

# **MUSEUM OF NEW MEXICO**

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## **OFFICE OF ARCHAEOLOGICAL STUDIES**

### **CULTURAL RESOURCES INVENTORY OF PROPOSED URANIUM SOLUTION EXTRACTION AND MONITORING FACILITIES AT THE CHURCH ROCK SITE AND OF PROPOSED SURFACE IRRIGATION FACILITIES NORTH OF THE CROWNPOINT SITE, MCKINLEY COUNTY, NEW MEXICO**

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**ARCHAEOLOGY NOTES 214**

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## ADMINISTRATIVE SUMMARY

At the request of Hydro Resources, Inc., the Office of Archaeological Studies, Museum of New Mexico, conducted archaeological and traditional cultural property inventories of proposed facility locations for solution uranium mining near the communities of Church Rock and Crownpoint, New Mexico. The inventories are in advance of well-field development and construction of satellite processing facilities at the Church Rock Site (portions of Sections 8 and 17, T16N, R16W), and for the planning of irrigation facilities and drilling-mud disposal areas north of Crownpoint Unit 1 (Section 12, T17N, R13W). Surveyed portions of Section 8 included both private land (approximately 173 acres) and land controlled by the Bureau of Land Management (BLM) (approximately 335 acres). The BLM land falls under the jurisdiction of the Farmington District Office. Surveyed portions of Section 17 (approximately 200 acres) are Navajo Nation Tribal Trust land. Section 12 is private land (640 acres).

Fieldwork was conducted between October 21, 1996, and March 15, 1996. Archaeological survey activity on private land was supervised by Nancy J. Akins, C. Dean Wilson, or Eric Blinman; activity on Navajo Nation land was supervised by C. Dean Wilson; and inventory activities on Bureau of Land Management land were supervised by Nancy J. Akins or H. Wolcott Toll. All ethnohistoric investigations were conducted by Janet E. Spivey. Eric Blinman served as principal investigator and participated in some survey and site recording.

At the Church Rock Site, archaeological survey of private land defined 27 isolated occurrences of artifacts or features (IOs). Eight previously recorded sites were relocated, and four new sites were identified. One of the new sites extends onto adjacent BLM land within the Church Rock Site, and one new site extends onto adjacent Navajo Nation land (Section 9) that is not within the proposed project area. One previously recorded site that had been originally located within Section 8 was found to be within Section 9 instead. Archaeological survey of BLM land defined 57 IOs. Six previously recorded sites were relocated, and fourteen new sites were defined. A modern burial plot was also encountered. Archaeological survey of Navajo Nation land within Section 17 defined 5 IOs, and no archaeological sites were identified.

At Section 12, the proposed irrigation and drilling-mud disposal facility north of Crownpoint Unit 1, archaeological survey of private land defined 73 IOs. One previously defined site was relocated and recorded, five previously noted but not formally recorded sites were relocated and recorded, and four new sites were identified.

Ethnohistoric research and interviews were conducted to determine if there were any traditional uses of the areas of the two proposed mining facility sites. No traditional uses of the landscape at either site were known to any Navajo chapter officials, local residents, or traditional practitioners. However, there are three modern burials on BLM land in Section 8, and there may be as many as two burials in Section 12 (accounts are contradictory). The Section 8 burials are within a single fenced and well-marked plot, away from any planned mining activity. Both possible burial locations in Section 12 are within the boundary of an archaeological site and can be protected in that context.

The proposed well-field development on private land within Section 8 could potentially overlap with 12 archaeological sites. All are eligible for inclusion in the *National Register of Historic Places* based on potential contributions to the understanding of regional history or prehistory. Each

of these sites will be fenced to avoid impacts. If portions of any of the sites cannot be avoided by construction activities, mitigation plans will be developed and implemented for these cultural resources. All construction activity within the vicinity of site boundaries will be monitored by a qualified archaeologist due to the potential presence of subsurface cultural features.

No construction or well-field development is currently planned on BLM land within Section 8. Before future development plans for mining, monitoring wells, irrigation facilities, or restoration activity on this area of BLM land are implemented, potentially effected sites will be evaluated, and appropriate protective measures or mitigation plans will be developed and followed. The modern burial plot will be avoided.

The proposed well-field development on Navajo Nation land within Section 17 does not overlap with any cultural resources, and no protective measures or mitigation plans are recommended. However, monitoring of construction on some areas of Navajo Nation land by a qualified archaeologist will be required due to the proximity of cultural resources on adjacent lands.

Cultural resources within Section 12 are limited to discrete areas and topographic settings, with large areas of the section free of potentially eligible archaeological resources. Protective measures for the identified sites may be required depending on final plans for the delivery and distribution of irrigation water and for the spreading of drilling mud. Where appropriate, sites will be fenced to avoid impacts, and ground-disturbing activities in the vicinity of cultural resources will be monitored by a qualified archaeologist.

In addition to specific treatments of cultural resources, measures will be taken to prevent indirect impacts to cultural resources both within and adjacent to the development sites. All on-site construction and mining personnel will be given formal orientations concerning the preservation of cultural resources. These orientations will include a review of laws and regulations protecting cultural resources, as well as explanations of the scientific importance of seemingly inconsequential materials such as surface artifacts and ancient construction timbers.

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Nancy J. Akins directed the majority of the archaeological survey for the OAS, but she was forced to move on to other commitments prior to project completion. In addition to the members of the survey crews, support during report preparation was provided by OAS staff members Raul Troxler and Sonya Urban. Nancy H. Warren printed the photographs, Robert Turner drafted the figures, and Tom Ireland edited and assembled the manuscript.

## INTRODUCTION

Hydro Resources, Inc. (HRI), is planning to develop a uranium solution mining project located to the northeast of Gallup, New Mexico (Fig. 1). The overall project is described in the Final Environmental Impact Statement (U.S. Nuclear Regulatory Commission et al. 1997). As an initial phase of this project, the Office of Archaeological Studies of the Museum of New Mexico (OAS) has conducted archaeological and traditional cultural property inventories of two proposed development sites. These development sites were identified for cultural resource inventory at this stage of the mining project by the Nuclear Regulatory Commission (1996). The Church Rock Site is approximately seven miles north-northeast of Church Rock, New Mexico, and Section 12 is a proposed irrigation site approximately 2.5 miles north-northwest of Crownpoint, New Mexico. The Church Rock Site encompasses private land (owned by HRI), land controlled by the Department of the Interior, Bureau of Land Management (BLM), and Navajo Nation Tribal Trust land. The Section 12 irrigation site is privately and jointly owned by HRI and Mr. Bill Davidson. Review and consultation responsibilities are determined by land ownership status, and inventory results in this report are organized by mining project site and land ownership status for the convenience of reviewers. Required supporting and confidential documents are provided in appendixes for each review agency.

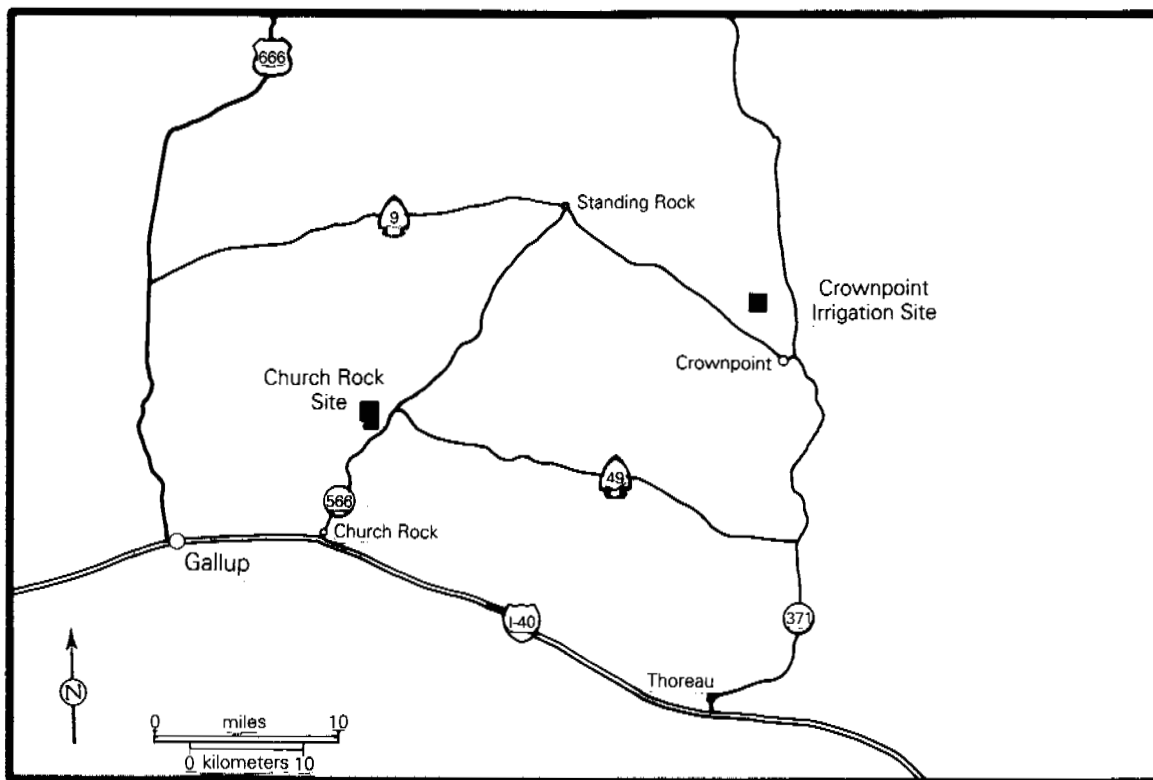


Figure 1. Locations of HRI project areas.

The uranium solution mining project will entail a range of land altering construction activities that differ by project site. The private land and Navajo Nation land portions of the Church Rock Site are the location of a proposed well field and satellite processing plant. There are no immediate plans for development on the BLM portion of the Church Rock Site, and cultural resource information is intended for use in planning future development. The Section 12 irrigation site may be used for the disposal of drilling mud and for irrigation with reclaimed water from the HRI processing facility at Crownpoint. Mud disposal methods, irrigation methods, and water delivery systems have not yet been designed, and cultural resource information is intended for use in facility planning.

The cultural resources inventory consisted of intensive pedestrian surveys (BLM Class III) and ethnohistoric research on traditional cultural properties. Records searches at the Navajo Nation Historic Preservation Department and the BLM Farmington District Office were carried out by Eric Blinman. Records searches of the New Mexico Cultural Resource Information System at the Laboratory of Anthropology were carried out by Steven A. Lakatos. Archaeological survey of private lands was supervised by Nancy J. Akins or C. Dean Wilson, depending on availability. Archaeological survey of BLM land was supervised by Nancy J. Akins or H. Wolcott Toll, depending on availability. Archaeological survey of Navajo Nation land was supervised by C. Dean Wilson. Field crews were drawn from the staff of the Office of Archaeological Studies. C. Dean Wilson provided continuity for all survey operations; other crew members included Phillip Aldritt, Eric Blinman, Steven A. Lakatos, Macy Mensel, Lloyd Moiola, Jim Quaranta, Marcy Snow, and Raul Troxler. Ethnohistoric research and interviews were carried out by Janet E. Spivey. Dr. Lorraine Heartfield served as the cultural resources liaison for HRI and participated as part of the field crew on some occasions. Dr. Glen Green provided field assistance and consulted on local geomorphology.

## PROPOSED PROJECT DEVELOPMENTS

The solution mining process is described in detail in the Final Environmental Impact Statement for the proposed development (U.S. Nuclear Regulatory Commission et al. 1997), and the process is only abstracted here as a background to the characterization of potential land altering activities. After a uranium ore body is located, closely spaced well arrays are drilled into the ore body. The arrays include injection and extraction wells. Water fortified with oxygen and sodium bicarbonate is injected into the ore body. This solution dissolves uranium salts in the ore body, and the solution then is pumped out of the extraction wells. The uranium-laden water is pumped from the extraction wells to local or satellite processing facilities, where the uranium salts are removed. This process is continued until the ore body is exhausted, at which time reclamation activity is pursued using the same well arrays. In addition to the production well arrays, monitoring wells are drilled at the margins of the production well field to evaluate water quality during mining operations.

Not all water can be recycled during the mining process, and some will need to be disposed after purification at the satellite or main processing facilities. One potential disposal method is surface irrigation, but other methods may be developed. In addition to water disposal, there will be a drilling-mud disposal need at the Crownpoint facility. Facilities that were constructed for previous mining operations by other corporations will be rehabilitated for use by HRI. Ponds that currently contain drilling mud will be cleaned out, and the old drilling mud will need to be disposed of on the landscape. Disposal entails dumping and spreading the mud on the land surface.

### *The Church Rock Site*

The Church Rock Site will be the location of a production well field and satellite processing facility. The processing facility will be developed entirely on the private land portion of Section 8. Well field development will take place on the private land portion of Section 8 with extensions onto leased areas of Navajo Nation land within a portion of Section 17. No immediate development is planned for the BLM portion of Section 8, and cultural resource information is intended for planning purposes in case future development is warranted.

#### *Section 8, Private Land*

The production well field will consist of closely spaced drill holes, drilling pads and drilling-mud containment facilities, access roads, and buried pipelines that connect the well arrays. Monitoring wells will be placed around the production well field at lower densities, with access roads, drilling pads, and mud containment facilities, but no pipelines. The satellite processing plant will consist of buildings, ponds, buried pipelines, and roads. Construction of all of these facilities entails ground disturbance. Directional drilling allows flexibility in well pad placement, and total avoidance of cultural resources is the preferred development plan; and monitoring wells and associated roads can be located with greater flexibility.

#### *Section 17, Navajo Nation Land*

The production well field will consist of closely spaced drill holes, drilling pads and drilling-mud containment facilities, access roads, and buried pipelines that connect the well arrays.



Monitoring wells will be placed around the production well field at lower densities, with access roads, drilling pads, and mud-containment facilities, but no pipelines. Construction of these well field facilities entails ground disturbance.

#### *Section 8, BLM Land*

No ground-disturbing activities are planned at this time.

#### *Section 12 Irrigation Site*

No specific facility plans have been developed for the private land of Section 12, but the categorical uses have been identified as irrigation and drilling-mud disposal. Irrigation would entail construction of buried pipelines, water-spreading devices, and access and maintenance roads. Drilling-mud disposal would entail access roads and a broad area for spreading the mud. Roads, pipelines, and spreading areas entail ground disturbance within delimited areas. Irrigation is intended to spread water at rates that do not generate runoff or erosion, and the risk of ground disturbance is small outside the immediate area of the spreading device.

#### *Additional Development Issues*

This inventory considers only those development sites specified as requiring cultural resource information at this stage of the mining project. Future developments related to plans for both the Church Rock Site and Section 12 may require ground-disturbing activities on other unsurveyed land parcels. Cultural resource inventories will be conducted for any of these other areas prior to development. Similarly, any specific plans for facilities on the BLM portion of Section 8 or specific plans for Section 12 will be developed using the cultural resources information in this report and will be subject to consultation prior to implementation.

## BACKGROUND OF THE CULTURAL RESOURCES INVENTORY

This background is intended only to provide a broad context for the inventory itself. More extensive information on both local and regional environmental and cultural contexts can be found in the sources cited in this section and elsewhere.

### *Environment*

#### *Church Rock Site*

The Church Rock Site is adjacent to the Puerco River, within 0.5 to 1.5 miles of its present course. Section 17 and a small portion of the private land of Section 8 are on the Puerco River floodplain, which is continuous with the easily eroded underlying Mancos Shale. The floodplain has been long abandoned by the current deeply entrenched river channel. Under today's climate, the Puerco River flows intermittently, fed by melting winter snows or by runoff from occasionally violent summer thundershowers. An unnamed and deeply entrenched tributary arroyo runs along the eastern side of Section 8, draining a moderate catchment to the north and emptying into the Puerco River. The remainder of Section 8 (including all of the BLM land) consists of steep canyon walls and benches, rising to a mesa top that separates the Puerco River valley from Hard Ground Canyon to the north. The elevation rise from the floodplain edge to the mesa top is 700 feet over a distance of as little as 0.5 mile.

The Church Rock Site is at the northwest corner of the Zuni Uplift, and the mesa top and canyon wall are formed of Cretaceous age Gallup sandstone, the Crevasse Canyon formation, Point Lookout sandstone, and the Menefee formation. Much of the sandstone is soft and highly fractured, eroding into irregular and somewhat unstable cliff faces. Hardness variation has contributed to the formation of a broad but dissected bench whose lip is at about 7,300 feet elevation. Cliffs leading up to the mesa top rise from the back of this bench. Access from the floodplain to the bench and ultimately to the mesa top can be gained by a series of trails. Although not difficult, the trails are steep and precarious in spots, and local residents have improved one to make it safer for the movement of livestock from the valley to the mesa top. There is no vehicle access between the floodplain and the mesa top within the study area, but the mesa top and the bench can be approached from the west and the north on dirt tracks that are remnants of roads cut for previous exploration wells.

Soils are thin outside of the floodplain, and they are rocky toward the floodplain margins. Puerco River floodplain soils are described as the Lohmiller-San Mateo association, and the rockier soils of the floodplain margins, canyon walls, and mesa tops are described as the Rockland-Travissilla association (Maker et al. 1974). When saturated during winter and spring thaws, the soils are extremely sticky, making foot or vehicle traffic difficult.

Long-term weather records are available for Fort Wingate (Gabin and Lesperance 1977), approximately eight miles south-southwest of the Church Rock Site. Trend surface maps (Tuan et al. 1973) suggest that the Church Rock Site is slightly warmer and slightly wetter than Fort Wingate. The regional climate is characterized as semiarid. Fort Wingate receives an average annual precipitation of 12.96 inches, of which 5.66 inches falls as monsoon thundershowers between July and September. Mean monthly temperatures range from a low of 30.8 degrees F in the winter to a high of 70.2 degrees F in the summer. The length of the frost-free growing season

is between 140 and 160 days (Tuan et al. 1973: Fig. 38).

Contemporary vegetation is influenced both by climate and land use. All areas of the Church Rock Site that are accessible to livestock have been heavily grazed and disturbed by trampling. In addition, previous Church Rock Mine facility construction and subsequent demolition have denuded large areas of Section 17. Although the Puerco River valley bottom is classified as juniper grassland habitat (Binford and Amsden 1992a: Fig. 5; Whitford 1978), the local vegetation is better characterized as scrubland. The landscape is dominated by sagebrush, rabbitbrush, and snakeweed, with a few grasses. At the transition from floodplain to canyon wall, the plant community changes to a piñon-juniper woodland. This community dominates most of the uplands in Section 8, with a few restricted areas of piñon-ponderosa pine woodland.

### *Section 12 Irrigation Site*

Section 12 is an area of relatively gentle relief. Exposures of bedrock form ridges and low tablelands with intervening broad alluvial flats and shallow valleys. Most of Section 12 drains to the west, but the flow ends, spreading and soaking into the ground before joining with the intermittent northward flow of Indian Creek (USGS Crownpoint 7.5 minute quadrangle). Maximum relief is from 6,680 feet along the western edge of the section to 6,840 feet at the ridge top in the southeast corner of the section. Bedrock escarpments rise 30-50 feet in two places, but elsewhere the ridges are less than 20 feet high. Topography poses no restrictions on access to any portion of the section.

The landscape is underlain by Cretaceous sedimentary rocks that include the Crevasse Canyon Formation and Point Lookout Sandstone. Many of the bedrock exposures have broken down into small fragments, but some exposures have supported stone quarrying for domestic building in the Crownpoint vicinity. Soils are thin on topographic rises, but sheet wash has created relatively thick well-drained soils in the drainages.

Long-term weather records are available for Crownpoint, three miles south-southeast of Section 12. The regional climate is characterized as semiarid. Crownpoint receives an average annual precipitation of 10.31 inches, of which more than half (5.30 inches) falls as monsoon thundershowers between July and September. Mean monthly temperatures range from a low of 29.6 degrees F in the winter to a high of 71.9 degrees F in the summer. The length of the frost-free growing season is between 140 and 160 days (Tuan et al. 1973: Fig. 38).

Contemporary vegetation has been affected by grazing, and some portions of the study area have been affected by development. The section is accurately characterized as snakeweed-grassland habitat, with weed cover that includes Russian thistle (tumbleweed). Some areas of the section have been subject to prior disposal of drilling mud, and vegetation is sparse in those areas.

A gated and locked gravel road provides access to Section 12 from Highway N 9. The road served Mobil Oil facilities within the section, some of which have since been dismantled, and the road currently serves the residence of Mr. Davidson, co-owner of the section. Other roads within the section served secondary Mobil Oil facilities (such as dumping areas for drilling mud), but these have not been maintained in recent years.

## *Prehistory*

Human occupation in New Mexico may extend back into the late Pleistocene (Chrisman et al. 1996), but the majority of archaeological evidence falls within the past 12,000 years. A detailed culture history presentation is beyond the scope of this report, and only an outline will be presented here. This outline has been assembled from summaries presented by Binford and Amsden (1992b), Cordell (1982), Judge (1989), Leblanc (1989), and Wilson et al. (1996). In addition, a large site cluster about three miles west of the Church Rock Site was excavated as part of the Transwestern Pipeline Expansion Project (Sullivan 1994). These excavations have provided cultural historical and geomorphic comparative information for interpreting sites in the Church Rock Site area.

The Paleoindian period (ca. 12,000-7500 B.P.) marks the first extensive occupation of west central New Mexico. Populations were thinly distributed, exploiting large territories in the changing postglacial environment. Hunting is the most visible activity because of the association of many Paleoindian sites with extinct megafauna, but resource exploitation should have been broad in scope. Site recognition is dependent on the discovery of distinctive spear point types (such as Clovis and Folsom), and even these are not clear indicators of Paleoindian sites. Scavenging and recycling of Paleoindian artifacts by later Archaic and Anasazi populations have resulted in the misattribution of some Paleoindian components. Similarly, however, a large proportion of Paleoindian sites and components are unrecognizable as such because diagnostic artifacts have been removed or were never left behind. Geomorphic processes over the millennia have also affected the distribution and recognition of Paleoindian sites. Many sites have been eliminated or covered on active landscapes such as the area around the Church Rock Site, while there is a higher probability of preservation and detection on landscapes such as the area of Section 12. No Paleoindian sites or components have been documented in the immediate vicinities of either area.

The Archaic period spans the end of the Paleoindian period through the adoption of pottery (ca. 7500 B.P. to A.D. 200-400). Relative environmental stability followed the postglacial warming, with the disappearance of the last of the Pleistocene megafauna and the development of modern semiarid vegetation distributions. Although stable in global terms, the Archaic period experienced cycles of changing aridity, alluviation, and the expansion and contraction of vegetation zones. Hunting is the most visible component of the Archaic lifeway, but it was clearly a broad spectrum gathering and hunting economy. Mobility was relatively great, with the exploitation of targeted resources over wide areas during the course of a year. Maize was introduced at ca. 3500-4000 B.P., supplementing wild resources and accelerating the cycle of increasing population density and increasing economic intensification. The Archaic period is subdivided into phases based on stylistic change in dart points, although some portions of the stylistic sequence appear to overlap significantly rather than being sequential (Hogan 1996).

Compared with Paleoindian sites, Archaic sites are abundant in west central New Mexico, but they suffer some of the same limitations in visibility and interpretability. Aceramic sites without stylistically diagnostic dart points are difficult to assign to a period with confidence. Also, although there have been fewer landscape changes through and subsequent to the Archaic period, a proportion of Archaic sites have suffered the same geomorphic destruction and burial as Paleoindian sites. No Archaic sites have been previously recorded within the vicinities of the Church Rock Site and Section 12, but there are archaeological sites of unknown age and cultural affiliation in the vicinities of both locations that could be Archaic sites. Archaic sites are more likely to have been eliminated, buried, or obscured by later components in the Church Rock area than in the Section 12 area.

Increasing sedentism and increasing population density mark the transition from the aceramic Archaic period to the ceramic period. Over the course of several centuries beginning about A.D. 200, pottery was incorporated into the agricultural complex. Between A.D. 400 and 600, pottery technology was modified to make use of the abundant shale clays of the Colorado Plateau, resulting in the Anasazi pottery tradition. Anasazi sites indicate greater sedentism, more investment in facilities, and the concentration of settlements in agricultural settings. Coupled with shallower time depth and relative geomorphic stability, Anasazi sites are highly visible and have been preserved on the landscape in higher proportions than sites dating to the earlier periods. Most Anasazi residential sites can be dated with precision based on patterns of stylistic change in ceramics, including the potential to distinguish individual components within sites that have complex occupation histories.

Previously documented Anasazi sites are present within both the Church Rock and Section 12 project areas. Components range from the early portion of the Anasazi sequence (Basketmaker III) through the end of the Anasazi sequence (Pueblo III). Site density is higher in the immediate vicinity of the Church Rock Site, but there are large and important Chacoan Anasazi communities defined in the areas around the Section 12 Site (Marshall 1992). The presence of sites dating throughout the Anasazi sequence suggests that this period is relatively free from the obscuring effects of regional geomorphic processes. However, local geomorphic processes clearly have obscured or eliminated some sites, as evidenced by discoveries of buried site features during the OAS survey of the Church Rock Site.

The end of the Pueblo III period marks a transition from Anasazi to Puebloan settlement and provides the setting for the start of the historic period. Global patterns of climate change modified the rainfall regime on the Colorado Plateau (Ahlstrom et al. 1995; McVickar and Brown 1996; Petersen 1995). This modification began in the thirteenth century and persisted until about A.D. 1500, correlating with the cessation of Anasazi farming to the north of the Puerco and San Jose river valleys in west central New Mexico. Anasazi populations migrated to the south of these valleys, reorganizing into communities that are ancestral to the modern Pueblo Indian communities. The Church Rock Site was close enough to these Puebloan resource areas that landscape use probably continued for other purposes than agriculture and residence. The vicinity of the Section 12 Site probably received less use by Anasazi descendants.

Hunting and gathering peoples presumably exploited these areas from the north after farmers had withdrawn. By A.D. 1500, these peoples included Athapaskan ancestors of the Navajos. The strongest early record of Navajo prehistory is in the Dinétah area of northwestern New Mexico (Towner and Dean 1996). Perhaps as early as the late seventeenth century, Navajo people had moved west of the Chuska Mountains (about 35 miles north-northwest of the Church Rock Site), and by the mid-eighteenth century, there were large Navajo settlements and communities (Gilpin 1996). This period of transition between the prehistoric and protohistoric period is poorly known in west central New Mexico, and most early Navajo sites are attributed to the Gobernador phase of the early or mid-eighteenth century (Marshall 1988, 1992). Clear dating criteria are lacking, but Navajo sites that may date to this period have been defined by previous archaeological survey in the vicinity of the Church Rock Site (Marshall 1993).

## History

Janet E. Spivey

The historic period in the Church Rock and Crownpoint project areas spans more than 400 years of interaction among Native Americans, Spanish, and Anglo-American cultures. A detailed summary of historical events is beyond the scope of this report. Some of the many sources that relate the events and patterns of the historic period are Gumerman and Olson (1968), Weaver (1978), Nelson and Cordell (1982), Scheick (1983), Kauffman (1985), Bailey and Bailey (1982, 1986), Reed and Horn (1990), K. Kelley (1982, 1984), L. Kelley (1968), Giese (1991), McNitt (1972), Van Valkenburgh (1974), Reeve (1960), Kluckhohn and Leighton (1962), and Brugge (1983).

The Navajos speak the Athapaskan language, as do other Apachean tribes of the Southwest. While scholars agree that the Navajo and Apaches originally lived in western Canada, there is no consensus on when they arrived in the Southwest. However, it is generally agreed that these groups migrated into the present southwestern United States sometime before the arrival of the Spaniards in New Mexico in 1540 A.D. Brugge (1984) suggests that by A.D. 1400 the former Anasazi territory probably contained a widespread Athapaskan population, which had entered the Southwest from the mountains and foothills of Colorado. Schaafsma believes the Athapaskans did not arrive in the Southwest until the late A.D. 1500s or 1600s. He suggests they entered the western High Plains about 1525 A.D. and then migrated into the Southwest. He argues the Navajos did not enter the San Juan Basin until after the Pueblo Revolt in 1680 (Amsden 1992:50).

As far as is known, the word *Navajo* did not appear in written Spanish documents until 1626, when Fray Jerónimo de Zárate Salmerón noted the presence of the "Apache Indians of Nabaju," who were occupying the Chama Valley and a portion of the San Juan Basin in northwestern New Mexico. Today the Navajo speak of this region as their original homeland, or Dinétah (Bailey and Bailey 1986:12).

In 1636, when Friar Benavides wrote a description of the early Navajos, he described them as agriculturalists and somewhat sedentary. Spanish documents from the early to mid-1700s stated that the Navajos were living in small communities on tops of mesas near their fields. Sheep and goats, acquired through raiding and trading, were already being utilized for food and wool (Kluckhohn and Leighton 1962:34-35).

The Navajos raided the Pueblos and Spanish settlements and were thus the target of retaliatory raids. As early as 1608, it is known that the Navajos were raiding the Spaniards for livestock. Spanish documents from the 1700s were mostly concerned with the Navajos in regard to warfare and trade; little is known about social organization or other parts of their lives (Bailey and Bailey 1986:13).

Spanish missions were set up in Navajo areas but for the most part were abandoned, with the result that the Navajos were able to avoid Spanish control and influence. Because the Navajos were less directly affected by the Spanish religion or government than the Pueblo Indians, they did not feel as compelled to drive the Spaniards out of the Southwest. Therefore, as far as is known, the Navajos did not play a major role in the Pueblo Revolt of 1680 or the Spanish Reconquest of 1692. During these events, some of the Pueblo refugees left the Rio Grande area and joined the Navajo groups. These Pueblo refugees brought with them knowledge of weaving, pottery-making, religion,

agriculture, and livestock. Some of this knowledge was adopted by the Navajos (Bailey and Bailey 1986:14-16; Brugge 1983:493; Kluckhohn and Leighton 1962:37).

In the early 1700s the Spaniards responded to Navajo raids by sending military expeditions into their territory. However, peaceful relationships existed between them from around 1720-1770, because both groups had to defend themselves against Ute and Comanche raids (Brugge 1968:31, 144). Schroeder (1965:59) and Reeve (1960:202-204) suggested that these raids pushed the Navajos south into the Cebolleta Mountains and west into the Chuskas. As the Spanish settlers moved into the Cebolleta Mountains, the adjacent Rio Puerco Valley, and the land to the west, they came into more direct contact with the Navajos. Between 1753 and 1772 a number of Spanish settlers received land grants in the Rio Puerco Valley and land west of it. This new settlement brought renewed conflict between Spaniards and Navajos (Reeve 1960).

Navajo raiding increased with the change of governments from Spain to Mexico in 1821. During the Mexican period (1821-1846), the villages of San Mateo and Cubero, established in 1833, formed the western edge of Euroamerican occupation. Raiding also occurred when the United States first occupied New Mexico in 1846. The United States Army soon became involved in military campaigns against the Navajos. The need to establish military posts was soon recognized, and Cebolleta was garrisoned by Colonel Charles Ruff in 1846 (McNitt 1972:97).

Fort Defiance was established in 1851, and the troops from Cebolleta were moved there. In 1860 Fort Fauntleroy was established and located at Bear Springs, about 35 miles southeast of Fort Defiance. In April 1861, Fort Defiance was abandoned, and the stores were removed to Fort Fauntleroy, which was renamed Fort Lyon in September 1861. It was not until July 1863 that Fort Defiance was reoccupied and renamed Fort Canby (McNitt 1972:417-24).

By the mid 1800s, greater dependence upon sheep and goats created a demand for larger herds, and as a result, Navajo raiding of Spanish-American herds increased. In 1862, with the U.S. Army involved in the Civil War, the Navajos began extensive raiding of the Rio Grande region. The first Fort Wingate was established in September 1862, sixty miles east of Gallup at Ojo del Gallo and five miles south of Grants at the present site of San Rafael. It was named after Captain Benjamin Wingate, of the 5th Infantry, who died from wounds received in the Battle of Val Verde, near Socorro. Eventually the Anglo settlers grew tired of the raids, resulting in the Navajo War of 1863-64.

In 1863, Colonel Kit Carson was ordered into Navajo country to destroy all the Navajo crops, fruit trees, livestock, and living areas. During this time the Navajos were rounded up and incarcerated at Bosque Redondo on the Pecos River. Fort Wingate played an important role as a deportation center for the Navajos during the Long Walk to Bosque Redondo in 1864. Many Navajos died en route to Bosque Redondo or during confinement. After four years, it became apparent to United States officials that the Navajos were never going to become self-sufficient farmers, and the government would have to continue to issue rations if they were to survive. At an annual cost of one million dollars, the government could not afford to continue this practice. In 1868, the U.S. government signed a treaty with Navajo leaders establishing a reservation in northwest New Mexico and northeast Arizona. Since Fort Wingate was too far away from the newly proposed reservation, it was officially abandoned on July 22, 1868, and reactivated at the Fort Lyon post. The Fort Lyon post was then renamed Fort Wingate. The purpose of the new Fort Wingate was to attempt to maintain control over the Navajos returning to the reservation and to control Navajo raiding parties. The Navajos were allowed to return to the new reservation and

were given 30,000 sheep and 4,000 goats, along with corn and other seeds, agricultural implements, and tools (Mangum 1990:52; Bailey and Bailey 1986:25; Underhill 1953:176-181).

For the first ten years after their return (1868-1878), the Navajos had to depend on government rations of corn, flour, and beef. The Navajo police, introduced in 1872, helped reduce raiding and conflicts. At first the families refrained from eating their sheep and goats to give the herds a chance to grow. The Navajo herds began to thrive and were well established by the 1880s. The Treaty of 1868 also allocated money for seed and farm implements to encourage farming. Corn became the most important crop. Navajo farmers irrigated their fields with floodwater and planted according to the depth of the snowpack in the mountains. A deep snowpack encouraged them to plant extensively, expecting a heavy spring runoff to irrigate their fields (Bailey and Bailey 1986:45-47).

The building of the railroad across New Mexico and Arizona in the 1880s brought disruption to the Navajo way of life. In 1876 Congress had given the Atlantic and Pacific Railroad Company, later the Santa Fe, a land grant through the heart of the Navajo country to finance the construction of a transcontinental railroad. The Navajos were forced to surrender much of their best lands to the advancing railroad. Land areas added to the reservation as a compensatory measure were not as desirable. One of the major problems was the granting to the Santa Fe railroad of all odd-numbered sections on each side of the right-of-way to a depth of 50 miles. Both the surface and subsurface rights were given to the railroad. Thus a checkerboard strip was created in this area, which had the heaviest concentration of Navajo population. Since no one was living on large portions of this land, Navajos had moved onto land that was not theirs. Complications arose over the years as Anglo ranchers from New Mexico and Colorado decided they wanted parts of the legal Navajo reservation and applied political pressure to have portions of the Navajo land returned to the public domain. Between 1900 and 1930, many legal battles were fought between Navajos who were living on the public domain and had filed patents to obtain legal ownership and Anglo ranchers who wanted to acquire it (Kluckhohn and Leighton 1962:42-44; Bailey and Bailey 1986:112-117). In the eastern off-reservation area, which today comprises much of the Eastern Navajo Agency, the government tried to resolve the conflicts by means of withdrawals, allotments, land trades, executive orders, and legislation, all with the purpose of giving more of the checkerboard over to the Navajos (Doleman 1979:12-13).

The Trading Post period (1881-1933) was characterized in the eastern reservation area by a considerable increase in population and livestock (Bailey and Bailey 1978:23-32). Due to arid conditions, farming contributed little to the Navajo subsistence. However, wage work (lumber, coal, railroad) contributed a great deal. Wagons, together with the increasing number of Anglo trading posts, provided the Navajos access to manufactured goods from the east and a market for products (meat, wool, rugs) of their pastoral economy (Bailey and Bailey 1978:31-32).

The Panic of 1893 severely affected the wool and livestock markets. Drought also devastated the Southwest, causing erosion around water supplies. Many of the Anglo ranches went bankrupt, and the Navajos had to butcher more of their herds to survive. It became so bad for the Navajos that the government had to resume issuing rations. Many of the trading posts went out of business. After 1900, when the New Mexico livestock industry began to recover, the Navajos no longer had to butcher their livestock. By 1915, there were 1,850,000 head of sheep and goats in Navajo country. During World War I, the price of wool was 50 cents a pound, and the price of sheep rose to \$10.00 a head. Many Navajos sold large numbers of their flocks and benefited greatly. Some even became wealthy. The sale of Navajo rugs also increased and helped the development of the classic trading post economy (Bailey and Bailey 1982:571-572).



The period 1913-1923 was one of relative prosperity for the eastern Navajos. However, conflicts over land use between Navajos, Anglos, and Hispanics increased in intensity. By 1923, a large block of townships east of the reservation boundary, north and south of Crownpoint, was leased, owned, or claimed by Anglo ranchers. Although much of this land was under Navajo grazing rights, access was often difficult because of fencing and intimidation (Brugge 1977:404-406).

Pressure was put on the Navajo Tribe in the 1920s to open the reservation to oil and gas exploration, leasing, and well drilling, and a lease was approved in August of 1921. A tribal council was created in 1923, and the first council granted the commissioner of the Navajo Tribe authority to sign oil, gas, and mining leases for the Navajo Indians on the treaty portion of the reservation. The Hogback and Rattlesnake oil fields were opened, and this meant jobs for some of the Navajos on the Northern Chaco Plateau (Kelley 1968:69; Bailey and Bailey 1986:120-121).

Some political and self-government control was asserted during the 1920s as the Navajo Tribal Council and chapters were formed. The chapters were introduced in 1926 and grew to over 100 in number during the 1930s (Winter 1993:62).

Navajos, Hispanics, and Anglos suffered financially from the stock market crash of 1929 and the collapse of the world economy. By 1933, the effects of extensive overgrazing resulting from the pastoral economy were recognized. One of the most serious effects was severe erosion. The U.S. government introduced the stock reduction program, but most Navajos never accepted the need for livestock reduction. They felt the reduction of their livestock caused the rain clouds to diminish. This kept the grass from growing, and the final result was erosion (Bailey and Bailey 1986:185-186). In October 1933, the U.S. government began a 50 percent Navajo livestock reduction program, aimed at stopping the severe erosion (Winter 1993:67).

The Taylor Grazing Act was passed by Congress in 1934 and led to the creation of federally regulated grazing districts. John Collier was in charge of the program, and it provided a number of incentives such as more reservation land, day schools, and irrigation projects, including the Navajo Irrigation Project along the San Juan River (beginning in 1938). In May 1936, 19 land management districts were created on the reservation and the "checkerboard" area. The basis of the Navajo economy was severely undermined as government agents bought and destroyed thousands of animals. The declining national economy had brought about significant drops in prices and demand for wool, pelts, meat, and rugs as early as 1928 (Brugge 1977:444). New Deal construction projects brought jobs to many Navajos, but during the late 1930s, government programs lost some of their appropriations, leading to more unemployment (Winter 1993:69). Doleman (1976:38) reports that the Navajo occupation of the Noserock area near Crownpoint had ended by at least 1940.

It was not until World War II that Navajo economics improved. The passage of the Lend-Lease Act in 1941 created the need to expand the U.S. Army ordnance depots in order to supply the United States allies during World War II. The Wingate General Ordnance Depot, near Gallup, underwent an extensive construction program. With the 1941 entry of the United States into World War II, Wingate became very active. Incoming and outgoing shipments grew from five cars a day in 1941 to sixty or more a day in 1943. Increased activity at the depot meant a greater need in the work force. At the peak of World War II, Wingate employed almost 1500 civilians and 13 officers. Approximately 90 percent of the civilian employees were Navajos (Higgins n.d.:45).

About 3,600 Navajos served in the military during World War II. The Navajo "Code Talkers" contributed greatly to the winning of the war in the Pacific theater. Although the period 1933-50 ended with a postwar economic decline, it set the stage for a mixed cash and pastoral economy that continues to this day (Doleman 1979:14).

Wage income opportunities increased considerably in the 1950s with the development of oil and gas fields, especially in the northeastern part of the reservation. Tribal wealth increased from mineral royalties. The 1980s and 1990s have seen an increase in the exploitation of coal and uranium resources. These activities have helped improve the Navajo economy and brought the Navajos into closer contact with the Anglo culture and cash economy. Although isolated houses and sheepherding activities continue today in the eastern reservation area, changes in the Navajo economy and culture are occurring at a rapid rate (Doleman 1979:14).

### *Regional Perspectives on Traditional Navajo Land Use*

Janet E. Spivey

Information concerning traditional uses of the region and project areas has been collected from traditional practitioners, Navajo chapter officials, and local knowledgeable elderly residents. The chapters (Church Rock, Crownpoint, Pinedale, Mariano Lake, Smith Lake, Little Water, Becenti, and Dalton Pass) represented in this report have boundaries within or adjacent to the Church Rock or Section 12 project areas. The following is a brief history and information about areas that are commonly used by traditional practitioners or chapter residents but not within the project areas.

Four sacred areas that are in current use are mentioned by all the traditional practitioners interviewed for this project: Hosta Butte, Little Hosta Butte, Mount Powell, and White Spot Rock, or Mesa Butte. Of these, Hosta Butte is perhaps the most sacred site to the Navajo people and is often visited as an offering place. Hosta Butte, the most prominent and elevated landform in the Lobo Plateau, lies five miles northwest of the Smith Lake Chapter and six miles south of the Crownpoint area. Hosta Butte rises to an elevation of almost 8,600 feet. There is evidence that Hosta Butte was an important shrine during the Chacoan Anasazi occupation of the region. The pinnacle is the destination of the Chaco South Road, which extends 34 miles, linking the great houses of Chaco Canyon with Kin Ya'a and Hosta Butte (Marshall 1992:21).

The Navajo people refer to Hosta Butte as AK' i dah nast' ani (The Mountain that Sits on Top of Another Mountain). The name *Hosta Butte* dates back to 1877, when it was given to the mountain by W. J. Jackson in honor of a Jemez Indian who guided Col. John Washington's expedition in 1849 (Marshall 1992:21). Numerous shrines are located on the summit, and many contain offerings. Mr. Jim Charley, a 76-year-old traditional practitioner from Smith Lake Chapter, stated that Hosta Butte is used during war times as a place to pray for peace and to pray for rain during a drought, and as a place for Navajo people to pray for harmony with the environment. Jean Mariano, a 77-year-old traditional practitioner from Mariano Lake, also identified Hosta Butte as a special shrine to place offerings and say prayers to the spirits. William Raymond, an 84-year-old traditional practitioner from Little Water, stated that Hosta Butte was a prime location for shrines and prayers for rain during a drought (Spivey 1996).

Little Hosta Butte is three miles west of Hosta Butte. According to Jean Mariano, it is used for gathering eagle feathers, but no ceremonies are held there. Also, Mount Powell is used as a

ceremonial and sacred place in time of war with another tribe or country. When the United States is at war with another country, ceremonies are conducted to ask protection for the soldiers and to win the war. Both Jim Charley of Smith Lake and William Raymond, from the Little Water Chapter, mentioned White Face (Spot) Rock or Mesa Butte, southwest of Pinedale, as a traditional use area for the local Navajo people (Spivey 1996).

## METHODS

This cultural resources inventory was designed to satisfy requirements specified by the Nuclear Regulatory Commission (NRC) in letters to the New Mexico State Historic Preservation Officer and the Navajo Nation Historic Preservation Department. The requirements were to conduct archaeological survey of previously unsurveyed portions of the development area, to verify the results of previous archaeological surveys, and to complete a traditional cultural properties inventory of the entire project area. Three land jurisdictions (private, BLM, and Navajo Nation) are present at the Church Rock Site, and the Section 12 Site is private land. Inventory methods were designed to satisfy the regulatory needs of all jurisdictions, and specific procedures were developed to satisfy the level of mapping precision needed for future engineering plans.

Although archaeological survey procedures and results can be reported efficiently by individual land jurisdiction, traditional cultural property investigations cannot. The timing, nature, and results of the ethnohistoric investigations are therefore presented in detail in this section of the report. Information that is relevant to particular land jurisdictions is then summarized in the individual results sections.

### *Records Checks*

Records of known cultural resources were consulted prior to initiating this inventory. Eric Blinman reviewed archaeological and traditional cultural property records at the Navajo Nation Historic Preservation Department (NNHPD), Window Rock, Arizona, on August 13, 1996. Steven A. Lakatos reviewed New Mexico Cultural Resource Information System (NMCRIS) records at the Laboratory of Anthropology beginning on August 26, 1996. Eric Blinman reviewed BLM site files at the Farmington District Office on September 20, 1996. Prior archaeological survey reports conducted for United Nuclear Corporation and HRI were also consulted. These reviews revealed that the NMCRIS archaeological site records for the Church Rock vicinity were complete, but that there were known but unregistered sites within Section 12. BLM and Navajo Nation records were complete for lands under their jurisdiction, but not for adjacent lands. No traditional cultural properties had been recorded in the vicinity of either project area according to NNHPD records and personnel.

### *Archaeological Survey*

C. Dean Wilson, Macy Mensel, and Steven A. Lakatos

The archaeological survey was directed and carried out by OAS staff. Prior to starting the fieldwork, background information was assembled for all previously known sites within the project areas and sites that were immediately adjacent to the project areas. Sites and isolated occurrences (IOs) identified in previous investigations were plotted on USGS 7.5' topographical maps that were available during fieldwork. Photocopies of site forms and site descriptions for previously recorded sites were also available during the fieldwork.

Horizontal control for the survey of the Church Rock Site (Sections 8 and 17) was based on maps provided by HRI from photogrammetric masters created for United Nuclear Corporation in the mid 1970s. These maps were at a scale of 1 inch:200 feet and were available both as

topographic maps and orthophoto imagery. Contours were drawn at 5 foot intervals except for steep terrain, where they were limited to 25 foot intervals. The aerial photos were not perfectly rectified, so that there was a slight systematic distortion compared with USGS quadrangles and engineering plans. Although some landscape features have changed since the photogrammetric maps were prepared in 1976 and 1977, in many cases the images were clear enough to allow the identification of individual trees and even large boulders. Extremely high-precision site boundary locations were required for sites within the proposed well field area, and in these areas horizontal control was supplemented with electronic transit measurements from section corners and permanent survey monuments. Because of the distortion of the unrectified aerial imagery, site locations determined only by topographic features cannot be directly compared with site locations plotted with transit data. Discrepancies of more than 200 feet affect the northeast portion of Section 8, and translations between field locations and engineering plans have attempted to correct for this distortion.

Horizontal control for the survey of Section 12 was provided by the USGS 7.5' Crownpoint Quadrangle. Because of the low relief of the section landscape and resultant uncertainty concerning the accuracy of the site locations that were mapped based on topography alone, site boundaries were verified by electronic transit measurements from section corners and fencelines.

Survey procedures were designed to meet or exceed the minimum requirements of the BLM Farmington District's *Cultural Resource Fieldwork and Report Standards and Guidelines* (1994) and the NNHPD's *Interim Fieldwork and Report Standards and Guidelines* (1991). Pedestrian survey was conducted with a maximum of 15 m between transects. All IOs on private or BLM lands were recorded on OAS Isolated Artifact Forms, and IOs on Navajo Nation land were recorded on NNHPD Isolated Occurrence Record Forms. All sites found on private and BLM lands were recorded on NMCRIS Laboratory of Anthropology Site Record forms. No sites were found during survey of Navajo Nation land, but one site was located that extends onto Navajo land to the east of Section 8, and one site was relocated outside of the Church Rock Site in Section 9. These sites were described using NMCRIS forms, and the information was translated to Navajo Nation Archaeology Department format for submission to the NNHPD. Most sites were mapped to scale using a tape and compass (either a Brunton Pocket Transit or a K&E mapping compass). Exceptions were sites within the proposed well field area which were mapped with an electronic transit. All sites and selected IOs were photographed. Although some sites had been previously recorded, new NMCRIS forms were completed to assure comparability in descriptions and to bring NMCRIS records up to date. Rock art was recorded on BLM Rock Art Attachment forms.

