NMCRIS No. 119488

RESULTS OF TESTING AT LA 166766, LA 166767, LA 166768, AND LA 166769 NEAR DEMING, LUNA COUNTY, NEW MEXICO

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Abstract

This report presents the results testing by TRC at four archaeological sites—LA 166766, LA 166767, LA 166768, and LA 166769–to determine their eligibility for listing on the National Register of Historic Places (NRHP).The City of Deming proposes to develop the Peru Hill Mill Industrial Park, a 253-ha (625-ac) parcel, located about 3.5 miles northwest of Deming in Luna County, southwestern New Mexico. The City of Deming is applying for a United States (U.S.) Economic Development Administration (EDA) grant to finance improvements required by the proposed project.

Testing, including both manual and mechanical methods, was conducted December 7 through 10, 2010. The field supervisors were Timothy McEnany and Ardale Delena. They were assisted by Mary Quirolo, David Montano, Lanny Noll, William Russell, Allison Harvey, Jesus Alvarez, Steve Storer, and Ignacio Ibarra. Two tractor-mounted backhoes were used for mechanical testing. With a combination of hand excavation methods—(1 x 1-m units, 2 x 2-m scrape areas)—and mechanical trenching and scraping with the aid of a backhoe, 1.7 to 2.9 percent of each of the four site areas was tested. Hand excavated units were 20-cm deep, and all hand-dug soil was screened through either ¼-inch or ⅛-inch mesh. All recovered artifacts were from the uppermost 10-cm (first level), with most being from the uppermost 5-cm.

The assemblages from LA 166766, LA 166767, and LA 166768 are entirely prehistoric, while LA 166769 consists of both prehistoric and historic materials. The artifact assemblages were primarily from the surface, with LA 166766 having 49 surface and 1 subsurface; LA 166767 having 74 surface and 9 subsurface, and LA 166768 having 149 surface and 4 subsurface. LA 166769 had 216 surface and 12 subsurface prehistoric artifacts. The aeolian sandy silt on with the four sites occur appears to have remained stable for the last several thousand years. The sites appear to have possible late Paleoindian (Folsom) through early, middle, and late Archaic occupations as represented by a variety of projectile point types, many represented by only their stems. Lithic analysis indicates bifacial tool manufacturing was a primary activity at the sites. Locally available raw materials were used for the manufacture of chipped stone implements. The assemblages are confined to the uppermost 2 to 4-cm of aeolian deposits. The remnants of former features, such as possible hearths, consist only of the fire-altered cobbles with no soil stains or organic remains containing suitable materials for radiocarbon dating or botanical identification. The sites are not likely to yield important information beyond what has already been acquired.

Table of Contents

List of Figures

List of Tables

1.0 Introduction

This report presents the results testing by TRC at four archaeological sites, LA 166766, LA 166767, LA 166768, and LA 166769, to determine their eligibility for listing on the National Register of Historic Places (NRHP) (Figure 1.1).The sites are within a 253-ha (625-ac) parcel about 3.5 miles northwest of Deming in Luna County, southwestern New Mexico, where the City of Deming proposes to develop the Peru Hill Mill Industrial Park. The City of Deming is applying for a United States (U.S.) Economic Development Administration (EDA) grant to finance improvements required by the proposed project.

Testing, including both manual and mechanical methods, was conducted December 7 through 10, 2010. The field supervisors were Timothy McEnany and Ardale Delena. They were assisted by Mary Quirolo, David Montano, Lanny Noll, William Russell, Allison Harvey, Jesus Alvarez, Steve Storer, and Ignacio Ibarra. Two tractor-mounted backhoes were used for mechanical testing. With a combination of hand excavation methods—(1 x 1-m units, 2 x 2-m scrape areas)—and mechanical trenching and scraping with the aid of a backhoe, 1.7–2.9 percent of each of the four site areas was tested. Hand excavated units were 20-cm deep, and all hand-dug soil was screened through either ¼-inch or ⅛-inch mesh. All recovered artifacts were from the uppermost 10 cm (Stratum I, loose sand layer), with most being from the uppermost 5 cm.

All prehistoric surface artifacts were piece plotted and collected for further analysis. The assemblages from LA 166766, LA 166767, and LA 166768 are entirely prehistoric, while LA 166769 consists of both prehistoric and historic materials. The artifact assemblages were primarily from the surface, with LA 166766 having 49 surface and 1 subsurface; LA 166767 having 74 surface and 9 subsurface, and LA 166768 having 149 surface and 4 subsurface. LA 166769 had 216 surface and 12 subsurface prehistoric artifacts. The subsurface artifacts were all from Stratum I, a stable aeolian soil horizon that has been deflated. None of the four sites exhibit cultural deposition nor have potential for subsurface cultural remains. The few discernible features consist only of fire-altered cobbles with no associated soil stains or charcoal suitable for yielding chronological or botanical remains. Therefore, TRC recommends none of the four tested sites is eligible for listing on the National Register of Historic Places (NRHP) and will not be affected by any proposed construction activities in the Peru Hill Industrial Park.

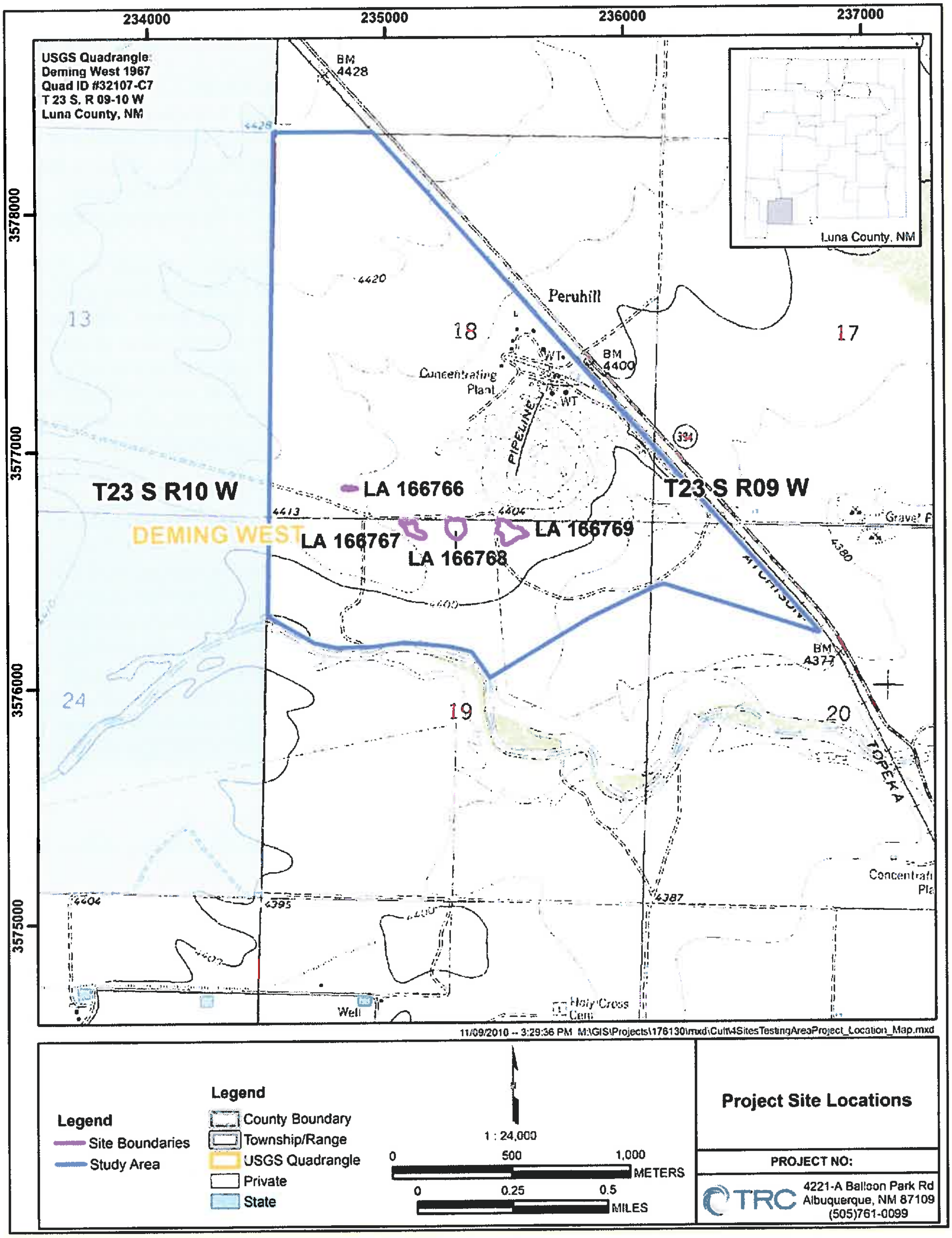

Figure 1.1 Project area location map showing the location of the four tested sites

2.0 Project Location and Description

Four archaeological sites—LA 166766, LA 166767, LA 166768, and LA 166769—lie within the boundaries of the proposed 253 ha (625-ac) Peru Hill Industrial Park, about 5.6 km (3.5 mi) northwest of Deming in Luna County, New Mexico (Figure 1.1). The property is bounded on the north and west by a fence line, on the east by a fence line, the Southwest Railroad, and SR 394 (Peru Hill Mill Road), and on the south by the Mimbres River, a power line, and a pipe line (Figures 2.1–2.4).

Figure 2.1 LA 166766, looking east

Figure 2.2 LA 166767, looking north

Figure 2.3 LA 166768, looking south

Figure 2.4 LA 166769, looking north

The general project area was first developed in 1928 by the Peru Mining Company, a subsidiary of Illinois Zinc Company. The Peru Hill Mill was constructed primarily for the processing of zinc sulfide ore, and the Peru Mining Company operated the mill until 1967. Barite of America (BOA) purchased the mill in 1979 to process barite, and operated it until 1985 when the company filed for bankruptcy. Barite Limited retained the title to the property until it passed to SMS Financial, at which time it was acquired by the City of Deming. A zinc-tailings remediation area lying between LA 166768 and LA 166769 is part of the Peru Hill Mill Property, a participant in the U.S. Environmental Protection Agency's Brownfield

Program. The New Mexico Environmental Department has issued the City of Deming a release stating no hazardous levels of materials are present.

The project area, including LA 166766, LA 166767, LA 166768, and LA 166769, is in Sections 18 and 19, Township 23 South, Range 9 West, on the Deming West (1978, 32107-C7) United States Geological Survey (USGS) 7.5-minute quadrangle. Universal Transverse Mercator (UTM) coordinates for the project were obtained with Trimble GeoExplorer3 Global Positioning Satellite (GPS) units using the Western U.S., 1983 North American Datum (NAD). After post-field differential correction, the GPS unit data has an error of less than 1-m (3.3-ft).

3.0 Natural Environment

3.1 Physiography and Geology

The present project is in southwestern New Mexico within the Mexican Highland Section of the Basin and Range province which extends into adjacent areas of Arizona and Chihuahua (Hawley 1986a:24, 1986b:26). The Mexican Highland Section includes large areas of basin-and-range topography and structure and contains a complex of internally drained basins. Mountains consist of Precambrian cores overlain by Paleozoic sedimentary deposits. Basin deposits can exceed 1524-m (5000-ft) in thickness and exhibit several distinct basin-fill facies, such as coarse-grained river deposits, piedmont alluvium, fine-grained lake and playa sediments, and aeolian deposits. In addition, locally extensive basalt fields occur on basin plains (Hawley 1986b:26). "A number of the basin-floor depressions were occupied by perennial lakes during Pleistocene glacial-pluvial intervals" (Hawley 1986b:26). The project area is on the Deming Plain, "the broad arid plain lying between the Rio Grande and Gila Valleys, with Deming as its center" Bailey 1913:16).

3.2 Soils

The four archaeological sites are associated with two major soils—Berino and Mohave (BA), and Mohave sandy clay loam, 0–3 percent slopes (MU) (NCRS 2010:13, 14, 23). These soils are discussed in more detail below. A windblown sand sheet blanketing the native soils at each site is topped by a thin layer of "green sand" derived from sands associated with the remediated zinc sulphide and barite tailings.

3.2.1 Berino and Mohave soils (BA)

The Berino and Mohave soils (BA) consist of 65 percent Berino and 30 percent Mohave soils and have 0–3 percent slopes. These soils occur on valley floors and fan piedmonts, are well drained and are not subject to flooding. Berino soil formed in alluvium derived from igneous and sedimentary rock. Permeability is moderately high-to-high and available water capacity is moderate. The typical Berino profile consists of loamy sand (0–5 in) underlain by sandy clay loam (5–40 in) which is underlain by loamy sand (40–60 in). Mohave soil has moderately high permeability and high water capacity. The typical Mohave profile consists of sandy loam (0–8 in) underlain by clay loam (8–60 in) (NRCS 2010:13–14). LA 166769 is associated with Berino and Mohave soils (BA).

3.2.2 Mohave sandy clay loam, 0–3 percent slopes (MU)

Mohave sandy clay loam, 0–3 percent slopes (MU), occurs on alluvial fans and hill slopes. This well drained soil formed in alluvium derived from limestone, sandstone, and shale and is not subject to flooding. Permeability is moderately high and available water capacity is high. The typical profile consists of sandy clay loam (0–8 in) underlain by clay loam (8–60 in) (NRCS 2010:23). LA 166766, LA 166767, and LA 166768 are associated with Mohave sandy clay loam (MU).

3.3 Water

The Mimbres River drains a closed basin that includes essentially all of Luna County. The river is formed by snow-pack and runoff on the southwestern slopes of the Black Range. Only the upper reach of the river is perennial. As it flows southward, the river dissipates on the desert floor north of Deming. About once a decade, during periods of unusually heavy rainfall in the Cooke's and Black ranges, the river floods the Deming area. Deming and the surrounding area are underlain by an aquifer with good water. The aquifer is slowly recharged by water from the mountains (Wikipedia 2010a, 2010b).

3.4 Climate

Deming has an arid continental climate characterized by low rainfall, warm summers, and mild winters. At an altitude of 1320-m (4331-ft), Deming is relatively warm throughout much of the year. The average high temperature is 82°F (27.5°C), with July as the hottest month, and the average low is 30.5°F (-0.8°C), with December as the coldest month. Maximum highs during the summers are primarily in the 90s, rarely reaching 100°F (37.4°C) or higher. Year-round humidity is low (City of Deming 2010a). The frost-free season averages about 220 days (Beck and Haase 1969:7).

The average annual precipitation is 229-mm (9 in). August is the wettest month and April and June are the driest. Precipitation primarily falls in July and August as brief, and often heavy, thundershowers, some of which are accompanied by hail. Winter snowfall is light and infrequent. Dust storms generally occur during late winter and spring when soils are dry and winds are moderate to strong. Throughout most of the year, however, the winds are light to moderate, averaging 16 km (10 mi) per hour and prevail from the west (City of Deming 2010a).

3.5 Vegetation

The project area lies within the Lower Sonoran Zone (Bailey 1913:16). The vegetation is variously classified as Grassland Savanna (Gross and Dick-Peddie 1979:117), Desert Grassland (Castetter 1956:256; Dick-Peddie 1993a, 1993b:103), and Chihuahuan Desertscrub (Brown and Lowe 1994). As defined by Dick-Peddie (1993b:106), Desert Grassland is a transitional vegetation that includes all desert shrub-grassland areas. Much of the Desert Grassland was previously grassland. As the result of intensive grazing, however, forbs and shrubs replaced palatable grasses. Due to its transitional nature, this plant community includes a large number of grass, forb, and shrub species. Black grama (*Bouteloua eriopoda*) is the dominant grass. Other grasses include sideoats grama (*B. curtipendula*), tobosa (*Hilaria mutica*), burrograss (*Scleropogon brevifolius*), bush muhly (*Muhlenbergia porteri*), and Indian ricegrass (*Oryzopsis hymenoides*). Forbs include burweed (*Ambrosia acanthicarpa*), gourds (*Cucurbita* spp.), fleabane (*Erigeron* spp.), and red globemallow (*Sphaeralcea coccinia*). Major shrubs include Mormon tea (*Ephedra torreyana*), broom snakeweed (*Gutierrezia sarothrae*), cholla (*Opuntia* spp.), yucca (*Yucca* spp.), fourwing saltbush (*Atriplex canescens*), and rabbitbrush (*Chrysothamnus nauseosus*) (Dick-Peddie 1993b:106–107, 116–120). Testing was conducted in late fall when much of the vegetation was dormant, but vegetation noted during the preliminary survey (Brown and Brown 2010) included soaptree yucca, snakeweed, slender blanketflower, desert globemallow, desert marigold, Indian ricegrass, and tobosa grass.

3.6 Fauna

Prior to historic settlement, a variety of vertebrate fauna—various lizards, snakes, birds, rodents, and carnivores—was present in the area. Deer (*Odocoileus* spp.), pronghorn (*Antilocapra americana*), cottontail (*Sylvilagus* spp.), black-tailed jackrabbit (*Lepus californicus*), ground squirrels (*Spermophilus* spp.), turkey (*Meleagris gallopavo*), and other upland game birds were important meat resources for the prehistoric and early historic inhabitants of the area. Many animals were also exploited as raw material sources (e.g., pelts, hides, feathers, bones) for tools, clothing, ornaments, and ceremonial uses. No wildlife other than songbirds and raptors was observed during testing, but javelinas are reported in the area, and deer tracks and coyote sign were observed.

3.7 Cultural Environment

The cultural environment is rural with a nearby electrical power station, railroads, I-40, scattered residences and associated access roads, transmission and distribution power lines, and liquid petroleum and gas lines. Impacts to the general area include ore milling activities, hazardous materials remediation, a municipal water well, access roads, fences, trails, and livestock grazing. LA 166769 is on the south side of the remediated tailings pile, and is bordered on the northeast by a two-track and a row of irrigated tree plantings. The proximity of LA 166769 to these recent features suggests they may have experienced additional vehicle impact during the active phases of tailings remediation and tree planting. Faint to moderately clear tire tracks indicate more recent casual traffic across each of the four archaeological sites. The City of Deming's locked gate controls access to LA 166766, 166767, 166768, and 166769, and no evidence of vandalism or looting of historic or archaeological resources was noted. No structures or other constructed features, standing or demolished, were observed within the sites.

4.0 Culture History

The prehistoric occupation of southwestern New Mexico is divided into three major periods—Paleoindian (10,000–6000 B.C.), Archaic (6000 B.C.–A.D. 200), and Formative (A.D. 200–1450). The latter includes the Mimbres branch of the Mogollon culture. The following brief overview of the culture history of the project area is based in part on Kearns et al. (2001) and Cordell (1979, 1984, 1997). Reports by Wase et al. (2000), MacNeish and Beckett (1987), and others are used.

4.1 Paleoindian Period (ca. 10,000–6000 B.C.)

Recent work at Pendejo Cave in southern New Mexico suggests the earliest human habitation in North America was as early as 37,000–55,000 years ago (Chrisman et al. 1996). This research remains controversial and most archaeologists recognize the Clovis complex as the earliest cultural manifestation in the American Southwest (Kearns et al. 2001:21). The earliest well-documented human occupation in New Mexico, the Paleoindian period (10,000–6000 B.C.), is divided into three subperiods—Clovis (10,000–9000 B.C.), Folsom (9000–8000 B.C.), and Plano (8000–6000 B.C.)—named for different cultural groupings. Stylistically distinct projectile points associated with late Pleistocene and early Holocene megafauna characterize these complexes. In addition, Paleoindian chipped stone assemblages exhibit a very refined and standardized technology. Clovis was associated with the hunting of mammoths and other late Pleistocene fauna. Folsom and Plano cultures were associated with the hunting of now-extinct forms of bison. By the end of the period, only modern fauna remained. In addition to hunting megafauna, the early Holocene hunters and foragers also exploited a variety of floral and smaller faunal resources (Cordell 1979:20, 1997:96, 99; Martin and Plog 1973:159–160).

The diagnostic artifact for Clovis components is the large lanceolate Clovis spear point, which exhibits a single short basal flute on both faces. The Clovis tool kit also includes spurred end scrapers; large unifacially flaked side scrapers; keeled scrapers on large blades; flake knives; backed worked blades; gravers; perforators; shaft straighteners; and bone points and foreshafts (Gunnerson 1987:10). Surface finds and a few excavated assemblages occur throughout North America.

The diagnostic artifact for Folsom assemblages is the small, finely made lanceolate Folsom projectile point, which has a single flute on each face, extending almost the entire length of the point. Technologically, the Folsom point developed from the preceding Clovis point form. Unlike Clovis points, however, "though heavily utilized and often damaged by impact fractures, Folsom points were frequently recovered, repaired, and re-used. For this reason, they often show evidence of extensive resharpening" (Boldurian and Cotter 1999:116). The tool kit also includes unfluted Midland points, knives, pointed scrapers, choppers, drills, gravers, spokeshaves, abrading stones, awls, and needles (Gunnerson 1987:13). Folsom assemblages are indicative of a hunting and gathering subsistence economy that focused on the seasonal availability of animal and plant resources.

Plano complexes are characterized by a variety of projectile point types that include laterally thinned, indented base, and constricted base series. Plano complex projectile points lack flutes and consist, instead, of large lanceolate forms with basal grinding and large parallel flaking (Wheat 1972; Wormington 1957). The Plainview complex contains laterally thinned points—Plainview, Meserve, Milnesand, and Frederick—and is generally considered the earliest Plano complex. The indented base series includes Firstview, Alberta, and Cody complex points, such as Eden and Scottsbluff. Agate Basin and Hell Gap points comprise the constricted base series (Cordell 1979:21).

Southwest New Mexico and southeastern Arizona has been an important region for the study of Paleoindian sites. In New Mexico, sites in the Gila and San Francisco River drainages, north of the project area, contain sites such as Tularosa Cave, Cordova Cave, the Wet Legget Site, and Bat Cave in the

Plains of San Augustin. In Arizona, the Cienega site was found north of the Gila River and the San Pedro River drainage contains the Murray Springs, Whitewater Creek, Naco, Lehner Ranch, and Adobe sites (Cordell 1984). Despite the finding of these sites in nearby areas, few Paleoindian sites or artifacts have been recorded in the vicinity of the project area (Railey and Holmes 2000:18; Wase et al. 2000:1.32). Folsom and Plano period sites and artifacts, including Cody and Agate Basin, are more common but few of these Paleoindian sites have been excavated and studied (Carmichael 1986; Elyea 1989; Hart 1994; Moore 1996:40; Wase et al. 2000:1.32–33).

Terminal Pleistocene environments in southwestern New Mexico were characterized by mixed juniper-oak woodland with grassland understory. Much of the country was open savanna with numerous lakes (now playas) and perennial streams that would have attracted herds of Pleistocene fauna. Paleoindian camps are commonly located along the shores of these former lakes (Anschuetz et al. 1990:20; Wase et al. 2000:1.33). LA 166767 has a possible base of a Folsom point.

4.2 Archaic Period (6000 B.C.–A.D. 200)

At the end of the Pleistocene, the juniper-oak woodland environment was gradually replaced by the Chihuahuan Desertscrub and grassland communities. The Archaic period (6000 B.C.–A.D. 200) was characterized by a continuation of the hunting and foraging economy of the preceding Paleoindian period but with technological adaptations to the changing climatic conditions. Around 6000 B.C., the North American climate changed to a much warmer and drier Altithermal pattern that caused widespread faunal and floral changes. Human populations apparently adapted to these changes and their material culture became diversified. Archaic point styles are smaller than those of the preceding Paleoindian period, with shouldered hafting elements appearing ca. 3200 B.C. Maize horticulture first appeared in the Southwest between 1500 and 1000 B.C. (Cordell 1997:129), and became a major reliable food source during the late Archaic (Berry and Berry 1986; Huckell 1990; Matson 1991; Wase et al. 2000:1.35; Wills 1988).

Although this period saw a continuation of the mobile hunting and gathering pattern of the Paleoindian period, there was a shift towards resource diversification. In other words, the Archaic adaptation was a "diffuse" economy (Judge 1982:49). The resource base included a variety of plants and the modern suite of fauna. Archaic populations probably had a primary dependence on plant foods, a seasonally mobile settlement pattern, and a flexible social structure in which group size and composition varied in response to changing economic opportunities. Areas where the density and distribution of key plant resources were predictable on a seasonal basis were reoccupied (Judge 1982:49). A greater dependence on plant foods is reflected in a higher frequency of grinding tools during the Archaic.

The Chihuahua tradition, an Archaic sequence proposed by MacNeish and Beckett (1987), represents an Archaic adaptation to the Chihuahuan desert of south-central New Mexico and northern Mexico. The Chihuahua Archaic is defined by the Archaic remains recovered from rock shelters and a few open-air sites in southern New Mexico that represent a diversified and mobile subsistence strategy based on the seasonal exploitation of diverse floral and faunal resources (Kearns et al. 2001:23; MacNeish 1993; Sebastian and Larralde 1989). The Chihuahua Archaic consists of four phases—Gardner Springs (6000–4300 B.C.), Keystone (4300–2500 B.C.), Fresnel (2500–900 B.C.), and Hueco (900 B.C.–A.D. 200) (MacNeish and Beckett 1987).

The Gardner Springs phase (Early Archaic) (6000–4300 B.C.) is poorly known in the project area. Sites are found on the desert floor, near playas, in foothills, and in rock shelters. It is currently characterized by burned caliche or fire-cracked rock features, ground stone tools, stemmed dart points, and an increasing use of local lithic materials. Projectile point styles include Jay, Bajada, and Uvalde dart points. Other artifacts include unifacial basin and slab metates, cobble manos, snub-nosed scrapers, and pebble choppers. Most of the data for this phase are from Fresnal, Pendejo and Todsen rock shelters (Kearns et al. 2001:23; MacNeish and Beckett 1987).

The Keystone phase (Middle Archaic) (4300–2500 B.C.) is characterized by open-air residential sites with multiple, shallow, semi-subterranean circular structures of jacal and brush. Burned rock features, unifacial and bifacial basin and slab metates, and stemmed dart points—Bat Cave, Lerma, Pelona, Akmagre-Gypsum—are also present. Excavated habitation sites include Keystone Dam Site 33 and Vista del Sol in the El Paso area (Kearns et al. 2001:23; MacNeish and Beckett 1987).

The Fresnel phase (Late Archaic) (2500–900 B.C.) corresponds to a more mesic environment and is represented a greater number of known sites. Residential architecture is similar to that of the earlier Keystone phase. The introduction of cultigens—maize and pumpkin—occurred during the Fresnal phase. Dart point types include San Jose, Pelona, Augustin, Chiricahua, La Cueva, Fresnal, Armijo, and Todsen. The presence of cultigens, Olivella shells, and a wide variety of dart point types reflects greater regional trade and interaction (MacNeish and Beckett 1987). Pit structures and thermal features have been excavated in the La Mesa coppice dune field near Santa Teresa (O'Leary 1987).

The Hueco phase (Late Archaic) (900 B.C.–A.D. 200/900) exhibits both Archaic characteristics and emerging Formative traits (Kearns et al. 2001:23; Hill and Staley 1999). Dart points decrease in frequency, reflecting the adoption of the bow and arrow (Roney 1985). The ground stone assemblage includes trough metates, unifacial, and bifacial one- and two-hand manos. Regional trade also increased during the Hueco phase (MacNeish and Beckett 1987). Numerous cultigens and intensive processing activities appear at extensive sedentary villages along the floodplain of the Santa Cruz River in southern Arizona (Mabry 1998a; 1998b) and along the Rio Casas Grandes at Cerro Junaquena in northern Chihuahua (Hard and Roney 1998; Kearns et al. 2001:23). LA 166766 has a Gardner Springs phase (6000–4300 B.C.) affiliation based on a Bajada projectile point; LA 166767 has a 1000 B.C.–A.D. 100 affiliation bas on the presence of a Maljamar projectile point. LA 166768 has a Late Archaic Fresnel phase (2500–900 B.C.) affiliation based on a Chiricahua projectile point, and LA 166769 has a 5500–3000 B.C. affiliation based on the presence of a Jay-like projectile point.

4.3 Formative Period: Mogollon Tradition (A.D. 200–1450)

The Mimbres Mogollon/Pueblo tradition (A.D. 200–1450), which succeeds the Chihuahuan Archaic period, is centered in the Mimbres River Valley of southwestern New Mexico, extending south to Deming and into northern Chihuahua, Mexico. It has been the focus of archaeological research for nearly a century (Haury 1992; Kearns et al. 2001:25; LeBlanc 1992). The Mimbres Mogollon is characterized by agriculture, sedentary villages with storage facilities, and the manufacture of utilitarian and trade ware ceramics. Settlements had access to arable land and water resources. As the population increased over time, advances included irrigation technology to enhance agricultural production. The population apparently increased until A.D. 1150 (Akins et al. 1999). The Mimbres Mogollon is divided into Early Pithouse (A.D. 200–550), Late Pithouse (A.D. 550–1000), and Pueblo (A.D. 1000–1450) periods (Kearns et al. 2001 26). None of the four sites has evidence of Formative period occupations.

4.3.1 Early Pithouse Period (A.D. 200–550)

The Early Pithouse period, which probably developed from the preceding Hueco phase, is characterized by the appearance of undecorated brownware pottery and pithouse architecture. Pottery includes Alma Plain, Alma Rough, and San Francisco Red (LeBlanc 1980). Occasionally, fugitive red slips were applied to vessels but they do not exhibit the highly polished surfaces of the true San Francisco Red of the Late Pithouse period (Anyon and LeBlanc 1984:21–22; Schutt 1994:15). LeBlanc (1980:119) suggests the earlier redware was a possible local variant of San Francisco Red. Pithouses are semi-subterranean, curvilinear structures consisting of a pole frame covered by mud-coated brush with most structures exhibiting long entryways (Haury 1992; LeBlanc 1980; Wheat 1955). Sites tend to occur on relatively isolated or inaccessible high ridges, mesas, and knolls (Anyon and LeBlanc 1984:22; Cordell 1984:114, 1997:203–205). "Villages of up to 50 pithouses are known for this period, and are typically situated on elevated, defensible locations adjacent to fertile bottomlands" (Railey and Holmes 2000:21). A variety of extramural hearths and storage facilities are common in villages. Flexed, bundle, and extended pit burials occur in both intramural and extramural contexts (Wheat 1955). In addition to agriculture, subsistence strategies included the hunting of deer, rabbits, and other game and the gathering of wild foods, including agave and the seeds of weedy annuals (Akins et al. 1999; Brown 1999; Kearns et al. 2001:26).

