MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

SUNSHINE MESA:
TESTING TWELVE SITES SOUTHEAST OF SANTA ROSA, NEW MEXICO

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ADMINISTRATIVE SUMMARY

Between May 10 and June 18, 1993, the Office of Archaeological Studies, Museum of New Mexico, conducted archaeological testing of 12 sites southeast of Santa Rosa, New Mexico. Limited testing at LA 8009, LA 8013-8016, LA 99846-99849, and LA 99851-99853 was conducted at the request of the New Mexico State Highway and Transportation Department to determine the extent and importance of cultural resources present as part of the proposed improvements along a 17.4 km (10.8 miles) stretch of US 84. Eleven of the 12 sites are on private and state land. The site of LA 8016 is located on State Trust Land.

LA 8013-8016, LA 99846-99849, LA 99851, and LA 99852 are surface lithic artifact scatters, and probably represent temporary or seasonal camping locations. No intact features were found at any of these sites. LA 99853 is a dual component site containing both a lithic artifact scatter and a historic Hispanic or Anglo homestead. The only intact feature present at LA 99853 is a historic masonry windmill base. LA 8009 is another dual component site, containing both a lithic artifact scatter and a historic dugout located outside the project area. Six rock art panels, possibly old enough to be considered historic, were also present at LA 8009.

In all 12 cases the data potential of the portions of the sites within the project area right-of-way were determined to be minimal beyond that already documented, and no further investigations are recommended.

MNM Project 41.561
NMSHTD Project No. NH-084-1(9), CN 2030, D 05486
CPRC Archaeological Survey Permit No. SP-146
New Mexico State Land Office Survey Permit No. 93/027

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INTRODUCTION

At the request of William L. Taylor, Environmental Section, New Mexico State Highway and Transportation Department (NMSHTD), a limited testing program was conducted at 12 sites (LA 8009, LA 8013-8016, LA 99846-99849, and LA 99851-99853), located on US 84 (Fig. 1, Appendix 2). The site of LA 8016 is located on State Trust Land. The other 11 sites are on private land, state land administered by the NMSHTD, or a combination of both. Limited testing was conducted under CPRC Archaeological Survey Permit No. SP-146, and New Mexico State Land Office Survey Permit No. 93/027. Field work was carried out between May 10 and June 18, 1993, conducted by Peter Bullock, Macy Mensel, Deborah Johnson, and Sonya Urban. Sherry Butler served as a volunteer. Timothy D. Maxwell served as principal investigator. Figures and artifacts were drafted by Ann Noble, the report was edited by Robin Gould, and photographs were printed by Nancy Warren.

Limited testing was conducted at LA 8009, LA 8013-8016, LA 99846-99849, and LA 99851-99853 to determine the extent and importance of the portion of the sites within the proposed project limits. Limited testing was restricted to the proposed project corridor of planned improvements to US 84, southeast of Santa Rosa, New Mexico.

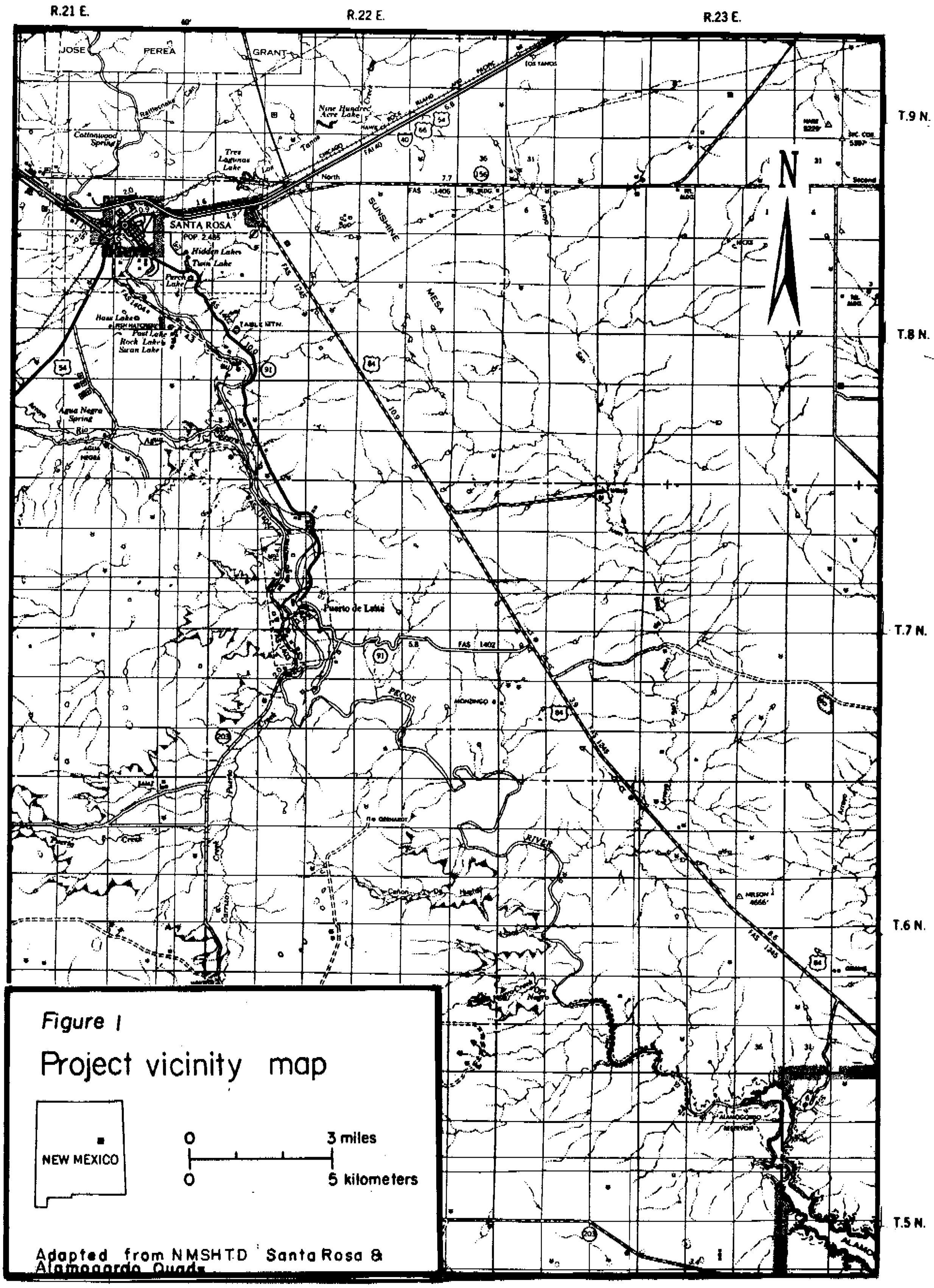

Figure 1

Project vicinity map

ENVIRONMENT

The project locale is in an area bounded by the Pecos River to the west, and the upper one-third of the project area is bounded by Sunshine Mesa to the east. In this area, drainage is directly to the Pecos River. The lower two-thirds of the project area are bounded on the east by the drainage of San Juan de Dios Arroyo. Elevation varies from 1,186.6 m (4,672 ft) to 1,251.7 m (4,928 ft). This area, southeast of Santa Rosa, is principally rolling mixed grassland. Occasional outcrops and breaks of exposed sandstone occur, particularly on the tops of ridges and in drainage areas. Rocky areas support a juniper parkland, with the rest of the area supporting a dense cover of mixed grasses. Mesquite, narrow leaf yucca, and cholla are common invasive species.

Geology

Guadalupe County is part of the Great Plains physiographic province (Jelinek 1967:35). The terrain is characterized by broad plains dipping gradually eastward. In this area of the Southern Plains, this eastward dip ends where it comes into contact with the caprock of the Llano Estacado.

Approximately .8 km (.5 miles) to the west of US 84 is the Pecos River. This two-terraced canyon system is the oldest portion of the Pecos River Valley, pre-dating the major course shift to the south of the middle Pecos River. The Pecos River south of Ft. Sumner ran toward the southeast through the Portales Valley and Lubbock, Texas, until the late Pleistocene (Jelinek 1967:5). This portion of the river valley varies in width and is lined for most of its length by broken cliffs of sandstone from the Santa Rosa and Chinle formations, which form the river's second terrace (Lucas et al. 1985:172-173). Away from the cliff edges these Triassic sandstones are buried in most places by Pleistocene gravels and sands (Kues et al. 1985:64).

In areas near the river, processes of solution have promoted a karst topography, a result of water acting on underlying beds of gypsum and limestone, and causing the collapse of the surface sandstones and shales of the Santa Rosa Formation (Lucas et al. 1985:172). The resulting sinkholes feed surface runoff into the Pecos River and into the numerous springs and seeps present along the Pecos River terraces (Levine and Mobley 1976:11).

Soils within the project area are characteristic of the Haplargids-Torriorthents-Calcirorthids association. Widely distributed, this association is dominated by gently sloping to undulating topography with widely spaced, small, steep escarpments, buttes, and rocky outcrops. Soils are deep, and formed of generally medium to fine alluvial and eolian sediments. They tend to be susceptible to erosion where vegetation cover is depleted or removed, with gully and arroyo cutting frequently taking place. This soil association is characterized by a thin brown to reddish brown noncalcareous fine loam topsoil. This is usually underlain by light reddish brown or pink limey loam. In areas, this sub-layer may develop into a solid caliche deposit. Areas of this soil association are primarily supportive of mixed grasses and mesquite, used for livestock grazing (Maker et al. 1974:67-68).

Climate

The semiarid climate of the project area is typical of the climate of eastern New Mexico. Although the amount of available moisture appears to have fluctuated repeatedly through the Archaic period, the overall trend has been towards a summer-dominant rain pattern and overall dryer regimen (Sebastian and Larralde 1989:16, fig. 1.9). In this area of New Mexico most precipitation occurs in the form of summer showers, with winter snow providing lesser amounts of precipitation (Tuan et al. 1973:24, fig. 6). Annual precipitation in Santa Rosa averages 35 cm (13.8 inches) (Gabin and Lesperance 1977:148-149; Tuan et al. 1973:18, fig. 2). The average number of frost-free days totals 200 (Tuan et al. 1973:87, fig. 38). South to southwesterly winds averaging 10 miles an hour are prevalent throughout the year (Maker et al. 1973:6-7).

Flora and Fauna

Although officially within the Woodland Biome (Castetter 1956:256, fig. 1), the project area is an area of mixing between the Woodland Biome and Mixed Grassland Biome. During the Pleistocene, this area is likely to have been mixed deciduous-pine woodland (Brunswig 1992:11-13). Vegetation differences in this area are characterized by soil and geological formation rather than climatic variation. In the project area, juniper parkland is present in areas of rocky and gravelly knolls, and in rough, broken areas where grasses are poorly developed. Mixed grassland is present in areas of medium to fine soils penetrable by grass root systems (Castetter 1956:271). The Mixed Grassland Biome exhibits a uniform physiography and vegetative character, with differences in relative vegetative composition resulting from climatic, topographic, and soil variation (Castetter 1956:266). The Mixed Grassland Biome in this area is dominated by short grass prairie climax vegetation (Levine and Mobley 1976:3). Grasses common to the project area include little bluestem, blue grama, sideoats grama, and sand dropseed. Snakeweed, cholla, and mesquite are common shrubs (Maker et al. 1974:67).

Faunal populations vary according to their habitats. These habitats for the most part correspond to the local plant communities. The number of plant communities in proximity to the project area suggests a range of occurrence greater than that characteristic for any single specific vegetation zone. Faunal species characteristic for the project area include jackrabbit, cottontail rabbit, prairie dog, and assorted small rodents such as mice, ground squirrels, and gophers. Larger faunal species common to the area include antelope, badger, and coyote. Deer and bobcat are also characteristic, but less common species occur in the area. Historically, bison were common on the Southern Plains adjacent to the Pecos River Valley (Levine and Mobley 1976:16-17).

CULTURAL RESOURCES OVERVIEW

A detailed reconstruction of the culture history of east-central New Mexico is beyond the scope of this report. Regional summaries are available for the area (Harlan et al. 1986; Levine and Mobley 1975).

Paleoindian Period

The Paleoindian period (10,000-5500 B.C.) was first recognized in 1926 at the Folsom site in northeastern New Mexico (Wormington 1947:20). A series of Paleoindian traditions have since been defined, beginning with Clovis and continuing through Plano (Stuart and Gauthier 1981:294-300). Originally defined on the plains of eastern New Mexico, the Paleoindian cultural area has been expanded to include virtually all of North America. Although originally believed to be dependent on big-game hunting, the importance of plant gathering and small animal hunting to Paleoindian subsistence is now recognized (McGregor 1965:120; Willey 1966:38; Jennings 1968:78-79; Wilmsen 1974:115; Cordell 1979:19-21; Stuart and Gauthier 1981:31-33).

Paleoindian sites of any period are rare. Paleoindian sites are recorded in the region, including the Clovis type site of Blackwater Draw, Locality No. 1, and Blackwater Draw, El Llano. Few are recorded in the general Santa Rosa area. Distinctively shaped Paleoindian projectile points have been found. One isolated Clovis base has been recorded for the Pecos River Valley, just to the west of the project area (Bullock 1995). Other Paleoindian sites are probably present, buried under alluvial or eolian deposits (Cordell 1982).

Archaic Period

The Archaic occupation of the upper Pecos River appears to have lasted longer than in other areas of New Mexico. Levine and Mobley (1976) define the Archaic occupation of northeastern New Mexico as lasting from 5000 B.C. to about A.D. 1000. A local chronology has not been developed for this area of New Mexico. Projectile points in eastern New Mexico have been identified belonging to the Oshara tradition (Irwin-Williams 1973) and falling into categories used in southern and western Texas (Johnson 1967).

The Archaic period in western New Mexico (5500 B.C.-A.D. 400), is generally referred to as the Oshara tradition (Irwin-Williams 1973). This period is distinguished by distinctive projectile points and lithic artifact scatters, which include grinding implements, fire-cracked rock, and a lack of ceramics. Archaic subsistence adaptations are based on a highly mobile, broad-based economy characterized by a combination of seasonally scheduled hunting and gathering activities. The Oshara tradition is divided into five phases: Jay (5500-4800 B.C.), Bajada (4800-3200 B.C.), San Jose (3200-1800 B.C., Armijo (1800-800 B.C.), and En Medio (800 B.C.-A.D. 400)(Irwin-Williams 1973). Although centered in the northwestern area of New Mexico, Oshara tradition projectile points occur in isolated instances as far east as the project area.

A sequence of projectile points for central and western Texas was developed by Johnson (1967) based on stratified sites yielding radiocarbon dates. This sequence is divided into five overlapping periods: Period 1 (8350-4800 B.C.) yielding Luma and Plainview projectile points, Period II (6810-1315 B.C.) yielding Early Barbed, Pandale, Nolan, Travis, and Bulverde projectile points, Period III (4850 B.C.-A.D. 110) yielding Shumla, Almagre, Langtry, Pedernales, Montell projectile points, Period IV (350 B.C.-A.D. 1245) yielding Ensor, Frio, Darl, Figuero, and Godley projectile points, and Period V (A.D. 1200-1710) yielding Scallorn, Livermore, Bonham, and Perdiz projectile points. In a number of cases the same projectile point morphologies have been given different names based on location. Additional chronologies, including a localized sequence for the lower Pecos Valley have also recently been developed (Regge Wiseman, pers. comm. 1993).

Pueblo Period

Evidence of Puebloan use of the Santa Rosa area is abundant, although no Pueblo sites with residential architecture have been recorded. The closest recorded pueblos to the Santa Rosa area are located at Pintada Canyon, approximately 32 km (20 miles) to the west. The Puebloan sites at Pintada appear to date from A.D. 1200-1400. Ceramic assemblages are dominated by Chupadero Black-on-white and brown utilitarian wares (Stuart and Gauthier 1981). Puebloan ceramics are found in association with open-air sites, lithic artifact scatters, and rock shelters along the Pecos River, side canyons, and along some main arroyos. The occasional occurrence of other ceramic types indicates both regional trade and possible use of the area by Pueblo groups from the Glorieta Mesa and Galisteo Basin areas. Sites associated with Puebloan use of the Pecos River Valley have been recorded for the western side of the Pecos River, opposite the project area (Hannaford 1979), and from the Los Esteros Lake area (Levine and Mobley 1975).

Jornada Mogollon ceramics also occur in the Santa Rosa area, with a number of possible Jornada Mogollon sites recorded (Harlan et al. 1986:42; Levine and Mobley 1974). None of the sites recorded for the Santa Rosa area is known to have residential architecture, although they are recorded to the south (Corley 1965).

A local Pueblo tradition is documented for the middle Pecos River Valley by Jelnick (1967). This Pueblo tradition appears in the late A.D. 800s as an outgrowth of the Jornada Mogollon tradition, and is characterized by Brown Wares and both pit and surface structures. This is the first appearance of a sedentary population with a maize-based subsistence system in this region.

Anasazi, or Anasazi-derived ceramics appear in the middle Pecos River Valley after A.D. 900 with the development of the Mesita Negra phase (Jelinick 1967:64-65). The Mesita Negra phase is characterized by gray wares and residential surface structures. The eastern limits of the area able to support this lifestyle (possibly a marginal area even at that time) appear to have been the Pecos Valley (Jelinek 1967:145-147). These developmental sequences continue until the termination of the Crosby phase in the lower-middle Pecos Valley between A.D. 1250 and 1300, and the termination of the Late McKenzie phase in the upper-middle Pecos Valley about A.D. 1300 (Jelinek 1967:65-67).

Plains Indian Period

Both Kiowa and southern Athapaskan groups appear to have moved into the eastern portion of New Mexico during the late Protohistoric period. Apachean sites are scattered throughout southeastern New Mexico as well as the central plains, and may date anywhere from the late 1400s to the late 1800s (Harlan et al. 1986:52).

Shoshonean-speaking Comanches moved into the Southern Plains about 1700-1715. All other Native American groups were driven from the area by these horse-mounted buffalo hunters, except for the closely allied Kiowas. Extermination of the buffalo herds combined with American military campaigns removed the Comanches, Kiowas, and other "Plains Indian" groups from the Southern Plains by 1875 (Schemer 1981). Sites identified as possibly Apache, Comanche, or other "Plains Indian" have been identified north of the project area at Los Esteros Lake (Levine and Mobley 1975).

Hispanic Occupation

Hispanic presence on the Eastern Plains of New Mexico was minor prior to the American era. The presence of mobile and potentially hostile Apache, and later Comanche and Kiowa Indians prevented Hispanic settlement along the upper Pecos until the 1850s. By 1860, 16 Hispanic settlements had been built on Pecos River land grants (Harlan et al. 1986:58), primarily from the Anton Chico Land Grant north. The Agua Negra Land Grant was formalized in 1865 by Don Celso Baca, with the ranch settlement of Agua Negra Chiquita, later becoming the settlement of Santa Rosa. By the 1880s Hispanic settlements were well established at Pintada on Pintada Arroyo, and at Puerto de Luna on the Pecos River. Farming was concentrated along the Pecos River and major drainages, but the main economic thrust of the Hispanic population was sheep raising. Sheep raising in the area of Santa Rosa was dominated by two major sheep ranches, the Agua Verde and the Juan de Dios, until the collapse of sheep prices in the 1920s, devastating the sheep raisers' economy (Harlan et al. 1986:58).

Racial tensions became apparent in the Pecos Valley as Anglo-American settlers, primarily from Texas, moved into the area after the late 1860s. A Texan dislike of Hispanics, generated by their war of independence from Mexico, was exacerbated by the fact that they were cattlemen while the Hispanics tended to raise sheep. This mutual dislike occasionally degenerated into violence and conflict. However, the different settlement patterns of the two groups tended to lessen this propensity for conflict. The Hispanic settlements were primarily located in the Pecos floodplain, while the Anglo-Americans tended to settle in dispersed ranches away from the river (Harlan et al. 1986:57-58).

Anglo-American Occupation

An American presence became established in the eastern part of New Mexico with the construction of Forts Union, Sumner, and Stanton in the early 1860s (Levine and Mobley 1976:31). Anglo-American settlement in the Eastern Plains of New Mexico did not, however, occur to any great extent until after the American Civil War.

Texas cattlemen began moving into the area in the mid-1860s. Some of the first to arrive were Charles Goodnight and Oliver Loving who brought a heard of cattle to Ft. Sumner in 1866. They opened the Goodnight-Loving Trail, which eventually ran from Cheyenne, Wyoming, south to Belknap, Texas (Harlan et al. 1986:59). A second herd of cattle was brought to Ft. Sumner from Paris, Texas, by John Chisum that same year (1866). Essentially the first Anglo-American settler to the middle Pecos Valley, Chisum eventually controlled a ranch 100 miles wide and stretching for 150 miles along the Pecos River (Broster 1983:13-14).

In time, a number of dispersed ranches were established, despite the hostile relations between the settlers and the resident Plains Indians. The regional vernacular architectural styles of some of these early ranch structures aids in their dating. One Texas vernacular style, the 'dog trot' house, was comprised of two rows of rooms separated by a covered breezeway. Construction of Texas 'dog trot' houses on the Southern Plains was limited to a period from the 1860s to the early 1880s. This house form was replaced by Victorian styles upon the economic and political integration of the area with the rest of the United States. A classic 'dog trot' house, the Jones-Howard Ranch, has been recorded just east of the project area on San Juan de Dios Arroyo.

With the final defeat of the Comanches and Kiowas and their removal in 1875 to Oklahoma, settlement of the area increased rapidly. This increase in settlement saw increased friction between the Anglo-American and Hispanic populations. A combination of drought and severe winters in 1887 and 1889 ultimately destroyed the great cattle empires of the Plains (Harlan et al. 1986:57-58).

The El Paso and Northwestern Railroad joined the Rock Island and Pacific Railway at Santa Rosa in 1902, linking the Plains to both Albuquerque and to cities in the Midwest. Homesteading farmers followed the railroad into the area. In Guadalupe County, the county seat was moved from Puerto de Luna to the bustling railroad town of Santa Rosa in 1912. New Mexico law stated that a county seat could only move if a new county was formed. The county was therefore renamed Leonard Wood County (after the Spanish-American War hero) for two years until the new county seat was established. The county name was then changed back to Guadalupe (Anonymous 1942). Santa Rosa, Portales, and Clovis were all eastern New Mexico railroad towns that prospered as shipping points for livestock and produce (Harlan et al. 1986:59).

Many of the farms in the area continued until the "dustbowl" days of the 1930s. Drought, combined with the economic slump of the Great Depression, forced many of the small landowners to sell their land (Harlan et al. 1986:60). Most of the area around Santa Rosa reverted back to cattle ranching in the 1940s, an activity that continues today. Most cattle raised around Santa Rosa are now shipped by truck to Clovis where they are loaded onto trains, or are shipped by truck directly to Amarillo.

TESTING PROGRAM

A limited testing program was designed for 12 sites located along US 84 south of Santa Rosa and implemented in consultation with the New Mexico State Historic Preservation Division. One site, LA 8016, was located on State Trust Land. The remaining 11 sites were located on both private land and state land administered by the New Mexico State Highway and Transportation Department.

LA 8013-8016, LA 99846-99849, LA 99851, and LA 99852 are located east of the Pecos River and are lithic artifact scatters varying in size (Nelson 1993). LA 99853 is both a lithic artifact scatter and a historic homestead. LA 8009 contains both a lithic artifact scatter and an historic dugout, as well as several rock art panels. All 12 sites were tested as part of the proposed improvements along a 17.4 km (10.8 miles) stretch of US 84 southeast of Santa Rosa, New Mexico. The purpose of the limited testing program was to determine the extent and importance of the portion of the sites located within the proposed project limits.

Field Methods

A main datum and baseline were established for each site. Surface artifacts were pinflagged to locate artifact clusters and to assist in recording and mapping site limits. A map of each site and the locations of all test pits and cultural features was produced using a transit, a stadia rod, and a 50-m tape. The location of surface artifacts was plotted with the use of a 50-m tape.

Surface artifacts were piece plotted, analyzed in the field, and left in place. Information on surface artiface placement is on file at the Archeological Records Management Section of the New Mexico Historic Preservation Division. Artifacts were collected only when they were recovered in a test pit, were diagnostic of cultural or temporal affiliation, or were in an area of the site that would be disturbed by test pit excavation.

Test pits, measuring 1-by-1 m in size, were hand-excavated within the portion of each site located within the project area. These test pits were located either within or adjacent to areas of heavy surface artifact concentration, or in other areas of possible prehistoric activity. Existing soil integrity was an added consideration in the placement of test pits. All of the excavated dirt was screened through ¼-inch wire mesh and the artifacts collected. Test pits were dug in 10-cm levels until either 20 cm of culturally sterile soil, or bedrock, was reached. The number of test pits excavated per site varied depending on surface artifact occurrence, remaining soil integrity, and site size. The number of excavated test pits did not exceed six per site.

Profiles were drawn for each test pit, and both test pit and general site photographs were taken. Test pits were backfilled when excavation was completed. Cultural material recovered through these investigations will be curated in the Archeological Research Collections at the Laboratory of Anthropology, Museum of New Mexico. Field and analysis records will be on file at the Historic Preservation Division, Archeological Records Management Section.

LA 99846 Testing Results

LA 99846, east of the Pecos River, is a diffuse lithic artifact scatter that measures 900-by-540 m; site area is 486,00 sq m (Figs. 2, 3). LA 99846 is present on both sides of US 84. Site elevation is 1,415.7 m (4,672 ft). A borrow pit associated with earlier US 84 construction is located within the site limits, west of the existing right-of-way. The site is relatively flat, sloping sightly downward toward the borrow pit.

A total of 538 artifacts was piece-plotted on the surface of LA 99846. An additional 27 artifacts were recovered from test units. The artifact total consisted of only lithic artifacts. Two beaked gravers, characteristic of late Paleoindian sites, were found on the surface (Fig. 4). The site is deflated and most surface artifacts have been redeposited. The presence of livestock may have contributed to site degradation. Areas of the site adjacent to the borrow pit also appear to have suffered churning from the use of heavy machinery associated with pit use. Six 1-by-1-m test pits were dug at LA 99846.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was east of US 84, in the northwest portion of the site. The area of the test pit exhibited intact topsoil, and was adjacent to a surface artifact cluster. Surface vegetation included mixed bunch grass and Mormon tea. One surface artifact was collected from this test pit prior to excavation.

Excavation ended 40 cm below the modern ground surface in culturally sterile soil. Testing encountered three strata of material. Stratum 1 was a fine reddish brown eolian sand. Three lithic artifacts, two flakes and a core, were recovered from this material. Stratum 2 was a reddish brown sandy soil. Decaying shale formed approximately 10 percent of the deposit. Stratum 3 is a reddish brown soft decaying shale. No artifacts were recovered from either Stratum 2 or 3.

Test Pit 2. Test Pit 2 was placed adjacent to a cluster of surface cobbles to investigate a possible feature. This test pit was in the southeastern portion of the site. A 30 percent coverage of mixed grasses make up the existing surface vegetation. Two surface artifacts, both of chipped stone, were collected from this test pit prior to excavation.

