
Core	8	1.6	0	0	8	1.6
Core Fragment	2	0.4	0	0	2	0.4
Stage 2 Biface	2	0.4	0	0	2	0.4
Stage 2 Biface Fragment	1	0.2	0	0	1	0.2
Stage 3 Biface	2	0.4	0	0	2	0.4
Primary Flake	125	25.5	0	0	125	25.5
Secondary Flake	284	58.0	0	0	284	58.0
Retouch Flake	37	7.6	0	0	37	7.6
Shatter	26	5.3	0	0	26	5.3
Chert Block	1	.2	0	0	1	.2
Hammerstone	2	.4	0	0	2	.4
TOTALS	490	100.0	0	0	490	100.0
LEVEL 7	**NON-FEATURE**		**FEATURE**		**TOTAL**	
OBJECT	#	%	#	%	#	%
Fire-Cracked Rock	28	9.2	0	0	28	9.2
Core	2	.7	0	0	2	.7
Core Fragment	1	.3	0	0	1	.3
Primary Flake	17	5.6	0	0	17	5.6
Secondary Flake	74	24.3	0	0	74	24.3
Retouch Flake	133	43.6	0	0	133	43.6
Shatter	50	16.4	0	0	50	16.4
TOTALS	305	100.1	0	0	305	100.1
LEVEL 8	**NON-FEATURE**		**FEATURE**		**TOTAL**	
OBJECT	#	%	#	%	#	%
Fire-Cracked Rock	5	5.3	330	16.5	335	16.0
Primary Flake	21	22.1	0	0	21	1.0
Secondary Flake	19	20.0	4	0.2	23	1.1
Retouch Flake	50	52.6	37	1.8	87	4.1
Heat Shattered (?) Chert Frag.	0	0	1590	29.4	1590	75.8
Degraded Cobble	0	0	42	2.1	42	2.0
TOTALS	95	100.0	2003	100.0		100.0
TOTALS FOR ALL LEVELS	1403		2003		3406	

Early Archaic Occupation Area #2 The second Early Archaic occupation area is defined by Feature 36 and cultural deposits from 50-65 cm below surface in six units in the 10 x 10 m block 10S40W. These deposits were situated between the 211.50 m and 211.60 contours near the highest point on the floodplain ridge referred to above. In contrast to the more deeply buried Early Archaic Area #1 deposits, this location appears to have experienced less flood deposition after the time of occupation. Figure 6.63 is a composite of *in situ* material recovered from this occupation area from 50-60 cm below surface and shows the approximate limits of a flake concentration. The base of Feature 36 (see Figure 6.61), the fire-cracked rock scatter, was at 65 cm below surface. Table 6.6 lists all material recovered from this area. The complete and incomplete points recovered have all been tentatively assigned to the Early Archaic. Of these, two bear resemblance to the Kirk Corner Notched Cluster, again dated to 7500-6900 B.C. (Justice 1987:71) and possibly later. Given the range and density of chert artifacts present, this occupation area appears to have involved fairly intensive lithic production representing all stages of chipped stone reduction.

Late Archaic Occupation Area #1 This Late Archaic occupation area is defined on the basis of Features 5,6,7,8, and 10 in the 10 x 10 m Block 10S10W, Feature 32 in the 10 x 10 m block 30S10W, and ARMS Phase II Features 9,10,11,12,13, and 15. Each of the ARMS features is described as a fire-cracked rock scatter. while the Phase III features range from an FCR scatter to FCR concentrations in shallow basins. With the exception of Feature 32, all of the features occurred at the base of the plow zone and have been therefore subject to partial disturbance from episodes of deep plowing. Feature 32 was encountered below the base of plow zone (56-68 cm below surface) in a trench near the 211.10 m contour. This contrasts with the base of plow zone features that were found near the 211.50 contour on the floodplain ridge. Feature 32 is at the same elevation as Features 26 and 29, which show evidence of flooding through historic times. Feature 32 was probably contemporaneous with the others in this group but experienced more episodes of deposition from periodic floods. This is supported by the radiocarbon results for Feature 10 (two sigma calibrated ranges 2855-2820; 2665-2110; 2090-2040 B.C.) and Feature 32 (two sigma calibrated range 2475-2015 B.C.). Table 6.7 provides an inventory of cultural material found associated with this occupation area.

Late Archaic Occupation Area #2 The second Late Archaic Occupation is located within the thirty meters of the first and is comprised of Features 1, 3, 16, 18, 20, 22, 24, 27, 28, 30 and associated material in the 10 x 10 m blocks 20N10E, 20N20E, 20N30E, and 40N10E (see Table 6.8). These features were mostly ambiguous fire-cracked rock scatters or concentrations. Features 1, 3, 16 (ARMS 1), 18, 27, 28, and 30 were encountered at the base of the plow zone. Features 20, 22, and 24 were encountered within 10-20 cm below the base of plow zone. ARMS Phase II Features 2, 3, 4,5,6, 7, and 8 can be included in this occupation area. Each is a fire-cracked rock or artifact scatter/concentration at the base of the plow zone. All fifteen features were situated on the gently sloping edge of the floodplain ridge near the 211.60 through 211.30 m contours. Features 20, 22, and 24, the most deeply buried, were situated at the lowest elevation.



10 YR 4/3 brown silt loam

Chert flake concentration

Fire-cracked rock

Charcoal

#1608 Point base

#1710a Point base

#1710b Point

#1736 Point tip

#1739/1 Stage 2 biface

#1740/3 Hammerstone

#1741/2 Hammerstone

#1746 Stage 2 biface

#1767 Point tip

#1984 Point

Figure 6.63 Early Archaic Occupation Area #2--composite of diagnostics and other tools from 50-60 cm below surface.

Table 6.6 Artifacts Recovered from Early Archaic Area #2.

	NON-FEATURE		FEATURE		TOTAL	
OBJECT	#	%	#	%	#	%
Fire-Cracked Rock	0	0.0	21	16.3	21	0.9
Core	13	0.6	0	0	13	0.5
Core Fragment	7	0.3	0	0	7	0.3
Stage 2 Biface	3	0.1	0	0	3	0.1
Stage 3 Biface	3	0.1	0	0	3	0.1
Point (Early Archaic)	1	0	0	0	1	0
Kirk Corner Notched Point	1	0	0	0	1	0
Point Tip (Early Archaic?)	2	0	0	0	2	0
Kirk Corner Notched (?) Base	2	0	0	0	2	0
Point Fragment	1	0	0	0	1	0
Utilized Flake	3	0.1	0	0	3	0.1
Primary Flake	618	27.2	0	0	618	25.7
Secondary Flake	1529	67.2	16	12.4	1545	64.3
Retouch Flake	62	2.7	86	66.6	148	6.2
Shatter	26	1.1	6	4.7	32	1.3
Hammerstone	2	0	0	0	2	0
Calcined Bone Fragment	1	0	0	0	1	0
TOTALS	2274	99.4	129	100	2403	99.5

Table 6.7 Artifacts Recovered from Late Archaic Area #1.