Surface artifacts were analyzed where present. Analysis strategies varied based on artifact quantity and distribution. If the total number of artifacts noted at a site was small (less than 200), all artifacts (primarily sherds) were analyzed and returned to the site surface. Artifact locations were marked with pinflags during the initial stage of site recording. After site boundaries had been established and mapped, artifacts were analyzed by moving from flag to flag. If initial field observations indicated the presence of more than one spatially distinct component at a site, artifacts from the different areas were recorded separately.

At sites containing very large numbers of artifacts, procedures were implemented to select representative analysis samples of sufficient size for interpretation. During site recording, areas with high artifact concentrations were designated for field sampling. Artifact concentrations were selected to provide information concerning the dating of the site components. If initial perusal of sherd concentrations indicated that more than one component might be present, study areas thought

to be associated with each possible component were selected for field analysis. At larger sites, areas associated with each roomblock or midden were sampled. Study areas were usually defined by a 1 m radius dog leash that was marked by placing pinflags around the perimeter. In cases where the number of artifacts within a selected area was not large enough for confident interpretation, the sampling area was extended to a larger radius. Unusual ceramic types or formal flaked lithic tools found outside the sampling area were recorded.

Field analysis of ceramics consisted of recording ceramic type and vessel form. Sherds were not collected during analysis but left where they were found. Small clips were taken from a very small number of sherds and placed in bags with a slip recording type and vessel form. Descriptions of the pottery types and interpretations of the ceramic data are provided in Appendix 1 of this report. Field analysis of flaked lithic artifacts included observations of material type, artifact form, and technological characteristics. Flaked lithic artifacts were extremely rare both at the sites and as IOs.

BLM Farmington District requirements include the collection of tree-ring specimens from Navajo sites during Class III archaeological inventories. Tree-ring samples were not collected during the initial phase of this inventory, but a separate tree-ring sampling phase is planned for the spring of 1997. This wood sampling plan will be extended to all Navajo sites on both private and BLM land within the Church Rock Site, and the plan is described in Appendix 2.

### *Ethnohistory and Traditional Cultural Properties*

Janet E. Spivey

Several modern peoples are accepted as having potential cultural interests in the landscape of the project areas: Navajo, Hopi, Zuni, Acoma, and Laguna. These interests fall into two categories: present uses, and concern with remains of past uses. HRI initiated contacts with the Hopi, Zuni, Acoma, and Laguna tribes concerning the project areas in February 1996. Only the Navajos have demonstrated current traditional uses of the project vicinities, while all of the groups are expected to be concerned with the treatment of resources that reflect past uses. If any archaeological sites cannot be avoided or if cultural resources are encountered during monitoring, specific consultations must be initiated with the concerned Native American groups.

Prior to the traditional cultural properties consultations, NMCRIS and NNHPD files were consulted for previously recorded resources in the vicinity of the project areas. Ethnohistoric survey work was carried out in accordance with the Navajo Nation Historic Preservation Department Traditional Cultural Properties Policy and the National Park Service National Register Bulletin 38.

The project areas lie within or adjacent to the borders of the Church Rock, Pinedale, Mariano Lake, Smith Lake, Little Water, Crownpoint, Becenti, and Nahodishgish (Dalton Pass) Chapters of the Navajo Nation. All these chapters are within the jurisdiction of the Eastern Navajo Agency. Published references on Navajo culture, traditional cultural properties, and general history were consulted for this report (Bailey and Bailey 1986; Brugge 1968, 1977, 1983; Kelley 1984; Kluckhohn and Leighton 1962; Van Valkenburgh 1941). These sources present some cultural and historical information relating to the general project areas, but no information on the specific project areas. Regional summaries are also available (Kelley 1982; Nelson and Cordell 1982;

Scheick 1983; Kaufman 1985).

Prior to OAS involvement with the project, a traditional cultural properties inventory had been conducted for both the Church Rock and Section 12 development sites by Ernest C. Becenti, Sr., a traditional practitioner and former Church Rock Chapter president. This inventory was prepared for the Environmental Impact Statement of the HRI mining project. The OAS ethnohistorian used this document as a resource, confirming its substance and augmenting the previous investigations with additional material and interviews.

Mr. Becenti's inventory of traditional cultural properties was conducted during July, August, and September of 1995, with supplemental site visits and discussions in August 1996. Mr. Becenti has been a traditional practitioner for over 30 years and was the Church Rock Chapter president in 1995. The traditional uses inventory was conducted by a walking tour of the private lands, Navajo Nation Trust lands, Navajo allotment lands, and Bureau of Land Management lands within the project areas of Church Rock and Crownpoint. The lands discussed in Mr. Becenti's report include areas outside of the two project development sites that are the concern of this report.

Mr. Becenti's report stated that "no significant sacred and traditional sites were found." The individuals that were interviewed stated that most of the sacred sites and herb gathering places were up in the mountains or along the mountain ridges, outside of the proposed project areas. The sacred shrines were altogether unknown and no longer used by the Navajo people. Mr. Becenti recommended that the mining project proceed as proposed, but that if a discovery were made, all project activities in that area should cease.

The OAS traditional cultural properties inventory was conducted by Janet E. Spivey, OAS ethnohistorian, with the assistance of Ben House from Smith Lake during the fall and winter of 1996. Detail concerning the entire inventory process is presented here, and summaries appropriate to the individual land jurisdictions are presented in the results section of this report.

On October 30, 1996, the ethnohistorian mailed letters containing a description of the proposed project and a project vicinity map to the chapter presidents of the Church Rock, Pinedale, Mariano Lake, Smith Lake, Little Water, Crownpoint, Becenti, and Dalton Pass Chapters. These letters were followed by telephone contacts and personal interviews during the months of November and December 1996. The ethnohistorian, with the assistance of Mr. House, contacted and visited knowledgeable Navajo traditional practitioners and chapter officials representing all the involved communities.

On November 7, 1996, the ethnohistorian and Mr. House visited with Jean Mariano, an elderly traditional practitioner who lives within the Mariano Lake Chapter boundaries. Ms. Mariano was born three miles northeast of her present house, which lies in the NE  $\frac{1}{4}$  of Section 30. She has lived in that area all her life. She is now 77 years old and began traditional practice at age 34. She was taught by her uncle, Chee Johnson. Ms. Mariano does not know of any traditional uses within Sections 8 or 17 of the Church Rock Site. The hills and mountains are the places to gather plants and herbs. These are gathered in the high places away from grazing animals or where people are not active on a daily basis. Plants and herbs need to be gathered where there is no contamination. She adds that the Navajos do not conduct ceremonies near housing developments or where there would be noise and lights. She does not know of any sacred or plant gathering areas on the Church Rock Site. She would accept Mr. Becenti's judgment and report about traditional uses in the vicinity of Sections 8 and 17.

Ms. Mariano stated she has concerns about how the uranium will be transported. It should be well protected and secured. There should be an immediate way of containing any spillage due to an accident. However, she noted that there are trucks travelling the roads all the time. Local residents don't know what is in them, she said, and uranium has been hauled over the roads in the past.

Later on November 7, 1996, the ethnohistorian and Mr. House met with Nelson J. Largo, Sr., Smith Lake Chapter president. Mr. Largo stated that he had received the letter about the project and was glad we were visiting him. He had no concerns about traditional uses in the project area. He stated that uranium trucks had travelled through the Smith Lake area before and that many trucks use the route hauling all kinds of things. He feels that as long as the HRI trucks stay on the paved roads and take safety precautions there should be no problems. He was glad we had consulted with Jean Mariano and would accept her judgment about traditional uses.

On November 8, 1996, the ethnohistorian and Mr. House visited with Bennie Y. Begay, a traditional practitioner and former vice president of the Pinedale Chapter. Mr. Begay is 75 years old and was born in the area. He has lived there all his life. He is very knowledgeable about traditional uses. The chapter boundaries of Church Rock and Pinedale are between three and four miles west of Mr. Begay's house. Mr. Begay stated that there are mesas in the Pinedale area that are used for ceremonial purposes but are isolated and not in the project areas or along the highway. There is a hill about 2,000 feet southwest of his house that is still considered a sacred place. This is because it is used by eagles during migration as a place to settle for a few days. This hill is not in the project areas or within the highway right-of-way. It would not be a place of concern as long as the trucks hauling uranium take safety precautions and stay within the right-of-way.

On the first mesa, just past the Pinedale Trading Post, there is a sacred location called the "Trail of Rainbows" because when it rains there is usually a rainbow there. A Squaw Dance ceremony has been held near the highway, about ¼ mile from his house, or four miles west of the Pinedale Trading Post. The Squaw Dance is conducted with the normal flow of traffic and noise along the highway. There would be no concerns as long as any trucks hauling the uranium stay within the right-of-way.

Mr. Begay expressed safety concerns only about the trucks. They should slow down, he said, because the highway is used by livestock and elderly people. He has no knowledge of traditional uses within Sections 8 and 17. He would accept Mr. Becenti's judgment about traditional uses within the project areas.

Mr. Begay appreciated that we were consulting with knowledgeable people about the traditional uses. Many companies had come into the area and would not consult with the local residents.

The Church Rock Chapter House was visited on November 8, 1996, to determine if the project letter had been received. Mr. Benally, chapter president, was not there, but the chapter clerk stated that the letter had been received and the chapter was familiar with the HRI project, especially regarding Sections 8 and 17 within their chapter boundaries. The Church Rock Chapter had signed a resolution supporting the uranium project after a vote was taken during the July 7, 1993, chapter meeting. It was suggested that we contact Mr. Benally on another day.

On November 11, 1996, Mr. House met with Jim Charley, a traditional practitioner, from the



Smith Lake Chapter. Mr. Charley had no concerns about traditional uses of either the Church Rock Site (Sections 8 and 17) or Section 12 near Crownpoint.

On November 21, 1996, the ethnohistorian, and Mr. House met with Tom Shorty of the Becenti Chapter and Lincoln Perry of Crownpoint. Both are knowledgeable traditional practitioners and are familiar with the project areas, especially Section 12.

Mr. Shorty is 67 years old and has been a traditional practitioner for 25 years. He is more familiar with Section 12 than with the vicinity of the Church Rock Site. About 60 years ago, the Kin Yaah Yazzie family lived in a house on Section 12. At that time plants and herbs were gathered for medicinal purposes. This is what people used when there were no western doctors or hospitals. If you were sick or hurt yourself you would pick a certain plant to use on the wound or make into a tea to drink. The "bee weed" plant is used for dying wool, medicine, and seasoning food. The yucca plant is used for shampoo and cleaning for ceremonies. Shrines, prayers, and ceremonies are placed or performed in very isolated places. Today most plants are gathered on mesa tops and ridges, away from grazing animals and use by people. The plants on the hills and mesas tend to reseed themselves, so there is no concern about their dying out. Section 12 is not used as a traditional use area today. It has been used by people too much and for grazing.

Mr. Shorty does not have any knowledge about traditional uses on the Church Rock Site. However, a place outside the Church Rock project area is considered sacred ground. It is on highway NM 371 between Becenti and Crownpoint. It is called Dragon Monster, and people do not travel through the area during ceremonial times. This area is similar to Snake Rock at Narbona Pass.

Mr. Perry is 67 years old and learned traditional practice from his grandmother. Like Mr. Shorty, he has no knowledge of traditional uses within the Church Rock Site area. Further west from Sections 8 and 17 is an area known as Nose Rock, which is used as a shrine. Nose Rock Point is slightly more than three miles west-southwest of the Church Rock Site. There used to be more game like deer and elk in the area, but since people have moved in, there is less wildlife.

Both Mr. Shorty and Mr. Perry agree that they have no concerns or knowledge of traditional uses within Sections 8 or 17. As far as transportation of the uranium, they feel as long as the trucks stay on the paved roads and are as safe as possible, they have no concerns.

On November 21, 1996, the ethnohistorian and Mr. House visited William E. Raymond, an elderly traditional practitioner and former chapter secretary from the Little Water community. Mr. Raymond is an 84-year-old traditional practitioner. Mr. Raymond stated that shrines and prayer offerings take place away from populated areas, usually up in the high places. Prayers are for rain, safety, and protection. Personal prayers are offered at home or near home.

There is a mesa about ½ mile from his house where there used to be a shrine, but the young people have desecrated it. At one time there was clay pottery for water offerings, but it has been destroyed. Some of the sacred places are Hosta Butte, Little Hosta Butte, Mount Powell, and White Face (Spot) Mesa, which is southwest of Pinedale. There are some Anasazi sites near Mr. Raymond's house. Pottery remains are present, and he thinks the Anasazi farmed in the low places near his house.

Mr. Raymond has no knowledge of traditional uses within the Church Rock Site area. He feels

Mr. Becenti should be the most knowledgeable person about that area.

The Little Water Chapter boundary comes up to NM 371, and Mr. Raymond has no concerns about traditional uses along the transportation route as long as the trucks stay on the paved roads. He has safety concerns about older people and livestock on the road. The truck drivers should be careful so as not to constitute a danger to people or livestock. Mr. Raymond has livestock that he sells and also uses for food. The transportation must be done safely, so livestock and vegetation will not be contaminated.

On November 22, 1996, the ethnohistorian and Mr. House visited Manuel Shirleson, Crownpoint Chapter community services coordinator. Mr. Shirleson confirmed that the project letter had been received and suggested we contact the chapter president, Charles Long, in the near future. Mr. Shirleson stated that the chapter is familiar with the HRI project. The Crownpoint Chapter had signed a resolution supporting the HRI project in general. Mr. Shirleson thought that the traditional practitioners who had been consulted would accept the project areas. A time was arranged to talk to Mr. Shirleson on December 4, 1996, to determine when Mr. Long would be available. The ethnohistorian contacted Mr. Shirleson on December 4, 1996, and scheduled a meeting with Mr. Long on December 11, 1996.

On December 11, 1996, the ethnohistorian and Mr. House met with Charles Long, Crownpoint chapter president, at the Crownpoint Chapter House. Mr. Long was familiar with the project areas and had helped with Mr. Becenti's report. He also felt that Lincoln Perry and the other traditional practitioners would accept what they said about traditional uses. He stated that as far as he knew, the Church Rock Site area was never considered a traditional use area. People go into the high places, like Hosta Butte, to gather plants or perform ceremonies.

Mr. Long stated that the Crownpoint Chapter had signed a resolution in support of the HRI project, and he knew of no traditional uses in the project areas.

Also on December 11, 1996, the ethnohistorian and Mr. House met with a traditional practitioner from the Dalton Pass Chapter who prefers not to be named in this report. This practitioner is familiar with the Dalton Pass and Crownpoint areas. However, he felt other practitioners closer to the Church Rock Site would be more knowledgeable about that area. He did mention the presence of a spring on top of a mesa about 2.5 miles southwest of the HRI Crownpoint offices. It is called Rock House. There are ruins on top of the mesa. This mesa is not within the project areas. This practitioner also mentioned the four sacred places used for ceremonies and shrines (Hosta Butte, Little Hosta Butte, White Spot Rock or Mesa Butte, and Mount Powell). He has no knowledge of any traditional uses within the project areas. His only concerns involve the safety of the people and livestock when transporting the uranium.

Later on December 11, 1996, visits were made to the Dalton Pass Chapter to confirm that the project letter had been received and to the Becenti Chapter House with Juliette Largo, Becenti community services coordinator.

On December 12, 1996, the ethnohistorian visited Herbert Benally, Church Rock Chapter President, to inquire about any concerns the Church Rock Chapter might have about traditional uses within the project areas. Mr. Benally will accept Mr. Becenti's findings and report on the Church Rock Site. Mr. Benally will go along with the previous administration's and chapter's position on uranium mining. He had no concerns about the project.

The Pinedale Chapter was also visited on December 12, 1996. Nelson Zuni, vice president, discussed the project. He is knowledgeable about the Church Rock Site and does not know of any traditional uses in the project area. He will accept Mr. Becenti's and Bennie Begay's judgments about traditional uses in the project area as well as the other local traditional practitioners. He has safety concerns about transporting the uranium.

Also on December 12, 1996, the ethnohistorian and Mr. House visited the Little Water Chapter House and met with George Tolth (council delegate), Bennie Enrico (chapter president), Thomas Barbone Sr. (chapter vice president), Paul Jones (chapter secretary and treasurer), and Ken Tapaha (chapter manager). Mr. Enrico stated he would accept the judgment of the local traditional practitioners concerning the project areas. Mr. Barbone stated that the medicine men or traditional practitioners should know about traditional uses, and he would accept whatever they said. He had concerns about the safety of the highways, especially during bad weather. He thought the highways should be upgraded to be able to carry the weight of the trucks.

Mr. Tolth stated that traditional practitioners use isolated high places to gather plants and herbs and to conduct ceremonies. He did not know of any concerns about traditional uses in the project areas. He has safety concerns about road conditions. There is a need to watch out for the elderly and livestock.

Mr. Tapaha had no concerns about traditional uses in the project areas. He had concerns about transporting the uranium. The roads can be slick and dangerous, especially through the canyon on highway NM 371. He would like to see the highway department widen the road through the canyon area.

On December 17, 1996, the ethnohistorian talked with Raquel Warner of the Mariano Lake Chapter and Juliette Largo, community services coordinator for Becenti Chapter. Ms. Warner said that Henry Tom, chapter president, would call back. Ms. Largo said she would talk to Mr. Hubbard, chapter president, about the project and suggested calling back on Friday, December 20. A call was made to Harrison Morgan, Dalton Pass chapter president, and Harry Jim, chapter vice president; neither was available.

On December 20, 1996, the ethnohistorian spoke with Raquel Warner, Mariano Lake community services coordinator. Ms. Warner had discussed the project with Henry Tom, chapter president. Mr. Tom stated that he had no concerns about the HRI project and would accept the judgment of the traditional practitioners.

On January 10, 1997, the ethnohistorian spoke with Juliette Largo, community services coordinator for the Becenti Chapter. Ms. Largo had discussed the project with Harry Hubbard, Becenti Chapter president. Mr. Hubbard stated that he had no concerns about the HRI project and would accept the judgment of the local traditional practitioners. If any concerns or traditional use areas were discovered after the project began, Mr. Hubbard wanted to be notified.

On February 5, 1997, Mr. House spoke with Harrison Morgan of Dalton Pass Chapter. Mr. Morgan had no concerns regarding [REDACTED] long as measures are taken to ensure safety and prevent contamination of the environment.

## CHURCH ROCK SITE INVENTORY RESULTS

Steven A. Lakatos and Eric Blinman

The Church Rock Site of the proposed mining project includes portions of both [REDACTED] [REDACTED]. This area includes private, BLM, and Navajo Nation land (Fig. 2). Private land within Section 8 occupies slightly more than the southeast quarter section (approximately 173 acres). Of the adjoining BLM land within Section 8, archaeological survey was confined to elevations below the upper mesa top. This area totals approximately 335 acres. Surveyed portions of Section 17 [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] the section. Archaeological survey results and summaries of the traditional cultural property inventory are presented separately for each land ownership status.

### *Private Land Portion of Section 8*

Several prior archaeological surveys have been carried out within the private land portion of [REDACTED]. Ford and DeHoff (1977) conducted a survey for United Nuclear Corporation that included Section 8 as well as three other sections. As a result of this survey, six sites were identified in Section 8, four of which are located on private land (one additional site was attributed to the private land portion of [REDACTED] but it is within [REDACTED] to the Section 8 boundary). In 1988, a brief reconnaissance of the [REDACTED] was carried out, and a protection program was proposed for the previously known sites within that area (Marshall 1988). Limited reconnaissance was also conducted within the [REDACTED] resulting in the recommendation that additional survey be conducted in that area. An intensive survey that focused on but was not limited to the [REDACTED] was carried out in 1992 (Marshall 1993). During this survey, four new sites and one previously identified site were located on BLM land in the [REDACTED] and four new sites were also identified on private land in the [REDACTED] total, these prior surveys had recorded eight sites in the private land portion of [REDACTED].

Because of the recent date of prior surveys in the [REDACTED] the NRC had called only for site relocation and rerecording in this portion of the project area (NRC 1996). During the process of reconciling prior site descriptions as part of the rerecording effort, discrepancies were noted between the prior site survey designations. Portions of adjacent sites appeared to have been grouped and labeled differently by Ford and DeHoff (1977) and Marshall (1988, 1993), and one new site was located by the OAS survey crew adjacent to Ford and DeHoff's primary site cluster. Adequate resolution of the discrepancies required intensive resurvey of the SE¼ section, and the resurvey was carried out as part of the overall survey of [REDACTED]. The resurvey of the private land portion encountered 26 IOs, eight previously recorded sites, and four new sites. After site identifications had been reconciled, it was also clear that the prior level of site location precision was inadequate for well field planning needs. Sites within or adjoining the planned injection and extraction well arrays were mapped with an electronic transit, and their boundaries were located precisely relative to the section boundaries.

### *IO Descriptions*

IO descriptions and their locations are listed in Table 1. Most of the 26 IOs are isolated sherds: 11 single sherds and 11 instances of multiple sherds. Only three flaked stone artifacts were noted: one isolated flake, one flake with a sherd cluster, and one hammerstone.

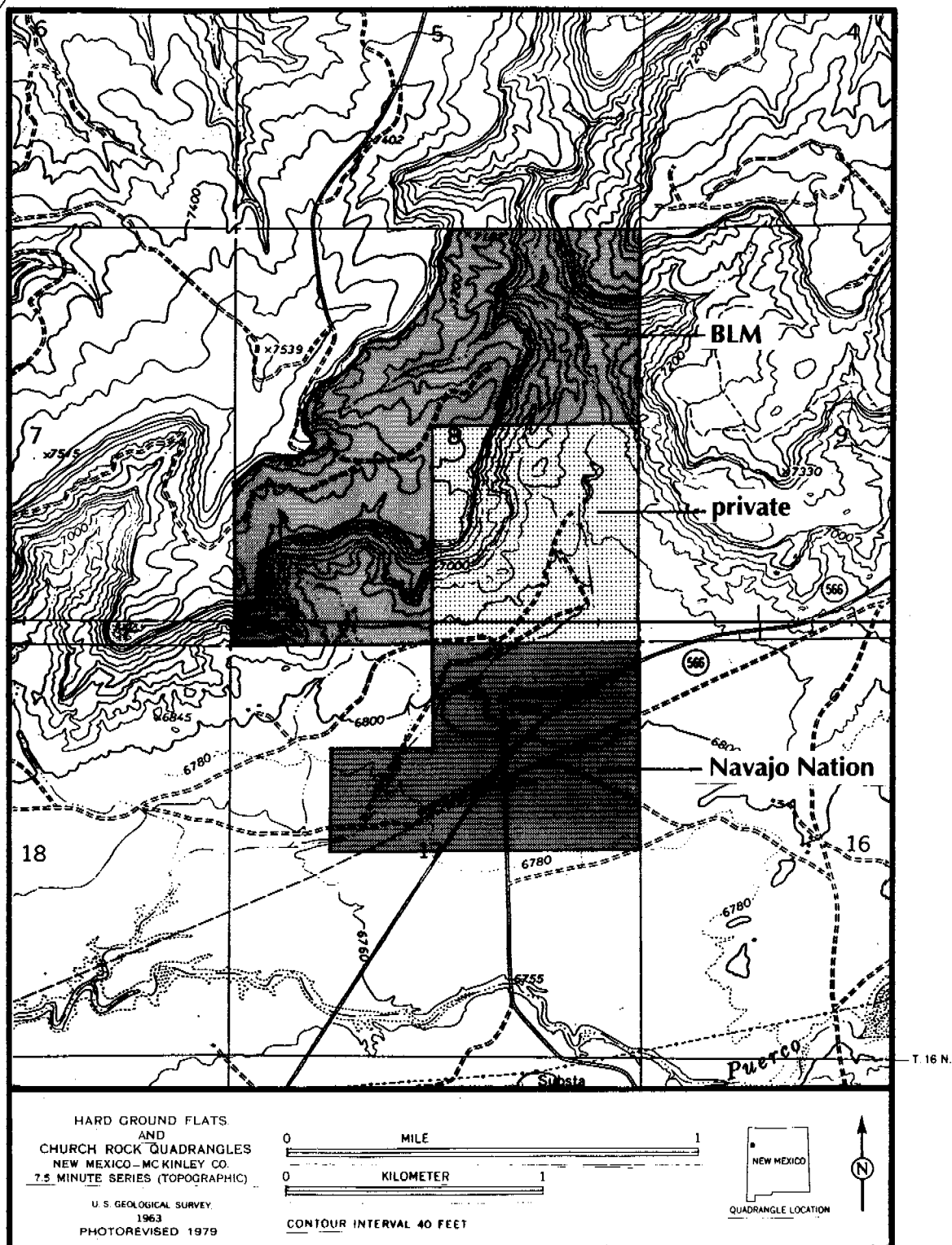


Figure 2. Land ownership and archaeological survey areas at the Church Rock Site.

Table 1. Isolated Occurrences, Church Rock Site, Section 8, Private Land

IO Number	Location <sup>1</sup>	Context	Cultural Affiliation	Description
1	[REDACTED] Elevation: 6,820 ft	Scrubland (rabbitbrush); open canyon floor	Anasazi (pottery technology)	1 Gallup Black-on-white bowl body sherd
2	[REDACTED] Elevation: 6,820 ft	Scrubland (rabbitbrush); open canyon floor	Anasazi (pottery technology)	1 Corrugated Gray jar neck sherd
3	[REDACTED] Elevation: 6,800 ft	Scrubland-woodland (grasses, juniper); base of talus slope	Anasazi (pottery technology)	3 Corrugated Gray jar body sherds; 1 medium-grained chert core flake, single facet stepped platform
4	[REDACTED] Elevation: 6,780 ft	Scrubland (grasses, juniper); open canyon floor	Anasazi (lithic technology)	1 distal white-reddish chalcedony core flake, heat-treated
5	[REDACTED] Elevation: 6,700 ft	Woodland (rabbitbrush, prickly pear, sage, juniper, piñon); base of talus slope	Anasazi (pottery technology)	1 Plain Gray jar body sherd
9	[REDACTED] Elevation: 6,860 ft	Scrubland (rabbitbrush, chamisa); eroding arroyo wall	Anasazi (pottery technology)	1 organic-painted white ware jar body sherd
10	[REDACTED] Legal: NE ¼ SE ¼ SE ¼ Elevation: 6,820 ft	Scrubland (rabbitbrush); arroyo slope	Anasazi (pottery technology)	1 polished white ware bowl sherd 1 Corrugated Gray jar sherd 1 Puerco-Escavada B/w jar sherd
11	[REDACTED] Elevation: 6,820 ft	Scrubland (snakeweed, rabbitbrush); arroyo bank	Anasazi (pottery technology)	1 polished white ware jar sherd
12	[REDACTED] Elevation: 6,840 ft	Arroyo wall	Anasazi (pottery technology)	1 Gallup B/w bowl rim sherd
13	[REDACTED] Elevation: 6,845 ft	Scrubland (rabbitbrush); ridge	Anasazi (pottery technology)	2 Plain Gray jar body sherds 1 Corrugated Gray jar body sherd
16	UTM: [REDACTED] [REDACTED] Elevation: 6,845 ft	Scrubland (rabbitbrush, sage); canyon floor, floodplain	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
17	UTM: [REDACTED] Legal: NW ¼ SE ¼ SE ¼ Elevation: 6,840 ft	Scrubland (rabbitbrush, snakeweed); canyon floor, floodplain	Anasazi (pottery technology)	1 Gallup B/w bowl sherd 1 Plain Gray jar body sherd
18	UTM: [REDACTED] Legal: [REDACTED] ¼ Elevation: 6,845 ft	Scrubland (rabbitbrush, snakeweed); canyon floor, floodplain	Anasazi (pottery technology)	1 Plain Gray jar body sherd 1 Corrugated Gray jar sherd
19	UTM: [REDACTED] 0 Legal: [REDACTED] Elevation: 6,860 ft	Scrubland (rabbitbrush); canyon floor	Anasazi (pottery technology)	1 late mineral-painted sherd
20	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,860 ft	Scrubland (rabbitbrush, sagebrush); canyon floor	Anasazi (pottery technology)	1 Corrugated Gray jar body sherd 2 Plain Gray jar body sherds 1 unpainted white ware jar sherd

Table 1. Isolated Occurrences, Church Rock Site, Section 8, Private Land

IO Number	Location <sup>1</sup>	Context	Cultural Affiliation	Description
21	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,840 ft	Scrubland (rabbitbrush); canyon floor	Anasazi (pottery technology)	3 Plain Gray jar body sherds 1 Corrugated Gray jar sherd 1 indeterminate white ware sherd
22	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,925 ft	Woodland; talus slope	Unknown	Boulder with overhang and 10+ burned rocks; no ash and no artifacts
23	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,920 ft	Woodland (piñon, juniper); talus slope	Anasazi (pottery technology)	1 Gallup B/w jar body sherd 1 Striated gray jar body sherd (Navajo?)
27	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,890 ft	Woodland (juniper); hill top	Anasazi (lithic technology)	1 hammerstone
28	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,895 ft	Woodland (juniper); hill top	Unknown, possibly recent	Cluster of small (< 10 cm) burned sandstone rocks (50 cm diameter)
31	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,920 ft	Woodland (juniper, piñon); base of talus slope	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
32	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,960 ft	Woodland (sage, juniper, piñon); arroyo bank	Anasazi (pottery technology)	2 Plain Gray jar sherds
33	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,980 ft	Woodland (sage, juniper, piñon); talus slope	Anasazi (pottery technology)	2 Plain Gray jar sherds 2 Polished white ware sherds 3 Indeterminate white ware sherds
38	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,850 ft	Scrubland (sage, rabbitbrush); floodplain	Anasazi (pottery technology)	1 Plain Gray jar sherd (oxidized)
65	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,240 ft	Woodland (piñon, mountain mahogany); bluff	Anasazi (pottery technology)	1 La Plata B/w bowl body sherd 1 Plain Gray jar sherd
68	UTM: [REDACTED] Legal: N [REDACTED] Elevation: 7,220 ft	Woodland (mountain mahogany, juniper, piñon); bluff edge	Anasazi (pottery technology)	1 Plain Gray jar body sherd

<sup>1</sup>UTM coordinates are within [REDACTED] Quarter sections are within [REDACTED] on the [REDACTED] minute quadrangles.

The potsherds found as IOs are a subset of types found at the Section 8 Anasazi sites. Plain Gray and La Plata Black-on-white can be associated with Basketmaker III or Pueblo I components. Corrugated Gray, Gallup Black-on-white, and Escavada-Puerco Black-on-white are all contemporary with the Late Pueblo II components of the sites. The single organic-painted white ware sherd may be from an imported Pueblo II vessel, or it may be related to an early Pueblo III use of the area. A single sherd of striated gray ware may be a Navajo sherd (Dinétah Scored, as used in descriptions by Marshall [1993]), although rare Anasazi Plain Gray sherds can have a striated appearance.

Two isolated features were defined as IOs. One of these, IO 22, consists of a large boulder and oxidized stone scatter adjacent to an east-facing canyon wall. The sandstone boulder has a north

face with a slight overhang, and at least 10 oxidized sandstone rocks are scattered in the overhang area. There is no ash, and no other artifacts are associated with the feature. The other feature, IO 28, is a 50 cm diameter cluster of oxidized sandstone at the top of a hill. The rocks are small (less than 10 cm diameter). There is considerable recent disturbance in the area from well drilling, and this feature could be recent in age.

### *Site Descriptions*

Twelve sites have been identified within the private land portion of Section 8 (Table 2). Six of these (LA 26159, LA 26160, LA 26163, LA 26164, LA 116112, and LA 116114) are large Anasazi sites at the juncture of the valley floor with the canyon wall (site locations are provided in Appendix 3). One of these sites, LA 26159, has a historic Navajo component. Three additional Anasazi sites are at locations above the valley floor (LA 88872, LA 116111, and LA 116120), and LA 116120 also has a minor historic component. Three small sites at locations above the valley floor are Gobernador phase Navajo components with architectural remains (LA 88871, LA 88875, and LA 88876). Geomorphic position and primary cultural affiliation are used to organize the individual site descriptions that follow. LA 116111 is on both private and Navajo Nation land along the boundary between Sections 8 and 9, and LA 116120 is on both private and BLM land.

**LA 26159.** LA 26159 is a multiple-component site with evidence of Basketmaker III and Late Pueblo II residential components and a historic Navajo component (Fig. 3). This site is part of a community of closely spaced Anasazi sites that have contemporary occupations (LA 26158 [BLM land], LA 26160, LA 26163, LA 26164, LA 116112, and LA 116114). The community is located at the base of a high south-facing cliff and talus slope. LA 26159 was originally recorded by San Juan College (Ford and DeHoff 1977) and described as a two-story masonry pueblo with 20 to 30 rooms. Rooms were believed to be two-story in an L configuration, with a kiva depression and associated trash mounds. The site was revisited by Marshall (1988), and a more detailed map and site description was produced. Marshall's summary illustrates and describes an upper roomblock, a lower unit pueblo, multiple middens, a Basketmaker component, and rock art panels. LA 26159 was relocated during the OAS survey, and all site information was updated. This included a new site form, a transit map of the area, photographs of features and structures, in-field artifact analysis, and auger tests. In-field analysis was conducted using 2 m radius sample areas within the middens (Tables 3 and 4). Auger tests were used to locate and determine the extent of subsurface deposits, identify probable pit structure depressions, and to determine the site boundary (Table 5). A site boundary was staked on the basis of the surface and subsurface distributions to facilitate later fencing.

LA 26159 is at the base of a south-facing cliff and talus slope on an alluvial fan above the Puerco River Valley. The site measures 130 by 80 m (all site and feature dimensions are given in the north-south direction followed by the east-west direction), and a shallow drainage flows south through the middle of the site, dividing the site into eastern and western segments. Surface observations indicate the site is in excellent condition. Although there is evidence of pothunting in two middens and three extramural features, the vandalism was limited in extent and has not compromised the integrity of the site as a whole. The site condition is stable in that there are no imminent threats to its integrity from either natural or cultural agents.

The Anasazi components consist of Basketmaker III and Late Pueblo II residences. The Basketmaker III component is in the southern portion of the site. This component is represented by architectural remains on both sides of the drainage. To the east is a 7 by 10 m sandstone rubble



Table 2. Sites Recorded on Section 8, Private Land

Site Number	Affiliation	Component	Features
LA 26159	Anasazi	Basketmaker III or Early Pueblo I	Two roomblocks, pit structure depressions, middens, various extramural features
		Late Pueblo II	Two roomblocks, kivas, middens, and extramural features
	Navajo	Recent	Petroglyphs
LA 26160	Anasazi	Late Pueblo II	Two roomblocks, kivas, middens, and extramural features
LA 26163	Anasazi	Late Pueblo II	Two roomblocks, kivas, pit structures, middens, and extramural features
LA 26164	Anasazi	Late Pueblo II	Three roomblocks, middens, and extramural features; extreme disturbance
LA 88871	Navajo	Gobernador phase	Single masonry room, midden
LA 88872	Anasazi	Late Pueblo II	Artifact scatter, hearth (?)
LA 88875	Navajo	Gobernador phase	Cribbed log hogan, masonry wall, midden
LA 88876	Navajo	Gobernador phase	Stone room footing, sherd scatter
LA 116111 <sup>1</sup>	Anasazi	Basketmaker III	Artifact scatter, cists, hearth (?)
LA 116112	Anasazi	Late Pueblo II	Artifact scatter, sandstone rubble
LA 116114	Anasazi	Basketmaker III	Ceramic scatter; extreme disturbance
		Late Pueblo II	Rubble scatter, midden; extreme disturbance
LA 116120 <sup>2</sup>	Anasazi	Late Pueblo II	Masonry structure or feature, artifact scatter
	Historic	Territorial or early Statehood	Artifact scatter

<sup>1</sup>This site is on the boundary between Section 8 and Section 9, and the western half is on Navajo Nation land.

<sup>2</sup>This site is on the boundary between private and BLM land, and the east half is on BLM land.

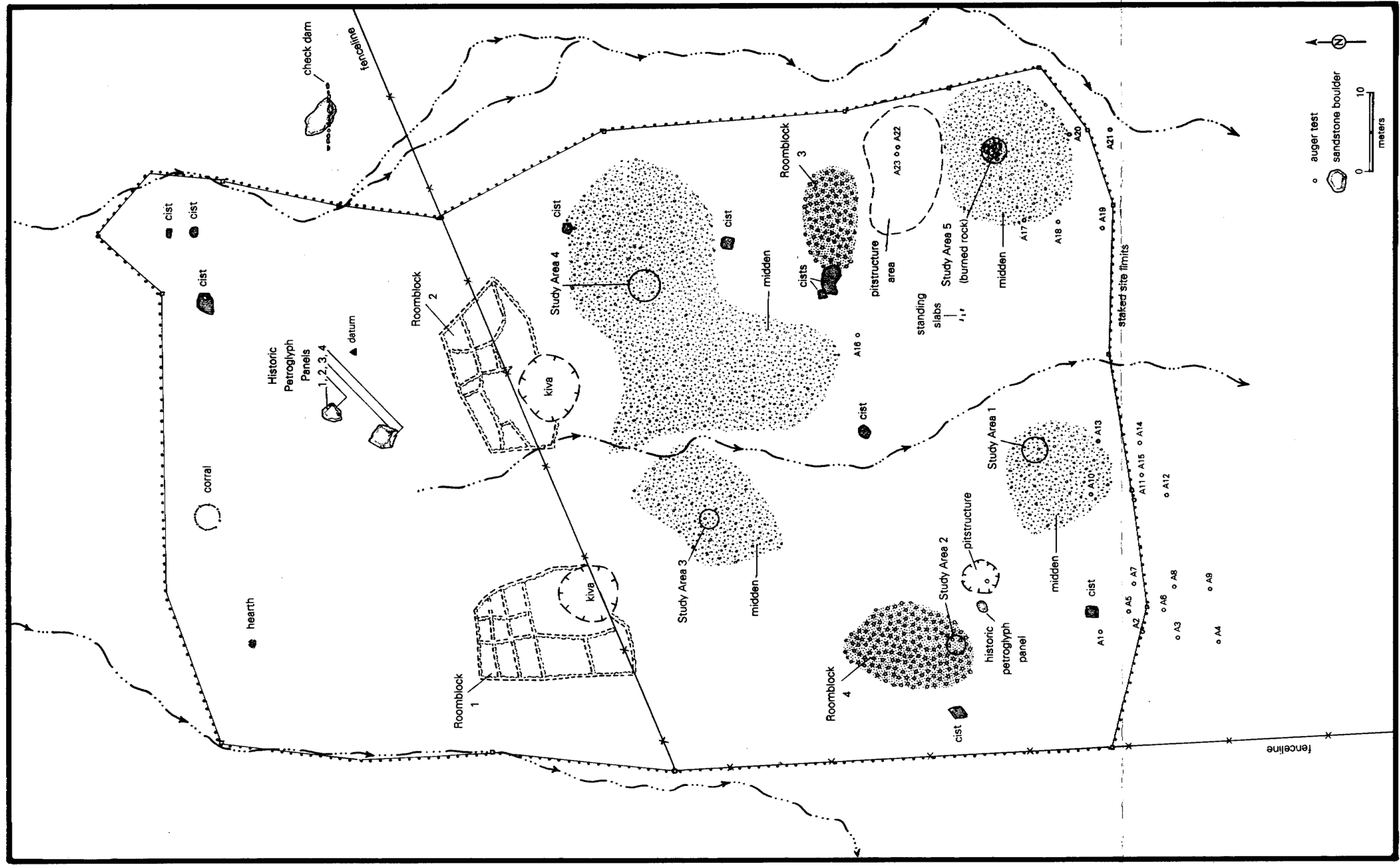


Figure 3. Plan of LA 26159.

Table 3. LA 26159 Ceramic Observations

Pottery type	Area 1 (count)	Area 2 (count)	Area 3 (count)	Area 4 (count)	Area 5 (count)
Anasazi Gray Ware					
Lino Gray	1	2		3	3
Plain Gray	31	37	69	148	63
Neckbanded Gray	1		2	2	
Pueblo II Corrugated Rim			2	3	
Corrugated Gray	1	2	73	169	4
Anasazi White Ware					
La Plata Black-on-white		1	3	2	
Red Mesa Black-on-white	1		12	15	
Gallup Black-on-white			9	28	1
Escavada-Puerco Black-on-white			1	6	
McElmo Black-on-white				1	
Unpainted white ware				23	1
Mineral painted white ware (late)			28	82	2
Anasazi Red Ware					
Puerco Black-on-red				1	
Wingate Black-on-red			2	1	
White Mountain Redware (indet.)			1	1	
Mogollon Brown Ware					
Reserve Smudged			1	2	
Total	35	42	203	487	74

Table 4. LA 26159 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Area 3	Thinning flake	Washington Pass chert	Glassy	Distal ½	0	
	Core flake	Red jasper	Fine	Complete	10	Cortical
	Core flake	Red dendritic jasper	Fine	Complete	0	Abraded
	Core flake, utilized edge	Obsidian (Jemez?)	Glassy	Complete	20	Collapsed
	Angular debris	Red jasper	Fine		0	
	Angular debris	Tan silicified wood	Fine		50	
	Core flake	Red jasper	Fine	Distal ½	0	
Area 4	Angular debris	Tan chert	Fine		50	
	Angular debris	Purple silicified wood	Fine		0	
	Core flake	Dark gray silicified wood	Fine	Medial	0	
	Angular debris	Yellow jasper	Fine		0	
	Core flake	Gray chert	Fine	Complete	50	Cortical
	Angular debris	White-brown silicified wood	Fine		20	
	Angular debris	Brown silicified wood	Fine		0	
	Core flake	White chert	Fine	Proximal	50	Collapsed
	Angular debris	Pink quartzite	Medium		0	
	Angular debris	Brown silicified wood	Fine		0	
Area 5	Core flake	Gray silicified wood	Fine	Complete	0	Collapsed

Table 5. LA 26159 Auger Test Results

Hole number	Depth (cm)	Observations
1	0-30	Moist sandy loam with clay, few sandstone gravels, and charcoal flecks; sherd at 30 cm
	30-60	Loose sandy loam with increased sandstone gravel; no charcoal or artifacts
2	0-30	Loose sandy loam with increased sandstone gravel; charcoal stops at 30 cm
	30-70	Loose sandy loam with sandstone gravel
3	0-20	Moist sandy loam with some sandstone gravel
	20-60	Loose dry sandy loam with increased number of gravel
4	0-20	Moist sandy loam with few sandstone gravels
	20-70	Loose dry sandy loam with increased sandstone gravel
5	0-30	Moist sandy clay loam with sandstone gravel and charcoal flecks
	30-65	Loose dry sandy loam with sandstone gravel
6	0-20	Moist sandy loam with a few sandstone gravels
	20-60	Loose dry sandy loam with sandstone gravel
	60-70	Loose sandy loam with coarse sandstone gravel
7	0-20	Moist brown sandy clay loam with charcoal flecks
	20-50	Loose dry sandy loam with sandstone gravel
	50-70	Loose dry sandy loam with coarse sandstone gravel
8	0-20	Silty sandy brown loam; wet
	20-40	Light brown silty sandy loam with sandstone gravel; hit rock
9	0-30	Loose wet brown silty sand
	30-60	Loose dry light brown silty sand with sandstone gravel
10	0-20	Brown sandy clay loam with large charcoal pieces; wet
	20-40	Loose light brown sandy loam with some sandstone gravel
	40-50	Loose light brown sandy clay loam with coarse sandstone gravel
11	0-10	Loose brown sandy clay loam
	10-40	Light brown sandy loam with coarse sandstone gravel
	40-60	Loose sandy loam with sandstone gravel
12	0-20	Loose brown sandy clay loam; wet
	20-60	Dry light brown sandy loam with sandstone gravel
13	0-10	Loose brown sandy clay loam with charcoal and sherd; wet
	10-20	Loose brown sandy clay loam; wet
	20-60	Dry light brown sandy loam with sandstone gravel
14	0-20	Loose brown sandy clay loam; wet
	20-40	Loose brown sandy clay loam; dry

Table 5. LA 26159 Auger Test Results

Hole number	Depth (cm)	Observations
	40-50	Loose silty sandy loam with coarse sandstone gravel
	50-60	Loose silty sandy loam with pea gravel
15	0-20	Loose brown sandy clay loam with charcoal (pit structure fill)
	20-100	Loose light brown sandy loam with small amounts of oxidized sandstone and charcoal (pit structure fill)
16	0-30	Loose brown sandy clay loam with charcoal flecks; wet; sherd at 20 cm (pit structure fill)
	30-60	Loose dry sandy silty loam with pea gravel (pit structure fill)
17	0-20	Loose sandy loam with charcoal flecks; wet (pit structure fill)
	20-40	Loose silty sand with pea gravel (pit structure fill)
	40-50	Loose silty sand with coarse sandstone gravel (pit structure fill)
18	0-20	Loose brown sandy loam with charcoal flecks (pit structure fill)
	20-40	Loose silty sand with pea gravel (pit structure fill)
	40-70	Loose silty sand with coarse sandstone gravel (pit structure fill)
19	0-20	Loose brown sandy clay loam (pit structure fill)
	20-70	Loose silty sand with pea gravel (pit structure fill)
20	0-20	Loose sandy clay loam with charcoal; sherd at 0-10 cm (pit structure fill)
	20-60	Loose silty sand with pea gravel (pit structure fill)
21	0-30	Loose silty sand; very recent alluvium (pit structure fill)
	30-60	Loose silty sand with gravel (pit structure fill)
22	0-20	Moist brown sandy clay loam with charcoal and stained soil (pit structure fill)
	20-35	Dry sandy loam with charcoal; hit oxidized sandstone (pit structure fill)
23	0-20	Moist brown sandy clay loam with charcoal and charcoal stained soil (pit structure fill)
	20-60	Loose silty sandy loam with charcoal; sherd at 40 cm; stopped by sandstone (pit structure fill)
24	0-30	Loose brown sandy clay loam with charcoal and some oxidized sandstone; sherd at 20 cm (pit structure fill)
	30-50	Loose silty sand with pea gravel (pit structure fill)
25	0-20	Loose brown sandy clay loam with charcoal flecks at 20 cm (pit structure fill)
	20-35	Loose silty sand with gravel; hit rock (pit structure fill)

scatter, which may be the remains of a surface roomblock. Two extramural slab-lined cists are adjacent to the roomblock to the west, and to the south of the roomblock are shallow depressions that represent pit structures. A sheet midden measuring 15 by 17 m is located directly south of the depressions. To the west of the drainage is a sandstone rubble scatter measuring 17 by 10 m. This represents remains of a surface roomblock. A slab-lined cist is adjacent to the roomblock to the west, and south of the roomblock is a shallow depression which auger tests suggest is a pit structure. A sheet midden 12 m in diameter is located south of this depression.

Elements of the Late Pueblo II component are concentrated at the north end of the site. A 20-30 room single-story masonry roomblock lies to the east of the drainage. The roomblock abuts a kiva depression, and a large midden lies to the south. The structure was constructed of tabular sandstone slabs forming a rough L-shape plan that measures 15 by 10 m. The adjacent kiva depression measures approximately 7 m in diameter. The midden is dense and extends 30 by 35 m. Six looter's excavations had been placed in the midden, and sandstone slabs were lying on the surface in the vicinity of the holes. This vandalism does not appear to be recent.