Excavation ended 30 cm below the modern ground surface in culturally sterile soil. Four strata of material were encountered. Stratum 1 was a yellow-brown eolian sandy soil. Four lithic artifacts were collected from this material. Stratum 2 was a fine sandy soil, probably eolian in origin. Stratum 3 was a reddish, fine, gravelly clay soil. Grit within this stratum was composed primarily of bits of decaying shale. Decaying shale interspersed with small amounts of clay formed Stratum 4. No artifacts were found within the lowest three strata of Test Pit 2.

Test Pit 3. Test Pit 3 was adjacent to the largest cluster of surface artifacts in the western portion of the site, west of US 84. A 40 percent vegetation cover of mixed grasses was present prior to excavation. Eight lithic artifacts were collected from the surface of Test Pit 3.

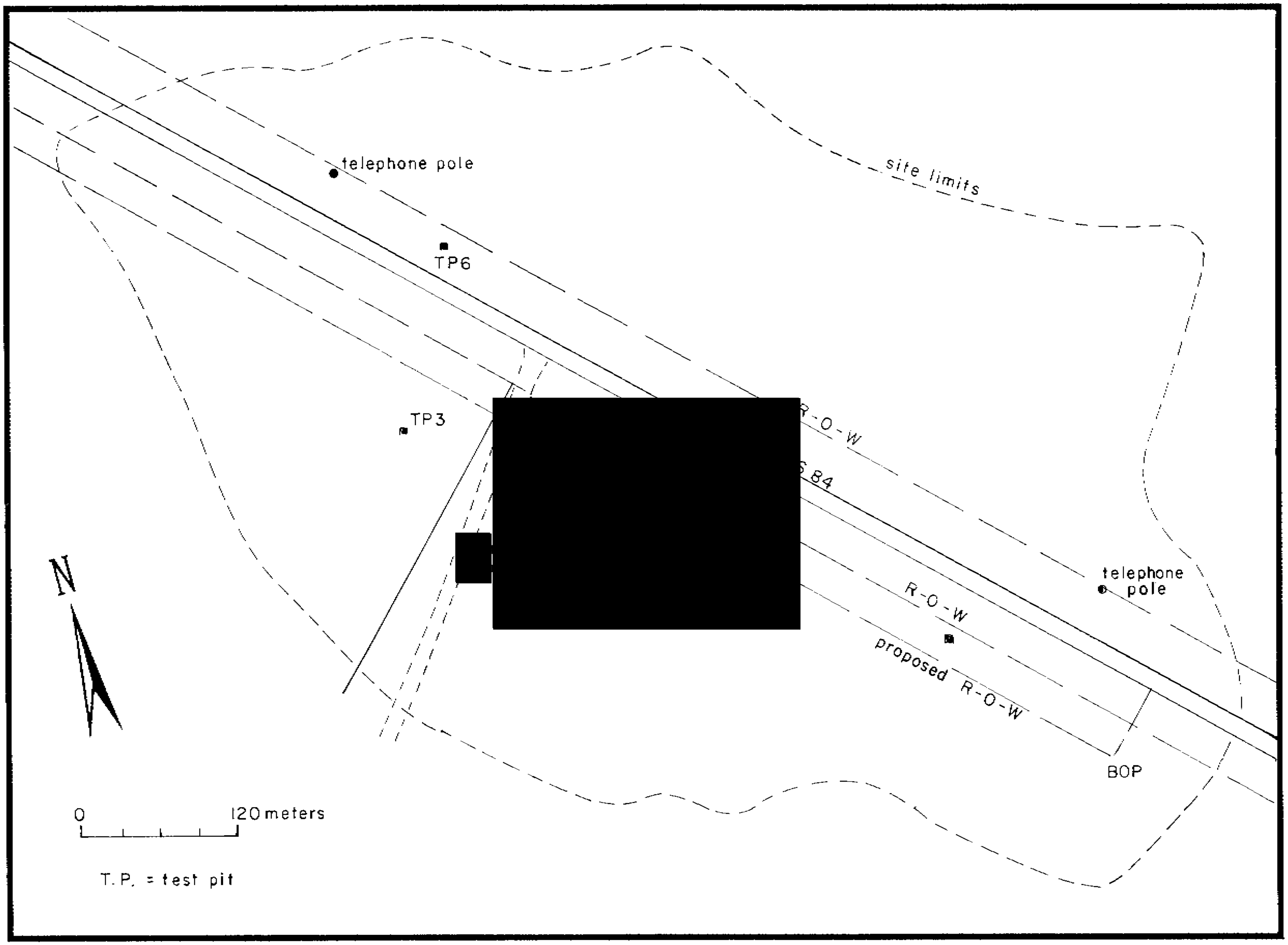

Figure 2. LA 99846 site map.

Figure 3. Cattle on SR 91, LA 99846, looking south.

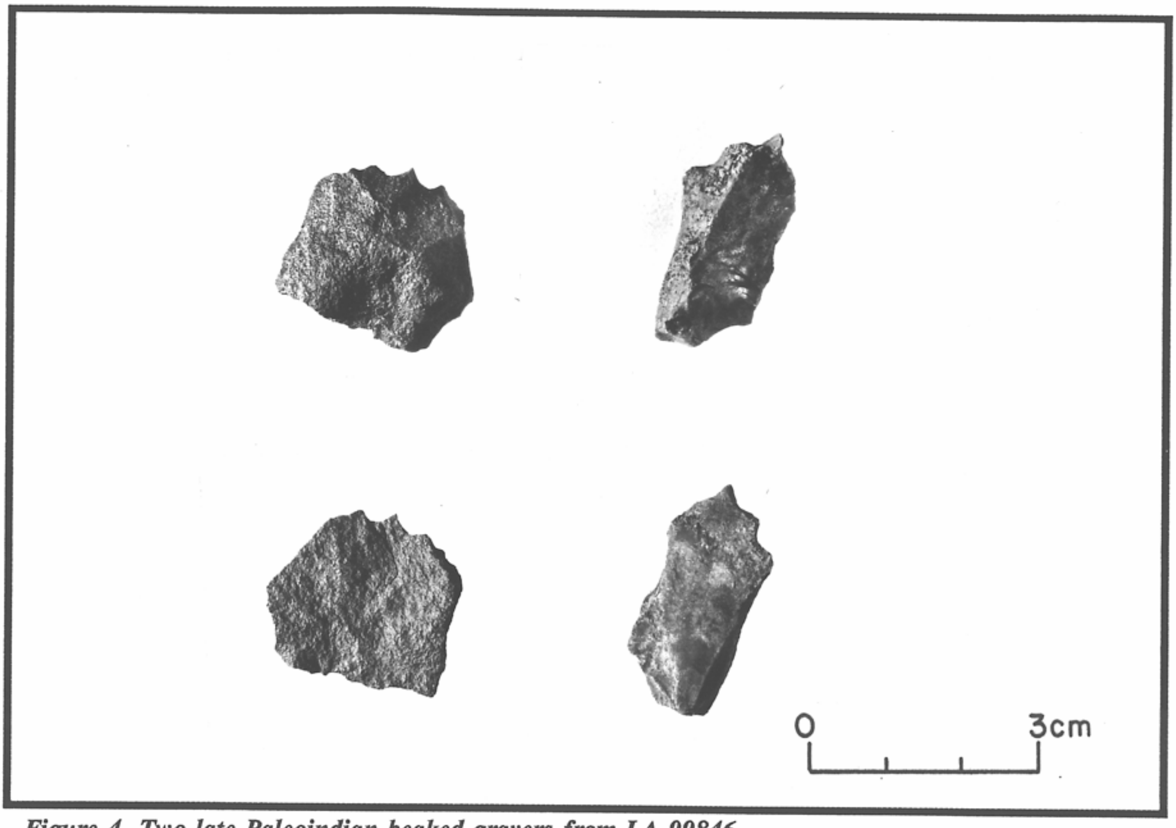

Figure 4. Two late Paleoindian beaked gravers from LA 99846.

Excavation of Test Pit 3 ended 40 cm below the present ground surface. Six strata were present within the test pit. Stratum 1 is a reddish brown fine eolian sand. Four lithic artifacts were recovered from this stratum. Stratum 2 was a brown, compacted, very fine sandy soil with extensive caliche development present. Stratum 3 was a dense, fine sandy soil, reddish brown in color without caliche. Stratum 4 was an area of rodent disturbance. This area may have originally been an extension of Stratum 3, but the disturbance was so extensive this was not possible to ascertain. Stratum 5 was a light reddish brown fine sandy soil similar in appearance to Stratum 3. Stratum 5 was a brown, very fine sandy soil with caliche present. Artifacts were restricted to Stratum 1.

Test Pit 4. Test Pit 4 was in an area of clustered surface artifacts on the northwestern side of the borrow pit. Surface vegetation was 50 percent mixed grasses. The rest of the original ground surface had been badly churned by livestock. A single lithic artifact, an early stage biface, was collected from the surface of Test Pit 4.

The excavation of Test Pit 4 extended to a depth of 15 cm. Two soil strata were present in the test pit profile. Stratum 1 was a fine brown colored eolian sand. One lithic artifact was recovered from this stratum. Stratum 2 was a decaying green shale that formed the bedrock in this area of the site.

Test Pit 5. Test Pit 5 was within a cluster of surface artifacts that had the appearance of a lithic reduction area. This was in the west-central portion of the site, just to the east of the borrow pit. Surface coverage in the area of the test pit was 90 percent. All of the vegetation was comprised of mixed grasses. Nine lithic artifacts were collected from the surface of Test Pit 5.

The excavation of Test Pit 5 extended to a depth of 40 cm below the modern ground surface. Three strata were present. Stratum 1 was a reddish brown fine eolian soil that contained 40 lithic artifacts. Stratum 2 was a fine reddish brown clayey soil. This material appears to be the original surface material in this area of the site, churned during the digging of the borrow pit. Two lithic artifacts were collected from this stratum. Stratum 3 was a dense reddish brown clay containing small bits of caliche. No artifacts were found within this stratum.

Test Pit 6. Test Pit 6 was in the same general area of the site as Test Pit 5. This was another possible area of lithic reduction. Surface vegetation is a 90 percent coverage of mixed grasses. Three lithic artifacts were collected from the surface of this test pit.

Excavation of Test Pit 6 extended to a depth of 30 cm. Three strata were present in this test pit profile. Stratum 1 was a dark reddish brown material, eolian in origin. Two artifacts were collected from this stratum. Stratum 2 was a hard red clay containing some caliche. Stratum 3 was a dark brownish red clay containing both caliche and some grit. No artifacts were recovered from Strata 2 and 3.

Cultural Features

No intact cultural features or deposits were found within the the proposed project limits.

LA 99847 measures 180-by-125 m; site area is 22,500 sq m. The site is a diffuse lithic artifact scatter [redacted]). LA 99847 is on the western side of US 84. Site elevation is 1,418.4 m (4,681 ft). The site slopes slightly towards the east.

A total of 423 surface artifacts were piece-plotted. Twenty-one artifacts were collected from the test pits. LA 99847 is heavily deflated and all of the surface artifacts are probably redeposited. The presence of livestock appears to have contributed to site degradation. The areas of the site adjacent to the borrow pit also appear to have been churned by heavy machinery, probably associated with borrow pit use. Six test pits were dug at LA 99847.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was in the northern portion of the site, adjacent to a cluster of surface artifacts. Mixed grassed covered 70 percent of the surface. One lithic artifact was collected from the surface of Test Pit 1.

Excavation of Test Pit 1 ended at a depth of 30 cm. Two strata were present. Stratum 1 was a reddish brown eolian sandy silt. Four lithic artifacts were collected from this stratum. Stratum 2 was a compact, fine reddish brown clay. No artifacts were recovered from Stratum 2.

Test Pit 2. Test Pit 2 was in the east-central portion of the site adjacent to a cluster of surface artifacts. Mixed grassed covered 70 percent of the surface. Five lithic artifacts were recovered from Test Pit 2 prior to excavation.

Excavation of Test Pit 2 ended at a depth of 30 cm below the modern ground surface. Two strata were present. Stratum 1 was a reddish brown fine eolian silt. Stratum 2 was a dark reddish brown clay. No artifacts or cultural material were present within either stratum.

Test Pit 3. Test Pit 3 was in the eastern portion of the site. Surface vegetation coverage was 60 percent, and was comprised of mixed grasses. No surface artifacts were present in Test Pit 3.

Excavation of Test Pit 3 ended at a depth of 30 cm below the modern ground surface. Three strata were present in this area. Stratum 1 was composed of reddish brown, fine, wind-deposited silty soil. Stratum 2 was a dark reddish brown clay. Stratum 3 was a dark reddish brown clay containing flecks of caliche. No artifacts were present in any of the strata.

Test Pit 4. Test Pit 4 was in the southeastern portion of the site, adjacent to a cluster of surface artifacts. Vegetation coverage was 90 percent, and was composed of mixed grasses. One lithic artifact was recovered from the surface of Test Pit 4.

Excavation of Test Pit 4 ended at a depth of 20 cm. Two strata were present within this test pit. Stratum 1 was a reddish brown, fine, wind-deposited soil. Stratum 2 was a reddish brown clay containing small gravels. A small number of caliche flecks were also present within this material. No artifacts were found below the modern ground surface within this test pit.

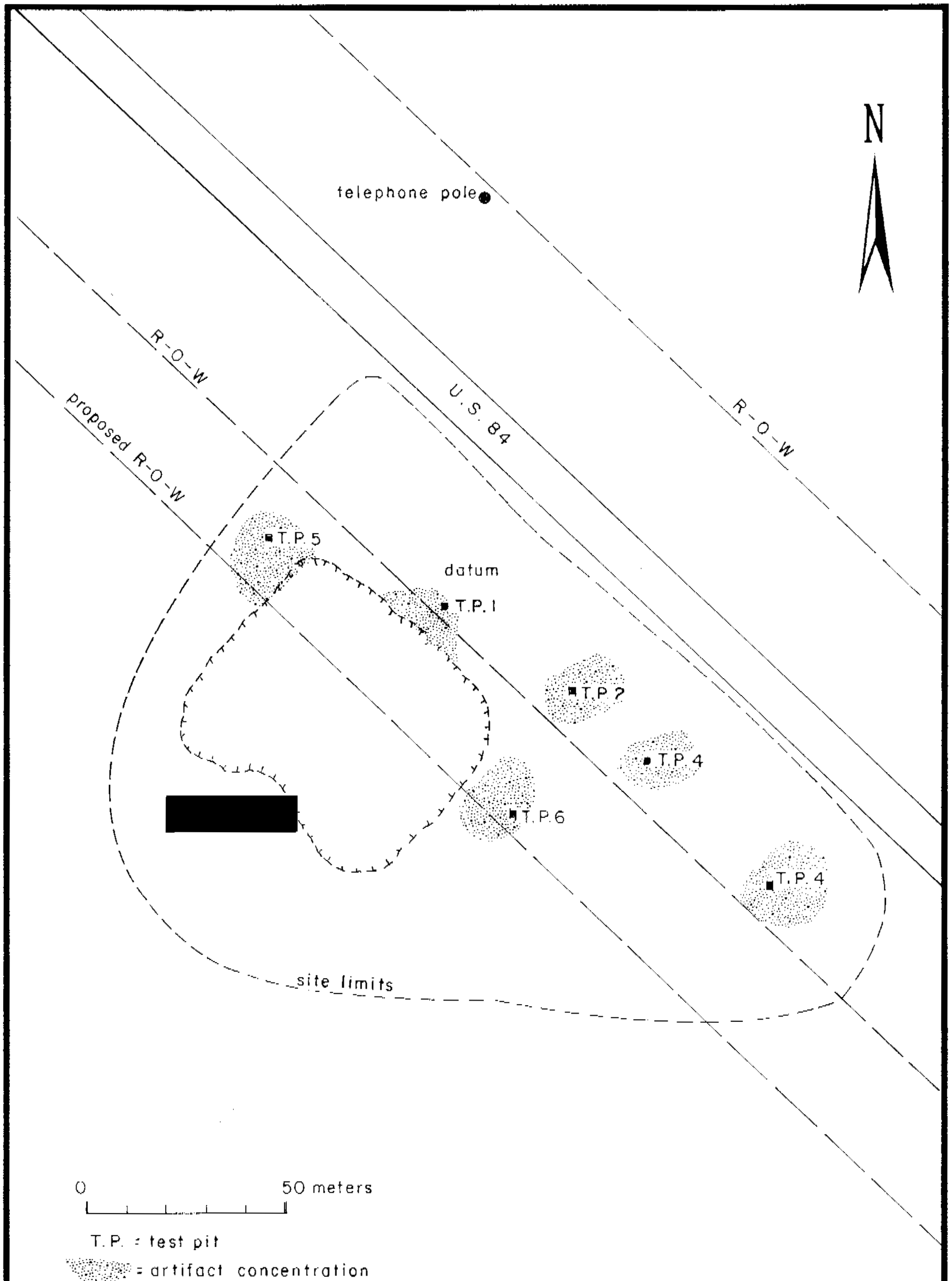

Figure 5. LA 99847 site map.

Figure 6. LA 99847, central portion of the site, looking northeast.

Test Pit 5. Test Pit 5 was within a large surface artifact cluster on the northern edge of the borrow pit. Mixed grasses covered 60 percent of the surface. Three lithic artifacts were collected from Test Pit 5 prior to excavation.

Excavation of Test Pit 5 ended at a depth of 30 cm. Two strata were present within the test pit. Stratum 1 was a yellowish red fine clay. Stratum 2 was a brown, fine, compact clay. No artifacts were found within either stratum.

Test Pit 6. Test Pit 6 was in the central area of the site, east of the borrow pit. A provocative alignment of cobbles suggested the possibility of an intact feature. Surface vegetation was limited to 50 percent mixed grasses. Five lithic artifacts were collected from the surface of the test pit prior to excavation.

Excavation of Test Pit 6 ended at a depth of 40 cm below the present ground surface. Five strata were present within the test pit. Stratum 1 was a fine, reddish brown eolian sand, containing some gravels. One lithic artifact was collected from this stratum. Stratum 2 was a reddish brown clay containing small gravels. One lithic artifact was recovered from this material. Stratum 3 was a dark, reddish brown clay, with some gravel. Stratum 4 was a reddish brown clay with medium to large gravels present. Stratum 5 was a dark reddish brown clay containing some caliche. No artifacts were collected from the lower three strata.

Cultural Features

No intact cultural features or deposits were found within the proposed project limits.

LA 99848 Testing Results

LA 99848 is a diffuse lithic artifact scatter, measuring 145 m by 330 m; site area is 47,850 sq m. Site elevation is 1,424.2 m (4,700 ft). The site is on a small knoll on both sides of US 84 (Fig. 7).

A total of 217 artifacts were piece-plotted on the surface of LA 99848. All recorded artifacts were lithic artifacts. Twenty-eight artifacts were collected from the test pits at LA 99848. These were lithic artifacts that occurred in the upper churned soil layer. LA 99848 has been badly deflated and all of the artifacts are probably redeposited. The presence of livestock also appears to have contributed to site degradation. Three 1-by-1-m test pits were dug at LA 99848.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was placed east of US 84 in an area with surviving soil integrity. Surface vegetation coverage was 30 percent and was comprised of mixed grasses. The rest of the test pit surface was covered with small to medium gravels. Three lithic artifacts were collected from the test pit surface prior to excavation.

Excavation of Test Pit 1 ended at a depth of 30 cm below the present ground surface. Three strata were present. Stratum 1 was a reddish brown sandy clay, containing medium gravel and cobbles. Five lithic artifacts were collected from this stratum. Stratum 2 was a reddish brown sandy clay. This stratum contained small gravel and flecks of caliche. Stratum 3 was a dark reddish brown clay. This stratum contained medium-sized gravel and caliche. No artifacts were recovered from Stratum 2 or 3.

Test Pit 2. Test Pit 2 was in the central part of the site, to the west of the highway. Surface vegetation was comprised of mixed grasses. This coverage totaled 45 percent. The exposed ground surface was covered with small to medium-sized gravel. Three lithic artifacts were collected from the surface of Test Pit 2 prior to excavation.

Excavation of Test Pit 2 ended at a depth of 30 cm below the present ground surface. Four strata were present. Stratum 1 was a yellowish red eolian silty soil. Eight lithic artifacts were collected from Stratum 1. Stratum 2 was a yellowish red clay. This stratum contained small to medium gravels and some broken glass. Four lithic artifacts were collected from this stratum. Stratum 3 was a loose, yellowish red clay containing areas of caliche. Stratum 4 was an alluvial gravel and cobble layer containing some caliche and some clay. No artifacts were recovered from Stratum 3 or 4.

Test Pit 3. Test Pit 3 was to the west of Test Pit 2, in a cluster of surface artifacts. Mixed grasses cover 10 percent of the surface. Three lithic artifacts were collected from the surface of Test Pit 3 prior to excavation.

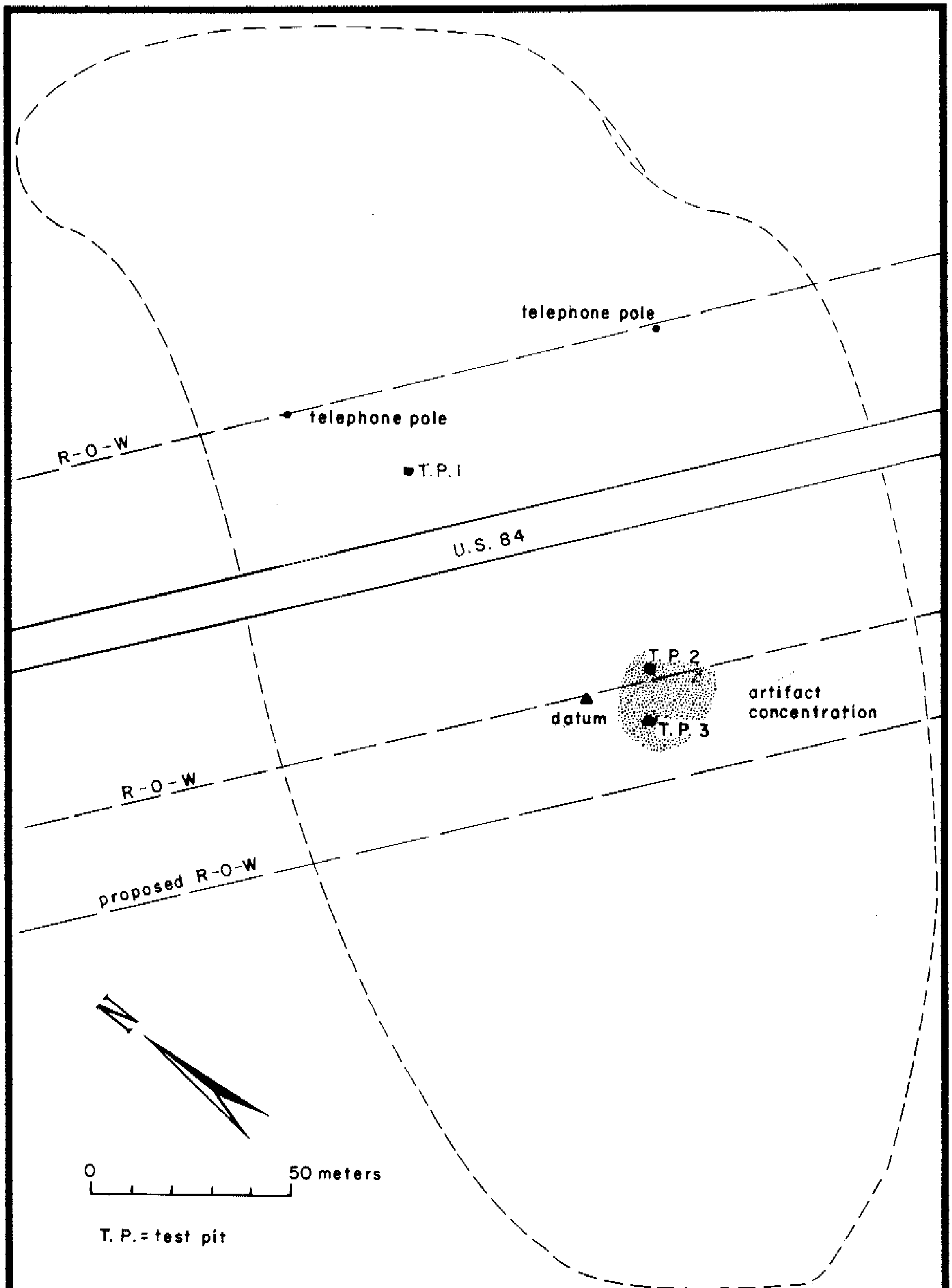

Figure 7. LA 99848 site map.

Excavation of Test Pit 3 ended at a depth of 30 cm below the present ground surface. Two strata were present. Stratum 1 is a fine, yellowish red silty clay. Two lithic artifacts were collected from this stratum. Stratum 2 was a fine, dark reddish brown clay. No artifacts were recovered from this stratum.

Cultural Features

No intact cultural features or deposits were found within the proposed project limits.

LA 99849 Testing Results

LA 99849 is a diffuse lithic artifact scatter measuring 69 m by 50 m; site area is 3,450 sq m. The site is relatively flat, and is on the west side of US 84 (Fig. 8). Site elevation is 1,418 m (4,680 ft).

A total of 28 artifacts were piece-plotted on the surface of LA 99849. All were lithic artifacts. Three artifacts were collected from test pits. The site has been deflated, and most of the surface artifacts have been redeposited. The presence of livestock has contributed to site degradation. Two 1-by-1-m test pits were dug at LA 99849.

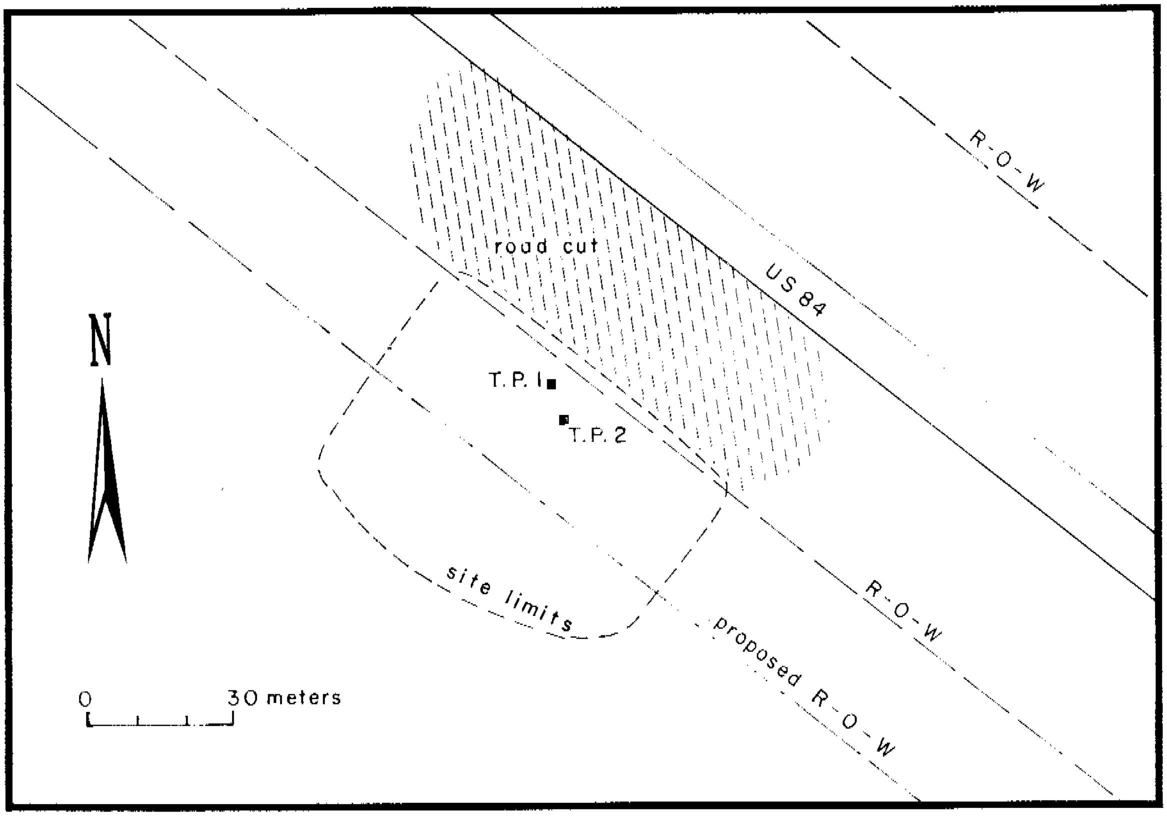

Figure 8. LA 99849 site map.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was in the central part of the site, adjacent to a surface artifact cluster. Mixed grasses covered 40 percent of the surface. One lithic artifact was collected from the surface of Test Pit 1.