4.3.2 Late Pithouse Period (A.D. 550–1000)

The Late Pithouse period "is marked by the abandonment of defensive locations on isolated knolls and the establishment of new villages on lower river terraces in the midst of good farmland" (Railey and Holmes 2000:21). Hunting and gathering remained important subsistence strategies throughout the Late Pithouse period (Cordell 1984:74, 114–115, 1997:205–208). An elaboration of burial practices and the construction of water control features also occurred during the Late Pithouse period (Anyon and LeBlanc 1984:22; McGraw and McCray 1995:4). In the Mimbres area, the Late Pithouse period consists of three phases—Georgetown (A.D. 550–650), San Francisco (A.D. 650–750), and Three Circle (A.D. 750–1000) (Anyon et al. 1981; Haury 1936). Haury (1936) based these phases on changing architectural and pottery styles.

The Georgetown phase (A.D. 550–650) is marked by the presence of circular and D-shaped pithouses with basin-shaped fire pits and inclined lateral entrance ramps. Communal structures are present. The pottery is unpainted and consists of San Francisco Red, Alma Plain, Alma Neck-banded, and Alma Scored (Anyon and LeBlanc 1984:22; Schutt 1994:15). Georgetown sites occur in a variety of topographic settings, including the first terrace above rivers. Burials are usually extramural but also occur in abandoned pithouses (LeBlanc and Whalen 1980:18).

The San Francisco phase (A.D. 650–750) is characterized by rectangular pithouses with rounded corners and plastered walls. Associated pottery includes the first painted types—Mogollon Red-on-brown and San Lorenzo Red-on-brown but production of San Francisco Red and Alma brownwares continued. Communal structures are larger than those of the preceding phase were (Anyon and LeBlanc 1984:22; Schutt 1994:15–17).

The Three Circle phase (A.D. 750–1000) is distinguished by rectangular pitstructures with squared corners and commonly, with masonry-lined walls (Anyon and LeBlanc 1984:22; Schutt 1994:17). New pottery types—Three Circle Red-on-white and Mimbres Boldface Black-on-white (Styles I and II)—are present (Anyon 1980:145–146), as are Alma Plain and San Francisco Red. Villages increased in size and pithouses decreased in size. In addition, there was a population expansion along secondary drainages (Cordell 1984:74, 114–115; Schutt 1994:17). By A.D. 1000, intramural family cemeteries were more common than extramural inhumations (Kearns et al. 2001:26; Shafer 1999).

4.3.3 Pueblo Period (A.D. 1000–1450)

The Pueblo period is divided into three phases: Classic Mimbres or Mimbres (A.D. 1000–1150), Black Mountain or Animas (A.D. 1150–1300), and Cliff or Salado (A.D. 1300–1450). The Classic Mimbres phase (A.D. 1000–1150) corresponds to the Early Pueblo period. The data suggest Classic Mimbres developed in situ. The Classic Mimbres is marked by the abrupt change from semi-subterranean pithouses to surface masonry pueblos. The shift from separated dwellings to contiguous ones is suggestive of major organizational changes (Anyon et al. 1981:212, 219; Anyon and LeBlanc 1984:23; Schutt 1994:18). "The common building form in the Classic was a series of contiguous, single-story rectangular rooms with walls made of unshaped river cobbles set in abundant adobe or mud mortar" (Cordell 1984:294). In addition, site sizes are variable, with both large and small sites increasing in frequency. The larger sites generally have a number of storage rooms, kivas, plazas, and slab-lined fire pits and frequently they were built along major drainages over Late Pithouse sites. The small sites, occurring along the main river valleys between the larger sites, are probable seasonal field houses or temporary sites, lack plazas and kivas, and are not built over earlier sites (Anyon and LeBlanc 1984:23; Schutt 1994:18). Ceremonial structures include very large, rectangular, semi-subterranean kivas and small pithouses remodeled for use as kivas. Although the villages were not planned constructions, room clusters were loosely arranged around an open plaza. Classic Mimbres pueblos, therefore, were aggregated, rather than nucleated, settlements (Cordell 1984:295–299).

Classic Mimbres pottery types include Mimbres Black-on-white (Style III) and Mimbres Polychrome. The production of Alma Plain and redware, however, continued (Schutt 1994:16). Trade is indicated by the presence of shell, turquoise, and exotic ceramic tradewares, but it was limited. The large Classic Mimbres population increase—estimated at two and a half times that of the preceding period—probably "resulted in a change toward more intensive and extensive exploitation of the environment. Agriculture was intensified by the construction of check dam systems and perhaps irrigation" (Anyon and LeBlanc 1984:23).

The end of the Classic Mimbres also marks the termination of the Mimbres Mogollon cultural sequence. Undoubtedly, considerable resource stress was a major factor in the collapse of the Mimbres Mogollon system (Anyon and LeBlanc 1984:23). Natural resources—firewood, wild game, and wild plant foods—were depleted over time and when crop failures resulting from several years of drought began in A.D. 1150, few backup resources were available. Consequently, many Mimbres sites were abandoned (Cordell 1984:74, 294–297, 1997:207–208).

The Black Mountain (Animas) (A.D. 1150–1300) and Cliff (Salado) (A.D. 1300–1400) phases are generally regarded as non-Mogollon cultural manifestations. The Black Mountain phase represents an occupation by Pueblo peoples shortly after the Mogollon abandoned the area. The phase is characterized by adobe, rather than cobble-walled, pueblos and by a settlement shift to drier portions of the Mimbres area. In addition, the ceramic assemblage is entirely new and includes polychromes—Chupadero Black-on-white, Three Rivers Red-on-terracotta, El Paso Polychrome, and Casas Grandes polychromes (Anyon and LeBlanc 1984:23–24). The presence of ceramic types "relatable to Casas Grandes (Playas Red Incised, El Paso Polychrome, and Ramos Polychrome) are viewed as marked departures from the Mimbres Classic and as evidence of a close tie between the Mimbres Valley and the important Chihuahuan area of Casas Grandes" (Cordell 1984:117, 1997:208). For reasons that are yet unclear, the population of the area dropped markedly at ca. A.D. 1300 and apparently coincided with the collapse of Casas Grandes itself (Anyon and LeBlanc 1984:25).

The Cliff phase, a local manifestation of the Salado culture of Arizona, is the closest Postclassic occupation to the project area. The majority of Cliff phase sites occur on the Gila River and its tributaries near Cliff, northwest of Silver City. Cliff phase sites are few and consist of small structures of puddle adobe, some enclosed by freestanding walls (Nelson and LeBlanc 1986). Some sites have been recorded on the upper Mimbres River (Schutt 1994:18). Pottery assemblages primarily consist of plainware and textured wares. Corrugated wares are absent and Gila Polychrome occurs in low frequencies (Anyon and LeBlanc 1984:25). Chupadero Black-on-white, El Paso polychrome, and Ramos Polychrome are rare but their association with Cliff phase sites indicates that the trade networks were still operational. Cremations were secondarily interred in jars, a practice from earlier periods (Kearns et al. 2001:27). As the Puebloan culture began to decline at ca. A.D. 1400, eventually disappearing from the area, nomadic Apachean groups arrived, claiming the area as their own.

4.4 Historic Period (A.D. 1540–Present)

The 1540–1542 *entrada* of Francisco Vasquez de Coronado was the first official European entry into present-day New Mexico. After the "failure" of the Coronado expedition, the Spanish ignored New Mexico for almost 40 years. Beginning, however, with the Rodriguez-Chamuscado expedition of 1581, Spanish interest in New Mexico was renewed. Juan de Oñate, leading a group of colonists into the Rio Grande Valley in 1598, founded the first European settlement—San Gabriel—in New Mexico. This was the beginning of a permanent Spanish presence in the region. Santa Fe was founded in 1610 as the Spanish capital of New Mexico (Athearn 1992:3–4; Jenkins and Schroeder 1974:17, 19). The Spanish presence radically altered Puebloan culture in terms of economy, religion, politics, and society. Endemic disease, slavery, the Spanish system of land grants and village establishment, as well as raiding by the Navajo, Ute, Apache, and Comanche, all drastically reduced traditionally held areas. The Pueblo Revolt of 1680 was partly a reaction to these stresses and temporarily removed Spanish rule. In 1692, an army under de Vargas reasserted Spanish claims on New Mexico that held until Mexican independence from Spain in 1821.

Governor Juan Bautista de Anza passed through the area in 1780 while on an unsuccessful search for a route between Santa Fe and the mines of Sonora, Mexico. Throughout most of this period, however, the Spanish exerted little influence in, and generally ignored, southwestern New Mexico, except along the Rio Grande. Lacking large Puebloan populations, the area was not attractive for intensive missionary efforts. The environmental nature of the area discouraged agricultural pursuits. Mineral wealth, the goal of Coronado's *entrada*, was elusive and was not found until almost the end of the Spanish Colonial period. In addition, southwestern New Mexico belonged to the Chiricahua Apache and the Spanish were never able to dislodge them from the area (Christiansen 1980:24). Consequently, the Spanish "remained on the fringes of the area and never made a concerted effort to occupy southwestern New Mexico" (Christiansen 1980:24).

Reportedly, an Apache had found copper deposits in the Santa Rita area in 1798 (Christiansen 1980:26) or 1800 (Sherman and Sherman 1975:188) and news of the find had been given to Spanish authorities. Copper ore production at Santa Rita began in 1804 (Myrick 1990:185). The Janos or Ore Road from Santa Rita to Chihuahua passed west of present-day Deming. In 1807, Lt. Zebulon Pike and his exploration party were the first Anglos to enter the project area, as prisoners, on their way to Mexico via the Camino Real. Pike recorded that the Santa Rita mine was producing 20,000 mule loads of copper each year (Pratt and Scurlock 1991:93).

Mexico obtained its independence from Spain with the signing of the Treaty of Córdova on August 24, 1821. New Mexico, therefore, became part of the Mexican nation. The Mexican Period (1821–1846) in southwestern New Mexico, however, was little different from that of the Spanish Colonial. Mexico, engaged in political struggles, had little time for southwestern New Mexico, an area perceived as harsh, unfriendly, and poor. The latter perception, however, was soon to change with the arrival of the Americans.

The establishment of the Republic of Texas in 1836 and its annexation by the United States in 1844 led to poor relations between Mexico and the United States and eventually resulted in the outbreak of war in 1846. New Mexico was captured by General Steven Watts Kearny's military force. The Treaty of Guadalupe Hidalgo, which ended the war in 1848, ceded most of Mexico's northern territory, including New Mexico, to the United States. The Territory of New Mexico was created in 1850 (Jenkins and Schroeder 1974). The arrival of the Americans had a major impact on southwestern New Mexico. With the Americans came mines, forts, towns, railroads, and the subjugation of the Apache.

During the Mexican War, Colonel Philip St. George Cooke and the Mormon Battalion marched down the Rio Grande and southwest, probably passing through the area near present-day Deming (Baxter 1986:108–109). The wagon road established during Cooke's march was used until ca. 1860 (Wase et al. 2000:1.45). A stage route was established through southwest New Mexico in response to the 1857 Pacific Wagon Road Act. The route was from El Paso to Fort Yuma, in Arizona (Pratt and Scurlock 1991:157). The Butterfield Overland Mail Company used the road as part of its route between St. Louis, Missouri and Stockton, California from 1857 to 1869 (Wase et al. 2000:1.46).

Livestock has been an important commodity in New Mexico since the Spanish came in 1598. Originally, sheep were most important, but cattle became more important with an influx of Texas cattlemen after the Civil War. The discovery of gold in California also opened a large market for beef. Beginning in 1848, Texas cattle were driven through what would become Deming. In 1852, Eugene Lietendorf drove cattle through this area from Illinois to California. At Pyramid, 14 km (9 mi) south of Lordsburg, he dug wells to water his cattle. This later became a water stop for the southern overland route to California (Pratt and Scurlock 1991:155; Wase et al. 2000:1.51). Responding to the renewed demand for beef after the Civil War, John Slaughter used the same trail in 1879 to drive cattle west to Arizona and California. The trail was named after him. After the arrival of the railroad in 1880, cattle drives were no longer required. The open range was replaced by fenced, privately owned ranches. Ranching continued to expand through the early 1920s (Wase et al. 2000:1.51–53).

The Territory of New Mexico achieved statehood in 1912, and within a few years the Mexican Revolution had a direct impact on the southwestern part of the new state. Pancho Villa's troops crossed into the United States and raided the community of Columbus and adjacent Camp Furlong on March 9, 1916. Within a week, 6,000 U.S. troops were along the border and soon, under General John J. Pershing, they crossed into Mexico. Although the American "punitive expedition" was ineffective, it spurred development in the region with the building of the Deming armory and establishment of Camp Cody (named after Buffalo Bill Cody), an 809 ha (2000 ac) facility near Deming. The 30,000 National Guardsmen stationed at Camp Cody were from Iowa, Minnesota, Nebraska, North Dakota, and South Dakota and were identified as the Thirty-fourth (or Sandstorm) Division. The camp's structures burned in 1939 (Kearns et al. 2001:29; Pratt and Scurlock 1991:259–260, 283; Wase et al. 2000:1.54).

By the 1920s, automobiles were spurring development in New Mexico. Between 1921 and 1931, highway expenditures in New Mexico quintupled and by 1932, the state had 5700 miles of improved highways (Roberts and Roberts 1988:172–173). The highway system was influential in promoting tourism that included the nearby City of Rocks State Park, Rock Hound State Park, and Gila Cliff Dwellings National Park. Highways, in conjunction with the railroads, facilitated transportation of people and goods through southwestern New Mexico (Wase et al. 2000:1.54).

In 1927, the first Army Air Force landing field in New Mexico was built south of Lordsburg. Charles Lindbergh dedicated the airfield in 1932. Hotels and motels sprang up (Wase et al. 2000:1.59). The local economy revived during World War II, partly due to the need for copper and the establishment of a military airfield at Deming and prisoner of war camps at Ulmorris, east of Lordsburg. Since the war, copper mining has ebbed in southwestern New Mexico. Cattle ranching, however, remains important (Kearns et al. 2001:29; Wase et al. 2000:1.54, 1.59). LA 166769 has an early twentieth century occupation represented by household refuse.

4.4.1 Mansos

The Mansos, based on early Spanish accounts, ranged from south of El Paso to possibly as far north as Hatch, and as far west as the Florida Mountains south of Deming. Forbes (1959:107) concludes that the Jano and Jocome, two other groups mentioned by the Spanish, were linguistic relatives of the Manso. By combining these groups, the Manso range may have extended as far west as southeastern Arizona and into northern Chihuahua (Beckett and Corbett 1992:3). The Mansos are the most likely descendants of the Jornada Mogollon. The earliest descriptions of the Mansos are from the expeditions of Chamuscado-Rodriguez in 1581–1582, Espejo in 1582–1583 and Benavides in 1630. These Spanish explorers reported that the Mansos lived in rancherias, in straw houses or huts of branches (e.g., wickiups), and may have numbered a thousand people. They reportedly ate maize, mesquite, jerked venison, and fish, which they caught with nets in the Rio Grande and in oxbow lakes. The Mansos hunted with the bow and arrow and clubs; they used flint knives for cutting. They wore little clothing (Benavides 1965; Hammond and Rey 1966). In the El Paso area, remnant Manso groups were reduced to mission communities by the late 1600s, and the last Spanish Colonial record of an independent Manso group dates to 1711 (Beckett and Corbett 1992). The Mansos were probably extinct as a tribe by the mid-1700s (Wase et al. 2000:1.42). None of the sites have Mansos occupations.

4.4.2 Chiricahua Apache

The project area is within the former territory of the Chiricahua Apache. One of the most controversial issues among anthropologists and archaeologists in the Southwest concerns the arrival of the Navajo and Apache—Southern Athapaskan groups—in the region. One hypothesis suggests Apachean groups arrived in the Southwest and Southern High Plains via the High Plains shortly before the arrival of Spaniards in the area in 1540 (Carlson 1965; Gunnerson 1956, 1974; Gunnerson and Gunnerson 1971, 1988:1–2; Hester 1962; Schaafsma 1981; Wilcox 1981). A date of ca. A.D. 1525 has been postulated. If this interpretation is correct, the southward Apachean migration coincided with the maximum of the "Little Ice Age." Apachean peoples may have followed bison herds along the front range of the Rocky Mountains (Gunnerson 1956; Gunnerson and Gunnerson 1988:2). Other researchers suggest the Navajo and other Apache groups arrived at different times and by different routes, such as an intermontane route through Colorado or Utah and the Great Basin or west of the Continental Divide (Hall 1944; Harrington 1940; Huscher and Huscher 1942; Opler 1975; Steward 1936:62; Worcester 1951). Because the Chiricahua and the Western Apache exhibit many Great Basin characteristics and few Plains traits, it is probable that these Apacheans entered the Southwest via an intermontane route (Opler 1983a:385).

Glottochronological data suggest Apachean linguistic differentiation began ca. A.D. 1300. Prior to that time, the Apacheans were a single group or very closely related groups (Opler 1983a:381, 385). Based on linguistic data, Opler (1983a:385) suggests the first Apachean groups entered the Southwest ca. A.D. 1400. During the sixteenth and early seventeenth centuries, the ancestral Chiricahua and Mescalero migrated south, down the Rio Grande valley. Eventually, both groups diverged and the Chiricahua established their territory west of the Rio Grande, in southwestern New Mexico, southeastern Arizona, and adjacent northern Mexico. The hunter-gatherers encountered by Coronado in southeastern Arizona in 1540 were probably Chiricahua Apache (Opler 1983a:384–385, 1983b:401–402). The Mescalero established their territory east of the Rio Grande, in southeastern New Mexico and northwestern Texas and adjacent portions of northern Mexico (Opler 1983a:385, 1983c:419). The Rio Grande formed the boundary between Chiricahua and Mescalero territory.

The Chiricahua consist of three bands—Eastern, Central, and Southern. "To the Eastern Chiricahua belonged almost all the Chiricahua territory west of the Rio Grande in New Mexico" (Opler 1983b:401), including the project area. Portions of the Eastern Chiricahua have been known as Mimbreños, Coppermine, Warm Spring, and Mogollon Apaches (Opler 1983b:401). In 1626, Fray Alonso de Benavides referred to the Apache west of the Rio Grande as Xila (Gila) Apache (Hodge et al. 1945:84–85). While accompanying an inspection of all presidios in New Spain in 1766–1768, Nicolás de Lafora noted a group of Gileños who were based mainly in the Los Mimbres Mountains. Other Gileños reportedly gathered mescal and hunted in the Burro and other mountains in southwestern New Mexico (Kinnaird 1958:78).

Spanish military strikes against the Chiricahua occurred in the Mogollon, Mimbres, and Burro mountains, as well as the Chiricahua, Socorro, Florida, and Hatchet mountains. In general, the military campaigns were unsuccessful and lapsed during the first quarter of the nineteenth century, when Mexico was in the throes of wresting its independence from Spain and establishing itself as a federal republic. Conciliatory efforts during this period led to shaky peace treaties and permission for mining operations in Chiricahua territory (Opler 1983b:403).

Following the Treaty of Guadalupe Hidalgo in 1848, which ended the Mexican War and ceded nearly all of present-day New Mexico to the United States, Americans were eager to exploit the mineral wealth of southwestern New Mexico. The discovery of gold in California in 1848 did not help the situation. Clashes between impatient immigrants—eager to reach the gold fields of California—and the Chiricahua were frequent. The resulting U.S. military policy sought to punish the Chiricahua for protecting their hunting grounds or for retaliating against mistreatment. Military posts were established in New Mexico to control the Indians. When Americans wanted to reopen the Santa Rita copper mines, Fort Webster was established nearby for protection in 1852. The influx of prospectors into Eastern Chiricahua territory heightened after the discovery of gold at Pinos Altos (Opler 1983b:403–404). "As mining and agricultural communities multiplied, the Apache presence in their traditional territories was less and less welcome" (Opler 1983b:404). The needs of the Chiricahua increased as their movements were restricted and as game became depleted. Consequently, the Chiricahua became more aggressive. Prominent Eastern Chiricahua leaders in southwestern New Mexico included Mangas Coloradas and Victorio.

As one government response to the situation, Congress voted for an appropriation in 1855 to concentrate the Eastern Chiricahua, provide them with necessities, and encourage them to farm. Although the plan ended in disaster when the military attacked a group of Eastern Chiricahua, Michael Steck, a sympathetic Chiricahua agent, continued with plans for a Chiricahua reservation. Steck selected a reservation site on a tributary of the Gila River, 24 km (15 mi) south of the Mogollon Mountains. In 1860, he received authorization to settle as many Eastern Chiricahua as possible on the reservation. Unfortunately, success was thwarted by the outbreak of the Civil War and the invasion of New Mexico Territory by Confederate forces. Several other failed attempts to settle the Chiricahua on a reservation—Bosque Redondo (1865), Tularosa Valley Reservation (1871), Chiricahua Reservation (southeastern Arizona Territory, 1872), Cañada Alamosa (Hot Springs) Reservation (1874)—occurred after the war. In 1876 and 1877, the Chiricahua were forced onto the San Carlos Apache Reservation in Arizona. Desertions from San Carlos soon followed (Opler 1983b:404–406).

Fugitive Chiricahua often fled to Mexico, making the rugged Sierra Madre range their base of operation. As a result, the Chiricahua also had to contend with pursuit by Mexican forces. In October 1880, while fleeing American forces, Victorio and most of his followers were killed in a battle with Mexican soldiers. In April 1882, another Chiricahua group trying to elude pursuing American forces fell into a Mexican ambush, suffering high casualties, especially among women and children (Opler 1983b:406).

Most of the Chiricahua fugitives returned to the San Carlos Reservation in 1883 and 1884. Fearing arrest in May 1885, Geronimo and Mangas headed for Mexico with their families. Running low on supplies and ammunition, the fugitives surrendered in March 1886. While on their way back to San Carlos, however, Geronimo and Naiche escaped with close family members. In retaliation, the returning fugitives who had not fled were sent to Florida for confinement in Fort Marion. Later the same year, in response to public clamor seeking the removal of all Chiricahua from Arizona Territory, the Chiricahua at San Carlos, including those who had served or were serving as U.S. Army scouts, were also moved to Fort Marion. Discouraged by the news of the removal of their people, Geronimo and Naiche finally surrendered on September 3, 1886. Although General Miles promised to send both men to Fort Marion, they and 15 others were imprisoned at Fort Pickens, Florida (Opler 1983b:407–408).

Due to crowded and unsanitary conditions, the removal of a desert mountain people to a hot and humid lowland climate, recent privations, enforced idleness, and fears and uncertainties concerning the future, more than 20 percent of the Chiricahua sent to Florida had died by the end of 1889. During this initial confinement period (1886–1889), the Chiricahua at both Florida forts were sent, in separate moves, to Mount Vernon Barracks in Alabama. In 1894, the Chiricahua were transferred to a reservation at Fort Sill, Oklahoma. The Chiricahua were granted full freedom in 1913. A small contingent decided to remain in Oklahoma and is known as the Fort Sill Apache. A majority of the tribe elected to move to the Mescalero Apache Reservation in Otero County, New Mexico (Opler 1983b:408–409).

4.4.3 Luna County

Luna County, named in honor of Solomon Luna, a prominent New Mexico sheep rancher, businessman, and political figure during the Territorial period, was created on March 16, 1901 from the western portion of Doña Ana County and the eastern portion of Grant County. Creation of the new county was in large part due to rivalry between Deming and Silver City. The first county offices were in the Bank of Deming for nine years (Beck and Haase 1969:49; Miller 1978:6; Whisenhunt 1979:25). A two-story brick courthouse, designed by W. B. Corwin, was completed in 1910. The building has a tall clock tower and a Greek portico (City of Deming 2010b; Whisenhunt 1979:25). The county contains four important mining districts—the Cook's Peak, the Floridas, the Tres Hermanas, and the Victorio districts. The first county extension agent in New Mexico was in Luna County (Miller 1978:7).

In 1909, water for irrigation was found by tapping into the aquifer of the Mimbres drainage and the land was ripe for exploitation. "Land companies were organized and expensive machinery was sold to farmers unacquainted with western agricultural methods" (Miller 1978:7). After a brief period of prosperity, which lasted until ca. 1914 or 1915, many farms were abandoned as unprofitable. Luna County had 340 farms in 1910 and although the number had fallen to 287 by 1920, the number of farms with more than 1000 acres under cultivation had increased from eight to 44. In 1940, the county had 170 farms and the three largest crops were beans, cotton, and sorghum. By 1978, 14,000 acres were under cultivation, with pinto beans, cotton, and feed crops as the main agricultural crops. The extent of irrigation is primarily based on the amount of water obtainable from subsurface pumping (Miller 1978:7). Today, "Luna County is known as the 'Chile Capital of the World.' Its secondary crops are cotton, onions, and sorghum" (DeMarco 2002).

Luna County is primarily cattle country. The county had 30,647 head of cattle in 1910. By 1920, the number had risen to 93,144, of which 92,132 were beef cattle. Poor market conditions and disastrous droughts resulted in a decline in the 1930s. In 1940, the county had 70 ranches with an average shipping yield of 12,000 head per year (Miller 1978:7).

4.4.4 Deming

From the end of the Mexican War until the Gadsden Purchase of 1853, the future site of Deming was a port of entry on the U.S.-Mexican border. The Butterfield Trail and the Butterfield Stage passed north of present-day Deming from 1858 to 1881. The Butterfield Stage was the longest overland route of its day, extending from Tipton, Missouri to San Francisco, California (McLemore and Dunbar 2000:67). Deming, the county seat of Luna County, was founded in 1881 and named after Mary Ann (or Anne) Deming Crocker, the wife of Charles Crocker, one of the four promoters of the Southern Pacific (SP) Railway system, which reached this point late in 1880 (Julyan 1996:108; May 1978:12–13; Whisenhunt 1979:25). A roundhouse and repair shops were built and a city of tents and shanties was erected. In early 1881, the Atchison, Topeka, and Santa Fe Railway (AT&SF) reached Deming, completing its junction with the Southern Pacific (Miller 1978:6). Prior to completion of the AT&SF line, the cost of the 193-km (120-mi) stagecoach ride from Rio Mimbres (near Deming) to San Marcial on the Rio Grande was $20.00 (Myrick 1990:11). With the influx of settlers in 1882, substantial buildings were constructed. The storerooms of the town's first mercantile, E. Germain and Company, consisted of old boxcars. In 1887, the population was 1600 and the town had a public and a private school, two Protestant churches, and four hotels. By 1891, Deming had four churches and two newspapers. The "City Club" had been organized to establish a library and to promote the town's social, commercial, and scientific development (Miller 1978:6–7). A five-room school was built in 1892 due to Deming's growth. Deming High School was built in 1911 and razed in 1961 for an addition onto Deming Junior High School (Anonymous 1978:20). In 1911, "Deming was a small place known as the windmill city. Every house had a windmill and the water was most delicious—99.99 percent pure. Many people came here to cure ailments such as tuberculosis. Deming had board sidewalks and dirt streets" (Haas 1978:89).

Deming, along with Columbus, was the chief cattle shipping point in southern New Mexico. It was also a cattle-shipping point for Mexico. In 1885, 13 carloads of beef cattle brought overland from Corralitos, Mexico were shipped to Kansas City from Deming (Miller 1978:7). Although Deming's current economy primarily consists of agriculture, tourism (mostly in the form of snowbirds), light industry, and ranching (DeMarco 2002), former military installations in the Deming area were important contributors to the local economy. "These installations bolstered the economy of the community for short periods and their withdrawals, of course, had the inevitable reverse effect" (Gustafson 1990).

4.4.4.1 Military Installations

During the Apache military campaign, to circumvent Apache sabotage of telegraph lines, the Army established a heliograph communications system in 1886. Most of New Mexico's 14 stations were on peaks and were manned by two or three operators and one to five guards. After the Apaches were subdued, the stations were abandoned, but they were reestablished in 1890 with 51 stations before being abandoned permanently (Couchman 1990:216–219; Pratt and Scurlock 1991:138–139; Wase et al. 2000:1.46). None were in the vicinity of the present project area.

At different times during the first half of the twentieth century, Deming was chosen as the site for military installations—three camps and an army air field. In 1914, World War I began and Mexico was in the midst of a 10-year revolution. Because of a possibility of war with Mexico and because of Deming's proximity to the U.S.-Mexico border, joint maneuvers of the State Guard and U.S. Army were held in Deming from July 11 to 21, 1914. The encampment, Camp Brookes, was west of town and north of the AT&SF roundhouse and consisted of 20 streets. The Deming Chamber of Commerce supplied the camp with water via 2-inch pipes and provided each street with a shower bath. The joint maneuvers were conducted by over 1,000 soldiers—750 state guardsmen, 133 men of Battery C of the Sixth U.S. Artillery, and 180 men of the 1st Battalion of the Sixth U.S. Infantry. The U.S. Army units were from Fort Bliss. The guardsmen included 62 local men of the then recently formed Company I. The maneuvers focused on scouting, patrolling, small target practice, and parading. A bugle call at 1 P.M. on July 21 signaled the dismantling of the camp. The success of Camp Brookes probably contributed to the later selection of Deming for Camp Deming and Camp Cody (Gustafson 1990; Krol 2010).

In July 1916, 7,800 troops from Delaware, Arkansas, Wyoming, and New Hampshire arrived in Deming and began constructing Camp Deming just northwest of town. Permanent construction included Brigade Headquarters, a field hospital, latrines, and showers. In addition, a temporary post office and a YMCA were set up (Anonymous 2010). The official opening of Camp Deming was on December 29, 1916. Although the outpost was to be used by the National Guard during the Mexican crisis, its mission was short-lived. The camp was abruptly closed in February 1917 (Anonymous 2010; Krol 2010).

Although the loss of Camp Deming resulted in a recession in town, it was cured with the June 1917 selection of Deming as a site for an army training facility, only one of four in the far West. One reason for its selection was its proximity to the railroad. The United States had declared war on Germany on April 6, 1917. Accepting the Deming City Government's offer of free land if selected for a new camp, the U.S.

War Department established a 2000-acre military facility just northwest of Deming to train soldiers during World War I. The new installation, named Camp Cody in honor of William "Buffalo Bill" Cody who had died earlier that year, was 4-km (2.5-mi) long and 2-km (1.25-mi) wide and was between the SP and AT&SF Railway lines. The SP laid track in the camp area for unloading building materials and eventually, troops. At the height of construction, the work force consisted of 3,000 men. The camp, which was designed for 36,000 soldiers, consisted of National Guardsmen from Iowa, Nebraska, Minnesota, and the Dakotas who formed the 34th Infantry Division, which was known as the Sandstorm Division (Anonymous 2010; Krol 2010; Kromeke 2010).

When completed, the camp had three main streets and 18 cross streets. In total, 19 km (12 mi) of streets had been graded and topped with 8-cm (3-in) of gravel. Due to heavy truck traffic, crude oil was eventually poured on the main streets. Buildings included Division Headquarters, a headquarters for each regiment, office buildings for each brigade, an 800-bed base hospital, 12-bed regimental hospitals, 120 mess houses, 1,200 shower bath houses, 6,000 8-men framed tents, 11 large warehouses, a post office, five YMCA buildings, a library, and a Knights of Columbus. The tents had wood floors, electric lights, and wood-burning stoves. Other facilities included two 100,000-gallon wooden water tank towers and a 100-acre remount station (Anonymous 2010; Krol 2010). Water was supplied by the United Land and Water Company (Noyes 1986). The remount station, equipped to handle 10,000 horses and mules, was in the northern portion of the camp and included corrals, a veterinary hospital, an immense loading platform, and a hose shoeing school (Gustafson 1995).