To the west of the drainage, the Late Pueblo II component consists of a 20-30 room single-story masonry roomblock, an attached kiva depression, and a midden. The roomblock was constructed of tabular sandstone slabs forming a rough L-shaped plan. The roomblock measures 20 by 13 m, and the probable kiva depression is approximately 7 m in diameter. A dense midden is located to the south and is 15 by 17 m. Three holes in the midden are probably looter's excavations, and sandstone slabs are lying on the surface around the holes. This vandalism does not appear to be recent.

The Navajo component is represented by six rock art panels and a small corral. All but one rock art panel are located among talus boulders at the north end of the site. The one exception is a panel on a boulder at the south west end of the site. The rock art consists of two general categories: images of modern life such as horses and cars, and inscriptions of names, dates, and addresses (Photo 1). The corral was constructed of tree limbs and sandstone boulders arranged in a rough circle measuring 3 m in diameter.

**LA 26160.** LA 26160 is a complex Anasazi site with one and perhaps two Late Pueblo II residential elements and another architectural element that may be Basketmaker III or Pueblo II (Fig. 4). This site is part of a Late Pueblo II community (LA 26158, LA 26159, LA 26163, LA 26164, LA 116112, and LA 116114) at the base of a cliff and talus slope. LA 26160 is less than 20 m east of LA 26159. LA 26160 was originally recorded by San Juan College (Ford and DeHoff 1977), and it was described as a 20-30 room sandstone pueblo with one or two kiva depressions, a trash mound, and an artifact scatter. The site was revisited and described by Marshall (1988) as a multiple-component site with a massive masonry roomblock with extramural features, an associated kiva, a small unit pueblo, a large midden area, and an artifact scatter. LA 26160 was relocated during the OAS survey, and site information was updated. This included a new site form, a transit map of the site, photographs of features and structures, in-field artifact analysis, and auger tests. In-field analysis was conducted using variable sample radii (Tables 6 and 7). Auger tests were used to locate subsurface deposits, confirm pit structure depressions, and determine the site boundary (Table 8). A site boundary was staked on the basis of the surface and subsurface distributions to facilitate later fencing.



Photo 1. Historic Navajo inscriptions on Panel 1, LA 26159.



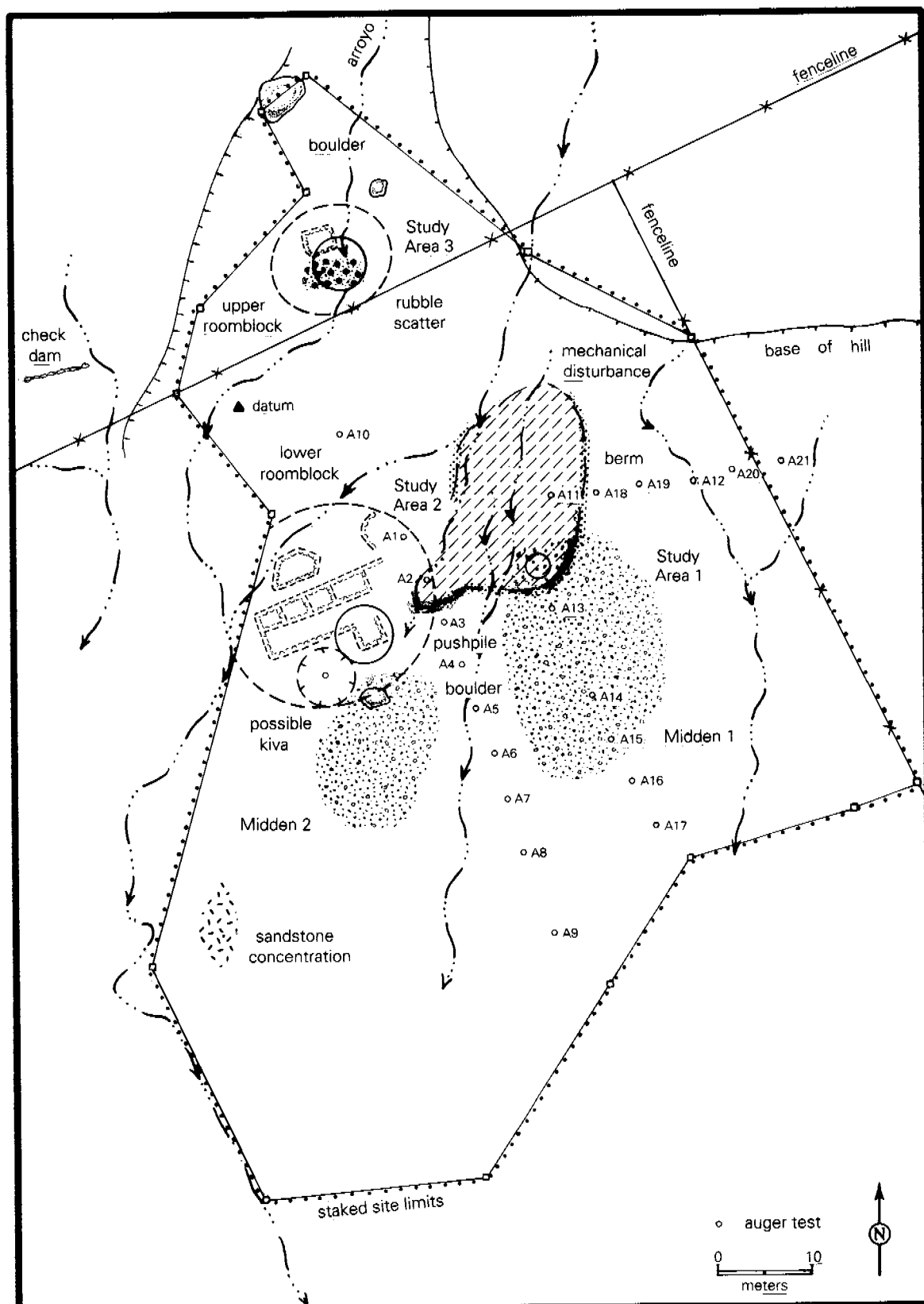


Figure 4. Plan of LA 26160.

Site dimensions are 115 by 85 m. Portions of the site surface have been affected by natural and cultural disturbance. Several areas of the northern and eastern portions of the site are covered with thin alluvium carried by the small drainages that cross the site. There is minor surface evidence of looting, but a large portion of the main roomblock area has been impacted by mechanical disturbance. The east end of the roomblock has been cut by a bulldozer, removing an unknown amount of the architecture and a corner of the adjacent midden. The condition of the remaining site surface is substantially stable, although the areas of mechanical disturbance are being subjected to accelerated erosion.

Table 6. LA 26160 Ceramic Observations

Pottery type	Area 1 (count)	Area 2 (count)	Area 3 (count)
Anasazi Gray Ware			
Plain Gray	10	9	20
Corrugated Gray	10	20	13
Anasazi White Ware			
Red Mesa Black-on-white	2		
Gallup Black-on-white		2	
Escavada-Puerco Black-on-white			1
Unpainted white ware	3	3	
Mineral painted white ware (late)		8	3
Organic painted white ware (late)	1	2	
Total	26	44	37

Table 7. LA 26160 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Area 1	Multidirectional core	Yellow-red jasper	Fine	Complete	0	
Area 2	Projectile point	Obsidian (Jemez?)	Glassy	Complete	0	
Area 3	Core flake	Red jasper	Fine	Complete	0	Single facet

Table 8. LA 26160 Auger Test Results

Hole number	Depth (cm)	Observations
1	0-5	Aeolian/alluvial wash; fine-grained sand; small tabular sandstone
	5-30	Brown clay; sparse charcoal and burned clay; stopped at sandstone
2	0-15	In alluvial wash area, with sand and silt
	15-20	Becomes clayey with sparse charcoal
	20-60	Silty sand with small pieces of sandstone; corrugated sherd at 50-60 cm; stopped at rock; possibly in cultural deposits
3	0-5	Still in alluvial channel; sand, silt, washed rock
	5-30	Sandy brown clay; large chunks of charcoal at 30 cm
	30-110	Soil now stained with charcoal and charcoal chunks, and burned rock; white ware at 70 cm
	110-120	Cleaner fill; sandy clay; stopped at rock; deep midden or kiva fill
4	0-20	Still in alluvial channel; silt and sand
	20-40	Brown sandy clay with sandstone chunks; sherds at 40 cm
	40-50	Charcoal in a dark trashy soil; stopped at rock
5	0-10	Medium brown sandy clay; damp; alluvial wash with small pieces of sandstone
	10-50	Light brown silty sand; 1 Escavada sherd at 20 cm; 1 corrugated sherd at 30 cm; charcoal, burned bone, sandstone pieces; intact deposits likely
6	0-25	Medium brown sandy clay with dark gray platelets; damp; recent alluvial
	25-45	Light brown silty sand; dry; 2 lithics at 30 cm; 6 corrugated sherds
7	0-20	Medium brown sandy clay with dark gray platelets; damp; recent alluvium
	20-65	Light brown silty sand with sandstone chunks; dry; Late mineral sherds (PII-PIII) at 50 cm
8	0-25	Medium brown sandy clay; damp; alluvial; clean
	25-100	Light brown silty sand with sandstone chunks; culturally sterile
9	0-25	Medium brown sandy clay with small pieces of sandstone; damp
	25-80	Light brown silty sand with sandstone chunks; dry; in all Layer 25 (tests 5-9), sandstone chunks were dense between 40-50 cm; possibly old gravel wash; culturally sterile
10	0-20	Dark brown sandy clay; wet
	20-60	Light brown silty sand with dense sandstone gravels; culturally sterile; within recent wash; probably an old wash as well
11	0-15	Medium brown silty clay with some sandstone pieces; damp
	15-80	Light brown silty sand with dense gravels and dark gray platelets; damp; 5 ceramics at 75-80 cm; possible push pile area
12	0-30	Medium brown silty clay with some sandstone pieces; damp
	30-80	Light brown silty sand with dark gray platelets; slightly damp; charcoal at 65 cm, and 75 cm
13	0-30	Medium brown silty clay with sandstone gravels; damp
	30-45	Light brown sand with sandstone gravels; sherds at 40 cm; layer of sandstone at 35-40 cm

Table 8. LA 26160 Auger Test Results

Hole number	Depth (cm)	Observations
	45-100	Dark brown fine silt with artifacts, NH bone, and charcoal; this layer not present in any other tests; concentrated charcoal, ash, and bone at 90 cm
14	0-30	Dark brown sandy loam; damp; alluvial wash with gray platelets
	30-75	Medium brown silty sand with gray platelets; 1 ceramic
	75-80	Dark brown fine silt with charcoal and ceramics
15	0-40	Dark brown silty loam; damp; sandstone; 1 ceramic
	40-60	Light brown silty sand with sandstone gravels; dense sandstone at 45 cm
	60-80	Yellowish brown silt with coarse sand and gravels
	80-100	Dark brown fine silt/clay with charcoal
16	0-20	Dark brown silty loam with sandstone gravels; damp
	20-100	Light brown silty sand; 1 fleck of charcoal at 40 cm; no organic layer present
17	0-30	Dark brown sandy loam; damp
	30-80	Light brown silt with dense sandstone slabs at 40 cm; sandstone concentration continues to 80 cm; slope wash?
18	0-30	Dark brown silty loam with gray platelets; damp
	30-105	Sandy silt with much sandstone gravel
	105-125	Silt; area is south of a drainage disturbed by a bulldozer
19	0-25	Dark brown silty loam; slightly damp
	25-105	Light brown sandy silt
20	0-25	Dark brown silty loam; damp
	25-60	Light brown sandy silt; sandstone gravel increases after 45 cm
	60-100	Light brown sandy silt with more clay colloids; charcoal, corrugated sherd after 70 cm
21	0-40	Dark brown silty loam; damp; transitional zone from 20-40 cm
	40-70	Light brown sandy silt with clay colloids
22	0-25	Dark brown sandy loam with charcoal and sherds; after 5 cm soil is less loamy and organic, though with no clear break (pit structure fill)
	25-120	Light brown sandy silt with charcoal; Puerco, Escavada, and corrugated sherds (pit structure fill)

The site elements include an upper roomblock at the north end of the site and a much more substantial lower roomblock in the center of the site. The upper roomblock consists of a single row of four rooms. These were recognized by 1 to 2 m rows of small sandstone rubble. A sparse artifact and rubble scatter lies to the south, and portions of this component have been buried by recent alluvium. The ceramic sample from the artifact scatter (Area 3) has a higher proportion of Plain Gray sherds than the other portions of the site, but Pueblo II sherds are present as well. Although it is possible that there is a Basketmaker III or early Pueblo I component in this area of the site, there is insufficient reason to assume that this small roomblock could not be Late Pueblo II in age.

The lower roomblock is the main part of the site. It consists of 10-20 rooms in a single-story masonry roomblock, one or possibly two kivas, and two middens. The roomblock was constructed of tabular sandstone, is linear in plan, and measures 8 by 15 m. The roomblock may have extended further to the east prior to bulldozer disturbance, or there may have been a second detached roomblock in the area. Auger tests revealed the probable presence of at least two kivas. The diameters of the kiva depressions are believed to be 6 m. A shallow drainage to the east of the intact rubble mound has deposited several centimeters of alluvium over this portion of the site.

There appear to be two middens at this site, but this appearance may be artificially enhanced by the bulldozer cut that runs just north of the midden area. The east midden extends 25 m south of the roomblock area and is 17 m wide. The west midden is directly south of the intact roomblock. It extends 15 m to the south and is 13 m wide. There have been attempts at pothunting, as evidenced by shallow holes and slabs strewn on the surface. Both middens are recognized by a dense surface concentration of artifacts. Pottery samples from both the roomblock and the eastern midden are consistent with a Late Pueblo II age for the central portion of the site.

**LA 26163.** LA 26163 is a complex Pueblo II Anasazi site (Fig. 5). It is part of a community of Late Pueblo II Anasazi sites (LA 26158, LA 26159, LA 26160, LA 26164, LA 116112, and LA 116114) at the base of a high cliff and talus slope. LA 26163 was originally recorded by San Juan College (Ford and DeHoff 1977) and was described as a 20-30 room L-shaped masonry pueblo, possibly two stories in the center, with two kiva depressions, trash mounds, and two rough square surface rooms northwest of the pueblo. The site was revisited by Marshall (1988), and a detailed sketch map was produced which illustrates and describes an upper roomblock, a lower unit pueblo, and multiple middens. Disturbance in the form of roads and well pads occurred between 1977 and 1988, along with mechanical disturbance that was not related to mining activity. LA 26163 was relocated during the OAS survey, and all site information was updated. This included a new site form, a transit map of the site, photographs of features and structures, in-field artifact analysis, and auger tests. In-field sampling was conducted within the middens (Tables 9 and 10). Auger tests were used to locate intact subsurface deposits (Table 11).

A site boundary had been fenced following Marshall's description, and the appropriateness of that boundary was confirmed by the OAS investigations. Scattered artifacts are present in a road and spoil pile area immediately south of the site (Photo 2), but the artifacts are in disturbed contexts. There is no evidence of structures or features outside of the fenced area, and there is no evidence that major elements of the site extended south of the present fence in either Ford and DeHoff's (1977) or Marshall's (1988) descriptions. LA 26163 measures 90 by 85 m and is at the base of a southeast-facing cliff and talus slope on an alluvial fan above the unnamed tributary of the Puerco River. Well pad and road construction prior to fence installation has destroyed portions of the middens and the upper roomblock. Auger tests in the disturbed areas identified the presence

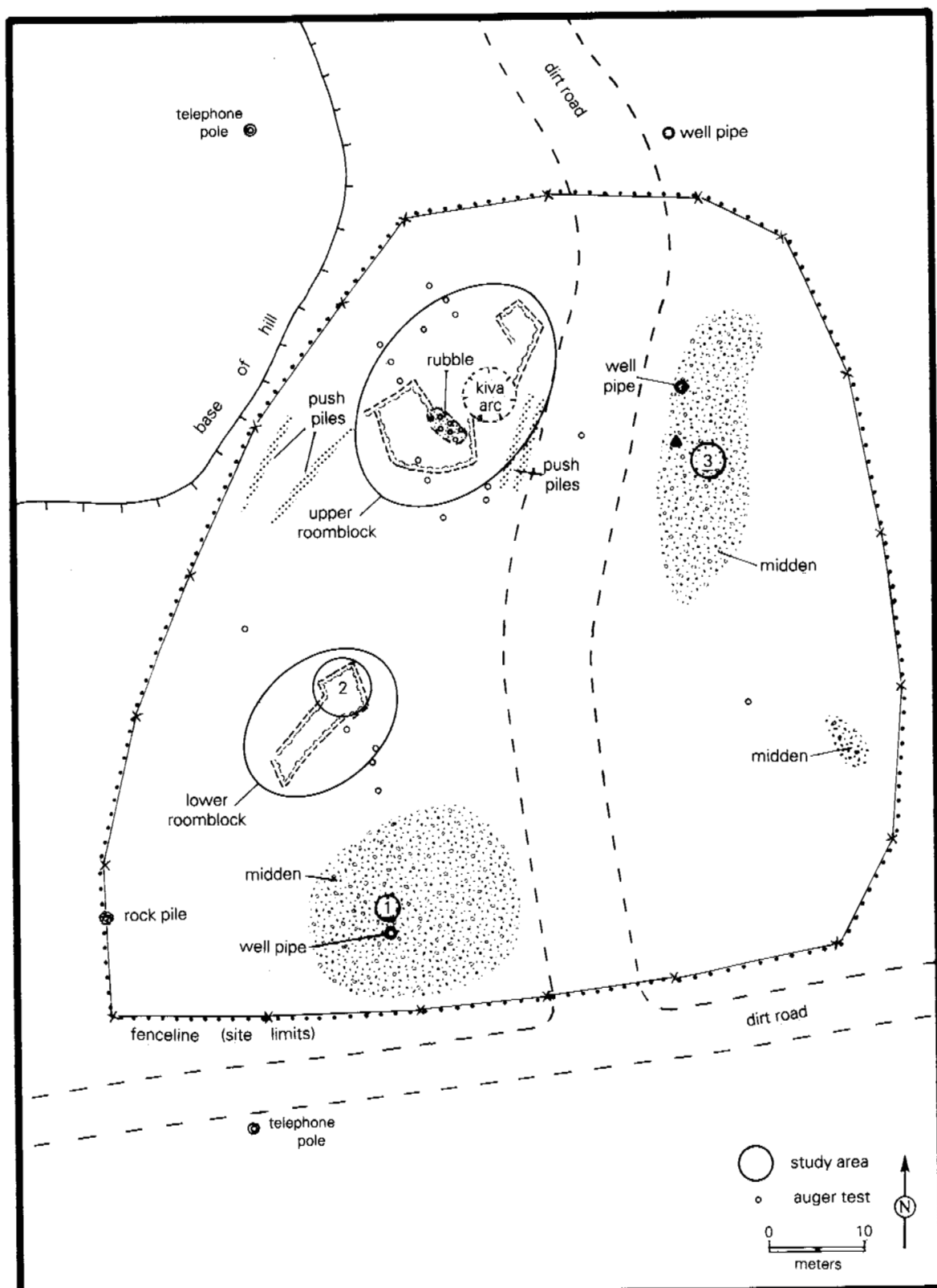


Figure 5. Plan of LA 26163.

Table 9. LA 26163 Ceramic Observations

Pottery type	Area 1 (count)	Area 2 (count)	Area 3 (count)	Area 4 (count)
Anasazi Gray Ware				
Lino Gray	3			
Plain Gray	69	9	18	3
Pueblo II Corrugated Rim	2			
Pueblo II-III Corrugated Rim	1		1	
Pueblo III Corrugated Rim	2			
Corrugated Gray	286	28	75	16
Anasazi White Ware				
Red Mesa Black-on-white	2	1		
Gallup Black-on-white	36	2	7	4
Escavada-Puerco Black-on-white	8	4	3	
Unpainted white ware	21	3		3
Mineral painted white ware (late)	12		6	7
Organic painted white ware (late)	2		3	
Anasazi Red Ware				
Puerco Black-on-red	1	2	3	2
White Mountain Redware, painted	2			1
White Mountain Redware, unpainted	1	2	2	1
Total	448	51	118	37

Table 10. LA 26163 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Area 1	Core flake	Tan silicified wood	Fine	Complete	0	Single facet
	Core flake	Red jasper	Fine	Complete	0	Single facet
	Core flake	Pink quartzite	Medium	Complete	40	Cortical
	Core flake	Brown dendritic chert	Fine	Distal ½	0	
Area 2	Angular debris	Red-tan silicified wood	Fine		0	
Area 3	Multidirectional core	Tan dendritic chert	Fine		0	
	Spall flake	Purple quartzite	Medium	Complete	60	Cortical
	Angular debris	Purple-red silicified wood	Fine		40	
	Multidirectional core	Tan dendritic chert	Fine		30	
	Angular debris	White chert	Fine		0	
	Core flake	Red jasper	Glassy	Proximal ½	0	Multiple facet
	Core flake	Tan-red chalcedony	Glassy	Complete	0	Single facet
	Angular debris	Red jasper	Fine		0	



Table 11. LA 26163 Auger Test Results

Hole number	Depth (cm)	Observations
1	0-10	Moist brown sandy clay loam
	10-20	Drier sandy clay loam with sandstone, gravel and charcoal fleck; hit rock-possible wall fall
2	0-20	Moist brown sandy clay loam
	20-30	Drier sandy loam with sandstone; hit sandstone; possible wall fall
3	0-20	Wet brown sandy clay loam
	20-30	Drier sandy clay loam with some sandstone
	30-40	Sandy loam with charcoal and artifacts; late ceramic sherds-banded bowl rim
4	0-10	Brown wet sandy clay loam
	10-40	Blocky consolidated brown clay; sherd and charcoal fleck at 20 cm
5	0-10	Wet brown sandy clay loam
	10-20	Drier sandy clay loam with charcoal, oxidized sandstone, artifacts and wood
	20-30	Sandstone and sandy loam; charcoal present; hit rocks; probably wall fall
6	0-10	Wet sandy clay loam
	10-30	Blocky brown clay with charcoal and sandstone; looks mixed; hit rock; probably wall fall
7	0-10	Wet sandy clay loam
	10-35	Blocky brown clay
8	0-10	Moist sandy loam with clay
	10-40	Sandy loam with sandstone gravel and charcoal flecks
	40-80	Sandy loam with artifacts, charcoal, and sandstone gravel; hit rock
9	0-10	Sandy loam with clay; wet
	10-70	Loose sandy loam with sandstone gravel; charcoal at 40 cm; large sandstone at 30 cm
10	0-10	
	10-20	Loose brown sandy loam with charcoal flecks; sherd at 20 cm
	20-50	Darker brown sandy loam with increase of sandstone gravel; hit rock
11	0-10	Moist sandy loam with clay
	10-20	Loose sandy loam with charcoal and a sherd
	20-40	Loose sandy loam with large pieces of sandstone
	40-90	Loose sandy loam with sandstone gravel
12	0-10	Moist sandy loam with clay and some sandstone gravel
	10-30	Loose sandy loam with sandstone gravel
	30-40	Loose sandy loam with larger pieces of sandstone
	40-60	Loose sandy loam with increased amounts of sandstone gravel
13	0-20	Sandy loam with sandstone gravel, artifacts, and charcoal; hit rock

Table 11. LA 26163 Auger Test Results

Hole number	Depth (cm)	Observations
14	0-50	Loose sandy loam with sandstone gravel and charcoal
	50-60	Big sherds and charcoal; hit rock
15	0-10	Wet sandy loam with clay and sandstone gravel
	10-30	Loose sandy loam with large pieces of sandstone and charcoal
	30-50	Loose sandy loam with sandstone gravel and charcoal flecks
	50-80	Loose sandy loam with charcoal, artifacts, and sandstone gravel; hit rock; possible pit structure
16	0-10	Wet sandy loam
	11-40	Loose and dry, sandy, with sandstone pieces
	40-50	Loose and dry, sandy, with large, dense sandstone layers
	51-100	Very fine silty sand with sandstone pieces
17	0-20	Wet brown sandy loam/clay, with small sandstone gravels
	20-49	Dry sand with sandstone fragments
	50-60	Dry sandy clay with sandstone fragments; more clay content; platey
18	0-20	Wet sandy clay; alluvial wash; less clay content than upper levels of previous tests; sherd from 0-10 cm
	20-30	Dry silty sand with sandstone fragments; 1 sherd
	30-50	Dry silty sand; increase in sandstone fragments
19	0-30	Wet sandy clay
	30-60	Dry sand with sandstone fragments; charcoal flecks from 30-50 cm
	60-75	Dry sand with an increase in size and number of sandstone fragments; small platelets of clay

of what appear to be intact deposits below the zone of disturbance. The site condition is mixed. Areas that have been unaffected by construction are generally stable, but the construction has encouraged local erosion that affects both disturbed and undisturbed portions of the site.

The Late Pueblo II Anasazi component is represented by an upper and lower roomblock, each with associated pit structure depressions and middens. The upper roomblock is the more substantial of the two. It consists of 20-30 rooms in a single-story masonry roomblock, and a kiva is integrated with the roomblock. A pit structure depression and a midden are adjacent. The roomblock was constructed of tabular sandstone slabs, originally forming a rough L-shape and measuring 10 by 20 m. South and adjacent to the roomblock is what appears to be a pit structure depression measuring approximately 6 m in diameter. A dense midden is located 15 m to the east of the rubble mound. Its extent has been truncated by road disturbance, and its present size is 30 by 10 m.

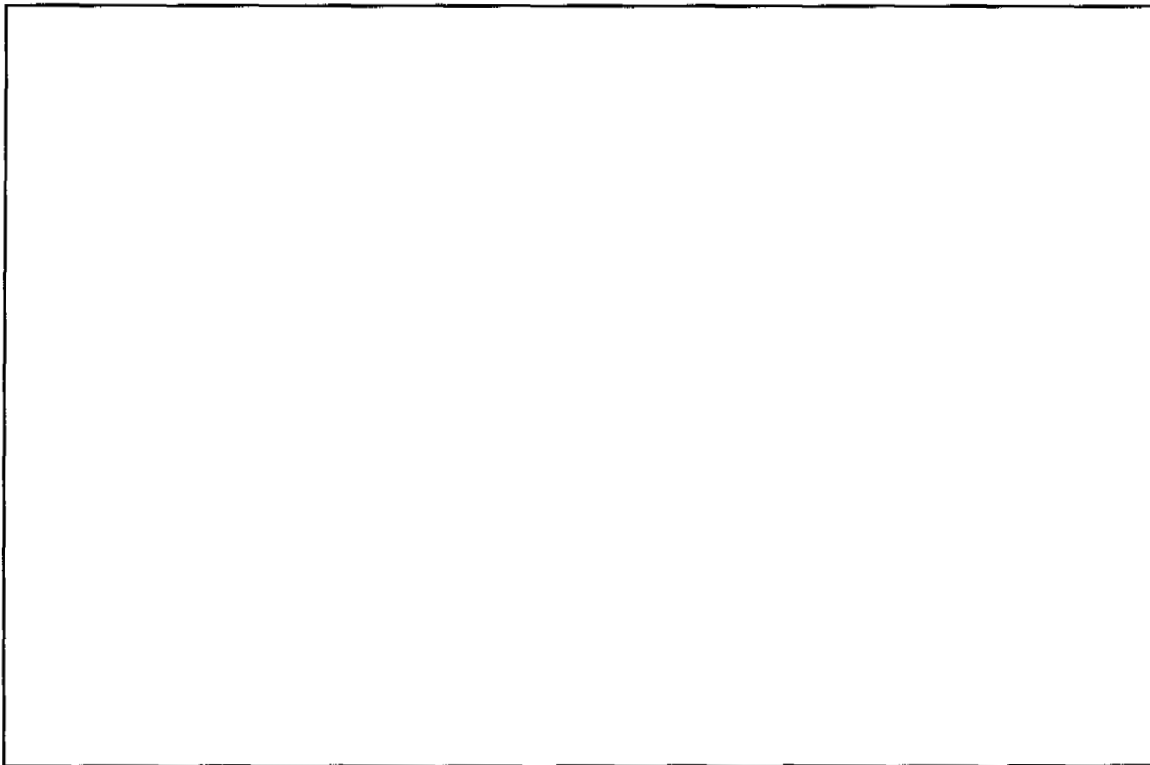


Photo 2. View south across LA 26163 toward road and spoil piles.

The lower roomblock is located 20 m to the south-southeast of the upper roomblock. It measures 3 by 13 m and consists of four or five single-story rooms. The structure was constructed of unshaped tabular sandstone slabs and rubble, and it is linear in plan. Auger tests revealed the presence of a 5 m diameter pit structure to the southeast of the roomblock. This feature had no surface manifestation. A dense midden is located 10 m to the south of the rubble mound and covers an area of 15 by 20 m. All of the ceramic samples appear to be contemporary, reflecting Late Pueblo II occupations.

**LA 26164.** LA 26164 is a complex and highly disturbed Late Pueblo II Anasazi site (Fig. 6). It is the northernmost of six sites (including LA 26158, LA 26159, LA 26160, LA 26163, LA 116112, and LA 116114) that form a community at the base of the high, south-facing cliff and talus slope.

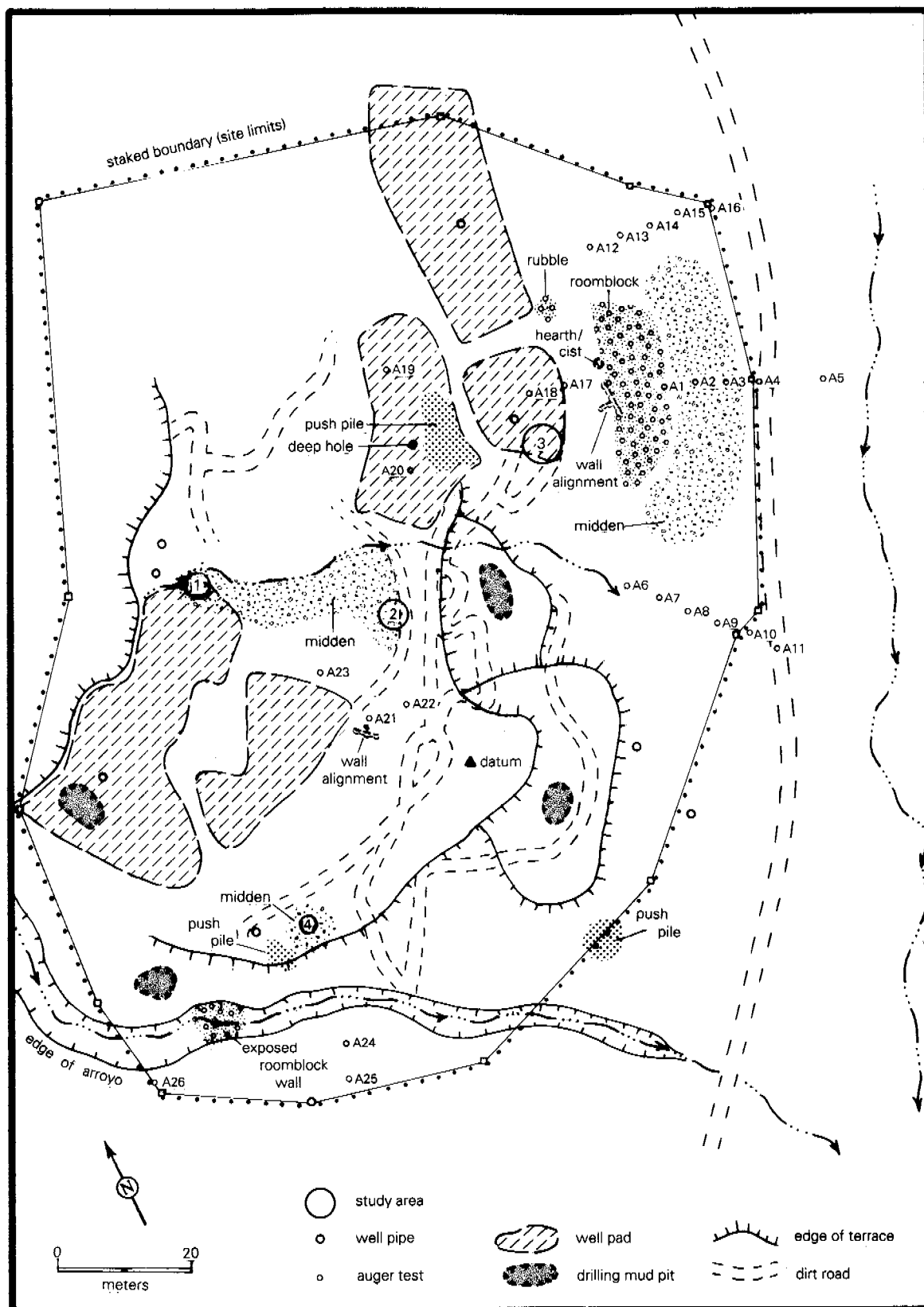


Figure 6. Plan of LA 26164.

Table 12. LA 26164 Ceramic Observations

Pottery type	Area 1 (count)	Area 2 (count)	Area 3 (count)	Area 4 (count)
Anasazi Gray Ware				
Lino Gray	1	1		
Plain Gray	3	2	5	1
Pueblo II-III Corrugated Rim		2		
Corrugated Gray	10	130	40	17
Anasazi White Ware				
Red Mesa Black-on-white	1		3	
Gallup Black-on-white	10	27	7	4
Escavada-Puerco Black-on-white	3	1	1	
Reserve Black-on-white			1	
Unpainted white ware	4	18	3	2
Mineral painted white ware (late)	5	24	7	
Total	37	205	67	24

Table 13. LA 26164 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Area 2	Core flake	Brown-purple silicified wood	Fine	Complete	0	Collapsed
	Angular debris	Red jasper	Fine		0	
Area 3	Angular debris	Purple quartzite	Medium		0	
	Angular debris	Brown silicified wood	Fine		0	
Area 4	Pecking stone	Brown-red silicified wood	Fine		30	

Table 14. LA 26164 Auger Test Results

Hole number	Depth (cm)	Observations
1	0-30	Dark brown silty loam; damp
	30-90	Light brown sandy silt; more clay platelets from about 65 cm; charcoal throughout
2	0-25	Dark brown silty loam; damp
	25-35	Light brown sandy silt
	35-55	Light brown sandy silt with compacted dry clayey lumps
3	0-25	Dark brown silty loam; damp
	25-40	Light brown sandy silt
	40-60	Light gray-brown sandy silt with clay lumps at about 50 cm
4	0-25	Dark brown silty loam; much blackish-gray clay from 0-10 cm; charcoal fleck at about 20 cm
	25-130	Light brown sandy silt; dry clayey lumps begin at about 70 cm; charcoal at 100 cm; small charcoal flecks with sandy clay lumps to 130 cm
5	0-25	Dark brown silty loam
	25-100	Light brown sandy silt; hard sandy-clay lumps from about 55-100 cm
6	0-30	Dark brown silty loam; damp
	30-100	Light brown sandy silt with sandstone gravel; charcoal at about 55 cm, and at about 80-100 cm
7	0-30	Dark brown silty loam; damp
	30-105	Light brown sandy silt; compaction at about 40 cm; charcoal fleck at about 55 cm, charcoal flecks to 105 cm
8	0-30	Dark brown silty loam; damp
	30-110	Light brown sandy silt; charcoal flecks at 40-110 cm
9	0-40	Dark brown silty loam with charcoal flecks; damp
	40-100	Light brown sandy silt with small charcoal flecks
10	0-30	Dark brown silty loam; damp
	30-100	Light brown sandy silt with a few small charcoal flecks
11	0-30	Dark brown silty loam; damp
	30-100	Light brown sandy silt; sparse charcoal flecks throughout
12	0-30	Dark brown silty loam; damp
	30-90	Light brown sandy silt with sparse charcoal flecks throughout; larger piece of charcoal at 70 cm
13	0-30	Dark brown silty loam; damp
	30-90	Light brown sandy silt; charcoal flecks at 55 cm, and sparsely distributed to 90 cm
14	0-30	Dark brown silty loam; damp
	30-100	Light brown sandy silt; charcoal and charcoal flecks from 55-100 cm
15	0-25	Dark brown silty loam; damp
	25-80	Light brown sandy silt; charcoal flecks very sparse from 50-80 cm

Table 14. LA 26164 Auger Test Results

Hole number	Depth (cm)	Observations
16	0-30	Dark brown silty loam with charcoal at about 25 cm; damp
	30-55	Light brown sandy silt
17	0-40	Silty loam mottled with light gray clay, decomposing crushed orange sandstone, and gravel
	40-90	Light brown sandy silt with much sandstone and few charcoal flecks; sherd at about 55 cm and 65 cm; sherd and piece of charcoal at about 75 cm
18	0-25	Dark brown sandy silt with much sandstone
	25-75	Light brown sandy silt; charcoal from 25-35 cm; sherds from 55-65 cm
19	0-30	Silty loam mottled with gray and orange sandstone
20	0-30	Silty loam mottled slightly with orange and gray; much sandstone
21	0-30	Silty loam mottled slightly with gray and orange; much sandstone
22	0-30	Silty loam mottled with orange and gray; much sandstone
23	0-30	Dark brown silty loam
	30-55	Light brown sandy silt with much sandstone; charcoal flecks at 30 cm
24	0-30	Dark brown silty loam
	30-140	Light brown sandy silt; charcoal fleck at 120 cm
25	0-30	Dark brown silty loam
	30-140	Light brown sandy silt
26	0-25	Dark brown silty loam
	25-145	Light brown sandy silt

This site was originally recorded by San Juan College (Ford and DeHoff 1977) and was described as several one-story roomblocks and a large artifact scatter. LA 26164 was relocated during the OAS survey, and site information was updated. This included a new site form, a transit map of the site area, photographs of features and structures, in-field artifact analysis (Tables 12 and 13), and auger tests (Table 14). A site boundary was staked on the basis of the surface and subsurface distributions to facilitate later fencing. In addition to these recording efforts, a map was created to describe the site condition in terms of estimated integrity.

Site condition has been affected by both erosion and construction. An entrenched arroyo crosses the southwestern portion of the site, both exposing and removing cultural features. The arroyo has exposed a portion of a buried roomblock and provides a stratigraphic profile of the alluvial fan deposits that buried the roomblock. The overlying alluvial deposit includes angular blocks of sandstone up to several meters across in a matrix of sands and gravels. This deposit reflects one or more extremely violent flood events originating from the canyon wall to the northwest of the site. The floods occurred after the site was abandoned and buried the southwestern portion of the site with up to 2 m of sediment. The modern arroyo entrenchment has dissected these deposits, exposing the buried roomblock and midden deposits to the southeast of the roomblock. Historic disturbance consists of road and well pad construction within the site boundaries. Some construction had already occurred when the site was originally described in 1977, and additional construction has taken place since. The site condition is substantially unstable. The natural entrenchment of the arroyo and erosion initiated by the construction activity pose a threat to the majority of the site, with the possible exception of the northeast corner.

As defined by surface and arroyo exposures, LA 26164 covers an area of 150 by 120 m. Scattered intact deposits include portions of two roomblocks and two middens, with an additional wall alignment that may reflect another roomblock location. These roomblocks, middens, and alignments appear to represent the remains of at least four different architectural components. No evidence of pit structures was detected. The two masonry roomblocks are located in the northeastern and southwestern portions of the site. The roomblocks are single story and were constructed of tabular sandstone. Due to the disturbance and alluvial cover, roomblock shapes and sizes cannot be determined with any accuracy. The midden associated with the northern roomblock covers an area of 40 by 15 m, and auger tests in this area identified subsurface cultural deposits. This portion of the site was sampled by Study Area 3, 15 m to the west of the roomblock. The central midden measures 15 by 30 m and was sampled by Study Areas 1 and 2. The southern midden is adjacent to the arroyo and was sampled by Study Area 4. Pottery types in all of the samples are consistent with contemporary occupations in the Late Pueblo II period.

Although the surface of this site has been subjected to extensive construction activity, intact cultural deposits are present on the surface, and the presence of some intact subsurface deposits was suggested by auger test results. In order to better characterize the integrity of the site, a map was prepared that reflects field estimates of site condition (Fig. 7). There are only three relatively small areas where the surface of the site is intact over discrete cultural features. These include the northeastern roomblock, the central midden, and the southwestern midden. Buried intact deposits are located at the northeastern side and southwestern corner of the site. A large area of the center of the site, the southeast corner, and a portion of the northeast corner are covered with disturbed deposits that may or may not overlie intact cultural deposits. Finally, intact cultural deposits are absent from the northwest corner, a small area in the center of the site, and a portion of the southeast corner.



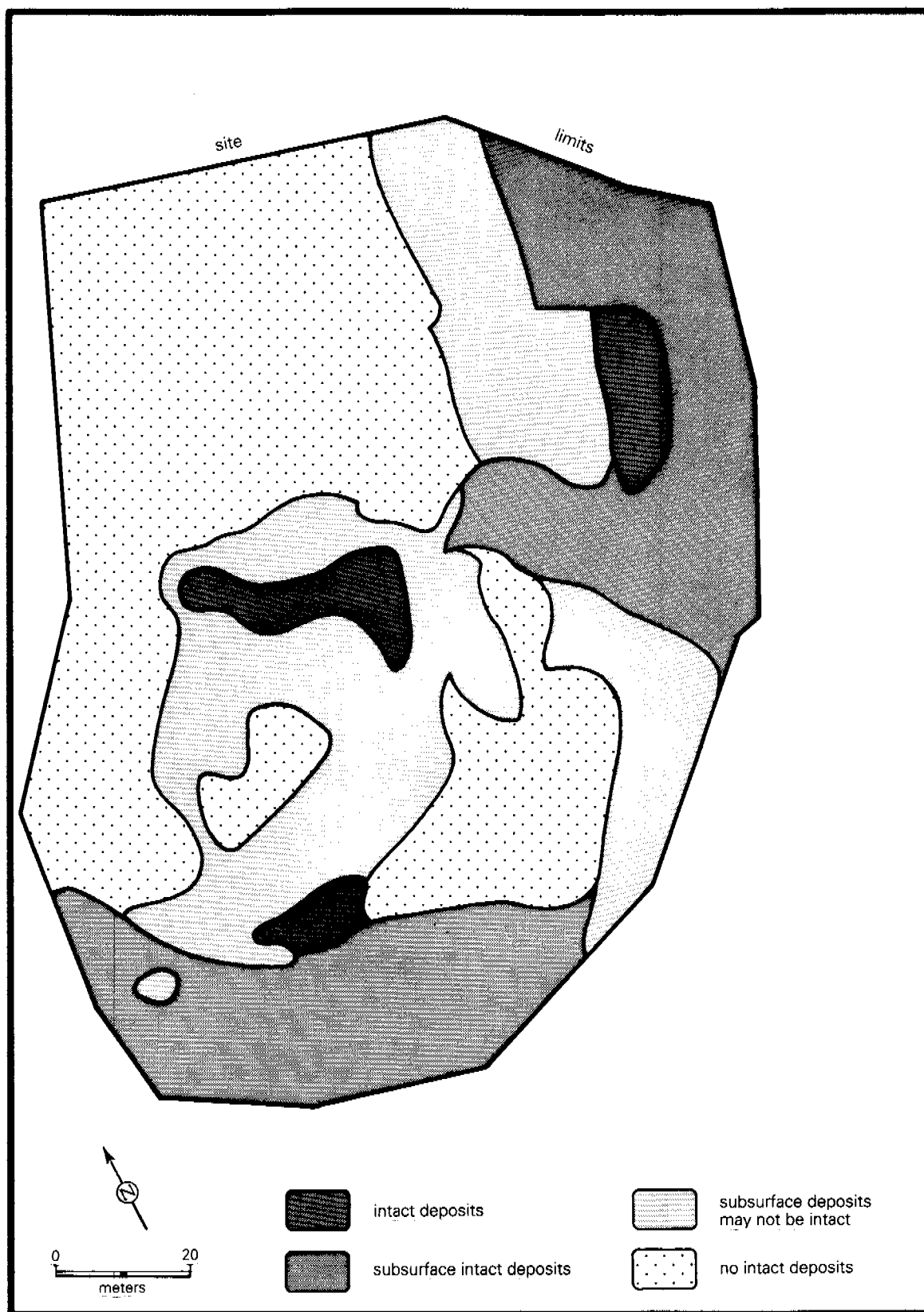


Figure 7. Integrity areas of LA 26164.

**LA 116112.** LA 116112 is a Late Pueblo II Anasazi site (Fig. 8). This site is on the floodplain of the major unnamed tributary arroyo of the Puerco River that runs along the east side of Section 8, and the site is about 30 m downslope from the southeast boundary of LA 26164. This site is part of the Late Pueblo II community that includes LA 26158, LA 26159, LA 26160, LA 26163, LA 26164, and LA 116114, but it is a minor element of that community. This previously unrecorded site was located during the OAS survey and was assigned field number HRI-2. Site recording included completion of a site record form, preparation of a transit map of the site area, photographs, in-field artifact analysis (Tables 15 and 16), and auger tests (Table 17). The site boundary was staked to facilitate later fencing.

The eastern boundary of the site is formed by the deeply entrenched tributary arroyo bank, and a smaller entrenched arroyo runs through the southern portion of the site. A well pad was constructed within the site boundaries. Construction activities have resulted both in ground disturbance and in some alluvial deposition that obscures a portion of the site surface. The site condition is mixed. The expansion of the entrenched arroyos through and adjacent to the site will progressively remove currently intact portions of the deposits. There is some erosion associated with the portions of the site affected by prior construction activities, but the pace and scale of that erosion is comparatively minor.

LA 116112 consists of a low-density artifact scatter and one possible surface feature. As defined by the artifact scatter, the site measures 55 by 57 m. The artifacts are sparsely distributed over the entire site, with a moderately dense concentration at the site center. This concentration measures 8 m in diameter consists primarily of ceramics. Two flaked lithic artifacts and two pieces of burned bone were observed on the site. A scatter of unshaped sandstone rubble is north of the artifact scatter and appears to include a rock alignment. The northern portion of this feature was disturbed by well pad construction.

The auger tests encountered lignite in several holes and charcoal in one. Lignite lenses are common in the natural alluvial deposits of the tributary arroyo and can be confused with charcoal that is probably of cultural origin. The single occurrence of charcoal was verified in auger hole 8 to the east of the artifact concentration. Based on this occurrence, it is likely that there are subsurface deposits at the site, but they are restricted in extent compared with the subsurface evidence from the more substantial sites of the Late Pueblo II community.

**LA 116114.** LA 116114 is a multiple-component Anasazi site that has been bladed (Fig. 9). Pottery types suggest the presence of a small Basketmaker III component with a larger Late Pueblo II component. The Late Pueblo II component is part of the community that includes LA 26158, LA 26159, LA 26160, LA 26163, LA 26164, and LA 116112. This site is set toward the back of the floodplain, separated from the canyon wall by LA 26160. Previously unrecorded, this site was located during the OAS survey and was assigned field number HRI-4. Site documentation included completion of a site record form, preparation of a transit map of the site area, photographs, in-field artifact analysis (Tables 18 and 19), and auger tests (Table 20). In-field analysis was conducted by recording all artifacts within three 5 m diameter sample areas.