Excavation of Test Pit 1 ended at a depth of 30 cm. Three strata were present. Stratum 1 was a brown, fine, silty clay. Two lithic artifacts were collected from this stratum. Stratum 2 was a fine, dark brown, sandy clay. Stratum 3 was a reddish brown sandy clay that also contained flecks of caliche. No artifacts were collected from Stratum 2 or 3.

Test Pit 2. Test Pit 2 was in the central portion of the site, just south of Test Pit 1. Mixed grasses covered 30 percent of the surface. No surface artifacts were collected from Test Pit 2.

Excavation of Test Pit 2 extended to a depth of 30 cm. Three strata were present. Stratum 1 was a dark brown, fine, silty clay. Stratum 2 was a brown, fine, sandy clay. Some small gravel was also present within Stratum 2. Stratum 3 was a reddish brown alluvial sand, that also contained some caliche. No artifacts were recovered from Test Pit 2.

Cultural Features

No intact cultural features or deposits were found within the proposed project limits.

LA 8016 Testing Results

LA 8016 is a diffuse lithic artifact scatter associated with and surrounding a rock outcrop (Fig. 9). The site measures 170 m by 100 m, and is present on both sides of US 84; site area is 17,000 sq m. Site elevation is 1,457.5 m (4,810 ft). LA 8016 was first recorded by Honea and Wood in 1962 (Nelson 1993).

A total of 106 artifacts were piece-plotted on the surface of LA 8016. Nine artifacts were collected from test pits at the site. All of the artifacts were lithic artifacts. The site is badly deflated, and most artifacts have been redeposited. Three 1-by-1-m test pits were dug at LA 8016.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was in the west-central portion of the site, in an area of apparent soil integrity. Mixed grasses covered 45 percent of the surface. No surface artifacts were collected prior to excavation.

The excavation of Test Pit 1 ended at bedrock, a depth of 10 cm. A single stratum was present. This was a yellowish brown, fine eolian soil. No artifacts were recovered from this test pit.

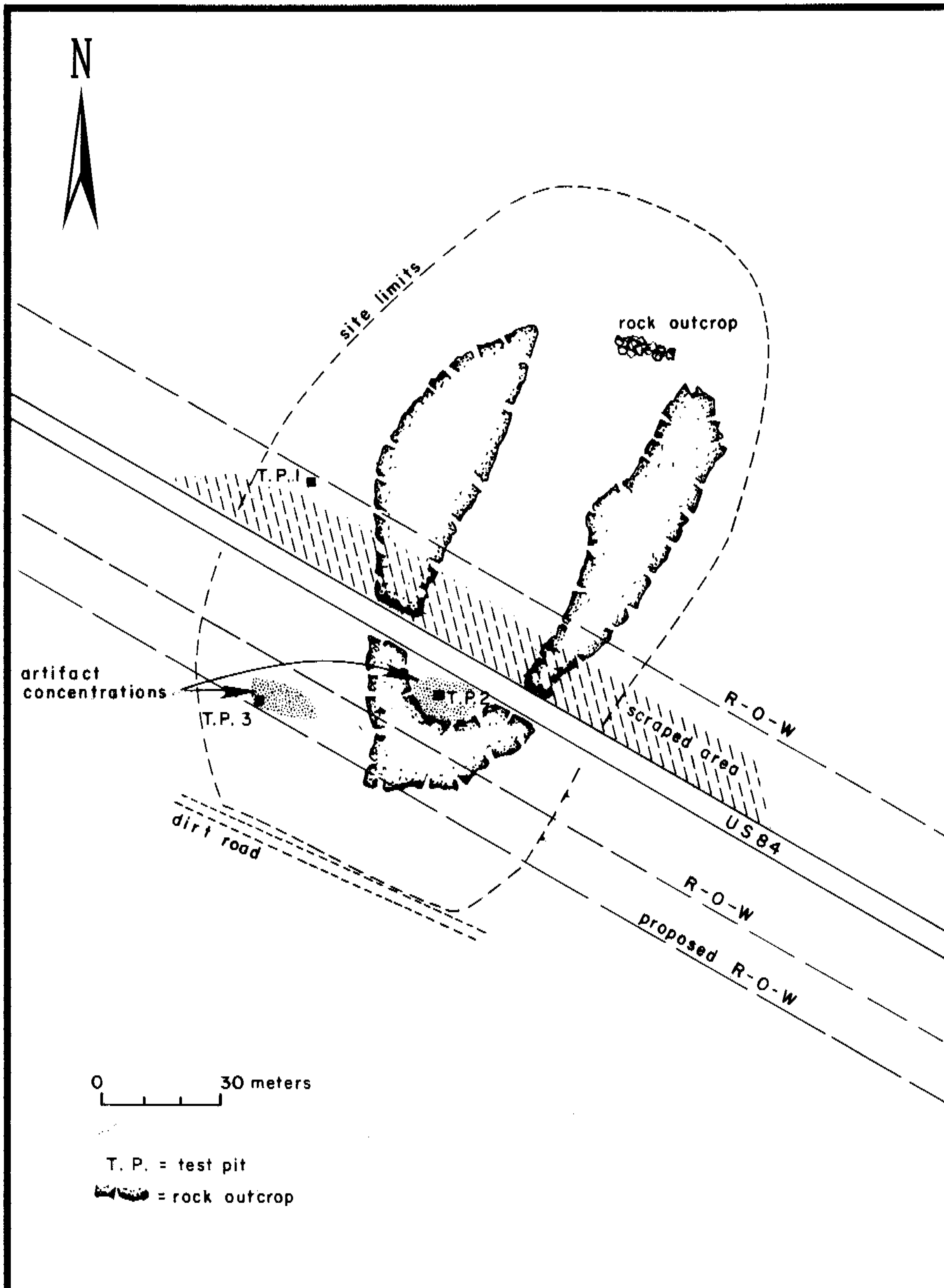

Figure 9. LA 8016 site map.

Test Pit 2. Test Pit 2 was in the central part of the site west of US 84. This test pit was in a slight depression within the rock outcrop. Mixed grasses covered 20 percent of the surface. Four surface artifacts were collected from Test Pit 2 prior to its excavation.

Excavation of Test Pit 2 ended at bedrock, a depth of 20 cm. Three strata were present. Stratum 1 was a dark, yellowish brown, fine sandy clay. One lithic artifact was collected from this stratum. Stratum 2 was a light, yellowish brown clay lens. Stratum 3 was a gray clay, composed of decaying shale, that also contained minor amounts of caliche. No artifacts were collected from Stratum 2 or 3.

Test Pit 3. Test Pit 3 was in the southwestern portion of the site, adjacent to a surface artifact cluster. Vegetation was mixed grasses, covering 40 percent of the surface. Three surface artifacts were collected from Test Pit 3 prior to excavation.

Excavation of Test Pit 3 ended at bedrock, a depth of 20 cm. Two strata were present. Stratum 1 was a dark brown, fine silty clay. One lithic artifact was found within this stratum. Stratum 2 was a dark brown clay containing pieces of decaying shale from the lower bedrock layer. No artifacts were recovered from Stratum 2.

Cultural Features

No intact cultural features or deposits were found within the proposed project limits.

LA 99851 Testing Results

LA 99851 is a thin, diffuse lithic artifact scatter measuring 140 m by 80 m (Fig. 10); site area is 11,200 sq m. The site is on the west side of US 84 in a low swale. Site elevation is 1,445 m (4,769 ft).

A total of 25 surface artifacts, all of them lithic artifacts, were piece-plotted on the surface of LA 99851. Two additional artifacts were collected from test pits. The site has been deflated, and the artifacts are redeposited. The presence of both livestock and a dirt road crossing the site have contributed to site degradation. Two 1-by-1-m test pits were dug at LA 99851.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was in an area of apparent remaining soil integrity, near the center of the site. Vegetation coverage was 70 percent and was comprised of mixed grasses. No surface artifacts were collected prior to excavation of Test Pit 1.

Excavation of Test Pit 1 ended at a depth of 30 cm below the present ground surface. Two strata were present. Stratum 1 was a dark brown, fine, silty eolian soil. Two artifacts, both lithic artifacts, were recovered from this stratum. Stratum 2 was a reddish brown clay. No artifacts were collected from Stratum 2.

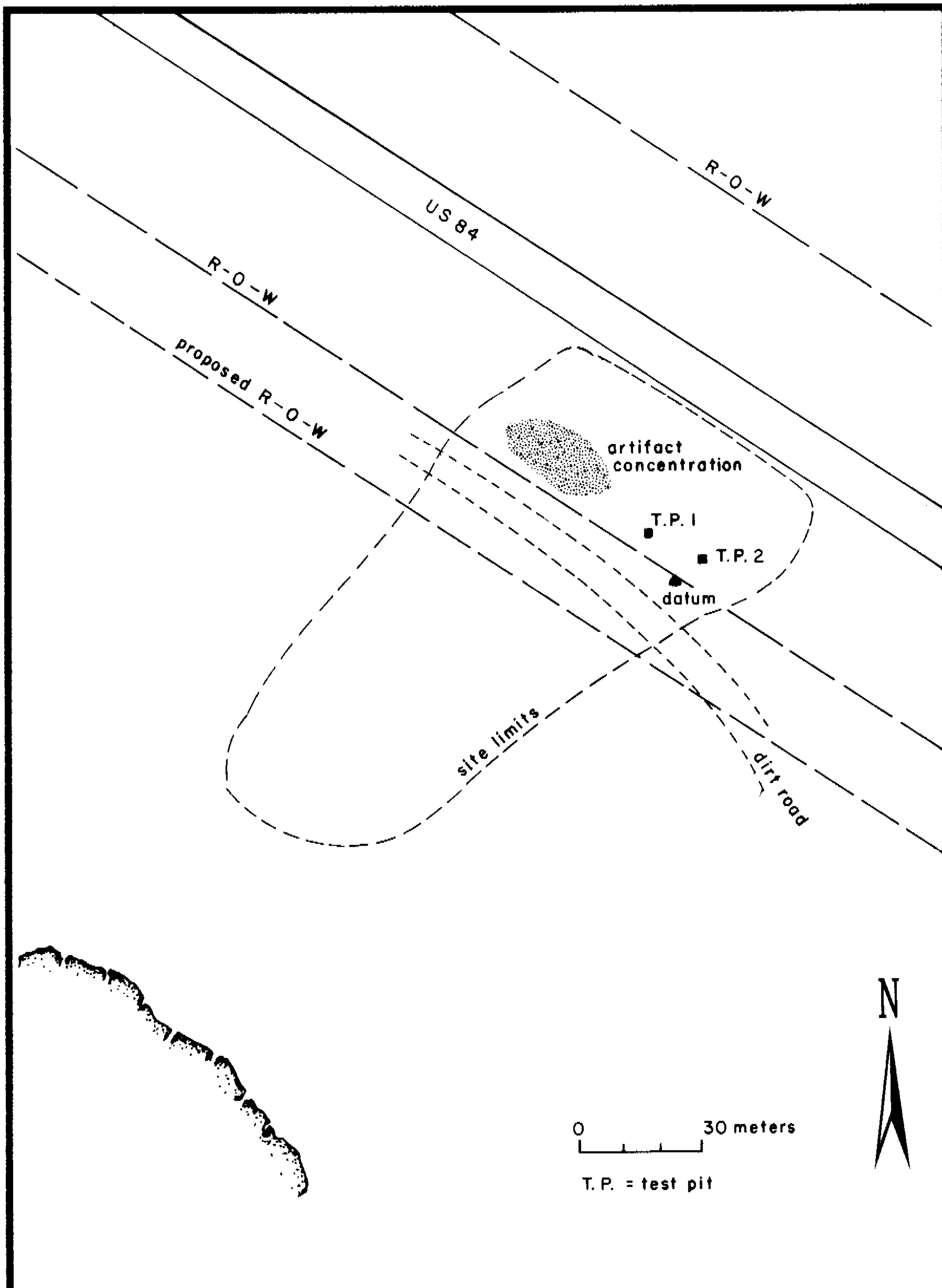

Figure 10. LA 99851 site map.

Test Pit 2. Test Pit 2 was located toward the southern edge of the site. This portion of the site was slightly higher and had the appearance of existing soil integrity. Mixed grasses covered 70 percent of the surface vegetation. No surface artifacts were collected in the area of this test pit.

Excavation of Test Pit 2 ended at a depth of 30 cm below the present ground surface. Two strata, similar in appearance to those recorded in Test Pit 1, were present. Stratum 1 was a dark brown fine eolian soil. Stratum 2 was a reddish brown clay. No artifacts were collected from Test Pit 2.

Cultural Features

No intact cultural features or deposits were found within the proposed project limits.

LA 8015 Testing Results

LA 8015 measures 230 m by 400 m; site area is 92,000 sq m. The site is a diffuse lithic artifact scatter surrounding a number of rock outcrops (Figs. 11, 12). LA 8015 is present on both sides of US 84, although surface artifacts are concentrated to the west of the highway. Site elevation is 1,438 m (4,740 ft). LA 8015 was first recorded in 1962 by Honea and Wood (Nelson 1993).

A total of 321 artifacts were piece-plotted on the surface of LA 8015. Twenty-seven artifacts were collected from test pits. All of the artifacts were lithic artifacts. The site is deflated and most, if not all of the artifacts have been redeposited. Six 1-by-1-m test pits were dug at LA 8015.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was in the central portion of the site, east of US 84 adjacent to a cluster of surface artifacts. Bunch grass covered 70 percent of the surface. No surface artifacts were collected from this pit prior to excavation.

Excavation of Test Pit 1 ended at a depth of 40 cm below the modern ground surface. Three strata were present. Stratum 1 was a reddish brown, fine, sandy silt. Three lithic artifacts were collected from this deposit. Stratum 2 was a reddish brown clay containing small gravels. Stratum 3 was a light gray gritty soil comprised of decaying shale. No artifacts were collected from Stratum 2 or 3.

Test Pit 2. Test Pit 2 was in the southern part of the site, east of the highway and adjacent to a cluster of surface artifacts. Mixed grasses covered 25 percent of the test pit surface. Small to medium gravels were also present on the modern ground surface. No surface artifacts were collected from this test pit.

Excavation of Test Pit 2 ended at a depth of 40 cm. Two strata were present. Stratum 1 was a reddish brown silty soil. Stratum 2 was a reddish brown clay containing a small amount of medium-sized gravel. No artifacts were recovered from either strata within Test Pit 2.

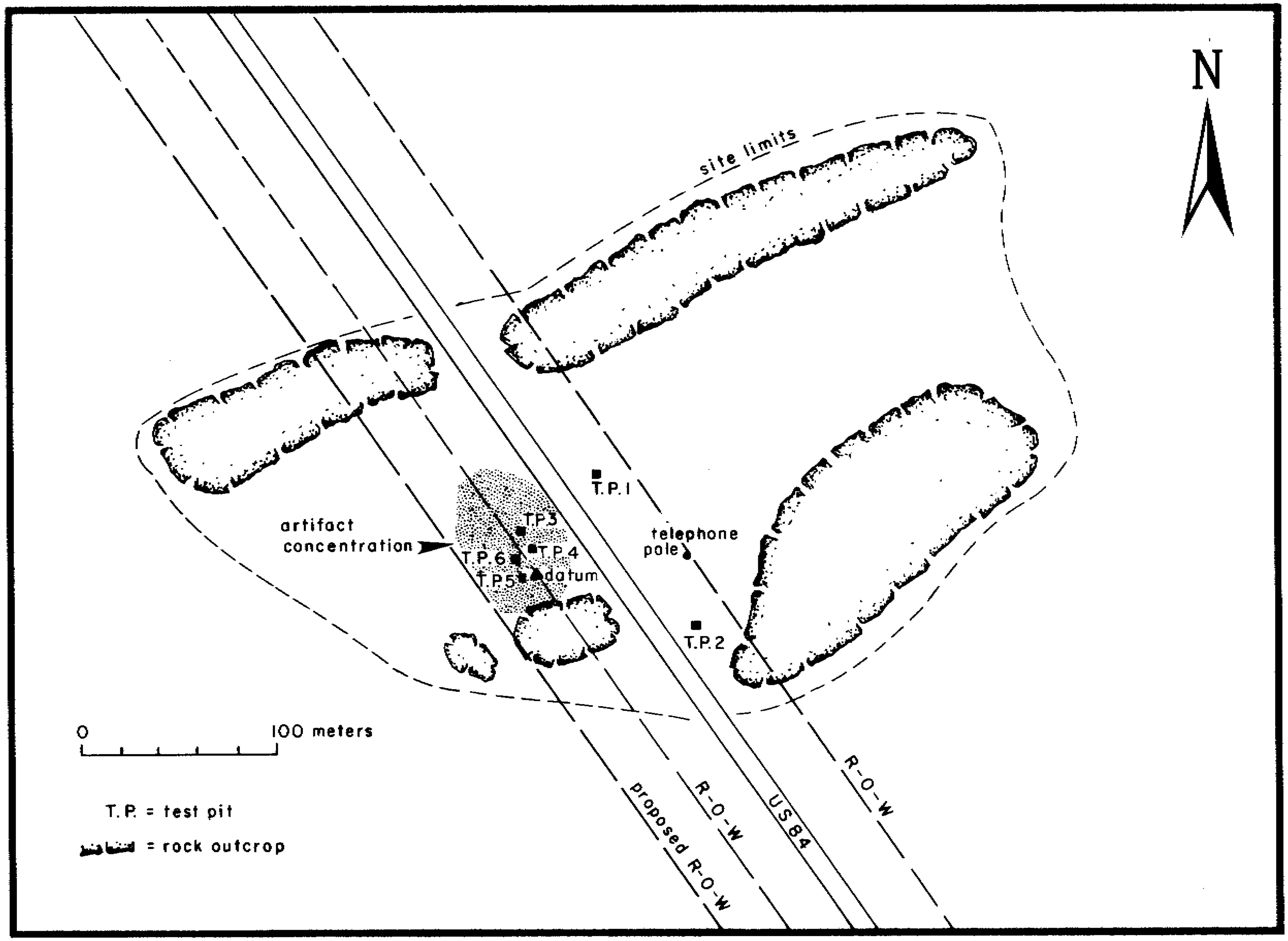

Figure 11. LA 8015 site map.

Figure 12. LA 8015 site overview, looking southeast.

Test Pit 3. Test Pit 3 was in the central portion of the site east of the road in a concentration of artifacts. Bunch grass covered 100 percent of the surface. Six lithic artifacts were collected from the surface of this pit prior to excavation.

Excavation at Test Pit 3 ended at bedrock, a depth of 20 cm. Two strata were present in this area. Stratum 1 was a fine reddish brown clay. Five lithic artifacts were collected from this stratum. Stratum 2 was a reddish brown clay containing some gravel. No artifacts were recovered from this layer. Underlying both of these strata was a soft, decaying gray shale layer.

Test Pit 4. Test Pit 4 was to the south of Test Pit 3. Surface vegetation was limited to mixed grasses on 30 percent of the surface. Four lithic artifacts were collected from the surface prior to excavation.

Excavation at Test Pit 4 ended at bedrock, a depth of 20 cm. Two strata were present. Stratum 1 was a reddish brown eolian silt. Three lithic artifacts were collected from this stratum. Stratum 2 was a dark reddish brown clay containing some sand and pieces of decaying shale. This stratum contained no artifacts. Underlying both of these strata was a soft, decaying variegated red and gray shale layer.

Test Pit 5. Test Pit 5 was to the southwest of Test Pit 4, within the densest concentration of surface artifacts. Mixed grassed covered 25 percent of the surface. No surface artifacts were collected prior to excavation.

Excavation of Test Pit 5 ended at bedrock, a depth of 10 cm below the modern ground surface. Five strata were present within this shallow test pit. Stratum 1 was a fine, light reddish brown silty clay. Strata 2 through 5 were bedded, sloping layers of decaying shale. All of these strata had a similar texture and consistency, varying only in color. This variation in color is due to variation in the parent shale material. No artifacts were recovered from any of these strata present within Test Pit 5.

Test Pit 6. Test Pit 6 was slightly to the southwest of Test Pit 5, still within the large surface artifact concentration. Little Bluestem grass covered 5 percent of the surface. Five lithic artifacts were collected from the surface of this test pit prior to excavation.

Excavation of Test Pit 6 ended at bedrock, a depth of 16 cm. Three strata were present. Stratum 1 was a reddish brown sandy clay. Stratum 2 was a reddish brown silty sandy clay containing pieces of decaying shale. Stratum 3 was the soft decaying upper portion of the shale bedrock. No subsurface artifacts were found in any of the strata.

Cultural Features

No intact cultural features or deposits were found within the proposed project limits.

LA 8014 Testing Results

LA 8014 is a diffuse lithic artifact scatter measuring 90 m by 150 m (Fig. 13); site area is 13,500 sq m. The site is on the west side of US 84 on a steep, north-facing slope. Site elevation is 1,484.8 m (4,900 ft). This site was first recorded by Honea and Wood in 1962 (Nelson 1993).

A total of 148 lithic artifacts were piece-plotted on the surface of LA 8014. Artifacts collected from the test pits at LA 8014 totaled 25. The site is deflated, and most artifacts have been redeposited. The presence of livestock has also contributed to site degradation. Two 1-by-1-m test pits were dug at LA 8014.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was in the northwestern portion of the site. It was placed in an area of possible existing soil integrity, adjacent to the largest surface artifact cluster. Mixed grasses, yucca, and juniper cover 20 percent of the surface. Four lithic artifacts were collected from the surface of this test pit prior to its excavation.

Excavation of Test Pit 1 ended at a depth of 40 cm below the modern ground surface. Three strata were present. Stratum 1 was a dark yellowish brown fine silty alluvial soil containing large to medium cobbles. Nine lithic artifacts were collected from this stratum. Stratum 2 was a dark brown, fine, silty alluvial soil containing both cobbles and mixed gravel. Stratum 3 was a solid bed of caliche. No artifacts were found in either Stratum 2 or Stratum 3.

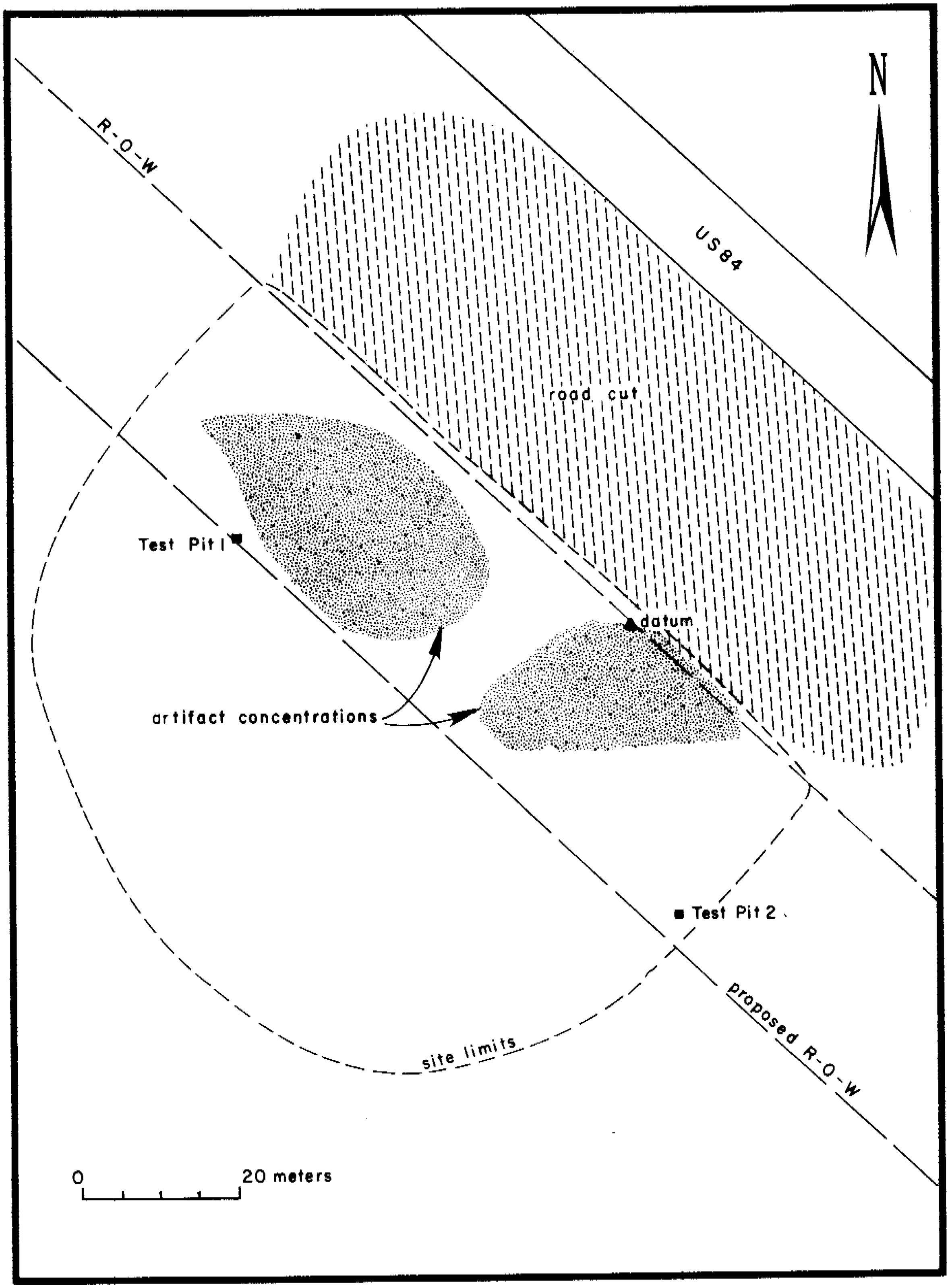

Figure 13. LA 8014 site map.

Test Pit 2. Test Pit 2 was at the southern edge of the site. Surface vegetation in this area was entirely comprised of mixed grasses; surface coverage was 75 percent. Large cobbles were also present on the surface. Four surface artifacts, all lithic artifacts, were collected from Test Pit 2.