	NON-FEATURE		FEATURE		TOTAL	
OBJECT	#	%	#	%	#	%
Fire-Cracked Rock	437	82.5	279	80.6	716	81.7
Stage 2 Biface	2	0.4	0	0	2	0.2
Point Tip	1	0.2	0	0	1	0.1
Utilized Flake	1	0.2	0	0	1	0.1
Retouched Flake	1	0.2	0	0	1	0.1
Primary Flake	31	5.8	1	0.3	32	3.7
Secondary Flake	45	8.5	6	1.7	51	5.8
Retouch Flake	3	0.6	28	8.1	31	3.5
Shatter	9	1.7	7	2.0	16	1.8
Hammerstone	0	0	1	0.3	1	0.1
Bone Fragment	0	0	1	0.3	1	0.1
Calcined Bone Fragment	0	0	23	6.6	23	2.6
TOTALS	530	100.1	346	99.9	876	99.8

Table 6.8 Artifacts Recovered from Late Archaic Area #2.

	NON-FEATURE		FEATURE		TOTAL	
OBJECT	#	%	#	%	#	%
Fire-Cracked Rock	443	67.2	876	60.2	1319	62.8
Core	3	0.5	2	0.1	5	0.2
Core Fragment	4	0.6	2	0.1	6	0.3
Bipolar Core	1	0.2	0	0	1	0
Stage 2 Biface	0	0	1	0	1	0
Stage 2 Biface Fragment	1	0.2	0	0	1	0
Stage 3 Biface	1	0.2	1	0	2	0
Biface Fragment	1	0.2	0	0	1	0
Brewerton CN Cluster Point	0	0	2	0.1	2	0
Bottleneck Stemmed Point	0	0	1	0	1	0
L. Arch. Stemmed Cluster Point	1	0.2	0	0	1	0
Point Tip	1	0.2	0	0	1	0
Graver	1	0.2	0	0	1	0
Utilized Flake	3	0.5	4	0.3	7	0.3
Primary Flake	63	9.8	48	3.3	111	5.3
Secondary Flake	83	12.9	330	22.7	413	19.7
Retouch Flake	2	0.3	129	8.9	131	6.2
Shatter	27	4.2	49	3.4	76	3.6
Chert Block	0	0	1	0	1	0
Hammerstone	0	0	1	0	1	0
Tooth	0	0	1	0	1	0
Calcined Bone Fragment	0	0	3	0.2	3	0.1
Shell Fragment	9	1.4	4	0.3	13	0.6
TOTALS	644	98.8	1455	99.6	2099	99.1

Late Archaic Occupation Area #3 A third Late Archaic occupation area was located at the far west end of the project area, approximately 80 meters from the first Late Archaic area. The area is defined by Features 21, 25 and 31 at the base of the plow zone in the 10 x 10 m blocks 40S100W and 40S90W, and the 5 x 20 block 30S90W. An unusually high number of flakes were also recovered in the area just to the west of the features in the 40S100W Block (see Table 6.9). The features and flakes were located between the 211.30 and 211.40 m contour, above a slight depression in the landscape.

The two sigma calibrated radiocarbon age of 2460-2025 B.C. associated with Feature 25 and the Merom Cluster point base from Feature 21 place this area firmly within the Late Archaic period. While this occupation area might be spatially distinct, the very close overlap of radiocarbon results with the other Late Archaic occupation areas suggests close temporal proximity. In fact, any temporal variability within and between the three areas can only be inferred from variability in diagnostic points.

Table 6.9 Artifacts Recovered from Late Archaic Area #3.

	NON-FEATURE		FEATURE		TOTAL	
OBJECT	#	%	#	%	#	%
Fire-Cracked Rock	596	49.7	509	84.5	1105	61.3
Core	1	0	0	0	1	0
Stage 2 Biface	1	0	0	0	1	0
Stage 3 Biface	1	0	0	0	1	0
Kirk CN Cluster (?) Point	1	0	0	0	1	0
Merom Cluster Point Base	0	0	1	0.2	1	0
Graver	1	0	0	0	1	0
Utilized Flake	1	0	0	0	1	0
Primary Flake	21	1.8	1	0.2	22	1.2
Secondary Flake	518	43.2	8	1.3	526	29.2
Retouch Flake	48	4.0	44	7.3	92	5.1
Shatter	7	0.6	22	3.7	29	1.6
Hammerstone	2	0.2	1	0.2	3	0.2
Calcined Bone Fragment	2	0.2	16	2.7	18	1.0
TOTALS	1200	99.7	602	100.1	1802	99.6

CHAPTER 7

PREHISTORIC ARTIFACT ANALYSIS

Classification of Chipped Stone Artifacts

UNMODIFIED FORMS

Block or Cobble

The term block or cobble is used to describe a sample of raw material without intentional flake scars when it is likely that it was deliberately transported to the site or appears heat modified. Naturally occurring specimens are not included in this category.

CORES AND TOOLS

Core

A core is defined as a block or cobble of raw material with at least one apparently intentional flake scar. Flake scars may be the result of testing of the raw material, removal of cortex, or platform preparation. A core represents Stages 1 and 2 (acquisition of raw material and initial reduction) of lithic reduction (Driskell 1986:50).

Core Fragment

A core fragment is a byproduct of platform preparation. The result is a thick, semi-pyramidal, or keeled spall that is no longer useful as a core (Ritchie and Funk 1973:30). Core fragments are distinguished from secondary flakes on the basis of size and shape.

Bipolar Core

Bipolar cores are common when material is scarce or rare materials are conserved (Lennox 1990:39) and is sometimes associated with lack of knapping skill (Weir 1976:40-41). Small blocks, cobbles, or pebbles of raw material are subjected to direct percussion while resting on a hard anvil (Crabtree 1972:10). The resulting core is blocky in cross-section and will exhibit crushing on opposite edges rather than a striking platform (Lennox 1990:47; Hayden 1980:3). Flake scars often extend the full length of the core and cortex is frequently visible (Hayden 1980:3).

Pièce Esquillée

Pièces Esquillées are termed "wedges" by some and represent multi-purpose scraping, gouging, and splitting tools (Wright 1986:25). Hayden (1980:3) feels they are most useful for splitting green bone with the aid of a tapping implement. Lothrop and Gramley (1982:8) feel that *pièces esquillées* are the *product* of this sort of bipolar utilization. *Pièces Esquillées* are formed on a flake or exhausted tool. Features of the ventral surface of the flake are sometimes still visible (Hayden 1980:2). The finished tool is roughly square or rectangular and is bi-convex in cross-section (Lothrop and Gramley 1982:8). One or more bipolar axes of percussion are visible and crushed (often

severely) opposing edges are visible. Flakes are often driven from both faces, giving the tool the appearance of a small biface (Lothrop and Gramley 1982:6-8; Ritchie and Funk 1973:27). Flake scars often show extreme concentric rippling and hinge and step fractures are common (Lothrop and Gramley 1982:6). Flakes scars are sometimes thin and elongated along an entire axis (Lothrop and Gramley 1982:6) or may extend only partway down a face (Hayden 1980:3).

Stage 2 Biface

A stage 2 biface represents early biface shaping. The result is a biface with uneven flake scars and possibly some untouched facets. It may be subjectively distinguished from a core if "length is significantly greater that width and width is significantly greater than thickness" (Driskell 1986:57). Callahan (1979:10) refers to this stage as initial edging. He specifies that the edge angle should be 55° to 75° degrees and the width to thickness ratio 2.00 or more. These figures are used as only a rough guide here.

Stage 3 Biface

A stage 3 biface represents secondary flaking. The result is a biface with a more refined shape including symmetry and thinning across the faces. Humps, ridges, and hinge fractures have been removed (Callahan 1979:10). The artifact cross-section is biconvex to flattened. Edges may be "ragged or sinuous as a result of removal of large, irregular flakes" (Driskell 1986:57). Callahan (1979:10) specifies that the edge angle should range roughly between 40° and 60° and the width to thickness ratio between 3.00 and 4.00. Again, these dimensions are used as only a rough guide. Some stage 3 bifaces are termed "preforms" in certain classification systems (i.e., Ritchie and Funk 1973:16).