This site has been subject to extensive and systematic blading over the entire site surface. Sufficient material culture and architectural rubble is present that its original surface manifestations were probably comparable to those of LA 26160. If it had been intact, this site should have been detected by either the Ford and DeHoff or Marshall surveys, but there is no independent indication of when the blading may have taken place. The blading has destroyed the integrity of all surface

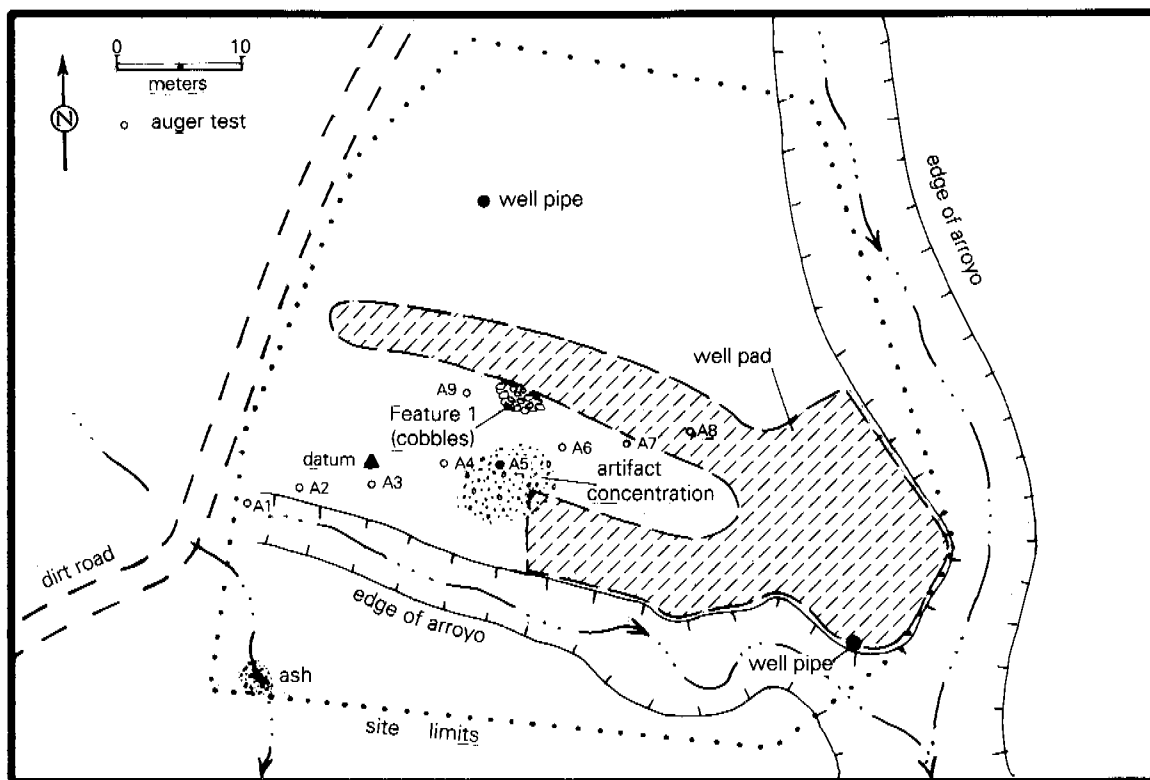


Figure 8. Plan of LA 116112.

Table 15. LA 116112 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	8
Unindented Corrugated Gray	1
Incised Corrugated Gray	1
Corrugated Gray	25
Anasazi White Ware	
Gallup Black-on-white	10
Escavada-Puerco Black-on-white	6
Pueblo II Black-on-white	6
Unpainted white ware	7
Total	64

Table 16. LA 116112 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Bidirectional core	Tan-yellow jasper	Fine	Complete	5	
	Core flake	Tan jasper with black spots	Fine	Complete	20	Collapsed

Table 17. LA 116112 Auger Test Results

Hole number	Depth (cm)	Observations
1	50	Backfill from road over light brown sandy loam
2	78	Light brown sandy loam
3	0-74	Sandy loam
	74-95	Caliche and sandy loam
	95-106	Medium sized pebbles
4	0-86	Medium brown sandy loam
	86-102	Caliche
5	0-30	Medium brown clay loam
	30-75	Sandy loam
	75	Caliche trace
	75-108	Sandy loam
6	0-48	Sandy loam cm; sandy loam to 1.16
	48	Caliche trace
	48-89	Sandy loam
	89-96	Sandy loam with lignite flecks
	96-116	Sandy loam
7	0-55	Medium brown clay loam to sandy loam
	55	Caliche trace
	55-72	Medium brown sandy loam
	72	Lignite trace
	72-118	Medium brown sandy loam
8	0-25	Medium brown clay loam
	25-96	Sandy loam
	96	Charcoal
	96-119	Sandy loam
9	0-76	Medium brown sandy loam
	76	Caliche trace
	76-107	Medium brown sandy loam with pebbles and small lignite flecks

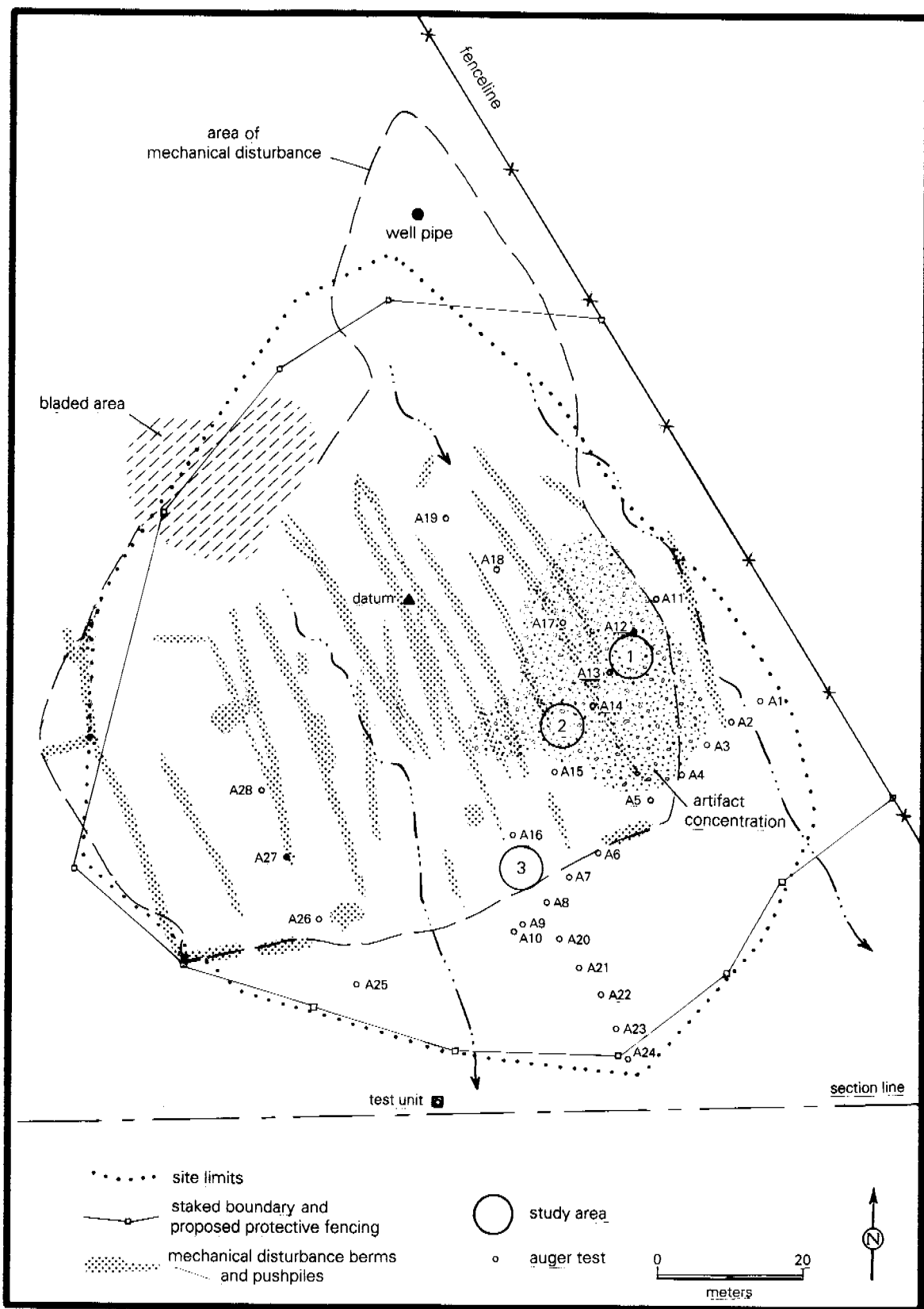


Figure 9. Plan of LA 116114.

Table 18. LA 116114 Ceramic Observations

Pottery type	Area 1 (count)	Area 2 (count)	Area 3 (count)
Anasazi Gray Ware			
Plain Gray	6	2	8
Corrugated Gray	12	5	5
Anasazi White Ware			
La Plata Black-on-white	1		1
Red Mesa Black-on-white		1	
Gallup Black-on-white		1	1
Escavada-Puerco Black-on-white		3	
Unpainted white ware		9	3
Organic painted white ware (late)	1		
Total	20	21	18

Table 19. LA 116114 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Core flake	Red siltstone	Medium	Proximal	0	Multifacet
	Core flake	Purple quartzite	Coarse	Proximal	0	Multifacet
	Core flake	White chert	Fine	Complete	0	Multifacet
	Core flake	Purple quartzite	Medium	Complete	20	Cortical

Table 20. LA 116114 Auger Test Results

Hole number	Depth (cm)	Observations
1	0-20	Dark brown silty loam; damp
	20-100	Light brown sandy silt; most very fine, some lumps of more clayey soil; tiny gray platelets at about 60 cm
2	0-20	Dark brown sandy silt; damp
	20-100	Light brown sandy silt, lenticular compressed sand lumps
3	0-20	Dark brown silty loam; damp
	20-55	Light brown sandy silt; clayey-sand lumps present at about 30 cm
4	0-30	Dark brown silty loam; damp
	30-55	Light brown sandy silt with clayey-sand lumps
5	0-30	Dark brown silty loam; damp
	30-55	Light brown sandy silt with clayey-sand lumps
6	0-20	Dark brown silty loam; damp
	20-55	Light brown sandy silt with clayey-sand lumps
7	0-25	Dark brown silty loam; damp
	25-90	Light brown sandy silt; fairly large charcoal pieces (.5 cm) found at 25-40 cm, 55-75 cm, and at 75-90 cm below surface; stopped at a rock
8	0-25	Dark brown silty loam; damp
	25-105	Light brown sandy silt with clayey-sand lumps; charcoal found at 25-40 cm, 55-75 cm, 75-95 cm, and 95-105 cm below surface
9	0-20	Dark brown silty loam; charcoal found near transition to the next stratum
	20-45	Light brown sandy silt with possible charcoal flecks; stopped at a rock
10	0-20	Dark brown silty loam; damp
	20-45	Light brown sandy silt; small flecks of charcoal at about 30-40 cm; stopped at a rock
11	0-20	Dark brown silty loam; damp
	20-55	Light brown sandy silt with clayey-sand lumps; charcoal at 20-30 cm
12	0-15	Dark brown silty loam
	15-130	Light brown sandy silt; charcoal found at 15-25 cm, and at 55-130 cm
13	0-30	Dark brown silty loam; charcoal present
	30-60	Light brown sandy silt; adobe, charcoal, adobe with charcoal in matrix at about 60 cm
14	0-20	Dark brown silty loam; damp
	20-90	Light brown sandy silt; charcoal at 30-40 cm, and at 85-90 cm
15	0-30	Dark brown silty loam; charcoal at 10-20 cm
	30-40	Light brown sandy silt
	40-60	Reddish sand; presence of decomposing red sandstone
16	0-40	Dark brown silty loam



Table 20. LA 116114 Auger Test Results

Hole number	Depth (cm)	Observations
17	40-80	Light brown sandy silt with lumps of clayey-sand and some tabular sandstone
	0-30	Dark brown silty loam
	30-40	Light brown sandy silt
	40-90	Reddish sand; sherd at 50 cm; copper wire and charcoal at 80 cm; sherd at 90 cm
	90-130	Light brown sandy silt with pockets of gray sandy clay; buried wood fragments at 120 cm
18	0-25	Moist brown sandy clay loam with few pea gravels
	25-40	Brown blocky clay with some pea gravel
	40-50	Brown clay mixed with reddish sand and pea gravels
	50-60	Brown sandy clay loam with pea gravels and gray clay lumps
19	0-25	Dark brown silty loam; damp; tiny charcoal flecks below 10 cm
	25-35	Light brown sandy silt with charcoal
	35-60	Red sand with lumps of gray sandy-clay; charcoal at 35-45 cm
20	0-25	Dark brown silty loam with tiny charcoal flecks; damp
	25-110	Light brown sandy silt with tabular sandstone; charcoal at 25-45 cm, and 65-100 cm
21	0-25	Dark brown silty loam with charcoal; damp
	25-30	Light brown silty sand with charcoal; stopped at a rock
22	0-25	Dark brown silty loam with charcoal; damp
	25-35	Light brown sandy silt with charcoal; stopped at rock
23	0-20	Dark brown silty loam; damp
	20-45	Light brown sandy silt; compacted at about 25 cm where clay colloids make the soil lumpy and hard within this fine strata
24	0-20	Dark brown silty loam
	20-55	Light brown sandy silt with much sandstone; sherd and charcoal at 20 cm, charcoal at 50 cm
25	0-35	Dark brown silty loam; damp
	35-90	Light brown sandy silt
26	0-25	Dark brown silty loam; damp
	25-60	Light brown sandy silt
	60-80	Coarse sandstone, gravel and sandy silt
27	0-20	Dark brown silty loam; damp
	20-95	Light brown sandy silt with pea gravel
28	0-20	Dark brown silty loam; damp
	20-75	Light brown sandy silt with pea gravel

deposits, and there is no remaining surface evidence of structures or features. However, intact subsurface deposits were identified through auger tests. Site stability is poor due to the greater susceptibility of the site surface to erosion. However, there are no immediate threats to the potentially intact subsurface deposits.

LA 116114 consists of a dense artifact scatter which measures 103 by 107 m, undoubtedly larger than its predisturbance size. Despite the considerable earth movement, there was a distinct concentration of surface artifacts in the east central portion of the site. The presence of La Plata Black-on-white in combination with Pueblo II pottery types in the sampling areas indicates two components, one Basketmaker III and one Late Pueblo II. Because of the disturbance, there is no possibility of distinguishing the two components spatially based on surface remains. Auger tests identified extensive intact subsurface cultural deposits starting at 25 cm below the surface (see Table 20). These deposits were also concentrated in the east half of the site and consisted of artifacts, charcoal, and burned adobe. The amount and depth of these deposits suggests the presence of buried structural remains. It is likely that the predisturbance site location was in the eastern two-thirds of the present site boundary.

**LA 88872.** LA 88872 is a single component Pueblo II Anasazi site (Fig. 10). The site is located toward the base of a talus slope on the east side of the major tributary arroyo to the Puerco River, about 3 m above the elevation of the floodplain. Water and wind erosion have deflated portions of the site. This site was originally recorded by Marshall (1993) and was described as a single masonry room, with abundant fallen masonry, a scatter of sherds from a single corrugated jar, and a hearth. LA 88872 was relocated during the OAS survey, and site information was updated. A new site form was completed, a compass map of the site area was prepared, photographs were taken of features and structures, and in-field analysis was completed for all surface artifacts (Table 21).

Table 21. LA 88872 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	2
Corrugated Gray	10
Anasazi White Ware	
Mineral painted white ware (late)	1
Total	13

As defined by the OAS survey, the site consists of a large boulder with a very low west-facing overhang, an artifact scatter, and a possible hearth within an 8 by 11 m area. The single masonry room and abundant fallen masonry described by Marshall could not be redefined with confidence, although most other site features and the artifact scatter were relocated. The artifacts were sparsely distributed, with a slight concentration west of overhanging boulder face. Within the overhang is a scatter of oxidized sandstone that may represent a small hearth. A hearth described by Marshall as being within the overhang of an adjacent boulder could not be redefined. The pottery recorded on the site surface represent remains of at least two cooking jars and an unclassifiable mineral-

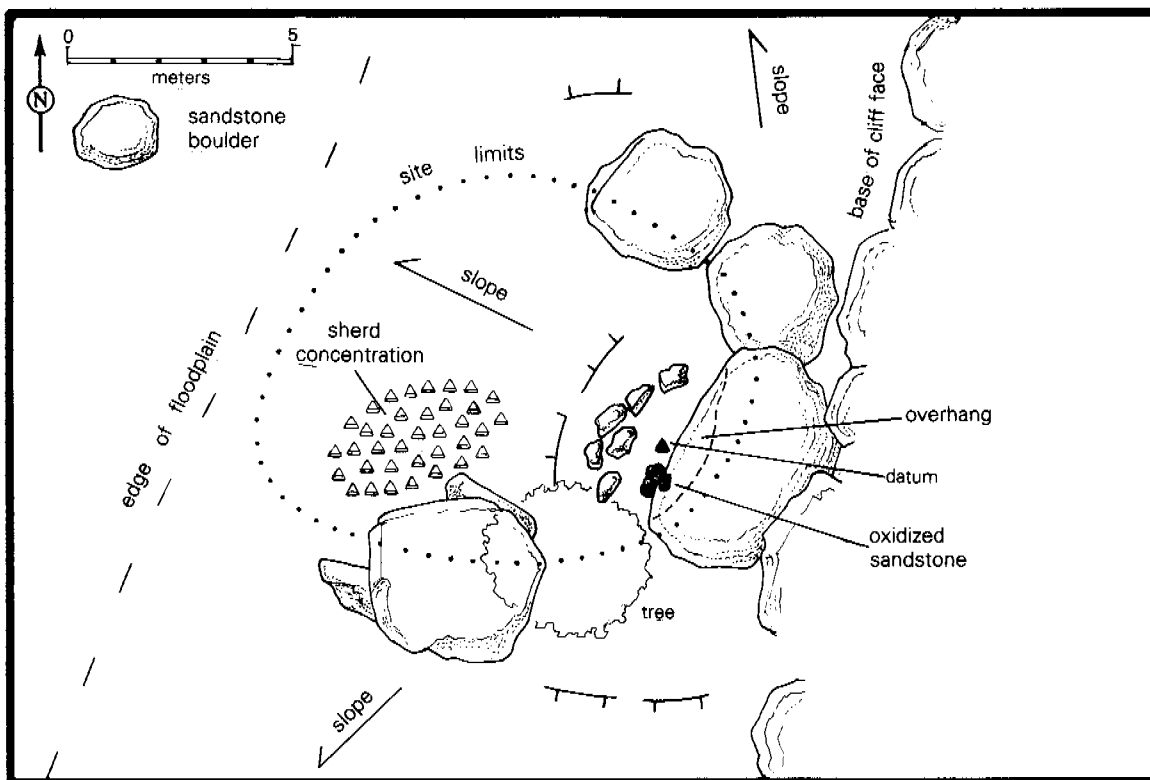


Figure 10. Plan of LA 88872.

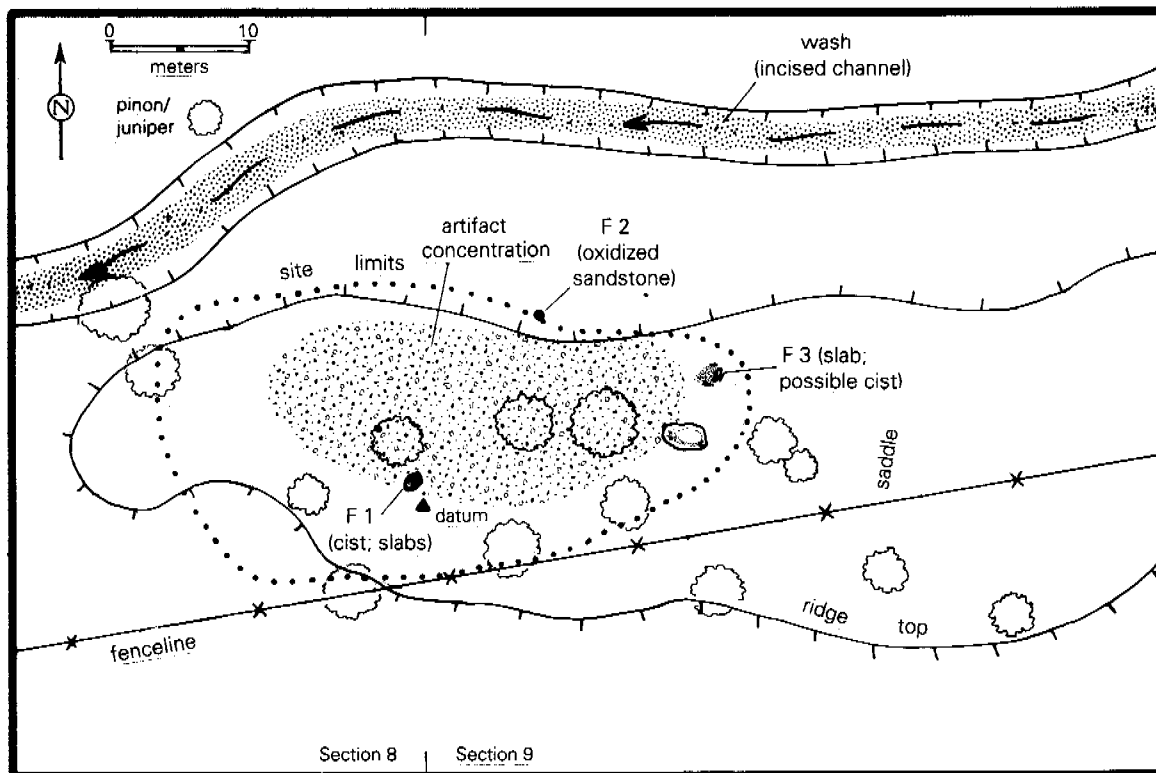


Figure 11. Plan of LA 116111.

painted white ware vessel. The site appears to be in stable condition, subject to natural sheetwash but no major erosion sources.

Based on the masonry components, Marshall had interpreted the site as representing the remains of a possible granary adjacent to probable floodplain field locations. The OAS survey identified the sandstone in the vicinity of the boulders as natural rather than as masonry remnants, and the in-field analysis recorded a more diverse pottery assemblage. Based on this definition of site content, site function probably was a field camp rather than a field granary.

**LA 116111.** LA 116111 is a single-component Basketmaker III Anasazi site (Fig. 11). This site is set above the floodplain on a narrow ridge which extends westward from the base of sandstone cliffs. The cliffs form the canyon wall of the unnamed tributary of the Puerco River, and the site overlooks the mouth of the tributary canyon. Erosion has exposed surface artifacts and features in portions of the site, while deposition around the site margins may have obscured some features and artifacts. The line between Section 8 and Section 9 runs through the center of the site; the western half is on private land, and the eastern half is on Navajo Nation land. The site condition is relatively stable now but could be subject to change. The site area is subject to more surface erosion due to sheetwash than sites would be in other topographic settings, and there is an entrenching drainage that comes within 2 m of the northern site boundary.

This previously unrecorded site was located during the OAS survey and was assigned field number HRI-1. Site information was recorded by completing a site record form and compass map of the site area, photographing features and structures, and analyzing all surface artifacts in the field (Tables 22 and 23).

LA 116111 consists of a low-density artifact scatter and three features. The site measures 23 by 43 m. Feature 1, located near the center of the site, is a large cist or room defined by several upright sandstone slabs. This feature measured 2.0 by 1.5 m. Feature 2, on the north slope of the ridge, is a 1 meter diameter concentration of oxidized sandstone. This feature may represent a hearth. Feature 3, at the eastern end of the site, is defined by an upright sandstone slab and other displaced slabs. This feature may have been as large as 1.0 by 3.0 m, and it may represent rooms or an area of storage cists.

Table 22. LA 116111 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	39
Anasazi White Ware	
La Plata Black-on-white	2
White Mound Black-on-white	1
Total	42

Table 23. LA 116111 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Core flake	Purple-gray speckled chert (thermally altered)	Fine	Medial	0	

Artifacts are concentrated in the northeast portion of the site and are sparsely scattered over the western half of the ridge. The assemblage is dominated by Plain Gray sherds, and examples of La Plata Black-on-white and White Mound Black-on-white place the age of the site in the late Basketmaker III period. The site is probably a temporary or permanent residence next to field locations on the floodplain.

**LA 116120.** LA 116120 is a multiple-component site with evidence of Pueblo II Anasazi and Territorial to Early Statehood occupations (Fig. 12). This site is set on the major bench within the upland portion of Section 8, about 400 feet above the floodplain and 200 feet below the edge of the mesa top. The site is toward the back of the bench, on a low rise within a shallow southeast-facing rincon. The site overlooks the Puerco River Valley. The site surface is slightly deflated and is traversed by shallow drainages. The area around the masonry is obscured by duff and broken branches. This previously unrecorded site was located during the OAS survey and was assigned field number HRI-10. Site information was recorded by completing a site record form and a compass map of the site area, photographing the site, and conducting in-field analysis of all surface artifacts (Table 24). The boundary line between private and BLM land runs through the center of the site, but its exact position cannot be estimated with confidence due to a lack of local survey monuments and the distortion of the orthophoto base map. The site condition is relatively stable. Sheet wash and wind erosion affect the area of the artifact concentration more than the structural portion of the site, which is stabilized by juniper trees.

The site consists of a masonry feature and an artifact concentration within a sparse artifact scatter. The site measures 19 by 42 m, and the masonry is separated from the artifact concentration by about 26 m. The masonry consists of two articulated upright sandstone slabs that are perpendicular to two unshaped sandstone cobbles. The feature is estimated to have been 2 by 2 m in size and may represent either a room or a large storage feature. The artifact concentration covers an area 15 by 6 m and contains sherds from at least three vessels. A few sherds are scattered between the concentration and the masonry structure, but there is no firm link between these two site features. Three pieces of purple glass are part of the sparse artifact scatter, suggesting use of the site sometime between A.D. 1880 and 1920, probably by Navajo residents of the area. The Anasazi component is defined based on the artifact concentration and probably includes the masonry structure. The historic component appears to be unrelated trash, fortuitous evidence of the occasional use of this landscape by Navajo residents of the area at the turn of the century.

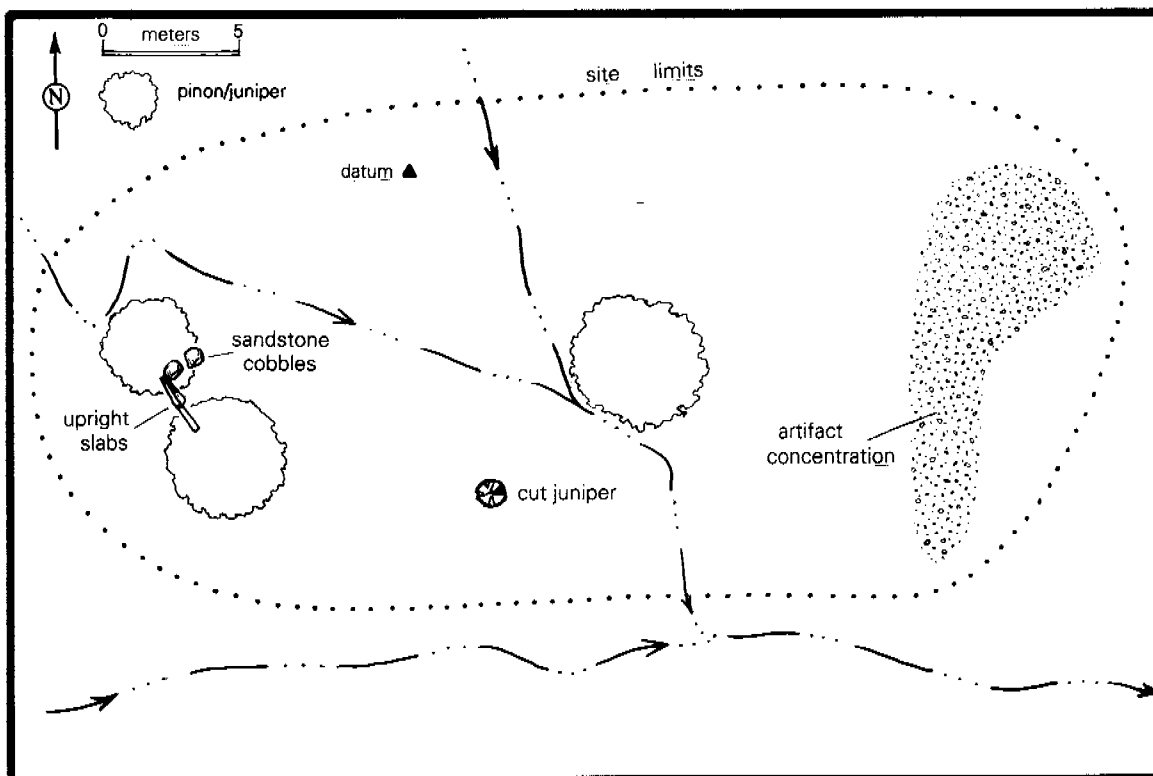


Figure 12. Plan of LA 116120.

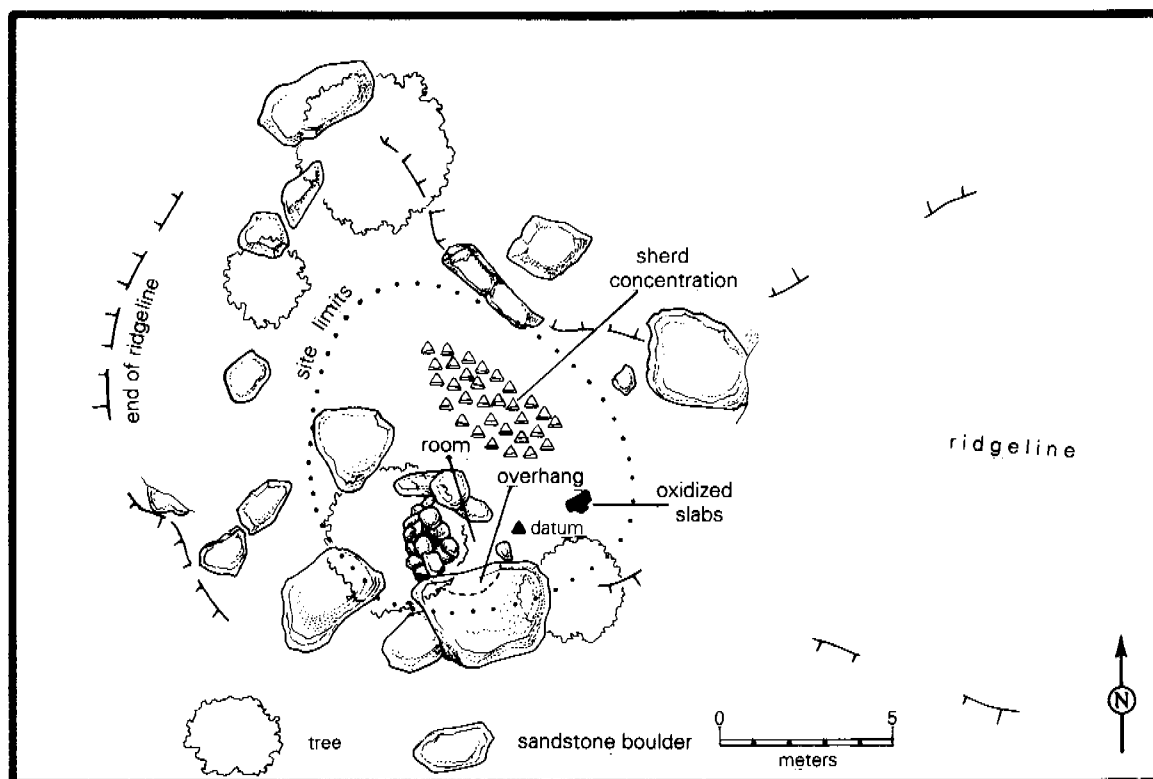


Figure 13. Plan of LA 88871.

Table 24. LA 116120 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	4
Pueblo II-III Corrugated Rim	4
Corrugated Gray	15
Anasazi White Ware	
Mineral painted white ware	1
Total	24

Table 25. LA 88871 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	3
Historic Puebloan	
Indeterminate red	1
Zuni-Acoma Polychrome	7
Navajo	
Striated utility	45
Total	56

Table 26. LA 88871 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Core flake, utilized	Red-gray speckled chert	Fine	Medial	0	
	Core flake	Tan spotted chert	Fine	Complete	10	Cortical

**LA 88871.** LA 88871 is a single-component Gobernador phase Navajo site (Fig. 13). The site is located on a narrow bench on the east side of the canyon wall, concealed among large talus boulders. The site overlooks the mouth of the unnamed tributary of the Puerco River, which flows south along the east side of Section 8. This site was originally recorded by Marshall (1993) and was described as a single masonry room and a small midden. LA 88871 was relocated during the OAS survey, and site information was updated. This included completion of a new site form, a compass map of the site area, photographs of features and structures, and in-field analysis of all surface artifacts (Tables 25 and 26). The site condition is stable, with no immediate threats of erosion or disturbance.

The site consists of a single masonry room constructed against a large boulder with a north-facing overhang. The room was constructed with unshaped sandstone slabs and rubble ranging in size from 20 to 50 cm. The interior of the room measures 3.25 by 2.3 m, and the masonry stands 0.5 m high. There appears to be an area of oxidation on the north wall, which may represent a hearth location. Entry to the structure appears to have been through the east wall.

A sparse midden scatter extends covers an area of about 9 by 9 m to the north structure location. The midden area was defined by a scatter of oxidized sandstone spalls, artifacts, and charcoal-stained soil. A possible slab-lined hearth is also located within the midden. This feature was defined by two upright slabs and contained charcoal-stained soil. Based on surface observations, there appears to be 10 to 30 cm of deposits in the midden area.

The pottery assemblage includes sherds from Anasazi, Navajo, and Pueblo vessels. There is no other evidence of an Anasazi component at the site, and the Plain Gray sherds are probably from an Anasazi jar that was recycled by the Navajo occupants of the site. Marshall said that the Pueblo polychrome sherds were probably from a Kiapkwa Polychrome bowl. Flaked stone artifacts are relatively rare on Navajo sites, and in addition to the two flakes described during the OAS survey, Marshall recorded a quartzite hammerstone.

**LA 88875.** LA 88875 is a single-component Gobernador Phase Navajo site (Fig. 14). This site is situated on a narrow bench concealed among large talus boulders. The site overlooks the large unnamed tributary of the Puerco River that flows south along the east side of Section 8. This site was originally recorded by Marshall (1993) and described as a small midden and a single cribbed or modified cribbed-log hogan. LA 88875 was relocated during the OAS survey, and all site information was updated. This included preparing a new site form and a compass map of the area, photographing features and structures, and in-field analysis of all surface artifacts (Table 27). Site condition is moderately stable. A road that has been constructed upslope from the site has changed drainage patterns in the area, and although there is no current evidence for increased erosion of the site itself, all drainage on the site is currently concentrated through the center of the midden. The wooden elements of the site are unstable in that they are subject to continued weathering and deterioration.

LA 88875 consists of the wooden remains of a cribbed log hogan and a midden. Immediately to the north of the hogan area is a space between two boulders. Sandstone rocks within the space could be rubble, but there are no alignments, and no artifacts or oxidized stones are present in the area. The site measures 24 by 12 m. Remaining evidence of the hogan includes seven to ten axe-cut logs averaging under 2 m in length. The arrangement of the timbers suggests that they formed a six-sided structure with an entry to the east. Interior structure measurements were 3.5 by 4.0 m. An axe-cut tree is within the site boundaries and may or may not be contemporary with the



structure.

A well-defined midden extends 10 m south of the structure and is 8 m wide. This midden includes a scatter of oxidized sandstone spalls and potsherds. Pottery types include a few sherds of striated Navajo utility ware and many sherds of a polished unpainted buff ware bowl, believed to be a historic Pueblo type. Two Anasazi sherds were either picked up by the Navajo residents of the site or are unrelated to the site features.

Table 27. LA 88875 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	1
Unpainted white ware	1
Historic Puebloan	
Polished tan	17
Navajo	
Striated utility	8
Total	27

Table 28. LA 88876 Ceramic Observations

Pottery type	Entire site (count)
Anasazi White Ware	
Unpainted white ware	1
Navajo	
Striated utility	117
Total	118

Systematic sampling of wood resources for tree-ring dating is a survey requirement for all Navajo sites that are located on BLM land. A wood sampling program for the BLM portion of Section 8 survey will be conducted in the spring of 1997, and the program will be extended to include the wood resources on this site as well. The wood sampling plan is described in Appendix 2.

**LA 88876.** LA 88876 is a single-component Gobernador phase Navajo site (Fig. 15). It is located on the southeast-facing slope of the toe of a long sandstone ridge that lies between the valley floor and the canyon wall. Although not concealed, the site cannot be seen from the Puerco River valley floor or from the floodplain of the tributary arroyo due to the presence of intervening hillocks and ridges. The site was originally recorded by Marshall (1993) and described as a cluster of four rock-

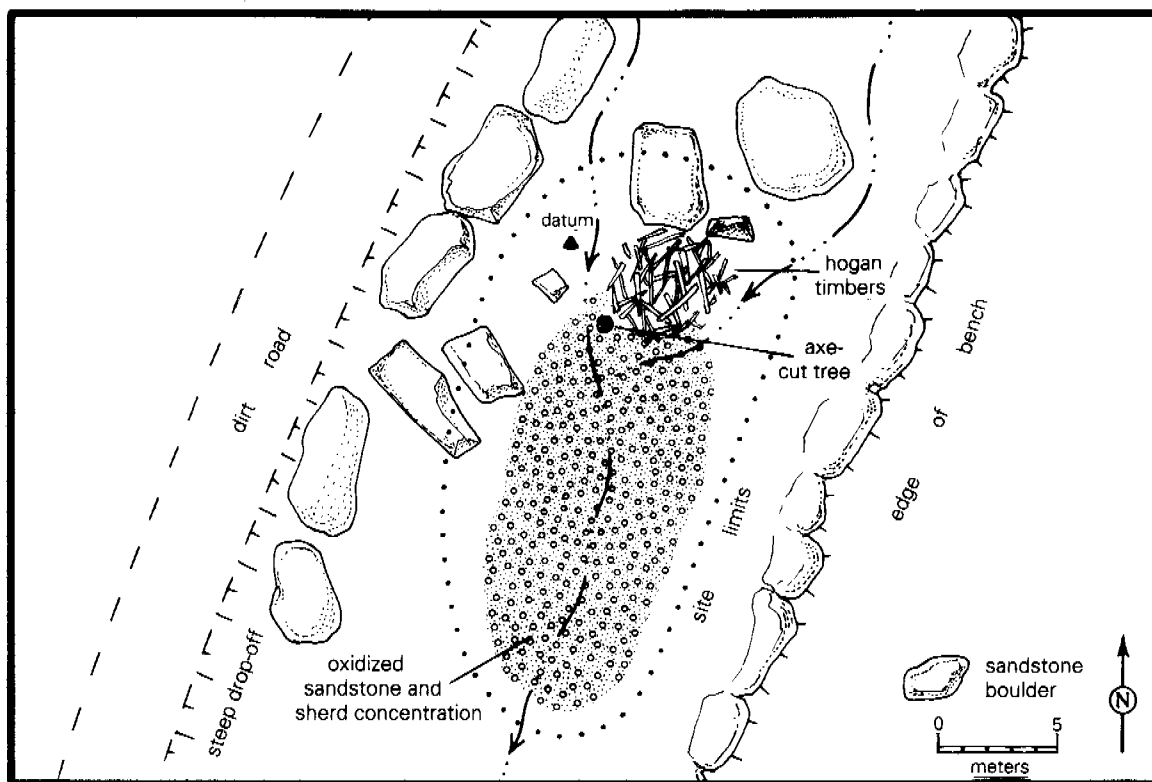


Figure 14. Plan of LA 88875.

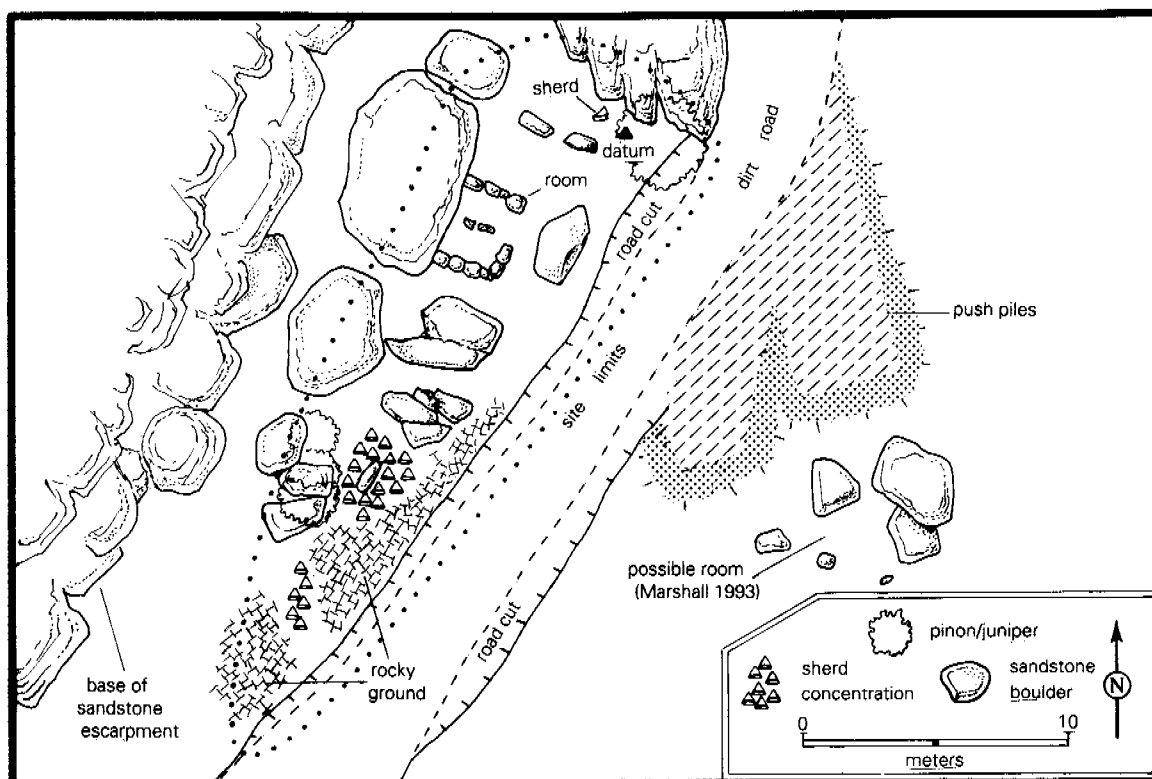


Figure 15. Plan of LA 88876.

based hogan rooms and a scatter of Dinéah Scored pottery. LA 88876 was relocated during the OAS survey, and all site information was updated. This included preparing a new site form, a compass map of the area, photographing features and structures, and in-field analysis of all surface artifacts (Table 28).



Photo 3. Rectangular masonry room footings at LA 88876.

The site has been built against a tilted sandstone ridge that has broken down into extremely large boulders surrounded by smaller sandstone rocks that occupy most of the ground surface. As defined by the OAS survey, the site consists only of an artifact scatter and a single rectangular masonry room built against a southeast-facing boulder. The room interior measures 2.5 by 2.0 m, and the walls are represented by a single course of sandstone masonry (Photo 3). There is no evidence of any fallen masonry, and the sandstone is probably a footing for a log or brush shelter. No timbers or other evidence of a superstructure is present, reflecting either scavenging or relative antiquity of the site. The artifact scatter consists of a single Anasazi sherd and many sherds from one and perhaps two striated Navajo utility jars. A single large striated rim sherd lacked any filleting or applied decoration. A small slab of sandstone foreign to the local formation was located just outside of the northeast corner of the masonry room footing. The eastern boundary of the site is formed by a bladed road that has removed the ground surface and any other cultural materials or features. This truncated site size is 30 by 10 m. Although the majority of the site surface is stable, the road cut is accelerating the erosion of the southeastern site margin.

The locations of the three other masonry wall alignments that had been identified by Marshall were examined. Two of these are within the OAS site boundary, and one is across the bladed road on a bench about 4 m lower in elevation. The ground surface in these areas was also carefully

examined for extensions of the artifact scatter. None of the other sandstone distributions noted by Marshall could be confidently interpreted as wall remnants, and no artifacts were found across the road in the vicinity of the possible room or elsewhere. Although the area of the lower room is included in the site map (see Fig. 15), the current site boundary is retracted to include only the one confidently defined room and the associated artifact scatter.

### *Traditional Cultural Properties*

Interviews concerning traditional cultural properties and the results of documentary research about traditional sites in the region are presented in detail in the "Background for the Cultural Resources Inventory" and "Methods" sections of this report. Substantive results regarding traditional uses of the Church Rock Site (including the private land portion of Section 8) are summarized in Table 29.

Table 29. Summary of Traditional Cultural Property Results. Church Rock Site. Section 8, Private Land

Consultant	Affiliation	Concerns
Ernest C. Becenti, Sr.	Church Rock Chapter; former chapter president; traditional practitioner	No known traditional uses
Ms. Jean Mariano	Mariano Lake Chapter; traditional practitioner	No known traditional uses
Nelson J. Largo, Sr.	Smith Lake Chapter president	No known traditional uses
Bennie Y. Begay	Pinedale Chapter; former chapter vice president; traditional practitioner	No known traditional uses
Jim Charley	Smith Lake Chapter; traditional practitioner	No known traditional uses
Tom Shorty <sup>1</sup>	Becenti Chapter; traditional practitioner	No known traditional uses
Lincoln Perry <sup>1</sup>	Crownpoint Chapter; traditional practitioner	No known traditional uses
William E. Raymond	Little Water Chapter; former chapter secretary; traditional practitioner	No known traditional uses
Charles Long	Crownpoint Chapter president	No known traditional uses
Confidential <sup>1</sup>	Dalton Pass Chapter; traditional practitioner	No known traditional uses
Herbert Benally	Church Rock Chapter president	No known traditional uses
Nelson Zuni	Pinedale Chapter vice president	No known traditional uses
George Tolth	Little Water Chapter; council delegate	No known traditional uses
Bennie Enrico <sup>2</sup>	Little Water Chapter president	No known traditional uses
Thomas Barbone <sup>2</sup>	Little Water Chapter vice president	No known traditional uses
Ken Tapaha	Little Water Chapter manager	No known traditional uses
Henry Tom <sup>2</sup>	Mariano Lake Chapter president	No known traditional uses

<sup>1</sup>Less familiar with the Church Rock Site than with Section 12.

<sup>2</sup>Defers to the traditional practitioners who have been consulted.

Table 30. *National Register Eligibility Summary, Church Rock Site, Section 8, Private Land*

Site Number	Description	Eligibility	Comments
LA 26159	Anasazi, multiple component habitation	Eligible, criterion d	Substantial site; good condition
LA 26160	Anasazi, Pueblo II habitation; Navajo, recent petroglyphs	Eligible, criterion d	Substantial site; about 10 percent of site surface affected by prior construction, but otherwise in good condition
LA 26163	Anasazi, Pueblo II habitation	Eligible, criterion d	Substantial site; about 30 percent of site surface affected by prior construction, but some subsurface integrity remains in disturbed areas, otherwise in good condition
LA 26164	Anasazi, Pueblo II habitation	Eligible, criterion d	Substantial site; about 90 percent of site surface affected by prior construction, subsurface integrity remains in limited areas
LA 88871	Navajo, Gobernador phase habitation	Eligible, criterion d	Small site; good condition
LA 88872	Anasazi, Pueblo II field camp	Eligible, criterion d	Small site; good condition
LA 88875	Navajo, Gobernador phase habitation	Eligible, criterion d	Small site; good condition
LA 88876	Navajo, Gobernador phase habitation	Eligible, criterion d	Small site; less than 40 percent affected by prior construction, otherwise in good condition
LA 116111	Anasazi, Basketmaker III field habitation	Eligible, criterion d	Small site; good condition
LA 116112	Anasazi, Pueblo II artifact scatter with architecture	Eligible, criterion d	Small site; about 20 percent of surface affected by prior construction, otherwise in good condition
LA 116114	Anasazi, multiple component habitation	Eligible, criterion d	Substantial site; 100 percent of site surface affected by prior construction, subsurface integrity remains in limited areas
LA 116120	Anasazi, Pueblo II limited activity with architecture	Eligible, criterion d	Small site; good condition

None of the chapter officials or traditional practitioners identified any traditional cultural properties within the private land portion of Section 8. Expressed concerns with the project related to general questions of safety, especially during the transport of mining products along the highways in the region.