Excavation of Test Pit 2 ended at a depth of 30 cm below the modern ground surface. Three strata were present. Stratum 1 was a dark yellowish brown silty alluvial soil containing gravel. Six lithic artifacts were recovered from this stratum. Stratum 2 was a dark yellowish brown silty soil containing small amounts of both clay and gravel. Stratum 3 was a solid bed of pinkish gray caliche, containing some gravel. No artifacts were found in either of the lower two strata.

Cultural Features

No intact cultural features or deposits were found within the the proposed project limits.

LA 8013 Testing Results

LA 8013 is a lithic artifact scatter measuring 227 m by 106 m on the western side of US 84 (Fig. 14); site area is 24,062 sq m. The site is on a north- and west-facing slope. Site elevation is 1,460.6 m (4,820 ft).

A total of 128 lithic artifacts were piece-plotted on the surface of LA 8013. These occurred as a single diffuse scatter. Four artifacts were collected from the test pits. All of these artifacts were lithic artifacts. The site has suffered from sheet erosion, particularly outside of the existing right-of-way, where the presence of livestock has contributed to site degradation. Five 1-by-1-m test pits were dug at LA 8013. This site was first recorded in 1962 by Honea and Wood (Nelson 1993).

Test Unit Descriptions

Test Pit 1. Test Pit 1 was located at the base of the slope, in an area of possible remaining soil integrity. Cholla, mesquite, and mixed grasses covered 40 percent of the surface. No surface artifacts were collected from the area of Test Pit 1.

Excavation at Test Pit 1 ended at a depth of 40 cm below the present ground surface. Three strata were present. Stratum 1 was a reddish brown sandy silt. Stratum 2 was a reddish brown sandy clay. Stratum 3 was a compact gray clay. No artifacts were found within any of the strata present.

Test Pit 2. Test Pit 2 was in the central part of the site, just to the east of a rock outcrop in a relatively flat area. Mixed grasses covered 60 percent of the surface. Small gravel covered most of the remaining surface of Test Pit 2. No surface artifacts were collected prior to excavation taking place.

Excavation of Test Pit 2 ended at a depth of 30 cm below the existing modern ground surface. Four strata were present. Stratum 1 was a reddish brown sandy silt. A single lithic

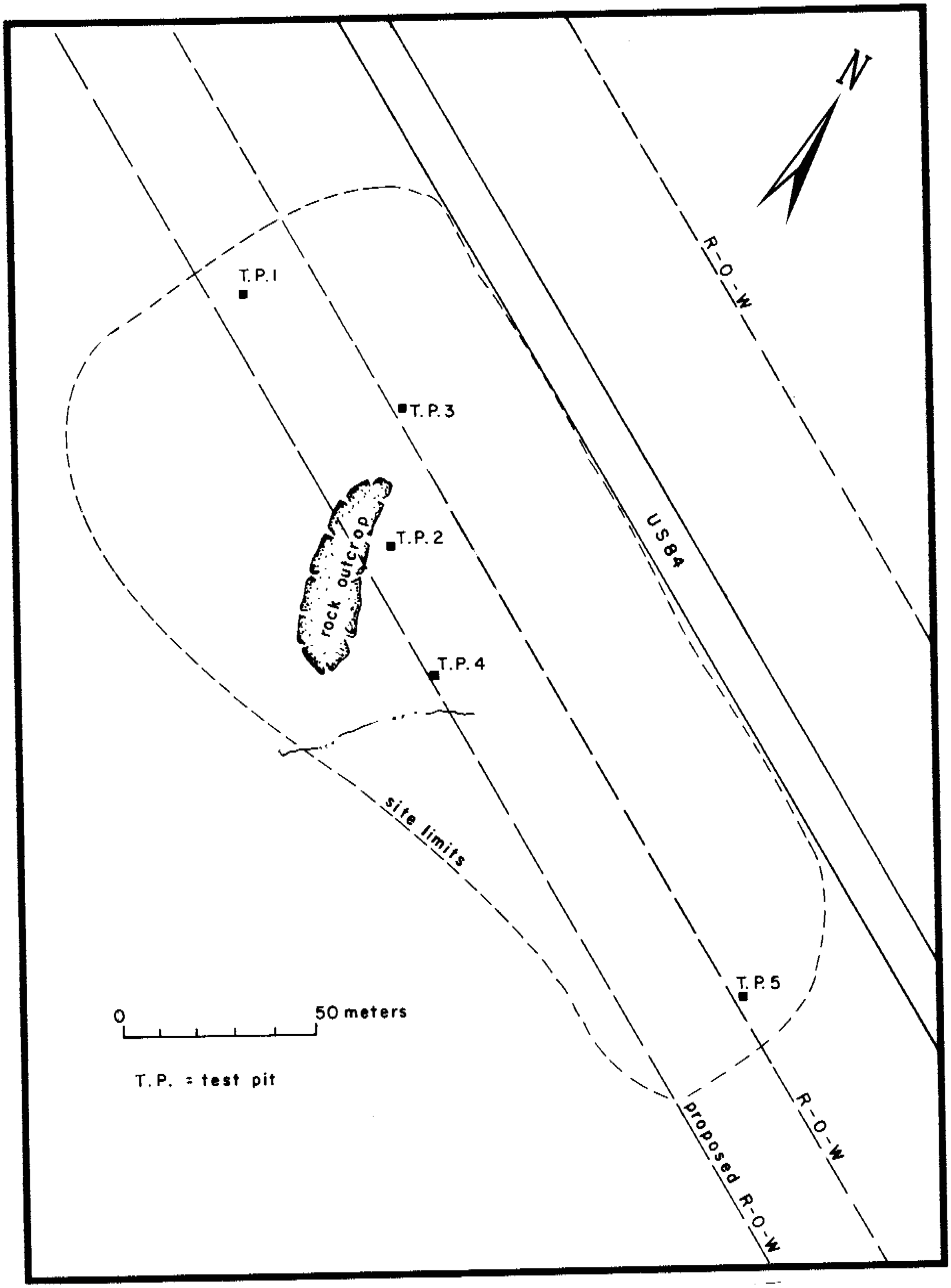

Figure 14. LA 8013 site map.

artifact was collected from this stratum. Stratum 2 was a reddish brown silty clay. Stratum 3 was a dark reddish brown clay containing pieces of gray shale. Stratum 4 was a light gray, soft decaying shale layer. No artifacts were recovered from Stratum 2, 3, or 4.

Test Pit 3. Test Pit 3 was located in the northern portion of the site adjacent a cluster of surface artifacts. Bunch grass covered 90 percent of the surface. No surface artifacts were collected prior to test pit excavation.

Excavation of Test Pit 3 ended at bedrock, a depth of 30 cm. Two strata were present. Stratum 1 was a reddish brown fine silty clay. One lithic artifact was collected from this stratum. Stratum 2 was a dark reddish brown clay containing some gravels, pieces of decaying shale, and flecks of caliche. No artifacts were recovered from this second stratum. Underlying these two strata was a soft decaying mottled red and gray shale layer.

Test Pit 4. Test Pit 4 was adjacent to a cluster of surface artifacts, in the central portion of the site. Mixed grasses covered 90 percent of the surface. No artifacts were collected from the surface of Test Pit 4.

Excavation of Test Pit 4 ended at a depth of 30 cm. Two strata were present. Stratum 1 was a reddish brown sandy silt. One lithic artifact was collected from this layer. Stratum 2 was a reddish brown clay. No artifacts were found within this second stratum.

Test Pit 5. Test Pit 5 was in the extreme southern portion of the site. This was adjacent to a cluster of surface artifacts. Mixed grasses covered 95 percent of the surface. Some surface gravels were also present. No surface artifacts were collected in the area of this test pit.

Excavation of Test Pit 5 ended at a depth of 30 cm below the present ground surface. Four strata were present in this portion of the site. Stratum 1 was a dark brown sandy silt containing a high percentage of medium gravel. A single lithic artifact was recovered from this stratum. Stratum 2 was a dark brown clay containing small gravel. Stratum 3 was a dark brown clay containing medium to large gravels. Stratum 4 was a dark reddish gray clay that contains pieces of decaying shale. No artifacts were found in Stratum 2, 3, or 4.

Cultural Features

No intact cultural features or deposits were found within the proposed project limits.

LA 99852 Testing Results

LA 99852 is a large diffuse lithic artifact scatter measuring 396 m by 250 m (Fig. 15); site area is 99,000 sq m. The site is located on both sides of US 84. Site elevation is 1,448.4 m (4,780 ft). LA 99852 slopes downward toward the south and east.

A total of 567 artifacts were piece-plotted on the surface of LA 99852. All of the recorded artifacts were lithic artifacts. Fifteen artifacts were collected from the test pits. The site is deflated, and most artifacts have been redeposited. The presence of livestock has also

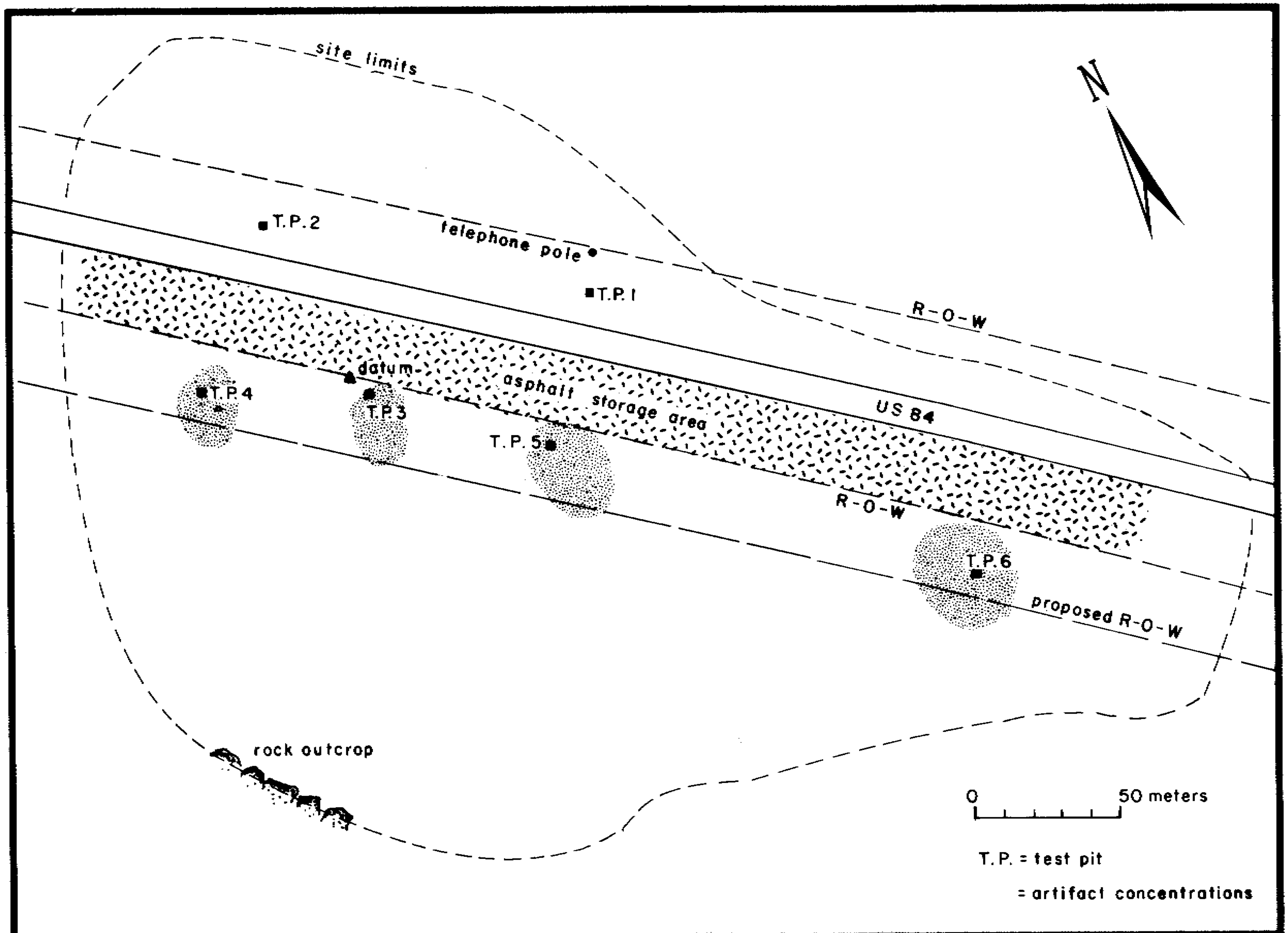

Figure 15. LA 99852 site map.

contributed to site degradation. The center of the site has been used by the county for the storage of asphalt. Six 1-by-1-m test pits were dug at LA 99852.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was adjacent to a large surface artifact cluster on the east side of US 84. Mixed grasses and mesquite covered 70 percent of the surface. Medium-sized gravel covered 10 percent of the test pit surface. No surface artifacts were collected in this area prior to test pit excavation.

Excavation of Test Pit 1 ended at a depth of 30 cm below the present ground surface. Two strata were present. Stratum 1 was a reddish brown silty clay. Stratum 2 was a dark reddish brown clay. No artifacts were collected from either stratum.

Test Pit 2. Test Pit 2 was located in the northern portion of the site, east of US 84, adjacent to a surface artifact cluster. Mixed grasses and cholla covered 40 percent of the surface. One lithic artifact was collected from the surface of this test pit prior to excavation.

Excavation of Test Pit 2 ended at a depth of 30 cm below the present ground surface. Three strata were present in this portion of the site. Stratum 1 was a dark reddish brown sandy clay. Stratum 2 was a reddish brown clay containing flecks of caliche. Stratum 3 was a light gray sandy clay that also contained pieces of decaying shale. No artifacts were collected from any of these strata.

Test Pit 3. Test Pit 3 was in the central portion of the site, to the west of US 84. Twenty-five percent of the test pit surface was covered with vegetation, all of it mixed grasses. No surface artifacts were collected from this portion of the site.

Excavation of Test Pit 3 ended at bedrock, a depth of 10 cm below the modern ground surface. One stratum was present. This was a light grayish brown silty clay. Underlying this was a light gray shale. No artifacts were recovered from Test Pit 3.

Test Pit 4. Test Pit 4 was in a cluster of surface artifacts in the northwestern area of the site. Mixed grasses covered 60 percent of the surface. One lithic artifact was collected from the surface of Test Pit 4.

Excavation of Test Pit 4 ended at a depth of 30 cm below the present ground surface. Three strata were present. Stratum 1 was a dark brown sandy silt containing some gravel. Stratum 2 was a dark brown clay. Stratum 3 was a light brownish gray clay. No artifacts were present in any of these strata.

Test Pit 5. Test Pit 5 is located in the central portion of the site. This is west of the highway, and in the middle of the largest surface artifact cluster on the site. Mixed grasses covered 70 percent of the surface. One lithic artifact was collected from the surface of Test Pit 5 prior to excavation.

Excavation of Test Pit 5 ended at a depth of 40 cm below the present ground surface. Three strata were present in this area. Stratum 1 was a reddish brown sandy clay containing some gravel. Four lithic artifacts were collected from this stratum. Stratum 2 was a dark reddish brown clay. One lithic artifact was found in this stratum. Stratum 3 was a reddish brown clay containing flecks of caliche. No artifacts were present within this layer.

Test Pit 6. Test Pit 6 was located in the southeastern portion of the site. Mixed grasses covered 65 percent of the surface. Six lithic artifacts were collected from the surface of this test pit.

Excavation of Test Pit 6 ended at a depth of 30 cm below the present ground surface. Three strata were present. Stratum 1 was a yellowish red sandy clay. One lithic artifact was collected from this stratum. Stratum 2 was a dark reddish brown clay containing some sandy grit. Stratum 3 was a reddish brown clay that contained flecks of caliche. No artifacts were found in Stratum 2 or 3.

Cultural Features

No intact cultural features or deposits were found within the proposed project limits.

LA 99853 Testing Results

LA 99853 is a dual component site measuring 40 m by 30 m (Fig. 16); site area is 1,200 sq m. One component is a diffuse lithic artifact scatter. The second component is a historic component consisting of a cement masonry windmill base and an associated thin surface scatter of historic artifacts. The remains of a stone structure are also present on the site, but are outside of the proposed project limits to the west. The site is on a slight northwest-facing slope, on the western side of US 84, at an elevation of 1,462 m (4,825 ft). The site is deflated and the surface artifacts have been redeposited. The presence of livestock has also contributed to site degradation.

A total of 56 surface artifacts were piece-plotted. Surface artifacts consisted of 42 lithic artifacts and 14 historic artifacts. The historic artifacts include 2 pieces of purple glass, 1 piece of graniteware, 2 barrel straps, the wheel bracket from a wagon, and 4 hole-in-top cans. One historic artifact of note was a triangle fashioned from a wagon box rod (Fig. 17). Five 1-by-1-m test pits were dug at the site. Four lithic artifacts were recovered from the test pits. The lithic artifacts are concentrated in the southern portion of the site, and the historic artifacts are scattered across the northern portion.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was in the center of the site, in an area of possible remaining soil integrity. This was just west of a cluster of both historic and lithic artifacts. Mixed grasses covered 80 percent of the surface. No surface artifacts were collected from Test Pit 1 prior to excavation.

Excavation of Test Pit 1 ended at a depth of 30 cm below the present ground surface. Two strata were present. Stratum 1 was a brown sandy soil containing some gravel. Stratum 2 was a dark brown clay. No artifacts were collected from either strata.

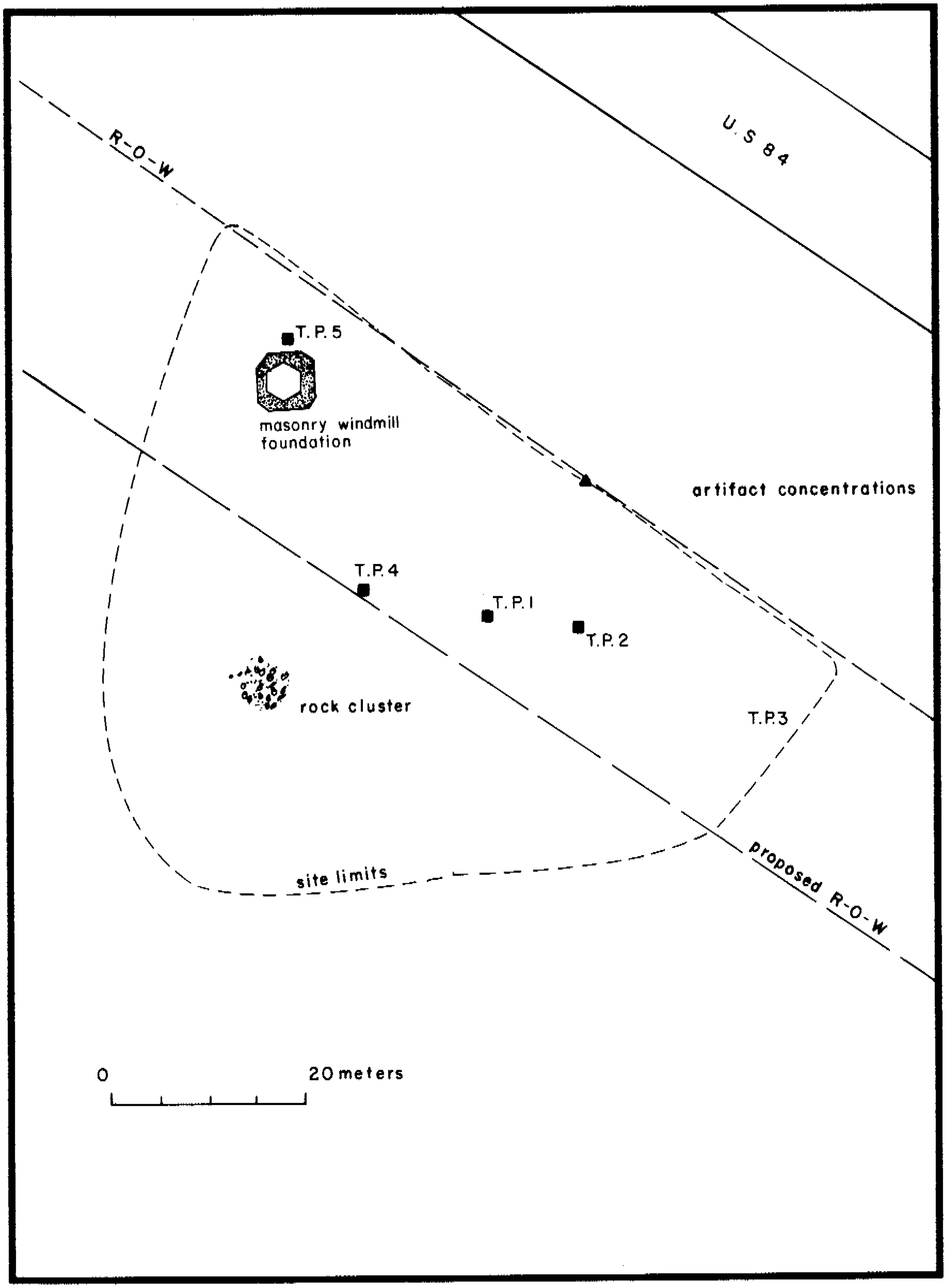

Figure 16. LA 99853 site map.

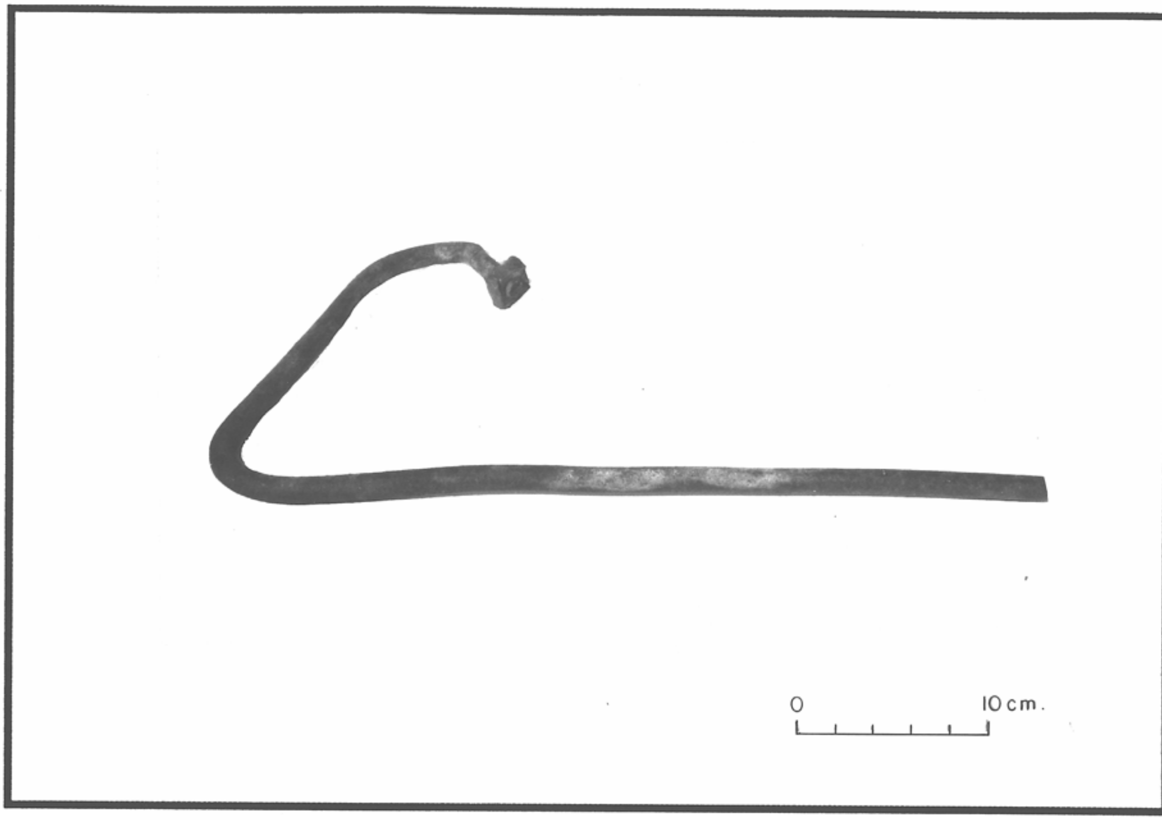

Figure 17. LA 99853, historic triangle made from a wagon box rod.

Test Pit 2. Test Pit 2 is located in the central portion of the site 8 m east of Test Pit 1. Mixed grasses cover 90 percent of the surface. No surface artifacts were collected from this portion of the site.

Excavation of Test Pit 2 ended at a depth of 30 cm below the present ground surface. Two strata were present. Stratum 1 was a reddish brown sandy clay. Stratum 2 was a reddish brown clay containing some gravels and flecks of caliche. No artifacts were found within Test Pit 2.

Test Pit 3. Test Pit 3 was placed in the extreme southeastern portion of the site. This area is the highest in elevation on the site. Mixed grasses covered 60 percent of the surface, although cholla was adjacent to the test pit. One lithic artifact was collected from the surface of this test pit prior to excavation.

Excavation of Test Pit 3 ended at a depth of 30 cm below the present ground surface. Two strata were present. Stratum 1 was a fine, reddish brown sandy clay. Stratum 2 was a compact reddish brown clay. No artifacts were recovered from either strata.

Test Pit 4. Test Pit 4 was in the central portion of the site, adjacent to a cluster of surface artifacts and in an area of possible remaining soil integrity. Mixed grasses covered 90 percent of the surface. No artifacts were collected from the surface of Test Pit 4 prior to excavation.

Excavation of Test Pit 4 ended at a depth of 30 cm below the present ground surface. Two strata were present. Stratum 1 was a reddish brown silty clay. Four artifacts were collected from Stratum 1 of Test Pit 4. Two lithic artifacts were collected, and the other two artifacts were historic. One historic artifact was part of a metal door latch, the other was a fragment of ironstone pottery. Stratum 2 was a dark reddish brown sandy clay. No artifacts were collected from Stratum 2.

Test Pit 5. Test Pit 5 was placed in the western portion of the site, adjacent to the concrete windmill base (Feature 1). Mixed grasses covered 80 percent of the surface. No artifacts were collected from the surface of this test pit.

Excavation of Test Pit 5 ended at a depth of 30 cm below the present ground surface. Two strata were present. Stratum 1 was a yellowish red sandy clay. One lithic artifact was collected from this stratum. Stratum 2 was a dark reddish brown sandy clay that contained some gravels and flecks of caliche.

Cultural Features

One feature, a cast concrete and wooden windmill base, was present. Although this feature appears to have some age, no artifacts were found that would directly tie this feature temporally to the historic artifacts present at the site. The number of artifacts found in association is small and their actual connection to the windmill is questionable. The historic artifacts suggest a date for the site's historic component between 1900 and the 1940s.

LA 8009 Testing Results

LA 8009 is a dual component site measuring 240 m by 170 m (Fig. 18); site area is 40,800 sq m. The site consists of a thin, diffuse lithic artifact scatter and six rock art panels of possible historic origin, located within the right-of-way. What appears to be a possible historic dugout structure is part of the site, but is located to the east, outside of the proposed project limits. LA 8009 is at an elevation of 1,454.5 m (4,800 ft).