Trash from the mess houses was burned in special incinerators. Even tin cans were discarded into the incinerators and disappeared (Anonymous 1917). Initially, the camp did not have a sewer system. Installation of a modern sewage system began in July 1918. The system was designed to begin at the west end of the camp and flow eastward. A 2.5-million-gallon septic tank was built on the east end of the camp. The tank was 30.5-m (100-ft) long and 24.5-m (80-ft) wide and was divided into 12 sections. A huge spillway was built to empty into the Mimbres River. The system, however, was never used because armistice was declared shortly before the project was completed and orders were issued to abandon the system, which cost about 500,000 dollars (Gustafson 1995; Krol 2010). "The huge spillway is one of the few visible remains from the Camp Cody era" (Gustafson 1995).

The camp closed in June 1919 (Gustafson 1995; Kromeke 2010). Some buildings were moved and the rest were salvaged, dismantled, or destroyed. The buildings of the main hospital, however, remained intact and were used for several months for wounded soldiers returning from the war (Anonymous 2010). The American Smelting and Refining Company (ASARCO) mill site is on part of the old camp, in the vicinity of the former huge warehouses (Krol 2010). The present project area is north of Camp Cody, across the Mimbres River.

The Deming Army Air Field was established in 1942, during World War II, to train bombardiers. The installation contained the 388th Base Headquarters and Air Base Squadron, which included the 321st, and the 322nd Bombardier Training Groups. The 321st consisted of the flying units and the 322nd consisted of the ancillary units—a signal service company, guard squadron, ordnance company, medical detachment, veterinary detachment, quartermaster platoons, and an Army Air Force band (Bossie 2006). The facility was a sub-base of Biggs Army Air Field in El Paso, Texas (Parrish 2010). More than 5,000 men were stationed at the base. By the time the Bombardier School closed in September 1946, about 12,000 cadets had gone through the program (Bossie 2006). The Deming Army Air Field was also a duty station for the Women Airforce Service Pilots (WASP) who flew AT-6s, B-25s, B-26s, and P-47s at the airfield (Parrish 2010). After closing, the facility became the Deming Municipal Airport, which is south of Interstate 10. In 2005, some of the old buildings remained, including three hangers (Bossie 2006).

4.4.4.2 Holy Cross Sanatorium

At the end of the World War I, most of the Camp Cody was taken down, but the hospital remained as a convalescent hospital for wounded soldiers. In 1922, the hospital was transferred to the Deming Chamber of Commerce. Soon after, the Sisters of the Holy Cross acquired the hospital and on May 12, 1923 dedicated the facility as the Holy Cross Sanatorium for people suffering from tuberculosis. The complex, which was renovated by Trost & Trost of El Paso, consisted of more than 500 acres with 28 buildings and included 320 acres for a farm, garden, and recreational building. Because the number of patients and the incidence of tuberculosis had declined, the sanatorium closed in 1938, leaving only six Sisters to care for the grounds. The facility was destroyed in 1939 by a fire that started in the Administration Building, cutting off telephone service. When the fire department arrived, it was too late. Only the concrete skeleton of the boiler room remains (Krol 2010). The site of the old hospital complex is south of the present project area.

4.4.5 Railroads

One reason for justifying the Gadsden Purchase of 1853 was it offered the lowest crossing of the Continental Divide at an elevation of 1397-m (4584-ft) with a few 1.5 percent grades (Myrick 1990:63). The Southern Pacific Railroad reached the Deming on December 15, 1880, eventually forming the western portion of the second transcontinental railroad when the AT&SF reached Deming on March 8, 1881 (Myrick 1990:xv, 12, 60). This southern route is still a major railroad route across the southern United States. In March 1882, the Silver City, Deming and Pacific Railroad Company was formed and began construction on a 75 km (47 mi) narrow-gauge line to Silver City. The line was completed in May 1883. Proposed continuations of the line to Clifton (west) and to Santa Rita and Georgetown (east) never materialized. In 1884, the line was sold to the AT&SF. The line was changed to standard gauge in 1886. Eventually, it became an important component of the transportation network of the copper industry (Myrick 1990:193–194).

Railroad grades also extended south from Deming. In ca.1890, the Deming, Sierra Madre and Pacific Railroad planned a railroad from Deming through Mexico to the Pacific Coast. Before its financial collapse, the railroad built a grade south from Deming to the international boundary near Las Palomas. In 1901 and early 1902, an El Paso & Southwestern railroad grade was built south from Deming to Hermanas as part of one of its routes linking the copper mine at Bisbee with the outside world (Myrick 1990:92–94). A railroad date nail and spike were recovered from LA 166769, which has an early twentieth century apparent household refuse component.

4.4.6 Mining

The history of the region was determined by geologic activity millions of years ago during a series of mountain-building events. "As molten rock forced its way up through the fractured crust, the viscous material deposited much copper, silver, and gold that would make this one of the country's richest mineralized areas" (Berry and Russell 1995:3). As a result, much of New Mexico's mining history centers on the southwest corner of the state (Myrick 1990:185).

The first hint of mineral wealth in southwestern New Mexico occurred in 1798 (Christiansen 1980:26) or 1800 (Sherman and Sherman 1975:188), when an Apache found copper in the Santa Rita area—about 56 km (35 mi) north of Deming. News of the find was passed on to Lieutenant Colonel Manuel Carrasco, commandant of a Spanish presidio. Lacking finances to develop the mine, Carrasco sold his interest in the property to Don Francisco Manuel Elguea, a wealthy Chihuahua banker (Sherman and Sherman 1975:189) or merchant (Christiansen 1980:26), in 1804. Using Indian slaves and convict labor—Elguea operated a penal colony under a Spanish crown grant—Elguea built a substantial presidio and mined the rich copper deposits. The copper was transported across the rugged Sierra Madres to Mexico City by burro train and was used for New Spain's copper coinage (Sherman and Sherman 1975:189).

For 13 years following Elguea's death in 1809, his widow leased the mine to various parties. After a massacre of Chiricahua at the Santa Rita in 1837, Mangas Coloradas led Apache raids against Santa Rita. The raids were so intense that the Spaniards abandoned the mine and fled south. Three years later, the Spaniard Siqueiros took over the mine until the outbreak of the American Civil War, when the Confederate Army briefly occupied the old presidio. After the Confederate retreat, the mine was operated intermittently by various men until 1870. Martin B, Hayes obtained clear title to the property in 1873 (Sherman and Sherman 1975:189). The Santa Rita Mining Company acquired the mine ca. 1899, and in 1909, the company was sold to the Chino Copper Company (Myrick 1990:186).

Although extensive underground mining had occurred from 1873 to 1910, the Chino Copper Company—later known as the Chino Mines Division of the Kennecott Copper Corporation—did not purchase the former company until the presence of large reserves of copper ore, suitable for open mining had been firmly established. Open pit mining operations, using steam shovels, began in 1910 (Myrick 1990:186–187). Currently, the Santa Rita pit—now owned by the Phelps Dodge Company—is the third largest open pit mine in the United States and one of the oldest copper mines in the county (Myrick 1990:185; Sherman and Sherman 1975:189).

LA 166766, LA 166767, LA 166768, and LA 166769 are within the Peru Hill Mill site west of SR 394, Peru Hill Mill Road. It is the location of a former mill operation, which primarily processed zinc sulfide ore. The area formerly contained abandoned ore milling facilities that included buildings, water wells, and tailings. Peru Mining Company (PMC), a subsidiary of Illinois Zinc Company, began the first milling operation in 1928. PMC operated the facility until 1967. The mill was vacant until purchased by Barite of America (BOA) in 1979. BOA operated the mill primarily for barite until 1985, when the company filed for bankruptcy. Barite Limited retained title to the property until SMS Financial, a financial title and holding company, acquired it through bankruptcy (McKinney et al. 2008:1). The City of Deming subsequently acquired the property for an industrial park. The Peru Hill Mill locality—including the four archaeological sites—is a brownfield site, having been remediated for hazardous materials.

The ore processed at the Peru Hill Mill site was shipped by rail from four nearby mines that included Hanover, Pewabic, Kearney, and Copper Flat. The mill was operated as a flotation concentration plant where ore was crushed, ground, mixed with water and pumped to flotation cells. Chemicals were added to separate the minerals from the mixture whereupon the minerals were skimmed and pumped to holding drums to be filtered and dewatered. The remaining ore and slurry were pumped to tailings on site. The containment for the liquid tailings failed, with a resulting spill on the west side of the tailings pile. The spill eliminated vegetation in the spill area and the subsequent wind erosion removed the top soil down to the undulating hardpan. The predominantly westerly winds eroded the tailings pile and spread it over a large area east of the PMC boundary (McKinney et al. 2008:1).

The City of Deming acquired the property and had the tailings remediated for hazardous materials. The New Mexico Environment Department recently issued the City of Deming a release, creating the area as a brownfield site with no hazardous levels of materials (Wayne Pilz, personal communication 2010).

One of the four tested sites, LA 166769, has a historic Euro-American affiliation. LA 166769 may be associated with residential, railroad, military, or mining activities in the area since the late nineteenth through early twentieth century.

5.0 Field and Laboratory Methods

The purpose of archaeological testing at LA 166766, 166767, 166768, and 166769 was to determine each site's eligibility for listing on the NRHP. The testing plan was designed to collect a full complement of information to determine the nature and extent of intact cultural materials within the currently-defined boundaries of each of the four sites in order to (1) determine eligibility, and (2) if eligible, to develop a research design for effective and informative data recovery.

5.1 Surface Reconnaissance and Mapping

TRC field personnel conducted a thorough review and recording of the four sites during the survey phase, and all discernible surface artifacts and features were marked for further recording and mapping (Brown and Brown 2010). For testing, site boundaries were defined based on the previous recording and the distribution of cultural materials, and the original site datum was retained. The site boundaries were pin-flagged and recorded using Trimble GeoExplorer3 GPS units. The results of GPS recordings were used to produce maps displaying each site's datum, features, point-provenienced artifacts, and the locations of manual and mechanical test excavations. Additional maps, including feature plans, excavation profiles, and stratigraphy drawings were drawn in the field and finalized in the office.

5.1.1 Artifact Analysis and Surface Collection

Initial work during site testing included mapping and collecting all prehistoric artifacts and diagnostic historic artifacts from LA 166769. At all four sites, every prehistoric artifact discerned on the surface was point-provenienced using the Trimble GeoExplorer3 GPS units, and all discernable prehistoric artifacts were collected for return to the laboratory for analysis. One site, LA 166769, has both historic and prehistoric components. Because of the large number of historic artifacts at LA 166769, only historic artifacts with discernible diagnostic markings were mapped and collected.

5.1.2 Manual Excavations

LA 166766, 166767, 166768, and 166769 were subjected to limited subsurface testing in order to ascertain their potential for intact subsurface cultural remains and to identify subsurface features. At least one 1-m^2 unit was manually excavated at each site. These were placed at feature edges in order to determine the depth of the feature deposit and acquire a partial profile. At LA 166768, where no features were identified, 1-m^2 units were placed within artifact concentrations. Each 1-m^2 unit was excavated using arbitrary, 10-cm levels within cultural or natural strata, and each was excavated 10-cm beyond the last evidence of cultural materials. Fill removed from these units was screened through ⅛ or ¼ inch mesh. All artifacts identified in the screened fill and/or in situ in the unit were collected and recorded on the study unit level forms.

In addition to the 1-m^2 unit(s), at least one 2 x 2-m unit was shovel-scraped at each site to help ascertain the potential for shallow cultural deposits, particularly stains. All fill from the 2 x 2-m shovel scrapes was screened through ⅛ or ¼ inch mesh, and all artifacts identified in the screened fill were collected and recorded on the study unit level forms.

5.1.2.1 Mechanical excavations

Mechanical excavation included backhoe trenches along the long and short axes of each site and at other locations of potential interest. The backhoe trenches were 18 and 24 inches wide and, for safety, no more than 1-m (3.3-ft) deep. Representative profiles were drawn of each trench. In addition, the backhoe was used to remove the uppermost 10 to 20-cm of sediments in selected areas to expose buried features. At each site, less than 5 percent of the total site area was excavated.

5.1.3 Specialized Samples

The testing plan and addendum (Higgins and Brown 2010) made provision for collection of specialized samples such as radiocarbon samples and bulk soil samples for flotation. Bulk soil samples were taken from Feature 1, Study Unit (SU) 1 at LA 166766. Bulk soil samples were also collected from Feature 1, SU 1, and from non-feature context in SU 3 in LA 166767. No features or unique cultural deposits were identified at LA 166768, and no specialized samples were collected. A possible feature at LA 166769 proved not to be, and no specialized sample was collected. Testing did not discern any associated soil staining, charcoal, or other organic materials with any of the cultural artifacts at the four sites.

5.1.4 Treatment of Human Remains

No human remains were encountered during the course of excavation. Had human remains been encountered, all activities would have immediately halted, and the City of Deming, the local law enforcement agency, the New Mexico Medical Examiner, and the New Mexico State Archaeologist and SHPO would have been notified in concurrence with the law. All project activities would have ceased until regulatory guidance was obtained.

5.1.5 Backfill

At the conclusion of testing at the four sites, the bottoms of all SUs were lined with plastic in order to indicate the depth of disturbance. The units were then completely backfilled using the backhoe.

5.2 Lithic Analysis

Variables monitored for all lithic artifacts for the lithic analysis included material type, size (recorded in-mm), condition and cortex percentage. *Material type* was examined to see if there are differences in how different materials such as rhyolite, chert, and chalcedony were used. Material type is important because it could be associated with different behaviors, as each material has its own physical properties and proximity to the sites. Local materials may be expected to be used more expediently. More distant, and hence rare, materials would have been found in smaller sizes and used more intensively. A number of artifacts collected from the surface of the four sites tested during the project are heavily patinated. The degree of patination on several items prevented an accurate determination of material type. The majority of these specimens are igneous cobbles of basaltic, rhyolitic, or andesitic composition. The materials are lighter in color than black basalt flakes and tools. Many have light or dark colored inclusions, probably hornblende in several specimens. The materials were generally used as core tools. In general, these materials are most likely available locally and were analyzed as a group.

A procedure or terminology employed by Sullivan and Rozen (1985) might be used as a starting point in lithic analysis. Flake completeness is treated as only one of many variables. *Flake completeness* is based on the Sullivan and Rozen (1985) system, and includes: (1) Complete flakes; (2) Broken flakes; (3) Flake fragments; (4) Debris; (5) Edge modified flakes; (6) and Cores. As noted above, complete flakes are defined as having a single interior surface (SIS), a point of applied force (also known as a striking platform), and intact margins. Broken flakes are defined as having a SIS, an intact platform, but the margins are not intact. Flake fragments have a single interior surface but no striking platform. Debris is defined as any flake not having SIS. Edge modified flakes have been utilized but have not been formally retouched.

Completeness is partially a function of material type, with stronger materials such as basalt and rhyolite more complete than more brittle materials such as obsidian (see also Mauldin and Amick 1989). If chert is the dominant material, this should not be a significant source of error. Based on Sullivan and Rozen's analysis, a high flake fragment percentage is more frequently associated with tool production/biface reduction than with core reduction. This makes intuitive sense, as biface production produces thinner flakes that are more likely to break during production than thicker core-reduction flakes. Also examined is the frequency of edge-modified flakes as a means to identify behavioral activity, with a high percentage of edge-modified flakes associated with their use in a more expedient form.

Sullivan and Rozen's (1985) completeness method of debitage analysis was not expressly used for this study. This method is based on flake completeness and uses a binary hierarchical decision tree to assign debitage types. With this decision tree, flakes are assigned to one of four mutually exclusive categories. These categories are determined based on three dimensions of flake variability: (1) Single interior surface (SIS); (2) Point of applied force; and (3) Margins. Each flake is first examined to see if it has a single interior surface, which is characterized by a single bulb of percussion or ripple marks. If a flake does not have a SIS, it is categorized as debris. All flakes with a SIS are then examined for the presence of a point of applied force, which occurs where the bulb of percussion intersects the striking platform. Both the bulb of percussion and the striking platform must be present to have a point of applied force. If a flake does not have a point of applied force, it can be classified as a flake fragment. Flakes with both a single interior surface and a point of applied force are finally examined for presence of intact margins, which exist when the original width and length of the flake can be reasonably determined. Broken flakes do not have intact margins, while complete flakes do. This method has the advantage of being replicable because it is based on mutually exclusive flake categories.

Potential problems exist with the Sullivan and Rozen system, as discussed by Mauldin and Amick (1989), Ensor and Roemer (1989), and, more recently, by Prentiss (1998). All of the researchers agree that the advantage behind Sullivan and Rozen's system lies in its replicability in assigning flake completeness between different observers. The main problem these researchers focus on with the Sullivan and Rozen system is that by itself flake completeness doesn't have inherent behavioral meaning—it only characterizes the debitage based on flake completeness.

In a formal attempt to test the relationship between flake completeness and behavioral activity, Prentiss (1998) created different artifacts using obsidian nodules, and found that the activities that Sullivan and Rozen suggest for their study did not correspond well to his experimental study. One potential problem of this critique is Prentiss's use of obsidian as the only material type to test the Sullivan and Rozen system. Obsidian is fragile and will often break compared to the stronger sedimentary rocks (i.e., chert) or the durable igneous rocks (i.e., rhyolite and basalt) (see Mauldin and Amick 1989). In fact, Sullivan and Rozen based their study on assemblages largely comprised of chert, not obsidian. Because the lithic assemblages in this study are largely dominated by cherts and rhyolites, Prentiss' critique of Sullivan and Rozen's method may not be especially relevant here.

Despite the potential problems with the Sullivan and Rozen system, it remains one viable method of characterizing debitage. It offers the advantage of individually examining every piece of debitage, versus the quicker mass analysis system proposed by Ahler (1989). Moreover, as previously noted, it offers controls for inter-observer error with its mutually exclusive flake categories. Other methods include a middle-range approach championed by Mauldin and Amick, but this also has problems (see Sullivan and Rozen 1985).

For the present study artifact condition was recorded using terms denoting the portion of the artifact represented or missing for each specimen. Flakes can be complete or fragmentary. The striking platform end is the proximal end. The termination forms the distal end. A medial fragment is missing both the proximal and distal portions. Flakes basically split in half are lateral portions. Portions of one side and part of the distal end may be present. Medial fragments may be missing part of one side and so on. Measurements of length are valid on lateral fragments, but not width. Comparison of all three metric dimensions, however, employs whole flakes only.

Flake size is the third variable examined, and can be divided into four categories based on maximum dimension: (1) 0-1 cm; (2) 1-2 cm; (3) 2-4 cm; and (4) > 4 cm, and so on. Smaller flake sizes are associated with greater reduction intensity and are likely related to the distance of the material source as well as the length of occupation. Larger flakes can be used without further modification as informal tools such as edge-modified flakes. *Cortex* was recorded for complete flakes and flake fragments and is based presence/absence of dorsal-flake cortex. More exterior flake cortex is often, but not always, associated with primary core reduction. The relative proportions of cortical and noncortical flakes in an assemblage may not be all that different. Similarly flake thickness is one metric variable, which may allow reasonable comparison of artifact size using both complete and fragmentary objects. The thickest portion of the original specimen, however, may not be present on all flake fragments.

Striking platform type as used by Sullivan and Rozen, and includes three types: (1) Cortical, (2) Plain, and (3) Faceted. Cortical platforms contain cortex on the actual point of impact of the striking platform. Plain platforms are characterized by a flat striking platform with no cortex. Faceted platforms include more than one facet on the striking platform. Cortical platforms are in general associated with core reduction, plain with hard-hammer percussion, and faceted with soft-hammer percussion or pressure flaking, but there is likely to be overlap between platform type and activity used to produce it. This variable may be most meaningful in conjunction with other indicators of behavior, such as completeness, cortex, flake size, etc. Evidence of platform preparation in the form of hinged and stepped fractures along platform margins was fairly common on whole flakes and proximal flake fragments in the lithic assemblages from the four sites. Platform angle and preparation are key components in identifying biface thinning flakes. Not all small and thin flakes are necessarily biface thinning flakes, but they are more likely to be associated with tool manufacture or at least a later stage of lithic reduction.

6.0 Testing Results

Four archaeological sites—LA 166766, LA 166767, LA 166768, and LA 166769—were tested to determine their eligibility for listing on the NRHP. The results of archaeological test excavations at each site are presented separately below.

6.1 LA 166766

Site Area: 868 m^2
Site Type: Chipped stone artifact scatter with feature
Land Status: City of Deming
Quadrangle: Deming West (1967)
Elevation (AMSL): 1345-m (4413-ft)
Dimensions: 62 x 14-m (203 x 46-ft)

Topographic Location: Flat in valley
Vegetation: Grasses, desert marigold, soaptree yucca
No. of Components: 1
Cultural Affiliation: Early Archaic
Features: Hearth (1) with no stain, ash, or charcoal
Artifacts: Cores, chipping debris

6.1.1 Site Description

LA 166766, a small, low-density prehistoric chipped stone artifact scatter with a thermal feature, is in an open flat area on City of Deming land in the Mimbres River valley (Figures 1.1, 6.1, and 6.2). The Mimbres River is to the south. The local plant community is desert scrubland and includes various grasses, snakeweed, Mormon tea, soaptree yucca, and desert marigold. Ground visibility is 80 percent. The soil is classified as Mohave sandy clay loam, 0–3 percent slopes (MU). The site was first recorded in the summer of 2010, when it was estimated to be 75–99 percent intact (Brown and Brown 2010).

Figure 6.1 LA 166766 overview, looking north

Feature 1, a 1.4 x 1.1-m (4.6 x 3.6-ft) area of heat-altered rock, was identified during the initial survey (Brown and Brown 2010) (Figure 6.1). The heat-altered rocks consisted of 21 quartzite and basalt cobbles, most of which were burned (Figure 6.3). No charcoal or ash was observed on the surface and none was noted in a trowel probe during survey.

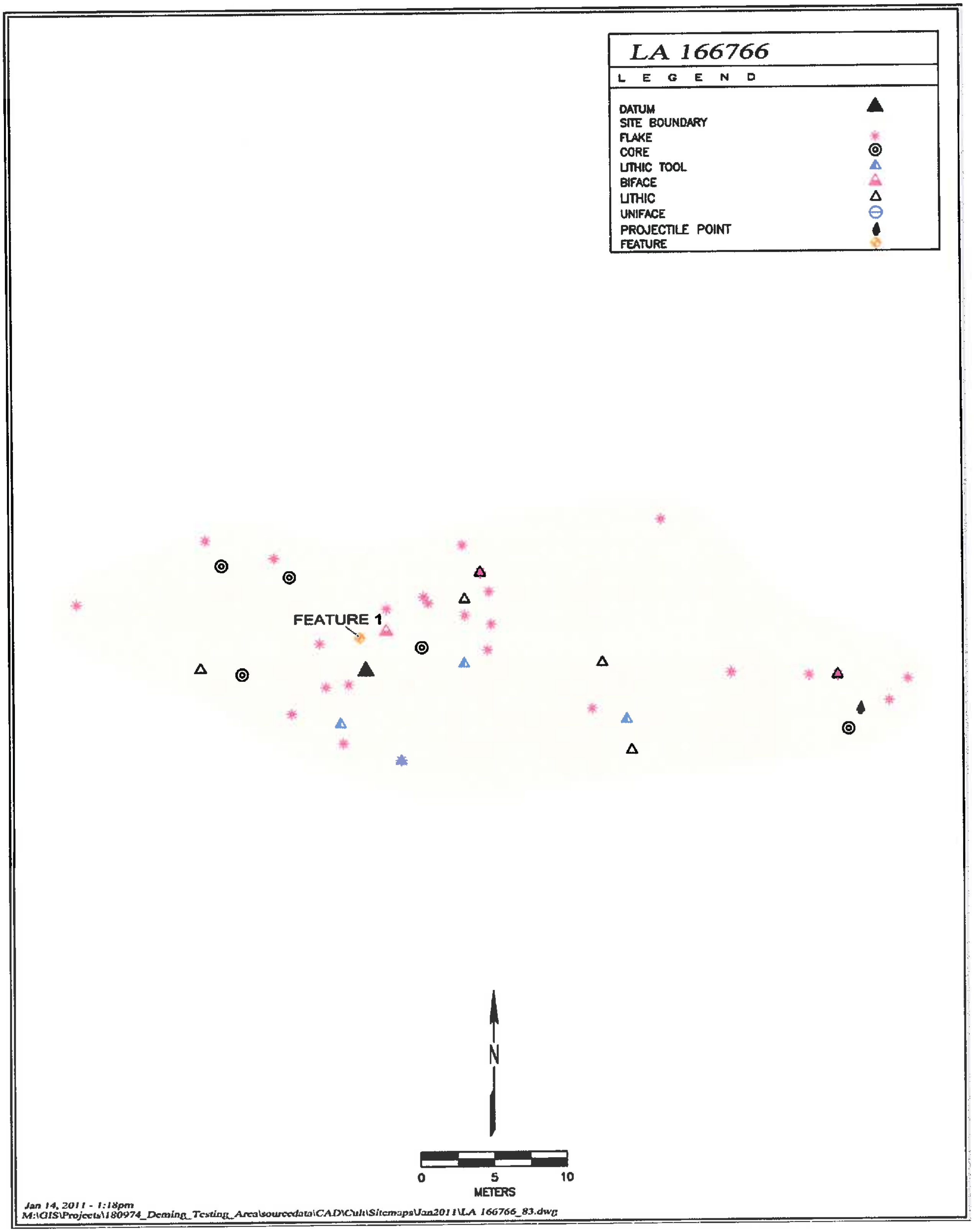

Figure 6.2 LA 166766 map showing feature and artifact locations

Figure 6.3 LA 166766, Feature 1, heat-altered cobbles

6.1.2 Surface Collection and Mapping

Prior to testing, all visible artifacts were flagged and their locations were recorded using the Trimble GeoExplorer3 GPS unit. The surface assemblage of 50 lithic artifacts was collected and returned to the TRC laboratory for further analysis (Table 6.1).

Table 6.1 LA 166766, artifact type by material type

Material	Flake	Thinning Flake	Biface	Uniface	Flake Tool	Core/ Core Tool	Other	Total
Chalcedony	4	5			1			**10**
Chert			1		2	1		**4**
Basalt	17	1	1	1	1			**21**
Igneous	10					4	1	**15**
Total	**31**	**6**	**2**	**1**	**4**	**5**	**1**	**50**

The assemblage is composed primarily of flakes and thinning flakes. Chipped stone tools include one biface fragment, one core, and four core tools. In addition, one small projectile point was recovered. In addition, four retouched and utilized flake tools were recovered. Basalt is the most common material type followed by unclassified igneous materials different from the more common black basalt. The unclassified igneous materials occur as flakes and core tools, the flakes representing debitage removed from core tools during manufacture. The igneous materials were not routinely used to make flake tools and other implements. Similarly, at least some of the black basalt flakes may represent debitage from the manufacture of the projectile point and uniface.

Including flake tools, 41 pieces of lithic debitage were collected. Nineteen pieces of debitage are cortical flakes and 22 are noncortical. Of the 41 pieces of debitage, 18 are complete flakes and 23 are flake fragments. The mean length for whole flakes is 27.6-mm. The mean width and mean thickness for complete flakes are 27.8-mm and 6.9-mm, respectively. The mean thickness for all flakes and flake fragments is 6.0-mm. Although a high percentage of broken flakes may be associated with biface manufacture, items classified as thinning flakes are uncommon. Exclude the unclassified igneous materials, however, and the proportion of thin flakes is much higher. The mean thickness values for the 41 chert/chalcedony, basalt and the unclassified igneous flakes and flake fragments are, respectively, 5.3-mm, 5.8-mm, and 7.2-mm. Seven of the ten unclassified igneous flakes are cortical while only 3 of 12 chert/chalcedony flakes exhibit cortex. Nine of 19 black basalt flakes have at least some cortex as well. Overall, the proportion of cortical flakes and flake fragments is relatively high (46 percent).

Chipped stone tools and cores from LA 166766 include one biface fragment, one core and four core tools (Table 6.2). In addition, one small projectile point was recovered. The projectile point is a small stemmed Bajada-like point of black basalt (Figure 6.4). It is 29.7-mm long and 15.1-mm wide at the shoulders. The base is slightly convex and the tip is damaged. One of the shoulders is less prominent than the other. For a stemmed point, the specimen is rather short. The blade has undoubtedly been resharpened. The Bajada projectile point is suggestive of an Early Archaic period occupation. A chert biface is triangular in shape. The biface fragment, however, was worked primarily on only one face. A relatively large stepped fracture is present on the same side. The implement may have been broken during manufacture. The edge angle of the more completely worked edge is 40 degrees. Like many of the tools recovered from the four sites the worked side of the uniface exhibits some patination, but some possible edge rounding is visible.

Figure 6.4 LA 166766, biface and projectile point

The four core tools are all large light to medium igneous cobble implements. FS 13 is a large triangular cobble fragment (Figure 6.5). The interior face exhibits a series of relatively large step fractures and smaller facets along nearly the entire interior/exterior margins. The shape of the tool suggests a possible digging implement. Three additional core tools (FS 3, FS 15, and FS 19) exhibit work faces at one or both ends of water worn cobbles (Figure 6.6). The materials used for these objects are lighter in color than the more common black basalt. As noted above, lithic reduction involving this class of materials was evidently intended primarily to produce tools of this kind. FS 3 and FS 19 have a single work face and relatively even straight edges with angles of about 70–75 degrees. FS 15 is a large semicircular shape cobble with two worked faces opposite each other. The edge angle of both faces averages about 45–50 degrees. The tools appear to be large scraping implements. FS 36 is a single unidirectional core of chert. The retouched flakes present at LA 166766 generally have high edges angles as well (60–70 degrees).