### *Facility Plans and Recommendations*

The private land of Section 8 is slated to be the location of the most intense construction activity of the first phase of mining development at the Church Rock Site. All developments will involve ground-disturbing activities, and only limited areas of the section margin are unlikely to see development either in this phase of mining or in future phases.

All of the sites identified within the private land are eligible for inclusion in the *National Register of Historic Places* on the basis of their potential to contribute important information to the understanding of regional prehistory or history (Table 30). Two of the Anasazi sites (LA 26264 and LA 116114) have been subject to extreme levels of prior construction disturbance, but intact deposits remain at both sites. Although the potential information contributions of these sites are limited in comparison to the potential of undisturbed sites, potential contributions to chronology and intercommunity and interregional relationships have not been adequately addressed through survey-level recording. Also, both of these sites include Anasazi residential components, with suggestions of multiple households and with sufficient material culture to infer multiple generations of site use. Under these circumstances, human burials are probably present within the site boundaries. For these reasons, the two disturbed sites will be given the same categorical considerations as the relatively undisturbed sites.

We recommend that the archaeological sites be avoided during the development of mining facilities within the private land of Section 8. If sites or portions of sites cannot be avoided, we recommend that data recovery be conducted. Any data recovery will require negotiations with concerned Native American groups in compliance with the Native American Graves Protection and Repatriation Act (NAGPRA). These negotiations will cover the treatment of archaeological resources, including potentially sacred materials and human remains.

Because of the overlap between many of the sites and the extent of the proposed construction activities, fencing or barrier construction will be necessary as a protective measure. The nature of this protection will depend on specific construction plans, only some of which can be anticipated at this time. Preferred fencing would consist of hog wire supported by T-posts and topped with barbed wire. This would serve as a mechanical equipment barrier and would discourage casual foot traffic trespass across site boundaries. Fencing would remain in place through construction and mining phases, and it would not be removed until after reclamation processes had been completed following the cessation of mining.

Within the lowland area of the section, site boundaries were defined and staked using both surface observations and auger test results. We recommend that protective fencing or barriers be placed at the staked site boundaries of LA 26163, LA 26164, LA 116112, and LA 116114. Protective measures should also be taken at LA 26159 and LA 26160, but we recommend that the two sites be enclosed with a single protective barrier. We also recommend that construction activity adjacent to all of these site boundaries incorporate erosion-control plans so that site conditions remain stable.

LA 88875 and LA 88876 are adjacent to an existing road that provides the only access to this margin of the proposed well field. In addition to the need for protective fencing, site conditions will be affected by any road improvements and by routine road maintenance. Road construction plans should incorporate erosion-control features that will either maintain or improve the stability of the sites.

LA 116111 is at the margin of the proposed well field development. We recommend that protective fencing be installed if any construction features (including roads) are planned within 100 feet of the site boundary. Due to its topographic position and susceptibility to erosion, the protective fencing should be placed outside of the site boundaries at the toe of the landform and outside of the drainages that lie to the north and the south of the site. The eastern portion of the site lies on Navajo Nation land in Section 9. This is outside of the HRI Church Rock Site project boundaries, and no development will affect that portion of the site.

LA 88871 and LA 88872 lie at the extreme corner of the private land portion of Section 8, at the margin of proposed well field development. We recommend that protective fencing be installed if any construction features (including roads) are planned within 100 feet of the site boundaries. Because of their susceptibility to changes in erosion patterns, we recommend that fencing be placed outside of the site boundaries at a sufficient distance to minimize the risk of ground disturbance that would accelerate erosion of the site surfaces.

LA 116120 straddles private and BLM land on the topographic bench in the northwest corner of the private land, about 400 feet above the location of most well field development. Although no construction is currently planned for this area, we recommend that protective fencing be installed if any future construction features (including roads) are planned within 100 feet of the site boundaries. Because of its susceptibility to changes in erosion patterns, we recommend that fencing be placed outside of the site boundaries at a sufficient distance to minimize ground disturbance that would accelerate local erosion.

In addition to protection through the installation of physical barriers, all on-site construction and mining personnel will be given formal orientations concerning the protection of cultural resources within the Church Rock Site. This policy will include prohibition of collection, excavation, and defacement of cultural resources, as well as a prohibition of non-work related access to adjacent lands within the Church Rock Site. Employees, contractors, and visitors violating the policy of nondisturbance and noncollection will be disciplined.

Despite confidence in the site boundaries established during this survey, there is a distinct possibility of the presence of undetected subsurface cultural resources given the intensity of human occupation at the margins of the lowland area. We recommend that all ground-disturbing construction activities within the vicinity of the sites be monitored by an archaeologist. Based on observations of the site locations, the stratigraphic exposures of the Puerco River floodplain and its tributary, and the experience of the Transwestern Pipeline construction data recovery and monitoring in the vicinity (Sullivan 1994), we recommend that monitoring take place whenever ground disturbance occurs within the area identified in Figure 16. The development of treatment protocols for the unexpected discovery of human remains will be initiated within the framework of NAGPRA and existing New Mexico state regulations concerning the treatment of unmarked burials.

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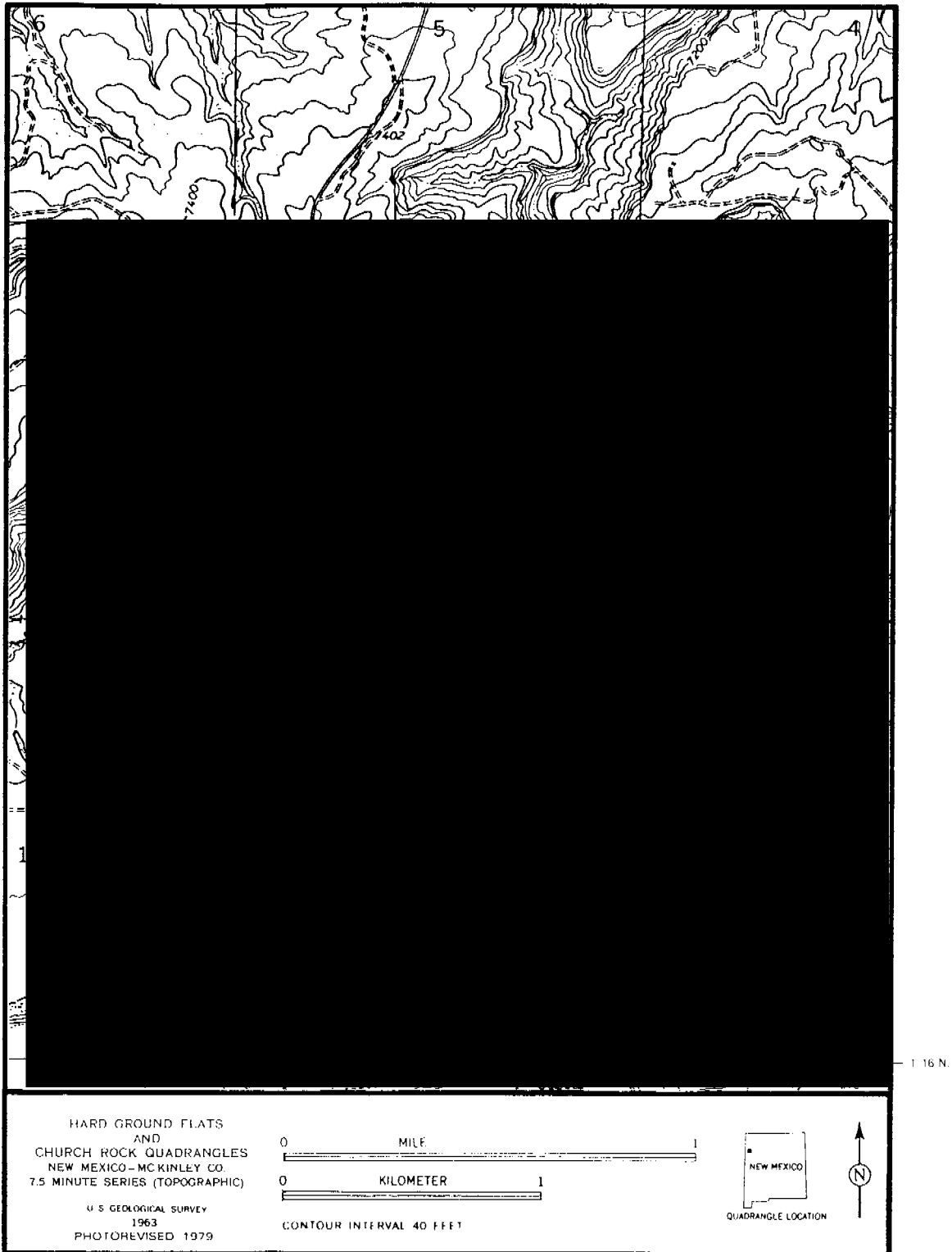


Figure 16. Proposed monitoring zone for construction activities within the Church Rock Site, private land.



### *BLM Portion of Section 8*

In preparation for the development of mining facilities at the Church Rock Site, the NRC has called for archaeological survey and traditional cultural property inventory of all lands that may be involved in the five-year development plan. There are no specific construction plans for BLM land within this first phase of mining development, but if mining facilities were expanded beyond the private land portion of Section 8, activities would be confined to the valley bottom and bench portions of the BLM land. This area is indicated in Figure 3 and generally consists of lands below 7,300-7,400 feet elevation. These lands have been included in the archaeological survey of Section 8 and have been the subject of traditional cultural property investigations. The cultural resources information is intended for planning purposes, should future development occur.

Several prior archaeological inventories have been conducted within the BLM portion of Section 8. In 1977, San Juan College conducted a survey for United Nuclear Corporation that included three other sections in addition to Section 8 (Ford and DeHoff 1977). Six sites were identified in Section 8, two of which are on BLM land. Several IOs were also defined on BLM land, including two petroglyphs, a possible water-control feature, segments of an axe-cut brush fence, and scattered isolated sherds. In 1988, a reconnaissance included BLM lands in the NE  $\frac{1}{4}$  of Section 8 (Marshall 1988). Ford and DeHoff's single site in the NE  $\frac{1}{4}$  was relocated, and the presence of additional unrecorded sites was noted on BLM land in the NE  $\frac{1}{4}$  of the section. Following the recommendation of the 1988 reconnaissance that additional survey be conducted, an intensive survey of the NE  $\frac{1}{4}$  of Section 8 and some adjacent portions of Section 8 was carried out in 1992 (Marshall 1993). During this survey, four new sites and one previously identified site were located on BLM land. In total, these prior surveys defined six sites on the BLM land portion of Section 8. Prior surveys of adjacent sections outside of Section 8 had located 46 sites, and locational information for sites within one mile of Section 8 is presented in Appendix 4.

All BLM lands indicated in Figure 3 were resurveyed by OAS staff (see "Methods" section for details of survey personnel and procedures). The resurvey encountered 57 IOs, relocated six previously defined sites, and located and recorded 14 new sites (one new site straddles the boundary between BLM and private land). Of the 20 sites, five have Navajo components that include architectural wood. This wood was not sampled for tree-ring dating as part of the survey. This BLM Farmington District survey requirement will be satisfied in the spring of 1997. A comprehensive wood sampling project will be conducted for these sites and for the Navajo sites on the private land portion of Section 8 (Appendix 2). A separate report will be prepared summarizing the results of the wood sampling project. A modern burial plot was also discovered on BLM land during the survey.

### *IO Descriptions*

During the survey of the BLM portion of Section 8, 57 IOs were identified (Table 31). They include artifacts, features, possible cultural locales, and historic inscriptions. Pottery occurrences account for the majority of the finds, and their cultural historical implications are discussed in greater detail in the "Summary of Findings" portion of this report. Single Anasazi sherds were found in 17 cases; in two cases, a single sherd was associated with a feature or another artifact; multiple Anasazi sherds were found in 20 cases; two Anasazi pot drops were found; there was one case of multiple Navajo sherds; and one location included two pieces of historic earthenware. In contrast with these 43 pottery occurrences, flaked lithic artifacts were found in only four instances.

Two isolated flakes were discovered, two flakes were discovered in one case, and in one case a flake and sherd were found together. This extremely low frequency of flaked lithic artifacts is consistent with the low frequency found in site surface collections throughout the Church Rock Site area.

The isolated features include both definite and possible cultural resources, and dating and cultural affiliation are problematic in most cases. An eroded hearth and an eroded cist are possible Anasazi features. In both cases, there was no associated material culture, and no other features were located in the vicinities. The cist is in an entrenched arroyo bottom, and there is a chance that it postdates the Anasazi occupation of the section. A scatter of sandstone slabs and an area of dark soil (5 m in diameter) are possible cultural features that may be affiliated with the Anasazi occupation of the section. A small rockshelter has no clear evidence of cultural use, but there are rocks outside that could be structural remains. Another rock alignment may or may not be cultural. One small petroglyph panel was encountered, which consists of a 20 by 20 cm area of pecked dots.

Historic isolated cultural resources include the previously mentioned earthenware, three inscriptions, a cairn, and a wood pile with bottles. The inscriptions are on sandstone boulders in the vicinity of Navajo livestock features in the southwest quarter of the section. The inscriptions include dates from 1950 through 1968, and Navajo inscriptions at LA 26159 include dates from 1952 to 1981. The wood pile and bottle concentration may be related to either Navajo use of the area, or they may be debris from energy exploration.

Table 31. Isolated Occurrences, Church Rock Site, Section 8, BLM Land

IO Number	Location <sup>1</sup>	Context	Cultural Affiliation	Description
6	[REDACTED] Elevation: 6,820 ft	Woodland (juniper); base of talus; soil disturbed by grazing and erosion	Unknown	Two upright slabs and a scatter of burned rocks; possible hearth; no associated artifacts
7	[REDACTED] Elevation: 6,880 ft	Scrubland (rabbitbrush, sagebrush); arroyo channel floodplain	Unknown	Isolated slab-lined cist; eroded with no undisturbed fill; no associated artifacts
8	[REDACTED] Elevation: 6,860 ft	Scrubland (rabbitbrush, snakeweed); arroyo bottom	Anasazi (pottery technology)	1 Corrugated Gray sherd; jar body
15	[REDACTED] Elevation: 6,925 ft	Woodland (juniper, sagebrush); top of narrow sandstone ridge	Anasazi (pottery technology)	1 unpainted white ware sherd (washy exterior slip); jar body
24	[REDACTED] Elevation: 6,940 ft	Woodland (juniper, piñon, sagebrush); base of talus slope	Anasazi (pottery technology)	1 Gallup B/w sherd; jar body 1 Corrugated Gray sherd; jar body
25	[REDACTED] Elevation: 6,900 ft	Scrubland (sagebrush, juniper, piñon); slope	Anasazi (pottery technology)	3 Corrugated Gray sherds from same Pueblo III vessel; rim, neck, and jar body
26	[REDACTED] Elevation: 6,900 ft	Woodland (piñon, juniper, sagebrush); canyon wall	Anasazi (pottery technology)	4 Plain Gray sherds; jar body 1 Clapboard Gray sherd; jar neck 1 Corrugated Gray sherd; jar body
29	[REDACTED] Elevation: 5,010 ft	Scrubland (sagebrush); bench in talus slope; drilling disturbance	Navajo (pottery technology)	2 Dinétah Gray jar body sherds

Table 31. Isolated Occurrences, Church Rock Site, Section 8, BLM Land





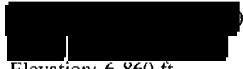
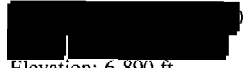
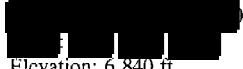







IO Number	Location <sup>1</sup>	Context	Cultural Affiliation	Description
34	 Elevation: 7,020 ft	Woodland (piñon, juniper); wash within talus slope	Anasazi (pottery technology)	2 mineral painted white ware sherds; jar body 1 Red Mesa B/w sherd 4 Plain Gray sherds; jar body
35	 Elevation: 7,020 ft	Woodland (sagebrush, piñon, juniper); talus slope	Anasazi (pottery technology)	1 unpainted white ware sherd 1 Corrugated Gray sherd; jar body 1 organic painted white ware sherd
36	 Elevation: 7,010 ft	Woodland (piñon, juniper); talus slope	Unknown	Dark gray soil in 5 meter diameter area; no artifacts
37	 Elevation: 7,080 ft	Woodland (piñon, juniper); talus slope	Anasazi (pottery technology)	1 Corrugated Gray sherd; jar body 1 Plain Gray sherd; jar body
39	 Elevation: 6,860 ft	Scrubland (rabbitbrush, sagebrush); valley bottom	Anasazi (pottery technology)	1 Late Pueblo II B/w sherd 1 Plain Gray sherd; jar body
40	 Elevation: 6,890 ft	Grassland (grasses, snakeweed, rabbitbrush); floodplain margin	Anasazi (pottery technology)	1 Plain Gray sherd; jar body 1 Corrugated Gray sherd; jar body
41	 Elevation: 6,840 ft	Scrubland (snakeweed, piñon, juniper, grasses); floodplain margin	Anasazi (pottery technology)	1 unpainted white ware sherd; bowl body 1 unpainted white ware sherd; jar body 2 Corrugated Gray sherds; jar body
42	 Elevation: 6,850 ft	Scrubland (snakeweed, rabbitbrush, piñon, grasses); floodplain margin	Anasazi (pottery technology)	1 Gallup B/w sherd; jar body 1 unpainted white ware sherd; bowl body 1 unpainted white ware sherd; jar body
43	 Elevation: 6,850 ft	Scrubland (snakeweed, rabbitbrush, sagebrush, grasses, piñon); floodplain margin	Anasazi (pottery technology)	1 Plain Gray sherd; jar body 1 unpainted White Mountain Redware sherd; jar body
44	 Elevation: 6,840 ft	Scrubland (snakeweed, rabbitbrush, sagebrush, grasses, piñon); floodplain margin	Anasazi (pottery technology)	1 Plain Gray sherd; jar body 1 white chalcedony core flake; single facet platform; no cortex
45	 Elevation: 6,845 ft	Scrubland (rabbitbrush, grasses, piñon); floodplain margin	Anasazi (pottery technology)	1 Plain Gray sherd; jar body 1 Corrugated Gray sherd; jar body
46	 Elevation: 6,844 ft	Scrubland (rabbitbrush, grasses, piñon); floodplain margin	Anasazi (pottery technology)	1 Plain Gray sherd; jar body
47	 Elevation: 6,854 ft	Scrubland (snakeweed, rabbitbrush, grasses, piñon, juniper); floodplain margin	Unknown	Scatter of sandstone slabs
48	 Elevation: 6,854 ft	Scrubland (rabbitbrush, grasses, piñon); hillslope	Historic	2 earthenware sherds with multicolored glaze decoration

Table 31. Isolated Occurrences, Church Rock Site, Section 8, BLM Land

IO Number	Location <sup>1</sup>	Context	Cultural Affiliation	Description
49	Legal: [REDACTED] Elevation: 6,890 ft	Scrubland (rabbitbrush, juniper, grama); hillslope	Anasazi (pottery technology)	1 Plain Gray sherd; jar body
50	Legal: [REDACTED] Elevation: 6,897 ft	Scrubland (rabbitbrush, juniper, grasses); slope	Anasazi (pottery technology)	1 Gallup B/w sherd; bowl body
51	Legal: [REDACTED] Elevation: 6,873 ft	Scrubland (rabbitbrush, juniper, grasses); slope	Historic	Inscriptions; name and dates: 1950, 1951, 1968
52	UTM: [REDACTED] Elevation: 7,233 ft	Woodland (piñon); bench below bluff	Unknown	Petroglyph (?); small area of pecked dots (problematic)
53	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,885 ft	Woodland (piñon, rabbitbrush); slope	Anasazi (pottery technology)	21 Plain Gray sherds; jar body; pot drop (?)
54	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,920 ft	Woodland (piñon, sagebrush, rabbitbrush, grasses); ridge	Anasazi (?)	1 chalcedony core flake, no cortex, single facet platform
55	UTM: [REDACTED] Elevation: 6,883 ft	Woodland (piñon, grasses); bench	Anasazi, Historic	1 Plain Gray sherd; jar body Inscription: May 7, 1961
56	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,860 ft	Woodland (piñon); ridge	Historic	Inscription: 31
57	Legal: [REDACTED] Elevation: 6,846 ft	Woodland (piñon, juniper, rabbitbrush, sagebrush); slope	Historic	Boulder with stack of wood and empty bottles
58	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,210 ft	Woodland (piñon, mountain mahogany); mesa bench edge	Anasazi (pottery technology)	1 Gallup B/w sherd; bowl body
59	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,277 ft	Woodland (juniper, scrub oak, mountain mahogany, prickly pear); slope; mesa bench edge	Anasazi (pottery technology)	1 Plain Gray sherd; jar body
60	UTM: [REDACTED] 1500 Legal: [REDACTED] Elevation: 7,276 ft	Woodland (juniper, piñon, mountain mahogany, grasses); mesa bench edge	Anasazi (pottery technology)	1 Plain Gray sherd; jar body
61	UTM: [REDACTED] E72 Legal: [REDACTED] Elevation: 7,302 ft	Woodland (piñon, juniper, mountain mahogany); mesa bench edge	Anasazi (?)	1 white chert core flake, proximal fragment, no cortex, single facet platform
62	UTM: [REDACTED] Elevation: 7,277 ft	Woodland (piñon, juniper); mesa bench edge	Anasazi (pottery technology)	2 Corrugated Gray sherds; jar body
63	UTM: N [REDACTED] 1470 Legal: S [REDACTED] Elevation: 7,283 ft	Woodland (piñon, juniper, mountain mahogany, grasses); mesa bench edge	Anasazi (pottery technology)	1 Corrugated Gray sherd; jar body

Table 31. Isolated Occurrences, Church Rock Site, Section 8, BLM Land

IO Number	Location <sup>1</sup>	Context	Cultural Affiliation	Description
64	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,203 ft	Woodland (piñon, mountain mahogany, grasses); wash	Anasazi (pottery technology)	1 Corrugated Gray sherd; jar body
66	UTM: [REDACTED] 0 Legal: [REDACTED] Elevation: 7,293 ft	Woodland (piñon); base of low bench	Anasazi (pottery technology)	1 La Plata B/w sherd; jar body 1 Plain Gray sherd; jar body with handle
67	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,305 ft	Woodland (piñon); mesa bench edge	Anasazi (pottery technology)	1 unpainted white ware sherd; jar neck 2 Kana'a Gray sherds; jar body 3 Plain Gray sherds; jar body
69	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,308 ft	Woodland (piñon, mountain mahogany); mesa bench slope	Anasazi (pottery technology)	1 Gallup B/w sherd; jar body 1 Puerco B/w sherd; bowl body
70	UTM: [REDACTED] ¼ Legal: [REDACTED] ¼ Elevation: 7,283 ft	Woodland (piñon, mountain mahogany, sagebrush); mesa bench slope	Anasazi (pottery technology)	1 Corrugated Gray sherd; jar body
71	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,282 ft	Woodland (piñon); mesa bench rim	Anasazi (pottery technology)	1 Corrugated Gray sherd; jar body
72	UTM: [REDACTED] Legal: [REDACTED] ¼ Elevation: 7,332 ft	Woodland; mesa bench slope	Anasazi (pottery technology)	Lino Gray sherd; bowl rim
73	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,343 ft	Woodland (juniper, mountain mahogany, sagebrush); mesa bench slope near drainage	Anasazi (pottery technology)	1 Corrugated Gray sherd; body
74	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,344 ft	Woodland (piñon, juniper, mountain mahogany, grasses); back of mesa bench	Anasazi (pottery technology)	1 Neckbanded Gray sherd; jar rim
79	UTM: [REDACTED] Legal: [REDACTED] ¼ Elevation: 7,370 ft	Woodland (piñon, juniper); mesa bench edge	Anasazi (?)	1 pink-red chert flake; cortical platform; 100 percent cortex 1 green chert core flake; no cortex; single facet platform
80	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,343 ft	Woodland (piñon, juniper); mesa bench edge	Navajo or historic	Rock cairn
81	UTM: [REDACTED] 0 Legal: [REDACTED] Elevation: 7,440 ft	Woodland (piñon, juniper, mountain mahogany, grasses); mesa slope	Anasazi (pottery technology)	2 Plain Gray sherds; jar body
82	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,415 ft	Woodland (piñon, juniper, mountain mahogany); mesa slope	Anasazi (pottery technology)	20 Pueblo II Corrugated sherds; jar rim and body; pot drop
83	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,465 ft	Woodland (piñon, juniper); mesa slope	Anasazi (pottery technology)	1 Neckbanded Gray sherd; jar neck 2 Plain Gray sherds; jar body 1 unpainted white ware sherd; jar body

Table 31. Isolated Occurrences, Church Rock Site, Section 8, BLM Land

IO Number	Location <sup>1</sup>	Context	Cultural Affiliation	Description
84	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,415 ft	Scrubland (piñon, juniper, mountain rose); ridge of mesa slope	Anasazi (pottery technology)	1 Corrugated Gray sherd; jar body
85	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,414 ft	Woodland (piñon, juniper); ridge of mesa slope	Anasazi (pottery technology)	4 Plain Gray sherds; jar body
86	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,258 ft	Woodland (piñon, juniper, sagebrush, prickly pear); mesa slope above drainage	Anasazi (pottery technology)	3 Plain Gray sherds; jar body
87	UTM: [REDACTED] Legal: [REDACTED] Elevation: 7,390 ft	Woodland (piñon, juniper, mountain mahogany); mesa slope	Anasazi (pottery technology)	1 Plain Gray sherd; jar body
88	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,913 ft	Scrubland (sagebrush); arroyo floodplain	Unknown	Rock alignment (?)
89	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,907 ft	Scrubland (sagebrush); arroyo floodplain slope	Unknown	Rock shelter (?)

<sup>1</sup>UTM coordinates are within Zone 12. Quarter sections are within Section 8, T16N, R16W, on the USGS Church Rock and Hard Ground Flats 7.5 minute quadrangles.

### Site Descriptions

Six previously known sites were relocated and redocumented, and 14 new sites were located and described (Table 32). Since there are no currently defined development priorities for BLM land, the site descriptions are organized by LA number rather than by geomorphic position and component age.

Table 32. Sites Recorded on Section 8, BLM Land

Site Number	Affiliation	Component	Features
LA 26158	Anasazi	Late Pueblo II	Single masonry roomblock, kiva, midden
	Navajo	Historic	Two dry-laid masonry rooms
LA 26162	Anasazi	Pueblo II-III	Artifact scatter
	Navajo	Historic	Sweat lodge
LA 88873	Anasazi	Late Pueblo II	Boulder overhang, hearth, artifact scatter
LA 88874	Anasazi	Late Pueblo II	Single masonry room, artifact scatter
LA 88877	Navajo	Gobernador Phase	Masonry structure, architectural wood, artifact scatter
LA 88878	Anasazi	Late Pueblo I-Pueblo II	Artifact scatter and possible dispersed hearths
LA 116113	Navajo	Historic	Developed trail
LA 116115	Navajo	Gobernador Phase (?)	Masonry and cribbed log hogan

Table 32. Sites Recorded on Section 8, BLM Land

Site Number	Affiliation	Component	Features
LA 116116	Anasazi	Late Pueblo II	Artifact scatter
	Navajo	Historic	Three cairns
LA 116117	Anasazi	Pueblo II	Artifact scatter
LA 116118	Anasazi	Basketmaker III-Pueblo II	Two cists, petroglyph panel, artifact scatter
	Navajo	Gobernador Phase	Sweat lodge, hearth
LA 116119	Anasazi	Pueblo II	Artifact scatter
	Historic	Territorial or early Statehood	Artifact scatter
LA 116120 <sup>1</sup>	Anasazi	Late Pueblo II	Masonry structure or feature, artifact scatter
	Historic	Territorial or early Statehood	Artifact scatter
LA 116121	Anasazi	Basketmaker III-Early Pueblo I	Artifact scatter
LA 117314	Archaic	Late Archaic-Basketmaker II	Possible pit structures, hearths, artifact scatter
	Anasazi	Late Pueblo II	Hearth (?), artifact scatter
	Navajo	Historic (?)	Masonry footings, architectural wood
LA 117315	Navajo	Historic	Tent camp
LA 117317	Unknown	Indeterminate	Petroglyphs (abstract)
LA 117316	Anasazi	Indeterminate	Petroglyphs (archer and deer)
LA 117318	Navajo	Historic	Sheep pen, structure
LA 117319	Unknown	Indeterminate	Petroglyph panel (spirals, abstracts)
	Historic	1950s-1990s	Graffiti

<sup>1</sup>This site is on the boundary between private and BLM land, and the east half is on BLM land.

**LA 26158.** LA 26158 is a multiple-component site with evidence of Pueblo II Anasazi and Navajo occupations (Fig. 17). This site is the westernmost of seven sites (the others are LA 26159, LA 26160, LA 26163, LA 26164, LA 116112, and LA 116114) that form a Late Pueblo II community at the base of a high cliff and talus slope on the north side of the Puerco River floodplain. This site was originally recorded by San Juan College (Ford and DeHoff 1977) and was described as a 20-30 room, single-story masonry pueblo with a kiva depression and trash mound. This site was relocated during the OAS survey, and site information was updated. Documentation included a new site form, site map, photographs, and in-field artifact analysis (Tables 33 and 34).

LA 26158 measures 64 by 55 m (all dimensions are expressed as north-south followed by east-west distances). The site is in relatively stable condition, with minor evidence of construction and looting activity. A road and drilling area are at the north edge of the site, to the north of the Navajo rooms. A single probable looter's trench is visible in the midden. Natural erosion consists of a drainage that flows along the eastern margin of the site. Prior to its slight incision, this shallow intermittent drainage has transported several centimeters of alluvium over a portion of the roomblock and midden.

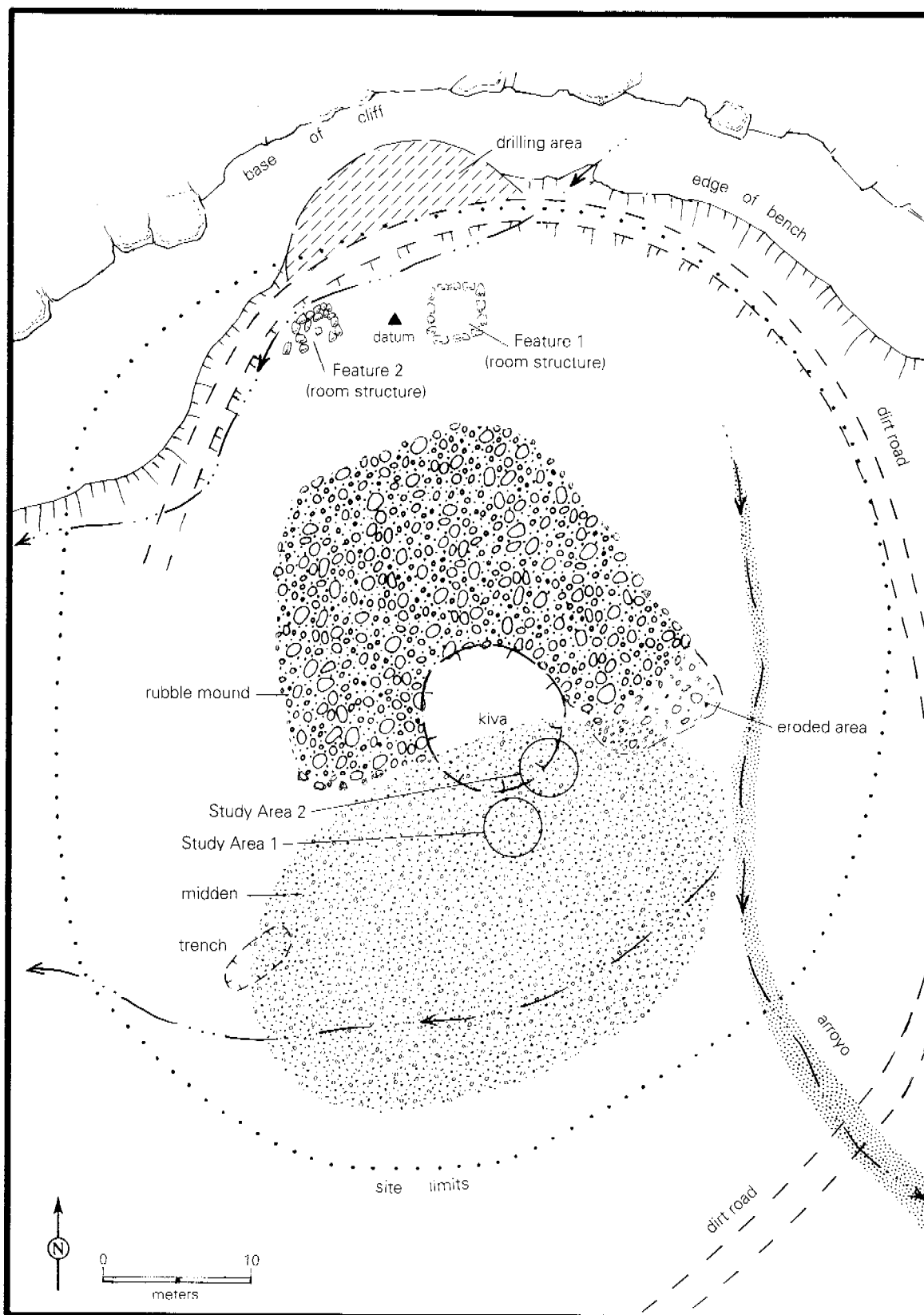


Figure 17. Plan of LA 26158.



Table 33. LA 26158 Ceramic Observations

Pottery type	Area 1 (count)	Area 2 (count)
Anasazi Gray Ware		
Plain Gray	29	40
Pueblo II Corrugated Rim	3	
Corrugated Gray	51	54
Anasazi White Ware		
Red Mesa Black-on-white	4	5
Gallup Black-on-white	3	3
Escavada-Puerco Black-on-white	3	1
Mineral painted black-on-white (late)	14	9
Unpainted white ware	10	5
Anasazi Red Ware		
Puerco Black-on-red		1
White Mountain Redware, unpainted		1
Total	117	119

Table 34. LA 26158 Flaked and Ground Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Area 1	Core flake	Tan-purple silicified wood	Fine	Complete	0	Multifacet
	Core flake	Yellow jasper	Fine	Complete	0	Single facet
	Angular debris	Dark gray silicified wood	Fine		0	
	Mano	Sandstone	Medium	Fragment		
Area 2	Angular debris	Black-brown silicified wood	Fine		0	
	Angular debris	Black-brown silicified wood	Fine		0	
	Core flake	Light green chert	Fine	Complete	0	Single facet
	Core flake	White chert	Fine	Fragment	0	

The Anasazi component at LA 26158 consists of a 20-30 room, single-story masonry roomblock, a kiva depression partially enclosed by the roomblock, and a midden. The roomblock was constructed of tabular sandstone forming a rough U shape, measuring 25 by 30 m. South and somewhat within the arms of the roomblock is depression measuring approximately 10 m in diameter that is probably a kiva. The midden extends 25 m south from the structure and measures about 30 m wide. This area contains a dense concentration of ceramics and some lithic artifacts. A pair of 2 m diameter sampling areas were established within this feature. Pottery types are consistent with a Late Pueblo II occupation of the site.

The Navajo component is located 5 m to the north of the roomblock. It consists of two probable structures spaced about 6 m apart. The eastern structure consists of unshaped sandstone rubble, one course high, and arranged to form a rough circle 3 m in diameter. The western structure is about the same size and also consists of unshaped sandstone boulders, one course high, but extensive disturbance has obscured its original shape. No artifacts were directly associated with these features, but they may be associated with the Navajo occupation of LA 116118 just to the west of this site.

**LA 26162.** LA 26162 is a multiple-component site with evidence of Pueblo II Anasazi and Navajo occupation (Fig. 18). This site is situated on a wide bench among large talus boulders. The site faces east, overlooking the unnamed tributary of the Puerco River that runs along the east side of Section 8. LA 26162 was originally recorded by San Juan College (Ford and DeHoff 1977) and was described as two sweat lodges. A cairn and architectural wood were located 200 feet (60 m) east of the sweat lodges. LA 26162 was revisited by Marshall (1993), who was able to relocate one of the sweat lodges (the eastern sweat lodge had been removed by road construction in the intervening years). The cairn area was identified as a tent camp consisting of a rectangular depression (tent base), a fireplace, milled lumber, and historic trash. The tent camp was at the base of the cliff, and the surviving sweat lodge was described as being concealed 30-50 m west on the talus slope above. The sweat lodge and tent camp were defined as a single site, and the dating of the tent camp was extended to the sweat lodges, with an estimated age of 1920-1950.

LA 26162 was relocated during the OAS survey, and all site information was updated. A new site form was completed, along with a compass map of the site, photographs of features and structures, and in-field analysis of all visible surface artifacts (Table 35). The tent camp and sweat lodge were both relocated on the orthophotographic maps (1"=200'), and these locations are separated by a horizontal distance of 100 m and by 85 feet in elevation. No other historic Navajo cultural manifestations could be located between the two. Based on the amount of separation and the lack of independent confirmation that the sweat lodge is contemporary with the tent camp, the sweat lodge was recorded as LA 26162, and the tent camp was recorded as a new site (LA 117315).

As defined by the OAS survey, LA 26162 consists of a Navajo sweat lodge (Photo 4) associated with a hearth and a burned rock scatter. The site measures 5 by 10 m, but prior to road construction it extended an additional 10 m to the east, based on Ford and DeHoff's observations (1977). The sweat lodge was constructed by excavating a shallow basin 45 cm deep and lining the sides with unshaped sandstone rubble. The interior of the basin measures 1.54 by 1.30 m; the exterior of the structure measures 2.10 by 1.70 m. The basin was roofed by approximately 20 axe-cut tree limbs. A central pole spanned the exterior walls of the pit and supported the shorter limb segments. The entrance appears to have faced east. Portions of the superstructure have collapsed into the bottom of the basin.

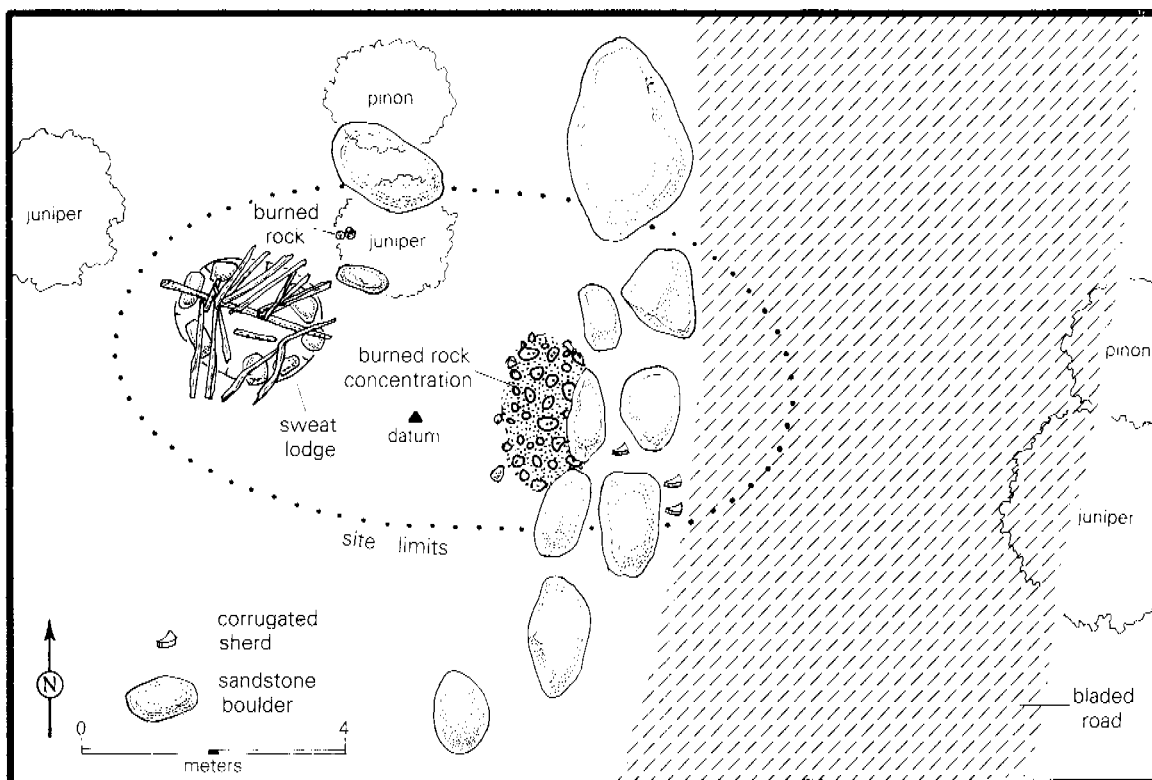


Figure 18. Plan of LA 26162.

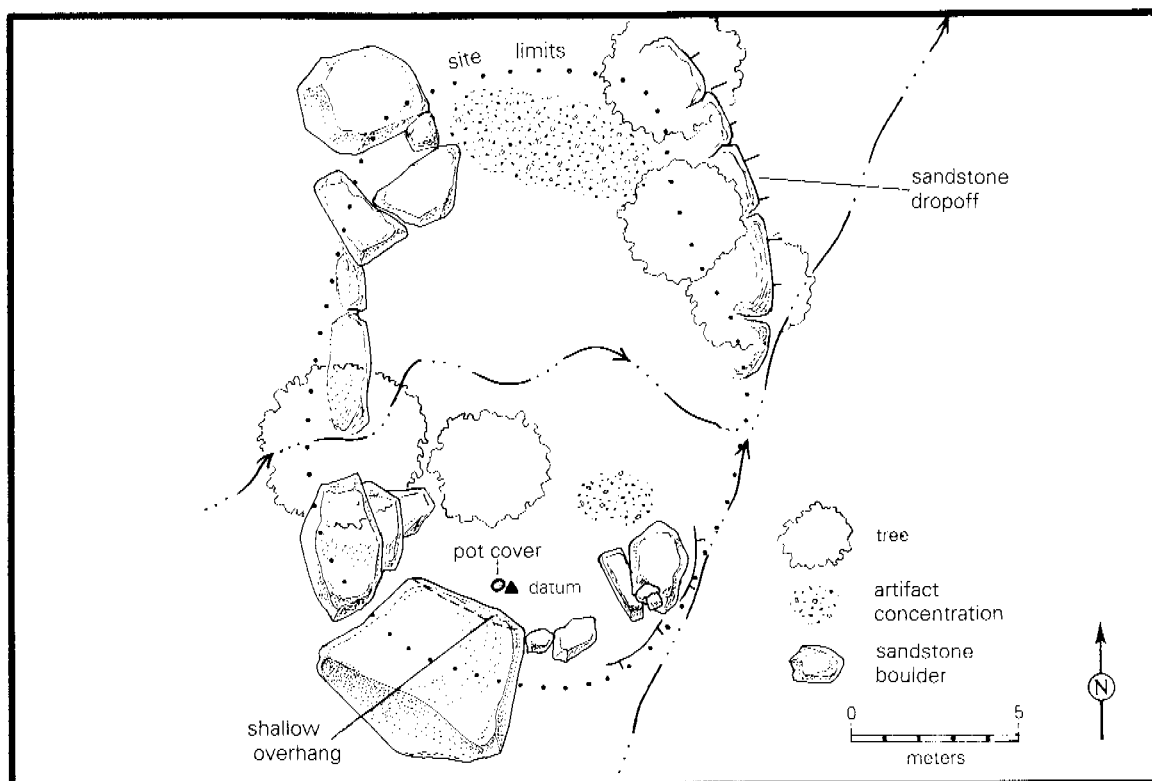


Figure 19. Plan of LA 88873.



Photo 4. Sweat lodge remains at LA 26162.

**LA 88873.** LA 88873 is a single-component Pueblo II Anasazi site (Fig. 19) on a narrow bench concealed among large talus boulders. The site overlooks the broad unnamed tributary of the Puerco River, which flows south along the east side of the section. This site was originally recorded by Marshall (1993) and described as a hearth and light artifact scatter. LA 88873 was relocated during the OAS survey, and site information was updated. A new site form was completed, including a compass map of the site area, photographs of features and structures, and in-field artifact analysis.

Two areas of burned rock are near the structure. One is 1.5 m northeast of the structure and contains three or four large oxidized sandstone boulders. This area appears to be a hearth. The other area, 3 m to the east, consists of a scatter of oxidized sandstone spalls and measures 2.5 by 1.5 m. This scatter appears to be a discard area associated with the sweat lodge.

The only artifacts noted on the site surface were six Anasazi corrugated sherds. These were east of the discard area and adjacent to the road. These sherds are the only evidence of an Anasazi component, and their presence reflects the high density of Anasazi sites in the surrounding area. Although both sweat lodges may have been built by residents of the tent camp in the valley below, the condition of the surviving structure is not obviously different from that of Navajo features that have been attributed to the Gobernador phase. Tree-ring samples from the remaining structure will clarify its dating, and it is tentatively assigned a historic Navajo affiliation.

LA 88873 consists of a large sandstone boulder with a natural overhang, a possible low wall constructed of unshaped sandstone rubble, and a scatter of artifacts and oxidized sandstone spalls. The site area is 18 by 13 m. The overhang faces northeast, with the possible wall constructed of

two stones adjacent to the south side of the boulder, extending 2 m to the east. The rubble ranges from 20 to 50 cm, and the wall stands 30 cm high. The overhang is 3.0 m long and 0.8 m deep. There is no evidence of an enclosing wall in front of the overhang. Based on surface observations, there appear to be 10 to 30 cm of deposits in the site area.

Table 35. LA 26162 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Corrugated Gray	6
Total	6

Table 36. LA 88873 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	4
Corrugated Gray	2
Anasazi White Ware	
Gallup Black-on-white	3
Escavada-Puerco Black-on-white	3
Anasazi Red Ware	
White Mountain Redware, unpainted	1
Total	13

Table 37. LA 88873 Flaked and Ground Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Core flake, utilized	Red-white chert	Glassy	Complete	10	Cortical
	Angular debris	Red-gray chert	Fine		0	
	Shaped slab (20 x 25 cm)	Sandstone	Medium	Complete		

All surface artifacts were analyzed (Tables 36 and 37). A thin round sandstone slab (probably a jar cover) is the only artifact in the overhang. A scatter of artifacts and oxidized sandstone spalls is northeast of the overhang, and a second low-density artifact scatter is 14 m north of the overhang. These artifacts are associated with oxidized sandstone spalls, which may represent the

disarticulated remains of a hearth. The pottery types are Pueblo II in age, and the site is probably contemporary with the Late Pueblo II community at the base of the canyon wall.