The site is east of US 84, on a high ridge topped with a shale rock outcrop and large shale boulders. This ridge was cut by the construction of US 84. The site was first recorded by Honea and Wood in 1962 (Nelson 1993). The site slopes downward towards the east from the shale rock outcrop. A late Archaic Scallorn projectile point was recovered from the site during survey (Fig. 19). Three additional unidentifiable projectile point fragments were recovered during testing.

A total of 54 surface artifacts were piece-plotted on the surface of LA 8009. Five artifacts were recovered from the test pits. All of the artifacts were lithics. Surface artifacts analyzed in the field included three projectile points and one piece of shell. The site is deflated and most of the artifacts are redeposited. The presence of livestock has also contributed to site degradation. Six 1-by-1-m test pits were dug at LA 8009 (Figs. 20-21).

Six rock art panels are present within the right-of-way (Fig. 22). Each panel appears to be Anglo or Hispanic in origin and consists of letters, numbers, or pictures scratched or pecked into the rock surface. Several of the inscriptions are legible English or Spanish words. Each panel is located on the upward facing surface of a separate boulder. The rock art appears

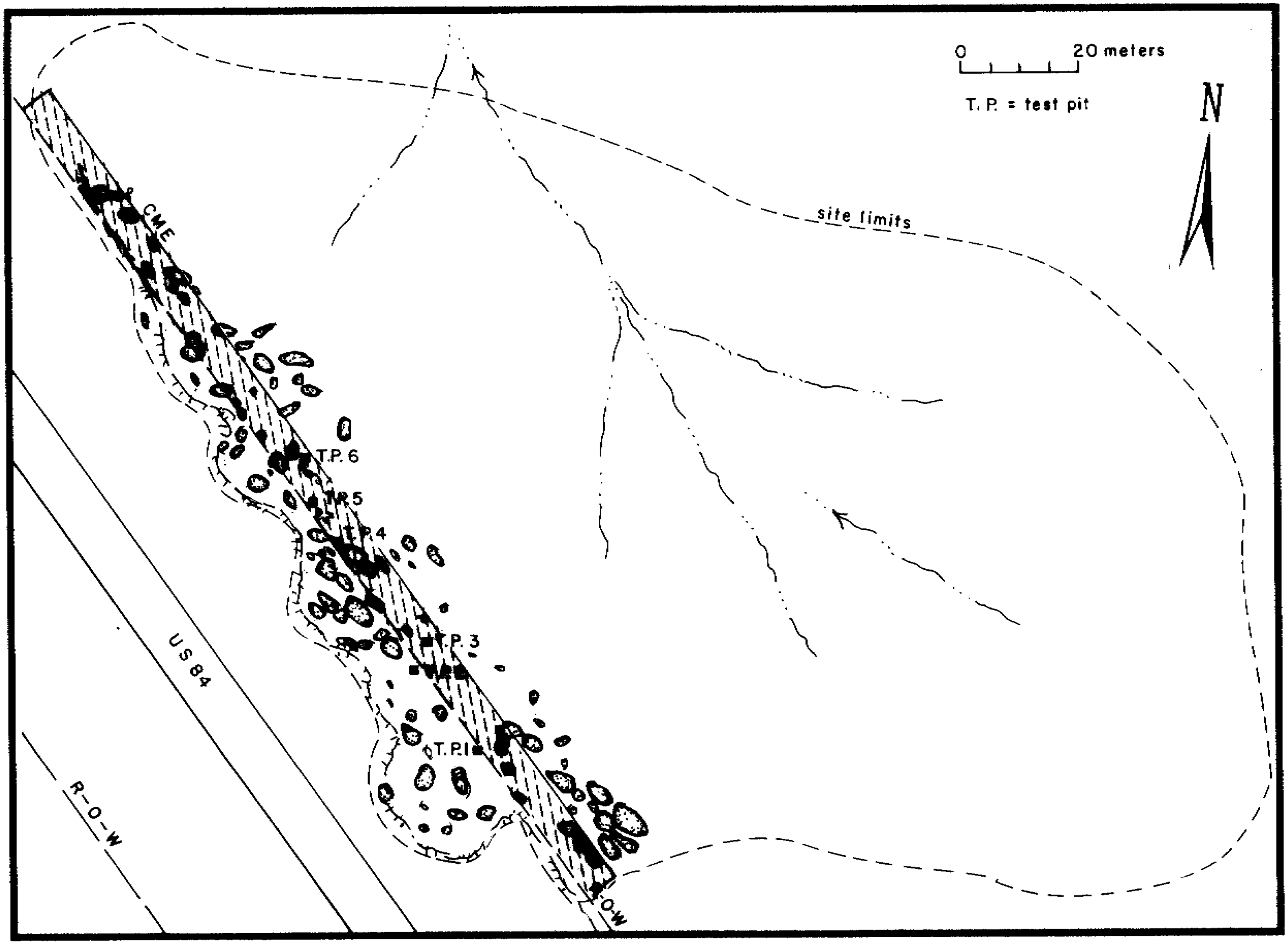

Figure 18. LA 8009 site map.

Figure 19. LA 8009, obsidian Scallorn projectile point, Late Archaic.

to vary in age from possible historic to recent, with the newer scratches located in the same panels directly over some of the older inscriptions. The soft nature of the rock (a shale), suggests even the most weathered inscriptions may be recent. The presence of new graffiti over several of the older inscriptions indicates the area is still being visited. A small number of lithic artifacts were found adjacent to the rock art panels, but are part of the earlier site component.

Test Unit Descriptions

Test Pit 1. Test Pit 1 was in the southwestern portion of the site, located in an area that exhibited soil depth. Surface vegetation was limited to mixed grasses, with surface coverage at 40 percent. A projectile point was collected from the modern ground surface of this test pit prior to it being excavated.

Excavation of Test Pit 1 ended at bedrock, a depth of 20 cm below the present ground surface. Two strata were present. Stratum 1 was a dark reddish brown sandy clay containing some gravel. Stratum 2 was a dark reddish brown sandy soil containing some pieces of decaying shale. Underlying both strata was a soft decaying shale bedrock. No artifacts were collected from Test Pit 1.

Test Pit 2. Test Pit 2 was approximately 16 m northwest of Test Pit 1, between two surface artifact clusters. Mixed grasses covered 60 percent of the surface. No surface artifacts were collected in this area prior to Test Pit 2 being excavated.

Excavation of Test Pit 2 ended at bedrock, 11 cm below the modern ground surface. One stratum was present, comprised of decaying shale, which ended on solid rock. No artifacts were recovered from this stratum.

Test Pit 3. Test Pit 3 was in the southern part of the site. Mixed grasses covered 30 percent of the surface. No artifacts were collected from Test Pit 3 prior to its excavation.

Excavation of Test Pit 3 ended at bedrock, 7 cm below the present ground surface. Stratum 1 was a reddish brown sandy soil. Underlying this stratum was shale bedrock. No artifacts were found within Stratum 1.

Figure 20. LA 8009, mapping rock art, looking southwest.

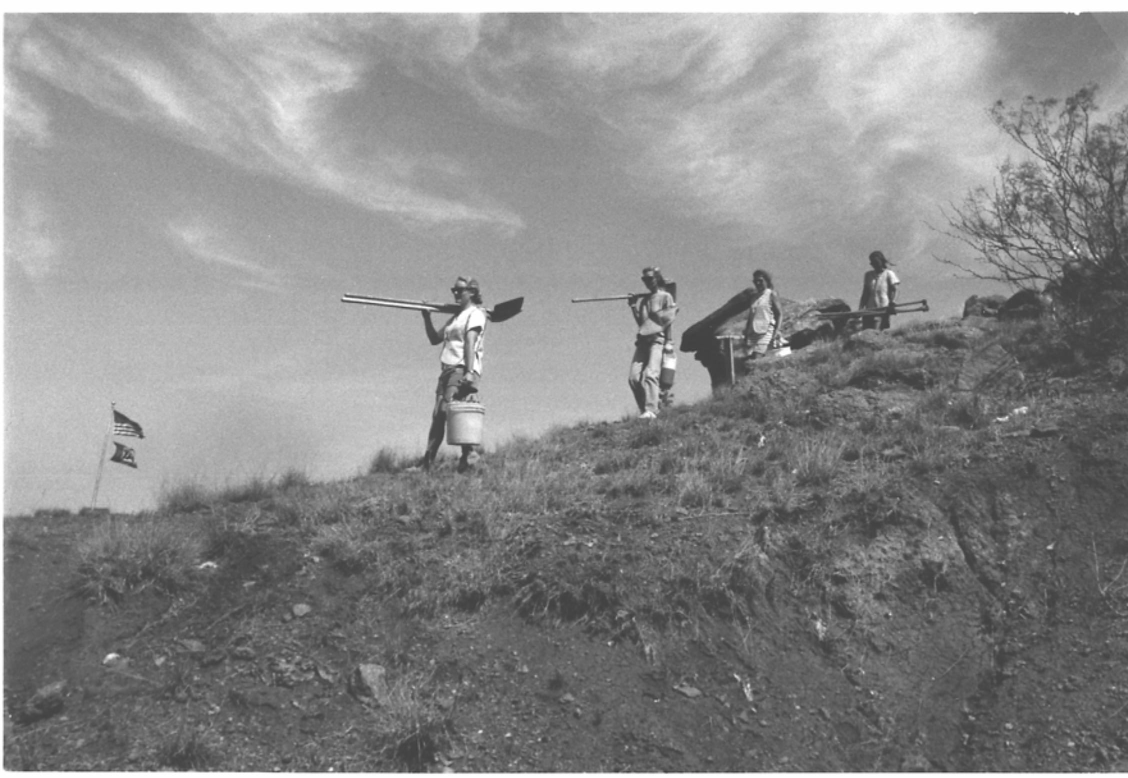

Figure 21. LA 8009, last day of project, looking northwest.

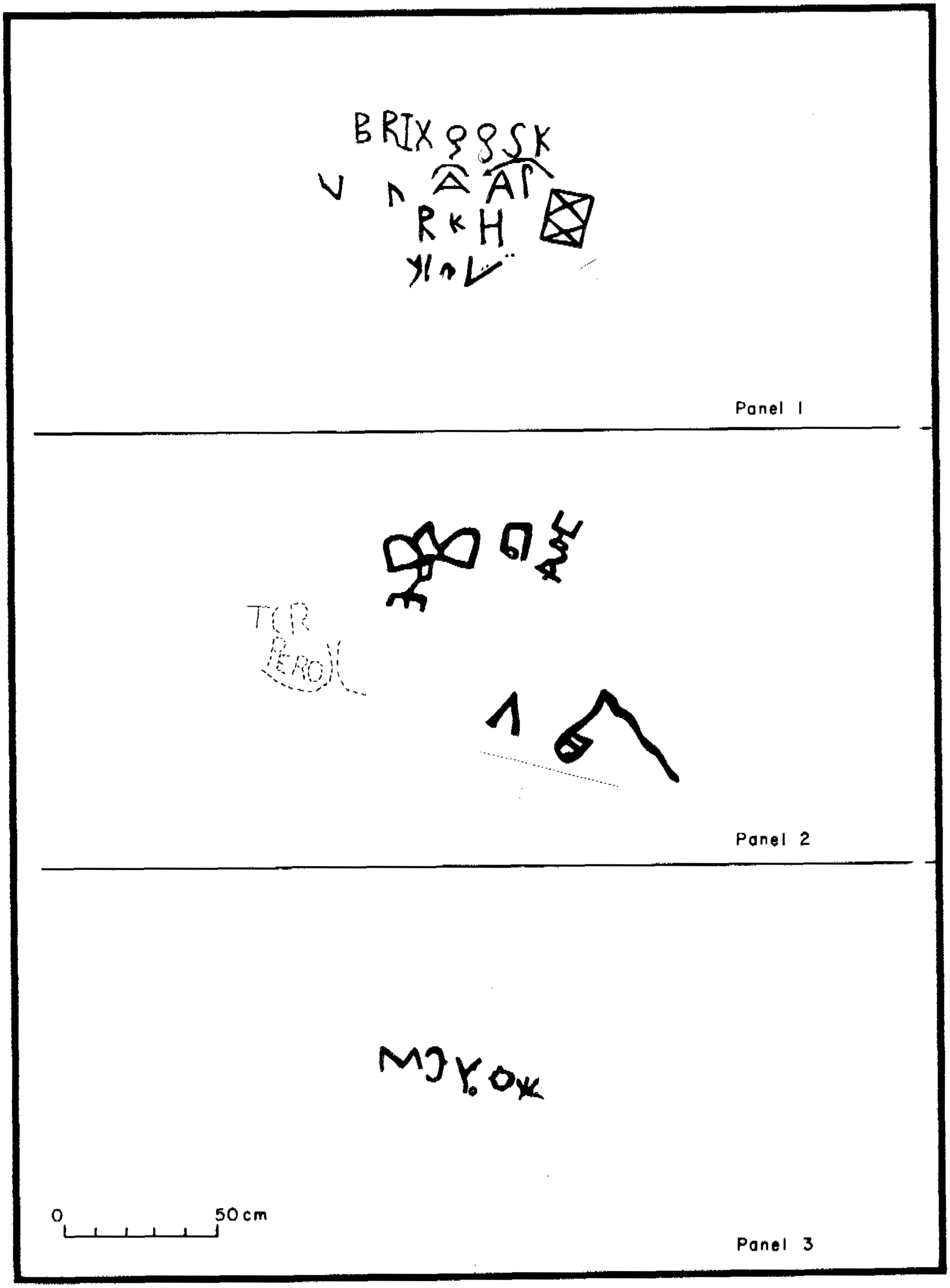

Figure 22. LA 8009 rock art panels 1-3.

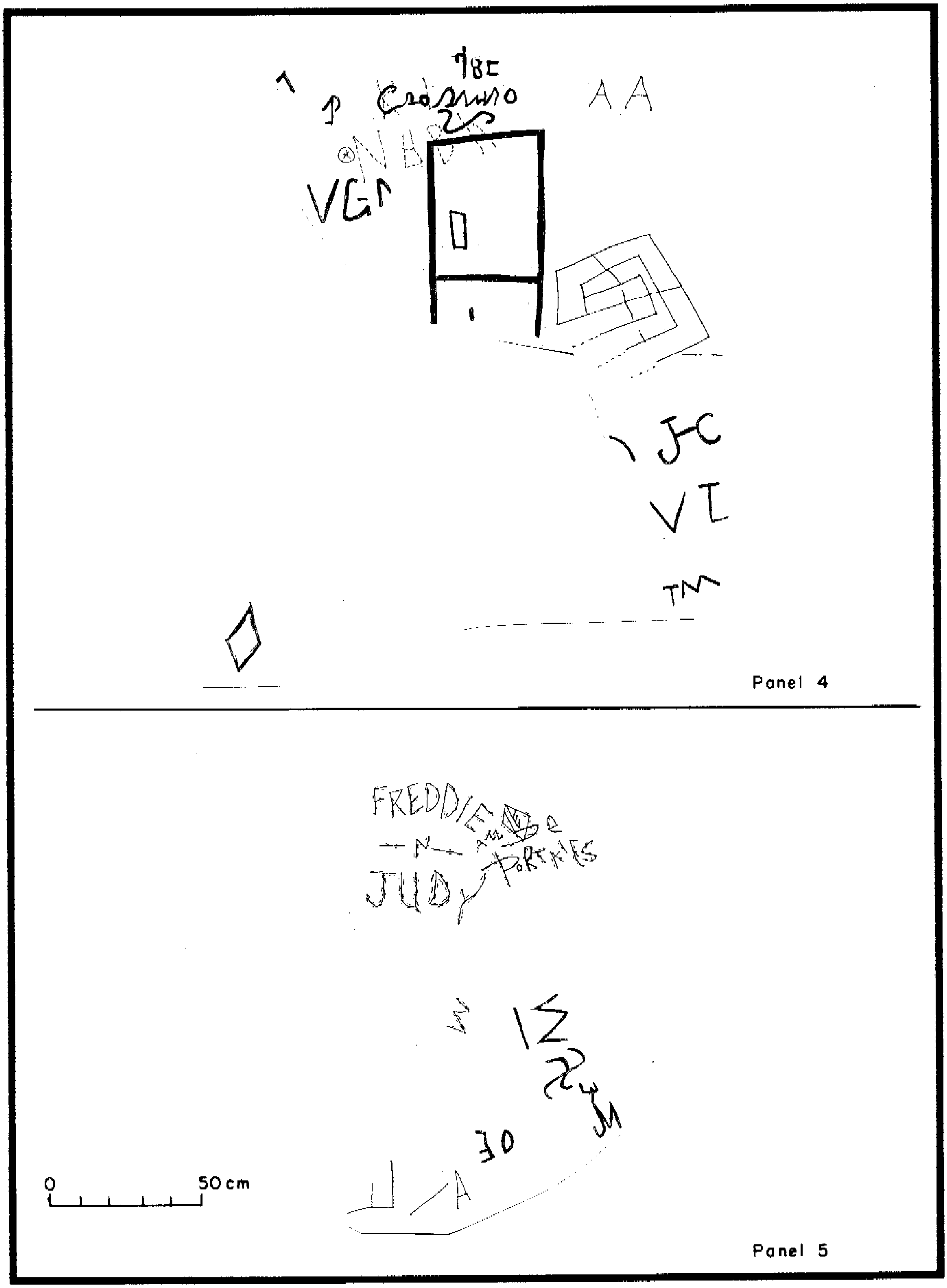

Figure 22. Continued, panels 4 and 5.

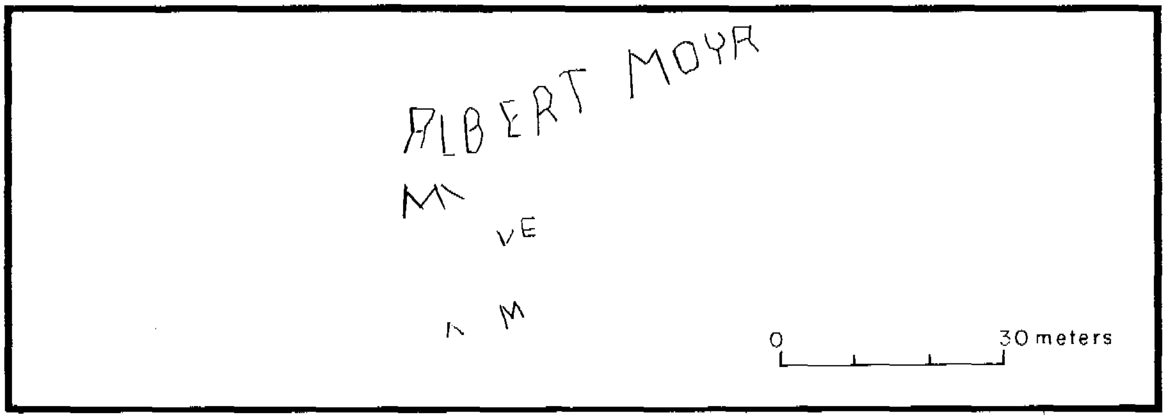

Figure 22. Continued; panel 6.

Test Pit 4. Test Pit 4 was positioned in a narrow area between two of the rock-art-covered boulders. Mixed grasses covered 100 percent of the surface. No artifacts were collected from the surface of this test pit.

Excavation of Test Pit 4 ended at bedrock, a depth of 24 cm below the present ground surface. Two strata were present. Stratum 1 was a dark brown sandy soil composed of decaying shale. Three lithic artifacts were collected from this stratum. Stratum 2 was a compact, dark brown sandy soil containing pieces of decaying shale. No artifacts were recovered from Stratum 2.

Test Pit 5. Test Pit 5 was in a clearing between two surface artifact clusters. Surface vegetation was limited to mixed grasses, with surface coverage of 70 percent. No surface artifacts were collected in this area prior to test pit excavation.

Excavation of Test Pit 5 ended at bedrock, a depth of 10 cm. One small area of the pit was taken down another level to a depth of 20 cm. One stratum of material was present in Test Pit 5. This was a fine, sandy soil containing large amounts of decaying shale. No artifacts were collected from this test pit.

Test Pit 6. Test Pit 6 was the farthest north of any of the test pits at LA 8009. Bunch grass covered 10 percent of the surface. No artifacts were collected from the surface of this test pit.

Excavation of this test pit ended at bedrock, a depth of 7 cm. One stratum was present. Stratum 1 was a sandy silty soil containing large amounts of decaying shale. No artifacts were found in this test pit.

Cultural Features

Cultural features within the proposed project limits are restricted to rock art panels of possibly historic age.

Summary

Intact cultural features occur on only 2 of the 12 sites within the proposed project area: (1) A historic masonry windmill base with a small number of possibly associated artifacts (LA 99853), and (2) six rock art panels, possibly old enough to be historic (LA 8009). No artifacts were found associated with this feature. In both cases, the potential for recovering additional data beyond that already documented appears to be unlikely. No additional investigations are recommended.

LITHIC ARTIFACT ANALYSIS

A total of 2,791 lithic artifacts from twelve sites were analyzed. A majority of the artifacts were from the present ground surface and were analyzed in the field. A small number of subsurface artifacts were collected and analyzed in Santa Fe. Surface artifacts collected in 1962 from four of the five sites recorded at that time, were also analyzed. These additional lithic artifacts totaled 12 for LA 8016, 30 for LA 8015, 17 for LA 8014, and 23 for LA 8009.

Analytical Methods

Attributes chosen for the field lithic analysis reflected the desire to achieve the greatest return of useful information within the available time constraints. The guidelines and format of the Office of Archaeological Studies' *Standardized Lithic Artifact Analysis: Attributes and Variable Code Lists* (OAS Staff 1995) were followed.

Microwear analysis was deemed impractical and too time consuming for field analysis. Microwear analysis is also limited in its ability to make specific interpretations concerning the worked material (Neusius 1988:211). Relative distinctions in artifact wear can be made based upon the hardness of the contact material (Neusius 1988:211), but failure to deal with the variation caused by differences in material properties (Brose 1975), including hardness, makes most analogy interpretations questionable. In areas of active environmental action, such as these site areas, weathering also confuses microwear studies (Schurrenberger and Bryan 1985:137).

The following attributes were included the in analysis.

Material Type

Codes for material types are for general material groups unless the material is unquestionably from a recognized source. For example, although a wide range of chert occurs on these sites, all were classified as "chert." If a specimen was of a specifically named chert (such as Alibates chert), it would have been coded by the specific name.

Morphology (Artifact Type)

This is the characterization of artifacts by form.

Portion

Portion is the part of the artifact recovered. Flakes and tools can be whole or fragmentary. Angular debris and cores are whole by definition.

Dorsal Cortex

Cortex is estimated to the nearest 10 percent increment. For flakes, this is the cortex on the dorsal surface. Cortex on the platform was not included. For other morphological types, the percentage of cortex on all surfaces is estimated and added together.

Flake Platform

Flake platform is recorded for whole and proximal flakes. Either the morphology of the impact area prior to flake removal or extreme modifications of the impact area caused by the actual flake removal is coded.

Size

Artifact size is recorded in millimeters.

Edge Number

Each utilized edge on an artifact was given an edge number. Consecutive numbers were used for artifacts with more than one utilized edge. Artifacts could conceivably have one or more utilized edge. Each edge was analyzed separately for function and wear patterns.

Function

Function characterizes and describes use on all artifacts.

Wear Patterns

Artifact modification caused by human use is coded as wear.

Analytical Results

Analysis was accomplished with two objectives in mind. The environmental setting of the sites should suggest the types of activities for which the locale is suited. Activities indicated by the lithic artifact assemblage can be used to define the range of tasks represented. We can also devise a list of expectations as to when and how the site area was used. The same general use can result in different artifact assemblages depending on the cultural group using the area. Thus, a hunting party from a logistically organized Pueblo might utilized the space in a differently than hunters from a mobile seasonal camp. The sites were evaluated within this context.

In the field, a bias toward larger more easily observed flakes probably skewed our data with regard to flake size and morphology. Large flakes tend to be core flakes from early stages of reduction and tend to exhibit unmodified platforms. The predominance of core flakes exhibiting cortical or single-faceted platforms in these assemblages may be the result of a sampling bias of this type, rather than from early stage lithic reduction. Few hammerstone flakes (spalls from hammerstones) were found on any of the sites. Angular debris, which occurs at all stages of flint knapping, was also present in low quantities. Low rates of angular debris to flakes are an indication of tool manufacturing.

The lithic artifact data are presented by attributes, enabling comparisons among the 12 sites.

Material Selection

Material use serves as an indication of human decision-making processes with regard to the suitability of materials (Young and Bonnichsen 1985:128). Testing material samples presumed to be usable lithic material and their subsequent discard indicates the accepted suitability of lithic materials for tool manufacture or use within a culture.

Two materials dominate these artifact assemblages. These are chert and a metamorphic sandstone, commonly known in the region as graywacke or greenwacke (Banks 1990:89)(Tables I.1-I.12). Lithic artifacts composed of metamorphic sandstone form the largest category of material in the assemblages from sites LA 8009 (59.7 percent), LA 99846 (65.9 percent), LA 99847 (46.8 percent), and LA 99848 (68.4 percent). Chert forms a majority of the remaining artifact assemblages LA 8013 (45.3 percent), LA 8014 (62.2 percent), LA 8015 (47.5 percent), LA 8016 (74.8 percent), 99849 (61.3 percent), LA 99851 (70.4 percent), LA 99852 (53.0 percent), and LA 99853 (73.9 percent). At sites with metamorphic sandstone as the largest material component, chert is the second highest occurring material. The reverse is true on sites where chert makes up the largest category of material used. On these sites metamorphic sandstone is the principal secondary material.

Other materials occur in extremely small amounts. Most of this material, such as quartzitic sandstone and silicified wood, is readily available in the local gravels and river terraces. Small amounts of exotic material are also present on a number of the sites. Obsidian is present at LA 8009 and LA 99852. Visually this appears to be from the Jemez Mountains of north-central New Mexico. The occurrence of both local and nonlocal lithic materials is common on Archaic sites (Perry 1987:225).

Material resembling Alibates chert is present in the assemblages from five sites (LA 8014, LA 8015, LA8016, LA 99846, and LA 99848). Although this material visually resembles Alibates chert from the Canadian River Valley located to the northeast, attributing it to this source is problematic. Small pieces of similar material were visible in the local Pleistocene gravels suggesting a possible Pecos Valley origin. The identification of cherts in this area of New Mexico is proving more complicated than previously thought. Cherts from the Tecovas, Chinle, and Yeso formations occur in this general region of the Pecos Valley (Banks 1990:88). These cherts, in particular Tecovas chert because of its wide range of color and texture, are easily confused with other cherts (Banks 1990:92). Madera cherts, originating in the Sangre de Cristo Mountains, are also present in the Pecos River Valley (Banks 1990:89). The wide range of color, texture, and flaking properties of Madera cherts (Banks 1990:72) includes material visually similar to Alibates chert.

Artifact Morphology and Material

Core flakes make up the largest morphological group within each of the data sets. Core flakes are also the largest morphological group within most material categories. This was not always true with the smaller more limited material classes.

Metamorphic sandstone, chert, and to a lesser extent siltstone, are the main materials utilized on these 12 sites, with chert having the largest artifact morphology range. This was true for all data sets.

Flake Morphology and Flake Portion

Whole flakes are the largest category of flake portion in the artifact assemblage (Tables I.13-I.24). Proximal flake fragments form the second largest category at most sites. Lateral flake fragments form the second largest category at LA 99853.