Point

The morphological term point denotes a pointed stage 4 (thinning, edge retouch, and hafting modifications) or stage 6 (reworking) biface (Driskell 1986:57). Following Justice (1987:1), this term does not imply function but includes artifacts described as arrow points, spear points, knives, and saws. The edge angle should range more or less between 25° and 45° and the width to thickness ratio between 4.00 and 6.00 (Callahan 1979:10).

Drill

A drill, also termed "perforator" or "piercing tool" (Cree and Cochran 1991:D3), is a stage 4 or 6 biface with a narrow tapering point and a hafting element. The point is square, circular, or diamond shaped when viewed in cross-section and may show some wear from drilling rotation (Lipinot et al. 1982:43). Cree and Cochran (1991:D3) suggest that some drills may actually represent exhausted cutting tools.

End Scraper

An end scraper is produced from a flake or core fragment and has a steeply beveled, unifacially retouched broad edge. The flake may be flat, ridged, or humpbacked (Ritchie and Funk 1973:21).

Side Scraper
A side scraper is produced from a flake or core fragment and has steep retouch parallel to the longitudinal axis (Lipinot et al. 1982:47). Side scrapers may show heavy wear on both the retouched and unworked edges (Ritchie and Funk 1973:21).

Retouched Flake
A retouched flake exhibits shallow and/or irregular retouch on one or more edges. Wear on unworked edges may also be present (Ritchie and Funk 1973:21-27).

Graver
A graver is made on a flake or core fragment by isolating a small, sharp spur through unifacial or bifacial retouch. Utilization may result in significant blunting of the spur and wear on the unworked edges may also be present (Ritchie and Funk 1973:27; Cree and Cochran 1991:D2).

Utilized Flake
A utilized flake shows macroscopic signs of use on one or more edges. Use may result in blunting, crushing, or the removal of tiny flakes (Ritchie and Funk:1973:27). Utilized flakes lack deliberate and patterned retouch flake scars. Modifications from protective blunting, platform preparation, and post-depositional environments should be carefully distinguished from utilization (Driskell 1986:197).

DEBITAGE

Shatter
A piece of shatter is irregularly-shaped and lacks flake characteristics (Driskell 1986:48). Shatter results from uncontrolled breakage during initial lithic reduction and cortex or a weathered facet may be visible (Lennox 1990:39). Shatter can also be the product of heat treatment or weathering. The terms "blocky fragment" or "block flake" are used by some to describe this class of artifact.

Primary Flake
A primary flake represents initial stages of chipped stone reduction. It is characterized by the presence of cortex and/or weathering on the dorsal surface and fresh chert on the ventral surface (Ritchie and Funk 1973:30). The flake may be thick and irregular but will have a well-defined bulb of percussion with no lipping on the interior edge of the striking platform. The flake termination can be sharp, hinged, or cortical (Driskell 1986:172-173).

Secondary Flake
The scars of previous flakes and little or no cortex are visible on the dorsal surface of a secondary flake (Ritchie and Funk 1973:30). The flake overall can be moderately thick or thin and regular. The striking platform is evident and lipping may occur on the interior edge, especially in the case of smaller and thinner flakes. The bulb of percussion

may range from pronounced to flattened and the flake will have a thin and sharp termination (Driskell 1986:172-173).

Retouch Flake

A retouch flake is small and results from late stage soft-hammer percussion or pressure-flaking (Ritchie and Funk 1973:30). Retouch flake attributes (flattened bulb of percussion, weakly developed and lipped striking platform at acute angle to the ventral surface, thin sharp termination) closely overlap with secondary flake attributes. Thus, following Lipinot et al. (1982:48), an arbitrary size of less than one centimeter in length or width distinguishes retouch flakes.

HEAT MODIFICATION

According to Luedtke (1992:103) heated cherts frequently turn pink or red due to oxidation of iron compounds. In other cases cherts may lighten, darken, or lose translucency. Heating also alters the luster of most cherts, in many cases increasing glossiness beneath the surface of the heated specimen. The increased glossiness is visible on flakes and flake scars made after heating. Chert can be damaged by overheating or overly-rapid heating. The damage may include shattering, pot-lid fracturing, crazing, loss of color or luster, and shrinkage (Luedtke 1992:106). Both intentional and accidental heating of chert (i.e., flakes slipping into a hearth) can produce any of the characteristics mentioned here. In order to infer that people were deliberately heat treating chert, an entire assemblage must be examined for appropriate patterning (Luedtke 1992:106).

Artifact Summary

There is relatively little diversity in the prehistoric assemblage for the Diefenbaugh site (see Table 7.1). Fire-cracked rock and chert artifacts are most abundant, and prehistoric ceramics are completely absent. Chert artifacts are largely made from locally available chert, as is detailed below. There is diversity within the chert artifacts in the sense that all stages of chipped stone reduction are represented. Numerous cores were recovered as well as finished points. For the classified bifaces, 65% represent Stage 2 of manufacture and 34% represent Stage 3. The debitage classes also indicate all stages of reduction, with 17% being primary flakes, 72% secondary flakes, and 11% retouch flakes (retouch flakes were recovered primarily from flotation samples and are underepresented for screened levels). An analysis of cores, bifaces, and debitage from various occupation areas indicated little intra-site variability when material was grouped by occupation area (see Table 7.2). The only variability that is apparent stems from the fact that more cores were recovered from the Early Archaic contexts.

For the site overall as well as the individual occupation areas, there are surprisingly few scrapers, retouched flake tools, and utilized flakes. This could be taken as an indication that the Diefenbaugh site was primarily occupied during the late spring or summer or for situations excluding hide processing. Anderson and Hanson (1988)

Table 7.1 Summary of Prehistoric Artifacts from 12-Hu-396.

MATERIAL/OBJECT	SURFACE	SUB-SURFACE	COMBINED
CHERT			
Core	8	70	78
Core Fragment	6	38	44
Bipolar Core	1	6	7
Pièce Esquillée	0	2	2
Stage 2 Biface	3	14	17
Stage 2 Biface Fragment	7	5	12
Stage 3 Biface	0	5	5
Stage 3 Biface Fragment	2	8	10
Biface Fragment	1	2	3
Point	3	9	12
Point Fragment	0	3	3
Point Tip	0	6	6
Point Base	0	4	4
Drill Tip	0	1	1
End Scraper	0	2	2
Side Scraper	1	0	1
Retouched Flake	12	10	22
Graver	0	4	4
Utilized Flake	24	5	29
Shatter	59	657	716
Primary Flake	233	1086	1319
Secondary Flake	520	4484	5004
Retouch Flake	12	667	679
Heat Shattered (?)	0	1523	1523
Unidentified Object	0	3	3
Unmodified Block or Cobble	0	257	257
	892	8871	9763
SLATE			
Flake	0	3	3
		3	3
ROUGHSTONE			
Hammerstone	0	11	11
	0	11	11
FAUNAL			
Teeth (Mammal)	0	5	5
Bone Fragments	0	34	34
Calcined Bone Fragments	0	307	307
Shell Fragments	1	15	16
	1	361	362
FLORAL*			
Carbonized Nutshells	0	148	148
Carbonized Nutmeat Fragments	0	3	3
Carbonized Seed	0	2	2
	0	153	153
FIRE-CRACKED ROCK			
Observed/Recorded/Not Collected	1415	2512	3927
Collected from Features	0	2131	2131
	1415	4643	6058
SITE TOTALS	**2308**	**14,042**	**16,350**

* material identified as "Present" in the archaeobotanical analysis not included

Table 7.2 Summary of Chert Artifact Classes by Prehistoric Occupation Area.