Table 6.2 Chipped stone tools from LA 166766

FS	Description	Length (mm)	Width (mm)	Thick (mm)	Condition*	Material	Edge <	Comment
16	Biface	29.82	25.45	7.46	D	Chert	.	Few if any ventral facets/some step dorsal
36	Core	49.67	38.36	38.06	C	Chert	.	7+facets/single noncortical platform face
3	Core tool	112.27	76.65	54.52	C	Igneous	70	3+ step facets one end /batter edge/micro
13	Core tool	170.30	72.88	59.97	C	Igneous	90	10+ overlap facets/two edges/hoe?/batter edges
15	Core tool	130.84	118.74	45.84	C	Igneous	45	Unidirect core/7+ facets along two edges/batter
19	Core	67.69	62.49	46.36	C	Igneous	75	Unidirect core/2+ facets one end cobble/batter
35	Projectile point	29.71	15.14	4.96	C	Basalt	.	Stemmed/small/slight round base 14.04 wide
9	Flake, retouched	30.56	19.85	4.74	D	Basalt	65	Retouch rounded distal and side
6	Flake, retouched	35.37	25.70	8.19	D	Chert	70	Entire edge retouch/one straight (<45)/one curved
20	Flake, utilized	38.50	20.47	5.47	C	Chert	20	Ground/isolated platform/variable transverse
30	Flake, retouched	39.83	27.12	6.62	C	Chalcedony	60	Platform part shear/end scraper/part edge missing
8	Uniface	50.92	44.45	11.94	IN	Basalt	40	One cortical/one ventral face/edge part missing

*D=Distal; M=Medial; L=Lateral; P=Proximal; C=Complete; IN=Indeterminate

Figure 6.5 LA 166766, core, FS 13

Figure 6.6 LA 166766, core tool, FS 3

Thinning flakes and retouched flakes are primarily chert or chalcedony. Three chalcedony thinning flakes are red and yellow. Although relatively common in this assemblage, the variety is rare overall and possibly nonlocally available. No silicified wood or quartzite flakes or tools were present at LA 166766. Obsidian was not identified in the assemblages from any of the four sites.

6.1.3 Testing

Testing consisted of a 1-m^2 unit, a 2 x 2-m scraped area, and two backhoe trenches, 15 and 25-m long. Each is discussed separately below (Figure 6.7).

6.1.4 Hand-excavated Test Units: SU 1 and SU 2

6.1.4.1 SU 1

One 1-m^2 unit (SU 1) was placed at the south edge of Feature 1, the area of heat-altered rocks (Figures 6.7 and 6.8). Seven of the 21 fire-altered cobbles that define the feature were within SU 1. The cobbles were mapped before removal but were not collected. SU 1 was excavated using 10-cm levels. All sediments were screened through ¼-inch mesh, except for a bulk sample of feature fill. Munsell color assessments were obtained on dry sediments.

Culture-bearing sediments proved to be limited to Stratum I, the 2–9 cm thick surface layer of loose aeolian sand in which the fire-altered cobbles were partly-buried. No artifacts were recovered below the surface of Stratum I, and no charcoal or ash-staining was present on the surface or within the stratum. Stratum I was a medium-sized, granular yellowish-brown sand with minor cobble inclusions, with Munsell soil color 10 YR 5/4, yellowish brown. Stratum I lay on a near-level compact layer of clayey silt (Stratum II).

Excavation continued into Stratum II to a depth of 20-cm below surface. Stratum II was a very dense brown soil with a high density of caliche nodules, Munsell soil color 10 YR 5/6, yellowish brown. No lamina was discernible. An Oakfield soil probe at the center of SU 2 was taken from the extent of manual excavation to 50-cm below surface. No indication of any cultural content was found in the soil probe into Stratum II.

6.1.4.2 SU 2

SU 2, a 2-by-2-m scraped unit, was placed within the densest portion of the surface artifact scatter (Figures 6.7 and 6.9). Stratification within SU 2 was similar to that of SU 1, with a 2–8 cm layer of yellowish brown (10 YR 5/4), windblown silty sand overlying a compact, nearly flat layer of yellowish brown (10 YR 5/6) silty clay with minor gravel inclusions (Figure 6.10). All excavated sediments were screened through ¼-inch mesh. No artifacts were found within Stratum I, but the surface of Stratum II yielded a small basalt flake. SU 2 was excavated to 13-cm below surface.

6.1.5 Backhoe Trenches 1 and 2

6.1.5.1 Trench 1

Trench 1 dug along the long axis of LA 166766 in the eastern half of the site (Figure 6.7). The trench was 15-m long, up to 1-m deep, and was 46–60 cm wide. Its excavation was monitored and the trench walls and spoil dirt were visually examined as trenching progressed. Backhoe spoil was not screened. No in situ or displaced artifacts were observed and no buried features were exposed.

The upper stratification exposed in Trench 1 was identical to that observed in SU 1 and SU 2 (Figure 6.11). A 7–14 cm thick layer of aeolian sand (Stratum I, 10 YR 5/4, yellowish brown) overlaid a compact 20–31 cm thick caliche-laden silty clay (Stratum II, 10 YR 5/6, yellowish brown). Stratum II graded to an undulating caliche zone (Stratum III, 10 YR 7/2, light gray) that was observed not only in each of the backhoe trenches at LA 166766, but within every backhoe trench dug during the present project (Figure 6.12) . No features or other cultural materials were exposed in Trench 1.

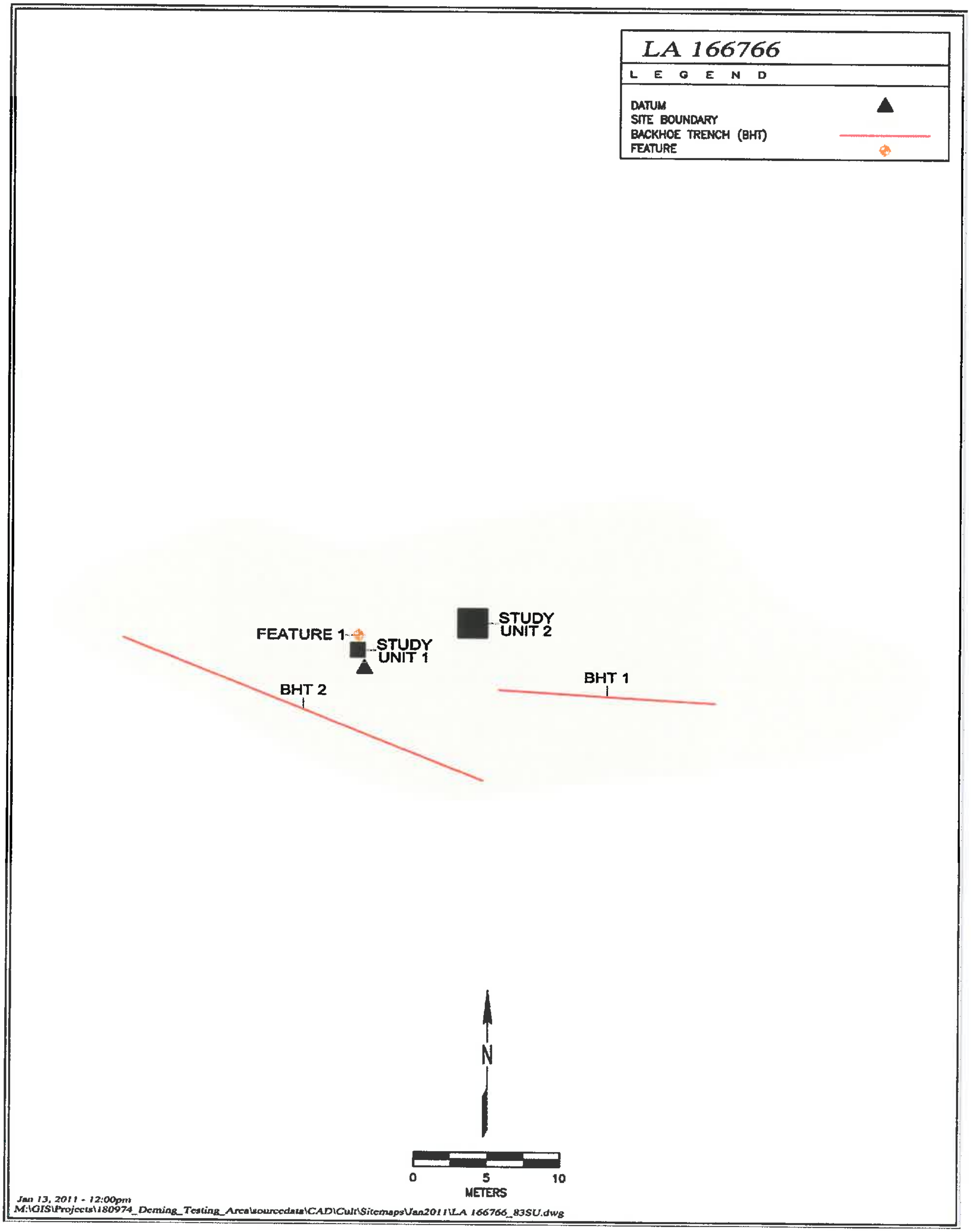

Figure 6.7 LA 166766 test excavation map

Figure 6.8 LA 166766, Feature 1, SU 1 excavation

Figure 6.9 LA 166766, SU 2 overview

Figure 6.10 LA 166766, SU 2, excavated

6.1.5.2 Trench 2

Trench 2 was 25-m long, 46–60 cm wide, and up to 95-cm deep. It was dug along the long axis of LA 166766 in the south half of the site (Figures 6.7 and 6.13). Its excavation was monitored throughout, and the trench walls and backhoe spoil were visually examined as trenching progressed. The backhoe spoil was not screened. Stratification exposed in Trench 2 was the same as in Trench 1, although the chroma and color of the non-cultural caliche layer Stratum III were slightly stronger at 10 YR 8/2, very pale brown. No in situ or displaced artifacts were observed in Trench 1, and no buried features were exposed.

6.1.6 Evaluation

The potential for buried cultural deposits at LA 166766 was determined with one 1-m ^{2}, one 2 x 2-m scraped area, and two backhoe trenches, 15 and 25-m long. The total excavated surface area was about 25 m^2, or 2.9 percent of the total site surface area (Table 6.3).

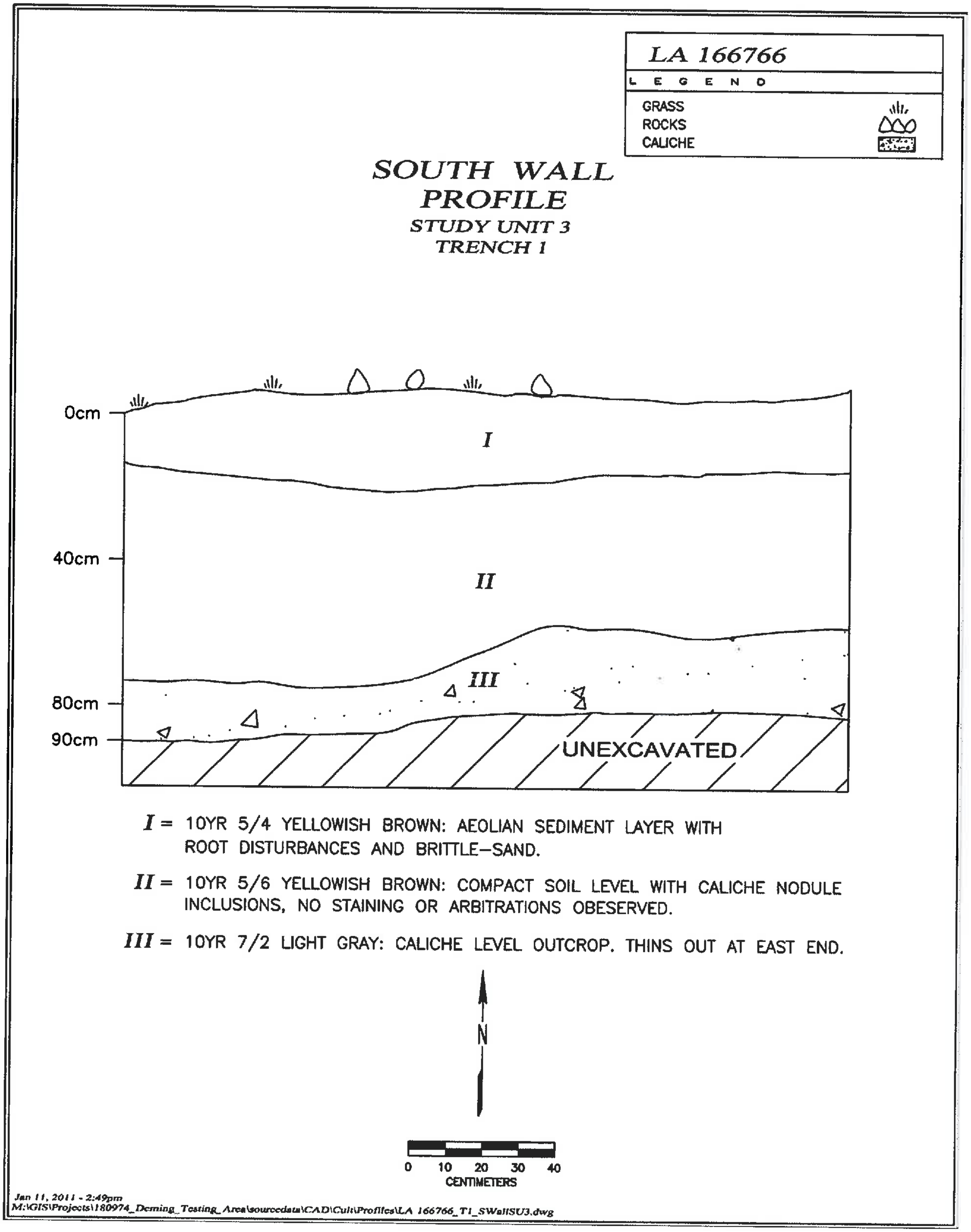

Figure 6.11 LA 166766, Trench 1 profile

Figure 6.12 LA 166766, Trench 1 overview

Figure 6.13 LA 166766, Trench 2 overview

Table 6.3 Excavations at LA 166766

SU	Unit	Length m	Width m	Area m^2	Depth m	Cubic m^3
1	Unit 1	1	1	1	0.2	0.2
2	Unit 2	2	2	4	0.2	0.8
3	Trench 1	15	0.5	7.5	0.9	6.8
4	Trench 2	25	0.5	12.5	0.9	11.3
Totals				**25**		**19.1**

Testing indicates the scatter of chipped stone is confined to the surface, scattered through the shallow layer of windblown sand that blankets the site. Test excavation of SU 1 at the south edge of Feature 1, the hearth, revealed no charcoal, ash, or stained soil, and no additional buried fire-altered rocks were found. The hearth was surficial. It appears to have been only lightly used, and except for the fire-cracked rocks, the hearth contents have blown away. These results indicate the feature holds no potential for buried cultural sediments that could add to knowledge of subsistence, technology, chronology, or use of resources. Excavation of the 2 x 2-m scraped area (SU 2) in a relatively high artifact density area also produced no evidence of buried features or artifacts. A total of 40-m of backhoe trenching produced no evidence of buried features or cultural deposits.

When recorded, LA 166766 was recommended eligible for nomination to the NRHP under Criterion D, information potential. The complete artifact assemblage has been collected and analyzed and will be curated at the Laboratory of Anthropology, Santa Fe. Results from testing demonstrate no potential for additional important information beyond what has already been recovered. Therefore, LA 166766 is recommended not eligible for listing on the NRHP.

6.1.7 Project Impact

Based on the results of archaeological testing at LA 166766, the site is recommended not eligible for listing on the NRHP. In addition, the site contents are surficial, and the entire artifact assemblage has been collected for analysis and curation at the Museum of Indian Arts and Culture, Museum of New Mexico in Santa Fe. Pending concurrence, future development will have no effect on LA 166766.

6.2 LA 166767

Site Area: 7820 m^2
Site Type: Chipped stone artifact scatter with feature
Land Status: City of Deming
Quadrangle: Deming West (1967)
Elevation (AMSL): 1344-m (4409-ft)
Dimensions: 115 x 68-m (377 x 223-ft)

Topographic Location: Flat in valley
Vegetation: Tobosa and other grasses, soaptree yucca, desert marigold
No. of Components: 1
Cultural Affiliation: Paleoindian, Late Archaic
Features: Burned rock concentration (1)
Artifacts: Projectile point fragments, bifaces, scraper, chipping debris

6.2.1 Site Description

LA 166767, a low-density prehistoric chipped stone artifact scatter with a burned rock concentration, was first recorded in the summer of 2010 (Brown and Brown 2010). The site is in an open flat area on City of Deming land in the Mimbres River valley, north of the Mimbres River (Figures 1.1, 6.14 and 6.15). The local plant community is desert scrubland and includes tobosa and other grasses, soaptree yucca, and desert marigold. Ground visibility is 80 percent. The soil is classified as Mohave sandy clay loam, 0–3 percent slopes (MU). The cultural material is surficial, and prior to excavation the site was estimated to be 75–99 percent intact.

Figure 6.14 LA 166767 overview, looking west

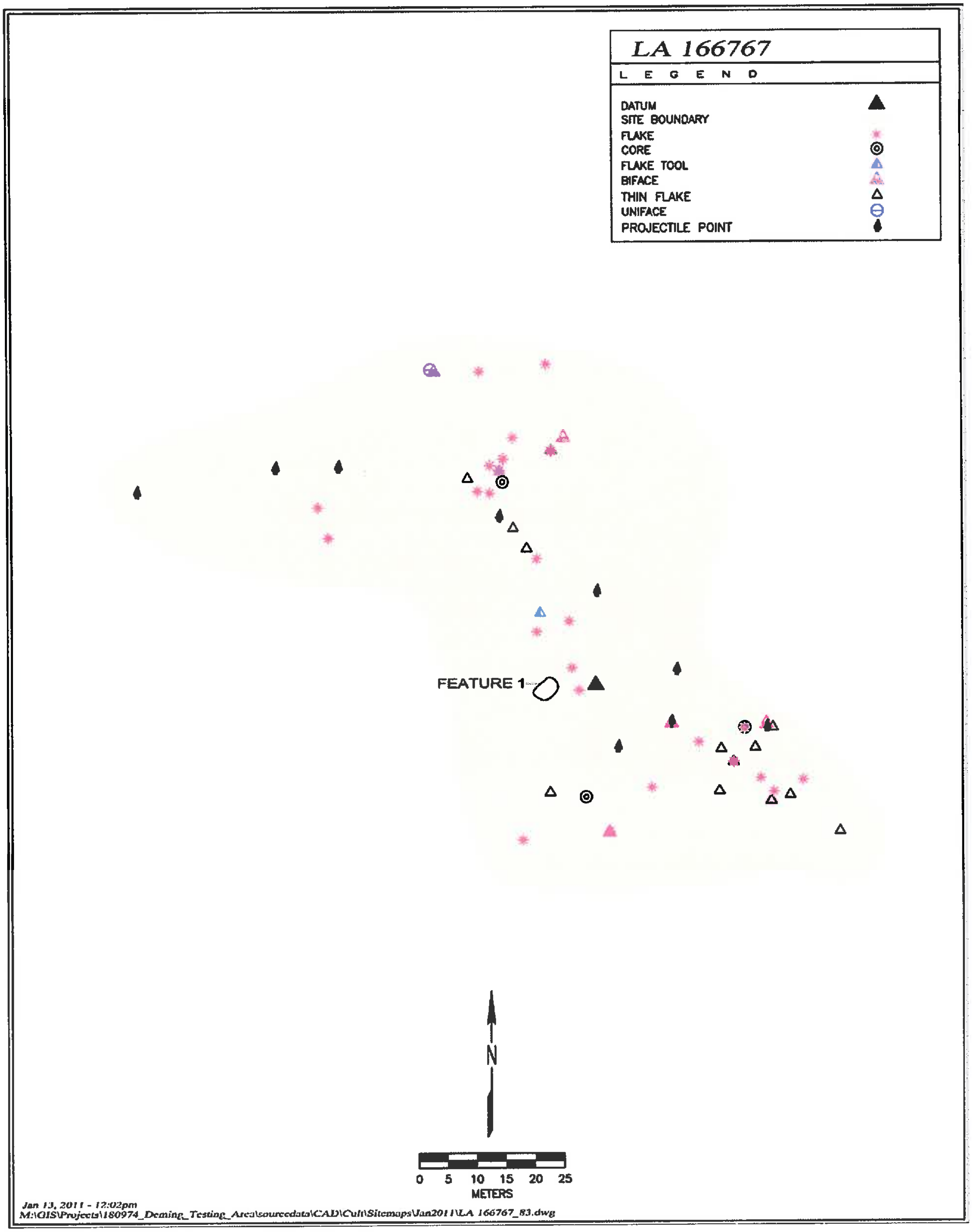

Figure 6.15 LA 166767 site map showing feature and artifact locations

One feature, a concentration of more than 100 quartzite and basalt fire-altered cobbles, was identified during survey (Figures 6.14 and 6.16). The survey observed no charcoal or ash on the surface and none was found in a trowel probe. However, the core of the burned rock concentration appeared to be intact, suggesting potential for buried cultural deposits.

Figure 6.16 LA 166767, Feature 1, fire-altered rock concentration

6.2.2 Surface Collection and Mapping

Before testing, all visible artifacts (n=73) were flagged and the location of each artifact was recorded using the Trimble GeoExplorer3 GPS unit. The lithic artifact assemblage from LA 166767 consists of 83 items, 73 of which were from the surface (Table 6.4). Ten lithic artifacts were recovered from the excavation units (SUs 1 and 2). The assemblage includes at least nine projectile points and projectile point fragments. Another notable characteristic of the LA 166767 assemblage is the high percentage of thinning flakes. The category includes a few items identified as sharpening (or resharpening) flakes. Finally, unlike the other three sites, core tools and flake tools are not a significant component of the tool assemblage from LA 166767. The collected materials indicate a consistent emphasis on biface manufacture even though the projectile points suggest multiple occupation or use of the site. The two cores present in the assemblage are bifacial cores. Initially, two small fragments of what were believed to be ground stone were collected, but upon closer inspection they were identified as fire-altered rock.

Table 6.4 LA 166767, artifact type by material type

Material	Flake	Thinning Flake	Biface	Uniface	Flake Tool	Core/ Core Tool	Other	Total
Chalcedony	18	17	6	2	1			**44**
Chert	8	2	6					**16**
Basalt	5	3	4		1	1		**14**
Igneous	2							**2**
Quartzite	3							**3**
Sandstone							2	**2**
Wood	1							**1**
Unknown							1	**1**
Total	**37**	**22**	**16**	**2**	**2**	**1**	**3**	**83**

Including retouched flakes, 61 pieces of lithic debitage were recovered from LA 166767. Forty-four of the 61 flakes and flake fragments are noncortical. Seventeen are cortical flakes or fragments. The assemblage includes 21 complete flakes and 40 less than complete specimens. The mean length for whole flakes is 28.3-mm. The mean width and thickness for complete flakes are 26.2-mm and 7.2-mm, respectively. The average for thickness could be considered high, but two or three unusually large complete flakes are affecting the value. The mean thickness for all flakes and flake fragments is 5.4-mm, less than that for LA 166766. The high frequency of broken flakes would in this case be consistent with an emphasis on tool manufacturing, specifically biface manufacturing. The mean thickness values for the 36 chalcedony flakes and flake fragments combined is 4.1-mm. The mean thickness for the 10 chert flakes and fragments is 7.8-mm. Two of the chert flakes, however, are unusually thick (greater than 1.5-cm). Three basalt flakes are unusually thick as well. Only six chalcedony flakes are cortical.

Chipped stone tools include five biface fragments (Figure 6.17), two unifaces, two retouched flakes (Figure 6.18), one core tool, two large biface tips of bifacial core fragments, and nine complete or nearly complete projectile points and projectile point bases (Table 6.5, Figures 6.19, 6.20, 6.21). At least two of the biface fragments may be portions of projectile points as well. One of the projectile point bases has a flute on one side. Three similarly shaped Midland-like bases do not have flutes. Two projectile point bases represent portions of stemmed and shouldered points similar to the Nolan-like point identified as IO 18 during the survey (Brown and Brown 2010). Stemmed points suggest occupation during the Gardner Springs or Keystone phases.

A large corner-notched point observed during the survey was collected during testing (Table 6.5). This nearly complete specimen, a Maljamar-like point (Justice 2002:182–186; Leslie 1978:140–142) found on the western edge of the site, is made of rhyolite and has slightly convex edges, corner notches, barbs, a rounded base, and a flattened cross section (Figure 6.20 [b]). The extreme tip is missing. The specimen is 41-mm long, 28-mm wide, and 35-mm thick. The flaking is non-patterned. Maljamar points date from ca. 1000 B.C.–A.D. 100 (Justice 2002:185).

Figure 6.17 LA 166767, biface fragments

Figure 6.18 LA 166767, modified flakes

Figure 6.19 LA 166767, projectile point bases

Figure 6.20 LA 166767, Maljamar-like projectile point (b)

Figure 6.21 LA 166767, Folsom base (a)

The possible Folsom base, a Paleoindian period point, was identified during the survey as an indeterminate Archaic dart or spear point (Table 6.5, Figure 6.21 [a]). The specimen is made of chalcedony and has straight sides, a slightly concave base, and a flattened cross section. The fragment is 30-mm long, 25-mm wide, and 3-mm thick. The lateral edges on one surface exhibit parallel to slightly diagonal parallel flaking that terminates in a hinge fracture, leaving an elongated raised area along the middle of the surface. The flute is shallow and terminates in a step fracture about 2-cm above the base.

6.2.3 Test Excavations

Test excavations consisted of one 1-m^2, two 2 x 2-m scraped areas, and seven backhoe trenches. Each is described separately below (Figure 6.22).

6.2.4 Hand-excavated Test Units

Three test units, SU 1, SU 2, and SU 3, were hand excavated. Manual testing totaled 9 m^2, or 1.8 cubic meters. All excavated sediments were screened through ⅛-inch mesh, and all Munsell color assessments were obtained on dry sediments.

6.2.4.1 SU 1

A 1-m^2 unit, SU 1, was placed over the south half of Feature 1, the concentration of fire-modified cobbles (Figure 6.22). A bulk sediment sample was collected immediately north of the north edge of SU 1, and 21 cobbles on the surface of SU 1 were mapped before excavation. The cobbles were removed and examined, and it was noted that not all were burned or fractured by heat, indicating a low-temperature fire or limited use in a hearth. The cobbles were medium- to fine-grained quartzite and vesicular basalt, and appeared to have been river cobbles. The upper 8-cm of sediment in SU 1 was loose, windblown sandy silt (Stratum I, 10 YR 5/4, yellowish brown) (Figure 6.23). All sediments were screened through ⅛-in mesh. Four fire-cracked rock fragments and one flake were recovered from the upper 3–6 cm of Stratum I. No ash or charcoal was observed, and no stain or fire-reddening was discernible.

Stratum II—compact, fine-to-medium-grained sandy silt or sandy, silty clay (10 YR 5/6, yellowish-brown)—contained no artifacts or fire-cracked rock, and was neither stained nor fire-reddened. SU 1 was excavated into Stratum II to a total depth of 20-cm below surface. An auger test at the center of SU 1 produced no cultural materials or soil changes to a depth of 50-cm. All Stratum II sediments were screened through ⅛-in mesh.

Table 6.5 Chipped stone tools from LA 166767

FS	Description	Length (mm)	Width (mm)	Thick. (mm)	Condition*	Material	Edge <	Comment
23	Biface?	42.57	39.04	11.93	D	Basalt	.	2-3 ventral facets/patina/tip?
39	Biface	49.94	34.89	10.69	D?	Basalt	.	7-8+ facets each/most step/complete oval?/stem broke?
8	Biface	45.71	23.23	7.45	L	Chalcedony	.	Smoky gray/white/red areas/well flaked
19	Biface	40.56	15.84	10.56	L	Chalcedony	.	Yellow brown/white specks
42	Biface	28.78	24.70	5.52	D	Chalcedony	.	Tip broke/transverse break fair even/point tip
17	Core/Biface	63.84	62.26	25.68	D	Chert	.	White spotty/inclusions/some step facets
37	Core/Biface	37.47	34.22	16.42	D?	Chalcedony	.	Thick biface end?/step break
9	Core tool?	66.36	96.02	19.23	D/L	Igneous	.	Half cobble/thin/one side broke/retouched?
24	Projectile point	38.98	26.80	6.70	P	Basalt	.	Long stemmed/uneven shoulder/base 15,62 wide
7	Projectile point	21.66	23.64	5.43	P	Chert	.	Base/slightly concave/even transverse break
20	Projectile point	21.57	23.02	5.99	P	Chert	.	Base slightly concave/slight lipped break
22	Projectile point	27.99	25.27	5.23	P	Chalcedony	.	Base/straight/parallel sides/flute one side/Folsom
23	Projectile point	20.10	19.67	4.71	P/L	Chalcedony	.	Base/straight/corner portion
46	Projectile point	37.77	27.41	6.74	P	Chert	.	Large corner?, broke before base thin/one poor notch
51	Projectile point	47.78	23.92	5.85	C	Chert	.	Corner/serrated edges/late/one base tang busted/13.92
52	Projectile point	41.09	27.26	6.13	C	Chert	.	Corner/part base and tip missing/one edge wavy
57	Projectile point	30.93	23.02	6.67	P	Igneous	.	Stem/shoulder part/side to side fracture dips/18.95 stem
34	Flake, retouched	45.02	36.49	5.52	C	Basalt	20	Mass hinge platform/multiple edges/even thickness
28	Flake, retouched	38.88	29.24	5.21	L?	Chalcedony	20	Two edges (side and end)
43	Uniface	30.16	16.65	7.45	L	Chalcedony	65	One/both side part missing/steep edge angle/thumb
60	Uniface	21.63	15.44	7.61	C	Chalcedony	70	Thumb/reworked larger tool?/steep and less steep

*D=Distal; M=Medial; L=Lateral; P=Proximal; C=Complete; IN=Indeterminate

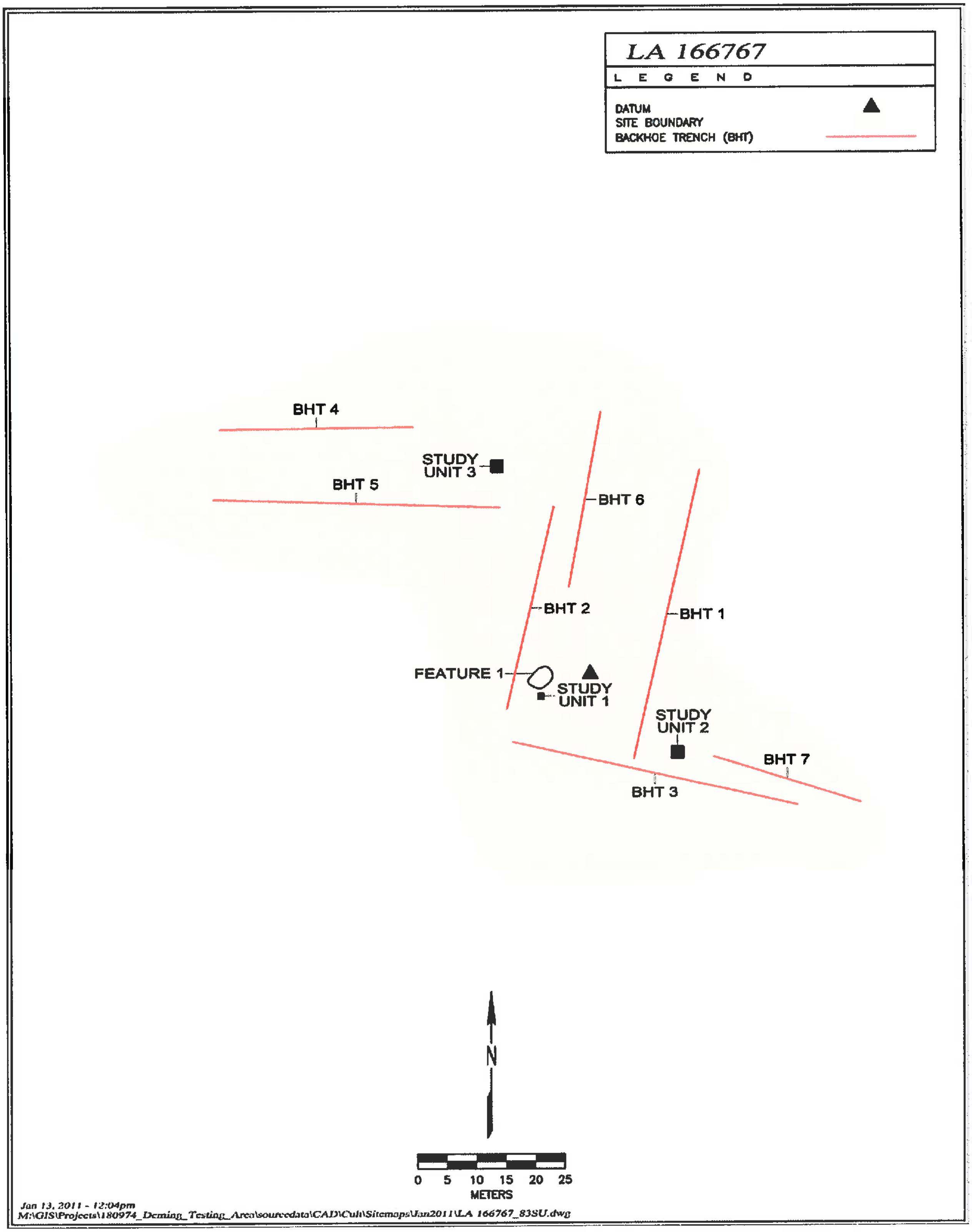

Figure 6.22 LA 166767 site map showing excavation units

Figure 6.23 LA 166767, Feature 1, concentration of fire-altered cobbles

6.2.4.2 SU 2

SU 2, a 2 x 2-m scraped unit, was placed in the southeast quadrant of LA 166767. No cultural materials—artifacts, fire-cracked rock, or stains—were on the unit's surface. Stratum I was 4–8 cm of loose, aeolian sand with a few cobble inclusions, and was consistent with Stratum I as recorded in all other areas examined at the site (10 YR 5/4, yellowish brown). Stratum II—compact silty sand/sandy silt, 10 YR 4/6, yellowish brown—was likewise consistent with Stratum II as recorded throughout LA 166767. No cultural materials were found on the surface or in Stratum I. No soil stains or other indication of a buried feature was observed at the interface of Stratum I and Stratum II (Figure 6.24). Stratum II was not excavated, but a soil probe 35-cm into Stratum II revealed no soil changes and yielded no cultural materials. All excavated sediments, including the Stratum II soil probe, were screened through ⅛-in mesh.