**LA 88874.** LA 88874 is a single-component Pueblo II Anasazi site (Fig. 20) on the toe of a south-facing sandstone ridge on the west side of the floodplain of the unnamed tributary of the Puerco River that flows south along the east side of the section. The upper portions of the site are slightly eroded by sheetwash, and significant amounts of recent alluvium may have buried the toe of the site. This site was originally recorded by Marshall (1993) and described as a single masonry room and a light artifact scatter. LA 88874 was relocated during the OAS survey, and site information was updated. This included a new site form, a compass map of the site area, photographs of features and structures, and in-field artifact analysis.

Table 38. LA 88874 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	2
Corrugated Gray	17
Anasazi White Ware	
Gallup Black-on-white	3
Escavada-Puerco Black-on-white	3
Mineral painted white ware (late)	4
Total	29

Table 39. LA 88874 Flaked and Ground Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Core flake	White chert	Fine	Distal ½	0	
	Angular debris	Gray silicified wood	Fine		10	
	Core flake	Silicified wood	Fine	Nearly complete	0	Missing
	Trough metate	Sandstone	Medium	40% complete		

LA 88874 measures 10 by 15 m. The site consists of a single masonry room and artifact scatter. The room was constructed with unshaped sandstone slabs and rubble ranging in size from 20 to 50 cm. The room interior measures 3 by 3 m, and the highest surviving wall stands 50 cm high. All visible artifacts were analyzed and recorded (Tables 38 and 39). Artifacts were concentrated within a 4.0 by 3.5 m area south of the room. One trough metate fragment was identified 8 m east

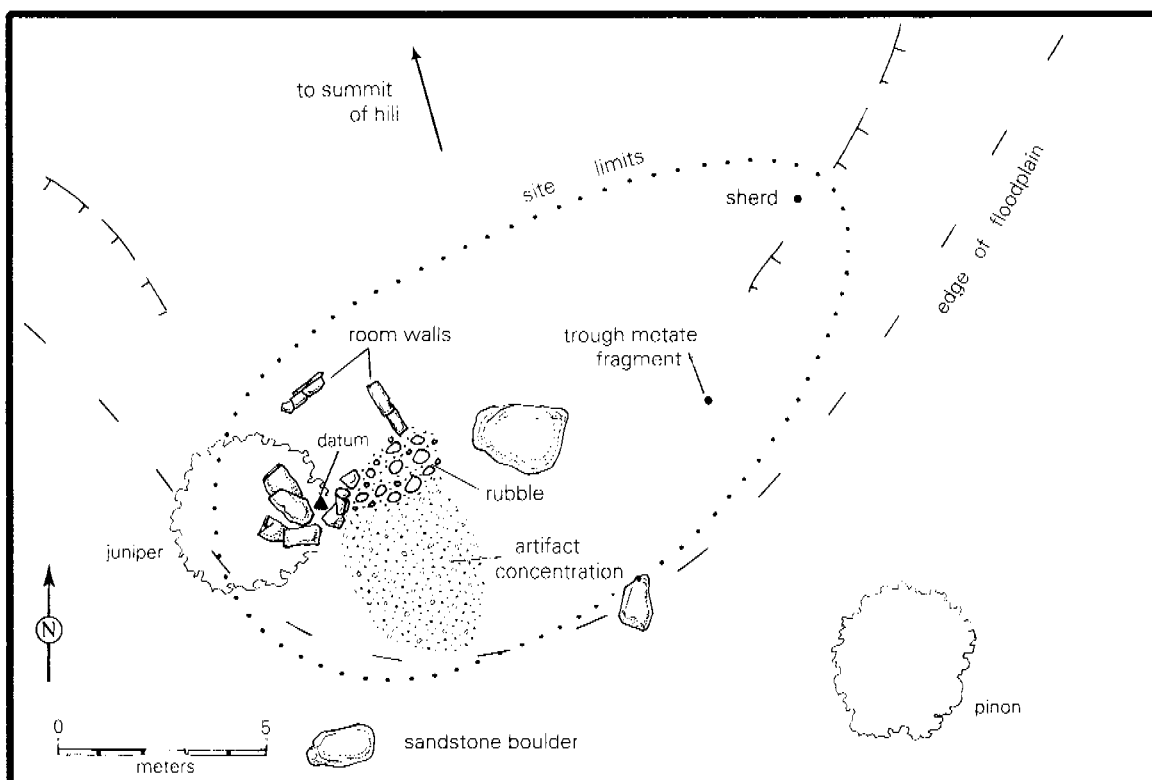


Figure 20. Plan of LA 88874.

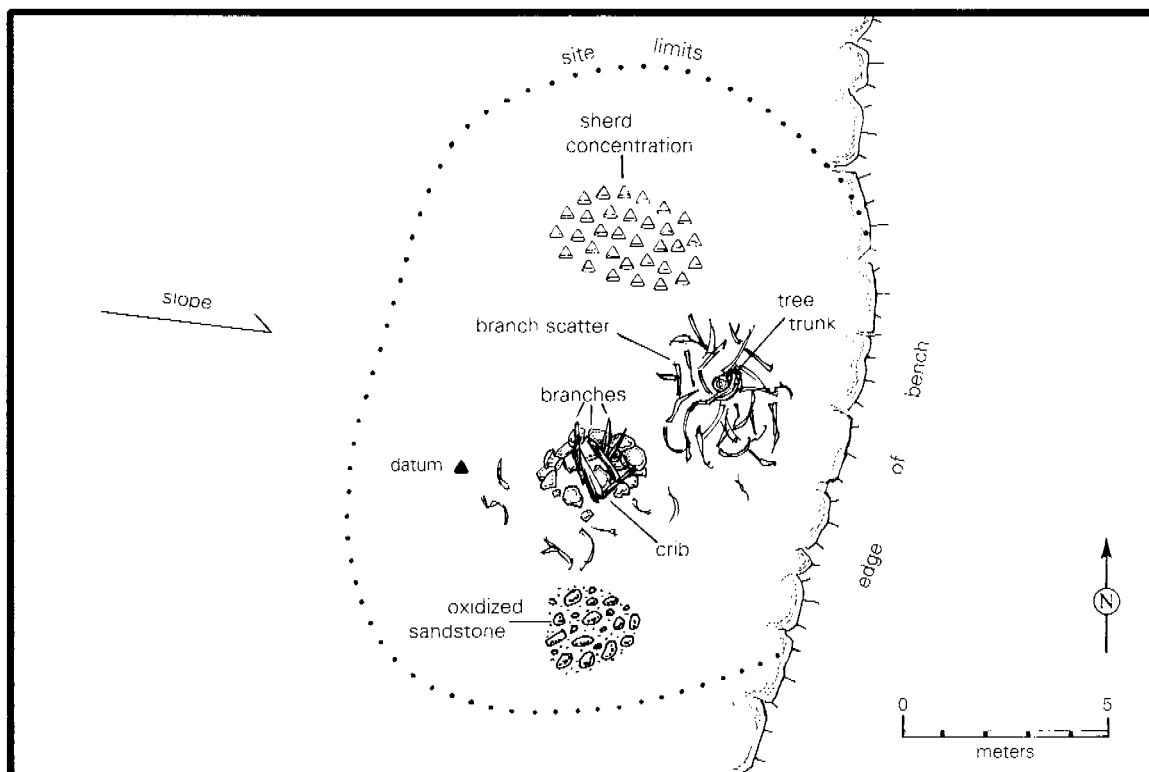


Figure 21. Plan of LA 88877.

of the room. Pottery types are Pueblo II in age, consistent with the types found at the Late Pueblo II residential sites within the section. Given the alluvial deposition around the toe of the ridge, the subsurface extent of the site may extend beyond the site boundary to the south.

**LA 88877.** LA 88877 is a single-component Gobernador phase Navajo site (Fig. 21). This site is set near the top of the canyon wall, on a narrow bench, on a point that separates the unnamed tributary of the Puerco River from a side canyon at the northeast corner of the section. The site faces north-northeast and is in stable and undisturbed condition. This site was originally recorded by Marshall (1993) and described as a masonry bin, possible hearth, and possible cribbed log hogan. LA 88877 was relocated during the OAS survey, and site information was updated. This included a new site form, complete compass map of the area, photographs of features and structures, and in-field analysis of all surface artifacts (Table 40).

Table 40. LA 88877 Ceramic Observations

Pottery type	Entire site (count)
Historic Puebloan	
Polished tan	5
Total	5

LA 88877 consists of a masonry bin or room, a low-density artifact scatter, and architectural wood that may be the remains of a log hogan. The site measures 15 by 12 m. The masonry feature is constructed with unshaped sandstone slabs and rubble, 20 to 40 cm, stacked up to five courses high (Photo 5). This three-sided crib structure is open to the south and appears to have been roofed with three to four axe cut tree limbs. The structure measures 2.1 by 1.4 m by 75 cm high. The possible hogan remains are a diffuse scatter of wood the east of the structure. Although a possible disarticulated hogan, one piece is a rotted trunk element, and the scatter may be a decayed deadfall rather than architectural wood. The possible hearth recorded by Marshall was relocated and appears to be a slightly oxidized natural rock outcrop.

A sparse scatter of artifacts 5 m north of the structure measures 2 by 3 m. This scatter consists of five tan polished historic Pueblo sherds with traces of matte paint, which Marshall describes as Ashiwi Polychrome or Kiapkwa Polychrome. Although the function of the crib is unknown and the presence of the hogan is problematic, this site is clearly part of the Gobernador phase occupation of the section.

**LA 88878.** LA 88878 is a single-component late Pueblo I or early Pueblo II Anasazi site (Fig. 22). This site is on the extensive bench 400 feet above the valley floor and 200 feet below the mesa top. The site is on the flat top of a point of the bench that is defined by the unnamed tributary of the Puerco River to the west and a side canyon of that tributary to the north. The site is far enough from the canyon rims that with today's vegetation, the only views are of the walls of the mesa to the northwest. This site was originally recorded by Marshall (1993) and described as three midden areas with burned sandstone and ash, all within a sparse artifact scatter that included an obsidian dart point base and Basketmaker III or Pueblo I pottery. LA 88878 was relocated by the OAS survey and the site information was updated. This included a new site form, a complete compass map of the area, photographs of the site, and in-field analysis of all surface artifacts (Tables 41 and 42).



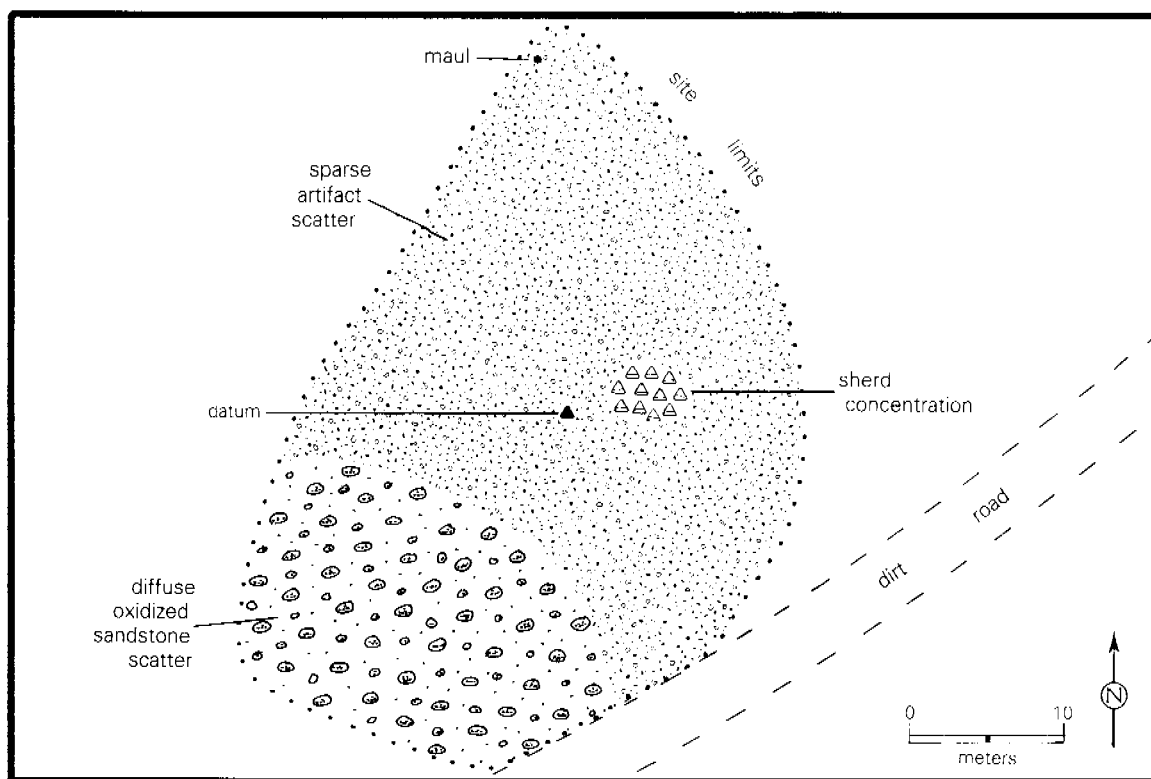


Figure 22. Plan of LA 88878.

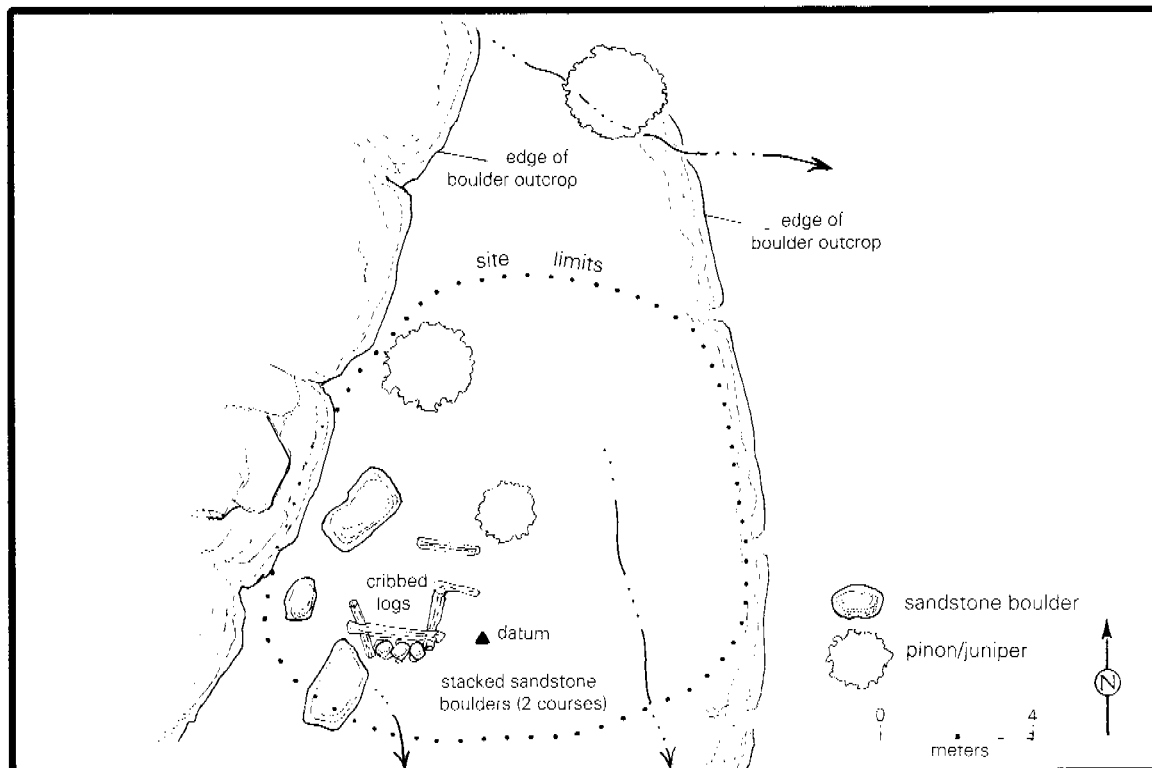


Figure 23. Plan of LA 116115.

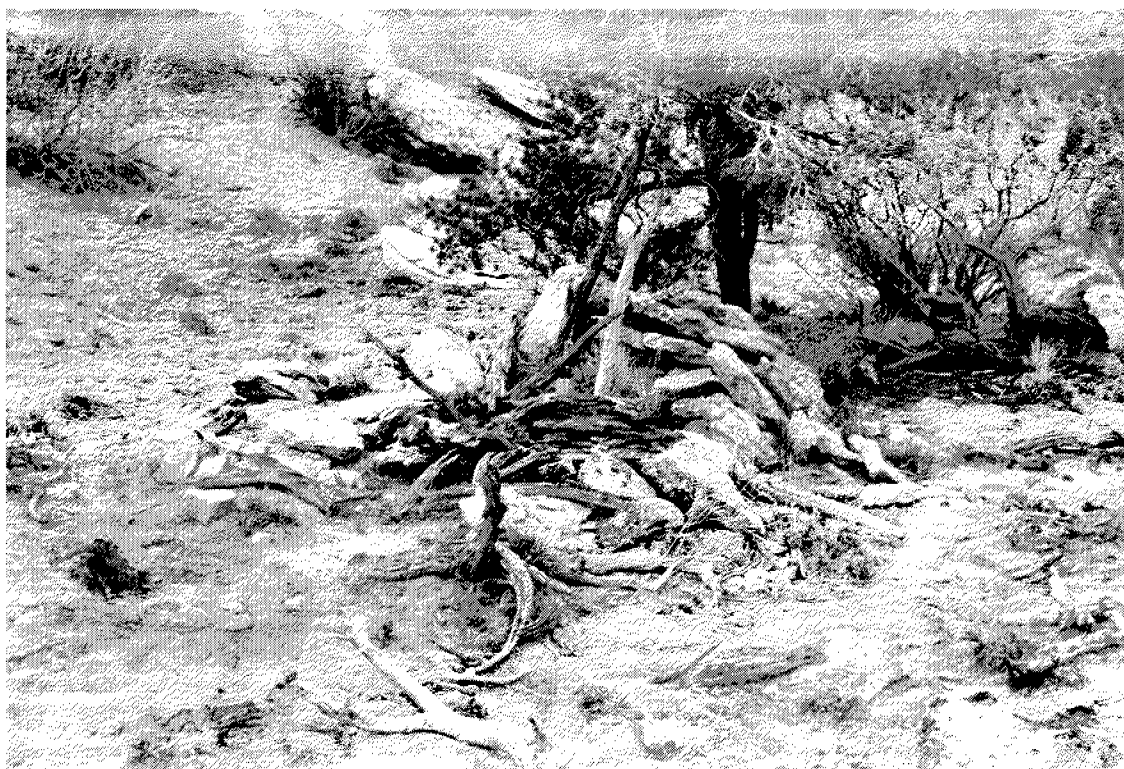


Photo 5. Crib structure at LA 88877.

The extent of the site is defined by a sparse scatter of artifacts and a diffuse scatter of oxidized sandstone spalls that is concentrated in the southern third of the site area. A bladed road has truncated the southeastern margin of the site, and no cultural materials could be located on the other side of the road. Although the oxidized sandstone may be the dispersed remains of hearths or burned structures, there is no clear evidence of structures or features within the site area. Most of the artifacts are sherds, but the four lithic artifacts include petrified wood hammerstone and a grooved sandstone maul. The obsidian dart point base reported by Marshall could not be relocated. The pottery types could represent multiple-component uses in the Basketmaker III and Pueblo II periods, but the more likely explanation is a single component in the early to mid-Pueblo II period. The site is in good and stable condition, and there is a possibility of subsurface deposits.

Table 41. LA 88878 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	2
Clabboarded Gray	7
Anasazi White Ware	
Gallup Black-on-white	3
Total	12

Table 42. LA 88878 Flaked and Ground Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Core flake	Tan chert	Fine	Complete	10	Single facet
	Late stage biface	Red chert	Fine	Corner fragment	0	Retouched
	Single grooved maul	Tan sandstone	Medium	Split		
	Hammerstone (well used)	Petrified wood	Fine, checked	Complete	90	

**LA 116113.** LA 116113 describes an improved trail which connects the bench top with the valley bottom along the unnamed tributary arroyo of the Puerco River. The trail is defined by a cleared path and a series of features that have improved or stabilized the path. The head of the trail at the top is blocked by a pile of branches that serves to keep livestock from passing (Photo 6). The trail can be traced continuously for approximately 200 m down from the bench top, but it has suffered damage from rock slides that have removed major portions, and the lower portion is discontinuous and cannot be traced with confidence. A loose pile of stones and short branches at one switchback appears to be a shrine or trailmarker (Photo 7), and other features are rough masonry walls that either support the trail bed or serve to keep travelers or livestock from wandering off of the trail.

The trail is currently being used by nearby residents and grazing leasees to move livestock to and from the bench top and the floodplain below. The instability of the canyon wall underlying portions of the trail is extreme, and several areas of the trail have been lost in the past few years. Isolated fragments of trail bed that were noted but not recorded during survey attest to continuous modification and reconstruction over at least the past several decades, and probably longer. The age of the trail and its improvements is unknown, but some portions are clearly modern and some portions are likely to be more than 50 years old.

During the archaeological survey, OAS archaeologists spoke with the BLM grazing lessee, James Lewis, about the trail. Mr. Lewis stated that the cow trail had been used for many years by the local Navajos as a cow and sheep trail to reach the top of the mesa and also for a travel route. The lessee had no concerns about the archaeologist using the trail: it was old, but not a "sacred trail." Other local residents who were asked by the archaeologists about the trail agreed that the trail was old but not considered sacred.

**LA 116115.** LA 116115 is a single-component Navajo site (Fig. 23). The site is on a narrow bench concealed among large talus boulders in an intact and stable condition. The site overlooks the mouth of the unnamed tributary of the Puerco River, which flows south along the eastern side of the section. This previously unrecorded site was located during the OAS survey and assigned field number HRI-5. Site information was recorded by completing a LA site record form, a compass map of the site area, and photographs. No artifacts were found associated with this site.



Photo 6. Mesa-top gate at the head of the trail, LA 116113.



Photo 7. Stones and branches, perhaps a trailside shrine, LA 116113.

LA 116115 consists of a single room or hogan constructed against a large talus boulder. Remains of three walls were identified. The south wall was constructed with a combination of six large pieces of unshaped sandstone rubble stacked two courses high and topped with cribbed logs. This wall incorporates a large boulder on the west. Cribbed logs are articulated at each end of the south wall to form the east and west sides of the structure. The interior of the room measures 3.5 by 3.5 m, and the highest wall stands 50 cm. No other features or artifacts were identified at this site. Site condition is comparable to other Navajo sites that are attributed to the Gobernador phase.

**LA 116116.** LA 116116 is a multiple-component site with evidence of Pueblo I Anasazi and Historic Navajo occupations (Fig. 24). This site is set on a low rise, which extends south from the base of a high talus slope and into the floodplain of the Puerco River and its unnamed tributary arroyo. This site is in a slightly deflated setting with evidence of mechanical disturbance. This previously unrecorded site was located during the OAS survey and assigned field number HRI-6. Site information was recorded by completing a LA site record form, a compass map of the site area, photographs, and in-field analysis of all visible surface artifacts (Tables 43 and 44).

Table 43. LA 116116 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Lino Gray	1
Plain Gray	18
Corrugated Gray	15
Anasazi White Ware	
Red Mesa Black-on-white	1
Gallup Black-on-white	1
Mineral painted white ware (late)	3
Unpainted white ware	2
Anasazi Red Ware	
White Mountain Redware, painted	1
Total	42

Table 44. LA 116116 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Core flake (thermally altered)	Reddish brown jasper	Glassy	Complete	100	Cortical
	Angular debris	White-gray chert	Fine		50	
	Core flake	Streaky silicified wood	Fine	Complete	50	Cortical

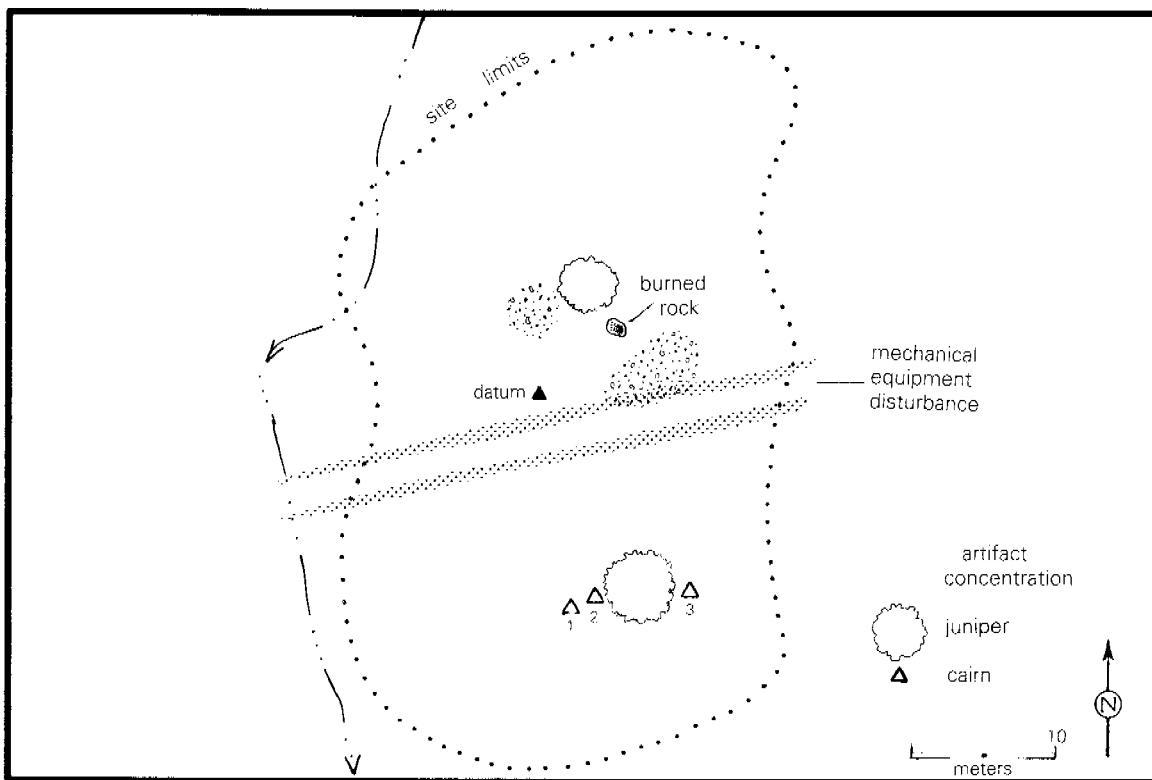


Figure 24. Plan of LA 116116.

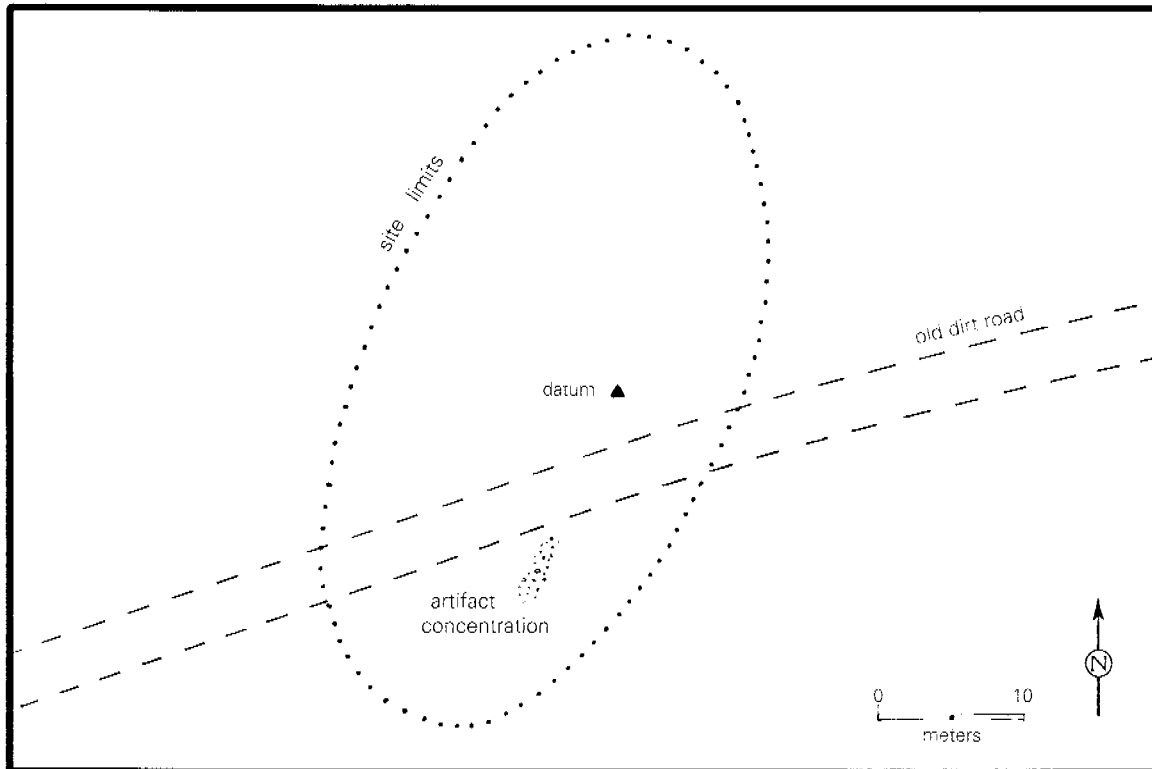


Figure 25. Plan of LA 116117.

LA 116116 consists of a low-density artifact scatter and three features. The site measures 45 by 32 m. The Anasazi component is represented by a low-density artifact scatter consisting primarily of ceramics. These artifacts are widely distributed over the entire site, with two concentrations near the center. These concentrations measure 3 m in diameter and 4 by 7 m. The larger concentration is adjacent to what appears to be a bulldozer cut. There is no evidence of structures at the site, and the potential for subsurface deposits is unknown. Use of the site was contemporary with the occupation of the surrounding Late Pueblo II habitations, but prehistoric activities were limited in scope and duration.

The Navajo component is represented by three rock cairns. These features are constructed primarily of stacked tabular sandstone. Cairn 1 contains seven sandstone slabs (20 by 30 by 2 cm) stacked 20 cm high. Cairn 2 contains six sandstone slabs (15 by 30 by 2 cm) stacked 25 cm high. Cairn 3 contains two sandstone slabs (20 by 40 by 2 cm), with a one gallon paint can stacked between the two.

**LA 116117.** LA 116117 is a single-component Pueblo II Anasazi site (Fig. 25). This site is set in the floodplain of the Puerco River and the unnamed tributary arroyo, separated from the canyon wall by LA 116116. LA 116117 is in stable condition and relatively intact despite disturbance associated with what appears to be an old road through the site. This previously unrecorded site was located during the OAS survey and assigned field number HRI-7. Site information was recorded by completing a LA site record form, a compass map of the site area, photographs, and in-field analysis of all visible surface artifacts (Table 45).

Table 45. LA 116117 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	12
Corrugated Gray	13
Anasazi White Ware	
Mineral painted white ware (late)	2
Total	27

The site consists only of a low-density ceramic scatter which measures 50 by 25 m. Sherds were widely distributed over the entire site with one concentration measuring 5 by 2 m to the south of the road. No architectural material or features were noted on the site surface, and the depth of cultural deposits is unknown. The pottery appears to be contemporary with the late Pueblo II community settlements that are on landforms to the east and west. However, the sherds at LA 116117 cannot have been washed to their current position from these large habitations due to local topography and drainage patterns. A more likely explanation is that this area was occasionally used for outdoor activities by community members, similar to the use inferred for LA 116116, but at a lower level of intensity.

**LA 116118.** LA 116118 is a multiple-component site with evidence of Pueblo II Anasazi and Gobernador Phase Navajo occupations (Fig. 26). This site is set along the eastern talus slope of a south-facing rincon. It is approximately 1 m above the floodplain of the Puerco River and its

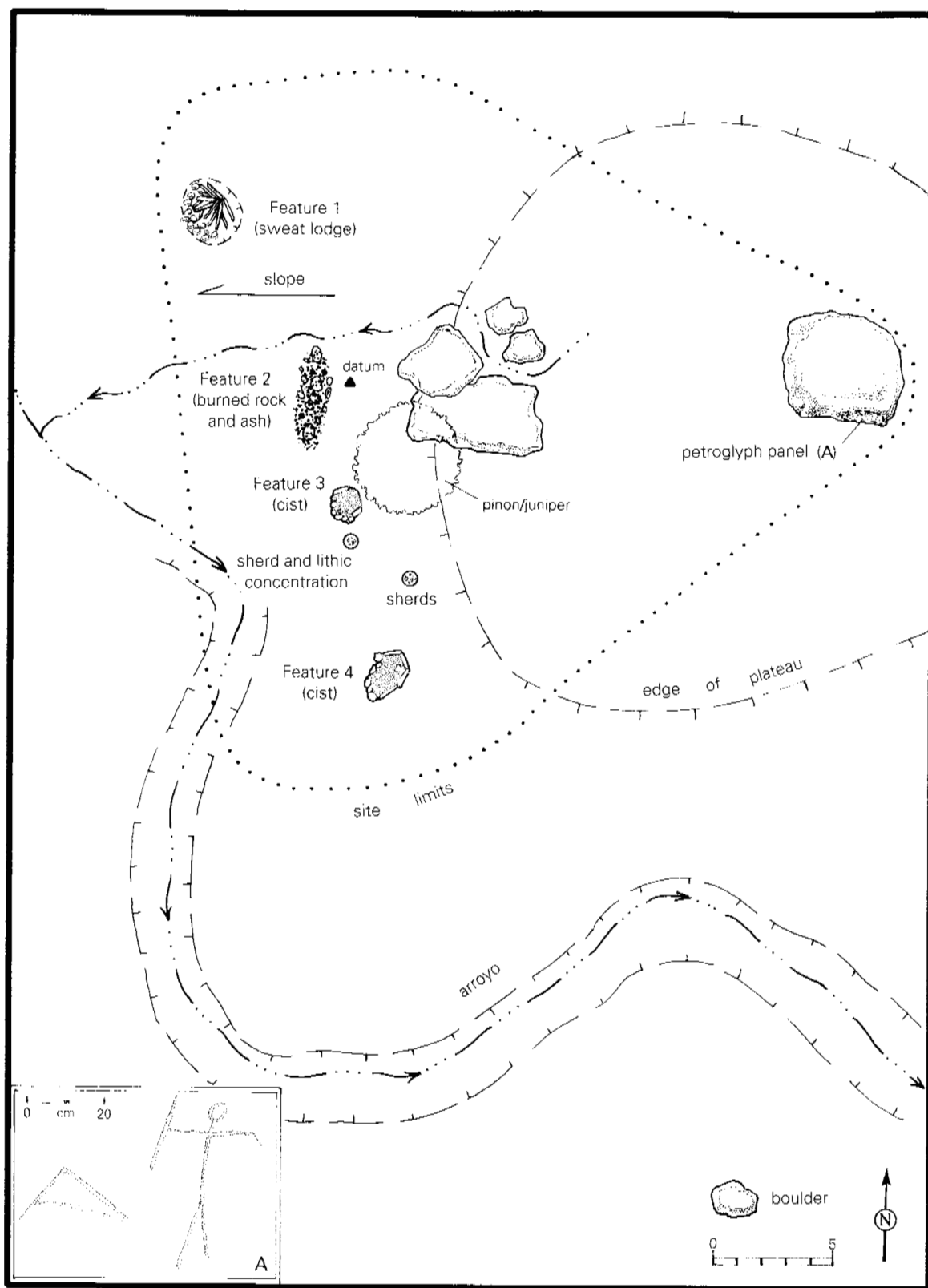


Figure 26. Plan of LA 116118.



unnamed tributary arroyo. This site is slightly deflated, with evidence of recent erosion promoted by grazing, and one feature appears to have been looted. The slope is approximately 26 degrees with a southwestern aspect. This previously unrecorded site was located during the OAS survey and assigned field number HRI-8. Site information was recorded by completing a LA site record form, a compass map of the site area, photographs, and in-field analysis of all visible surface artifacts (Tables 46 and 47).

LA 116118 consists of four features, five artifacts, and a petroglyph panel within a 29 by 30 m area. Some of the artifacts and features can be confidently assigned to one of the two components, while others cannot be assigned with confidence. The Anasazi component is defined on the basis of four sherds, and the single flake and a rock art panel are probably part of the Anasazi component. The artifacts are in the southern portion of the site between two cists, Features 3 and 4. The petroglyph panel is at the extreme east of the site, about 18 m from the artifacts. The panel is 0.7 m wide and 0.5 m high, and the image appears to be a stick figure of an upright human holding a staff or pole in one hand (see Fig. 26). The cists and the panel are not unequivocally Anasazi and could be related to the Navajo component.

Table 46. LA 116118 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	3
Anasazi White Ware	
Unpainted white ware	1
Total	4

Table 47. LA 116118 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Core flake	Tan chert	Fine	Medial fragment	100	

The Navajo component is represented by a sweat lodge (Feature 1), an associated burned rock scatter, and a possible hearth (Feature 2). The sweat lodge roof is supported by forked sticks over a 2.2 m diameter shallow basin (Photo 8). Unshaped sandstone slabs line the depression, and the juniper latillas that closed the roof have collapsed, but all elements appear to be present. A scatter of oxidized sandstone spalls spreads to the west of the sweat lodge. Feature 2, 6 m southeast of the structure, consists of a scatter of oxidized sandstone spalls and charcoal-stained soil. This scatter probably represents a hearth.

Features 3 and 4 are burned slab-lined cists. These features could be associated with either site component. Feature 3 includes two upright slabs and measures 1.2 m in diameter. This feature was completely filled to the top of the slabs with soil. Feature 4 includes four upright slabs and measures 1.8 by 1.6 m. This feature appears to have been looted, which has caused the western

slabs to collapse. The exposed slabs are oxidized, and oxidized and charcoal-stained soil are present at the base of the feature. Functions of these cists are unknown, but the intensity of oxidation is reminiscent of the larger sandstone-lined trench kilns used to fire pottery in the Northern San Juan Anasazi region (Fuller 1984).



Photo 8. Navajo component sweat lodge at LA 116118.

**LA 116119.** LA 116119 is a multiple-component site with evidence of Pueblo II Anasazi and Territorial to Early Statehood occupations (Fig. 27). This site is set on a south-facing talus slope covered with small fragments of tabular sandstone. It is approximately 1 m above the floodplain of the Puerco River and its unnamed tributary arroyo. The site is slightly deflated, accelerated by grazing.

This previously unrecorded site was located during the OAS survey and assigned field number HRI-9. Site information was recorded by completing a LA site record form, a compass map of the site area, photographs, and in-field analysis of all visible surface artifacts (Table 48). LA 116119 consists of a low-density artifact scatter in an area 31 by 16 m. The site consists primarily of prehistoric ceramics, with a few pieces of purple bottle glass identified at the north end of the site. There is no surface evidence of features or structures at the site, and the depth of cultural deposits is unknown. This site is similar in setting and structure to LA 116116 and LA 116117, and although it is poorly dated by ceramics, it may be a similar part of the Late Pueblo II community settlement pattern within Section 8.

**LA 116120.** LA 116120 straddles the boundary between BLM and private land in Section 8. It is a multiple-component site with evidence of Pueblo II Anasazi and Territorial to Early Statehood

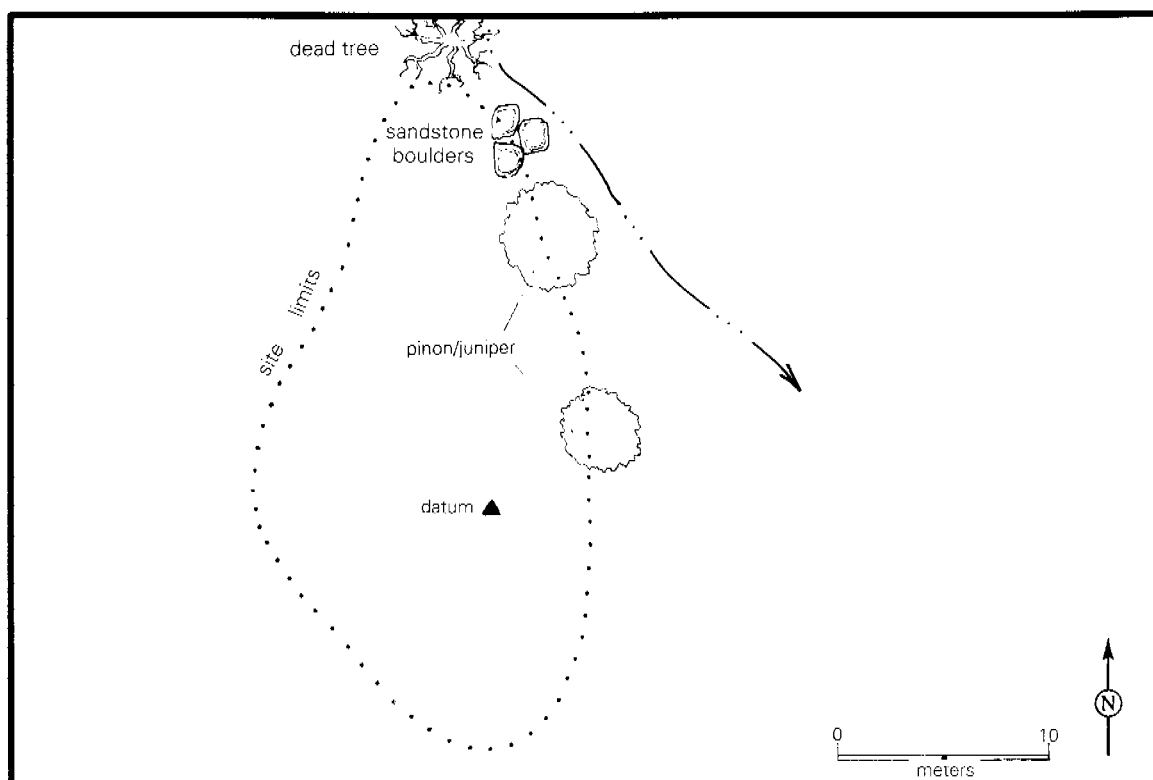


Figure 27. Plan of LA 116119.

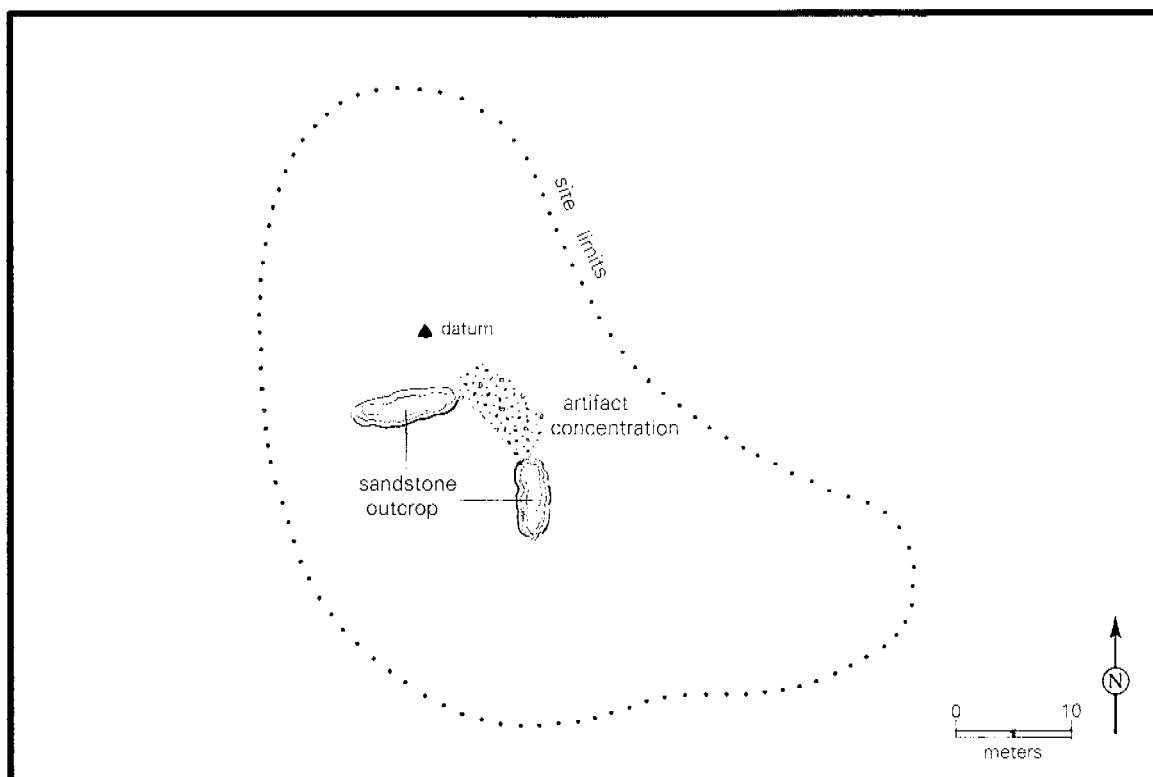


Figure 28. Plan of LA 116121.

occupations (see Fig. 12). This site is set on the major bench within the upland portion of the section, about 400 feet above the floodplain and 200 feet below the edge of the mesa top. The site is toward the back of the bench, on a low rise within a shallow southeast-facing rincon overlooking the Puerco River Valley. The site surface is slightly deflated and traversed by shallow drainages. The area around the masonry is obscured by duff and broken branches. This previously unrecorded site was located during the OAS survey and assigned field number HRI-10. Site information was recorded by completing a site record form, a compass map of the site area, photodocumentation, and in-field analysis of all surface artifacts (see Table 24). The boundary line between private and BLM land runs through the center of the site, but its exact position cannot be estimated with confidence due to a lack of local survey monuments and the distortion of the orthophoto base map. The site condition is relatively stable. Sheet wash and wind erosion affect the area of the artifact concentration more than the structural portion of the site, where the ground surface is stabilized by juniper trees.

The site consists of a masonry feature and an artifact concentration within a sparse artifact scatter. The site measures 19 by 42 m, and the masonry is separated from the artifact concentration by about 26 m. The masonry consists of two articulated upright sandstone slabs that are perpendicular to two unshaped sandstone cobbles. The feature is estimated to have been 2 by 2 m, and it may represent a room or a large storage feature. The artifact concentration covers an area 15 by 6 m and contains sherds from at least three vessels. A few sherds are scattered between the concentration and the masonry structure, but there is no firm link between these two site features. Three pieces of purple glass are part of the sparse artifact scatter, suggesting use of the site sometime between A.D. 1880 and 1920, probably by Navajo residents of the area. The Anasazi component is defined based on the artifact concentration and probably includes the masonry structure. The historic component appears to be unrelated trash, fortuitous evidence of the occasional use of this landscape by Navajo residents of the area at the turn of the century.

**LA 116121.** LA 116121 is a single-component Anasazi site with an occupation during the Basketmaker III or Early Pueblo I period (Fig. 28). The site is on the broad bench that is part way between the Puerco River floodplain and the mesa top to the north. The site is close to the edge of the major bench, overlooking the Puerco River Valley. Portions of the site are deflated due to water and wind erosion. This previously unrecorded site was located during the OAS survey and assigned field number HRI-11. Site information was recorded by completing a LA site record form, a compass map of the site area, photographs, and in-field analysis of all visible surface artifacts (Table 49).

LA 116121 consists of a low-density artifact scatter that measures 56 by 55 m. The site consists entirely of prehistoric ceramics. The artifacts were concentrated in shallow swells among sandstone bedrock outcrops. Artifacts become increasingly sparse toward the edge of the mesa. There is no evidence of structures or features, but there may be some depth to the deposits away from the sandstone outcrops.