	Early Archaic Occupation Area #1		Early Archaic Occupation Area #2		Late Archaic Occupation Area #1		Late Archaic Occupation Area #2		Late Archaic Occupation Area #3	
	#	%	#	%	#	%	#	%	#	%
Core, Core Frag.	19	100.0	20	100.0	0	0.0	12	100.0	1	100.0
Bifaces										
Stage 2 Bifaces	3	60.0	3	50.0	2	100.0	2	50.0	1	50.0
Stage 3 Bifaces	2	40.0	3	50.0	0	0.0	2	50.0	1	50.0
	5	100.0		100.0	2	100.0	4	100.0	2	100.0
Debitage										
Primary Flakes	286	23.1	618	26.7	32	28.1	111	16.9	22	3.4
SecondaryFlakes	682	55.1	1545	66.9	51	44.7	413	63.1	526	82.2
Retouch Flakes	270	21.8	148	6.4	31	27.2	131	20.0	92	14.4
	1238	100.0	2311	100.0	114	100.0	655	100.0	640	100.0

offered such an interpretation for the Early Archaic Rucker's Bottom Site in the Savannah River drainage, which bears some similarities to the Diefenbaugh Site.

> Given the absence of well-defined hearths or evidence of structures of any kind, warm-weather occupations are suggested. This inference is supported by the assemblage data. The low incidence of formal scraping tools (i.e., steep-angled hafted unifaces) indicates a minimal amount of hide-working, an activity that probably took place in the fall and winter, when animal pelts were in prime condition (Anderson and Hanson 1988:274).

Unfortunately, any interpretation of Diefenbaugh site seasonality is hindered by the fact that the site was built from small occupations taking place over many years.

Fire-cracked rock was found in fired and unfired features as well as in widely dispersed scatters. The high quantities of this material, as shown in the artifact summary table, are not surprising if Munson's (1986) thesis regarding Archaic Period hickory nut exploitation is accepted. Specifically, he suggests the evolution of a new technology for extracting nut meats and oils.

> The technology to do this involves nothing more complex than lining a small, shallow, basin-shaped pit with a hide, filling it with water, heating the water with hot stones, tossing the crushed hickory nuts into the boiling water, and skimming off the meats and oil that float to the surface. The appearance of such pits, plus great a increase in quantities of fire-cracked rocks, coincides with the appearance of sites or strata containing quantities of hickory nutshells (Munson 1986:280).

The recovery of carbonized nutshells, primarily hickory and/or walnut, from some Late Archaic flotation samples lends strong support to this interpretation. The data also suggests that some of the Late Archaic occupations took place during the fall or winter, after the nut harvest. The possibility of storage, however, reduces the certaintly of such an interpretation.

Points

A summary of the points, point bases, and point tips from the Diefenbaugh site appears in Table 7.3. A relatively small number of points were recovered, and only a few came from feature contexts. They primarily represent the Early and Late Archaic Periods. Cluster names, type names, and temporal affiliations follow Justice (1987). Question marks are used to mark indeterminate points or to note tentative interpretations. Some of the incomplete points were assigned a temporal affiliation on the basis of combined diagnostic attributes such as beveling, serration, parallel pressure flaking, and basal grinding. Points representing later periods were found on the surface only. Most of the points were manufactured from locally available Liston Creek chert, which in many cases appear to have been successfully heat treated.

Table 7.4 is a comparison of the Diefenbaugh site point assemblage with results from Anuszczyk and Cochran's survey of the Wabash Valley and Landmark excavations at the nearby multicomponent Moore Site (12-Hu-935) (after Sherman 1996:79). All three collections show a dearth of points representing the Paleo-Indian and Early and Middle Woodland Periods. The Early to Late Archaic and Late Woodland periods are

Table 7.3 Summary of Points Recovered During the 1995 Field Season.

	CLUSTER OR TYPE	PERIOD	CHERT	UNIT	LEV.	FEAT.	CAT #
Point	Late Archaic Stemmed Cluster?	Late Archaic	Liston Creek (Heat Treated?)	28N20E	1		1279/3
Point	Kirk Corner Notched Cluster?	Early Archaic?	Liston Creek	30S90W	BOPZ		1475/15
Point	Karnak Unstemmed	Late Archaic	Liston Creek	20S20W	BOPZ		167/1
Point (2 pieces)	?	Early Archaic	Liston Creek--Heat Treated	4S40W	2		1710a
Point	Kirk Corner Notched	Early Archaic	Liston Creek (Heat Treated?)	6S40W	2		1984
Point	?	Late Archaic?	Attica?	40S60W	SURF		225
Point	Bottleneck Stemmed	Late Archaic	Liston Creek--Heat Treated	46N14E	BOPZ	3	226
Point	Brewerton Side Notched?	Late Archaic	Liston Creek--Heat Treated	10N20W	PZ		227
Point	Kirk Corner Notched Cluster	Early Archaic	Liston Creek--Heat Treated	10N20W	BOPZ		228
Point	Madison	Late Woodland	?	no prov	SURF		229
Point	Lowe Cluster	Late Middle Woodland	Holland	no prov	SURF		230
Point	Brewerton Corner Notched Cluster	Late Archaic	Liston Creek--Heat Treated	24N20E	BOPZ	1	299
Point	Brewerton Corner Notched Cluster	Late Archaic	Attica--Heat Treated	24N20E	BOPZ	1	300
Point Base	Table Rock Cluster	Late Archaic	Liston Creek--Heat Treated	16N45E	3		1022
Point Base	Merom Cluster	Late Archaic	Liston Creek--Heat Treated	32S88W	1	21	1129
Point Base/Mid	Kirk Corner Notched Cluster?	Early Archaic?	Liston Creek	6S40W	1		1608
Point Base/Mid	Kirk Corner Notched Cluster	Early Archaic	Liston Creek--Heat Treated	4S40W	2		1710b
Point Tip	?	Early Archaic?	Liston Creek (Heat Treated?)	32N80E	3		1019
Point Tip	?	Early Archaic?	Liston Creek	28N20E	1		1276
Point Tip	Kirk Corner Notched Cluster?	Early Archaic?	Liston Creek--Heat Treated	6S36W	1		1736
Point Tip	?	Early Archaic?	Liston Creek	10S40W	1		1767
Point Tip	?	?	Wyandotte?	0N6W	BOPZ		397
Point Fragment	?	Late Archaic?	?	30N86E	3	15	661
Point Base Frag	Kirk Corner Notched Cluster?	Early Archaic	?	70S84W	6		1541

Table 7.4 Comparison of the Diefenbaugh Site Point Assemblage to Two Other Upper Wabash Valley Assemblages (after Sherman 1996).