Flake portions vary within each flake type category. Except for cor flakes, other flake categories occur in extremely low frequencies. Proximal flake fragments outnumber distal flake fragments by a ratio greater than 2:1, except at LA 8013 (1:1.2), LA 8015 (1.1.9), and LA 99847 (1:1.9). Two of the 12 sites (LA 99851 and LA 99853) had no distal fragments present in their lithic artifact assemblages. Flake portions may have been affected by the presence of livestock on the sites. Cattle and horses can easily break or modify flakes by stepping on them. All 12 of the sites within the project area have been heavily grazed for decades.

Dorsal Cortex and Platform Type

The amount of cortex on lithic artifacts and the predominance of core flakes exhibiting cortical or single-facet platforms can provide evidence of the stage of lithic reduction that took place within a given locale. Cortical and single-facet platforms are predominant in this assemblage (see Tables I.13-I.24). Single-facet platforms dominate all flake assemblages except at LA 99853 where cortical platforms are the majority. Cortical and single-facet platform frequencies are equal on two sites (LA 99848 and LA 99849).

Dorsal cortex is present on a majority of artifacts in each site assemblage (Appendix I, Tables I.25-I.36). The percentage of artifacts with cortex varies from site to site, ranging from a low of 76.8 percent at LA 8009, to a high of 92.6 percent at LA 99851.

The range of cortex occurrence is indicative of material reduction, the greater the range of cortex present within a material category, the more likely it is that reduction of that material took place. In this manner, evidence for the reduction of the two most common materials (chert and metamorphic sandstone) is present on all twelve sites. Siltstone reduction probably occurred at six sites (LA 8013, LA 8014, LA 8015, LA 99847, LA 99848, and LA 99852). The reduction of both quartzite and silicified wood appears to have occurred at LA 8013. Quartzite and quartzitic sandstone reduction probably took place at LA 8015. Both LA 99847 and LA 99848 show evidence of quartzitic sandstone reduction.

Utilization by Material

Use analysis is limited primarily to presence or absence, and a description of the form of utilization or wear. Bidirectional wear is traditionally considered an indication of cutting or slicing, while unidirectional wear was thought to indicate scraping. Experiments conducted by Vaughan (1985) and Moore (J. L. Moore, pers. comm. 1992), indicate that wear patterns are unreliable indicators of the type of use.

Notches and denticulates are more specialized tool forms and may be indicators of specific activities connected with the manufacture and maintenance of items constructed from perishable materials (Wikle 1977:14-15). As with other tools, however, they may have been used in a variety of ways for which they were not designed. The range of recorded wear patterns on tools from these sites show that a number of activities, involving more than just tool manufacturing and finishing, took place.

Utilized single-function artifacts (artifacts with a single utilized edge) for all 12 sites are primarily metamorphic sandstone and chert, with siltstone occurring as a distant third material (Appendix I, Tables I.37-I.48). These three materials span the greatest number of functional categories, although most functional categories span the whole range of material types on at least some of the 12 sites. LA 99846 has the narrowest range of materials represented by functional categories, with virtually all functional artifacts limited to metamorphic sandstone and chert.

Artifacts exhibiting two functions parallel single-function artifacts with regard to material use (see Appendix I, Tables I.37-I.48). Metamorphic sandstone and chert predominate, with siltstone also utilized on some sites. Quartzitic sandstone is present within the multiple function artifact assemblages for sites LA 8014 and LA 8015. LA 8015 also contains Alibates chert (two pieces), exhibiting multiple functions. Rhyolite exhibiting multiple functions is present at LA 99846 where it is one of only two utilized artifacts not comprised of either chert or metamorphic sandstone. Both quartzite and silicified wood are present as multiple-function artifacts at LA 99852.

Artifacts exhibiting three functions occur in low frequencies on five sites (LA 8014, LA 8015, LA 99846, LA 99847, and LA 99852) (see Appendix I, Tables I.37-I.48). Materials represented decrease as the number of artifacts decrease, however the number of functions increase. All of these artifacts are utilized debitage except for a single hammerstone flake present at LA 8014.

Material Quality

Single-function artifacts reflect the dominant materials of each site assemblage. Depending on the site involved, this is either metamorphic sandstone (medium to coarse grained), chert (medium to fine grained), or siltstone (medium to fine grained). This pattern of material use is repeated by multiple-function artifacts. Artifact use thus appears to be determined by material availability and not material quality.

Finer grained lithic materials (chert, silicified wood, fine-grained quartzite, and siltstone), are exactly the cryptocrystalline, isotropic, highly silicious lithic materials with elastic qualities that are usually considered the most desirable for reduction (Crabtree 1972:4-5). These materials also produce the sharpest cutting edges, rather than the more durable edges produced by coarser grained materials (Akins and Bullock 1992:26).

The material quality of both single- and multiple-function classes indicates selection for convenience (locally available materials) rather than for material quality. Both are related to project area site locations near, but in, the Pecos Valley.

Use of the project area by groups unfamiliar with the region may account for the preference of locally available lithic material. Kelley and Todd (1988:231-244) have suggested just such a strategy for the early Paleoindian period. A similar exploitation strategy by later Archaic, Anasazi, historic Pueblo, or even Plains groups unfamiliar with the area is possible.

The reliance on immediately available lithic resources may also be related to the possible sudden need for lithic tools, presumably by successful hunting parties. This need for quick, expedient tools could result in the utilization of the immediately available lithic material of adequate quality. This use strategy could be dictated by a hunting strategy designed for exploitation of the local landscape, transcending cultural affiliation.

Tools

Diagnostic artifacts are rare on these sites. Two of the 12 sites can be assigned to cultural periods based on artifacts within their assemblages. The assignment of LA 8009 to the Late Archaic is based on the occurrence of a single Late Archaic Scallorn projectile point (Fig. 19). This point is constructed of a variegated obsidian that is visually similar to that from the Jemez area of north-central New Mexico. Three additional unidentifiable projectile point fragments were recovered from this site.

The presence of two beaked gravers (see Fig. 4) on LA 99546 suggests this is a late Paleoindian site. Beaked gravers are strongly characteristic of the late Paleoindian period (Benedict 1992:356). The absence of projectile points however, makes any finer dating of the site impossible.

Use of the sites as logistical or resource extraction locations rather than residential areas should be supported by the presence of bifaces and biface resharpening flakes (Akins and Bullock 1992:27). A biface is a flake or core blank that has been reduced on both faces from two parallel but opposing axes (Kelly 1988:718). Bifaces can be used as either tools or cores without further modification, thus maximizing tool edges and providing durable, long use-life tools, while minimizing the amount of lithic material transported. Bifaces have the advantage over other lithic tools by being reliable, easy to maintain, and potentially reshapeable. A difference in biface frequencies should be evident between residential versus logistical sites (Kelly 1988:721-723). Biface production and use in residential sites should result in large proportions of biface flakes, low numbers of utilized biface flakes, low numbers of simple cores, and a high frequency of expedient flake tools as opposed to utilized biface flakes. Bifacial tools would be produced and maintained in residential sites, but used as tools or cores on logistical sites, resulting in large numbers of utilized biface thinning flakes. Large unifaces may also occur as part of this biface tool complex. Three sites within the project area (LA 99846, LA 99847, and LA 99849) could be residential sites based on this criteria.

Limited numbers of bifaces and biface resharpening flakes show evidence of biface production and use, but the noncore flake tool component for most of these sites is too small to test the application of this model. The high occurrence of cores and core flakes suggest emphasis on the use of local rather than exotic materials (Kelly 1988:719).

Table 1. Site Debitage:Tool Ratios

Site Number	Debitage:Tool Ratio	Tool Percentage
LA 8009	0.5:1	56.0
LA 8013	3.5:1	27.0
LA 8014	2.8:1	35.6
LA 8015	2.9:1	34.2
LA 8016	3.8:1	25.9
LA 99846	3.0:1	33.0
LA 99847	3.1:1	31.3
LA 99848	2.7:1	36.8
LA 99849	2.2:1	45.1
LA 99851	3.0:1	33.3
LA 99852	2.8:1	35.5
LA 99853	2.8:1	34.7

The debitage to tool (including utilized debitage) ratios and percentages vary for each site (Table 1).

The proportion of formal tool forms comprising prehistoric tool kits tends to change through time and space, reflecting the range and duration of activities pursued (Christensen 1987:77). The nature of these assemblages is such that any classification of cultural affiliation beyond a rough determination of late Paleoindian, Early Archaic, or Archaic is not possible. Tool location has been determined to aid in the interpretation of site occupation (Schlanger 1991). These sites are too deflated and modified for this to be successfully attempted. The occurrence of utilized debitage as expedient tools may indicate a wider range, or more intense pursuit, of activities took place than those represented by the formal tools. Utilized debitage may also represent the occurrence of an unplanned or unexpected activity (Akins and Bullock 1992:28-29).

DISCUSSION

A search of the New Mexico Cultural Resource Information System (NMCRIS) files at the Laboratory of Anthropology shows 50 sites with cultural affiliation within the 15 USGS quadrangles surrounding the project area. A study of these sites by topography (Table 2) shows Archaic and Anasazi sites occurring in the widest variety of topographical locations, primarily canyon rim, cliff/bluff/scarp, and terrace. These numbers are based solely on recorded sites.

For the twelve sites included in this study, differences in site location are more than offset by the similarities in site placement. The eight sites in the southern portion of the project area are all located in association with the narrow divide between the Pecos River and San Juan de Dios Arroyo. The four northern sites are located within the drainage of the Pecos River, but visually differ little from the other sites in the project area.

Table 2. The Cultural Affiliation of Sites by Topography in the 15 USGS Quadrangles Surrounding the Project Area

	Paleo indian n = %	Archaic n = %	Anasazi n = %	Mogollon n = %	Historic Pueblo n = %	Plains n = %
Arroyo/wash			1 = 5.2%			
Blow out		1 = 5.8%	1 = 5.2%			
Canyon Rim	1 = 100%	5 = 29.4%	4 = 21.0%			2 = 28.5%
Cliff/ scarp/bluff		2 = 11.7%	2 = 10.5%	2 = 40.0%		2 = 28.5%
Hill top			1 = 5.2%			
Hill slope		2 = 11.7%		1 = 20.0%		1 = 14.2%
Low rise						1 = 14.2%
Mesa/butte		1 = 5.8%	1 = 5.2%			1 = 14.2%
Open canyon			1 = 5.2%			
Ridge			1 = 5.2%	1 = 20.0%		
Terrace		3 = 17.6%	5 = 26.3%			
Other (unknown)		3 = 17.6%	2 = 10.5%	1 = 20.0%	1 = 100%	
Totals	1 = 100%	17 = 99.6%	19 = 99.5%	5 = 100%	1 = 100%	7 = 99.6%

All twelve sites are located in areas where their position on or adjacent to a slope affords long-distance visibility in at least one direction. LA 99846, LA 99847, LA 99848, and LA 99849 face toward the east. LA 8016, LA 99851, LA 8015, and LA 8014 face toward the north and west. LA 8013 faces east, west, and north. LA 99852 faces east, south, and west. LA 99853 and LA 8009 both face east and north. We can assume site location is related to this long-distance visibility, although the directions represented by this sample may not reflect actual regional patterning.

The Pecos River Valley is an area of both cultural and ecological contact and interaction. The area was utilized by most of the prehistoric cultural groups of eastern New Mexico, but there appears to have been no permanent prehistoric presence of these groups in the valley (Ward et al. 1987). Today, this portion of the Pecos Valley is juniper parkland, with riverine habitat present along the Pecos River and along its main side canyons and arroyos (Sebastian and Larralde 1989:10, fig. 1.5). Juniper parkland is also present in localized areas of broken terrain within the grasslands east of the Pecos River Valley. These localized areas, as well as the river valley, function as ecological edge areas.

Ecological edge areas are the areas of contact between different biotic communities. They generally occur at changes of elevation, or where physical changes are present in the landscape. Ecological edge areas are "the most convenient location for proximity to the widest variety and stability of resources" (Epp 1984:332). Correlations have been demonstrated between site location and ecological edge areas for sites dating from the Archaic period to the Protohistoric in Saskatchewan, Canada (Epp 1984), and for Archaic sites in the northern San Juan Basin of New Mexico (Reher and Witter 1977:124). A similar positive correlation has been demonstrated by Thurmond (1990:13-20) for Paleoindian sites in the Southern Plains. Thurmond (1990:17) suggests that site concentrations along many of these biotic borderlands maximizes density as well as diversity of both faunal and floral food resources. The almost continuous utilization of the Pecos River Valley through time would seem to support the concept of the area as one of relative abundance based on increased variety of available resources.

It is likely that the 12 sites within the project area, although not occupied at the same time, were all connected to the utilization of those faunal and floral resources. The juniper parkland and riverine areas would have provided habitat for deer, a number of smaller mammal species such as jackrabbit and cottontail rabbits, as well as a variety of bird species. Pronghorn and bison have historically been present on the open grasslands both east and west of the Pecos Valley. The overlapping distributions and adjacent habitats of these species suggest that all of them may have been exploited by the inhabitants of these sites.

The open positions of most of these sites and the wide range of visibility they offer, suggest bison and perhaps pronghorn may have been the prey of choice. The sites that are located in or adjacent to wooded areas, such as LA 8009, LA 8014, LA 8015, LA 8016, and LA 99851, may have been utilized by people focused more on hunting deer. Flexibility in hunting strategy would have allowed for the opportunistic utilization of whatever resource was encountered, but site location can indicate primary focus of effort.

Lithic resource procurement also took place on these sites, but not as the primary focus of activity. The degree of utilization in combination with the evident level of lithic tool production suggests this was never more than a secondary concern, even when lithic production was possibly pursued in connection with a successful hunting strategy.

Few archaeological sites are actually activity specific. The lithic artifact assemblage suggests a number of activities for each of these sites. Hunters processing game, maintaining or supplementing their tool kit, or simply passing the time by flint knapping would contribute to a varied assemblage. The repeated utilization of specific camp or processing sites is another possibility for the composition of these artifact assemblages.

Knowing how the site areas may have been used may provide clues to both who used the sites and when they were used. A model combining hunter-gather subsistence (Binford 1980), and early and late Archaic subsistence (Irwin-Williams 1984), and observations of prehistoric and historic Pueblo subsistence practices has been developed (Schelberg and Akins 1987; Akins and Bullock 1992:32). This model is based on the premise that there is enough variation in how these different groups would have utilized the same resource to enable some evaluation of lithic assemblages, even when diagnostic artifacts are not present.

Early Archaic groups were essentially foragers (Binford 1980:5-9; Irwin-Williams 1984:9). These groups moved their residential bases frequently and gathered food on a daily basis during short forays from these bases. Longer forays, or resource procurement trips, were made by specialized work parties, such as parties of hunters to subcamps. These subcamps, or "extractive locations" were used for short periods of time, a fact exhibited by low rates of tool abandonment. Early Archaic tools reflect high cost acquisition and curation, and a wide niche exploitation based on smaller animals and unspecialized gathering. Greater mobility and dependence on hunting could be reflected into the use of nonlocal lithic resources and greater technological skill (Schelberg and Akins 1987:20; Akins and Bullock 1992:33). The longer the foray, the greater the amount and complexity of the equipment utilized (Kelley 1988:720). Lithic assemblages from early Archaic sites thus should lack cores and the amount of cortex in the assemblage should be low, indicating that primary reduction was performed at the place of material procurement. This combined with a relatively high level of nonlocal materials is consistent with the high degree of mobility suggested for the early Archaic (Akins and Bullock 1992:33).

Later Archaic groups are classified as collectors, groups who live on stored food for at least part of the year, and who gather food in logistically organized food procurement groups (Akins and Bullock 1992:33; Binford 1980:10). Middle and late Archaic groups, operating with broader economic bases and higher population densities should produce lithic assemblages indicative of reduced exploitation areas, the scheduling of resource utilization, and storage (Akins and Bullock 1992:33; Irwin-Williams 1984:9-10). Resources would be exploited by task-oriented groups focused on a specific resource that could be gathered in quantity. Middle and late Archaic assemblages should therefore be dominated by nonlocal materials, and specialized tools should be present at task-oriented sites (Akins and Bullock 1992:34).

Anasazi and historic Pueblo subsistence is better understood, with Anasazi subsistence postulated based on historic Pueblo organization. Small mammals and birds were hunted both individually and opportunistically, but were also hunted in large-scale communal hunts. Larger mammals, deer, pronghorn, and bison, were hunted individually when it was possible, but were usually hunted by hunting parties. White (1962:301-302) describes these hunts at Zia Pueblo as usually lasting for six days. Vegetal foodstuffs were gathered in a similar manner. These were gathered individually, except when seasonally available plants or fruit became available in large quantities. In these cases organized communal gathering took place (White 1962:302).

Modern Pueblo activities, including hunts, were scheduled in advance around agricultural duties. Because these hunting parties had definite focus and goals, we would expect a high degree of preparation to have taken place. However, because of the lower degree of dependence on hunting, we would expect a lower level of technological expenditure (Akins and Bullock 1992:35). Lithic assemblages from Anasazi sites reflect an expedient lithic technology, with flakes primarily produced for use as short-term disposable tools. Formal tools, other than projectile points, tend to be rare.

A similar pattern seems to exist for historic Plains Indian sites. Flakes are commonly present, but formal tools, other than projectile points, tend to be rare.

Lithic artifact attributes have been used by a number of researchers to distinguish Archaic from Anasazi artifact assemblages. Archaic assemblages tend to have more formal tools and small flakes, produced during formal tool manufacture. Anasazi expedient tool production or core reduction tends to produce larger core flakes. Material preference in tool use also distinguishes the two groups. A set of expectations derived from subsistence patterns, degree of mobility, and level of technology is presented in Table 3. This suggests that material use should help distinguish early from late Archaic, and that technology will help distinguish Archaic from Anasazi (Akins and Bullock 1992:36).

The 12 sites within the project area are compared with a number of sites located within the same general area of eastern New Mexico and the upper Pecos Valley. A range of time periods and site types are represented. Attributes between these sites are compared in Table 4a-e. Although differences in analysts can make some comparisons difficult, general trends can still be observed.

The sites chosen for comparison tend to be single-component sites with good cultural designations based on the presence of diagnostic artifacts. LA 55693 is located approximately 3 km (2 miles) east of the project area. LA 57453 is located west of Portales, approximately 128 km (80 miles) to the southeast. LA 18455, LA 18469, LA 18674, LA 18580, LA 18472, LA 18476, and LA 18669 are sites located in the Los Esteros Project, approximately 32 km (20 miles) to the north of the project area in the Pecos River Valley.

Table 3. Expected Early and Late Archaic and Anasazi Lithic Assemblages

	Late Paleoindian-Early Archaic	Late Archaic	Anasazi
Subsistence Pattern	forager	collector	collector
Degree of Mobility	high	intermediate	low
Lithic Materials	nonlocal	some nonlocal	few nonlocal
Technology	biface	biface	expedient
Archaeological Results			
Debitage/Tool ratio	low	low	high
Flake percentage	high	high	very high
Core Percentage	high	present	low
Bifaces	present	present	few present

Main consideration is directed toward four 'marker' attributes within a lithic assemblage. These are (1) the ratio between debitage and tools (including utilized debitage), (2) the percentage of flakes within the assemblage, (3) the percentage of cores within the total assemblage, and (4) the percentage of bifaces present. Two general trends should be present in a comparison of this type. One is an increase in both the debitage:tool ratio, and of the percentage of flakes within the total assemblage, through time. The second trend is a corresponding decrease in the percentage of the assemblage composed of bifaces and cores. Through a comparison of these four attributes, cultural affiliation can be determined for sites where diagnostic artifacts are not present. This is accomplished by plotting each site's position within a progression between well-dated sites (sites with diagnostic material).

In a perfect world, all four of our 'marker' attributes will confirm the position of a specific site, relative to firmly dated sites within a general region. It is more likely that one or more of these four attributes will not conform as expected. Site variation, whether real or caused through sampling bias, can easily affect one or more of these percentages. However, the general trend should be sufficient to place the site within a cultural affiliation, relative to other sites, even if no finer resolution is possible.

Of the twelve sites within the project area, two sites (LA 99846 and LA 8009) contain diagnostic artifacts that allow them to be assigned to cultural periods. The lithic assemblage from LA 99846 contains two beaked gravers, usually considered characteristic of the late Paleoindian period. Core and flake percentage data supports this conclusion, as does the debitage:tool ratio to a lesser extent. Biface data does not, however, support this conclusion.

Site LA 8009 is assigned a late Archaic date based on the presence of a late Archaic Scallorn projectile point. Unlike LA 99846 however, none of the four marker attributes agrees with this conclusion. The LA 8009 sample was small and was limited to an area of boulders; both could have affected the results. The last, and possibly the best explanation is that LA 8009 is a multicomponent site. The attribute frequencies suggest it should date to the early Archaic, the projectile point is definitely late Archaic. This suggests that the site was used a number of times (at least twice) by prehistoric peoples.

A study of our four 'marker' attributes indicates that both LA 88948 and LA 99849 probably can be assigned to the late Paleoindian-early Archaic period. The biface percentage for LA 99849 is high, but this may have resulted from the small total number of artifacts.

The other eight sites have been assigned to a general "Archaic" cultural period; finer resolution was not possible. The attributes indicate these sites fall in the Archaic period, located between the early Archaic site LA 8009, and the Archaic sites of LA 18455 and LA 18469. A finer designation of middle or late Archaic is not possible. All four aspects of the marker data rarely agree within a single site assemblage. Two attributes, and in a number of cases, three attributes, agree for each of these eight sites. The general preponderance of the data does put them all in the Archaic period. It is possible that conflicting site data for these sites may also be indicative of the presence of more than one component, or may be a by-product of site modification.

Table 4a. Comparison of Selected Lithic Assemblage Attributes from Project Sites, with Sites in the General Upper Pecos Valley

Site number	LA 55693	LA 57453	LA 99846*	LA 99848*
Time period	Late Paleoindian Early Archaic	Late Paleoindian-Early Archaic	Late Paleoindian	Late Paleoindian-Early Archaic
Site type	Lithic scatter	Lithic scatter	Lithic scatter	Lithic scatter
Number of lithics	161	80	615	247
Material percent		(debitage)		
chalcedony	7.4	11.0		
chert	53.4	24.0	31.3	21.8
siltstone	3.1		0.4	3.2
quartzite	1.2	58.0	0.3	1.2
quartzitic ss.	29.2		0.4	2.4
metamorphic ss.				
other			65.8	68.4
	5.6	7.0	1.3	2.8
Cortex % 0	23.6		21.8	17.0
1-30	16.9		14.5	10.6
31-60	21.7		20.5	16.2
61-90	12.3		24.3	28.7
91-100	25.5		19.0	27.5
Debitage:Tool ratio	1.9:1	1.9:1	3.0:1	2.7:1
% Flakes	58.3	56.0	79.9	75.7
% Cores	24.8	8.4	14.6	17.4
% Bifaces	4.3	8.4	0.9	2.4
% Ground Stone		16.8		

Source: LA 55693: Harlan et al. 1986; LA 57453: Lintz et al 1988.
Sites marked with an asterisk (*) are within the US 84-Sunshine Mesa project.

Table 4b. Comparison of Selected Lithic Assemblage Attributes from Project Sites, with Sites from the General Area of Upper Pecos Valley

Site number	LA 99849*	LA 8013*	LA 8014*	LA 8015*
Time period	Late Paleolithic, Early Archaic	Archaic	Archaic	Archaic
Site type	Lithic scatter	Lithic scatter	Lithic scatter	Lithic scatter
Number of Lithics	31	132	188	377
Material percent				
chalcedony				
chert	61.2	45.5	62.2	47.4
siltstone		24.2	9.5	3.9
quartzite		1.5	9.5	1.3
quartzitic ss.	6.4	0.7	3.1	2.1
metamorphic ss.				
other	32.2	26.5	6.3	42.7
		1.5	8.4	2.2
Cortex % 0	12.9	15.9	13.3	17.8
1-30	12.9	8.3	16.5	17.6
31-60	22.6	25.7	20.7	20.7
61-91	29.1	29.5	31.4	28.9
91-100	22.6	20.5	8.5	15.1
Debitage:Tool ratio	2.2:1	3.5:1	2.8:1	2.9:1
% Flakes	67.7	85.6	82.4	83.8
% Cores	19.4	9.8	11.7	14.3
% Bifaces	3.2	0.7	2.6	1.3
% Ground Stone				

Sites marked with an asterisk (*) are within the US 84-Sunshine Mesa project.

Table 4c. Comparison of Selected Lithic Assemblage Attributes from Project Sites, with Sites from the General Upper Pecos Valley

Site number	LA 8016*	LA 99847*	LA 99852*	LA 99853*
Time period	Archaic	Archaic	Archaic	Archaic
Site type	Lithic scatter	Lithic scatter	Lithic scatter	Lithic scatter
Number of lithics	127	444	582	46
Material percent				
chalcedony				
chert	74.8	43.0	53.0	73.9
siltstone	0.7	4.5	4.2	2.1
quartzite	0.7		2.0	
quartzitic ss.	3.1	2.2	0.3	
metamorphic ss.				
other	18.1	46.8	37.2	23.9
	2.1	3.0	1.3	
Cortex % 0	19.7	19.1	17.9	15.2
1-30	23.6	10.6	13.7	13.0
31-60	18.3	19.6	18.9	13.1
61-90	24.4	32.1	37.3	54.1
91-100	14.9	18.5	12.2	13.0
Debitage:Tool ratio	3.8:1	3.1:1	2.8:1	2.8:1
% Flakes	83.8	84.3	82.4	82.5
% Cores	14.3	11.7	14.8	13.1
% Bifaces	1.3	1.3	0.2	2.2
% Ground Stone				

Sites marked with an asterisk (*) are within the US 84-Sunshine Mesa project.

Table 4d. Comparison of Selected Lithic Assemblage Attributes from Project Sites, with Sites in the General Upper Pecos Valley

Site number	LA 99851*	LA 18674	LA 18455	LA 18469
Time period	Archaic	Archaic	Archaic	Archaic
Site type	Lithic scatter	Rockshelter	Lithic scatter	Lithic scatter
Number of lithics	27	346	705	3342
Material percent				
chalcedony				
chert	70.3			
siltstone	3.7			
quartzite				
quartzitic ss.				
metamorphic ss.				
other	25.9			
Cortex % 0	7.4			
1-30	29.6			
31-60	14.8			
61-90	29.6			
91-100	25.9			
Debitage/tool ratio	3.0:1	6.2:1	9.5:1	11.2:1
% Flakes	88.9	86.3	90.0	91.8
% Cores	7.4	6.3	4.0	4.7
% Bifaces		3.1	3.5	1.3
% Ground stone		2.6	1.5	0.9

Source: LA 18455, LA 18469, LA 18674: Ward et al. 1987
Sites marked with an asterisk(*) are within the US 84-Sunshine Mesa project.