**LA 117314.** LA 117314 is a multiple-component site with evidence of Late Archaic or Basketmaker II, Pueblo II, and historic Navajo occupations (Fig. 29). This site is on a bench between the base of the canyon wall to the west and a tilted sandstone ridge to the east. LA 117314 has a broad southern exposure and is well protected from the prevailing winds. There has been some mechanical disturbance along the eastern side of the site, which has encouraged erosion, and natural down-cutting is accelerating erosion along the course of a drainage in the western portion of the site. The remainder of the site area is intact and in stable condition. This previously

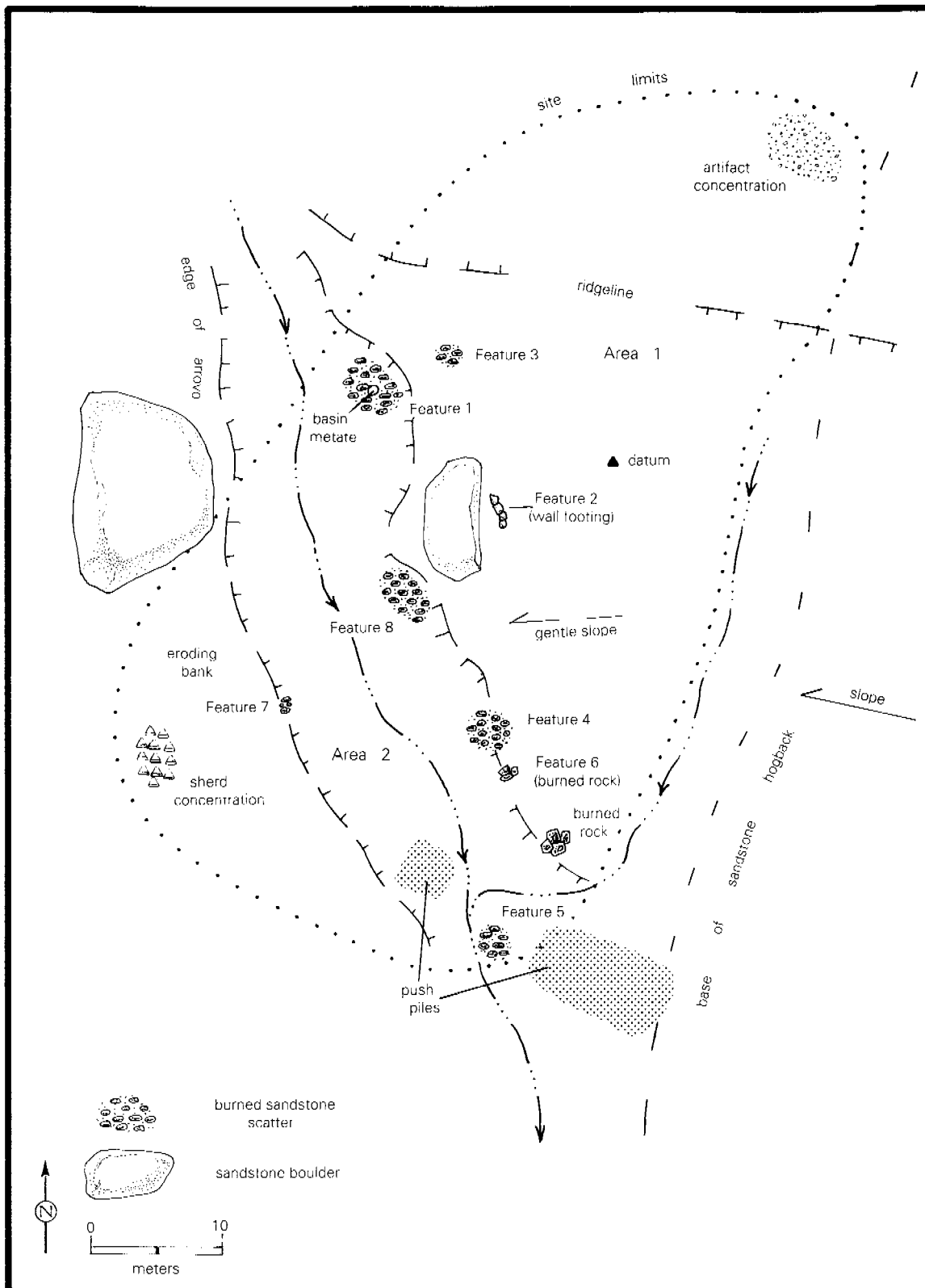


Figure 29. Plan of LA 117314.

Table 48. LA 116119 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	3
Corrugated Gray	4
Anasazi White Ware	
Unpainted white ware	2
Mineral painted white ware (late)	2
Total	11

Table 49. LA 116121 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	35
Neckbanded Gray	1
Anasazi White Ware	
Mineral painted white ware (late)	1
Total	37

Table 50. LA 117314 Ceramic Observations

Pottery type	Area 1 (count)	Area 2 (count)
Anasazi Gray Ware		
Plain Gray	4	6
Corrugated Gray	6	1
Anasazi White Ware		
Indeterminate white (possibly early)		1
Escavada-Puerco Black-on-white	3	
Mineral painted white ware (late)	4	7
Anasazi Red Ware		
Puerco Black-on-red		1
Total	17	16

unrecorded site was located during the OAS survey and assigned field number HRI-12. Site information was recorded by completing a site form, a compass map of the area, photographs of features and structures, and in-field artifact analysis of all visible artifacts. Recording was carried out within discrete portions of the site in an effort to better-define the components (Tables 50 and 51).

The site lies within an area of 66 by 56 m, and the Late Archaic or Basketmaker II component is the most extensive of the three components. This component consists of three large areas of charcoal-stained soil associated with lithic artifacts, groundstone artifacts, and oxidized tabular sandstone spalls that are probably fire-cracked rock. These features are exposed in the eroding banks of small drainages through the site. Based on the size of the stains and associated artifacts, these areas may be the remains of pit structures.

Feature 1 is a charcoal-stained area at the western margin of the site that measures 3.5 by 4.5 m. This feature is associated with a complete basin metate, a variety of flaked lithic artifacts, and a scatter of fire-cracked rock. Feature 4 is a charcoal-stained area in the south-central portion of the site that measures 2.8 by 3.0 m. It is associated with large quantities of fire-cracked rock and a core flake. Feature 8 is a charcoal-stained area in the center of the site that measures 4.0 by 3.5 m. Large quantities of fire-cracked rock and two lithic artifacts are in the vicinity of the feature and are scattered to the southwest, including a complete chipped stone drill. Features 3, 5, and 6 are concentrations of fire-cracked rock and charcoal-stained soil. These features may represent extramural hearths associated with the pit structures.

The Pueblo II component is represented by sherds that were concentrated at the northern and southwestern portions of the site. One feature in the southwest portion of the site is confidently associated with this component. Feature 7 is a dense concentration of oxidized tabular sandstone and rich charcoal stained soil. The feature measures 1.3 by 1.0 m and is associated with burned ceramics.

The Navajo component is defined by Feature 2, a small shelter constructed against a large overhanging boulder. The enclosure is constructed of six pieces of unshaped sandstone rubble stacked two courses high, adjacent to the stump of an axe-cut tree. The interior of the enclosure measures 1.25 by 1.15 m. No artifacts were identified with this component, but there are other axe-cut trees in the vicinity the site. This feature could be a livestock facility such as a lambing pen, or it could be a camp associated with wood gathering in the area.

**LA 117315.** LA 117315 consists of a rectangular depression, a sandstone rock pile, and a scatter of milled lumber and historic artifacts within an area 14 by 13 m. This historic site was originally noted by Ford and DeHoff (1977) as part of their description of sweat lodges at LA 26162. The historic features were formally incorporated into the definition of LA 26162 by Marshall (1993). However, the sweat lodges are separated from these features by a horizontal distance of 100 m and by 85 feet in elevation, with no intervening cultural material that can be attributed to the historic period. Also, no material culture is associated with the surviving sweat lodge (one was destroyed by road construction between 1977 and 1988), and unless tree-ring samples from the sweat lodge can be dated and demonstrate contemporaneity, there is no reason to assume that the sweat lodge is historic as opposed to being associated with the Gobernador phase occupation of the area. For these reasons, the historic features have been defined and recorded as a distinct site by the OAS survey. During the initial survey the site was identified as IO 30, and it was later recorded as site HRI-13.

Table 51. LA 117314 Flaked and Ground Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Area 1 (exclusive of features 1, 4, 5, and 6)	Angular debris	Tan silicified wood	Fine		0	
	Core flake	White-black chert	Glassy	Complete	0	Single facet
	Core flake	White chalcedony	Glassy	Complete	0	Collapsed
Area 1, Feature 1	Bifacially retouched flake (side scraper?)	Tan chert	Fine	Complete as tool	0	Missing
	Multidirectional core	Tan-gray silicified wood	Fine	Complete	0	
	Angular debris	Pink chert	Fine		0	
	Hammerstone	Petrified wood	Fine	Complete	60	
	Core flake	Pink quartzite	Medium	Nearly complete	20	Missing
	Angular debris	Gray silicified wood	Fine		20	
	Indet. ground stone, smoothed surface	Sandstone	Medium	Unknown		
	Basin metate	Sandstone	Medium	Complete		
	Indet. ground stone, 40 x 60 cm, pecked over 22 x 36 cm area	Sandstone	Medium			
Area 1, Feature 4	Core flake	Red jasper	Fine	Distal ½	50	
Area 1, Features 5 and 6	Angular debris	Silicified wood	Fine		0	
	Core flake	Red jasper	Fine	Complete	50	Cortical
	Angular debris	Red jasper	Fine		0	
	Angular debris	White chert	Glassy		0	
	Core flake	White chert	Glassy	Distal ½	0	
	Core flake	Dark gray silicified wood	Fine	Complete	0	Cortical
	Slab with smoothed and pecked surface	Sandstone	Medium			
Area 2	Bifacial drill	Gray rhyolite (?)	Fine	Complete as tool	0	Missing
	Core flake	White chert	Glassy	Distal ½	0	



LA 117315 is within a shallow southeast-facing bay or rincón at the edge of the floodplain of the unnamed tributary of the Puerco River (Fig. 30). The most prominent feature of the site is a roughly rectangular pile of sandstone slabs and blocks that appears to have been a dry-laid stone fireplace. Scattered around and to the southwest of the fireplace are pieces of milled lumber. A 6 by 6 inch timber has a row of round nails along one edge, several of which had been driven through folded layers of rubberized cloth. A large (8 by 6 m) shallow depression with two straight sides abuts the fireplace; this depression was interpreted as a tent base by Marshall (1993). Historic artifacts include a piece of clear glass, round nails, a variety of milled lumber sizes, and tin can fragments. One baking powder tin is embossed with "General Can Company Chicago." A five-gallon rectangular tin container is about 10 m to the south-southwest of the site boundary. The ends of the tin have been cut, apparently with a hack saw rather than a chisel. There is little trash and no evidence of burning except for stones in the interior of the fireplace.

The site is in relatively good condition. Well pad construction has scraped the northern end of the site, and a drainage to the west is beginning to deposit alluvium over the southwestern site margin. The material culture is relatively recent compared with other historic sites within the section. It could date as early as the 1920s, but a date in the 1950s is more likely. The site appears to be a temporary camp, perhaps associated with seasonal use of the section for livestock grazing.

**LA 117316.** LA 117316 is an isolated petroglyph panel along the base of a low cliff at the back of the major bench within Section 8 (Fig. 31). The panel had not been recorded previously and was recognized during the initial OAS survey as IO 75. The panel was later recorded as site HRI-15. Another isolated petroglyph was encountered about 25 m to the west along the cliff, with no intervening cultural materials. The second petroglyph is different in style and appears to be different in age. It has been recorded as LA 117317.

The panel at LA 117316 is a representation of a deer being hunted by an archer (Photo 9). Several smaller paired motifs appear to be hoof prints, and several larger areas of pecking cannot be interpreted with confidence. The figures are on a nearly vertical sandstone fracture surface within an area 65 cm high by 54 cm wide. Weathering has turned the sandstone surface a light red, while the images are the tan of the unweathered rock. All portions of the designs are pecked with the exception of the bowstring, which is incised. The use of bow imagery places the age of the petroglyph after A.D. 600, and the representational style is most consistent with the Pueblo II and Pueblo III rock art styles on the Colorado Plateau (Schaafsma 1980).

The panel has suffered some damage from rock fracture and rock fall. It is slightly protected from direct weathering by a tree that is growing in front of the cliff face, but the overhanging rocks of the cliff appear to be unstable (within a time frame of decades to centuries).

**LA 117317.** LA 117317 is an isolated petroglyph panel along the base of a low cliff at the back of the major bench within Section 8 (Fig. 32). The panel had not been recorded previously and was recognized during the initial OAS survey as IO 77. The panel was later recorded as site HRI-17. Another isolated petroglyph was encountered about 25 m to the east along the cliff, with no intervening cultural materials. The second petroglyph is different in style and appears to be different in age. It has been recorded as LA 117316.

The panel at LA 117317 is small (55 cm high by 95 cm wide) and abstract (Photo 10). There are four pecked lines in one area of the panel, defining a rectangular area, with the upper and lower lines extending beyond the vertical lines. Other areas of the panel include dots, small areas

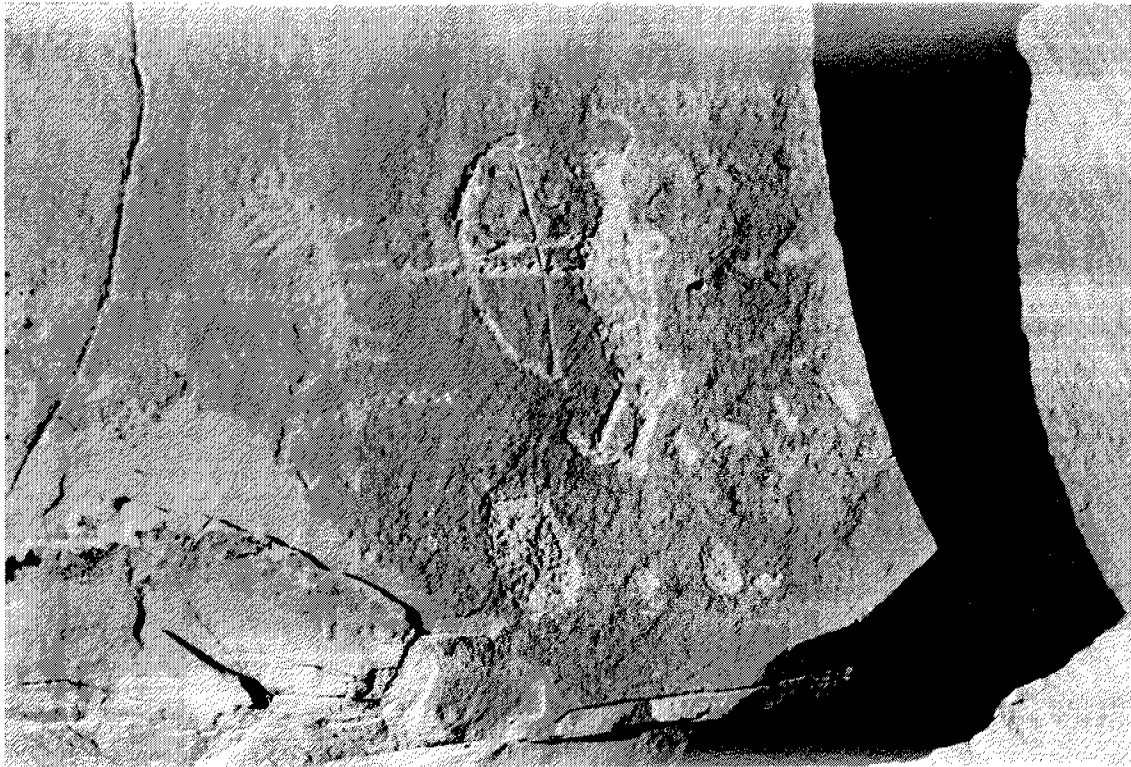


Photo 9. Petroglyphs at LA 117316.

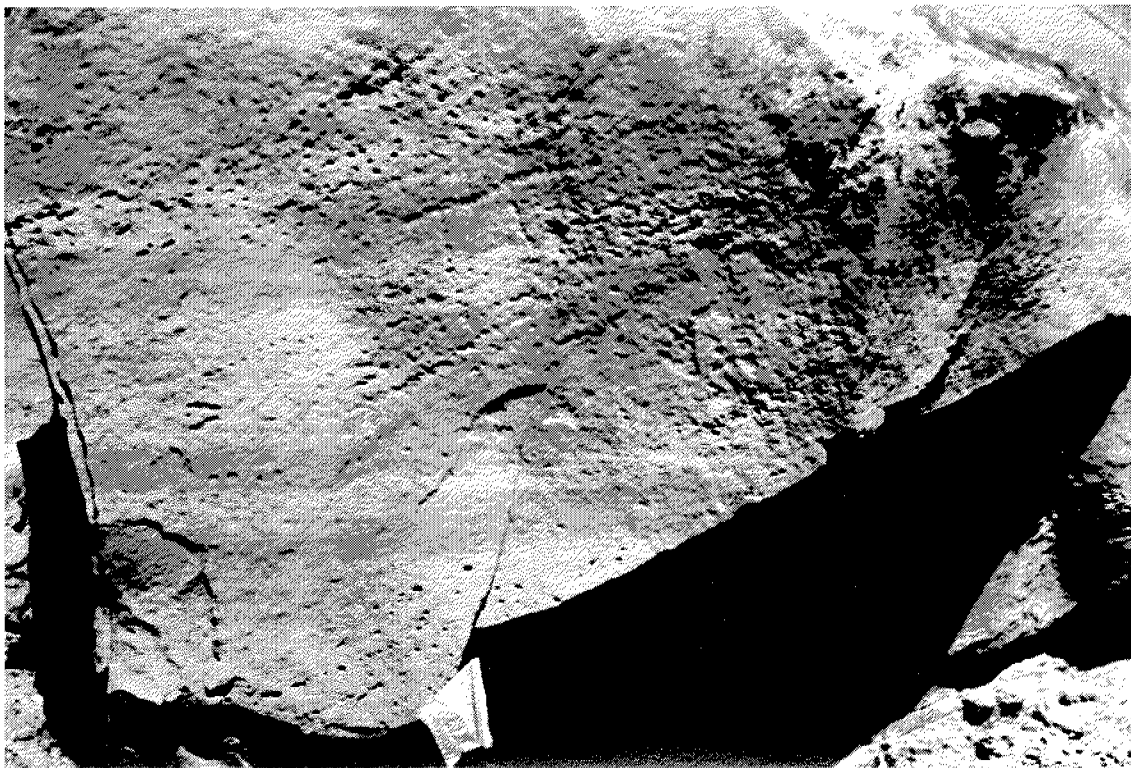


Photo 10. Petroglyph at LA 117317.

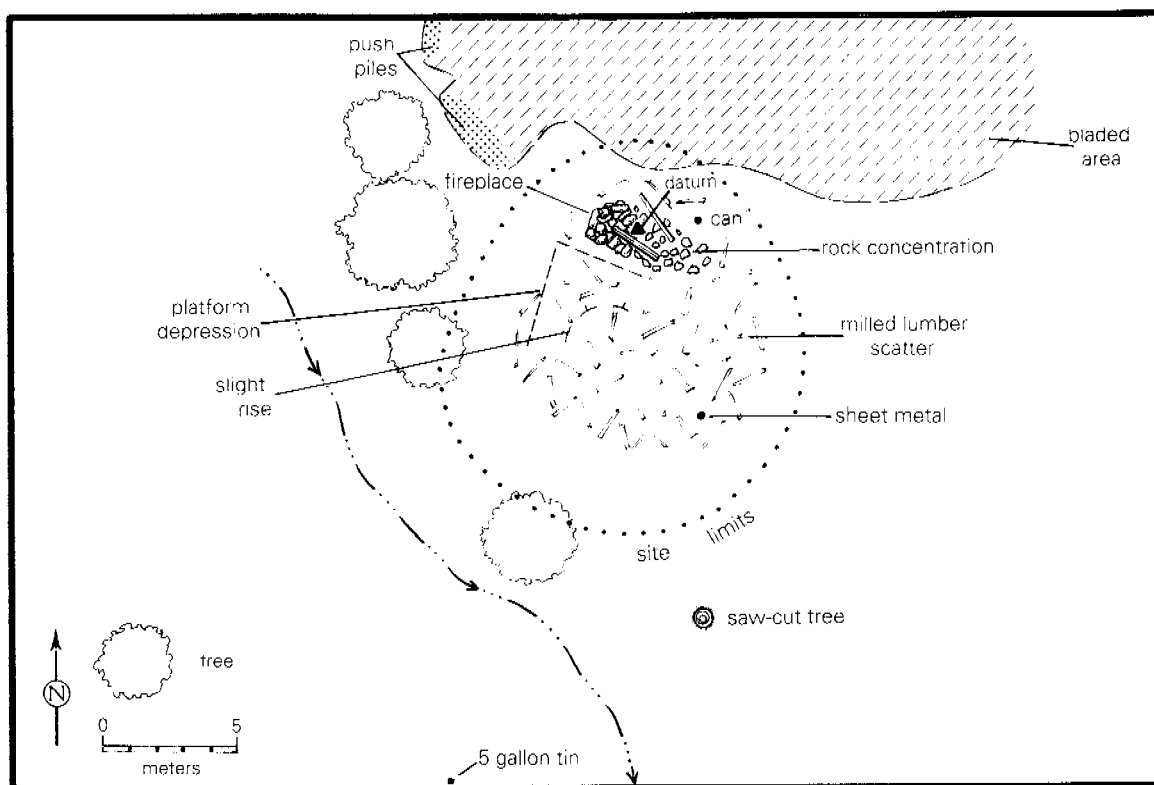


Figure 30. Plan of LA 117315.

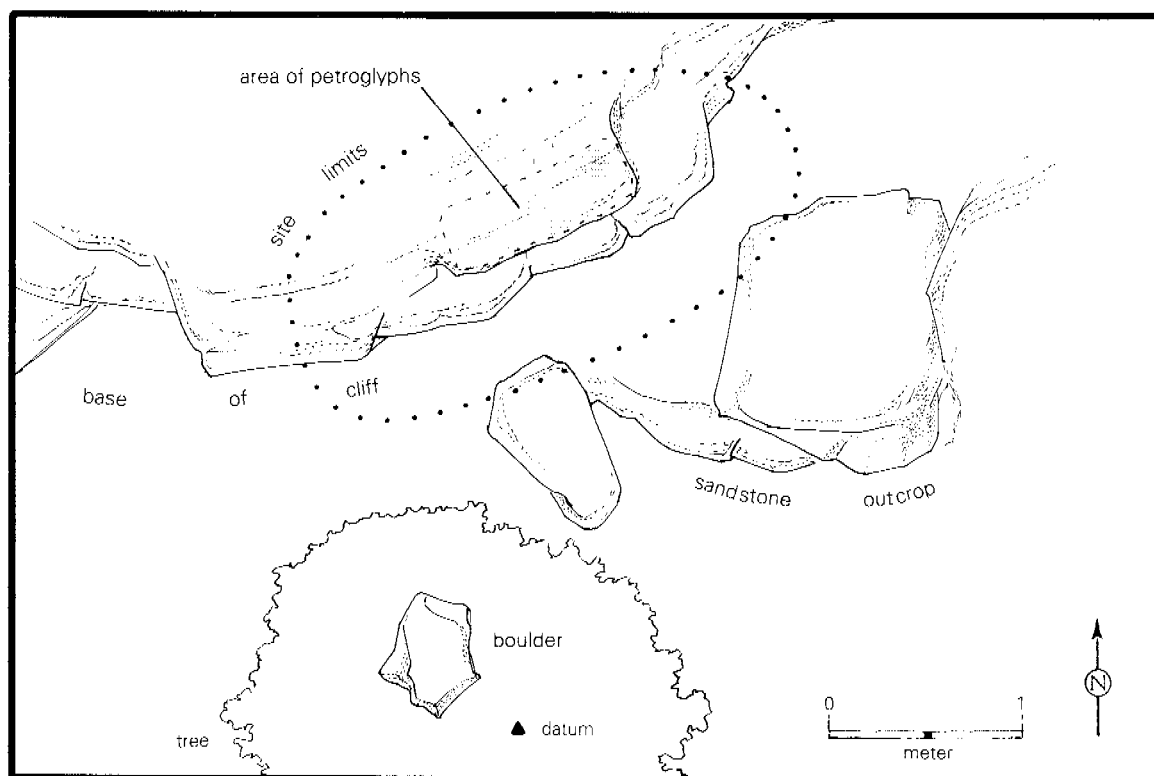


Figure 31. Plan of LA 117316.

of pecking, and curved and straight lines. Additional designs appear to have been present at the lower right of the panel but have been obscured by weathering. The background color of the rock face is tan, and there is little difference in color or weathering between the background and the pecked areas. Both stylistically and on the basis of weathering, these images appear to be older than the images of the deer and hunter at LA 117316. Although undated, this panel could be Archaic in age.

The images on the panel have suffered from weathering but are otherwise in good condition. However, the cliff face that supports both LA 117316 and 117317 is slowly receding, and several areas of the cliff within several hundred meters have collapsed within the recent past.

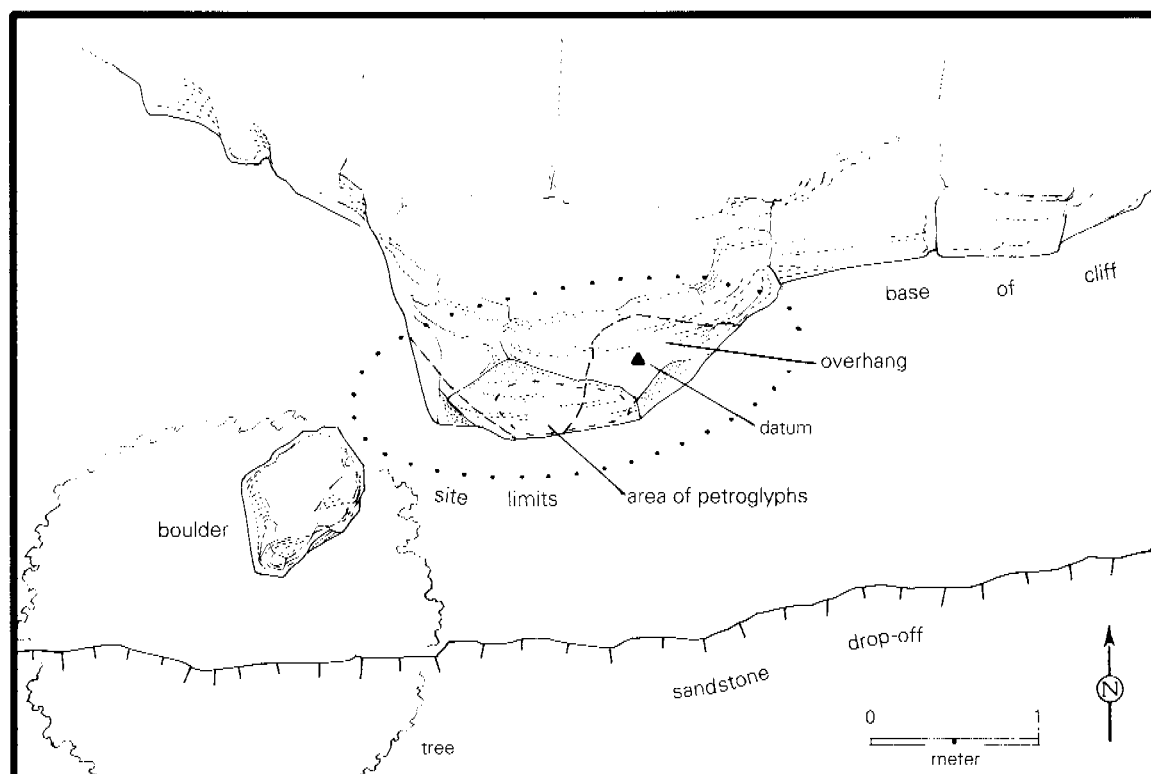


Figure 32. Plan of LA 117317.

**LA 117318.** A historic livestock (sheep) camp is on the southwestern portion of the major upper bench. It is near road access between the bench and currently occupied Navajo homesites west of Section 8. This previously unrecorded site was identified as IO 78 during the OAS survey and was later recorded as site HRI-16. The site does not appear to have been in existence during the survey by San Juan College (Ford and DeHoff 1977), since well pad features that are part of the site do not appear on the aerial photographs dating to November 1976.

LA 117318 covers an area 53 by 38 m and consists of an animal pen, a sparse scatter of historic artifacts, and construction debris (Fig. 33). The site faces southeast, about 75 m from the bluff edge, overlooking the expanse of the Puerco River Valley. The pen takes advantage of a row of large boulders that is bisected by a minor drainage (Photo 11). Gaps in the boulders are filled by branches, brush, and pallets to form a continuous barrier. A juniper post and hog wire fence extends across the front of the arc from the east arm. The west side of the pen is currently open, but large sheet metal panels (originally part of a metal storage shed) lie on the ground in this area

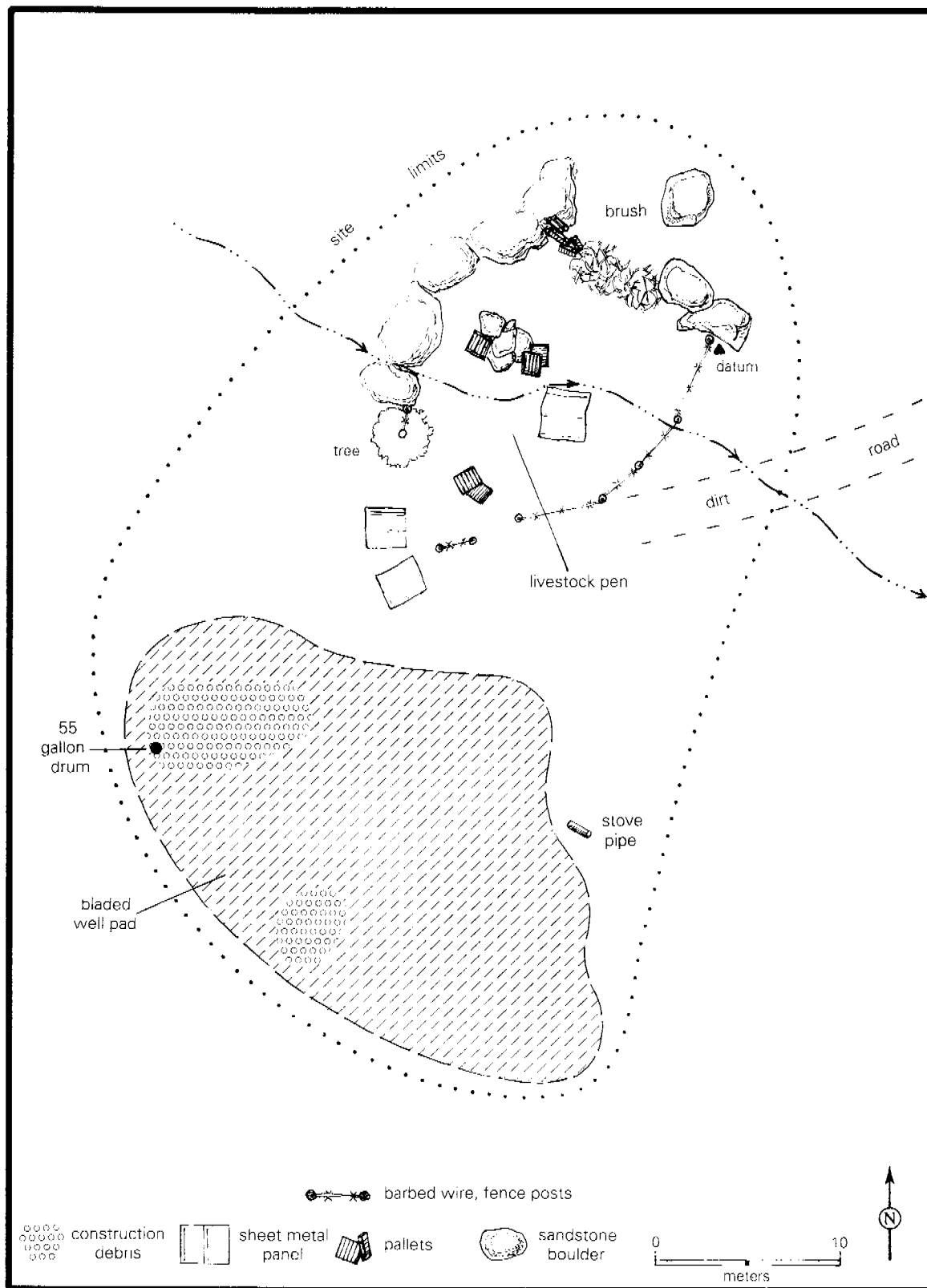


Figure 33. Plan of LA 117318.

and may have completed the fence on this side. Additional pallets and sheet metal are scattered inside the pen.

The pen is constructed to the east of a broad scraped area that appears to have been a well pad. A 55 gallon drum, weathered dry wall, and other construction debris are scattered over the scraped surface. A stove pipe segment is adjacent to the disturbed area. A dirt road that has not been used in some time approaches the site from the east. The pen is not usable in its present condition, but it could be made secure with a relatively little effort.



Photo 11. Livestock pen at LA 117318.

**LA 117319.** LA 117319 is a large petroglyph and inscription panel on a narrow bench in the canyon wall overlooking the unnamed tributary arroyo along the east side of Section 8 (Fig. 34). The panel had not been described as a site by previous surveys due to the predominance of historic graffiti, and it was assigned field number HRI-18 by the OAS survey. A road has been constructed along the outer edge of the bench, providing access to various well pads to the north of the site.

The panel is on an extremely large area of sandstone that is an in situ part of the canyon wall rather than a large boulder. The bench in front of the panel is 13 m wide and has an unobstructed view of the tributary canyon below. The bench surface is relatively flat in front of the panel, and there is a light scatter of oxidized sandstone spalls, but there are no artifacts in the site area. The road has truncated the edge of the oxidized sandstone scatter, and oxidized sandstone does not extend on the opposite side of the road. Road construction has not directly effected the panel, but the road has increased its visibility and has improved access, undoubtedly contributing to the proliferation of recent inscriptions and graffiti. The sandstone itself is poorly cemented and includes considerable textural variation, and it is subject to wind and water erosion to a greater degree than the other petroglyph panels encountered within the Church Rock Site.

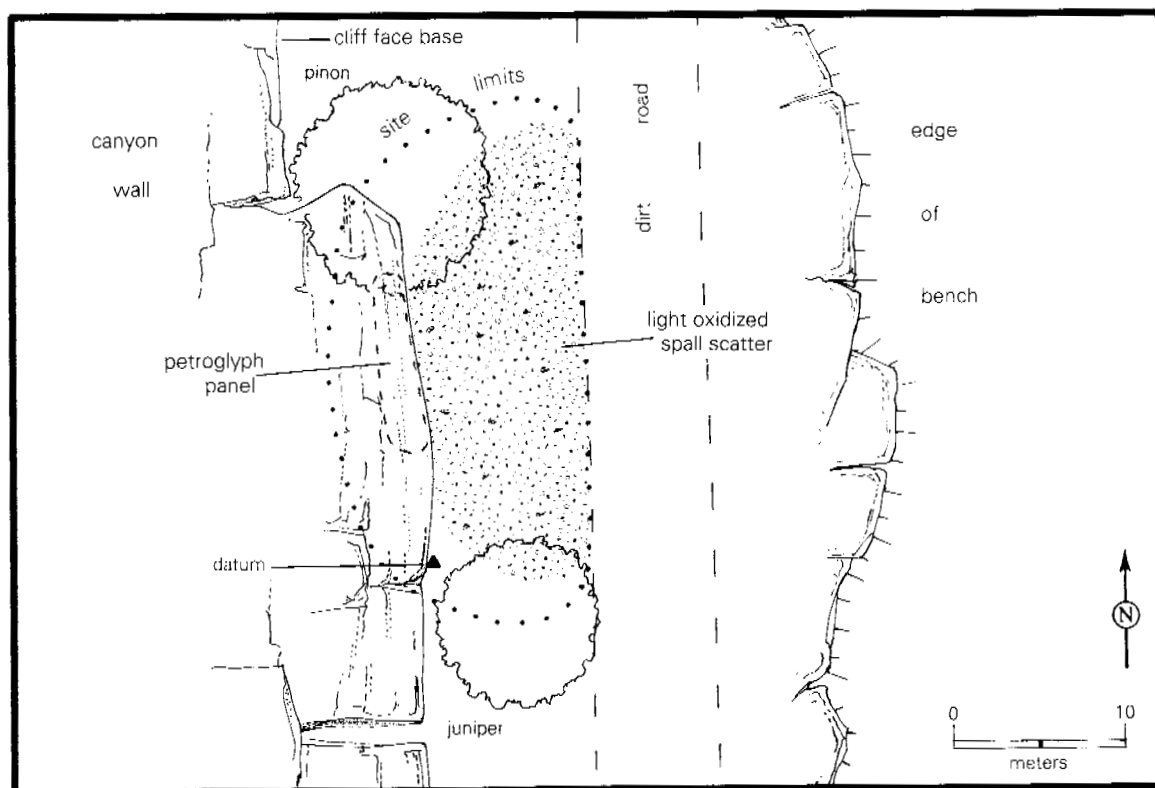


Figure 34. Plan of LA 117319.

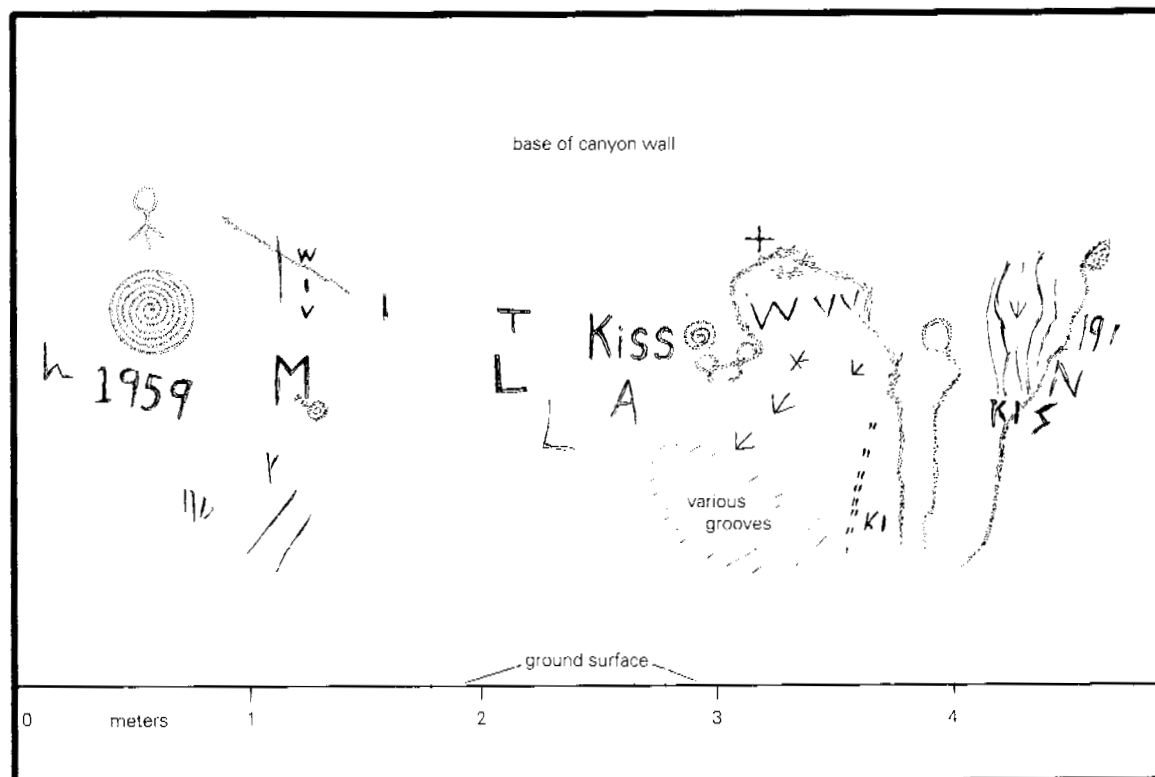


Figure 35. Petroglyph panel at LA 117319.

Content of the panel includes Anasazi, possible Archaic, and historic glyphs (Fig. 35). The sandstone does not patinate, so that superposition, distinctness, and style are the only bases for interpreting motif age. The rock art is confined within a portion of the rock face that is slightly less than 5 m long. The lowest images are about 50 cm above the present ground surface, while the tallest images are slightly more than 2 m above the ground.

Probable Anasazi images occur sparsely on the panel. These include one large and several small pecked concentric or spiral elements. The relative position of a small stick figure and the largest spiral at the upper left of the panel suggest that the stick figure may also be Anasazi in age. Incised "bird tracks" are prehistoric based on superimposed historic images, and they also are probably Anasazi in age. More problematic images include indistinct and abstract pecked lines that are present in several areas of the panel. These are less distinct than the spiral motifs, and they may be Archaic or Anasazi in age. One area toward the lower right of the panel is covered with a series of straight but unaligned grooves. These intersecting lines are reminiscent of awl-sharpening grooves, but they tend to have acute triangular cross sections, as if made by a sharp implement such as a flake or nail. These lines are more distinct than adjacent probable prehistoric glyphs, and they may be Anasazi or historic in age.

The vast majority of discernable motifs are historic graffiti and inscriptions. The one complete date is 1959, and an incomplete date appears to be in the 1990s. Various initials are scattered across the panel, and there are at least two attempts to commemorate the rock music group Kiss. The only clearly historic representational rendering is of a nude female torso.

#### *Traditional Cultural Properties*

Interviews concerning traditional cultural properties and the results of documentary research about traditional sites in the region are presented in detail in the "Background for the Cultural Resources Inventory" and "Methods" sections of this report. Substantive results regarding traditional uses of the Church Rock Site are summarized in Table 52. The results apply to the entire Church Rock Site, and they are the same as the those presented for the private land portions of Section 8. None of the chapter officials or traditional practitioners identified any traditional cultural properties within the BLM land portion of Section 8. Expressed concerns with the project relate to general questions of safety, especially during the transport of mining products along the highways in the region.

#### *Modern Burials*

Although there are no traditional concerns for Section 8, Mr. Becenti's sacred and traditional places documentation forms contain references to grave sites in the vicinity of the Church Rock Site. The grave sites were not specifically located as part of Mr. Becenti's ethnohistoric documentation, but a modern grave site was located on BLM land during the OAS archaeological survey. The three graves are recent and well-marked within a fenced plot. They are marked with plaques from Cope Memorial Funeral Home, Gallup, New Mexico. One grave is that of Jones James with the date of 1974-1993; the second of Alpert James, July 1, 1992; the third of Elsie James, 1923-1992. There are plastic flowers and crosses at the graves. The location of the burial plot is noted with the site location information in Appendix 4. Modern burial plots fall within the policy and regulatory framework of BLM land use rather than within the framework of traditional cultural properties (Jim Copeland, BLM archaeologist, Farmington District, personal communication, 1997).



Table 52. Summary of Traditional Cultural Property Results, Church Rock Site, Section 8, BLM Land

Consultant	Affiliation	Concerns
Ernest C. Becenti, Sr.	Church Rock Chapter; former chapter president; traditional practitioner	No known traditional uses
Jean Mariano	Mariano Lake Chapter; traditional practitioner	No known traditional uses
Nelson J. Largo, Sr.	Smith Lake Chapter president	No known traditional uses
Bennie Y. Begay	Pinedale Chapter; former chapter vice president; traditional practitioner	No known traditional uses
Jim Charley	Smith Lake Chapter; traditional practitioner	No known traditional uses
Tom Shorty <sup>1</sup>	Becenti Chapter; traditional practitioner	No known traditional uses
Lincoln Perry <sup>1</sup>	Crownpoint Chapter; traditional practitioner	No known traditional uses
William E. Raymond	Little Water Chapter; former chapter secretary; traditional practitioner	No known traditional uses
Charles Long	Crownpoint Chapter president	No known traditional uses
Confidential <sup>1</sup>	Dalton Pass Chapter; traditional practitioner	No known traditional uses
Herbert Benally	Church Rock Chapter president	No known traditional uses
Nelson Zuni	Pinedale Chapter vice president	No known traditional uses
George Tolth	Little Water Chapter; council delegate	No known traditional uses
Bennie Enrico <sup>2</sup>	Little Water Chapter president	No known traditional uses
Thomas Barbone <sup>2</sup>	Little Water Chapter vice president	No known traditional uses
Ken Tapaha	Little Water Chapter manager	No known traditional uses
Henry Tom <sup>2</sup>	Mariano Lake Chapter president	No known traditional uses

<sup>1</sup>Less familiar with the Church Rock Site than with Section 12.

<sup>2</sup>Defers to the traditional practitioners who have been consulted.

### *Facility Plans and Recommendations*

The BLM land of Section 8 is not currently slated to be the location of any specific construction activity during the first phase of mining development at the Church Rock Site. Future developments may involve ground-disturbing activities, and cultural resources information is provided here as a basis for planning and future consultation.

Most of the 20 sites identified within the BLM portion of Section 8 are eligible for inclusion in the *National Register of Historic Places* on the basis of their potential to contribute important information to the understanding of regional prehistory or history (Table 53). Twelve sites are eligible based on survey observations of their information potential and their integrity. In five cases, survey observations are inadequate to determine eligibility, due primarily to the unconfirmed possibility of subsurface deposits.

Table 53. National Register Eligibility Summary, Church Rock Site, Section 8, BLM Land

Site Number	Description	Eligibility recommendation	Comments
LA 26158	Anasazi Late Pueblo II habitation; historic livestock features	Eligible, criterion d	Substantial site; good condition
LA 26162	Navajo, Gobernador phase (?), sweat lodge	Eligible, criterion d	Small site; about 50 percent of site surface affected by prior construction; remaining features in good condition
LA 88873	Anasazi, Late Pueblo II limited activity or seasonal residence	Eligible, criterion d	Moderate-sized site; portions of the site surface have been affected by erosion, but subsurface integrity remains in good condition
LA 88874	Anasazi, Late Pueblo II short term residential	Eligible, criterion d	Small site; subsurface deposits are substantially intact
LA 88877	Navajo, Gobernador phase habitation	Eligible, criterion d	Small site; good condition
LA 88878	Anasazi, Late Pueblo I to Pueblo II	Eligible, criterion d	Large but sparse site; good condition
LA 116113	Navajo, historic trail	Not eligible	Trail features are unlikely to yield additional information important to local or regional history
LA 116115	Navajo, Gobernador phase (?) habitation	Eligible, criterion d	Small site; good condition
LA 116116	Anasazi, Late Pueblo II artifact scatter; Navajo, historic cairns	Potentially eligible	Small site; good condition; extent of subsurface materials is unknown but is not likely
LA 116117	Anasazi, Pueblo II artifact scatter	Potentially eligible	Small site; minor road disturbance but otherwise in good condition; extent of subsurface materials is unknown
LA 116118	Anasazi, Basketmaker III-Early Pueblo I, field facility; Navajo, Gobernador phase, sweat lodge	Eligible, criterion d	Small site; substantially good condition
LA 116119	Anasazi, Pueblo II artifact scatter; Historic artifact scatter	Potentially eligible	Small site; good condition; extent of subsurface materials is unknown
LA 116120 <sup>1</sup>	Anasazi, Pueblo II, limited activity with architecture	Eligible, criterion d	Small site; good condition
LA 116121	Anasazi, Basketmaker III-Early Pueblo I, artifact scatter	Potentially eligible	Small site; good condition; extent of subsurface materials is unknown
HRI-12	Late Archaic residential; Anasazi limited activity; Navajo limited activity	Eligible, criterion d	Moderate-sized site; portions of the site surface have been affected by erosion, but subsurface integrity remains in good condition
HRI-13	Navajo, historic, tent camp	Not eligible	Small site; good condition; no subsurface extent; adequately documented by survey recording
HRI-15	Anasazi, petroglyphs	Eligible, criterion d	Small isolated panel; representation of hunter and deer
HRI-16	Navajo, historic (1970s-1990s) livestock feature	Not eligible	Small site; good condition; no subsurface extent; adequately documented by survey recording
HRI-17	Unknown prehistoric, petroglyph	Potentially eligible	Small isolated panel; abstract pattern of lines without recognizable motifs

Table 53. National Register Eligibility Summary, Church Rock Site, Section 8, BLM Land

Site Number	Description	Eligibility recommendation	Comments
HRI-18	Unknown prehistoric and modern (1950s-1990s) petroglyphs and graffiti	Eligible, criterion d	Large single panel; modern graffiti has obscured some faint prehistoric images; information content not adequately documented by survey recording

In three cases, we do not believe that the cultural resources are eligible for inclusion in the *National Register of Historic Places*. LA 116113 is the historic trail from the valley floor to the rim of the bench. The trail is currently in use and has been subject to periodic collapse and reconstruction, so that its current path and many of its features are less than 50 years old. One possible trail shrine will be documented and sampled for tree-ring dating as part of the wood sampling project for Gobernador phase sites, and that documentation coupled with the existing survey documentation will exhaust its information potential.