PERIOD	WABASH VALLEY SURVEY*		MOORE SITE (12-HU-935)**		DIEFENBAUGH SITE (12-HU-396)@	
	#	%	#	%	#	%
PALEO-INDIAN	4	3.4	2	2.9	0	0.0
EARLY ARCHAIC	14	12.0	12	17.6	7	29.2
MIDDLE TO LATE ARCHAIC	44	37.6	44	64.7	8	33.3
EARLY WOODLAND	7	5.9	0	0.0	0	0.0
MIDDLE WOODLAND	2	1.7	0	0.0	1	4.2
LATE WOODLAND	31	26.5	6	8.8	1	4.2
UNCLASSIFIED	15	12.8	4	5.9	7	29.2
TOTALS	**117**	**99.9**	**68**	**99.9**	**24**	**100.1**

*from survey data in Anuszczyk and Cochran (1984)

**from mitigation report by Sherman (1996)

@ from 1996 mitigation results only, points from private collections not included

far better represented. The Diefenbaugh assemblage represents the most restricted span. The majority of the points are from the Early and Late Archaic periods only, as are the features from the site with absolute dates.

Early Archaic Points (Figures 7.1, 7.2, 7.3, and 7.4). Eleven specimens have been identified (some tentatively) as representing the Early Archaic Period. Seven have been assigned to the Kirk Corner Notched Cluster. These points vary significantly. One (#228) was carefully manufactured from high quality chert and has distinct beveling. Specimen #1984 was made from coarser chert and thus appears to have been less finely made. Specimen #1475/15 is a small resharpened point. The two base/midsection fragments (1710b, 1608) are somewhat crude; the reverse of 1710b is sheared and probably was broken during manufacture. The small base fragment (#1541) is clearly from a corner notched point, and flaking and grinding attributes suggest an Early Archaic affiliation. The point tip (#1736) exhibits parallel flaking and the remnants of serrations. All but one of the points assigned to the Kirk Corner Notched Cluster are made from Liston Creek chert, with two-thirds appearing pinkened from heating. The remaining specimens that have been tentatively assigned to the Early Archaic are also made of Liston Creek chert. Two of the four appear to be heat treated.

Late Archaic Points (Figures 7.5, 7.6, and 7.7). Ten specimens have been assigned to the Late Archaic Period. The two Brewerton Corner Notched Cluster points (#299 and #300) are broad bladed with excurvate edges. Specimen #299 is made of Liston Creek chert containing an area of cortex or bedding plane while #300 is made of higher quality Attica chert. Both appear to have been heat treated based on their slightly pinkish-red appearance. The possible Late Archaic Stemmed point is extremely beveled and almost suggests an Early Archaic St. Charles point. However, the thickness and flaking of the point, as well as the presence of cortex at the base, are more consistent with the Late Archaic Period. Of the two examples from the Table Rock Cluster, the Bottleneck Stemmed point (#226) is very finely made and exhibits a high degree of basal grinding. Both were probably heat treated, through only #1022 shows a distinctive color change. The Karnak Unstemmed point (#167/1) is made from variable and poor quality Liston Creek chert. Heat treated Liston Creek chert is again dominant in this group of specimens. The non-local Attica chert is the only exception to exploitation of local materials.

Middle and Late Woodland Points (see Figure 7.8). Both points assigned to Woodland Period types came from the surface of the site. One is a very thin Lowe Cluster point with a snapped base (#230). This point is made of Holland chert or similar high quality material. The second point is of the Late Woodland Madison type and is made from a yellowish chert of unknown origin.

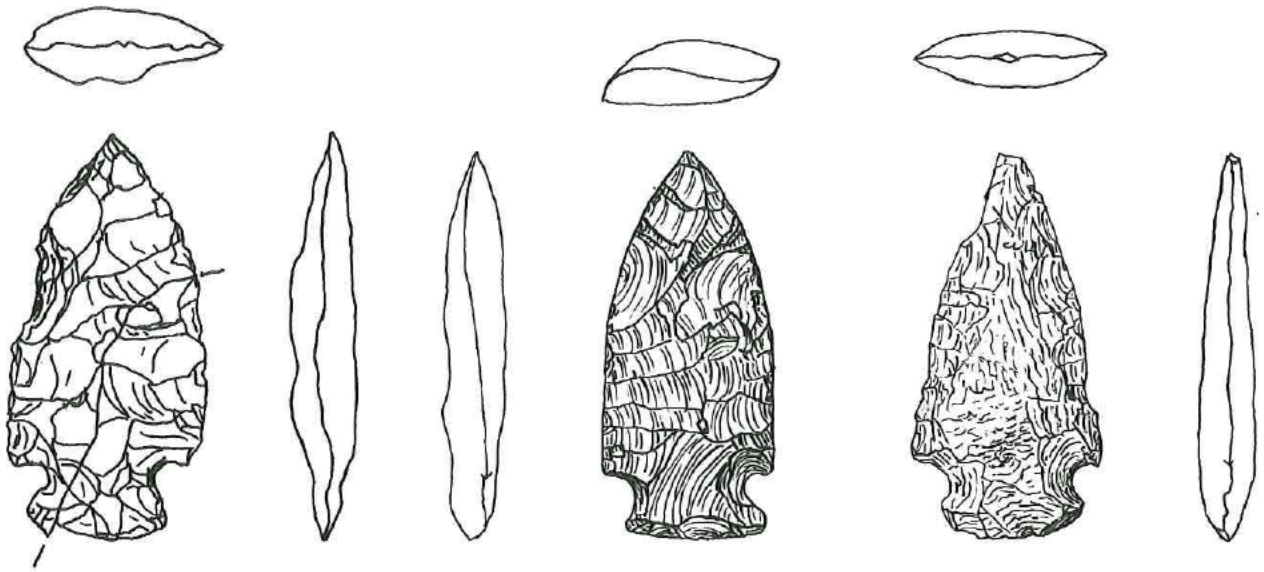


Figure 7.1 Points--#1710a (Early Archaic?, Heat Treated Liston Creek Chert); #228 (Kirk Corner Notched Cluster, Heat Treated Liston Creek Chert); #1984 (Kirk Corner Notched, Liston Creek (Heat Treated?).

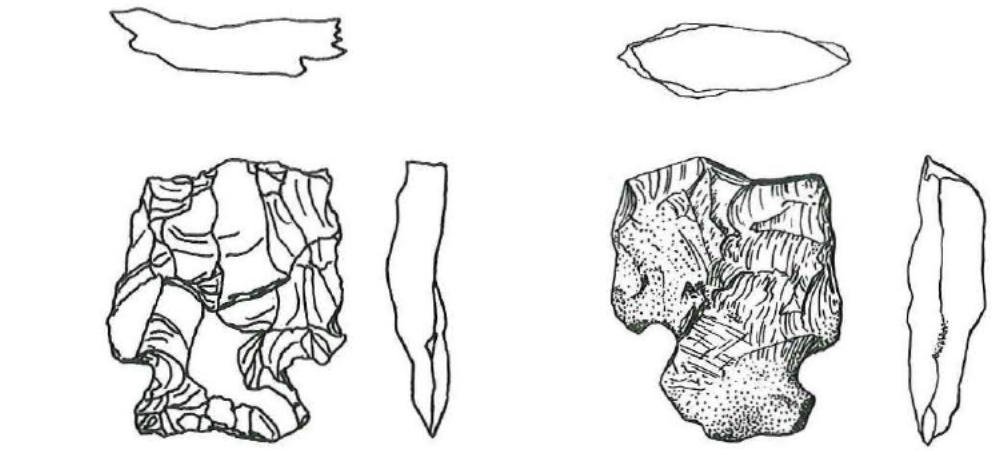


Figure 7.2 Point Bases--#1710b (Kirk Corner Notched Cluster, Heat Treated Liston Creek Chert); #1608 (Kirk Corner Notched Cluster?, Liston Creek Chert).