Table 4e. Comparison of Selected Lithic Assemblage Attributes of Project Sites, with Sites in the General Upper Pecos Valley

Site number	LA 8009*	LA 18580	LA 18472	LA 18669	LA 18476
Time period	Late Archaic	Anasazi	Historic Pueblo	Historic Pueblo	Proto/Historic Plains
Site type	Lithic scatter	Lithic scatter	Lithic scatter	Rockshelter	Tipi settlement
Number of lithics	82	183	1852	5351	3365
Material % chalcedony chert siltstone quartzite quartzitic ss. metamorphic ss. other	 31.7 1.2 2.4 2.4 59.7 2.4				
Cortex % 0 1-30 31-60 61-90 91-100	23.3 23.2 19.4 29.3 4.8				
Debitage/Tool ratio	0.5:1	25.1:1	33.2:1	16.3:1	21.5:1
% Flakes	79.3	96.1	97.0	94.0	98.5
% Cores	13.4	0.5	0.1	0.8	less than .0
% Bifaces	7.3	1.6	1.0	3.0	less than .0
% Ground Stone		1.0	0.4	1.1	less than .0

Source: LA 18476: Mobley 1978; LA 18472, LA 18580: Ward et al. 1987
Sites marked with an asterisk(*) are within the US 84-Sunshine Mesa project.

ASSESSMENTS AND RECOMMENDATIONS

Information derived from the surface mapping, the test excavations, and the analysis of their artifact assemblages, provides insight into the functions of these 12 sites and aids in the interpretation of those portions of the sites existing within the right-of-way.

LA 99846

LA 99846 is a Late Paleoindian site. Although flake and core percentages suggest this is a residential site, the heavily deflated nature of the site makes any dteermination of site form suspect. Two diagnostic artifacts were recovered from the site surface. Both artifacts are beaked gravers made from metamorphic sandstone. No intact feature or cultural deposits were found within the proposed right-of-way. The nature of the artifact assemblage, containing large numbers of both core flakes, and utilized flakes and tools suggests that a number of activities took place at LA 99846. These activities included lithic reduction and food processing utilizing bifaces and scrapers. The artifact assemblage is large, but all materials were found in the top 10 cm of soil, except in areas adjacent to a borrow pit, where some churning of soil appears to have taken place. The lithic artifact assemblage includes debitage, utilized debitage, and formal tools.

Archaeological testing within the proposed right-of-way at LA 99846 did not reveal any features or deposits likely to yield important information on the prehistory of LA 99846 or the region. It is our opinion that no further investigations are needed at LA 99846.

LA 99847

LA 88947 is an Archaic site. The heavily deflated site area, and in the area adjacent the borrow pit heavy churned soil, make it impossible to determine whether this site was residential or a limited activity area. No intact features or deposits, or diagnostic artifacts were found within the proposed right-of-way. The combination of large numbers of core flakes and utilized artifacts suggests that both lithic reduction and material processing took place at LA 99847. Although the artifact assemblage is large, the artifacts were all found in the upper 10 cm of soil, except where the movement of heavy machinery churned had previously caused the churning of the soil, particularly in the are adjacent to the borrow pit. A full range of artifacts from debitage to formal tools is present.

Archaeological testing within the proposed right-of-way at LA 99847 did not reveal any features or deposits likely to yield important information on the prehistory of LA 99847 or the region. It is our opinion that no further investigations are needed at LA 99847

LA 99848

The site of LA 99848 is a Late Paleoindian-Early Archaic site. No intact features or cultural deposits were found within the proposed right-of-way. The heavily deflated and churned nature of the site makes determination of residential or limited activity use, impossible to determine. The core and flake percentages within the artifact assemblage however suggest this is a residential site. The combination of large numbers of both core flakes and utilized lithic artifacts suggests a number of activities, including material processing, took place at this site. The large numbers of artifacts were all found within the top 10 cm of soil.

Archaeological testing within the proposed right-of-way at LA 99848 did not reveal any features or deposits likely to yield important information on the prehistory of LA 99848 or the region. It is our opinion that no further investigations are needed at LA 99848.

LA 99849

LA 99849 is a Late Paleoindian-Early Archaic site. No intact features or cultural deposits were found within the proposed right-of-way. A number of activities, including lithic reduction are indicated by the artifact assemblage, which also suggest this is a residential site. The small number of artifacts at this site includes debitage, utilized debitage, and formal tools, all of which were located on the present ground surface, or in the upper 10 cm of soil.

Archaeological testing within the proposed right-of-way at LA 99849 did not reveal any features or deposits likely to yield important information on the prehistory of LA 99849 or the region. It is our opinion that no further investigations are needed at LA 99849.

LA 8016

LA 8016 is an Archaic site. The area is heavily deflated and most of the artifacts have been redeposited. No intact cultural features or deposits were found within the proposed right-of-way. The artifact assemblage which ranges from debitage to formal tools, is indicative of both lithic reduction as well as a number of other possible activities. The deflated nature of the site makes it impossible to determine the type of site this was (residential or limited activity area), and what specific activities occurred. All artifacts were found on the present ground surface, or within the upper 10 cm of soil.

Archaeological testing within the proposed right-of-way at LA 8016 did not reveal any features or deposits likely to yield important information on the prehistory of LA 8016 or of the region. It is our opinion that no further investigations are needed at LA 8016.

LA 99851

LA 99851 is a badly deflated Archaic site. No features or cultural deposits were found within the proposed right-of-way. The artifact assemblage is small, but includes evidence of a number of activities, including some lithic reduction. The artifacts present are principally core flakes. All artifacts were found either on the present ground surface or within the upper 10 cm of soil.

Archaeological testing within the proposed right-of-way did not reveal any features or deposits likely to yield important information on the prehistory of LA 99851 or the region. It is our opinion that no further investigations are needed at LA 99851.

LA 8015

LA 8015 is an Archaic site. As with most of the project area, the heavily deflated nature of the site makes determination of site structure or function (residential or limited activity area), impossible to determine. No intact features or deposits were found within the proposed right-of-way. The nature of the assemblage, containing large numbers of both core flakes, utilized flakes, and tools, suggests that a number of activities took place here, including some lithic reduction and material processing The artifact assemblage is large, but all artifacts were found within the upper 10 cm of soil.

Archaeological testing within the proposed right-of-way at LA 8015 did not reveal any features or deposits likely to yield important information on the prehistory of LA 8015 or the region. It is our opinion that no further investigations are needed at LA 8015.

LA 8014

LA 8014 is an Archaic site. The heavily deflated and redeposited nature of the site makes it impossible to determine if the site is residential or a limited activity area. No intact features or cultural deposits were found within the proposed right-of-way. The nature of the artifact assemblage suggests a number of activities, primarily connected with material processing, took place at LA 8014. All of the artifacts were found within the upper 10 cm of soil.

Archaeological testing within the proposed right-of-way at LA 8014 did not reveal any features or deposits likely to yield important information on the prehistory of LA 8014 or the region. It is our opinion that no further investigations are needed at LA 8014

LA 8013

LA 8013 is an Archaic site. The site is heavily deflated making it impossible to determine the possible residential or logistical nature of the site. No diagnostic artifacts or intact features or deposits were found within the proposed right-of-way. The lithic artifact assemblage contains large numbers of both utilized lithic artifacts (including both utilized debitage and formal tools) and core flakes. This suggests that a variety of activities took place at this site. All artifacts were found within the upper 10 cm of soil.

Archaeological testing within the proposed right-of-way at LA 8013 did not reveal any features or deposits likely to yield important information on the prehistory of LA 8013 or the region. It is our opinion that no further investigations are needed at LA 8013.

LA 99852

LA 99852 is an Archaic site. The heavily deflated nature of the site makes it impossible to determine whether it was a residential site, or a limited logistical activity area. No intact features or deposits were found. No diagnostic artifacts were present. This large artifact assemblage includes both an extensive number of core flakes and a large number of utilized artifacts, indicating that a variety of activities took place at this site. Lithic artifacts present included debitage, utilized debitage, expedient tools, and formal tools. Some lithic reduction also appears to have taken place at LA 99852. All artifacts were found within the upper 10 cm of soil.

Archaeological testing within the proposed right-of-way at LA 99852 did not reveal any features or deposits likely to yield important information on the prehistory of LA 99852 or the region. It is our opinion that no further investigations are needed at LA 99852.

LA 99853

LA 99853 is a dual component site. It has an early Archaic component, and a later historic, early 20th century settler component. The deflated condition of the site makes it impossible to determine the nature of the Archaic occupation. No intact features or deposits were found connected with this period of site use. The artifacts assemblage is small for this site, but does include both debitage, and utilized material (utilized debitage and formal tools). All artifacts were recovered from the upper 10 cm of soil.

The small number of historic artifacts at LA 99853 were present as a small deposit of sheet trash. The main area of the historic component is located to the west outside of the project area. Historic artifacts suggest a date for the sites historical component of between 1900 and the 1940s. All artifacts were found on the present ground surface, or in the upper 10 cm of soil. The only intact feature found for this period was the masonry base of a windmill. This feature was documented, but it is impossible to directly tie this feature temporally to the few historic artifacts present.

Archaeological testing within the proposed right-of-way at LA 99853 did not reveal any features or deposits likely to yield important information on the prehistory or history of LA 99853. For the one feature present (the windmill base), any information recovery potential appears unlikely, beyond that already documented. It is our opinion that no further investigations are needed at LA 99853.

LA 8009

LA 8009 is another dual component site. The early component Late Archaic. The last component consists of 6 rock art panels possibly old enough to be historic. The site is heavily deflated, making it impossible to determine the nature of the sites prehistoric occupation. One diagnostic artifact was found on this site, a Scallorn projectile point. No intact features or deposits were found within the project area. The artifact assemblage is small, but the presence of utilized debitage and formal tools indicates a number of activities took place on this site.

The latest component is represented by 6 rock art panels illustrated in Appendix 2. Elements of these panels may be old enough to be historic. The soft nature of the shale on which these inscriptions were carved, suggests they are not historic. All 6 rock art panels were documented. The area is still actively utilized for graffiti, making it impossible to determine the actual age of the inscriptions. No intact features or deposits were found within the project area, associated with the rock art panels.

A possible historic dugout structure was recorded as part of this site. This feature is located to the east outside of the project area. No historic artifacts that might have been associated with the possible historic component identified with the dugout, or the rock art inscriptions, were found on the site.

Archaeological testing within the project area at LA 8009 did not reveal any features or deposits likely to yield important information on the prehistory or history of LA 8009. For the 6 rock art panels, the information recovery potential appears unlikely beyond that already documented.

CONCLUSIONS

Twelve prehistoric archaeological sites were tested within the proposed right-of-way and project area of the planned improvement of US 84, southeast of Santa Rosa, Guadalupe County, New Mexico. One site (LA 99846) shows evidence of a Late Paleoindian occupation, based on the presence of diagnostic beaked gravers. Two additional sites (LA 99848, and LA 99849) show evidence of Late Paleoindian-Early Archaic occupation, based on flake and core percentages, and site debitage:tool ratios. These also suggest LA 99846, 99847, and LA 99848 are residential sites. The presence of a Scallorn projectile point indicates that the prehistoric component at LA 8009 dates to the Late Archaic. All of the other sites, including the prehistoric component at LA 99853, date to the Archaic period.

The heavily deflated nature of the sites, and site modification caused by livestock, makes site the determination of site type, as habitation, limited activity area, or seasonal resource procurement area, impossible to determine. Two of the sites (LA 99853 and LA 8009), contain features of possible historic origin within the project area. But both by their nature and condition are unlikely to yield additional information important to the understanding of local or regional history.

It is our opinion that no further investigations are needed at any of the 12 sites (LA 99846-99849, LA 99851-99853, LA 8009, and LA 8013-8016) located within the project area.

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APPENDIX I. LITHIC ARTIFACT ANALYSIS TABLES

Table I.1. LA 8009, Artifact Morphology by Material Type

	Material Type														Total	
	Metamorphic Sandstone		Chert		Siltstone		Quartzitic		Quartzitic Sandstone		Obsidian		Igneous			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	43	87.8	15	57.7	1	100.0	2	100.0	2	100.0			1	100.0	64	78.0
Biface Thinning Flake	1	2.0													1	1.2
Biface, early stage			2	7.6											2	2.4
Biface, late stage			1	3.8											1	1.2
Projectile point			2	7.6											3	3.6
Bidirectional Core			1	3.8							1	100.0			1	1.2
Multidirectional Core	5	10.2	5	19.2											10	12.2
Total	49	100.0	26	100.0	1	100.0	2	100.0	2	100.0	1	100.0	1	100.0	82	100.0

Table I.2. LA 8013, Artifact Morphology by Material Type

	Material Type												Total	
	Metamorphic Sandstone		Chert		Siltstone		Limestone		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	26	74.3	51	85.0	29	90.6	2	100.0	1	100.0	2	100.0	111	84.1
Biface, early stage					1	3.1							1	0.8
Bidirectional Core	1	2.9	2	3.3									3	2.3
Multidirectional Core	3	8.6	5	8.3	2	6.3							10	7.6
Tested Cobble	2	5.7	1	1.7									3	2.3
Angular Debris	1	2.9	1	1.7									2	1.5
Hammerstone Flake	2	5.7											2	1.5
Total	35	100.0	60	100.0	32	100.0	2	100.0	1	100.0	2	100.0	132	100.0

Table I.3. LA 8014, Artifact Morphology by Material Type

	Material Type																		Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Rhyolite		Siltstone		Limestone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	11	91.7	87	74.4			1	100.0	16	88.9	1	100.0	15	83.3	5	83.3	10	71.4	146	77.7
Biface Thinning Flake			1	0.9													1	7.1	2	1.1
Resharpening Flake			1	0.9															1	0.5
Biface, early stage			5	4.3															5	2.7
Unidirectional Core			2	1.7															2	1.1
Bidirectional Core			1	0.9									1	5.6			2	14.3	4	2.1
Multidirect. Core	1	8.3	14	12.0													1	7.1	16	8.5
Tested Cobble			2	1.7	1	100.0							2	11.1	1	16.7			6	3.2
Hammerstone Flake			4	3.4					2	11.1									6	3.2
Total	12	100.0	117	100.0	1	100.0	1	100.0	18	100.0	1	100.0	18	100.0	6	100.0	14	100.0	188	100.0

Table I.4. LA 8015, Artifact Morphology by Material Type

	Material Type																Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	136	84.5	142	79.3	2	100.0	5	83.3	10	66.7	5	100.0	6	75.0			306	81.2
Biface Thinning Flake	1	0.6															1	0.3
Resharpening Flake	1	0.6															1	0.3
Uniface			1	0.6													1	0.3
Biface, early stage	1	0.6	3	1.7													4	1.1
Unidirectional Core	3	1.9	1	0.6													4	1.1
Bidirectional Core	9	5.6	1	0.6									1	12.5			11	2.9
Multidirect. Core	7	4.3	24	13.4			1	16.7	5	33.3			1	12.5	1	100.0	39	10.3
Tested Cobble	2	1.2															2	0.5
Hammerstone Flake	1	0.6	7	3.9													8	2.1
Total	161	100.0	179	100.0	2	100.0	6	100.0	15	100.0	5	100.0	8	100.0	1	100.0	377	100.0

Table 1.5. LA 8016, Artifact Morphology by Material Type

	Material Type																Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	19	82.6	72	75.8	1	100.0							4	100.0	1	100.0	97	76.4
Biface Thinning Flake			1	1.1													1	0.8
Biface, early stage			3	3.2													3	2.4
Unidirectional Core			2	2.1													2	1.6
Bidirectional Core	1	4.3	2	2.1													3	2.4
Multdirect. Core	1	4.3	12	12.6			1	100.0	1	100.0							15	11.8
Tested Cobble	1	4.3															1	0.8
Angular Debris			2	2.1							1	100.0					3	2.4
Hammerstone Flake	1	4.3	1	1.1													2	1.6
Total	23	100.0	95	100.0	1	100.0	1	100.0	1	100.0	1	100.0	4	100.0	1	100.0	127	100.0

Table I.6. LA 99846, Artifact Morphology by Material Type

	Material Type																Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	301	74.3	154	79.8	1	100.0	3	60.0	2	66.7	2	100.0	3	100.0	3	100.0	469	76.3
Biface Thin. Flake			1	0.5													1	0.2
Resharp. Flake	2	0.5															2	0.3
Uniface	1	0.2	1	0.5													2	0.3
Biface, early stage	3	0.7															3	0.5
Biface, middle stage	1	0.2															1	0.2
Unidir. Core	6	1.5	2	1.0													8	1.3
Bidir. Core	12	3.0	6	3.1													18	2.9
Multi. Core	44	10.9	17	8.8			2	40.0	1	33.3							64	10.4
Tested Cobble	16	4.0	3	1.6													19	3.1
Ang. Debris	7	1.7	2	1.0													9	1.5
Hammerstone Flake	12	3.0	7	3.6													19	3.1
Total	405	100.0	193	100.0	1	100.0	5	100.0	3	100.0	2	100.0	3	100.0	3	100.0	615	100.0

Table I.7. LA 99847, Artifact Morphology by Material Type

	Material Type														Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone		Limestone		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	161	77.4	168	88.0	7	87.5	18	90.0	1	100.0	7	70.0			363	81.8
Biface Thin. Flake			2	1.0									1	25.0	3	0.7
Resharp. Flake											1	10.0			1	0.2
Uniface	1	0.5													1	0.2
Biface, early stage	3	1.4					1	5.0					1	25.0	5	1.1
Unidir. Core							1	5.0							1	0.2
Bidir. Core	10	4.8	4	2.1											14	3.2
Multi. Core	19	9.1	15	7.9	1	12.5					1	10.0	1	25.0	37	8.3
Tested Cobble	9	4.3	1	0.5											10	2.3
Ang. Debris			1	0.5									1	25.0	2	0.5
Hammerstone Flake	6	2.8									1	10.0			7	1.6
Total	209	100.0	191	100.0	8	100.0	20	100.0	2	100.0	10	100.0	4	100.0	444	100.0

Table I.8. LA 99848, Artifact Morphology by Material Type

	Material Type																		Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Rhyolite		Siltstone		Limestone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	121	71.6	42	77.8			2	66.7	5	62.5	1	50.0	3	100.0	5	83.3	1	100.0	180	72.9
Resharp. Flake					1	100.0													1	0.4
Uniface	2	1.2							1	12.5									3	1.2
Biface, early stage	3	1.8																	3	1.2
Unidir. Core	3	1.8	3	5.6															6	2.4
Bidir. Core	14	8.3	2	3.7					1	12.5									17	6.9
Multi. Core	12	7.1	6	11.1			1	33.3			1	50.0							20	8.1
Tested Cobble	8	4.7																	8	3.2
Ang. Debris	2	1.2							1	12.5									3	1.2
Hammerstone Flake	4	2.4	1	1.9											1	16.7			6	2.4
Total	169	100.0	54	100.0	1	100.0	3	100.0	8	100.0	2	100.0	2	100.0	6	100.0	1	100.0	247	100.0

Table I.9. LA 99849, Artifact Morpology by Material Type

	Material Type						Total	
	Metamorphic Sandstone		Chert		Quartzitic Sandstone			
	N	%	N	%	N	%	N	%
Core Flake	5	50.0	11	57.9	1	50.0	17	54.8
Biface Thinning Flake			1	5.3			1	3.2
Biface, early stage			1	5.3			1	3.2
Bidirectional Core	1	10.0	1	5.3			2	6.5
Multidirectional Core	2	20.0	2	10.5			4	12.9
Tested Cobble	1	10.0	2	10.5			3	9.7
Hammerstone Flake	1	10.0	1	5.3	1	50.0	3	9.7
Total	10	100.0	19	100.0	2	100.0	51	100.0

Table I.10. LA 99851. Artifact Morphology by Material Type

	Material Type						Total	
	Metamorphic Sandstone		Chert		Siltstone			
	N	%	N	%	N	%	N	%
Core Flake	6	85.7	17	89.5	1	100.0	24	88.9
Bidirectional Core	1	14.3	1	5.3			2	7.4
Tested Cobble			1	5.3			1	3.7
Total	7	100.0	19	100.0	1	100.0	27	100.0

Table I.11. LA 99852, Artifact Morphology by Material Type

	Material Type																Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Obsidian		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	169	77.9	257	83.2	5	83.3	18	72.0	7	58.3	2	100.0			9	100.0	467	80.2
Biface Thinning Flake			2	0.6									9	100.0			4	0.7
Resharpening Flake			3	1.0													3	0.5
Biface, early stage	1	0.5															1	0.2
Unidirectional Core	2	0.9	2	0.6					1	8.3							5	0.9
Bidirectional Core	7	3.2	5	1.6			1	4.0									13	2.2
Multidirectional Core	28	12.9	33	10.7			4	16.0	3	25.0							68	11.7
Tested Cobble	7	3.2	2	0.6	1	16.7	1	4.0	1	8.3							12	2.1
Angular Debris			2	0.6			1	4.0									3	0.5
Hammerstone Flake	3	1.4	3	1.0													6	1.0
Total	217	100.0	309	100.0	6	100.0	25	100.0	12	100.0	2	100.0	2	100.0	9	100.0	582	100.0

Table I.12. LA 99853, Artifact Morphology by Material Type

	Material Type						Total	
	Metamorphic Sandstone		Chert		Siltstone			
	N	%	N	%	N	%	N	%
Core Flake	8	72.7	25	73.5	1	100.0	34	73.9
Biface Thinning Flake	1	9.1	1	2.9			2	4.3
Biface, middle stage	1	9.1					1	2.2
Bidirectional Core			1	2.9			1	2.2
Multidirectional Core	1	9.1	4	11.8			5	10.9
Tested Cobble			1	2.9			1	2.2
Hammerstone Flake			2	5.9			2	4.3
Total	11	100.0	34	100.0	1	100.0	46	100.0

Table I.13. LA 8009, Flake Morphology

	Morphology by Portion									
	Whole		Proximal		Distal		Lateral		Total	
	N	%	N	%	N	%	N	%	N	%
Core Flake	53	98.1	6	100.0	1	100.0	4	100.0	64	98.5
Biface Thin. Flake	1	1.9							1	1.5
Total	54	100.0	6	100.0	1	100.0	4	100.0	65	100.0

	Morphology by Platform													
	Absent		Cortical		Single		Multiple		Collapsed		Crushed			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	1	100.0	20	100.0	36	100.0	4	80.0	2	100.0	1	100.0	64	98.5
Biface Thin. Flake							1	20.0					1	1.5
Total	1	100.0	20	100.0	36	100.0	5	100.0	2	100.0	1	100.0	65	100.0

Table I.14. LA 8013, Flake Morphology

Morphology by Portion	Whole		Proximal		Distal		Lateral		Total	
	N	%	N	%	N	%	N	%	N	%
Core Flake	84	97.7	9	100.0	7	100.0	7	100.0	111	98.2
Hammerstone Flake	2	2.3							2	1.8
Total	86	100.0	9	100.0	7	100.0	7	100.0	113	100.0

Morphology by Platform	Absent		Cortical		Single		Multiple		Cortical and Single		Collapsed		Crushed		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	11	100.0	36	100.0	50	96.0	1	100.0	1	100.0	7	100.0	5	100.0	111	98.2
Hammerstone Flake					2	3.8									2	1.8
Total	11	100.0	36	100.0	52	100.0	1	100.0	1	100.0	7	100.0	5	100.0	113	100.0

Table 1.15. LA 8014, Flake Morphology

	Morphology by Portion													
	Whole		Proximal		Medial		Distal		Lateral				Total	
	N	%	N	%	N	%	N	%	N	%			N	%
Core Flake	110	94.8	17	94.4	4	100.0	5	83.3	10	90.9			146	94.3
Biface Thinning Flake	1	0.9					1	16.7					2	1.3
Resharpening Flake	1	0.9											1	0.6
Hammerstone Flake	4	3.4	1	5.6					1	9.1			6	3.9
Total	116	100.0	18	100.0	4	100.0	6	100.0	11	100.0			155	100.0
	Morphology by Platform													
	Absent		Cortical		Single		Multiple		Collapsed		Crushed		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	9	90.0	58	98.3	71	94.7	1	33.3	6	100.0	1	50.0	146	94.2
Biface Thinning Flake	1	10.0					1	33.3					2	1.3
Resharpening Flake							1	33.3					1	0.6
Hammerstone Flake			1	1.7	4	5.3					1	50.0	6	3.9
Total	10	100.0	59	100.0	75	100.0	3	100.0	6	100.0	2	100.0	155	100.0

Table I.16. LA 8015, Flake Morphology

	Morphology by Portion												
	Whole		Proximal		Medial		Distal		Lateral			Total	
	N	%	N	%	N	%	N	%	N	%		N	%
Core Flake	231	95.9	37	100.0	4	100.0	20	100.0	14	100.0		306	96.8
Biface Thinning Flake	1	0.4										1	0.3
Resharpening Flake	1	0.4										1	0.3
Hammerstone Flake	8	3.3										8	2.5
Total	241	100.0	37	100.0	4	100.0	20	100.0	14	100.0		316	100.0
Morphology by Platform Total														
	Absent		Cortical		Single		Multiple		Collapsed		Crushed		
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	24	100.0	113	100.0	152	100.0	6	75.0	7	87.5	4	100.0	306	96.8
Biface Thinning Flake									1	12.5			1	0.3
Resharpening Flake							1	12.5					1	0.3
Hammerstone Flake			1	0.9	6	3.8	1	12.5					8	2.5
Total	24	100.0	114	100.0	158	100.0	8	100.0	8	100.0	4	100.0	316	100.0

Table 1.17. LA 8016, Flake Morphology

	Morphology by Portion											Total	
	Whole		Proximal		Medial		Distal		Lateral				
	N	%	N	%	N	%	N	%	N	%		N	%
Core Flake	73	96.1	14	100.0	1	100.0	5	100.0	4	100.0		97	97.0
Biface Thinning Flake	1	1.3										1	1.0
Hammerstone Flake	2	2.6										2	2.0
Total	76	100.0	14	100.0	1	100.0	5	100.0	4	100.0		100	100.0

	Morphology by Platform													
	Absent		Cortical		Single		Multiple		Collapsed		Crushed			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	5	100.0	32	97.0	54	98.2	1	100.0	3	75.0	2	100	97	97.0
Biface Thinning Flake					1	1.8							1	1.0
Hammerstone Flake			1	3.0					1	25.0			2	2.0
Total	5	100.0	33	100.0	55	100.0	1	100.0	4	100.0	2	100.0	100	100.0

Table I.18. LA 99846, Flake Morphology

	Morphology by Portion											Total	
	Whole		Proximal		Medial		Distal		Lateral				
	N	%	N	%	N	%	N	%	N	%		N	%
Core Flake	294	94.5	74	97.4	20	100.0	35	100.0	46	93.9		469	95.5
Biface Thinning Flake	1	0.3										1	0.2
Resharpening Flake	2	0.6										2	0.4
Hammerstone Flake	14	4.5	2	2.6					3	6.1		19	3.9
Total	311	100.0	76	100.0	20	100.0	35	100.0	49	100.0		491	100.0

	Morphology by Platform																	
	Absent		Cortical		Single		Multiple		Collapsed		Crushed		Broken		Battered			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	55	100.0	163	100.0	210	96.8	7	63.6	16	100.0	12	80.0	5	100.0	1	100.0	469	95.5
Biface Thinning Flake					1	0.5											1	0.2
Resharpening Flake					1	0.5	1	9.1									2	0.4
Hammerstone Flake			8	4.7	5	2.3	3	27.3			3	20.0					19	3.9
Total	55	100.0	171	100.0	217	100.0	11	100.0	16	100.0	15	100.0	5	100.0	1	100.0	491	100.0