Figure 6.24 LA 166767, SU 2 overview

6.2.4.3 SU 3

SU 3, a 2 x 2-m scraped unit, was placed within an artifact concentration in the north-central part of the site where the land sloped slightly northeast (Figure 6.22). Four flakes were recovered from the surface of SU 2 before excavation commenced, and all excavated materials were screened through ⅛-in mesh. Stratum I was a 2–4 cm thick layer of loosely-packed aeolian sandy silt containing small to medium gravel. Except for the thinness of the stratum, it was entirely consistent with Stratum I at LA 166767 SU 1 (10 YR 5/6, yellowish-brown). Except for the four flakes on the surface, no cultural materials were recovered from Stratum I.

Stratum II was very compact sandy, silty clay with caliche nodules (10 YR 5/6, yellowish brown) (Figure 6.25). One flake was recovered from Stratum II, however, the excavators noted the flake was recovered during wall straightening. SU 2 was excavated into Stratum II to a total depth of 20-cm below surface, and a further 10-cm was examined using a soil probe. No cultural materials were recovered from the excavation and probe of Stratum II.

Figure 6.25 LA 166767, SU 3 overview

6.2.5 Backhoe Trenches 1–7

Seven backhoe trenches were dug with an 18-inch bucket (Figure 6.22). Trenches 1 through 7 were closely monitored. The trench walls and backhoe spoil were visually examined as trenching progressed, but the backhoe spoil was not screened. No in situ or displaced artifacts were observed in any of the seven trenches, and no buried features or artifacts were exposed in any stratum of any trench wall.

Based on the width of the 18-inch backhoe bucket, each trench was a minimum of 46-cm wide and was excavated 0.9–1 m deep. Trenches 1–5 each measured 50-m long and Trenches 6 and 7 were each 25-m long, for a linear total of 300-m, an area of 150-m^2, and a volume of about 135-m^3.

Because the stratification exposed in the walls of Trenches 1–7 is redundant, it will be summarized as expressed in Trench 3 (Figures 6.26 and 6.27). In all trenches, Stratum I was a 7-to 18-cm layer of aeolian loose, silty sand to sandy silt (10 YR 4/6, dark yellowish brown, to 7.5 YR 4/5, strong brown). It is consistent with Stratum I as it was recorded in each hand-excavated SU. The lower boundary of Stratum I lay on Stratum II.

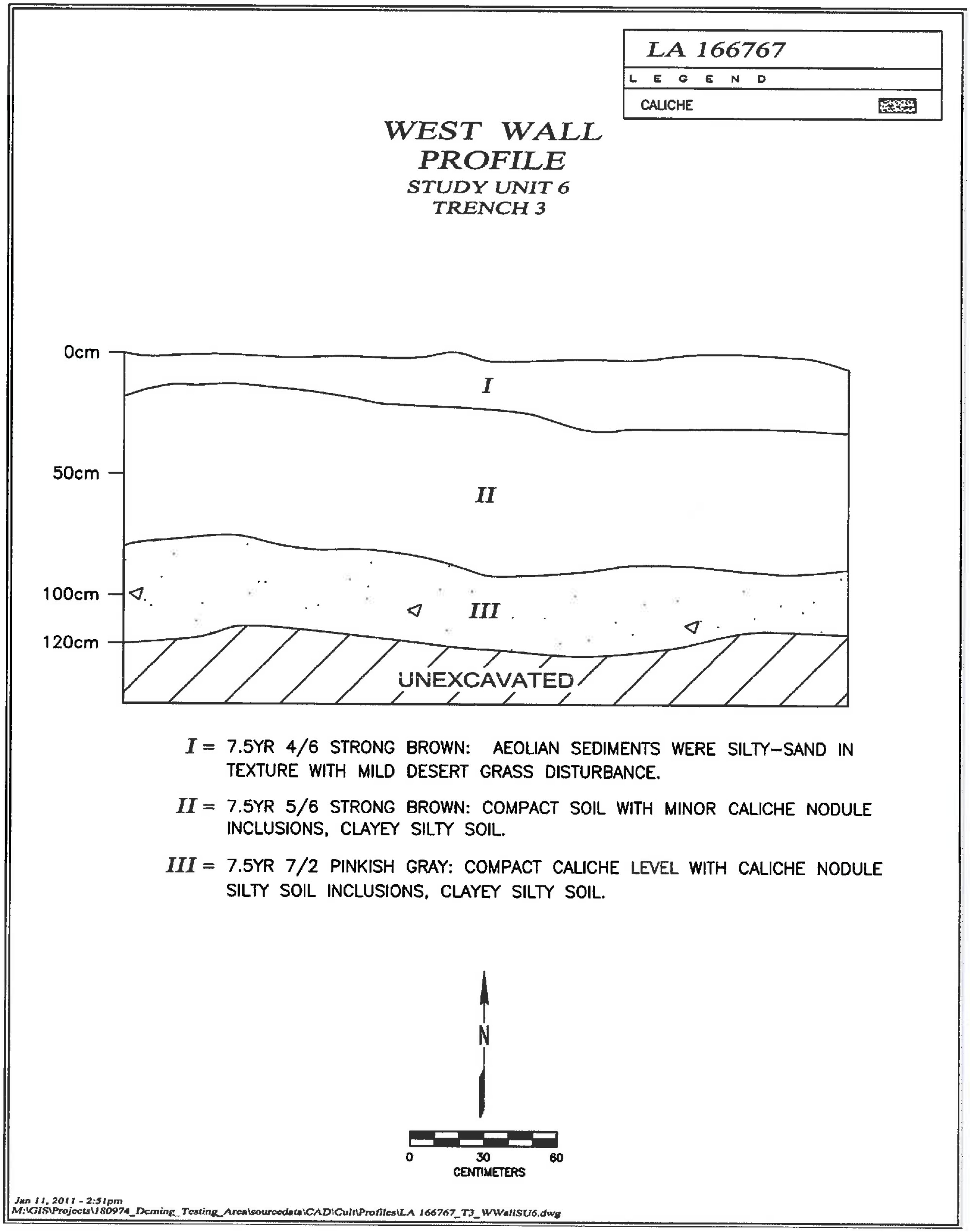

Figure 6.26 LA 166767, Trench 3, profile

Figure 6.27 LA 166767, Trench 3 profile

Stratum II is compact clayey silt with occasional caliche inclusions (10 YR 5/6 yellowish-brown to 7.5 YR 4/6, strong brown). The visual boundary between Stratum I and Stratum II was gradual, but the texture was abrupt. The layer was generally about 30-cm thick, but ranged from a minimum of 23-cm to a maximum of 42-cm thick. It is consistent with Stratum II as recorded in the hand-excavated SUs 1, 2, and 3.

The backhoe trenches exposed a deeper soil layer, Stratum III. Stratum III was a very compact layer of caliche-laden clayey silt (7.5 YR 7/2, pinkish gray). The boundary between Stratum II and Stratum III was gradual to clear, depending on the strength of the caliche component. Stratum III was observed in each of the backhoe trenches, and extended below their depths.

6.2.6 Evaluation

The potential for buried cultural deposits at LA 166767 was determined with one 1-m^2, two 2 x 2-m scraped areas, and seven backhoe trenches totaling an area of 150-m^2. Subsurface testing revealed no buried cultural deposits. Feature 1, the concentration of fire-altered river cobbles, was determined to be almost entirely surficial. The few buried fragments of fire-altered rock found during testing of SU 1 were within the upper few cm of the loose aeolian sediments of Stratum I, and no ash, charcoal, or soil staining was evident in Stratum I or Stratum II. Only five artifacts were found below surface in the course of manually excavating 9-m^2. A total of 159-m^2 was manually and mechanically excavated, or about 2 percent of the site surface (Table 6.6). All five artifacts recovered from subsurface contexts were from near the surface within Stratum I.

Table 6.6 Excavations at LA 166767

SU	Unit	Length m	Width m	Area m^2	Depth m	Cubic m^3
1	Unit 1	1	1	1	0.2	0.2
2	Unit 2	2	2	4	0.2	0.8
3	Unit 3	2	2	4	0.2	0.8
4	Trench 1	50	0.5	25	0.9	22.5
5	Trench 2	50	0.5	25	0.9	22.5
6	Trench 3	50	0.5	25	0.9	22.5
7	Trench 4	50	0.5	25	0.9	22.5
8	Trench 5	50	0.5	25	0.9	22.5
9	Trench 6	25	0.5	12.5	0.9	11.3
10	Trench 7	25	0.5	12.5	0.9	11.3
Totals				**159**		**136.9**

When recorded, LA 166767 was recommended eligible for nomination to the NRHP under Criterion D, information potential. The site's Paleoindian age is based on a possible Folsom point base and its Archaic age and affiliation is based on the presence of a Maljamar projectile point and other stemmed projectile point bases. The entire surface assemblage was collected and analyzed and will be curated at the Museum of Indian Arts and Culture, Museum of New Mexico in Santa Fe. Archaeological testing demonstrated the site is surficial, with no potential for buried cultural deposits that can provide additional important information. Therefore, LA 166767 is recommended not eligible for listing on the NRHP.

6.2.7 Project Impact

Based on the results of archaeological testing, LA 166767 is recommended not eligible for listing on the NRHP. The site is surficial, and the entire artifact assemblage has been analyzed, reported, and prepared for curation at the Museum of Indian Arts and Culture, Museum of New Mexico in Santa Fe. Pending concurrence, future development will have no effect on LA 166767.

6.3 LA 166768

Site Area: 6396 m^2
Site Type: Chipped stone artifact scatter
Land Status: City of Deming
Quadrangle: Deming West (1967)
Elevation (AMSL): 1344-m (4409-ft)
Dimensions: 82 x 78-m (269 x 256-ft)

Topographic Location: Flat in valley
Vegetation: Tobosa and other grasses, soaptree yucca, desert marigold, desert globemallow
No. of Components: 1
Cultural Affiliation: Late Archaic
Features: None
Artifacts: Bifaces, scrapers, cores, chipping debris

6.3.1 Site Description

LA 166768 is a low-density prehistoric chipped stone artifact scatter on an open flat area on the north side of the Mimbres River in the Mimbres River valley (Brown and Brown 2010) (Figures 1.1, 6.28, and 6.29). The local plant community is desert scrubland and includes tobosa and other grasses, soaptree yucca, desert marigold, and desert globemallow. Ground visibility is 80 percent. A two-track borders the southeast edge of the site and gravel is exposed in some areas, particularly where vehicles have left the two-track and crossed the site. The soil is classified as Mohave sandy clay loam, 0–3 percent slopes (MU). The site was first recorded in the summer of 2010, and it was estimated at that time to be 75–99 percent intact. A Chiricahua projectile point provides a Fresnel phase of the Cochise Tradition affiliation and an age of 2500–900 B.C. for the site.

Figure 6.28 LA 166768 overview, looking southwest

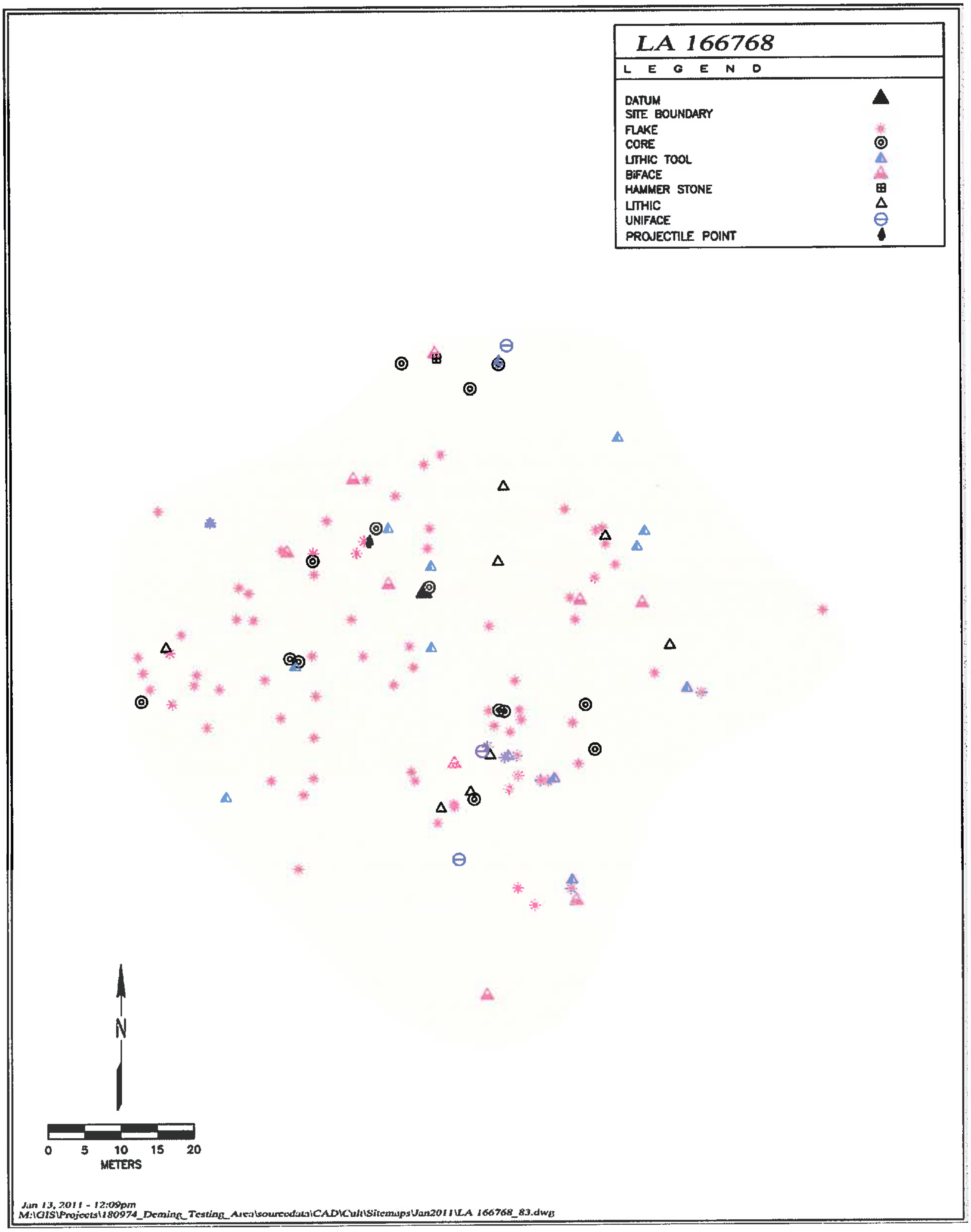

Figure 6.29 LA 166768 site map showing artifact locations

6.3.2 Surface Collection and Mapping

All artifacts observed on the surface (n = 149) were piece-plotted before manual or mechanical testing commenced. Artifact locations were recorded using the Trimble GeoExplorer3 GPS unit (Figure 6.28). After plotting, the entire surface assemblage was collected for analysis and subsequent curation at the Museum of Indian Arts and Culture, Museum of New Mexico in Santa Fe.

A total of 153 lithic artifacts was recovered from LA 166768 (Table 6.7). Only four artifacts were recovered from the excavation units. The assemblage consists primarily of 85 flakes and flake fragments, 17 cores or core tools, and 14 flake tools. Nine bifaces including one projectile point were included in the assemblage. Most of the cores and core tools are unclassified igneous materials. These materials are similar to 27 items classified as black basalt, but generally lighter in color and often heavily patinated. Cortex, when present, is water worn and very dark brown on some specimens. Facets frequently appear as smoothed over shiny or lustrous surfaces including portions exhibiting evidence of use. Three relatively large pieces of vesicular basalt were collected from LA 166768 as possible ground stone implements. Black basalt and unclassified igneous are the most common material types, followed by chert and chalcedony. A few artifacts of gray quartzite and silicified wood were also identified in the assemblage.

Table 6.7 LA 166768, artifact type by material type

Material	Flake	Thinning Flake	Biface	Uniface	Flake Tool	Core/ Core Tool	Other	Total
Chalcedony	5	7	1		3		1	**17**
Chert	8		3		2	3		**16**
Basalt	15	3	3	2		1	3	**27**
Igneous	47		1	1	7	11	6	**73**
Quartzite	6		1			1		**8**
Sandstone							1	**1**
Wood	4				1		1	**6**
Unknown					1	1	3	**5**
Total	**85**	**10**	**9**	**3**	**14**	**17**	**15**	**153**

Including flaked tools, 109 pieces of lithic debitage were collected. Forty-eight flakes are complete and 60 are fragments. The condition of one flake was not recorded during analysis. The relative proportion of complete and broken flakes at LA 166768 is identical to LA 166766 (44 percent complete and 56 percent broken). The higher percentage of flake fragments in the LA 166767 assemblage is slightly higher (66 percent). Among the complete flakes at LA 166768, 24 (50 percent) are cortical and an equal number are noncortical. Among flake fragments, 31 are cortical and 29 are noncortical. Overall, the relative proportion of cortical and noncortical flakes at LA 166768 is similar to LA 166766, while the percentage of noncortical flakes is higher at LA 166767.

In addition, few thinning flakes were identified in the assemblage from LA 166768. Core tools and flake tools are more common at LA 166766 and LA 166768. Excluding unclassified igneous materials, however, the proportion of thin flakes would increase significantly for LA 166768 as well as LA 166766. Chalcedony and chert flakes are far more likely to be thinning flakes. However, identifying thinning flakes among flake fragments is complicated by the absence of platforms on some specimens and other factors. Mean thickness values for the 25 chert/chalcedony, 18 black basalt, and 54 unclassified igneous flakes and flake fragments combined are, respectively, 6.3-mm, 7.2-mm, and 11.3-mm.

Chipped stone tools and cores from LA 166768 include 8 biface fragments and one projectile point (Table 6.8). The projectile point is made of black basalt, complete and probably best described as a San Pedro-like point (Figure 6.30). At least four of the biface fragments are probably projectile point tips although some are relatively thick. One specimen (FS 68) is too heavily patinated to be sure of artifact type.

Figure 6.30 LA 166768, San Pedro-like projectile point

Several core tools are present in the LA 166768 assemblage. In general these implements can be divided into those with a continuous worked face and edge along one of two sides of the tool (Table 6.9, Figures 6.31–6.35). The edge angle and overall angle of the face is broadly similar. Edges angles are high, usually in the 60 degree range and higher. Other tools have an edge meeting at the junction of two worked faces at an angle like tools usually described as choppers. Three well-shaped tools of basalt and unclassified igneous rock were classified as unifaces. Flake tools of the unclassified igneous materials are more common at LA 166768 possibly due to the larger assemblage size (Figures 6.36 and 6.37). One possible chert hammerstone was present at LA 166768. Hammerstones were rarely identified and collected from the field during testing. Evidently hammerstones were often too fragmented or patinated to identify as artifacts or simply overlooked and assumed to be natural cobbles. One would have thought there would have been more hammerstones present.

Table 6.8 Chipped stone tools from LA 166768

FS	Description	Length (mm)	Width (mm)	Thick. (mm)	Condition*	Material	Edge <	Comment
8	Biface	23.61	28.28	7.93	D/M	Basalt	.	5+ dorsal and ventral/most stepped/tip?
18	Biface	21.60	21.68	6.95	D	Basalt	.	Rounded tip/5-6 facets/uneven work
130	Biface	40.79	29.89	6.60	D	Basalt	.	Triangular tip/taper to rounded point/tilt break
33	Biface	39.32	30.71	15.73	D	Chert	.	Tip/triangular/smoky gray to yellow brown/4+ ventral
38	Biface	42.86	30.99	10.85	D	Chert	.	Tip/few facets/two small originate at break
63	Biface	18.64	33.07	10.80	D	Chert	.	Semicircular fragment/biface tip?
75	Biface?	37.59	18.97	12.07	M/L?	Chalcedony	.	One ventral+facets/other facets and pit/flaw too?
68	Biface?	28.62	20.09	8.72	IN	Igneous	.	Facets indistinct/looks like point stem/crude/nothing?
97	Biface	29.64	21.25	5.39	D	Quartzite?	.	Triangular tip
19	Core tool	93.19	91.48	58.74	C	Igneous	.	Patina/brown gray/water cortex/chopper/uneven edge
44	Core tool	81.13	77.63	36.19	C	Igneous	70	Cortex surface and flaked face opposite/some wear?
64	Core tool	116.53	93.76	29.36	C	Igneous	60	Water/even thick//retouch one end/5+step facets
79	Core tool	86.52	71.97	57.09	C	Igneous	70	Two adjacent facet sides/edges/approx 5+/most step area
115	Core tool?	102.39	75.96	55.30	C	Igneous	.	Cobble/one facet end/patina/some edge wear/batter?
117	Core tool	85.81	71.72	38.55	L	Igneous	.	Cortical face/broken face opposite/sides
132	Core tool	108.13	84.17	57.73	C	Igneous	60	Two sides/edges/one straight(end)/one convex(50-60)
132	Core tool	124.63	62.55	51.53	C	Basalt	80	Facet ends/both edges retouch/wear (80 and 50)
62	Hammerstone?	105.90	72.59	49.37	C	Chert	.	Cobble/water brown cortex or weather/steps one end
72	Projectile point	28.38	24.67	6.27	C	Basalt	.	Chiricahua/indented base width 22.66/side notch
23	Flake, utilized	.	.	.	.	.	.	
10	Flake, retouched?	24.32	26.85	6.52	C	Chalcedony	.	Large thin flake?/uneven retouch
28	Flake, retouched	.	.	.	C	Chert	50	Cobble end/white to pink to yellow
35	Flake, retouched	32.12	30.14	8.73	D	Chalcedony	.	Rounded ventral near end
61	Flake, retouched	48.15	41.80	19.80	C	Chert?	50	Patina/shiny/one edge part retouched
136	Flake, retouched	24.32	12.03	3.53	C	Chalcedony	80	Hinge platform margin/step below/retouch distal
4	Flake, retouched?	33.47	48.80	14.58	C	Igneous	.	Platform part snap off/patina/3-4 side and end facets
9	Flake, retouched?	39.25	59.81	10.33	C	Igneous	.	Hinge dorsal by platform/water/distal retouch partly
83	Flake, utilized?	100.34	91.05	32.08	C	Igneous	.	Nibbled distal edge/smooth brown gray cortex
84	Flake tool?	62.83	51.08	15.75	C	Igneous	.	Cortex?/part step thick lateral/ventral facets
111	Flake, retouched	49.28	19.32	11.14	C	Igneous	30	Platform in corner/edges retouch (2)/battered
116	Flake, retouched?	48.18	37.11	11.89	D	Igneous	.	Step/unifacial retouch one side?
135	Flake, retouched	48.82	90.94	19.66	C	Igneous	.	Water gray/one edge part retouch/orientation?
69	Flake, retouched	22.04	14.66	3.69	D/L	Wood	.	Retouch one part broken edge
60	Uniface	67.05	45.69	23.90	C	Basalt	70	8+stepped facets platform margin/one lateral edge
39	Uniface?	77.91	64.33	22.88	C	Igneous	.	Platform small/ step facets below and at distal/ brown
47	Uniface	81.54	75.35	37.18	C	Igneous	60	12+facets/hinging two edges/75/60/45 angles/well shape

*D=Distal; M=Medial; L=Lateral; P=Proximal; C=Complete; IN=Indeterminate

Table 6.9 Chipped stone cores from LA 166768 and LA 166769

Site	FS	Description	Length (mm)	Width (mm)	Thick (mm)	Condition*	Material	Comment
166768	67	Core	97.10	87.09	35.02	C	Basalt	8+facets one patina face/opposite cortical plus 3-4 facets
166768	20	Core	36.13	32.94	19.01	C	Chert	Small/turtleback/3 facets flat side/15 total/bidirection
166768	53	Core fragment	34.67	31.89	16.22	C	Chert	Yellow brown to smoky and red/7+ some stepped
166768	52	Core/test rock	77.84	37.21	29.95	C	Igneous	Cobble end/one facet from ventral platform
166768	70	Core/test rock?	44.19	40.78	39.98	C	Igneous	Patina facets/one recent
166768	103	Core/flake?	58.82	39.65	20.36	P/L?	Quartzite?	Odd orientation/shape
166768	133	Core	118.02	96.35	89.12	C	Igneous	One facet side/base/taper to round end/sides part cortex

*D=Distal; M=Medial; L=Lateral; P=Proximal; C=Complete; IN=Indeterminate

Figure 6.31 LA 166768, core

Figure 6.32 LA 166768, core

Figure 6.33 LA 166768, core

Figure 6.34 LA 166768, core

Figure 6.35 LA 166768, core fragment

Figure 6.36 LA 166768, tool fragment

Figure 6.37 LA 166768, modified flake

6.3.3 Testing

Testing consisted of a 1-m^2, two 2 x 2-m scraped areas, and 13 backhoe trenches. Each of these is described individually below (Figure 6.38).

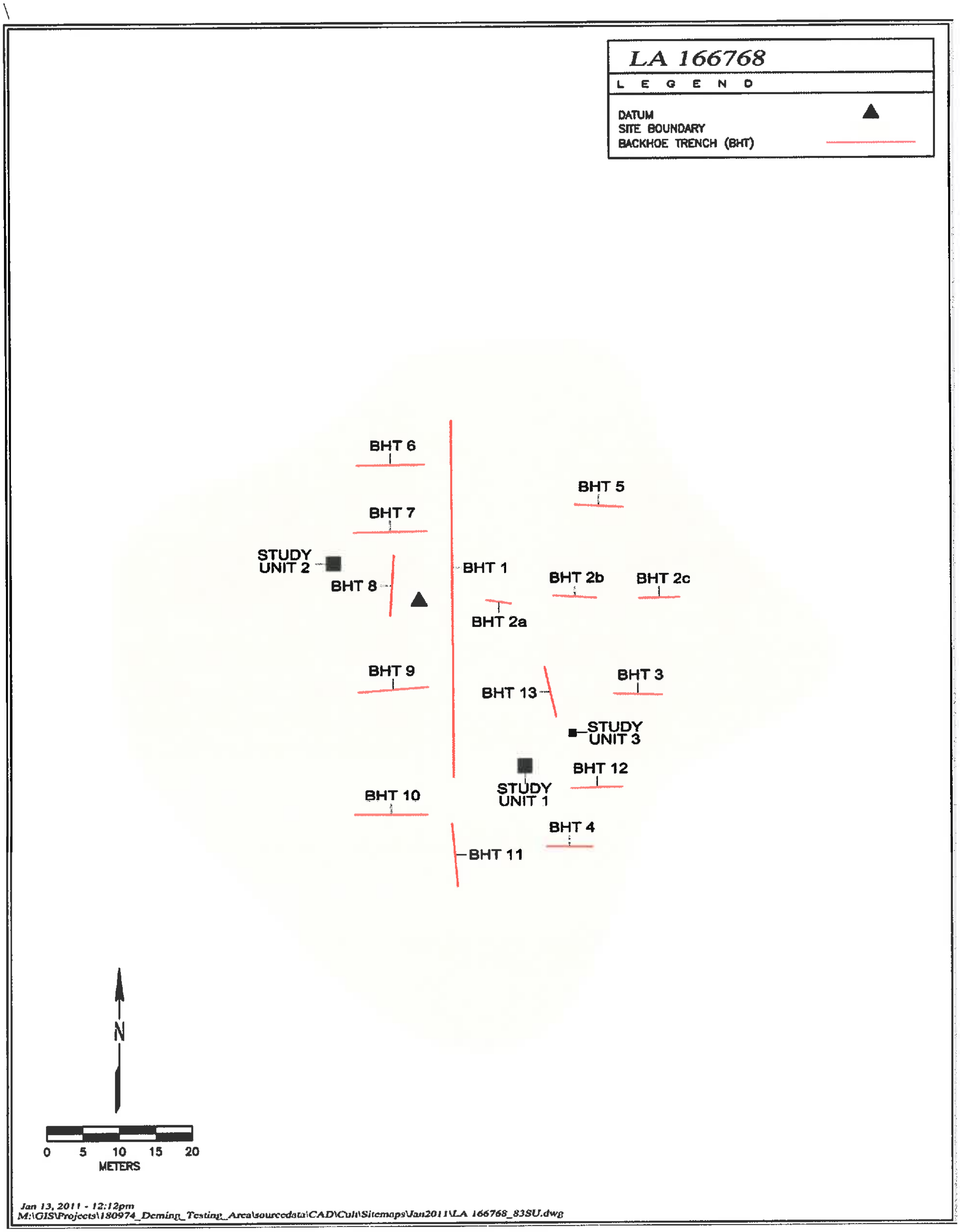

Figure 6.38 LA 166768 map showing excavation units

6.3.4 Hand-excavated Test Units

SU 1 and SU 2 were each 2 x 2-m shovel scraped areas, and SU 3 was a 1-m^2 unit. Manual testing totaled 9 m^2, or 1.8 cubic meters. All hand-excavated sediments were screened through ⅛ inch mesh, and all Munsell color assessments were obtained on moistened sediments.