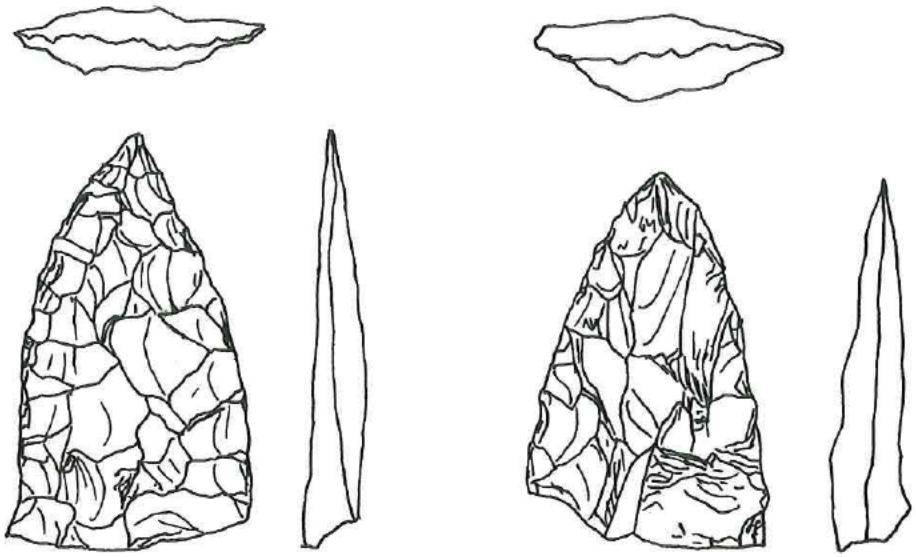


Figure 7.3 Point Tips--#1276 (Early Archaic?, Liston Creek Chert); #1767 (Early Archaic?, Liston Creek Chert).

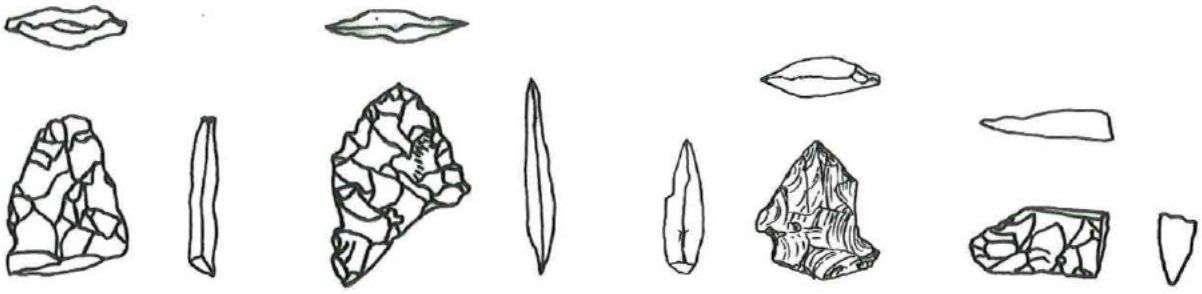


Figure 7.4 Point, Point Tips, and Point Base Fragment--#1019 (Early Archaic?, Liston Creek Chert (Heat Treated?)); #1736 (Kirk Corner Notched Cluster, Heat Treated Liston Creek Chert); #1475/15 (Kirk Corner Notched Cluster?, Liston Creek Chert); #1541 (Kirk Corner Notched Cluster, Unknown Chert).

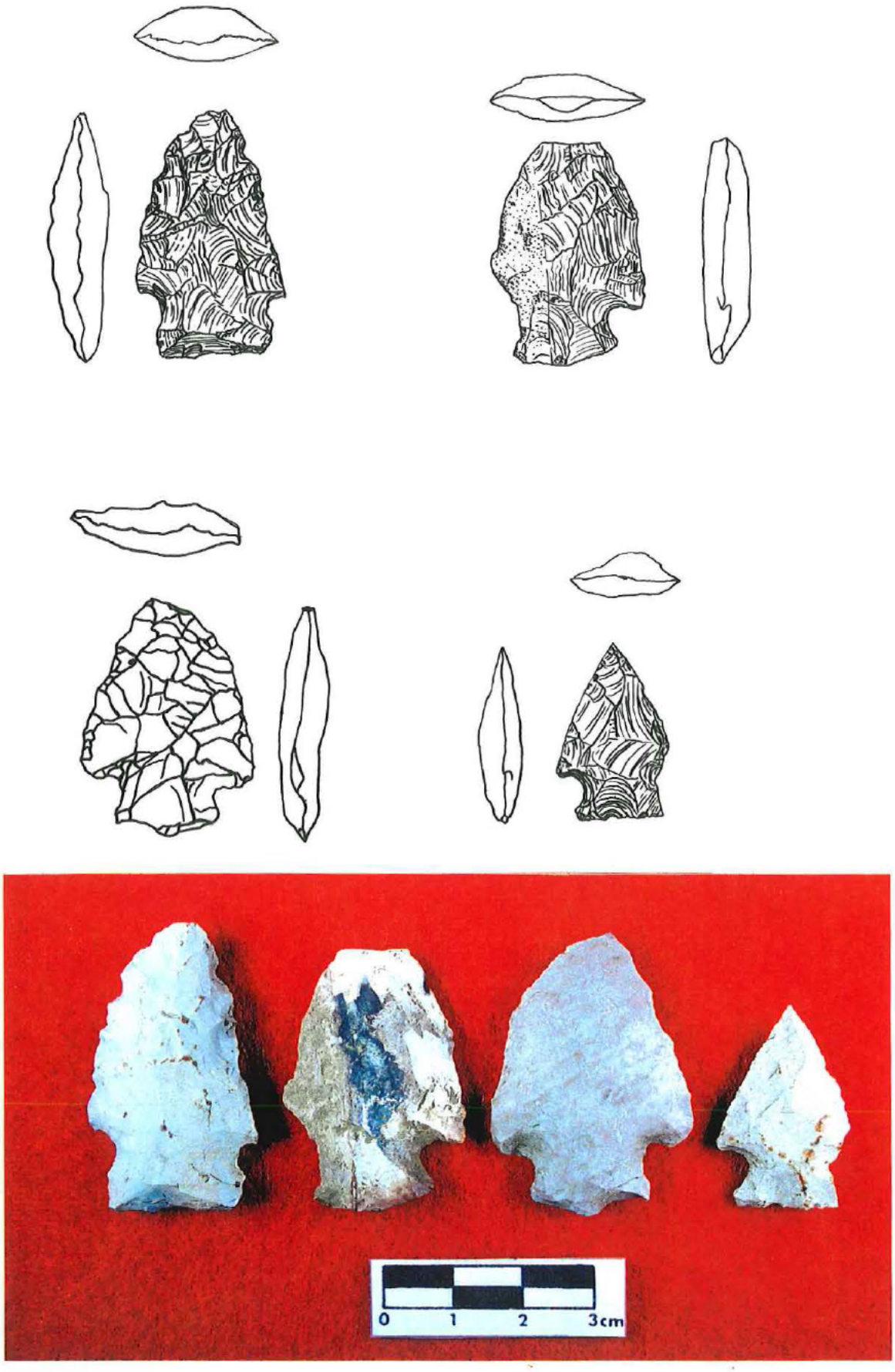


Figure 7.5 Points--#227 (Brewerton Side Notched?, Heat Treated Liston Creek Chert); #299 (Brewerton Corner Notched Cluster; #300 (Brewerton Corner Notched Cluster, Heat Treated Attica Chert); Heat Treated Liston Creek Chert); #225 (Late Archaic?, Attica Chert?).