Table I.19. LA 99847, Flake Morphology

Morphology by Portion

	Whole		Proximal		Medial		Distal		Lateral			Total	
	N	%	N	%	N	%	N	%	N	%		N	%
Core Flake	265	96.7	38	100.0	14	100.0	20	100.0	20	92.9		363	97.1
Biface Thinning Flake	2	0.7							1	3.6		3	0.8
Resharpening Flake									1	3.6		1	0.3
Hammerstone Flake	7	2.6										7	1.9
Total	274	100.0	38	100.0	14	100.0	20	100.0	22	100.0		374	100.0

Morphology by Platform

	Absent		Cortical		Single		Multiple		Collapsed		Crushed		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	36	100.0	134	98.5	162	96.4	1	50.0	21	95.5	9	90.0	365	97.1
Biface Thinning Flake					1	0.6			1	4.5	1	10.0	3	0.8
Resharpening Flake							1	50.0					1	0.3
Hammerstone Flake			2	1.5	5	3.0							7	1.9
Total	36	100.0	136	100.0	168	100.0	2	100.0	22	100.0	10	100.0	374	100.0

Table I.20. LA 99848, Flake Morphology

	Morphology by Portion												
	Whole		Proximal		Medial		Distal		Lateral			Total	
	N	%	N	%	N	%	N	%	N	%		N	%
Core Flake	265	96.7	38	100.0	14	100.0	20	100.0	26	92.9		363	97.1
Biface Thinning Flake	2	0.7							1	3.6		3	0.8
Resharpening Flake									1	3.6		1	0.3
Hammerstone Flake	7	2.6										7	1.9
Total	274	100.0	38	100.0	14	100.0	20	100.0	28	100.0		374	100.0

	Morphology by Platform													
	Absent		Cortical		Single		Multiple		Collapsed		Crushed			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	14	100.0	74	98.7	76	93.8	4	80.0	10	100.0	2	100.0	180	96.3
Resharpening Flake							1	20.0					1	0.5
Hammerstone Flake			1	1.3	5	6.2							6	3.2
Total	14	100.0	75	100.0	81	100.0	5	100.0	10	100.0	2	100.0	187	100.0

Table I.21. LA 99849, Flake Morphology

	Morphology by Portion											
	Whole		Proximal		Distal		Lateral				Total	
	N	%	N	%	N	%	N	%			N	81.0%
Core Flake	11	73.3	4	100.0	1	100.0	1	100.0			17	4.8
Biface Thinning Flake	1	6.7									1	14.3
Hammerstone Flake	3	20.0									3	100.0
Total	15	100.0	4	100.0	1	100.0	1	100.0			21	

	Morphology by Platform										Total	
	Absent		Cortical		Single		Collapsed		Crushed			
	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	1	100.0	7	100.0	7	77.8	1	33.3	1	100.0	17	81.0
Biface Thinning Flake							1	33.3			1	4.8
Hammerstone Flake					2	22.2	1	33.3			3	14.3
Total	1	100.0	7	100.0	9	100.0	3	100.0	1	100.0	21	100.0

Table I.22. LA 99851, Flake Morphology

	Morphology by Portion						Total	
	Whole		Proximal		Lateral			
	N	%	N	%	N	%	N	%
Core Flake	20	100.0	3	100.0	1	100.0	24	100.0
Total	20	100.0	3	100.0	1	100.0	24	100.0
Morphology by Platform								
	Cortical		Single		Crushed			
	N	%	N	%	N	%	N	%
Core Flake	10	100.0	13	100.0	1	100.0	24	100.0
Total	10	100.0	13	100.0	1	100.0	24	100.0

Table 1.23. LA 99852, Flake Morphology

	Morphology by Portion											Total	
	Whole		Proximal		Medial		Distal		Lateral				
	N	%	N	%	N	%	N	%	N	%		N	%
Core Flake	383	98.2	37	92.5	7	100.0	13	100.0	27	90.0		467	97.3
Biface Thinning Flake	2	0.5							2	6.7		4	0.8
Resharpening Flake	1	0.3	1	2.5					1	3.3		3	0.6
Hammerstone Flake	4	1.0	2	5.0								6	1.3
Total	390	100.0	40	100.0	7	100.0	13	100.0	30	100.0		480	100.0

	Morphology by Platform													
	Absent		Cortical		Single		Multiple		Collapsed		Crushed			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Core Flake	20	95.2	169	99.4	244	96.8	3	50.0	23	100.0	8	100.0	467	97.3
Biface Thinning Flake					1	0.4	3	50.0					4	0.8
Resharpening Flake	1	4.8			2	0.8							3	0.6
Hammerstone Flake			1	0.6	5	2.0							6	1.3
Total	21	100.0	170	100.0	252	100.0	6	100.0	23	100.0	8	100.0	480	100.0

Table I.24. LA 99853, Flake Morphology

	Morphology by Portion								Total	
	Whole		Proximal		Medial		Lateral			
	N	%	N	%	N	%	N	%	N	%
Core Flake	27	90.0	2	66.7	2	100.0	3	100.0	34	89.5
Biface Thinning Flake	1	3.3	1	33.3					2	5.3
Hammerstone Flake	2	6.7							2	5.3
Total	30	100.0	3	100.0	2	100.0	3	100.0	38	100.0
Morphology by Platform									Total	
	Absent		Cortical		Single		Multiple			
	N	%	N	%	N	%	N	%	N	%
Core Flake	2	100.0	18	94.7	14	87.5			34	89.5
Biface Thinning Flake					1	6.3	1	100.0	2	5.3
Hammerstone Flake			1	5.3	1	6.3			2	5.3
Total	2	100.0	19	100.0	16	100.0	1	100.0	38	100.0

Table I.25. LA 8009, Cortex Percentages by Material Type

	Material Type														Total	
	Metamorphic Sandstone		Chert		Siltstone		Quartzitic		Quartzitic Sandstone		Obsidian		Igneous			
Cortex %	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	11	22.4	7	26.9							1	100.0			19	23.2
10	7	14.3	4	15.4											11	13.4
20	4	8.2	3	11.5	1	100.0									8	9.8
30	4	8.2	2	7.7									1	100.0	7	8.5
40	5	10.2	2	7.7											7	8.5
50	2	4.1													2	2.4
60	2	4.1	4	15.4			1	50.0	1	50.0					8	9.8
70	5	10.2	1	3.8											6	7.3
80	8	16.3	2	7.7											10	12.2
90	1	2.0							1	50.0					2	2.4
100			1	3.8			1	50.0							2	2.4
Total	49	100.0	26	100.0	1	100.0	2	100.0	2	100.0	1	100.0	1	100.0	82	100.0

Table I.26. LA 8013, Cortex Percentages by Material Type

Cortex %	Material Type												Total	
	Metamorphic Sandstone		Chert		Siltstone		Limestone		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	4	11.4	7	11.7	10	31.3							21	15.9
10	4	11.4	2	3.3							1	50.0	7	5.3
20			2	3.3	2	6.3							4	3.0
30	2	5.7	10	16.7	3	9.4	1	50.0	1	100.0	1	50.0	18	13.6
40	3	8.6	3	5.0	1	3.1							7	5.3
50	5	14.3	4	6.7									9	6.8
60	4	11.4	5	8.3	3	9.4							12	9.1
70	1	2.9	10	16.7	2	6.3							13	9.8
80	4	11.4	8	13.3	1	3.1	1	50.0					14	10.6
90	4	11.4	6	10.0	5	15.6							15	11.4
100	4	11.4	3	5.0	5	15.6							12	9.1
Total	35	100.0	60	100.0	32	100.0	2	100.0	1	100.0	2	100.0	132	100.0

Table I.27. LA 8014, Cortex Percentages by Material Type

	Material Type																		Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Rhyolite		Siltstone		Limestone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
Cortex %	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	1	8.3	18	15.4									3	16.7			3	21.4	25	13.3
10	1	8.3	17	14.5					1	5.6									19	10.1
20	3	25.0	6	5.1					1	5.6							2	14.3	12	6.4
30			11	9.4					6	33.3			1	5.6			2	14.3	20	10.6
40	2	16.7	8	6.9									1	5.6	1	16.7	1	7.1	13	6.9
50			5	4.3									1	5.6			1	7.1	7	3.7
60	2	16.7	10	8.5					1	5.6			2	11.1	1	16.7	2	14.3	18	9.6
70	1	8.3	12	10.3					2	11.1	1	100.0	1	5.6					17	9.0
80	1	8.3	14	12.0					2	11.1			2	11.1	2	33.3	3	21.4	24	12.8
90	1	8.3	7	6.0	1	100.0	1	100.0	4	22.1			4	22.2					18	9.6
100			9	7.7					1	5.6			3	16.7	2	33.3			15	8.0
Total	12	100.0	117	100.0	1	100.0	1	100.0	18	100.0	1	100.0	18	100.0	6	100.0	14	100.0	188	100.0

Table I.28. LA 8015, Cortex Percentages by Material Type

	Material Type																Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
Cortex %	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	34	21.1	30	16.8	1	50.0	1	20.0			1	20.0					67	17.8
10	11	6.8	20	11.2					1	6.7			1	12.5			33	8.8
20	12	7.5	15	8.4					4	26.7	1	20.0	1	12.5			33	8.8
30	18	11.2	15	8.4					2	13.3			2	25.0			37	9.8
40	12	7.5	10	5.6					1	6.7							23	6.1
50	7	4.3	10	5.6			1	20.0									18	4.8
60	9	5.6	11	6.1					1	6.7			1	12.5	1	100.0	23	6.1
70	15	9.3	16	9.2	1	50.0	1	20.0	2	13.3	1	20.0					36	9.5
80	19	11.8	26	14.5			1	20.0	2	13.3	1	20.0	1	12.5			50	13.3
90	6	3.7	14	7.8					2	13.3			1	12.5			23	6.1
100	18	11.2	13	7.3			1	20.0			1	20.0	1	12.5			34	9.0
Total	161	100.0	180	100.0	2	100.0	5	100.0	15	100.0	5	100.0	8	100.0	1	100.0	377	100.0

Table I.29. LA 8016, Cortex Percentages by Material Type

	MaterialType																Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
Cortex %	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0			24	25.3	1	100.0											25	19.7
10	1	4.3	13	13.7									1	25.0			15	11.8
20	2	8.7	13	13.7													15	11.8
30	1	4.3	5	5.3			1	100.0					1	25.0	1	100.0	9	7.1
40	1	4.3	4	4.2													5	3.9
50	3	13.0	4	4.2					1	100.0							8	6.3
60	2	8.7	4	4.2													6	4.7
70	3	13.0	8	8.4													11	8.7
80	5	21.7	8	8.4									1	25.0			14	11.0
90	1	4.3	2	2.1							1	100.0					4	3.1
100	4	17.4	10	10.5									1	25.0			15	11.8
Total	23	100.0	95	100.0	1	100.0	1	100.0	1	100.0	1	100.0	4	100.0	1	100.0	127	100.0

Table 1.30. LA 99846, Cortex Percentages by Material Type

Cortex %	Material Type																Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	79	19.5	51	26.4	1	100.0	1	20.0							2	66.7	134	21.8
10	22	5.4	18	9.3					1	33.3			1	33.3			42	6.8
20	30	7.4	14	7.3					1	33.3	1	50.0					46	7.5
30	38	9.4	18	9.3											1	33.3	57	9.3
40	26	6.4	12	6.2			1	20.0									39	6.3
50	22	5.4	9	4.7													31	5.1
60	36	8.9	6	3.1			1	20.0					1	33.3			44	7.2
70	32	7.9	19	9.8													51	8.3
80	39	9.6	13	6.7			1	20.0	1	33.3							54	8.8
90	27	6.7	14	7.3			1	20.0			1	50.0					43	7.0
100	54	13.3	19	9.8									1	33.3			74	12.0
Total	405	100.0	193	100.0	1	100.0	5	100.0	3	100.0	2	100.0	3	100.0	3	100.0	615	100.0

Table I.31. LA 99847, Cortex Percentages by Material Type

	Material Type														Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone		Limestone		Quartzitic Sandstone		Silicified Wood			
Cortex %	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	32	15.4	39	20.4	2	25.0	7	35.0	2	100.0	2	20.0	1	25.0	85	19.1
10	8	3.8	11	5.8							3	30.0			22	5.0
20	13	6.3	11	5.8			1	5.0							25	5.6
30	12	5.8	22	11.5	1	12.5					1	10.0			36	8.1
40	10	4.8	12	6.3			1	5.0			1	10.0	1	25.0	25	5.6
50	10	4.8	14	7.3			1	5.0			1	10.0			26	5.9
60	26	12.5	21	11.0	4	50.0	2	10.0							53	11.9
70	24	11.5	17	8.9			3	15.0			1	10.0			45	10.1
80	29	13.9	14	7.3							1	10.0	1	25.0	45	10.1
90	20	9.6	17	8.9	1	12.5	3	15.0					1	25.0	42	9.5
100	24	11.5	14	7.3			2	10.0							40	9.0
Total	208	100.0	192	100.0	8	100.0	20	100.0	2	100.0	10	100.0	4	100.0	444	100.0

Table I.32. LA 99848, Cortex Percentages by Material Type

	Material Type																		Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Rhyolite		Siltstone		Limestone		Quartzitic		Quartzitic Sandstone		Silicified Wood			
Cortex %	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
0	30	17.8	8	14.8			1	33.3	1	12.5					1	16.7	1	100	42	17.0
10	8	4.7	5	9.3											1	16.7			14	5.7
20	8	4.7	4	7.4															12	4.9
30	10	5.9	6	11.1					1	12.5	1	50.0							18	7.3
40	5	3.0							1	12.5			1	33.3					7	2.8
50	8	4.7	5	9.3											2	33.3			15	6.1
60	16	9.5	6	11.1			1	33.3							1	16.7			24	9.7
70	19	11.2	5	9.3	1	100.0			1	12.5									26	10.5
80	16	9.5	4	7.4			1	33.3											21	8.5
90	15	8.9	3	5.6					3	37.5	1	50.0							22	8.9
100	34	20.1	8	14.8					1	12.5			2	66.7	1	16.7			46	18.6
Total	169	100.0	54	100.0	1	100.0	3	100.0	8	100.0	2	100.0	3	100.0	6	100.0	1	100.0	247	100.0

Table I.33. LA 99849, Cortex Percentages by Material Type

Cortex %	Material Type						Total	
	Metamorphic Sandstone		Chert		Quartzitic Sandstone			
	N	%	N	%	N	%	N	%
0	1	10.0	2	10.5	1	50.0	4	12.9
10	1	10.0	2	10.5			3	9.7
20			1	5.3			1	3.2
30			1	5.3			1	3.2
40			1	5.3	1	50.0	2	6.5
50	2	20.0	2	10.5			4	12.9
60	1	10.0	1	5.3			2	6.5
70	2	20.0	2	10.5			4	12.9
80			3	15.8			3	9.7
90	2	20.0	3	15.8			5	16.1
100	1	10.0	1	5.3			2	6.5
Total	10	100.0	19	100.0	2	100.0	31	100.0

Table I.34. LA 99851, Cortex Percentages by Material Type

Cortex %	Material Type						Total	
	Metamorphic Sandstone		Chert		Siltstone			
	N	%	N	%	N	%	N	%
0			2	10.5			2	7.4
10	1	14.3	1	5.3			2	7.4
20	1	14.3	5	26.3			6	22.2
30	1	14.3					1	3.7
40			1	5.3			1	3.7
50								
60			2	10.5			2	7.4
70	2	28.6	2	10.5			4	14.8
80	1	14.3	1	5.3			2	7.4
90	1	14.3	1	5.3	1	100.0	3	11.1
100			4	21.1			4	14.8
Total	7	100.0	19	100.0	1	100.0	27	100.0

Table I.35. LA 99852, Cortex Percentages by Material Type

Cortex %	Material Type																Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Obsidian		Silicified Wood		N	%
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
0	46	21.2	49	15.9	1	16.7	5	20.0			1	50.0	2	100.0			104	17.9
10	15	6.9	25	8.1			1	4.0							1	11.1	42	7.2
20	12	5.5	21	6.8			4	16.0							1	11.1	38	6.5
30	12	5.5	28	9.1			4	16.0	3	25.0					1	11.1	48	8.2
40	16	7.4	20	6.5			1	4.0									37	6.4
50	9	4.1	16	5.2													25	4.3
60	25	11.6	27	8.7	1	16.7	1	4.0									54	9.3
70	22	10.1	34	11.0	1	16.7			2	16.7							59	10.1
80	34	15.7	53	17.2	3	50.0	5	20.0	3	25.0	1	50.0			5	55.6	104	17.9
90	19	8.8	22	7.1			2	8.0	4	33.3							47	8.1
100	7	3.2	14	4.5			2	8.0							1	11.1	24	4.1
Total	217	100.0	309	100.0	5	100.0	25	100.0	1	100.0	2	100.0	2	100.0	9	100.0	582	100.0

Table I.36. LA 99853, Cortex Prcentages by Material Type

Cortex %	Material Type						Total	
	Metamorphic Sandstone		Chert		Siltstone			
	N	%	N	%	N	%	N	%
0	0	18.2	5	14.7			7	15.2
10								
20			2	5.9			2	4.3
30			4	11.8			4	8.7
40	1	9.1					1	2.2
50			1	2.9			1	2.2
60	2	18.2	3	8.8			5	10.9
70	3	27.3	3	8.8			6	13.0
80	3	27.3	11	32.4			14	30.4
90			2	5.9			3	4.3
100			3	8.8	1	100.0	4	8.7
Total	11	100.0	34	100.0	1	100.0	46	100.0

Table I.41. LA 8016, Artifact Function by Material Type

	Material Type												Total	
	Metamorphic Sandstone		Chert		Alibates Chert		Siltstone		Quartzite		Quartzitic Sandstone			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Primary Function														
Utilized Debitage	2	50.0	9	36.0			1	100.0	1	100.0			13	39.4
Retouch Debitage			2	8.0									2	6.1
Utilized/Retouched Debitage	2	50.0	5	20.0	1	100.0							8	24.2
Hammerstone			1	4.0									1	3.0
Chopper			2	8.0									2	6.1
Graver			1	4.0									1	3.0
Notch			2	8.0									2	6.1
Denticulate											1	100.0	1	3.0
Scraper, undiff.			1	4.0									1	3.0
Scraper, side			2	8.0									2	6.1
Total	4	100.0	25	100.0	1	100.0	1	100.0	1	100.0	1	100.0	33	100.0
Secondary Function														
Utilized debitage			2	40.0									2	40.0
Retouched Debitage			1	20.0									1	20.0
Utilized/retouch debitage			2	40.0									2	40.0
Total			5	100.0									5	100.0

Table I.42. LA 99846, Artifact Function by Material Type

	Material Type								Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone			
	N	%	N	%	N	%	N	%	N	%
Primary Function										
Utilized Debitage	64	45.1	21	35.6			1	100.0	86	42.4
Retouched Debitage	3	2.1	7	11.9					10	4.9
Utilized/Retouched Debitage	21	14.8	8	13.6					29	14.3
Hammerstone	18	12.7	6	10.2					24	11.8
Chopper	15	10.6	2	3.4					17	8.4
Graver	5	3.5	1	1.7					6	3.0
Notch	7	4.9	2	3.4					9	4.4
Scraper, undif.	3	2.1	3	5.1					6	3.0
Scraper, end	2	1.4	5	8.5	1	100.0			8	3.9
Scraper, side	3	2.1	4	6.8					7	3.4
Knife	1	0.7							1	0.5
Total	142	100.0	59	100.0	1	100.0	1	100.0	203	100.0

	Material Type								Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone			
	N	%	N	%	N	%	N	%	N	%
Secondary Function										
Utilized Debitage	10	33.3	6	57.0	1	100.0			17	10.6
Retouched Debitage	1	3.3							1	2.3
Utilized/Retouched Debitage	7	19.8	2	18.0					9	21.4
Hammerstone	2	6.6							2	4.6
Chopper	3	6.6	1	9.0					4	9.2
Notch	4	13.2							4	9.2
Scraper, end			1	9.0					1	2.3
Scraper, side	1	3.3	1	9.0					2	4.6
Biface	1	3.3							1	2.3
Knife	1	3.3							1	2.3
Total	30	100.0	11	100.0	1	100.0			42	100.0
Tertiary Function										
Utilized Debitage	1	33.3	1	100.0					2	50.0
Retouched Debitage	1	33.3							1	25.0
Utilized/Retouched Debitage	1	33.3							1	25.0
Total	3	100.0	1	100.0					4	100.0

Table I.43. LA 99847, Artifact Function by Material Type

	Material Type												Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Primary Function														
Utilized Debitage	20	27.0	14	29.2	1	50.0	1	11.1	1	33.3			37	26.6
Retouched Debitage	1	1.4	2	4.2			1	11.1					4	2.9
Utilized/Retouched Debitage	18	24.3	16	33.3			4	44.4	1	33.3	1	50.0	40	28.8
Hammerstone	6	8.1	4	8.3									10	7.2
Chopper	11	14.9	1	2.1			2	22.2					14	10.1
Graver	1	1.4							1	33.3			2	1.4
Notch	2	2.7											2	1.4
Scraper, undiff.	1	1.4	1	2.1									2	1.4
Scraper, end	9	12.2	5	10.2	1	50.0	1	11.1					16	11.5
Scraper, side	3	4.1	5	10.2									8	5.8
Biface	1	1.4									1	50.0	2	1.4
Knife			1	2.1									1	0.7
Uniface	1	1.4											1	0.7
Total	74	100.0	49	100.0	2	100.0	9	100.0	3	100.0	2	100.0	139	100.0

	Material Type												Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone		Quartzitic Sandstone		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Secondary Function														
Utilized Debitage	8	50.0	3	42.7			1	100.0	1	100.0			12	
Utilized/Retouched Debitage	4	25.0	3	42.7									7	
Hammerstone	1	6.25											2	
Notch	1	6.25											1	
Scraper, side	1	6.25											1	
Biface	1	6.25											1	
Knife			1	14.6									1	
Total	16	100.0	7	100.0			1	100.0	1	100.0			25	100.0
Tertiary Function														
Utilized Debitage			1	100.0									1	100.0
Total			1	100.0									1	100.0

Table I.44. LA 99848, Artifact Function by Material Type

	Material Type								Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone			
	N	%	N	%	N	%	N	%	N	%
Utilized Debitage	64	45.1	21	35.6			1	100.0	86	42.4
Retouched Debitage	3	2.1	7	11.9					10	4.9
Utilized/Retouched debitage	21	14.8	8	13.6					29	14.3
Hammerstone	18	12.7	6	10.2					24	11.8
Chopper	15	10.6	2	3.4					17	8.4
Graver	5	3.5	1	1.7					6	3.0
Notch	7	4.9	2	3.4					9	4.4
Scraper, undiff.	3	2.1	3	5.1					6	3.0
Scraper. end	2	1.4	5	8.5	1	100.0			8	3.9
Scraper. side	3	2.1	4	6.8					7	3.4
Knife	1	0.7							1	0.5
Total	142	100.0	59	100.0	1	100.0	1	100.0	203	100.0
Secondary Function										
Utilized Debitage	7	70.0					1	10.0	8	72.7
Utilized/Retouched debitage	1	10.0							1	9.1
Hammerstone	1	10.0							1	9.1
Chopper	1	10.0							1	9.1
Total	10	100.0					1	100.0	11	100.0

Table I.45. LA 99849, Artifact Function by Material Type

	Material Type						Total	
	Metamorphic Sandstone		Chert		Quartzitic Sandstone			
	N	%	N	%	N	%	N	%
Primary Function								
Utilized Debitage	3	60.0	3	37.5	1	100.0	7	50.0
Utilized/Retouched Debitage	1	20.0					1	7.1
Hammerstone			2	25.0			2	14.3
Chopper	1	20.0					1	7.1
Notch			1	12.5			1	7.1
Scraper, undiff.			1	12.5			1	7.1
Biface			1	12.5			1	7.1
Total	5	100.0	8	100.0	1	100.0	14	100.0
Secondary Function								
Utilized Debitage	1	100.0	2	100.0			3	100.0
Total	1	100.0	2	100.0			3	100.0

Table I.46. LA 99851, Artifact Function by Material Type

	Material Type						Total	
	Metamorphic Sandstone		Chert		Siltstone			
	N	%	N	%	N	%	N	%
Primary Function								
Utilized Debitage	1	33.3	1	20.0			2	22.2
Utilized/Retouched Debitage	1	33.3	2	40.0	1	100.0	4	4.44
Chopper	1	33.3					1	11.1
Graver			2	40.0			2	22.2
Total	3	100.0	5	100.0	1	100.0	9	100.0
Secondary Function								
Utilized Debitage	1	100.0					1	100.0
Total	1	100.0					1	100.0

Table I.47. LA 99852, Artifact Function by Material Type

	Material Type																Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Obsidian		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Primary Function																		
Utilized Debitage	26	27.1	21	24.4			2	15.4	1	16.7	1	100.0			1	25.0	52	25.1
Retouched Debitage	1	1.1															1	0.5
Utilized/ Retouched Debitage	28	29.5	31	36.0			6	46.2	3	50.0			1	100.0	1	25.0	70	33.8
Hammerstone	4	4.2	9	10.5													13	6.3
Chopper	17	17.9	5	5.8			2	15.4									24	11.6
Graver			1	1.2			1	7.7									2	1.0
Notch	6	6.3	1	1.2													7	3.4
Scraper, end	7	7.4	6	7.0	1	100.0			1	16.7					2	50.0	17	8.2
Scraper, side	2	2.1	9	10.5			2	15.4	1	16.7							14	6.8
Scraper, end/side	2	2.1	3	3.5													5	2.4
Biface	1	1.1															1	0.5
Knife	1	1.1															1	0.5
Total	95	100.0	86	100.0	1	100.0	13	100.0	6	100.0	1	100.0	1	100.0	4	100.0	207	100.0

	Material Type																Total	
	Metamorphic Sandstone		Chert		Rhyolite		Siltstone		Quartzitic		Quartzitic Sandstone		Obsidian		Silicified Wood			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Secondary Function																		
Utilized Debitage	4	40.0	1	11.1			3	100.0	1	100.0							9	37.5
Utilized/Retouched Debitage	6	60.0	5	55.5											1	100.0	12	50.0
Hammerstone			2	22.2													2	8.2
Scraper, side			1	11.1													1	4.1
Total	10	100.0	9	100.0			3	100.0	1	100.0					1	100.0	24	100.0

Table I.48. LA 99853, Artifact Function by Material Type

	Material Type						Total	
	Metamorphic Sandstone		Chert		Siltstone			
	N	%	N	%	N	%	N	%
Primary Function								
Utilized Debitage	2	28.6	1	12.5	1	100.0	4	25.0
Retouched Debitage	1	14.3					1	6.3
Utilized/Retouched Debitage	2	28.6	5	62.5			7	43.8
Chopper	1	14.3	1	12.5			2	12.5
Notch			1	12.5			1	6.3
Biface	1	14.3					1	6.3
Total	7	100.0	8	100.0	1	100.0	16	100.0
Secondary Function								
Utilized Debitage	1	100.0					1	50.0
Hammerstone			1	100.0			1	50.0
Total	1	100.0	1	100.0			2	100.0
Tertiary Function								
Utilized Debitage	2	100.0					2	100.0
Total	2	100.0					2	100.0