6.3.4.1 SU 1

SU 1, a 2 x 2-m shovel scraped area, was placed in the southeast quadrant of LA 166768 where artifact density was slightly higher (Figure 6.38). One flake was collected from the SU 1 surface before excavation commenced. All sediments were screened through ⅛-in mesh. Stratum I was a 10–12 cm thick layer of loose, wind-blown silty sand that blankets the site and its surroundings (7.5 YR 4/3, brown). One chipped stone flake was recovered from the upper 10-cm of Stratum I, and the unit was excavated an additional 10-cm. Stratum II, a compact layer of reddish-brown silty clay to fine-sandy clay (5 YR 4/3), directly underlaid Stratum I and continued to the extent of excavation at 20-cm below surface (Figure 6.39). No cultural materials, including artifacts, fire-cracked rock, or soil stains were discerned in Stratum II.

6.3.4.2 SU 2

SU 2 was a 2 x 2-m shovel scraped area in the northwest quadrant of the site where artifacts were more dense (Figures 6.38 and 6.40). All excavated sediments were screened through ⅛-in mesh. The results of excavation at SU 2 were similar to those of SU 1. Stratum I, the aeolian sand sheet, was 10–12 cm thick. Three chipped stone flakes and one piece of fire-cracked rock were recovered from Stratum I. The excavation continued an additional 10-cm below surface. Stratum II, the reddish-brown silty to fine-sandy clay (5 YR 4/3) was encountered between 10 and 12-cm below surface. No cultural materials were found in Stratum II, which continued to the extent of excavation at 20-cm below surface

Figure 6.39 LA 166768, SU 1, overview

Figure 6.40 LA 166768 SU 2, overview

6.3.4.3 SU 3

SU 3, a 1-m^2 unit, was placed at the southeast edge of the site where several cores were recorded during surface collection. SU 3 was excavated in 10-cm levels within Stratum I (brown silty sand, 7.5 YR 4/3) and Stratum II (reddish-brown silty to fine-sandy clay, 5 YR 4/3) (Figures 6.38 and 6.41). The unit was excavated to 20-cm below surface and all sediments were screened through ⅛-in mesh. No cultural materials were recovered from SU 3.

6.3.5 Backhoe Trenches 1–13

Backhoe trenching consisted of 13 trenches, each 60-cm wide and 90-cm deep. A total of 162-m of trenching was dug, equivalent to a surface area of 97 m^2 and a volume of 87.5 m^3. Trench 1 was dug along the long axis of the site, and the other 12 trenches were dug parallel and perpendicular to it (Figure 6.38). Trenching was closely monitored. Walls were examined as trenching proceeded, and backhoe spoil was examined but was not screened.

Consistent stratification was exposed in the trenches, and it will be summarized rather than reiterated for each trench. Stratum I is aeolian and consists of brown silty fine sand to fine sandy silt (7.5 YR 4/2 to 7.5 YR 4/3). Average depth of Stratum I is 4-cm. The textural boundary between Stratum I and Stratum II, very compact reddish-brown silty to fine-sandy clay (5 YR 4/4), is abrupt. Stratum II averages about 50-cm thick and becomes more compact with depth. Stratum III was a very compact layer of caliche-laden clayey silt (dry sediment, 7.5 YR 7/2, pinkish gray; moist sediment, 5 YR 4/4, reddish brown). The Trench 2a profile shown in Figure 6.42 and Figure 6.43 (from Trench 2a), are representative of the stratification at LA 166768. No buried features or other cultural deposits were exposed in any of the backhoe trenches, and no artifacts or other cultural materials were found in the backhoe spoil.

Figure 6.41 LA 166768, SU 3, overview

Figure 6.42 LA 166768, Trench 2a, overview

6.3.6 Evaluation

The potential for buried cultural deposits at LA 166768 was determined by one 1-m^2, two 2 x 2-m scraped areas, and 13 backhoe trenches totaling an area of 101.2 m^2 for a total tested area of 106.2 m^2, or about 1.7 percent of the total site area (Table 6.10). Testing revealed no buried cultural deposits, indicating the artifact assemblage is entirely on and within Stratum I, the 2–4 cm windblown sand sheet that covers the site. When LA 166768 was first recorded in the summer of 2010, it was recommended not eligible for nomination to the NRHP because no features or artifact concentrations were identified and the assemblage consisted of undiagnostic chipped stone debitage (Brown and Brown 2010). The present testing project collected and analyzed the entire surface artifact assemblage.

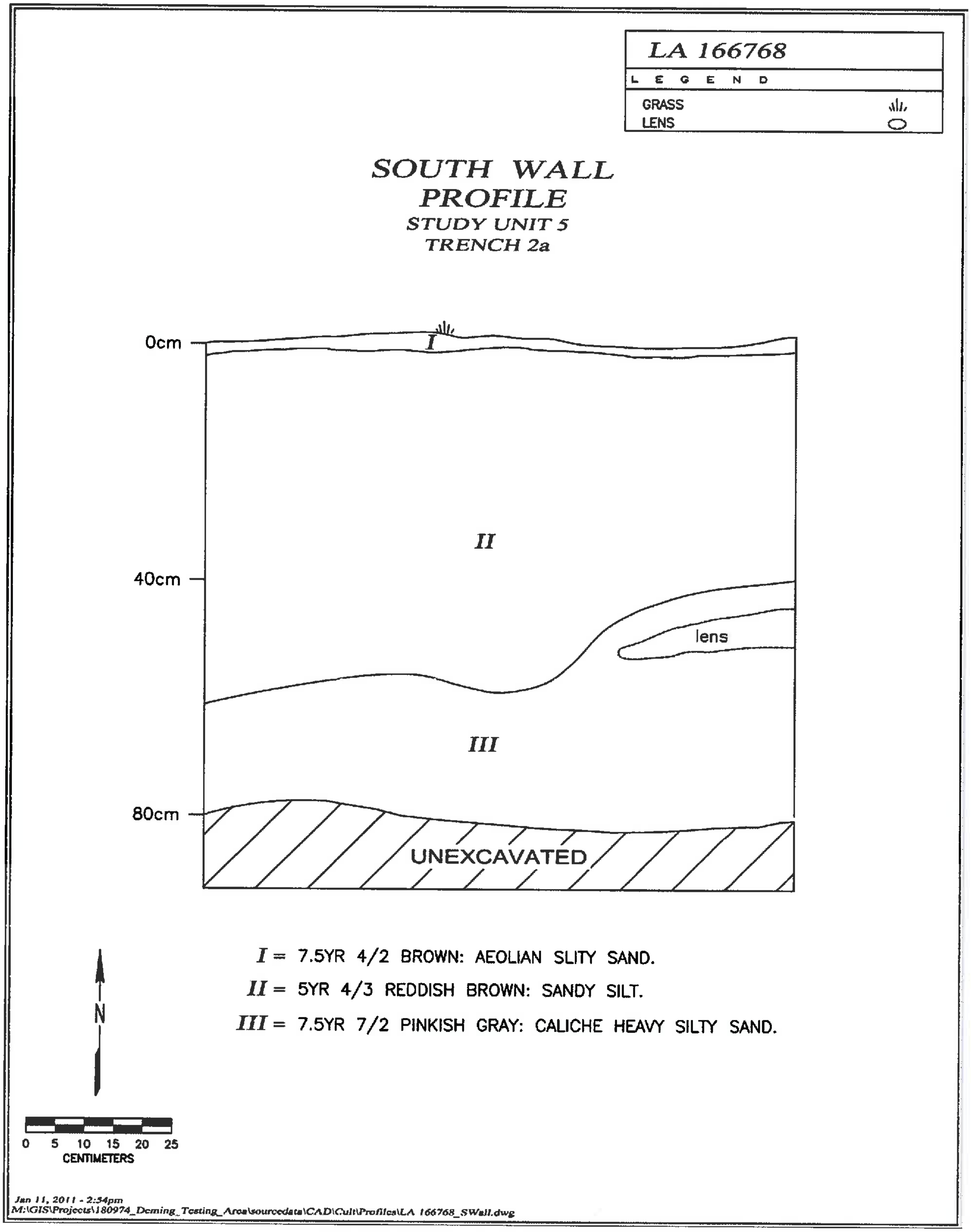

Figure 6.43 LA 166768, Trench 2a profile

Table 6.10 Excavations at LA 166768

SU	Unit	Length m	Width m	Area m^2	Depth m	Cubic m^3
1	Unit 1	2	2	4	0.2	0.8
2	Unit 2	2	2	4	0.1	0.4
3	Unit 3	1	1	1	0.2	0.2
4	Trench 1	50	0.6	30	0.9	27.0
5	Trench 2	20	0.6	12	0.9	10.8
6	Trench 3	7	0.6	4.2	0.9	3.8
7	Trench 4	7	0.6	4.2	0.9	3.8
8	Trench 5	8	0.6	4.8	0.9	4.3
9	Trench 6	9	0.6	5.4	0.9	4.9
10	Trench 7	10	0.6	6	0.9	5.4
11	Trench 8	9	0.6	5.4	0.9	4.9
12	Trench 9	9	0.6	5.4	0.9	4.9
13	Trench 10	10	0.6	6	0.9	5.4
14	Trench 11	9	0.6	5.4	0.9	4.9
15	Trench 12	7	0.6	4.2	0.9	3.8
16	Trench 13	7	0.6	4.2	0.9	3.8
Totals				**106.2**		**89.1**

Testing demonstrated the site is a surficial artifact scatter without features and with no potential for buried cultural deposits that might yield important information beyond what has already been collected. Therefore, LA 166768 is recommended not eligible for listing on the NRHP.

6.3.7 Project Impact

Based on the results of archaeological testing, LA 166768 is recommended not eligible for listing on the NRHP. The site is surficial, and the entire artifact assemblage has been collected, analyzed, reported, and prepared for curation at the Museum of Indian Arts and Culture, Museum of New Mexico in Santa Fe. Pending concurrence, future development will have no effect on LA 166767.

6.4 LA 166769

Site Area: 9504 m^2

Site Type: Prehistoric and historic artifact scatter with features

Land Status: City of Deming

Quadrangle: Deming West (1967)

Elevation (AMSL): 1343-m (4407-ft)

Dimensions: 99 x 96-m (325 x 315-ft)

Topographic Location: Floodplain

Vegetation: Various grasses, mesquite, soaptree yucca, desert marigold, desert globemallow

No. of Components: 2

Cultural Affiliation: Early Archaic, Euro-American

Features: Burned rock concentration (1), historic artifact concentration (1)

Artifacts: Projectile point, bifaces, scrapers, cores, chipping debris

6.4.1 Site Description and Background Information

LA 166769, a large multi-component site containing a prehistoric chipped stone artifact scatter and possible thermal feature and a historic artifact scatter, was recorded in 2010 (Brown and Brown 2010). The site is in an open area on City of Deming land on the north floodplain of the Mimbres River (Figures 1.1, 6.44, and 6.45). Although the components overlap, most of the prehistoric artifacts are in the northwest portion of the site, and the historic artifacts are primarily in the eastern three-quarters of the site. A large zinc tailings pile is about 100-m (328-ft) to the north, and a two-track and a linear tree plantation with a decommissioned irrigation line is between the site and the tailings dump.

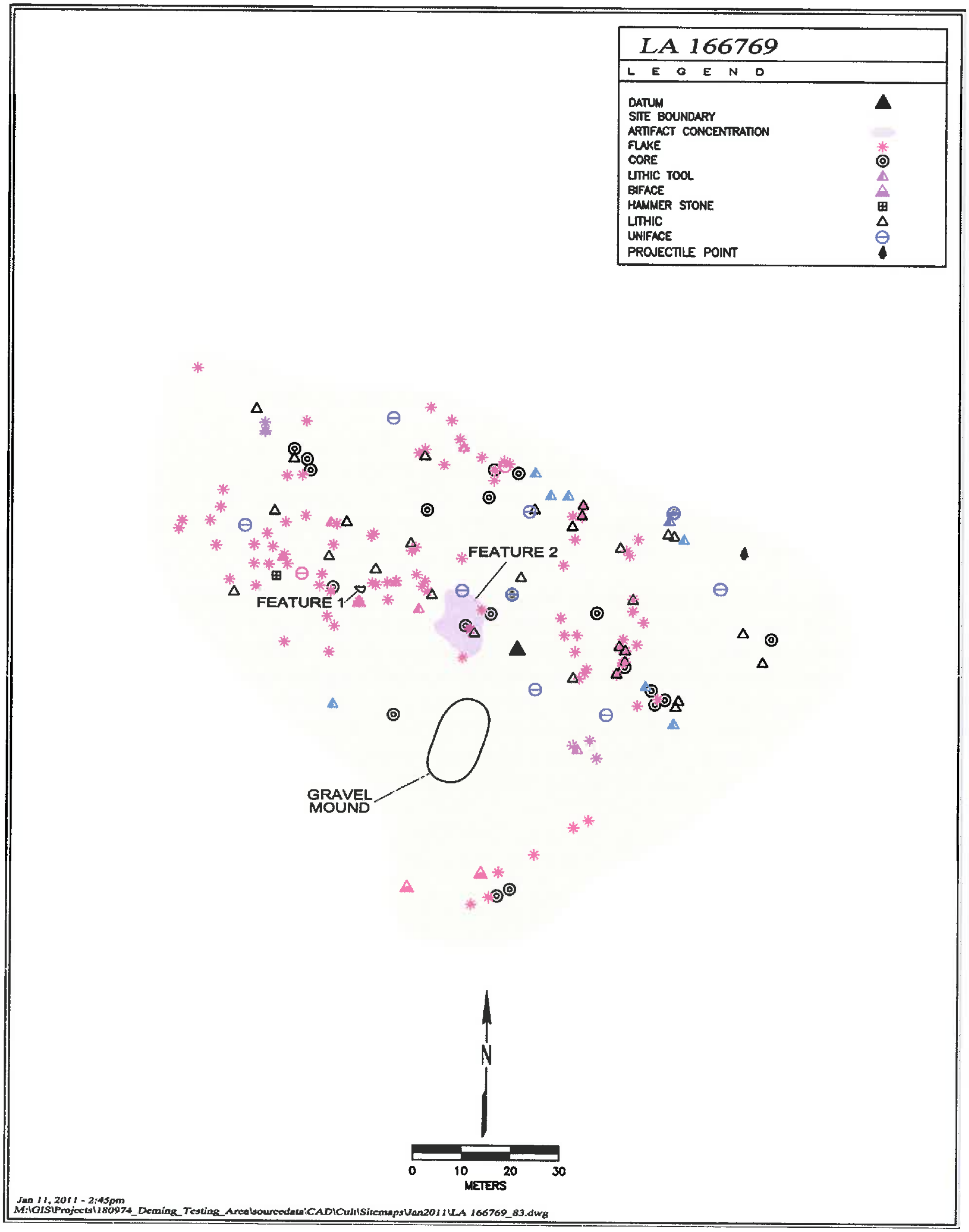

Figure 6.44 LA 166769 site map showing features and artifact locations

Figure 6.45 LA 166769 overview, looking southeast

The local plant community is desert scrubland and includes various grasses, mesquite, soaptree yucca, desert marigold, and desert globemallow. Ground visibility is 80 percent. The soil is classified as Berino and Mohave soils (BA) (NCSS 2010). The northern portion of the site has been mechanically disturbed by the former zinc mill activities and tree planting. Prior to the test excavations, the site was estimated to be 50–75 percent intact.

Two features—a burned rock concentration (Feature 1) and a historic artifact concentration (Feature 2)—were identified during the survey phase (Brown and Brown 2010:49). The 3-m (10-ft) diameter burned rock concentration (Feature 1) is associated with the prehistoric component (Figure 6.46). Although no charcoal or ash was observed on the surface and none was noted in a trowel probe during the survey phase, the hearth appeared to be mostly intact. The previously-recorded prehistoric chipped stone artifact scatter contained a complete Jay-like basalt dart point, four cores, two bifaces, two scrapers, and three utilized flakes, and 75 pieces of chipped stone debitage, indicating hunting, small-scale animal or plant resource processing, and stone tool production activities. Although Jay points are associated with the Early Archaic, the blade of the dart point was heavily resharpened, suggesting extended use or reuse. Its presence at the site may be due to later recycling. Nevertheless, the hearth and chipped stone artifact scatter probably represent a short-term campsite of prehistoric, possibly Archaic, affiliation.

Figure 6.46 LA 166769, Feature 1 looking north

The historic artifact concentration (Feature 2) is 11 x 9-m (36 x 30-ft) and consists of hundreds of glass and historic ceramic fragments, and a few metal artifacts (Figure 6.47). Although the composition of the artifact concentration suggests a single dumping episode, the size and distribution of the concentration indicates post-depositional disturbance.

Figure 6.47 LA 166769, Feature 2 looking north

6.4.2 Surface Collection and Mapping

Before commencing manual and mechanical excavations, the entire prehistoric artifact assemblage, which consisted entirely of chipped stone artifacts, was piece-plotted and collected. Because the historic assemblage contains hundreds of redundant and non-informative fragmentary artifacts (particularly glass), a judgmental sample of diagnostic historic artifacts was recorded and collected. Prehistoric and historic artifact locations were recorded using the Trimble GeoExplorer3 GPS unit (Figure 6.44). After plotting, the entire prehistoric surface assemblage and the diagnostic historic artifact assemblage were collected.

6.4.2.1 Surface Collection: Prehistoric Artifacts

A total of 216 lithic artifacts was collected from LA 166769 (Table 6.11). The assemblage is similar to the other sites, being composed primarily of non-thinning flakes, thinning flakes, several core or core tools, and flake tools. Bifaces are not well represented at LA 166768 while flake tools (primarily retouched flake tools) and unifaces are relatively common. Two items were collected as possible ground stone. One sandstone cobble fragment appears to have been used for light grinding and could be classified as a mano fragment. Only one hammerstone was identified in the assemblage. Two objects included in the other or unknown type category were a burned spall from a cobble and one unburned cobble fragment with facets from retouch or more recent damage. Two projectile point fragments were identified in the collected materials. Both may be portions of stemmed and shouldered points (Table 6.12).

A relatively small and complete Jay-like stemmed point observed during the survey was not relocated during testing. The specimen was described as having a contracting stem, slight shoulders, a straight base, and convex blade edges. The point was 35-mm long and 20-mm wide. The blade had been heavily resharpened, suggesting extended use or reuse. Therefore, although Jay points are associated with the Early Archaic, its presence at the site may be due to later recycling (Figure 6.48).

Figure 6.48 LA 166769, Jay-like basalt dart point

The most common material types at LA 166769 are chalcedony, black basalt, and unclassified igneous materials presumably of basaltic, andesitic, and rhyolitic composition (Table 6.11). Some flakes and tools of gray quartzite and silicified wood form a minor component of the assemblage. When present, cortical surfaces are most often water worn suggesting a secondary alluvial source for most materials. Natural cobbles of some materials are common on the surface at these four sites, and at LA 166769 perhaps more than the other three. Quartzite was commonly identified as one component of the rock concentrations identified as features, but few artifacts or quartzite were identified in the assemblages. Some of the heavily patinated igneous materials may be quartzite. Cores and core fragments of basalt, chert, and chalcedony are more common at LA 166769 than at the other sites (Table 6.13).

Including flake tools, 181 pieces of lithic debitage were collected from LA 166769 (Table 6.11). Sixty-one pieces of debitage are cortical flakes and 120 are noncortical. Of 180 pieces of debitage, 48 are complete flakes and 132 are flake fragments. Condition was not recorded for one flake. The mean length for whole flakes is 30.2-mm. The mean width and mean thickness for complete flakes are 27.5-mm and 8.2-mm, respectively. The mean thickness for all flakes and flake fragments is 6.7-mm. The mean thickness values for chert/chalcedony, basalt and the unclassified igneous flakes and flake fragments are, respectively, 5.2-mm, 7.2-mm, and 9.9-mm. Twenty-five of the 37 unclassified igneous flakes are cortical while only 15 of 88 chert/chalcedony flakes exhibit cortex. Seventeen of 45 black basalt flakes have at least some cortex as well. Overall, the proportion of cortical flakes and flake fragments is relatively low (34 percent). Sixteen retouched flake tools and one utilized flake are present. Edge angles for nine flake tools range from 25–65 degrees with a mean of 40 degrees. Edge angles on tools classified as unifaces range from 30–80 degrees with a mean of 53 degrees. Six of the flake tools have edge angles of 50 degrees or lower.

Table 6.11 LA 166769, artifact type by material type

Material	Flake	Thinning Flake	Biface	Uniface	Flake Tool	Core/ Core Tool	Other	Total
Chalcedony	29	23	3	2	11	4	2	**74**
Chert	7	13		6	3	3	1	**33**
Basalt	33	10	2	2	1	5	4	**57**
Igneous	38					7	2	**47**
Quartzite	5					1		**6**
Sandstone							1	**1**
Other	1		1	1	1			**4**
Wood		2					1	**3**
Unknown	1	1			1			**3**
Total	**114**	**49**	**6**	**11**	**17**	**20**	**11**	**228**

Table 6.12 Chipped stone tools from LA 166769

FS	Description	Length (mm)	Width (mm)	Thick. (mm)	Condition*	Material	Edge <	Comment
47	Biface	22.19	31.89	7.75	D	Basalt	.	Triangular tip/rounded end/slight step fracture
109	Biface	29.51	28.68	10.83	C	Chalcedony	.	Large step facets one side/retouch unifacial most edges
111	Biface?	10.52	23.21	9.24	D	Chalcedony	.	Tip?/may be distal flake/irregular lenticular
197	Biface. notch	24.32	16.74	6.22	D	Chalcedony	.	Triangular/round tip/notch one side
93	Core tool?	99.68	94.35	26.85	C	Basalt	.	Sides are facets (ends/part one side), cortex, break
90	Core tool	92.82	86.26	45.25	C	Quartzite	45	All facets adjacent/4+facets along edge+retouch/wear
106	Core tool?	104.36	87.54	61.23	C	Igneous	75	Adjacent facets/step edge/batter side/top margin/wear?
112	Core tool?	84.53	70.39	47.94	C	Igneous	.	Most facet area associated with one edge/base length
154	Core tool	67.09	40.92	31.61	C	Igneous	.	Ventral platform for most facets/no wear?
159	Core tool?	83.38	80.97	46.80	C	Igneous	.	Semicircular/work edge flat side/dorsal thumb facet?
27	Hammerstone?	72.31	73.70	64.94	C	Chalcedony	.	4-5 faces in section/batter/cobble only?
100	Projectile point?	19.98	17.06	4.95	M	Basalt	.	Stem/shoulder area?/grainy patina one face
169	Projectile point	39.71	24.42	7.16	P	Sedimentary	.	Very end of base missing/stemmed/lanceolate point
97	Flake, retouched?	30.68	22.43	8.48	C	Basalt	.	Platform shear toward side/retouch distal face
6	Flake, retouched	44.10	28.52	9.45	M?	Chalcedony	30	Triangular/retouched edge/corners part broke
29	Flake, retouched	28.46	17.07	5.33	IN?	Chalcedony	60	Large facet plus retouch/one straight/one concave edge
34	Flake, retouched	26.24	20.48	6.33	M/L	Chalcedony	25	Triangular/two breaks/one edge/cortex/flaw?
55	Flake, retouched	19.77	24.94	7.45	D/L	Chalcedony	50	7+ dorsal/edge part missing/unifacial/edge rounding?
67	Flake, retouched?	28.40	19.69	11.26	P?	Unknown	.	One side ventral retouch?/hinged platform margin
69	Flake, retouched	25.88	28.05	7.59	D	Chalcedony	45	Retouch side and end/thick part missing distal/water
84	Flake, retouched	21.32	31.13	5.87	M?	Chalcedony	25	Rectangular fragment/one edge/part missing probably
118	Flake, retouched?	33.59	23.88	12.86	IN	Chalcedony	.	Most ventral facets/dorsal retouch
131	Flake, retouched?	24.59	26.66	7.36	P	Chalcedony	.	Retouch/used break margin platform angled to distal
132	Flake, retouched	21.55	26.39	9.06	M	Chalcedony	.	Rectangular medial/ uniface retouch side and breaks
135	Flake, retouched?	18.42	32.04	5.80	P?	Chalcedony	.	Platform gone or crush/retouch one side?
153	Flake, drill?	36.49	22.14	5.78	C	Chalcedony	.	Part collapse platform/mf?/hinge/step below/projection
156	Flake, utilized?	37.24	19.91	4.59	C	Chert	25	Near complete/one edge used?/step below miss platform
160	Flake, retouched	52.71	28.88	15.33	IN	Chert	.	Roughly semicircular/edge flat side/ unifacial
171	Flake, retouched	31.55	37.94	7.27	L	Chert	45	Part collapse single/side break retouch
197	Flake, retouched	16.57	22.70	8.51	D	Chalcedony	65	Flake tip/one side retouched
137	Flake, retouched?	41.21	35.62	8.44	P	Sedimentary	.	Cortex?/some dorsal/some ventral retouch/ugly tip?
96	Uniface	47.54	27.51	10.34	C?	Basalt	45	Part one end missing?/end 45/side 70/fairly well shaped
1	Uniface	53.64	38.68	17.76	C	Chert	45	Flat ventral/9+ facets and cortical//water worn

FS	Description	Length (mm)	Width (mm)	Thick. (mm)	Condition*	Material	Edge <	Comment
66	Uniface	29.28	21.70	8.97	C	Chalcedony	60	Thumbnail/retouch except platform end/end 75 angle
88	Uniface?	33.50	22.82	18.23	IN	Chalcedony	.	Broke parallel/perpendicular to edge/triangular shape
100	Uniface	40.64	36.42	10.34	C	Chert	.	Retouch dorsal all around/not well shape/has ventral
120	Uniface	43.90	25.49	8.94	C/L	Chert	30	Part one side missing/fair well shape/end 30
121	Uniface	25.90	27.89	9.84	IN	Chert	60	Rectangular/one steep edge?/break side/uneven
133	Uniface	40.52	32.98	16.16	C	Chert	80	End scraper/80% retouch/thick end(wedge)/thumb spot
170	Uniface	74.45	48.35	20.07	C	Chert	40	Part like #169/retouch main one end/ventral/60 angle end
136	Uniface/core tool	57.53	56.40	13.28	C?	Igneous	45	2 edges/step unifacial, but opposite faces/cortex face 70%
43	Uniface	110.88	74.38	47.37	C	Limestone?	70	Fair well shape near all edges/thumbnail/flat ventral

*D=Distal; M=Medial; L=Lateral; P=Proximal; C=Complete; IN=Indeterminate

Table 6.13 Chipped stone cores from LA 166769

Site	FS	Description	Length (mm)	Width (mm)	Thick (mm)	Condition*	Material	Comment
166769	3	Core fragment	35.55	20.14	15.84	C	Basalt	Single break face/retouch edge? some irregular facets
166769	41	Core fragment	41.75	41.37	33.57	C	Chalcedony	Blocky/patina brown/5 faces/one most water/batter
166769	102	Core fragment	35.52	27.75	13.42	C	Chert	Small bifacial end?/some faces patina
166769	91	Core	56.55	45.49	19.80	C	Basalt	~5 facets each/most step/uneven/noncortical face flat
166769	7	Core	23.83	30.47	15.55	C	Chalcedony	Semicircular/thick biface tip/core
166769	11	Core	30.52	37.62	21.80	C	Chalcedony	Water/not biface tip/cortex flat side and one face/like #7
166769	98	Core, retouched	45.94	40.44	21.69	C	Chert	Small cortex patch one face/30 % other/retouch one end
166769	95	Core	68.11	57.92	37.78	C	Basalt?	Core fragment?/one face no facets or cortex
166769	164	Core	63.94	44.83	35.28	C	Basalt	Some step/trapezoid to hexagonal/no batter/patina
166769	68	Core/test rock	89.66	51.85	35.15	C	Igneous	One face and one side cortex/one batter junction
166769	167	Core	62.85	45.34	24.86	C?	Chert	Ventral present?/irregular shape/prominent projection
166769	144	Core	76.32	44.86	24.14	C	Igneous	Ventral/20% cortex other/step areas/fair even thick
166769	157	Core	108.17	89.47	49.78	C	Igneous	Ventral platform/facets two places/no obvious edge

*D=Distal; M=Medial; L=Lateral; P=Proximal; C=Complete; IN=Indeterminate

6.4.2.2 Surface Collection: Diagnostic Historic Artifacts

The historic assemblage included hundreds of relatively uninformative glass fragments. Ceramic artifacts were next most frequently identified materials, and metal artifacts were remarkably scarce. Artifacts observed but not sampled included fewer than five fragments of 1-inch metal strapping. In addition to the historic artifacts that were observed and recorded, artifacts that were not present are of interest. No cans—historic or recent—were found in any part of the site, although a very few thin scraps of sheet metal may once have been cans. No common mid- to late-twentieth century or twenty-first century material classes (for example, aluminum) were found, and no artifacts related to electrical or mechanical equipment were observed. The results of analysis of the judgmental sample are summarized in Table 6.14 and elements of the sample assemblage are discussed within material and functional categories below.