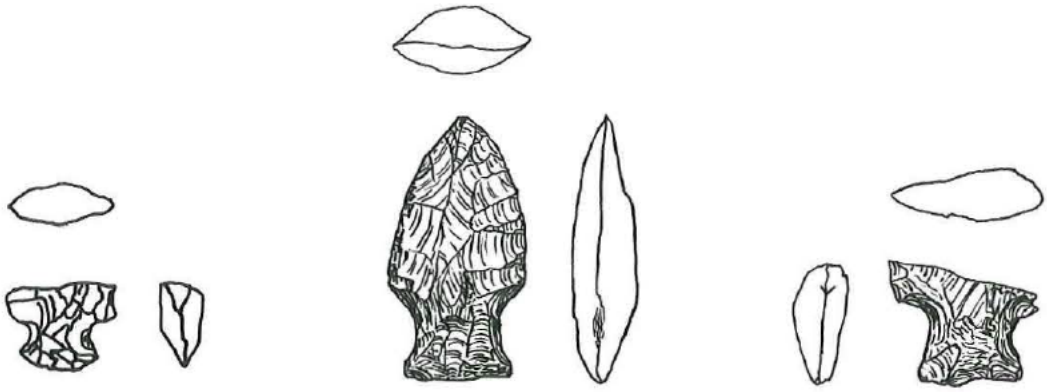


Figure 7.6 Point and Point Bases--#1129 (Merom Cluster, Heat Treated Liston Creek Chert); #226 (Bottleneck Stemmed, Heat Treated Liston Creek Chert); #1022 (Table Rock Cluster, Heat Treated Liston Creek Chert).

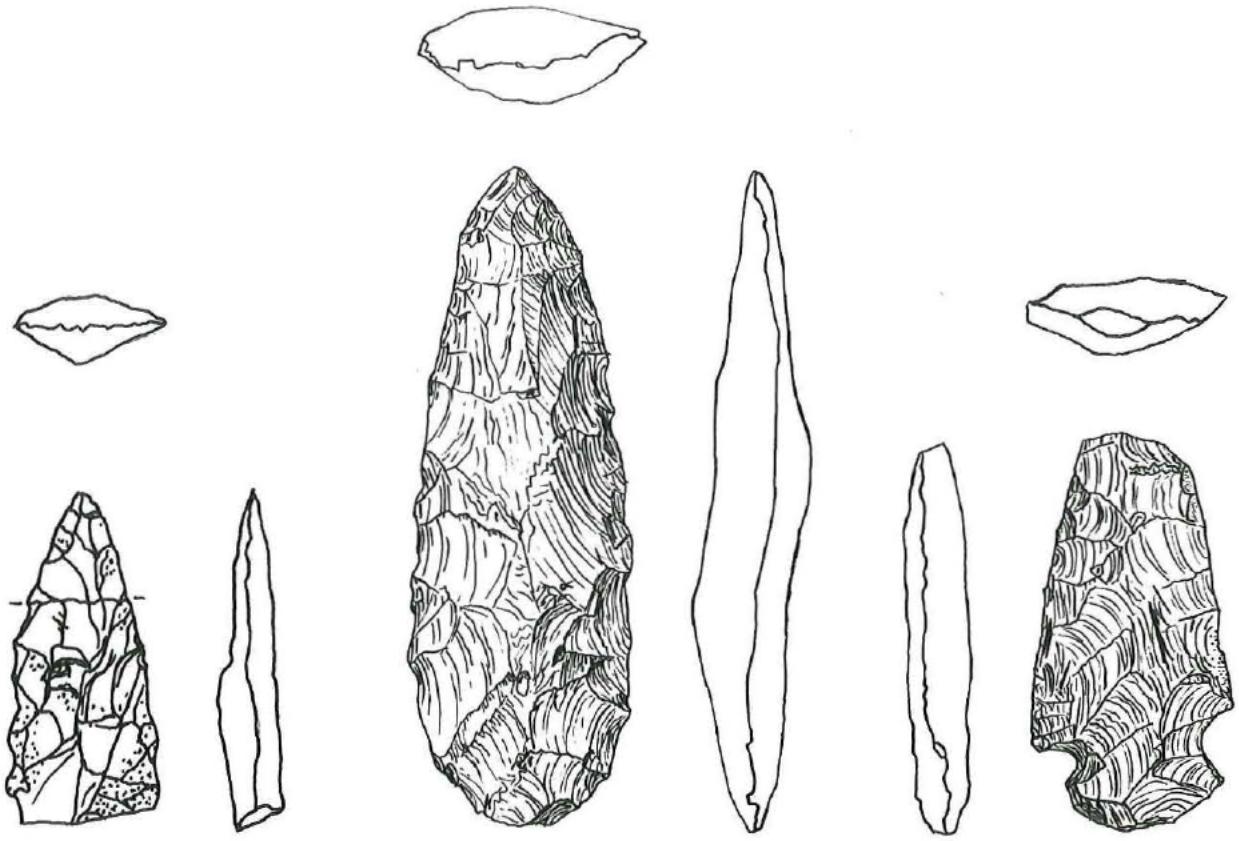


Figure 7.7 Points--#661 (Late Archaic?, Unknown Chert); #167/1 (Karnak Unstemmed, Liston Creek Chert); #1279 (Late Archaic Stemmed?, Liston Creek (Heat Treated?).

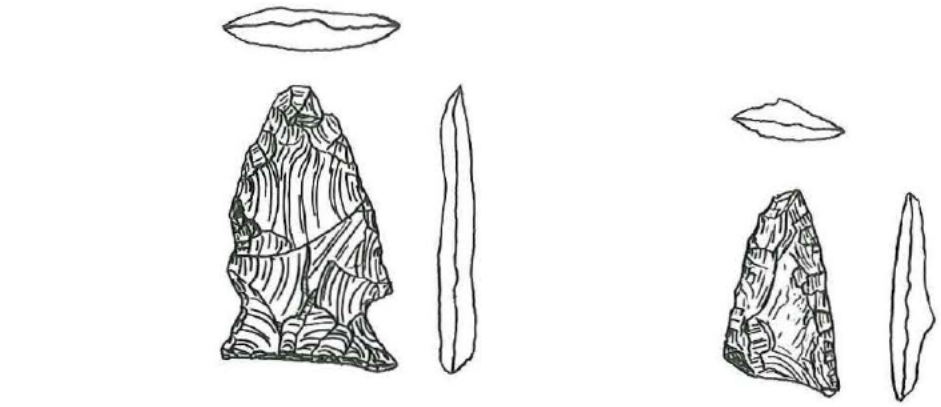


Figure 7.8 Points--#230 (Lowe Cluster, Holland Chert); #229 (Madison, Chert Unknown).

Analysis of Chert Types

It is clear from the previous section that locally available Liston Creek chert dominates the whole and fragmentary point assemblage for the Diefenbaugh site. Over fifty percent of these Liston Creek chert points appear to have been heat treated, though this is actually difficult to establish with absolute certainty due to natural variation in color and luster in Liston Creek chert. Examples with unusual luster and/or reddening, or extreme darkening and loss of luster were considered good candidates to be labeled as heat treated specimens. Unfortunately, the number of points recovered relative to the size of the site was small. To obtain a better overview of the range of variation within the assemblage, a more extensive analysis of chert types from sub-surface contexts was conducted.