Table 6.14 Judgmental sample of diagnostic artifacts from Feature 2

FS	Material	Object	Treatment	Metrics	Comment
179, 185	Glass	Bottle bases	Three-piece mold, aqua glass	Diameter $3^{3}/_{16}$ inch	AB-joined makers mark
181	Glass	Bottle finish and neck	SCA, 2-pc mold, automatic machine	Lip diameter 1⅛ inch; bore diameter ½ inch	
183		Bottle finish, neck, partial shoulder and panel	Molded, SCA	Lip diameter $^{15}/_{16}$ inch; bore diameter ½ inch	Finish, two-part collared ring
184	Glass	Bottle finish and partial neck	2-part mold, automated	Lip diameter 1¼ inch; bore diameter ⅝ inch	Perry Davis type finish, v-shaped string rim
186	Glass	Tumbler	Press mold, SCA	Base dia., 2⅜ inch	16 ribs, faceted heel
188	Glass	Bottle finish, neck, shoulder, partial panel	2-part mold, fully automated machine	Lip diameter $1^{1}/_{16}$ inch; bore diameter $^{9}/_{16}$ inch	Perry Davis type finish, round string rim
191	Glass	Bottle finish, neck, partial shoulder, body	2-part mold, applied finish, SCA	Lip diameter 1 inch; Bore diameter ½ inch	
193	Glass	Partial bottle base and body	Molded, SCA	Base, estimated 1½ x 3 inch	Oval base, Illinois Glass Co. makers mark.
194	Glass	Bottle finish, neck partial shoulder	2-part mold, fully automated machine	Lip 1 inch; bore $1^{1}/_{16}$ inch	All exposed surfaces wind-etched, colorless glass not solarized.
180	Ceramic	Bowl base (2 non-joining sherds)	White-glazed ironstone	Part of 7 ⅛-inch or 8-inch "soup coupe"	Partial backstamp: Homer Laughlin "Hudson"
187	Ceramic	Plate base	White-glazed ironstone	N/A	Partial backstamp: "Johnson Bros. England"
192	Ceramic	Plate rim, cup rim	Ironstone, impressed, white underglaze, blue overglaze	N/A	Similar fragments in general scatter and recovered in SU 3
190	Ceramic	Rim sherd, 2 body sherds	Transparent glaze, terra cotta	N/A	Tapered rim. Possibly Mexican utility ware.
182 a	Steel	Date nail	Drawn wire shank, drop-forged head	Head diameter ⅝ inch; near-complete shank $2^{3}/_{16}$ inch	Head stamped "9"
182 b	Iron	Spike	Forged	Shank length 4¼ inch	Most of head is missing. Narrow gauge or mine rail?
191	Iron	Toy part	Cast	From seat to top of cap 1¾ inch	Human figure, wagon(?) driver

6.4.2.2.1 *Historic Glass Artifacts*

Glass was the most common material class among the historic artifact scatter. The Society for Historical Archaeology's *Historic Glass Bottle Identification & Information Website* (Lindsey 2010), Jones and Sullivan (1989), were consulted regarding characteristics, age, and method of manufacture of the glass artifacts, and reports of other glass specialists, particularly Lockhart (2004a, 2004b, 2006a, 2006b), Lockhart et al. (2007, 2008, 2010), and Toulouse (1971), were consulted as needed. Glass artifacts noted but not collected included three sun-colored amethyst (SCA) lamp chimney fragments with beaded ("crimp top") edges.

- **Glass Beverage Bottles**

FS 181 is a bottle fragment consisting of a finish and neck. The finish is a down-tooled type with a round string rim, and the neck is tapered. The artifact is faintly SCA, suggesting that it was originally colorless and therefore probably did not contain beer. This form was generally cork-sealed and contained an alcoholic drink such as brandy or wine. The outside diameter of the lip at the bore is 1⅛ inches, and the bore diameter at the lip is ½-inch. Mold seams extend the length of the neck and through one side of the finish, indicating the bottle was manufactured after 1900 using a fully automated bottle machine (Lindsey 2010; Stelle 2001) (Figure 6.49).

Figure 6.49 Bottle fragment, finish and neck (FS 181)

FS 179 and 185 are aqua bottle bases with an AB-joined makers mark. Both are $3^{3}/_{16}$ inches in diameter. The AB-joined makers mark identifies these bases as having been manufactured by the American Bottle Company between 1904 and 1917 (Lockhart 2004a; Lockhart et al. 2007) or between 1905 and 1929 (Whitten 2010). By 1920, the American Bottle Company was reported to be the largest manufacturer of bottles for beer, water, soda and other carbonated beverages in the U.S., with an annual capacity of about 300,000,000 bottles (Walbridge 1920:104). "K 1" below the joined-AB on FS 179 and "R 6" below the joined-AB on FS 185 probably indicate specific factories (Lockhart 2004a). The specific factories have not been identified. Except for the probable factory numbers, the specimens are from identical bottles that once held beer or another effervescent beverage.

- **Glass Medicine and Other Non-Food Bottles**

FS 183 is a faintly SCA bottle finish, neck, partial shoulder and partial panel (Figure 6.50). The finish is a two-part collared ring (similar to IMACS No. 24), with an outside diameter of $^{15}/_{16}$-inch at the lip and a bore of ½-inch. Collared-ring finishes and body panels were commonly found on early twentieth century druggist or prescription bottles. The neck tapers directly to the shoulder, and the remnant of one flat panel is present, supporting the artifact's identification as a medicine bottle.

Figure 6.50 SCA bottle finish, neck, partial shoulder and panel

FS 191 is a SCA bottle finish, neck, partial shoulder, and partial body (Figure 6.51). It has an applied two-part finish with turned-down type lip and round string rim. The top of the lip is very flat and may have been ground. The tapered neck measures $^{7}/_{8}$-inch from the bottom of the string rim to an abrupt shoulder. Mold lines extend the length of the neck but are obscured by the applied finish. Very little of the body is present, but a small part of a panel is centered between the lines of the mold seams. The artifact is likely a patent medicine bottle.

Figure 6.51 SCA bottle finish, neck, partial shoulder and body

FS 184 and FS 188 are parts of ball-neck bottles (Figures 6.52 and 6.53). FS 188 is the more complete, retaining the finish, neck, shoulder, and a partial panel. FS 184 is a finish and partial ringed neck. The necks are tapered. The finishes are similar to a Perry Davis type finish, common on patent/proprietary medicine bottles, liquor flasks, sauce or narrow necked food bottles, and occasionally on figured or pictorial flasks and ink bottles (Historic Bottle Website 2010). The string rim on FS 184 is v-shaped, and the string rim on FS 188 is rounded. FS 188 is slightly smaller than FS 184, with an external diameter at the lip of $1^{1}/_{16}$-inch and an internal diameter of $^{9}/_{16}$-inch. The outside diameter at the lip of FS 184 is 1¼-inch, and the inside diameter is ⅝-inch. Both artifacts are pale green glass. Mold seams extend the full length of both artifacts, including the neck ring and finish, indicating manufacture after 1900 using a fully-automatic bottling machine (Stelle 2001; Newsletter of the Archaeological Society of New Jersey 1981 (120):117). The bottles may have contained some sort of patent medicine (c.f. Baker and Harrison 1986:250), but ball neck bottles were also used for flavoring extracts, cosmetics, furniture polish, cologne, and many other products (Lindsey 2010).

Figure 6.52 Ball-neck bottle (FS 184)

Figure 6.53 Ball-neck bottle (FS 188)

An oval bottle base fragment, FS 193, is strongly SCA. Only part of the base and a curved segment of body are present, but the body appears to have been a plain oval or Philadelphia oval form. A maker's mark consisting of a "235" within a horizontal diamond indicates manufacture by Illinois Glass Company, Alton, Illinois (1873–1929) (Whitten 2010). Based on the position of the maker's mark and the curved body remnant, the artifact is part of a relatively small bottle. The 1906 and 1920 Illinois Glass catalogs were consulted (Illinois Glass Co. 1906, 1920). "235" was not a model number used in those publications, so the actual content or content type remains unknown. The shape suggests it was a medicine bottle.

- **Glass Tableware**

A press-molded glass tumbler base (FS 186) is very lightly SCA. Part of the tumbler wall is present, and 16 convex ribs are represented. The body remnant is slightly tapered. Measured from outside rib to outside rib, the base diameter (measured at the foot) is 2⅜ inches. The molded heel displays three facets directly beneath each rib, the foot is flat, and the slightly concave, circular base shows a faint valve mark.

- **Bottle of Undetermined Function**

FS 194 is a colorless glass bottle finish, neck, and partial shoulder (Figure 6.54). The two-part finish consists of a turned-down type lip and rounded string rim. Mold seams extend the length of the artifact, including the tapered neck and finish, indicating the bottle was made in a fully automated bottle machine after 1900 (Stelle 2001; Newsletter of the Archaeological Society of New Jersey 1981 (120):117). With the exception of the inside of the neck, the glass appears evenly etched (frosted) over its interior and exterior surfaces. However, given the etched broken edges and the protected and un-etched neck interior, the etching probably resulted from the constant impact of windblown sand. There is little to no solarization, which suggests the colorless glass artifact was probably manufactured no earlier than about 1920.

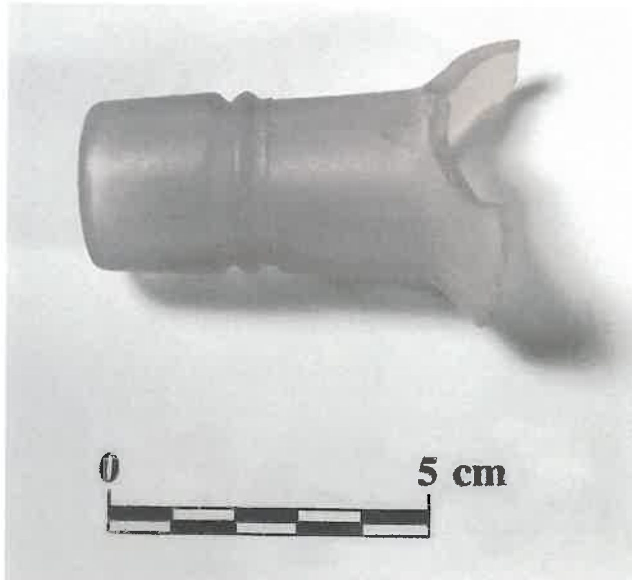

Figure 6.54 Colorless glass bottle finish, neck and partial shoulder

6.4.2.2.2 Historic Ceramic Artifacts

- **Ceramic Tableware**

Before sampling it was observed that the ceramic assemblage was small, numbering in the 10s, and the diagnostic ceramic assemblage was smaller still. Most ceramic artifacts were undecorated white-glazed ironstone sherds. A scatter of salt-glazed stoneware sherds was also present. Very few decorated sherds were observed, and of those, all but one was a blue-overglazed dinnerware. A sample of the blue-overglazed sherds were collected (FS 192, Table 6.13). One faded pink and green underglaze-decorated ironstone sherd was too fragmentary for analysis and was not collected.

Two thin, white-glazed ironstone sherds were found in close association (FS 180). Both retain part of a similar-diameter foot-ring, and one retains a partial black underglaze backstamp reading

"-HLIN
-dson"

It is a fragment of the Homer Laughlin China Co. "Hudson" backstamp. Hudson was a suite of dinnerware shapes rather than a decorative pattern. Introduced on January 1, 1908, Hudson was listed in Homer Lauglin catalogs until 1926, and remained a popular and widely-used form until about 1929 (Gates and Ormerod 1982:134; Page et al. 2003:49). An alphanumeric code on Hudson backstamps may indicate the form or a decorative pattern applied to the form, but only a fragment of the last character is present. Nevertheless, based on the remnant of the foot-ring and wall profile, and their proximity on the surface of LA 166769, the sherds are probably part of a single 7⅞-inch or 8-inch "soup coupe", as listed in the Hudson Type Piece list (Page et al. 2003:54). Several Homer Laughlin dinnerware styles, almost certainly including the popular Hudson form, were available through mail order houses (c.f. Montgomery Ward, Sears-Roebuck) and through direct purchase from retailers.

A second ceramic artifact with a maker's mark was found among the scatter. FS 187 is a white-glazed ironstone plate or saucer base bearing a Johnson Bros. (England) mark used from 1883–1913 (Kovel and Kovel 1986:12I) (Figure 6.55).

Figure 6.55 White-glazed ironstone plate or saucer, Johnson Bros. mark

At least 12 floral and scroll-impressed, white-glazed earthenware or ironstone sherds with a blue overglaze were scattered across the site, and two were recovered in SU 3. Two representative sherds—a plate rim fragment and a cup rim fragment—were selected from the surface scatter (FS 192). The angulation of the cup rim suggests a vase form rather than a bowl form. No maker's mark or backstamp was present, and the pattern and maker are unidentified. Nevertheless, the general style suggests the late nineteenth to early twentieth century.

- **Other Ceramic Vessels**

Three sherds of transparent-glazed terra cotta (FS 190) were from a thin-walled vessel, possibly Mexican utilityware. Dark sand temper was clearly visible in the reddish paste. One sherd is a tapered rim fragment, and two are body fragments.

6.4.2.2.3 Metal

- **Metal Fasteners**

Two metal artifacts were found in close proximity (FS 182). FS 182-A is a railroad date nail with a raised "9" on the $^5/_8$-inch diameter head. The tip is missing, and the present shank length is $2^3/_{16}$ inches. Date nails were first used to date a tie for the purpose of evaluating the effects of different preservatives and conditions, but not all "date nails" show dates. According to Oakes (2006), although numbers may indicate dates (c.f. a "4" indicates 1904), but "many are code nails." The Southern Pacific used code nails 0 through 9 to number bridge pilings Oakes (2006). FS 182 may indicate 1909, but could also have been removed from a Southern Pacific Railroad bridge piling.

FS 182-B is the forged shank and partial head of a possible narrow gauge railroad spike. The Santa Fe Railroad joined the Southern Pacific line at Deming in 1881, but this combined system used standard gauge and the spike is not likely to have derived from it. No narrow-gauge operations are recorded in the vicinity of the site, and none were noted in a survey of mines in the Little Florida Mountains Mining District near Deming (Oakes and Zamora 2007). It is possible that narrow-gauge rails were used at the nearby zinc milling or mining operations, or this fastener may have been used for some other construction.

■ Metal Toys

FS 191, the cast iron figure of a wagon or other vehicle driver, is part of a toy (Figure 6.56). The figure is mold-cast in two symmetrical but otherwise identical halves, and portrays a man in a flat hat, arms reaching forward (as if holding reins) and legs forward as if braced. A horizontal hole at the hand position probably once held reins or another steering device. A molded peg held the figure to the vehicle seat. Cast-iron toys were common from the 1870s until World War II. Most early twentieth century cast iron toys were wagons, cars, trucks, trains, or motorcycles, and planes and dirigibles appeared in the 1920s (Antique-Antique 2010).

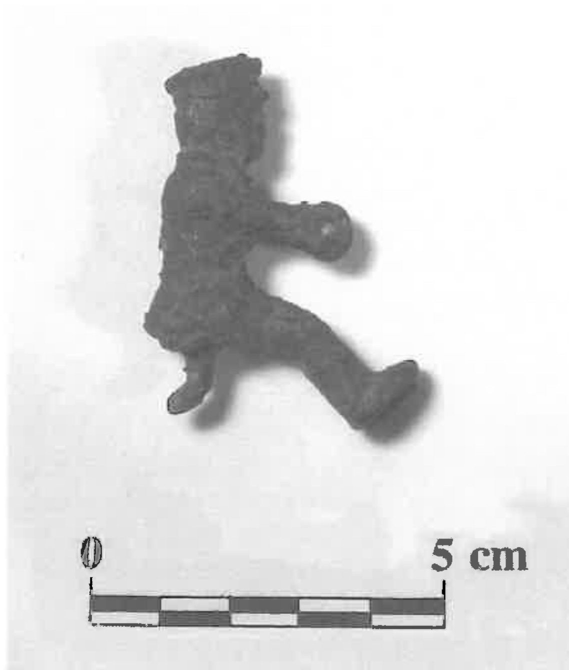

Figure 6.56 Cast-iron figure

6.4.3 Testing

Testing consisted of two 1-m^2, two 2 x 2-m scraped areas, two mechanically scraped areas, and six backhoe trenches. Each of these is discussed separately below (Figure 6.57).

6.4.4 Hand-excavated Test Units

Two 1-m^2 and two 2-by-2-m scraped areas were dug. SU 1, a 1-m^2 unit, was placed in a high artifact density area within Feature 2, the historic artifact concentration (Figures 6.57 and 6.58), and a second 1-m^2 unit, SU 2, was placed over the south edge of Feature 1, the prehistoric burned rock concentration (Figures 6.57 and 6.59). SU 3 and SU 4, each 2-by-2-m shovel-scraped units, were placed in areas where the density of prehistoric chipped stone artifacts was higher. All manually excavated sediments at LA 166769 were screened through ⅛ inch mesh. Munsell soil color readings were made on dry sediments.

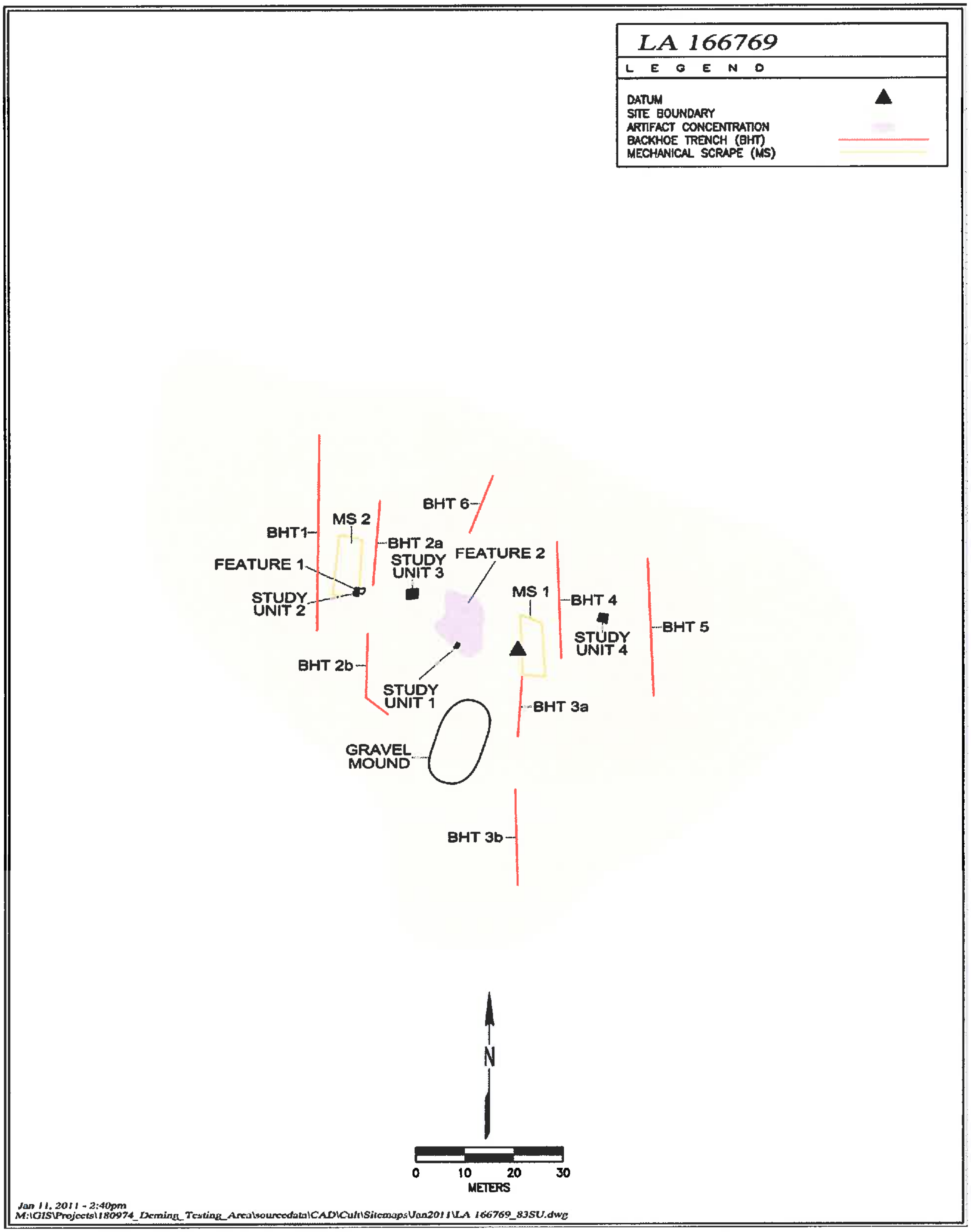

Figure 6.57 LA 166769, location of test units and trenches

Figure 6.58 LA 166769, SU 1, overview

Figure 6.59 LA 166769, SU 2, overview

6.4.4.1 SU 1

SU 1, a 1-m^2, was placed within Feature 2, the historic artifact concentration. The unit was excavated in 10-cm levels. Stratum I, the loose, sandy silt found across the site and its surroundings, contained as a minor component "green sand" blown from the surface of the remediated tailings dump north of the site. All cultural materials recovered from SU 1 were in Stratum I (10 YR 4/4, dark yellowish brown). Stratum I lay directly over Stratum II, a compact reddish-brown silty to sandy clay containing a few caliche filaments (dark yellowish brown 10 YR 4/6). A shallow depression in the north wall of SU 1 may represent a vehicle track. SU 1 was excavated to 20-cm below surface, into sterile deposits in Stratum II (Figure 6.60).

Figure 6.60 LA 166769, SU 1, excavated overview

A SCA bottle base on the SU 1 surface was collected before the study unit was excavated. The bottle base was marked

"No. 63
PAT.IN.U[S]
DEC.22.1903
JULY.17.1906
M 6"

The outside diameter of the base was 2⅝ inches, and the body was straight and thick-walled. Its general shape, size, color and the patent date suggest it is part of an early twentieth century beverage bottle.

Three lead balls, probably molded 50 cal. shot for a black powder rifle or musket, were recovered together in the bottom of Stratum I. One was flattened as if spent, but no rifling or other marks were discernible on its surface. The other two appear unfired (Figure 6.61). Black powder rifles were common in the late nineteenth century, and although old-fashioned, some were retained into the early twentieth century, and are still collected by aficionados. No other artifacts or cultural materials were identified within Stratum I, and none were recovered from Stratum II.

Figure 6.61 50 cal. lead shot

6.4.4.2 SU 2

SU 2, a 1-m^2, was placed across the south edge of Feature 1, the burned rock concentration, to determine the feature's depth and whether it retained in situ hearth contents. Three stones, one of which was fire-cracked, were on the surface of the northeast quadrant of SU 2. These were mapped and removed before excavation. The test unit was excavated in 10-cm levels and all sediments were screened through ⅛ inch mesh. Stratum I was the dark yellowish brown sandy silt (10 YR 4/4) found across the site, and Stratum II was the compact silty to sandy clay containing a few caliche filaments (dark yellowish brown 10 YR 4/6) (Figure 6.62). SU 2 was excavated to 20-cm below surface, into sterile deposits in Stratum II.

Figure 6.62 LA 166769 Feature 1, SU 2, overview

The three stones on the surface of SU 2 provided the only indications of a hearth at this locus. No additional fire-cracked or fire-reddened rocks were found, and Stratum I and Stratum II sediments were neither fire-reddened nor stained. No ash or charcoal was observed, and no basin or other structural indication of a feature was discerned. Only two artifacts—a fragment of undiagnostic glass and a white-glazed earthenware dinnerware sherd—were recovered, both from the upper 3-cm of Stratum I. Stratum II was culturally sterile.

6.4.4.3 SU 3

SU 3, a 2 x 2-m scraped area, was placed in the north central portion of the site. The unit was shovel-scraped to the top of Stratum II, the layer of compact to highly compact silty to sandy clay with caliche inclusions (Figure 6.63). Stratum I, the loose upper stratum of sandy silt found across the site, was sifted through ⅛-inch mesh screen. Twenty-four historic artifacts were recovered from Stratum I (Table 6.15).

Figure 6.63 LA 166769, SU 3, overview

Table 6.15 Historic artifacts recovered from Stratum I, SU 3, LA 166769

Material	Count	Object	Color/Treatment	Comment
Glass	1	Partial bottle finish, neck, and shoulder	Pale green	Retains lower edge of molded finish and upper edge of shoulder
Glass	2	Bottle body panel, square/rectangular	Pale green/aqua	Fragments of two bottles, based on thickness and color
Glass	2	Flat/pane	Colorless	Two panes, based on thickness
Glass	5	Bottle body and neck	Colorless	Undiagnostic, small fragments
Glass	1	Bottle finish, straight.	SCA	
Glass	1	Bottle body fragment, chamfered (beveled) corner from panel bottle	SCA	
Glass	1	Bottle body fragment, panel	SCA	
Glass	2	Unidentified	SCA	Small, undiagnostic
Ceramic, ironstone	4	Dinnerware. Based on rim profiles, at least two forms: saucer and soup bowl	Impressed scallop, white underglaze, blue overglaze	Examples also found in surface collection
Ceramic, ironstone	3	Dinnerware, saucer rim and plate/saucer base	White glazed	
Iron/steel	2	Wire nail, and wire or nail shank	Drawn	

The top of Stratum II, the reddish-brown silty clay, was 10–12 cm below the present ground surface. No soil stains or other cultural features were exposed on the surface of Stratum II, and no artifacts were discerned. The uppermost 10-cm of Stratum II was culturally sterile and it was not further excavated.

6.4.4.3.1 Artifacts from Stratum I, SU 2

A small fragment of a SCA bottle was unique among artifacts observed or recovered from Feature 2. It consisted of a straight finish and the barely discernable remains of the shoulder. The straight finish is consistent with Finish #15 as defined by IMACS (University of Utah 1992). Its inside diameter is 0.5 inch (1.27-cm), and the height of the neck from shoulder to rim is also 0.5 inch (1.27-cm). The rim is sheared and fire-polished, with no evidence of grinding. According to Lindsay (2010:2), with few exceptions, straight finishes are rarely if ever found on "soda, mineral water, or beer/ale bottles, canning jars, and bottles produced after the 1870s". Straight finishes are, however, commonly found on ink bottles manufactured into the 1880s (High Desert Historic Bottles 2010). Ink bottle finishes were frequently but not invariably cracked off rather than sheared before fire-polishing, resulting in an uneven edge. While the present specimen has a straight-edged, sheared and fire-polished finish, it is consistent with the short-necked, small bore straight finish found on late nineteenth century ink bottles.

The remainder of the assemblage recovered from SU 3 consisted of non-diagnostic glass, metal, and ceramic fragments. No prehistoric artifacts were found in the screened Stratum I sediments from SU 3, and no artifacts of any kind were observed in or on Stratum II.

The historic assemblage recovered from SU 3 is consistent with general household (or possibly, restaurant) refuse and provides a few chronological indicators. Sun-colored amethyst (SCA) glass results from the solarization of manganese used as a decolorizer in the production of glass, and primarily dates from ca. 1890 to ca. 1920 (Lockhart 2006a:52, 54). In general, green glass dates from ca. 1865 to the present; and most truly colorless glass (not decolorized with manganese dioxide) dates after 1920 (Duran and McKeown 1980:1040; Fike 1987:13; University of Utah 1992; Ward et al. 1977:240). White-glazed earthenware or ironstone tableware is still being manufactured, but the decorative style of the impressed, blue-overglazed dinnerware is typical of the late nineteenth to early twentieth century (Stelle 2001). Large-scale production of wire nails began in the 1880s. Wire products such as the nail and shank or wire fragment would have become readily available in the Deming area with the arrival of the railroad in 1881 (University of Utah 1992). Together, the assemblage recovered in Stratum I of SU 3 suggests the artifacts date to the late nineteenth century or early twentieth century and are of domestic origin.

6.4.4.4 SU 4

A second 2 x 2-m shovel scrape unit, SU 4, was placed in a high density prehistoric artifact scatter (Figure 6.57). SU 4 was excavated by cultural and natural layers. Stratum I sediments (dark yellowish brown sandy silt, 10 YR 4/4) were shoveled directly into the ⅛-inch mesh screen where they were sifted. Stratum I varied from 9–11 cm in depth across the 2 x 2-m unit, and lay directly above Stratum II. Because artifacts were found in Stratum I, Stratum II was excavated 10-cm beyond the bottom of Stratum I, with all Stratum II sediments being screened through ⅛-inch mesh. Stratum II was the compact to highly compact silty to sandy clay with caliche inclusions (dark yellowish brown 10 YR 4/6) (Figure 6.64). No artifacts, soil stains, or other indication of cultural remains were discerned in Stratum II.

Figure 6.64 LA 166769, SU 4, excavation

6.4.5 Backhoe Trenches 1–6, Mechanically Scraped (MS) Areas 1–2

Six backhoe trenches were dug across LA 166769 (Figure 6.57). Backhoe trenches were dug using an 18-inch bucket, and ranged from 51–61 cm (20–24 inches) wide. The trenches varied from 10–40 m long and had a total length of 166.5-m. In addition, Stratum I sediments were scraped to the top of Stratum II in two mechanically scraped areas (MS 1 and MS 2) (Figure 6.57). MS 1 was 4-m wide and 10-m long, and MS 2 was 4-m wide and 12-m long. In total, 183.9 m^2 were mechanically excavated at LA 166769.

No features were exposed in the backhoe trenches or scraped areas, and no artifacts were observed in any of the areas of mechanical excavations or spoils. Stratification revealed in the mechanical excavations was nearly identical across the site (Figure 6.65). The exposed top of Stratum II at MS 1 is shown in Figure 6.66, and stratification in Trench 3, where the hardpan was particularly marked, is shown in Figures 6.67 and 6.68 profile drawing. Table 6.16 summarizes the results of backhoe trench excavations. Depths below surface to the tops of the strata, and the characteristics of each stratum, were obtained at typical locations along each of Trenches 1 through 5. Trench 6 revealed a profile similar to the other five trenches and was not drawn or photographed. The locations and orientation of each mechanically-excavated unit were recorded using the Trimble GeoExplorer3 GPS unit.

Figure 6.65 LA 166769, Trench 2b, typical stratigraphy

Figure 6.66 LA 166769, sediments exposed in MS 1

Figure 6.67 LA 166769, Trench 3, stratigraphy

6.4.6 Evaluation

The potential for buried cultural deposits at LA 166769 was determined with two 1-m², two 2 x 2-m scraped areas, and 183.4 m² of mechanical excavations (Trenches 1–6 and Scraped Areas 1 and 2), for a total excavated area of 192.4 m², or about 2 percent of the total site area (Table 6.16).

Table 6.16 Excavations at LA 166769

SU	Unit	Length m	Width m	Area m²	Depth m	Cubic m³
1	Unit 1	1	1	1	0.2	0.2
2	Unit 2	1	1	1	0.2	0.2
3	Unit 3	2	2	4	0.2	0.8
4	Unit 4	2	2	4	0.2	0.8
5	Trench 1	40	0.5	20	0.9	18.0
6	Trench 2	30	0.6	18	0.9	16.2
7	Trench 3	30	0.6	18	0.9	16.2
8	Trench 4	25	0.6	15	0.9	13.5
9	Trench 5	27	0.6	16.2	0.9	14.6
10	Trench 6	12	0.6	7.2	0.9	6.5
11	Scraped 1	10	4	40	0.1	4.0
12	Scraped 2	12	4	48	0.1	4.8
Totals				**192.4**		**95.8**

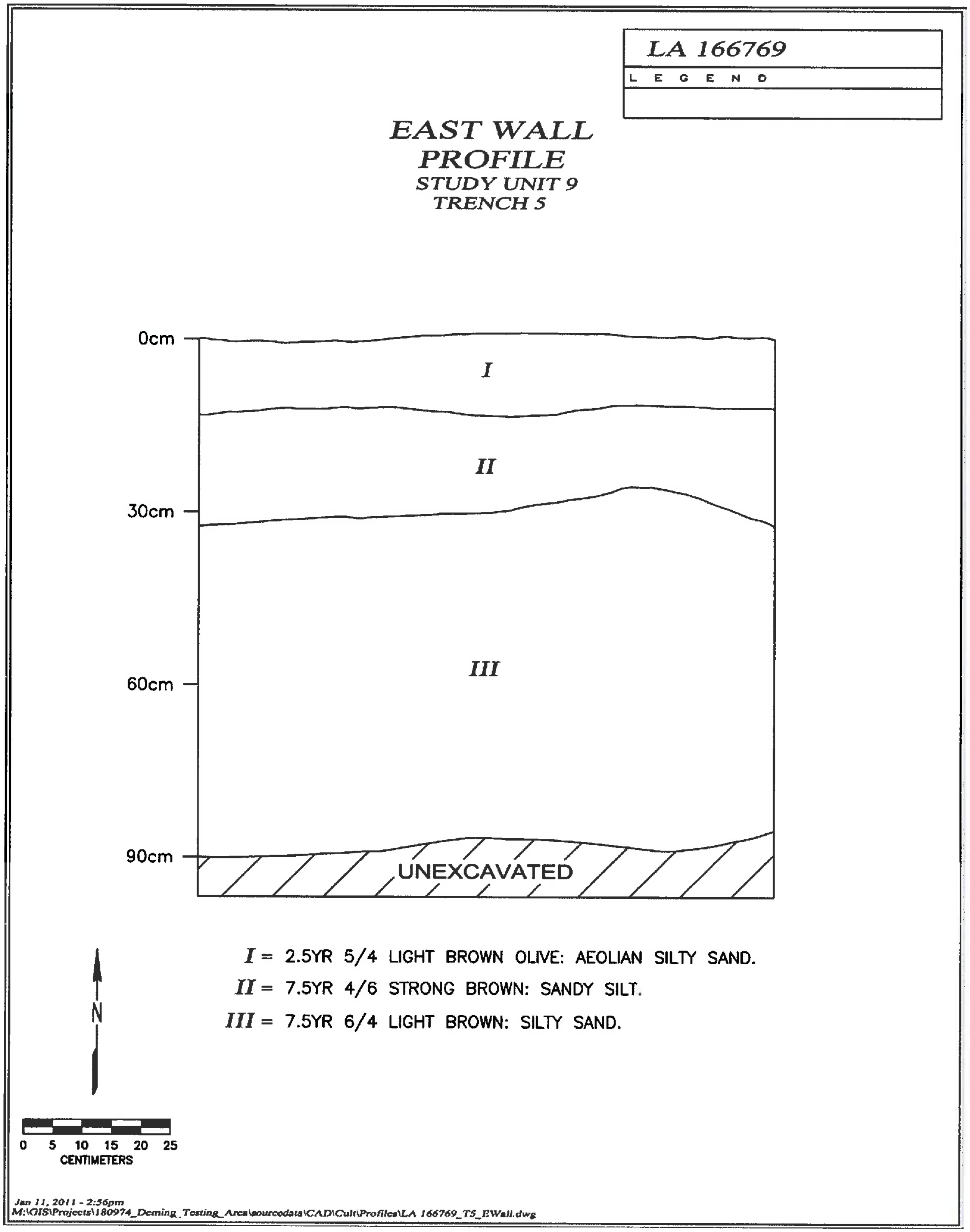

Figure 6.68 LA 166769, representative trench profile

The prehistoric component consists of a large chipped stone artifact scatter. Feature 1, a burned rock concentration, is probably associated with the prehistoric component. Testing of Feature 1 indicates the feature does not retain integrity and contains no additional cultural material beyond the fire-altered rock observed on the surface. The chipped stone assemblage was collected and analyzed.

The historic component consists of a diffuse cluster of thousands of historic glass, ceramic, and metal artifacts (Feature 2). The assemblage is consistent with domestic refuse representing items manufactured from the late nineteenth century through as late as 1920. The artifacts may represent a single or several discrete household trash disposal episodes over an extended period of time. Further, the dumping episode itself may greatly post-date the age of the materials dumped. The historic cultural material is surficial and is not likely to provide additional information concerning the early twentieth-century occupation of the Deming area.

Testing revealed no buried cultural deposits, indicating the artifact assemblage is entirely on and within Stratum I, the 2–4 cm windblown sand sheet that covers the site. When LA 166769 was first recorded in the summer of 2010, it was recommended eligible for nomination to the NRHP because features and artifact concentrations were identified and the assemblage consisted of diagnostic chipped stone items (Brown and Brown 2010). The present testing project collected and analyzed the entire surface artifact assemblage. Testing demonstrated the site is a surficial artifact scatter without subsurface features and with no potential for buried cultural deposits that might yield important information beyond what has already been collected. Therefore, LA 166769 is recommended not eligible for listing on the NRHP.

6.4.7 Project Impact

Based on the results of archaeological testing at LA 166769, the site is recommended not eligible for listing on the NRHP. In addition, the site contents are surficial, and the entire artifact assemblage has been collected for curation at the Museum of Indian Arts, Museum of New Mexico in Santa Fe. Pending concurrence, future development will have no effect on LA 166769.

7.0 Cultural Resource Management

The four sites—LA 166766, LA 166767, LA 166768, and LA 166769—are associated with Berino and Mohave soil or Mohave sandy clay loam, 0–3 percent slopes. Berino and Mohave soils occur on valley floors and fan piedmonts, are well drained and are not subject to flooding. Berino soil formed in alluvium derived from igneous and sedimentary rock. Permeability is moderately high-to-high and available water capacity is moderate. The typical Berino profile consists of loamy sand (0–5 in) underlain by sandy clay loam (5–40 in) which is underlain by loamy sand (40–60 in). Mohave soil has moderately high permeability and high water capacity. The typical Mohave profile consists of sandy loam (0–8 in) underlain by clay loam (8–60 in) (NRCS 2010:13–14). Mohave sandy clay loam occurs on alluvial fans and hill slopes. This well drained soil is formed in alluvium derived from limestone, sandstone, and shale and is not subject to flooding. Permeability is moderately high and available water capacity is high. The typical profile consists of sandy clay loam (0–8 in) underlain by clay loam (8–60 in) (NRCS 2010:23).

It is apparent from the extensive backhoe trenching at the four sites that these landforms have remained stable for the past several thousand years and there is a low probability of there being buried cultural remains within the upper three to four feet of deposits. Because this area is within the Mimbres River floodplain, it does not rule out the possibility of there being more deeply buried cultural remains, such as 10–20 feet deep, dating 10,000 or more years old. The present testing program was not designed to search for deeply buried cultural remains. The present testing program was designed to test for National Register eligibility of the four known sites visible on the ground surface. The results of extensive testing indicate the landform on which the sites are located has remained stable and all cultural remains are confined to the Stratum I aeolian soil horizon. Reoccupied sites are represented by collapsed stratigraphy, thus attempts to discern statistically meaningful intrasite activity areas from the piece-plotted surface assemblages are problematic and were not attempted during this project.

Table 7.1 summarizes the testing at the four sites. All artifacts were recovered from either the surface or from Stratum I, the 2–4 cm aeolian deposit occurring on the four sites. No artifacts were recovered from the underlying Stratum II or Stratum III deposits, and none of the testing exposed buried cultural features. The four sites are surficial and the remnants of former hearths, as expressed by clusters of fire-altered rocks and cobbles, have been deflated with no stained soils or other deposits containing charcoal or organic material suitable for obtaining radiocarbon dating or retrieving botanical or faunal remains.

Table 7.1 Site excavation summary

Site No.	Site Type	Site Date	Area Excavated m^2	Cubic m^3 Excavated	Site % Excavated
LA 166766	Prehistoric artifact scatter	6000–4300 B.C.	25	19.1	2.9
LA 166767	Prehistoric artifact scatter	9000–8000 B.C.; 1000 B.C.–A.D. 100	159	136.9	2
LA 166768	Prehistoric artifact scatter	2500–900 B.C.	106.2	89.1	1.7
LA 166769	Prehistoric and Historic artifact scatter	5500–3000 B.C.; ca. A.D. 1880–1920	192.4	95.8	2

TRC conducted data recovery at six sites with Archaic period occupations along NM 90 in Grant and Hidalgo counties in 1999 (Turnbow 2000). The six sites—Beargrass (LA 121158), Forest Home – North, Forest Home – South, Wood Canyon – East, Wood Canyon – West, and Peterson Canyon—yielded projectile points indicative of middle to late Archaic occupations. The Beargrass site yielded a Cienega and a San Pedro point, indicative of a late Archaic occupation. Peterson Canyon yielded a Cienega point.

Forest Home- North yielded Cienega (n=23), San Pedro-like (n=1) and San Pedro/Cienega (n=2) projectile points and Forest Home- South yielded Cienega (n=1) and San Pedro-like (n=1). Wood Canyon- East yielded Cienega (n=4), San Pedro (n=3), San Pedro-like (n=1), San Pedro/Cienega (n=1) and Wood Canyon West yielded Cienega (n=4), San Pedro (n=7), San Pedro-like (n=3), San Pedro/Cienega (n=1), and Chiricahua (n=1) points (Van Hoose 2000:367). Raw material types are dominated by chert, rhyolite, obsidian, with white chert/chalcedony, tan chert, quartzite, and igneous also present (Van Hoose 2000:370). The types of Archaic projectile points and associated raw materials are similar to those for the four tested sites in the present study. It would not be unexpected for an association between the present study sites in the lower Mimbres River valley with those farther northwest in the Mimbres River headwaters. One notable difference between the assemblages documented by Van House and the present is the occurrence of hammerstones. The four tested sites did not have any discernible hammerstones, which may have been overlooked as natural cobblestones.

7.1 Lithic Analyses

A total of 514 lithic artifacts were recovered from LA 166766, LA 166767, LA 166768 and LA 166759 (Table 7.2). Nearly all (95 percent) of the collected materials represent surface collections. Only 5 percent (26 artifacts) were recovered from excavation units. No artifacts were recovered from the mechanical excavation units. Fifty lithic artifacts, primarily flakes and flake tools, were collected from LA 166766 and 83 lithic artifacts were collected from LA 166767. In addition to debitage, several projectile points and projectile point fragments were found at LA 166767. A total of 153 lithic materials were collected from LA 166768. The assemblage from this site includes a relatively large number of core tools. One complete projectile point was collected from the surface. The assemblage from LA 166769 included 228 lithic artifacts as well as a sample of diagnostic historic materials collected from Feature 2 and the surrounding area. Although soil samples were collected from three sites—LA 166766, LA 166767, and LA 166768—they did not contain organic remains. No datable charcoal or ash was encountered during the excavation of the prehistoric features.

Table 7.2 Summary of site assemblages

Level	LA 166766	LA 166767	LA 166768	LA 166769	Total
Surface	49	74	149	216	**488**
Subsurface	1	9	4	12	**26**
Total	**50**	**83**	**153**	**228**	**514**

7.1.1 Debitage Attributes

Archaeological excavation conducted by the Office of Archaeological Studies (OAS), Museum of New Mexico, at Fallen Pine Shelter (LA 110339) along U.S. 70 on the Mescalero Apache Reservation near Ruidoso produced 85 radiocarbon samples yielding dates ranging from 1410 B.C.–A.D. 1640. Occupation appears to have been not quite continuous, but on a fairly regular basis throughout prehistory. Although a Late Archaic component was substantiated on the basis of projectile points and associated dates, the primary occupation of LA 10339 occurred between A.D. 1000 and 1200. Hearths, roasting pits, and a burial were found within the shelter, along with a series of eight occupational surfaces (Oakes 2004). The analytic approach to lithic artifacts was similar to procedures used by others in the same area and surrounding regions.

The lithic analysis anticipated differences in mobility patterns between the Archaic and Pueblo peoples who occupied the shelter (Alldritt and Oakes 2004). The Archaic assemblage was expected to reflect a curated reduction strategy, while the later Pueblo assemblage would presumably be based on an expedient flake technology. Specific expectations included finding a larger number of generalized bifaces in the

Archaic assemblage and more specialized bifaces in the Pueblo period (Moore 1996:109), along with a higher number of informal tools. In order to determine the type of lithic reduction strategy used by the Archaic and Pueblo occupations of the shelter, the analysis employed various means of identifying curated versus expedient reduction methods. Following Moore (1996:246–247) several indicators for examining the type of reduction strategy employed were examined including the following:

1. Percentage of noncortical debitage: a high percentage equates with curated technology, while low percentage represents an expedient strategy.
2. Percentage of manufacturing flakes (bifaces vs. core flakes): the higher the percentage of bifaces, the greater the focus on tool production.
3. Percentage of modified platforms: a large number of modified platforms indicates tool manufacture.
4. Flake to angular debris ratio: a high ratio represents tool manufacture; a low ratio indicates core reduction.
5. Flake breakage pattern: A higher number of broken flakes indicates tool manufacture; a lower number indicates core reduction.
6. Platform lipping. A high number of pressure flakes indicates tool manufacture.
7. Presence of opposing dorsal scars. A high percentage indicates biface manufacture.
8. Flake to core ratio. A high ratio indicates tool manufacture; a low ratio indicates expedient core reduction (however, cores could have been reduced elsewhere).

A higher number of broken flakes suggest an emphasis on tool manufacture. A low number of broken flakes indicate an emphasis on core reduction. Both the Archaic and Pueblo assemblages, however, included high percentages of broken flakes. A high ratio of flakes to angular debris in an assemblage represents tool manufacture, while a low ratio indicates core reduction. At Fallen Pine Shelter, angular debris was much less common than flakes. The ratio of flakes (557) to angular debris (58) for the Archaic materials was 9.6; the ratio of flakes (420) to angular debris (78) for the Pueblo assemblage was 5.3. The ratios for both occupations were considered high, indicating curated rather than expedient strategies were employed by both groups

An examination of raw material sources was expected to reveal information on the mobility patterns used during the two periods. Alldritt and Oakes (2004:66) conclude that the manufacture of tools, such as bifaces, requires removal of a large amount of flakes to produce the desired shape, increasing the amount of noncortical debitage. Flakes have less and less dorsal cortex as tool reduction proceeds. Many flakes with minimal or no dorsal cortex indicate late stages of tool manufacture.

The analysis indicated that core flakes outnumbered biface flakes in the Fallen Pine Shelter assemblage. (Alldritt and Oakes 2004:Table 20), indicating more of an emphasis on core reduction rather than tool manufacture. A high frequency of modified platforms on flakes indicates that tool manufacture was of high priority on a site. The type of prepared platform can inform on the reduction technology involved. Cortical platforms usually indicate an early phase of core reduction. Single-facet platforms are frequently associated with removal of core flakes. Multifaceted platforms infer previous removal along an edge and indicate that a great deal of earlier reduction has taken place (Moore 1996:251).

For both occupations, curated strategies outweighed expedient technology. Alldritt and Oakes (2004:69) suggest that formal tools (such as projectile points) may have been brought to the shelter in a completed or nearly completed stage, while many other tools were expediently produced for cutting or scraping activities. In part, this was due to a relative abundance of raw material in the vicinity of the site which would allow for this strategy. An examination of tools (other than projectile points) in the assemblage supported expedient manufacture of flakes for immediate use. The fact that both occupations employed the same strategies implies that the use of the shelter essentially the same for both groups. Although Archaic Period assemblages were characterized by a higher percentage of biface manufacturing flakes than Pueblo Period assemblages, materials classified as simple core reduction flakes were far more common accounting for 930 of 977 (95.2 percent) total flakes. Thus, while indices for both Archaic and Pueblo assemblages indicate a curated reduction strategy, a principal by-product of biface manufacture is relatively rare.

7.1.2 Flake Condition and Cortex Patterns

Of the 390 complete and broken flakes at the four tested sites, broken flakes outnumber complete flakes in all four assemblages (Table 7.3). LA 166769 has the highest broken flake to complete flake ratio followed by LA 166767 where most of the projectile points and fragments occur. Few bifaces including projectile points were found at LA 166769, suggesting the association between broken flakes and biface manufacture is not applicable in some cases or perhaps most completed bifacial tools were generally taken from the site and used elsewhere. LA 166767 and LA 166769 both have more noncortical flakes and flake fragments (Table 7.4) and thinning flakes (Table 7.5). Among cores, most are either unidirectional or multidirectional in terms of reduction. Unidirectional platforms have a single platform surface. Objects that could be classified as bifacial cores are not common. Two large distal biface fragments from LA 166767 may be portions of bifacial cores or simply large bifaces in an early stage of reduction. LA 166766 and LA 166768 have nearly similar high percentages of cortical flakes, 46 and 51 percent, respectively. Similarly, LA 166767 and LA 166769 have nearly similar low percentages of cortical flakes, 28 and 34 percent, respectively (Table 7.4). This is suggestive of more initial core and tool production at LA 166766 and LA 166768 and likely greater refined tool finishing and rejuvenation at LA 166767 and LA 166769.

Interestingly, LA 166767 has a large number of projectile points (n=9+) and has a correspondingly low frequency of flakes with cortex (28 percent). LA 166769 has a large quantity of core tools and also has a low frequency of flakes with cortex (34 percent). In contrast, LA 166768 has a large number of bifaces, core tools, and retouched flakes and a high frequency of flakes with cortex (51 percent) as does LA 166766 which has a single projectile point and a few core tools, retouched flakes and bifaces and a high frequency of flakes with cortex (46 percent) (Tables 7.4 and 7.5). Given the visual proximity of the four sites, the level terrain and nearly identical topography and soil conditions, the reason(s) for selecting them for occupation was most likely similar.

Table 7.3 Flake Condition

Site	Complete	Broken	Total
LA 166766	18	23	**41**
	0.44	0.56	**1.00**
LA 166767	21	40	**61**
	0.34	0.66	**1.00**
LA 166768	48	60	**108**
	0.44	0.56	**1.00**
LA 166769	48	132	**180**
	0.27	0.73	**1.00**
Total	**135**	**255**	**390**

Table 7.4 Flake Cortex

Site	Cortical	Noncortical	Total
LA 166766	19	22	41
	0.46	0.54	**1.00**

Site	Cortical	Noncortical	Total
LA 166767	17	44	**61**
	0.28	0.72	**1.00**
LA 166768	55	53	**108**
	0.51	0.49	**1.00**
LA 166769	61	120	**181**
	0.34	0.66	**1.00**
Total	**152**	**239**	**391**

Table 7.5 Artifact type by site

Site	Flake	Thinning Flake	Biface	Uniface	Flake Tool	Core Tool	Total
LA 166766	31	6	2	1	4	5	**49**
	0.62	0.12	0.04	0.02	0.08	0.10	
LA 166767	37	22	16	2	2	1	**80**
	0.45	0.27	0.19	0.02	0.02	0.01	
LA 166768	85	10	9	3	14	17	**138**
	0.56	0.07	0.06	0.02	0.09	0.11	
LA 166769	114	49	6	11	17	20	**217**
	0.50	0.21	0.03	0.05	0.07	0.09	
Total	**267**	**87**	**33**	**17**	**37**	**43**	**484**

7.1.2.1 Flake Thickness

Flake size values were grouped into five categories based on maximum dimension: (1) 0–2.5mm; (2) 2.5–5-mm; (3) 5–7.5-mm, (4) 7.5–10-mm, and (5) greater than 10-mm (Tables 7.6–7.9). Debitage of material types placed into the unclassified igneous material group were nearly absent from LA 166767 as are core tools of these same materials.

The distribution of flakes within size categories is similar for all materials at LA 166766. Around 70 percent of both the black basalt and chert/chalcedony flakes and flake fragments are less than 5-mm thick at LA 166767. At LA 166768 and LA 16679, both with larger assemblages than LA 166766 and LA 166767, basalt and chert/chalcedony flakes and flake fragments are generally thinner than debitage and are presumably associated with the production of core tools. Although chronological evidence of when these two sites were occupied is minimal, the similarities in assemblages suggest similar activities during a similar time period. The primary difference between LA 166768 and LA 166769 is the occurrence of a higher frequency of thinning flakes possibly associated with the production of unifaces as well as bifaces. LA 166766, LA 166768, and LA 166769 all have a similar proportion of core tools.

Table 7.6 Flake thickness by material, LA 166766

Material	Condition	Cortex	Flake Thickness (mm)					Total
			0–2.5	2.5–5	5–7.5	7.5–10	10.0+	
Basalt	Complete	No Cortex	1		1		1	3
		Cortical			2	1		3
Basalt	Fragment	No Cortex		6	1			7
		Cortical		1	2	2	1	6
Basalt		**Total**	**1**	**7**	**6**	**3**	**2**	**19**
		%	**0.05**	**0.37**	**0.32**	**0.16**	**0.11**	**1.00**
Chalcedony/Chert	Complete	No Cortex		2	2			4
		Cortical			2			2
Chalcedony/Chert	Fragment	No Cortex	1	2		2		5

Material	Condition	Cortex	Flake Thickness (mm)					Total
			0–2.5	2.5–5	5–7.5	7.5–10	10.0+	
		Cortical		1				1
Chalcedony/Chert		**Total**	**1**	**5**	**4**	**2**	**0**	**12**
		%	**0.08**	**0.42**	**0.33**	**0.17**	**0.00**	**1.00**
Igneous	Complete	No Cortex			1			1
		Cortical			2	1	2	5
Igneous	Fragment	No Cortex	1	1				2
		Cortical		1	1			2
Igneous		**Total**	**1**	**2**	**4**	**1**	**2**	**10**
		%	**0.10**	**0.20**	**0.40**	**0.10**	**0.20**	**1.00**

Table 7.7 Flake thickness by material, LA 166767

Material	Condition	Cortex	Flake Thickness (mm)					Total
			0-2.5	2.5-5	5.0-7.5	7.5-10	10.0+	
Basalt	Complete	No Cortex		3	1			4
		Cortical		1			1	2
Basalt	Fragment	No Cortex	1	2				3
		Cortical						0
Basalt		**Total**	**1**	**6**	**1**	**0**	**1**	**9**
		%	**0.11**	**0.67**	**0.11**	**0.00**	**0.11**	**1.00**
Chalcedony/Chert	Complete	No Cortex	2	4	2	1		9
		Cortical		2			3	5
Chalcedony/Chert	Fragment	No Cortex	6	16	3	1		26
		Cortical		1	1	4		6
Chalcedony/Chert		**Total**	**8**	**23**	**6**	**6**	**3**	**46**
		%	**0.17**	**0.50**	**0.13**	**0.13**	**0.07**	**1.00**

Table 7.8 Flake thickness by material, LA 166768

Material	Condition	Cortex	Flake Thickness (mm)					
			0-2.5	2.5-5	5.0-7.5	7.5-10	10.0+	Total
Basalt	Complete	No Cortex		1	2	1		4
		Cortical		1	1		2	4
Basalt	Fragment	No Cortex	3	2			2	7
		Cortical			1		2	3
Basalt		**Total**	**3**	**4**	**4**	**1**	**6**	**18**
		%	**0.17**	**0.22**	**0.22**	**0.06**	**0.33**	**1.00**
Chalcedony/Chert	Complete	No Cortex	3	3	1		1	8
		Cortical					1	1
Chalcedony/Chert	Fragment	No Cortex	1	4	2	2		9
		Cortical		1	1		4	6
Chalcedony/Chert		**Total**	**4**	**8**	**4**	**2**	**6**	**24**
		%	**0.17**	**0.33**	**0.17**	**0.08**	**0.25**	**1.00**
Igneous	Complete	No Cortex		4	4	1	1	10
		Cortical		3	1	2	12	18
Igneous	Fragment	No Cortex			2	1	2	5
		Cortical		2	4	2	13	21
Igneous		**Total**	**0**	**9**	**11**	**6**	**28**	**54**
		%	**0.00**	**0.17**	**0.20**	**0.11**	**0.52**	**1.00**

Table 7.9 **Flake thickness by material, LA 166769**

Material	Condition	Cortex	Flake Thickness (mm)					
			0-2.5	2.5-5	5.0-7.5	7.5-10	10.0+	Total
Basalt	Complete	No Cortex	1	2	1	1		5
		Cortical		1	2	3	2	8
Basalt	Fragment	No Cortex	5	10	2	3	3	23
		Cortical			3	1	5	9
Basalt		**Total**	**6**	**13**	**8**	**8**	**10**	**45**
		%	**0.13**	**0.29**	**0.18**	**0.18**	**0.22**	**1.00**
Chalcedony/Chert	Complete	No Cortex	1	14	5	1	1	22
		Cortical						0
Chalcedony/Chert	Fragment	No Cortex	10	23	14	2	2	51
		Cortical		4	4	4	3	15
Chalcedony/Chert		**Total**	**11**	**41**	**23**	**7**	**6**	**88**
		%	**0.13**	**0.47**	**0.26**	**0.08**	**0.07**	**1.00**
Igneous	Complete	No Cortex		1	2			3
		Cortical			1	1	7	9
Igneous	Fragment	No Cortex		3	2	2	1	8
		Cortical		3	4	4	6	17
Igneous		**Total**	**0**	**7**	**9**	**7**	**14**	**37**
		%	**0.00**	**0.19**	**0.24**	**0.19**	**0.38**	**1.00**

7.1.2.2 Platform Types

Striking platform type used by Sullivan and Rozen includes three types: (1) Cortical; (2) Plain; and (3) Faceted. Cortical platforms contain cortex on the actual point of impact of the striking platform. Plain (or single-faceted) platforms are characterized by a single flat striking platform with no cortex. Multifaceted platforms include more than one facet on the striking platform. Cortical platforms are assumed in general to be associated with core reduction, plain (single-facet) with hard-hammer percussion, and faceted with soft-hammer percussion or pressure flaking.

As noted above, evidence of platform preparation in the form of hinged and stepped fractures along platform margins was fairly common on whole flakes and proximal flake fragments in the lithic assemblages from the four sites. Platform angle and preparation are key components in identifying biface thinning flakes. Not all small and thin flakes are necessarily biface thinning flakes, but they are more likely to be associated with tool manufacture or at least a later stage of lithic reduction.

Cortical platforms are more common at LA 166768 followed by LA 166769 and LA 166766 (Table 7.10). The assemblages from all four sites contain at least one or a few cores and/or core tools. Core tools are predominantly of unclassified igneous materials. Flake platforms observed on whole flakes and proximal flake fragments in this group are primarily cortical or single-facet and are usually unprepared. Prepared single-facet and multifaceted platforms are more common with the chert/chalcedony and on debitage of black basalt. Prepared, collapsed, and multifaceted platforms combined account for nearly 50 percent of all platforms at all sites except LA 166768. In any case, prepared, collapsed, and multifaceted platforms were more likely to be found on chert and chalcedony flakes from all four of the sites. A division in the reduction patterns and use of the three different materials or material groups is suggested by data for both tools and debitage.

Table 7.10 Platform type comparison

Site	Material	CT	SF	CTp	SFp	MF	MFp	CO	Total
LA 166766	Basalt	2	5		2			1	10
	Chert/Chalcedony		1		4	3		1	9
	Igneous	3	2		1				6
	Total	**5**	**8**	**0**	**7**	**3**	**0**	**2**	**25**
	%	**0.20**	**0.32**	**0.00**	**0.28**	**0.12**	**0.00**	**0.08**	**1.00**
LA 166767	Basalt		3				1	3	7
	Chert/Chalcedony	3	12		3	4	3	3	28
	Total	**3**	**15**	**0**	**3**	**4**	**4**	**6**	**35**
	%	**0.09**	**0.43**	**0.00**	**0.09**	**0.11**	**0.11**	**0.17**	**1.00**
LA 166768	Basalt	2	6	1		1		2	12
	Chert/Chalcedony	5	7		3	1		2	18
	Igneous	21	15	4	3			2	45
	Total	**28**	**28**	**5**	**6**	**2**	**0**	**6**	**75**
	%	**0.37**	**0.37**	**0.07**	**0.08**	**0.03**	**0.00**	**0.08**	**1.00**
LA 166769	Basalt	8	9	1	3	2		3	26
	Chert/Chalcedony		14		8	10	8	8	48
	Igneous	9	6	2	2			1	20
	Total	**17**	**29**	**3**	**13**	**12**	**8**	**12**	**94**
	%	**0.18**	**0.31**	**0.03**	**0.14**	**0.13**	**0.09**	**0.13**	**1.00**

While not exhaustive, the above lithic analysis has attempted to provide some general patterns in the four assemblages recovered from the sites. The sites are similar in many respects, but also different in others. In the absence of suitable organic remains for acquiring absolute chronological indicators such as radiocarbon dates, the projectile points are indicative of late Paleoindian (Folsom), early Archaic, middle Archaic, and late Archaic occupations. It is believed that the sites best represent short-term camps used for the procurement of season resources along the northern shore of the Mimbres River environs. The soils upon which the four sites occur have been stable for the past several thousand years and there is no indication there has been any alluvial deposition that has buried cultural deposits beyond the surface 2–4 cm aeolian silty sands. The discernible fire-altered cobbles do not have associated organic soil stains suitable for obtaining absolute chronological markers such as radiocarbon dates nor macrobotanical and archaeofaunal remains.

In the event that bones or prehistoric or historic archaeological materials are uncovered during construction or earth-disturbing activities, work will cease immediately. The remains will be protected from further disturbance, and the appropriate land management agency will be notified. If bones are found, local law enforcement and the Office of the Medical Investigator (OMI) will immediately be notified pursuant to 18-6-11.2C (Cultural Properties Act NMSA 1978). In accordance with 18-6-11.2C and/or 36 CFR 800.13(b) (Protection of Historic Properties), the State Historic Preservation Officer (SHPO) or the State Archaeologist will be immediately notified at (505) 827-6320. In either case, the appropriate land management agency and the SHPO will determine the necessary steps to evaluate significance, document, protect or remove the material or remains, in compliance with the law.

7.2 Curation

TRC is preparing the artifacts for curation at the Museum of Indian Arts and Culture, Museum of New Mexico in Santa Fe as stipulated in the Testing Plan and in accordance with the New Mexico State statute 4.10.8.19 NMAC Curation of collections and records.

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