To assess the range of variation in chert artifacts associated with features, a 25% sample of all secondary flakes from features contexts was examined. An attempt was made to identify the chert type (using type collections) as well as the presence of heat modification. No attempt is made here to say whether flakes were deliberately heated to enhance the quality of the chert. Rather, the presence of such characteristics as changes in luster, reddening, and pot-lid spalling are taken to indicate intentional *or* unintentional heating. The results of the chert analysis are presented in Table 7.5. Liston Creek chert (97.7%) dominates the sample, with 30.3% of the cases showing signs of heat modification. These results show even less variability than the point assemblage.

A similar study of chert types was conducted for 25% of the subsurface cores and 100% of the subsurface whole and fragmentary bifaces from the site. A number of these specimens are shown in Figures 7.9 through 7.13. Table 7.6 shows little departure from the results of the previous analyses, though Attica or Wyandotte cherts are represented in 4 (7.7 %) of the cases. Both cherts are available within Indiana. Attica chert is primarily found in Fountain County in the west-central part of the state and was generally used during all prehistoric periods. Wyandotte chert is primarily found in Harrison county near the state's southern boundary (Cantin 1994:8-9, 31).

Table 7.5 Chert Type for Secondary Flakes from Prehistoric Feature Contexts.

	SECONDARY FLAKES		FREQUENCY BY CHERT TYPE		
FEATURE	Total # of Secondary Flakes	25% Sample of Secondary Flakes	Liston Creek	Heat Modified Liston Creek	Unknown
1	78	20	7	13	0
2	0	0	0	0	0
3	226	57	43	14	0
5	1	1	0	1	0
6	1	1	1	0	0
7	1	1	0	1	0
8	3	1	1	0	0
9	0	0	0	0	0
10	4	1	1	0	0
13	0	0	0	0	0
16	10	3	2	1	0
18	0	0	0	0	0
19	0	0	0	0	0
20	2	1	1	0	0
21	1	1	0	1	0
22	1	1	1	0	0
23	0	0	0	0	0
24	2	1	1	0	0
25	1	1	0	1	0
26	108	27	18	6	3
27	0	0	0	0	0
28	1	1	0	1	0
29	16	4	3	1	0
30	5	2	2	0	0
31	1	1	1	0	0
32	0	0	0	0	0
34	5	2	2	0	0
35	4	1	1	0	0
36	16	4	4	0	0
TOTALS			**132 (67.4%)**	**40 (30.3%)**	**3 (2.3%)**

Table 7.6 Chert Type for Cores and Bifaces.

OBJECT	SAMPLE	FREQUENCY BY CHERT TYPE			
		Liston Creek	**Heat Modified Liston Creek**	**Attica**	**Wyandotte**
Core	18 (of 70)	18	0	0	0
Stage 2 Biface	14	11	2	1	0
Stage 2 Biface Fragment	5	5	0	0	0
Stage 3 Biface	5	4	0	0	1
Stage 3 Biface Fragment	8	6	1	1	0
Biface Fragment	2	1	0	1	0
TOTALS	**52**	**45 (86.5%)**	**3 (5.8%)**	**3 (5.8%)**	**1 (1.9%)**

*Proveniences for specimens of non-local chert:
1) 70S86W, L-5, biface fragment/Attica chert;
2) 20N42E, L-4, Stage 2 biface, Attica chert;
3) 70S84W, L-6, Stage 3 biface fragment, Attica chert;
4) 32S90W, BOPZ, Stage 3 biface, Wyandotte chert.

Figure 7.9 Cores--top, #1878/20, #1370/7; bottom, #1013, #1607.

Figure 7.10 Cores--left, #1694, #1694; middle, #1712; right, #1715.

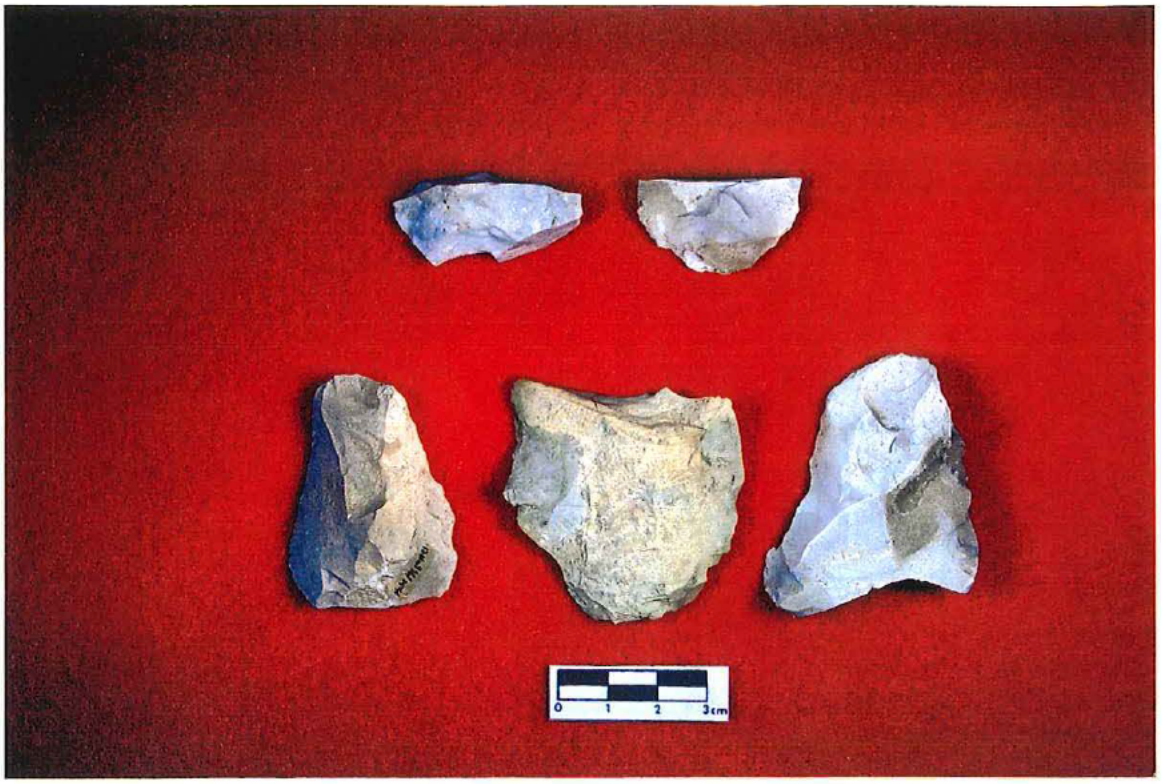


Figure 7.11 Bifaces from Early Archaic Occupation Area #1--top, #1541 (Stage 3 fragment), #1541 (Stage 3 fragment); bottom, #1541 (Stage 2), #1714 (Stage 2), #1712 (Stage 2 fragment).

Figure 7.12 Bifaces from Early Archaic Occupation Area #2--top, #1737 (Stage 3 fragment), #1710 (Stage 3), #1693 (Stage 3 fragment); bottom #1742/5 (Stage 2); #1746 (Stage 2), #1739 (Stage 2), #1710, Stage 2).

Figure 7.13 Bifaces from Late Archaic Occupation Areas 1-3--top, #1148 (Stage 3), #120/10 (Stage 2 fragment); bottom #284 /2 (Stage 2), #435 (Stage 2).

Figure 7.14 Sample of possibly heat shattered chert from Feature 35.