LA 117315 is a historic tent camp on the valley floor near the unnamed tributary to the Puerco River. There is limited material culture on the site, and although its dating is uncertain (1920s-1950s), all indications are that the site falls at the more recent end of the range. Although the fireplace and milled lumber suggest an initial investment in the construction of site facilities, the lack of historic artifacts suggests that the duration or intensity of site occupation was limited. There are no indications of any significant subsurface extent to the site, and survey observations have documented the majority of the information potential of the cultural resource.

LA 117318 is a historic livestock pen near the edge of the bench, 400 feet above the valley floor. The site does not appear on aerial photos taken in the mid-1970s, and it was not noted in the prior survey of this area by San Juan College. None of the hardware or historic artifacts are incompatible with a date in the late 1970s or 1980s. This site is too recent for inclusion in the *National Register of Historic Places*, and the survey documentation is adequate to document its potential contribution to regional history.

We recommend that the eligible and potentially eligible cultural resources be avoided should planning and development of mining facilities take place within the BLM lands of Section 8. BLM policy includes a preference for 100 foot buffers between undertakings and site boundaries. If eligible or potentially eligible sites cannot be avoided, we recommend that data recovery be conducted for the eligible sites. All data recovery will require compliance with NAGPRA, other federal laws and regulations, and BLM policies on the treatment of cultural resources.

Even in cases where sites can be avoided, the ground-disturbing nature of many of the potential construction activities suggests that fencing or barrier construction will be necessary as a protective measure. Appropriate types of fencing or barrier construction will depend on specific construction plans, duration and type of land use, and possible alternative land uses that could be concurrent with mining operations. Fencing would remain in place through active construction and mining phases, and it would not be removed until after reclamation processes had been completed following the cessation of mining. Any such decisions must be made in consultation with the BLM.

BLM policies normally require monitoring of all ground-disturbing activities within 100 feet of eligible cultural resources. Despite confidence in the site boundaries established during this survey, there is a distinct possibility of the presence of undetected subsurface cultural resources

given the intensity of human occupation at the margins of the lowland area of Section 8. We recommend that all ground-disturbing construction activities within 100 feet of sites on BLM land be monitored by a qualified archaeologist. Based on observations of the site locations and the local geomorphology, we recommend that monitoring take place in a more extensive area in the lowland portion of Section 8 (Fig. 36). Treatment of any cultural resource discoveries during monitoring will conform to the requirements of NAGPRA, other federal laws and regulations, and BLM policies.

Whether or not future construction is extended to BLM lands, the presence of mining operations on the adjacent private land of Section 8 poses a risk of indirect impacts to cultural resources. All construction and mining personnel will be given formal orientations concerning the protection of cultural resources within the Church Rock Site. These orientations will include a review of federal laws and regulations regarding the protection of cultural resources on BLM land. Part of this orientation will include a policy of restricted access from HRI property to adjacent BLM land.

*Navajo Nation Land, [REDACTED]*

In preparation for the development of mining facilities at the Church Rock Site, the NRC has called for archaeological survey and traditional cultural property inventory of all lands that may be involved in the five-year development plan. These plans include well field development of mining leases on approximately 200 acres of Navajo Nation lands in Section [REDACTED]. This area is indicated in Figure 3 and consists of the [REDACTED] of the section. These lands have been included in the archaeological survey of Church Rock Site and have been the subject of traditional cultural property investigations. The inventories have been carried out under Navajo Nation Cultural Resources Investigation Permit B96167.

The surveyed portion of Section 17 is totally within the Puerco River floodplain, and it includes a segment of the lower course of the unnamed tributary arroyo that passes through the eastern side of Section 8. There is little relief in the survey area, and much of the land surface has been affected by the prior construction and then demolition of facilities for the now defunct Church Rock Mine.

Several prior archaeological inventories have been conducted within the portion of Section 17 included in the Church Rock Site. In 1977, San Juan College conducted a survey for United Nuclear Corporation that included three other sections in addition to Section 17 (Ford and DeHoff 1977). Two sites were identified in Section 17, along with isolated occurrences of two low-density sherd scatters, a historic inscription, a modern field marker, and a trash scatter and tire sculpture. Of these, only the field marker and the trash sculpture were within the Church Rock Site survey area. Powerline and pipeline corridors have also been surveyed for cultural resources within Section 17 (Amsden 1992; Copeland 1987; Hudgens 1979). Only one other archaeological site has been reported within Section 17, but it is outside of the Church Rock Site survey area.

Prior surveys within 0.5 miles of the Section 17 survey have located 15 sites as of 1996 (Table 54). Most of these sites have Pueblo II Anasazi components. Historic or Navajo components were present at a minority of sites. This appears to accurately reflect site composition associated with the floodplain and its immediate margins. However, a significant number of Gobernador phase Navajo sites are just outside the 0.5 mile radius, within the canyons that border the river valley.

Archaeological survey within the Section 17 portion of the Church Rock Site was supervised

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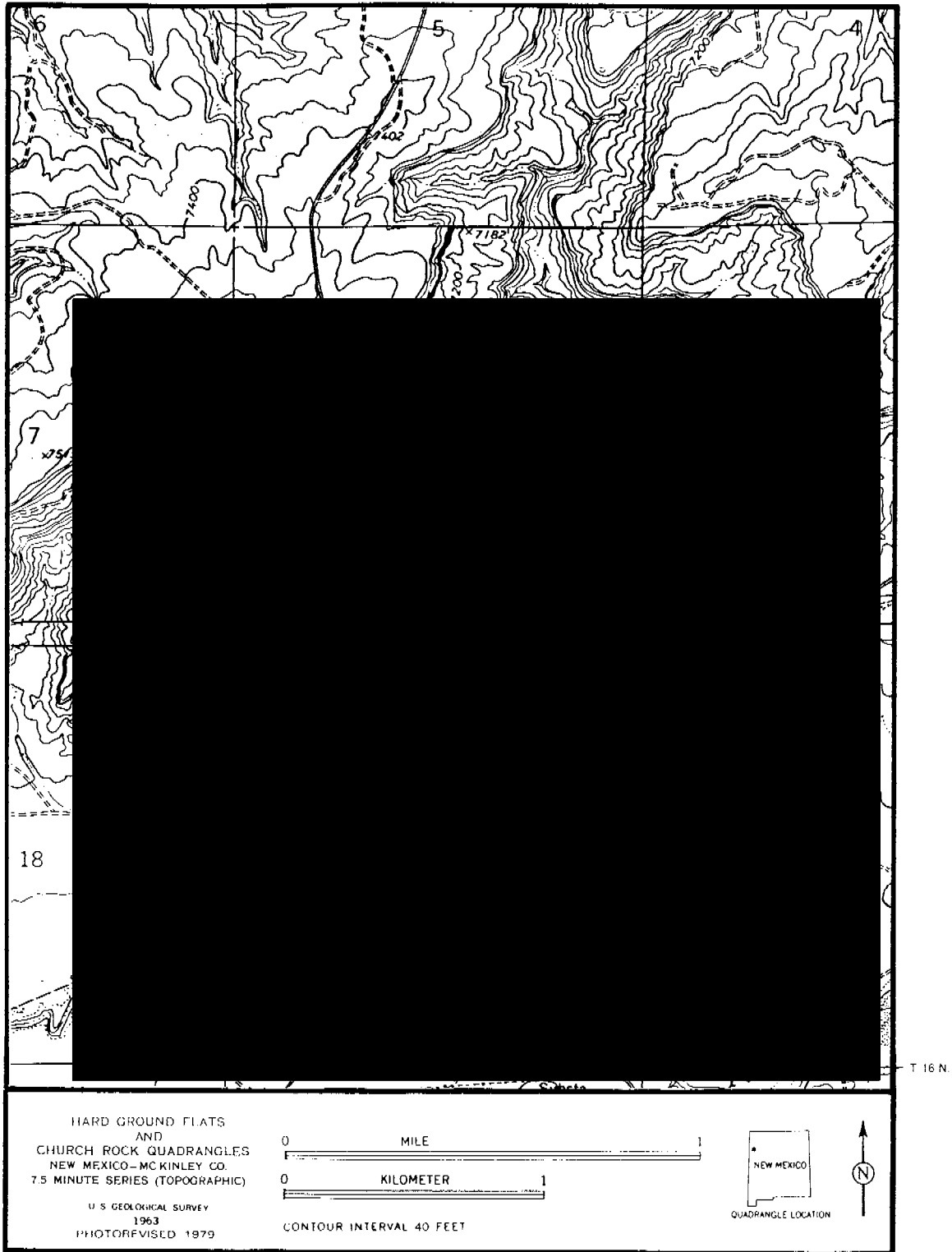


Figure 36. Proposed monitoring zone for construction activities within the Church Rock Site, BLM land.

by C. Dean Wilson under permit B96167. Descriptions of survey procedures are provided in the “Methods” section of this report. The traditional cultural property inventory of Section 17 was conducted by Janet E. Spivey as part of the investigation of the Church Rock Site as a whole.

### *IO Descriptions*

The six IOs encountered during the survey of the portion of the Church Rock Site within Section 17 are listed in Table 55. All of the IOs are individual Anasazi sherds, and the range to types is consistent with the generalized Pueblo II occupation of the region. No isolated features were noted, either on the ground surface or in subsurface exposures created by past construction disturbance.

### *Traditional Cultural Properties*

Interviews concerning traditional cultural properties and the results of documentary research about traditional sites in the region are presented in detail in the “Background for the Cultural Resources Inventory” and “Methods” sections of this report. Substantive results regarding traditional uses of the Church Rock Site are summarized in Table 56. The results apply to the entire Church Rock Site, and they are the same as those presented for the private land and BLM portions of Section 8. None of the chapter officials or traditional practitioners identified any traditional cultural properties within Section 17. Expressed concerns with the project relate to general questions of safety, especially during the transport of mining products along the highways in the region.

Table 54. Previously Recorded Sites within 0.5 miles (0.8 km) of the Inventory Portion of Section 17, T16N, R16W

Site number	Setting	Cultural Affiliation	Time Period	Site Type	Reference
LA 26158	Slope, grassland	Anasazi	Pueblo II-III	Masonry roomblock, kiva	Ford and DeHoff 1977
LA 26159	Bench, grassland	Anasazi	Unknown	Masonry roomblock, kiva	Ford and DeHoff 1977
LA 26160	Bench, grassland	Anasazi, unknown	Unknown, historic	Masonry roomblock, kivas, petroglyphs	Ford and DeHoff 1977
LA 26161	Ridge, grassland	Unknown	Unknown	Stone ring	Ford and DeHoff 1977
LA 26163	Bench, grassland	Anasazi	Unknown	Masonry roomblock, kivas, possible water control feature	Ford and DeHoff 1977
LA 26164	Slope, grassland	Anasazi	Unknown	Masonry roomblocks	Ford and DeHoff 1977
LA 26170	Bench, grassland	Anasazi	Pueblo II-III	Masonry roomblock	Ford and DeHoff 1977
LA 26171	Knoll, juniper grassland	Anasazi	Pueblo II-III	Masonry roomblock	Ford and DeHoff 1977
LA 47103	Bench, grassland	Navajo	1930s and later	Structures, trash mounds, hearths	Hudgens 1979
LA 67374	Hill, grassland	Anasazi	Pueblo I-II	Masonry roomblock, pithouse depression	Copeland 1987
LA 83495	Ridge, grassland	Anasazi	Pueblo II	Ceramic and lithic scatter	Amsden 1992

LA 88518	Flood plain	Anasazi	Unknown	Hearth, storage pit	ARMS file
LA 89483	Bench, unknown	Anasazi	Pueblo II	Masonry roomblock	Amsden 1992
LA 89484	Plain, unknown	Anasazi	Pueblo II	L-shaped masonry roomblock, (Bonito style great house), great kiva	Amsden 1992
LA 89485	Plain, unknown	Anasazi	Pueblo I	Masonry roomblock, pithouse depression	Amsden 1992

Table 55. Isolated Occurrences for the Surveyed Portion of Section 17, Navajo Nation Tribal Trust Land

IO Number	Location <sup>1</sup>	Context	Cultural Affiliation	Description
1	[REDACTED] Elevation: 6,780 ft	Scrubland; valley floor; ground disturbed by prior construction.	Anasazi (pottery technology)	1 late mineral-painted white ware sherd; jar body
2	[REDACTED] Elevation: 6,820 ft	Scrubland; in trench; ground disturbed by prior construction.	Anasazi (pottery technology)	1 Corrugated Gray sherd; jar body
3	[REDACTED] Elevation: 6,807 ft	Scrubland; valley floor; ground disturbed by prior construction.	Anasazi (pottery technology)	1 Plain Gray sherd; jar body
4	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6,797 ft	Scrubland; valley floor.	Anasazi (pottery technology)	1 Gallup Black-on-white sherd; jar body
5	[REDACTED] Legal: [REDACTED] Elevation: 6,805 ft	Scrubland; valley floor; ground disturbed by prior construction.	Anasazi (pottery technology)	1 Corrugated Gray sherd; jar body
6	UTM: [REDACTED] [REDACTED] Elevation: 6,807 ft	Scrubland; valley floor.	Anasazi (pottery technology)	1 Polished White Ware sherd; bowl body

<sup>1</sup>UTM coordinates are within Zone 12. Quarter sections are within Section 17, T16N, R16W, on the USGS Church Rock 7.5 minute quadrangle.

Table 56. Summary of Traditional Cultural Property Results, Church Rock Site, Section 17, Navajo Nation Land

Consultant	Affiliation	Concerns
Ernest C. Becenti, Sr.	Church Rock Chapter; former chapter president; traditional practitioner	No known traditional uses
Ms. Jean Mariano	Mariano Lake Chapter; traditional practitioner	No known traditional uses
Nelson J. Largo, Sr.	Smith Lake Chapter president	No known traditional uses
Bennie Y. Begay	Pinedale Chapter; former chapter vice president; traditional practitioner	No known traditional uses
Jim Charley	Smith Lake Chapter; traditional practitioner	No known traditional uses
Tom Shorty <sup>1</sup>	Becenti Chapter; traditional practitioner	No known traditional uses
Lincoln Perry <sup>1</sup>	Crownpoint Chapter; traditional practitioner	No known traditional uses

Table 56. Summary of Traditional Cultural Property Results, Church Rock Site, Section 17, Navajo Nation Land

Consultant	Affiliation	Concerns
William E. Raymond	Little Water Chapter; former chapter secretary; traditional practitioner	No known traditional uses
Charles Long	Crownpoint Chapter president	No known traditional uses
Confidential <sup>1</sup>	Dalton Pass Chapter; traditional practitioner	No known traditional uses
Herbert Benally	Church Rock Chapter president	No known traditional uses
Nelson Zuni	Pinedale Chapter vice president	No known traditional uses
George Tolth	Little Water Chapter; council delegate	No known traditional uses
Bennie Enrico <sup>2</sup>	Little Water Chapter president	No known traditional uses
Thomas Barbone <sup>2</sup>	Little Water Chapter vice president	No known traditional uses
Ken Tapaha	Little Water Chapter manager	No known traditional uses
Henry Tom <sup>2</sup>	Mariano Lake Chapter president	No known traditional uses

<sup>1</sup>Less familiar with the Church Rock Site than with Section 12.

<sup>2</sup>Defers to the traditional practitioners who have been consulted.

#### *Other Navajo Nation Lands*

Although no survey was conducted on Navajo Nation lands other than the designated portions of Section 17, two sites were recorded within the Navajo Nation land of Section 9. This land is to the east of the private land portion of Section 8 and to the northeast of Section 17. It is not included within the development plans for the Church Rock Site. One of these sites (LA 26161) had originally been recorded by Ford and DeHoff (1977) and located within Section 8. Since 1977, survey monuments have been installed that identify the boundary between Sections 8 and 9, and LA 26161 has now been located within the western margin of Section 9. The site is outside of the Church Rock Site and is not included in the body of this report, but an updated site form and locational information are included in Appendix 5. The second site straddles the boundary between the private and Navajo Nation land (Sections 8 and 9). This site has been described within the private land portion of Section 8, and a copy of the site documentation is provided in Appendix 5.

#### *Facility Plans and Recommendations*

Construction plans for the surveyed portion of Section 17 call for well field development (U.S. Nuclear Regulatory Commission et al. 1997). Production wells, monitoring wells, pipelines, and roads are all ground-disturbing activities. The only cultural resources identified in the survey are isolated artifact occurrences consisting of single potsherds. These isolated occurrences are unlikely to yield important information concerning local or regional prehistory beyond that already documented during the survey, and therefore they are not eligible for inclusion in the *National Register of Historic Places*.



Although no eligible cultural properties are present on the Navajo Nation land of the Church Rock Site, eligible properties are present on adjacent private and BLM land. The alluvial setting of the Puerco River Valley makes the presence of buried cultural resources possible, but the likelihood is low in some areas. The Transwestern Pipeline Expansion Project traversed the Section 17 portion of the Church Rock Site and encountered no buried cultural resources. Also, the prior ground disturbance of Section 17 for the construction and demolition of prior mining facilities increased the likelihood that shallowly buried cultural resources would have been detected by the OAS survey. Given this information, we believe that construction activities on Navajo Nation land should be monitored by a qualified archaeologist along the northern margin of the lease area (Fig. 37). Discoveries during monitoring will be handled in conformance with NAGRA, other applicable federal laws and regulations, and Navajo Nation regulations and policies concerning the treatment of cultural resources.

R 17 W R 16 W

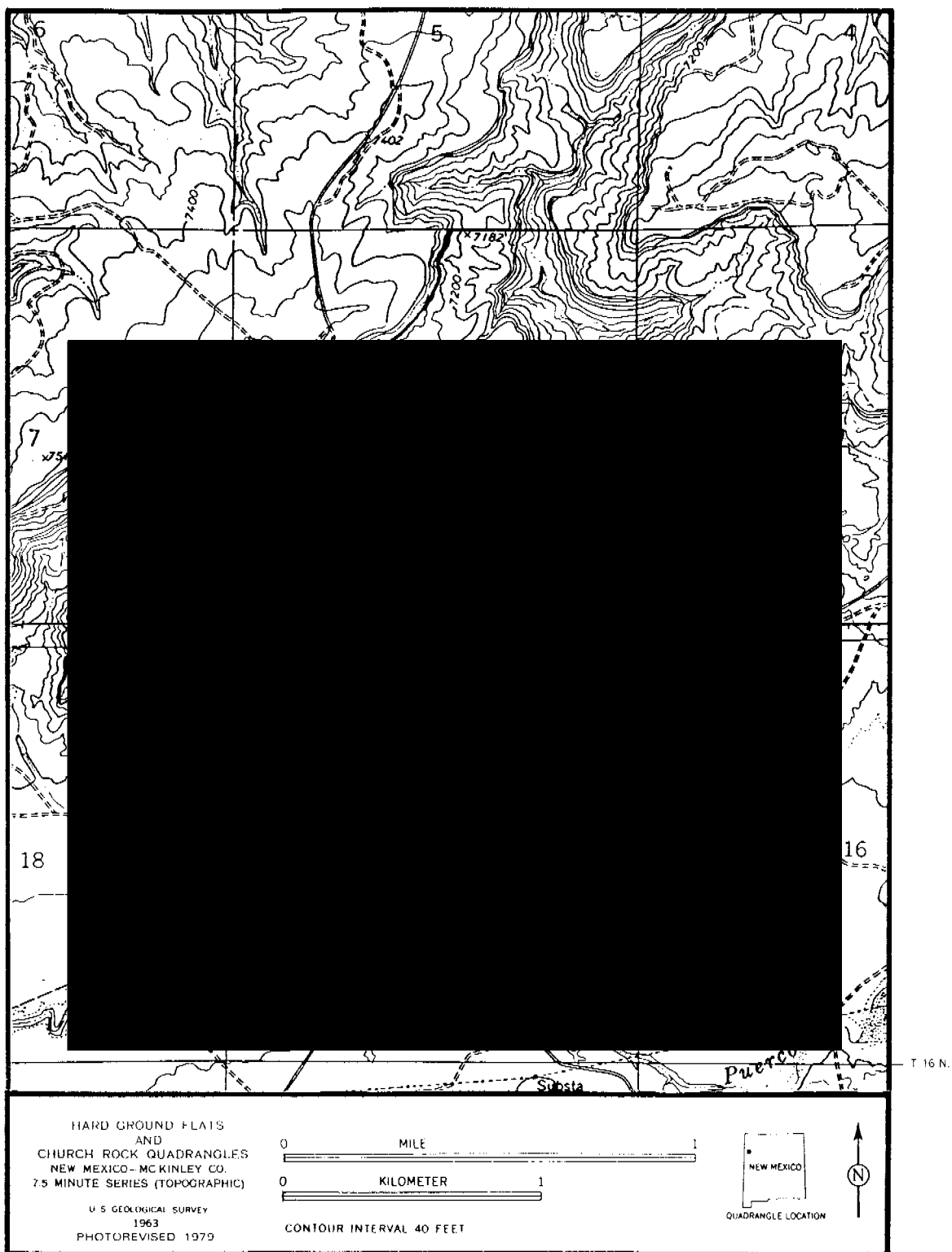


Figure 37. Proposed monitoring zone for construction activities within the Church Rock Site, Navajo Nation land.

## SECTION 12 CROWNPOINT IRRIGATION SITE INVENTORY RESULTS

Eric Blinman and Steven A. Lakatos

In preparation for the development of mining facilities at the Church Rock Site, the NRC has called for archaeological survey and traditional cultural property inventory of all lands that may be involved in the five-year development plan. No specific facility plans have been developed for the private land of Section [REDACTED], but the categorical uses have been identified as irrigation and drilling-mud disposal. Irrigation would entail construction of buried pipelines, water-spreading devices, and access and maintenance roads. Drilling-mud disposal would entail access roads and a broad area for spreading the mud. Roads, pipelines, and spreading areas entail ground disturbance within delimited areas. Irrigation is intended to spread water at rates that do not generate runoff or erosion, and the risk of ground disturbance is small outside the immediate area of the spreading device.

The 640 acres of Section 12 lands (Fig. 38) have been included in the OAS archaeological survey and have been the subject of traditional cultural property investigations. The cultural resources information is intended for planning purposes in advance of engineering and construction decisions. Confidential locational information is provided in Appendix 6.

Two prior archaeological inventories were conducted within Section 12. C. D. Brooks (n.d.) conducted a reconnaissance of the section for Mobil Oil during their ownership of the property. Brooks identified 14 sites, nine of which were attributed to twentieth-century Navajo occupation of the section, and five of which were attributed to prehistoric Anasazi occupations. Although the sites were located on a large-scale map of the section and thoroughly described, the sites were never assigned LA numbers or entered into the records of the Laboratory of Anthropology. In 1977, J. Lee Correll conducted a pedestrian and vehicular reconnaissance of Section 12 for Mobil Oil at the request of Dan B. Hurley. One large Navajo site was recognized, and it was documented on Navajo Land Claim Field Forms. It was assigned LA 70110 at a later date, but no site description form was ever filed at the Laboratory of Anthropology.

Several of the land parcels surrounding Section 12 have received attention from prior surveys, and 20 sites have been identified within 0.5 miles (0.8 km) of Section 12 (Table 57; Appendix 6). Six of these have been identified during surveys for Mobil Oil (Correll 1975, 1976, 1977) and a survey of a Navajo homesite (McCabe-Benner 1989). The remainder were identified as part of a study of Anasazi communities in the San Juan Basin (Marshall et al. 1979). One site is a historic Navajo homestead, while the remainder are Anasazi sites representing Pueblo I through Pueblo III period occupations. The majority of the Anasazi sites date to the late Pueblo II period and are described as part of the Muddy Water Nuclear Community (Marshall et al. 1979:207-225), a large Chacoan Anasazi community whose center is about two-thirds of a mile from Section 12. Fifty-six sites are included in the community as a whole, and one masonry roomblock of the community is within 50 m of the Section 12 boundary.

The OAS archaeological survey was supervised by Nancy J. Akins and C. Dean Wilson, and ethnohistoric investigations were conducted by Janet E. Spivey. Details of inventory personnel and procedures are described in the "Methods" section of this report. During the survey, 72 IOs were described, and 10 archaeological sites were defined. These sites incorporate the one previously recorded site, all of the cultural features described in Brooks's survey of Section 12 and four additional unrecorded sites. The survey was conducted using the USGS Crownpoint 7.5'

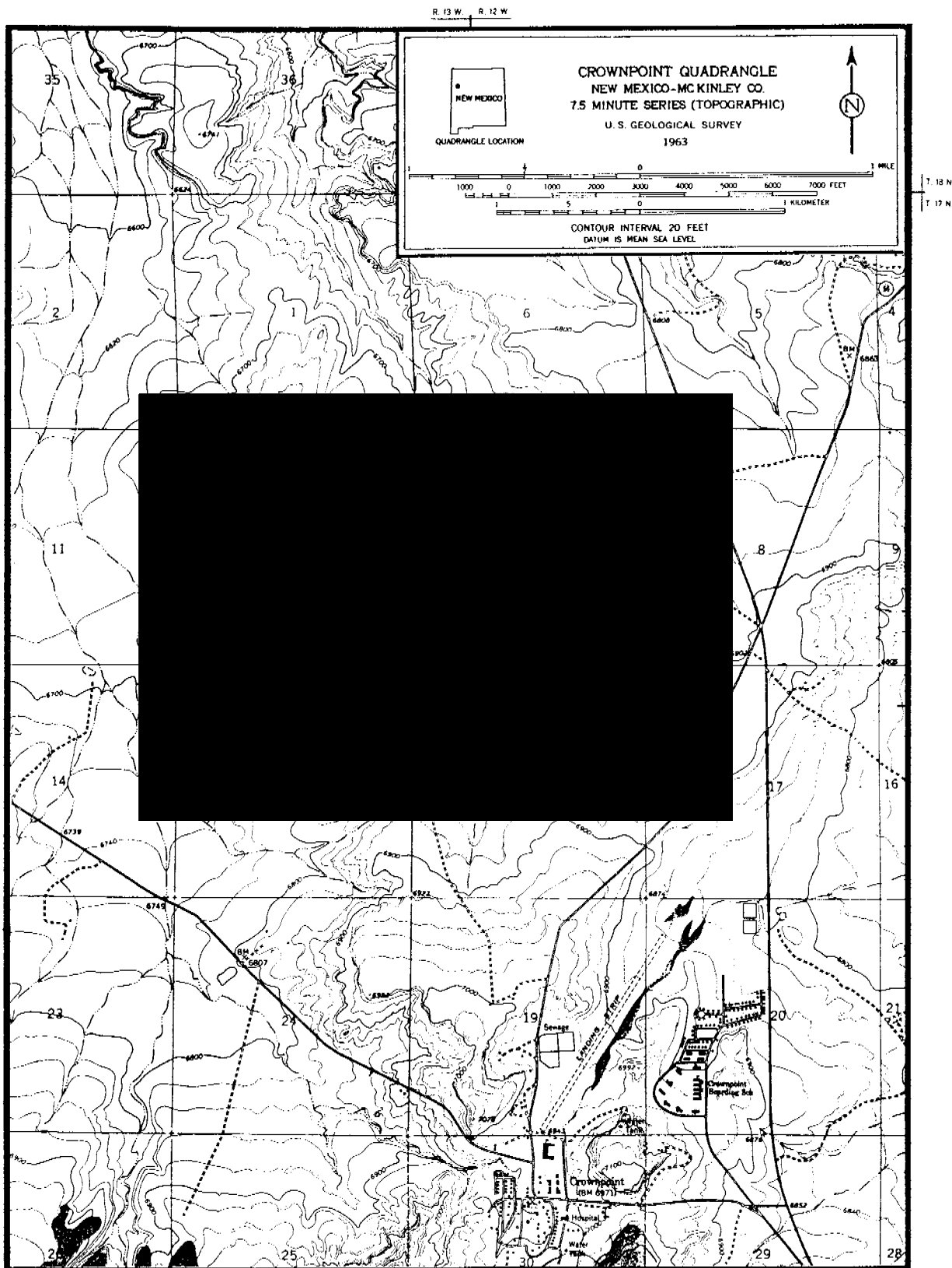


Figure 38. Location of Section 12, Crownpoint Irrigation Site.

quadrangle as a base map, but all site locations were subsequently verified using electronic transit measurements from section corners and lines.

### *IO Descriptions*

During the pedestrian survey, 72 IOs were described (Table 58). The majority (35 cases) were single sherds or multiple sherds (12 cases). Flakes were rare: four were found as isolates, and two were found with sherds. A hammerstone and a mano fragment were found singly, two pieces of indeterminate ground stone were found with sherds, and one ground stone artifact was found with historic trash. One discrete relatively recent trash dump was encountered, and three pieces of historic trash were encountered as isolates in addition to those that occurred with prehistoric artifacts. One cist feature with upright slabs was found, but there were no other cultural materials in association with it. Six concentrations or piles of sandstone slabs were encountered. Several of these are probable historic cairns, others may be truck ballast piles, and one cluster that includes burned sandstone may be prehistoric or historic, but there are no associated cultural materials. Historic sandstone quarrying activity is the probable interpretation of one IO. It is not associated with any datable material, but the stone is consistent with much of the stone used in the construction of the buildings at a large Navajo settlement within Section 12 (LA 70610). A final feature is a rock alignment, but it may have been created by ground-disturbing heavy equipment.

None of the prehistoric IOs appear to have significant information potential to contribute to the understanding of local or regional prehistory. The historic IOs are either recent trash stemming from the use of Section 12 by Mobil Oil personnel, or drift or limited-activity remnants associated with the intensive Navajo occupation of LA 70610.

### *Site Descriptions*

Of the 10 archaeological sites within Section 12 (Table 59), four were previously unknown, one was previously registered, and five had been described but had not been formally registered. The Anasazi sites are relatively small, and only one has clear evidence of multiple components. Four Basketmaker III or Early Pueblo I habitation or seasonal use components are present at the sites, one late Pueblo I seasonal use component, and five Pueblo II components that include one substantial roomblock and four seasonal use locations. The remaining site is a large historic Navajo settlement that has a complex and intensive use history within the past century.

#### *LA 70610*

LA 70610 is a very large (510 by 620 m) historic Navajo habitation site with evidence of sequential occupations from the turn of the century through the 1950s (Fig. 39). This site is located on a gentle ridge, overlooking Indian Creek to the west. The site is in a slightly deflated setting, with wind and sheetwash erosion encouraged by extensive cattle grazing. A road to the west and north of the site is in good condition and provides access to a windmill and the currently occupied residence on the section. The road along the southern margin of the site provides access to a Mobil Oil drilling-mud disposal area to the east of the site, but the road has not been maintained since Mobil Oil decommissioned its facilities within the section.

This site was originally described by Brooks (n.d.), who identified nine separate features as

Table 57. Previously Recorded Sites within 0.5 Miles of Section 12, T17N, R13W

Site number	Context	Cultural affiliation	Time period	Site type	Reference
LA 10717	Ridge; grassland	Anasazi	Pueblo III	U-shaped masonry roomblock	Marshall et al. 1979
LA 17226 (LA 10716)	Ridge; grassland	Anasazi	Pueblo III	Bonito Phase masonry roomblock, kiva	Marshall et al. 1979
LA 17227	Ridge; grassland	Anasazi	Late Pueblo II	Masonry roomblock, kiva	Marshall et al. 1979
LA 17228	Ridge; grassland	Anasazi	Late Pueblo II	Masonry roomblock	Marshall et al. 1979
LA 17229	Ridge; grassland	Anasazi	Late Pueblo II	L-shaped masonry roomblock	Marshall et al. 1979
LA 17230	Ridge; grassland	Anasazi	Late Pueblo II	L-shaped masonry roomblock	Marshall et al. 1979
LA 17253	Ridge; grassland	Anasazi	Late Pueblo II	L-shaped masonry roomblock	Marshall et al. 1979
LA 17254	Ridge; grassland	Anasazi	Early-Middle Pueblo III	Linear masonry roomblock	Marshall et al. 1979
LA 17255	Ridge; grassland	Anasazi	Late Pueblo II	Masonry roomblock	Marshall et al. 1979
LA 17257	Ridge; grassland	Anasazi	Middle Pueblo III	Large masonry roomblock, 2 kivas	Marshall et al. 1979
LA 17258	Ridge; grassland	Anasazi	Late Pueblo II	Masonry roomblock	Marshall et al. 1979
LA 17259	Ridge; grassland	Anasazi	Pueblo I	Linear masonry roomblock	Marshall et al. 1979
LA 17260	Ridge; grassland	Anasazi	Late Pueblo II	Linear masonry roomblock	Marshall et al. 1979
LA 17261	Ridge; grassland	Anasazi	Late Pueblo II	Linear masonry roomblock	Marshall et al. 1979
LA 17262	Ridge; grassland	Anasazi	Early Pueblo II	L-shaped masonry roomblock	Marshall et al. 1979
LA 17268	Ridge; grassland	Anasazi	Late Pueblo II	Masonry roomblock	Marshall et al. 1979
LA 17269	Ridge; grassland	Anasazi	Early Pueblo II	L-shaped roomblock	Marshall et al. 1979
LA 56757	Slope; grassland	Anasazi	Pueblo II-III	Sherd and lithic scatter	McCabe-Benner 1989
LA 70611	Base of ridge; grassland	Navajo	Historic	Stone-ring hogan, corral	Correll 1977
LA 89252	Slope; grassland	Anasazi	Pueblo II-III	Masonry roomblock	Correll 1975

Table 58. Isolated Occurrences for Section 12, Irrigation Site

IO Number	Location <sup>1</sup>	Context	Cultural affiliation	Description
1	UTM: [REDACTED] Elevation: 6705 ft	Scrubland (juniper, saltbush, tumbleweed); valley floor; construction disturbance	Anasazi (pottery technology)	1 Unpainted white ware jar sherd
2	UTM: [REDACTED]	Grassland (saltbush, grasses); plain	Anasazi (pottery technology)	Sandstone fragment with grinding striations; 1 Plain Gray jar sherd
3	[REDACTED]	Grassland (saltbush); plain	Anasazi (pottery technology)	Two-hand sandstone mano; 1 Plain Gray jar sherd 1 Pueblo III B/w sherd 1 Unpainted white ware bowl sherd
4	[REDACTED]	Grassland (saltbush); sandstone outcrop on low rise	Anasazi (pottery technology)	Washington Pass chert flake fragment, heat treated, unifacial retouched on one edge, no cortex; 1 Corrugated Gray jar sherd 7 Plain Gray jar sherds
5	[REDACTED]	Grassland (saltbush); base of low rise	Anasazi (pottery technology)	1 Corrugated Gray jar sherd 1 Tin can
6	[REDACTED]	Grassland (saltbush); low rise	Anasazi (pottery technology)	Obsidian core flake, single facet platform, no cortex; 3 Unpainted white ware bowl sherds
7	[REDACTED]	Grassland (saltbush); low rise and hilltop; bladed and graveled platform	Anasazi (pottery technology)	1 Plain Gray jar sherd
8	[REDACTED]	Grassland (sage, grama); base of slope and plain/flat	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
9	[REDACTED]	Slope	Anasazi (pottery technology)	1 Puerco/Escavada jar sherd
10	[REDACTED]	Grassland (saltbush, grama); gradual slope	Unknown	Concentration of burned sandstone (app. 20 pieces)
11	[REDACTED]	Grassland (saltbush, tumbleweed); top of low rise	Historic	Base of green glass dessert dish with embossed design on base
12	[REDACTED]	Grassland (saltbush, grama); eroding sandstone outcrop on gradual slope of low hills	Anasazi (pottery technology)	11 Corrugated Gray jar sherds 1 Lino Gray jar rim sherd 1 Plain Gray jar neck sherd
13	[REDACTED]	Grassland (saltbush, grama); low hill gradual slope	Anasazi (pottery technology)	1 Unpainted white ware jar sherd
14	[REDACTED]	Grassland (grama); low hill slope	Anasazi (lithic technology)	Washington Pass chert core flake fragment (multifacet platform, heat treated, missing lateral edge)
15	[REDACTED] ft	Grassland (saltbush, rabbitbrush); plain/flat; near small wash	Anasazi (pottery technology)	1 Polished white ware jar sherd

Table 58. Isolated Occurrences for Section 12, Irrigation Site

IO Number	Location <sup>1</sup>	Context	Cultural affiliation	Description
16	[REDACTED] 4	Grassland (saltbush, grama); plain/flat	Anasazi (pottery technology)	1 Unpainted white ware jar sherd
17	[REDACTED]	Grassland (saltbush, grama); plain/flat	Anasazi (pottery technology)	1 Gallup B/w jar sherd
18	[REDACTED] 6200 Elevation: 6685 ft	Plain/flat	Unknown, probably historic	Cluster of 14 sandstone slabs
19	[REDACTED]	Grassland (grama, tumbleweed, saltbush); plain/flat	Historic (Navajo?)	Trash scatter (1 evaporated milk, 1 tobacco, 3 fruit or vegetable, and 3 meat cans; jelly jar or drinking glass, plate or soup bowl, unidentified glass object); White earthenware, red slipped, banded sherd; White earthenware
20	[REDACTED] 4 Elevation: 6690 ft	Grassland (grama grass); low rise slope	Anasazi (pottery technology)	1 Plain Gray jar sherd 1 Carbon-painted white ware bowl sherd
21	[REDACTED] Legal: [REDACTED] Elevation: 6745 ft	Grassland; sandstone outcrop or rise on southern slope	Unknown	Sandstone cist, 86 by 80 cm
22	UTM: [REDACTED] Legal: N [REDACTED] 4 Elevation: 6745 ft	Grassland (saltbush, grama); sandstone low rise top	Unknown	Gray and white chalcedony biface thinning flake, incomplete, unmodified
24	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6730 ft	Grassland (grama); sandstone low rise on gradual southern slope	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
25	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6705 ft	Grassland (saltbush, grama); open plain	Anasazi (pottery technology)	1 Corrugated Gray jar sherd 1 White ware bowl sherd
26	UTM: [REDACTED] Legal: [REDACTED] 4 Elevation: 6750 ft	Grassland (saltbush, grama); sandstone low rise top	Anasazi (pottery technology)	2 Gallup B/w jar sherd 1 Puerco/Escavada jar sherd 1 Mineral painted white ware bowl rim 1 Plain Gray jar sherd
27	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6750 ft	Grassland (tumbleweed); plain/flat	Anasazi (pottery technology)	1 Plain Gray jar sherd
28	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6700 ft	Grassland (grama); plain/flat	Anasazi (pottery technology)	1 Plain Gray jar sherd
29	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6730 ft	Grassland (saltbush, grama); bottom of slope on southern side of low hills	Anasazi (pottery technology)	2 Plain Gray jar sherds
30	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6750 ft	Grassland (grama); southern slope of low hills	Anasazi (lithic technology)	Quartzite hammerstone



Table 58. Isolated Occurrences for Section 12, Irrigation Site

IO Number	Location <sup>1</sup>	Context	Cultural affiliation	Description
31	UTM: [REDACTED] 0 Elevation: 6725 ft	Low and gradual southern slope	Anasazi (pottery technology)	2 Corrugated Gray jar sherds
32	UTM: [REDACTED] 0 Elevation: 6725 ft	Grassland (grama); open plain/flat	Anasazi (pottery technology)	1 Puerco/Escavada B/w jar sherd
33	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6765 ft	Grassland (grama, saltbush); long gradual slope	Anasazi (pottery technology)	1 Puerco/Escavada B/w jar sherd
34	UTM: [REDACTED] 0 Legal: [REDACTED] Elevation: 6740 ft	Grassland (grama, saltbush); low hill top	Unknown	Rock pile, possible cairn, of large (75+ cm) sandstone slabs and rocks
35	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6745 ft	Grassland (grama, snakeweed, saltbush); low rise on open plain	Unknown	Pile of sandstone slabs (cairn)
36	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6745 ft	Hill top	Historic	Sandstone quarry area, 2 borrow pits or depressions; very large sandstone slabs
37	UTM: [REDACTED] Elevation: 6730 ft	Grassland (saltbush, grama); open plain/flat	Anasazi (pottery technology)	2 Pueblo II white ware bowl sherds 1 Gallup B/w jar sherd 1 Plain Gray jar sherd
38	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6730 ft	Grassland (saltbush, grama); open plain/flat	Anasazi (pottery technology)	1 Plain Gray jar sherd
39	UTM: [REDACTED] Elevation: 6770 ft	Grassland (grama); open plain/flat	Anasazi (pottery technology)	1 Plain Gray jar sherd
40	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6745 ft	Grassland (grama); open plain/flat	Anasazi (pottery technology)	1 Plain Gray jar sherd
41	UTM: [REDACTED] 0 Legal: [REDACTED] Elevation: 6750 ft	Grassland (grama, sagebrush, tumbleweed); open, floodplain	Anasazi (pottery technology)	1 Gallup B/w jar neck sherd
42	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6735 ft	Grassland (grama, sagebrush, tumbleweed); open plain/flat; flood plain	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
43	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6750 ft	Grassland (grama, sagebrush); open plain/flat	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
44	UTM: [REDACTED] Elevation: 6750 ft	Grassland (grama, sagebrush, tumbleweed); open plain/flat; flood plain	Anasazi (pottery technology)	2 Corrugated Gray jar sherds
45	UTM: [REDACTED] Legal: [REDACTED] 4 Elevation: 6770 ft	Grassland (grama, sagebrush, tumbleweed); open plain/flat	Unknown	Green glass, bottle neck with rim; 1 Indeterminate groundstone

Table 58. Isolated Occurrences for Section 12, Irrigation Site

IO Number	Location <sup>1</sup>	Context	Cultural affiliation	Description
46	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6765 ft	Grassland (grama, sagebrush, tumbleweed); open plain/flat; flood plain; disturbed soil	Unknown, historic	Rock alignment (?) in disturbed area; Pop-top can
47	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6750 ft	Grassland (grama, sagebrush); open plain/flat	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
48	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6745 ft	Grassland (grama, sagebrush); open plain/flat	Anasazi (pottery technology)	2 Plain Gray jar sherds 1 Corrugated Gray jar sherd
49	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6735 ft	Grassland (grama, tumbleweed); low rise	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
50	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6755 ft	Grassland (grama, sagebrush); ridge	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
51	[REDACTED] Elevation: 6770 ft	Grassland (grama, tumbleweed); plain/flat; flood plain	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
52	[REDACTED] Elevation: 6770 ft	Grassland (grama, sagebrush, tumbleweed); open plain/flat	Historic	1 Earthenware saucer (fragment; "First right, made in Holland
53	[REDACTED] Legal: [REDACTED] Elevation: 6755 ft	Grassland (grama, sagebrush, tumbleweed); ridge	Unknown	1 Mano fragment (10 x 5 x 5 cm)
54	UTM: [REDACTED] Elevation: 6755 ft	Grassland (grama, tumbleweed); ridge	Anasazi (lithic technology)	1 White chert core flake, no platform
55	UTM: [REDACTED] Elevation: 6745 ft	Grassland (grama); ridge	Anasazi (pottery technology)	1 Plain Gray jar sherd
56	[REDACTED] Elevation: 6785 ft	Grassland (grama, sagebrush); ridge	Anasazi (pottery technology)	1 Plain Gray jar sherd
57	[REDACTED] Elevation: 6790 ft	Grassland (grama, tumbleweed); slope	Anasazi (pottery technology)	1 Plain Gray jar sherd
58	UTM: [REDACTED] Elevation: 6765 ft	Grassland (grama, tumbleweed); base of talus slope	Anasazi (pottery technology)	1 Organic painted white ware jar sherd
59	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6770 ft	Grassland (grama, sagebrush, tumbleweed); plain/flat; slope	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
60	UTM: [REDACTED] Elevation: 6775 ft	Grassland (grama, tumbleweed); plain/flat	Anasazi (pottery technology)	1 Gallup B/w jar sherd 1 Plain Gray jar sherd 2 Corrugated Gray jar sherds
61	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6780 ft	Grassland (grama, rabbitbrush); ridge; slope	Anasazi (pottery technology)	1 Plain Gray jar sherd

Table 58. Isolated Occurrences for Section 12, Irrigation Site

IO Number	Location <sup>1</sup>	Context	Cultural affiliation	Description
62	UTM: [REDACTED] Legal: [REDACTED] Elevation: 6780 ft	Grassland (grama); slope; ridge	Anasazi (pottery technology)	1 Corrugated Gray jar sherd
63	[REDACTED]	Grassland (rabbitbrush); plain/flat; slope	Anasazi (pottery technology)	1 Gallup B/w jar sherd 1 Plain Gray jar sherd
64	[REDACTED]	Grassland (rabbitbrush); plain/flat; slope	Anasazi (pottery technology)	1 Plain Gray jar sherd
65	[REDACTED]	Grassland (grama); slope	Unknown	1 White chert secondary flake
66	[REDACTED]	Grassland (grama, rabbitbrush); ridge; slope	Unknown	Sandstone slab pile (cairn ?), 5 by 6 m, 0.5 m high
67	[REDACTED]	Grassland (grama, rabbitbrush); ridge; slope	Anasazi (pottery technology)	1 Plain Gray jar sherd
68	[REDACTED]	Grassland (grama, rabbitbrush, sagebrush); plain/flat; slope	Unknown	Circular sandstone slab feature
69	[REDACTED]	Grassland (grama, rabbitbrush, sagebrush); plain/flat; slope	Unknown	Tin can with sanitary seal
70	[REDACTED]	Grassland (grama, rabbitbrush); plain/flat; slope	Anasazi (pottery technology)	1 Corrugated * sherd with black interior; bowl body
71	[REDACTED]	Grassland (grama, rabbitbrush); plain/flat; slope	Anasazi (pottery technology)	12 Corrugated Gray jar sherds with black interior
72	[REDACTED]	Grassland (grama, rabbitbrush); plain/flat; slope	Anasazi (pottery technology)	1 Unpainted white ware jar sherd
73	[REDACTED]	Grassland (grama, rabbitbrush); ridge; slope	Anasazi (pottery technology)	1 Red Mesa B/w bowl sherd

<sup>1</sup>UTM coordinates are within Zone 12. Quarter sections are within Section 12, T17N, R13W, on the USGS Crownpoint 7.5' quadrangle.

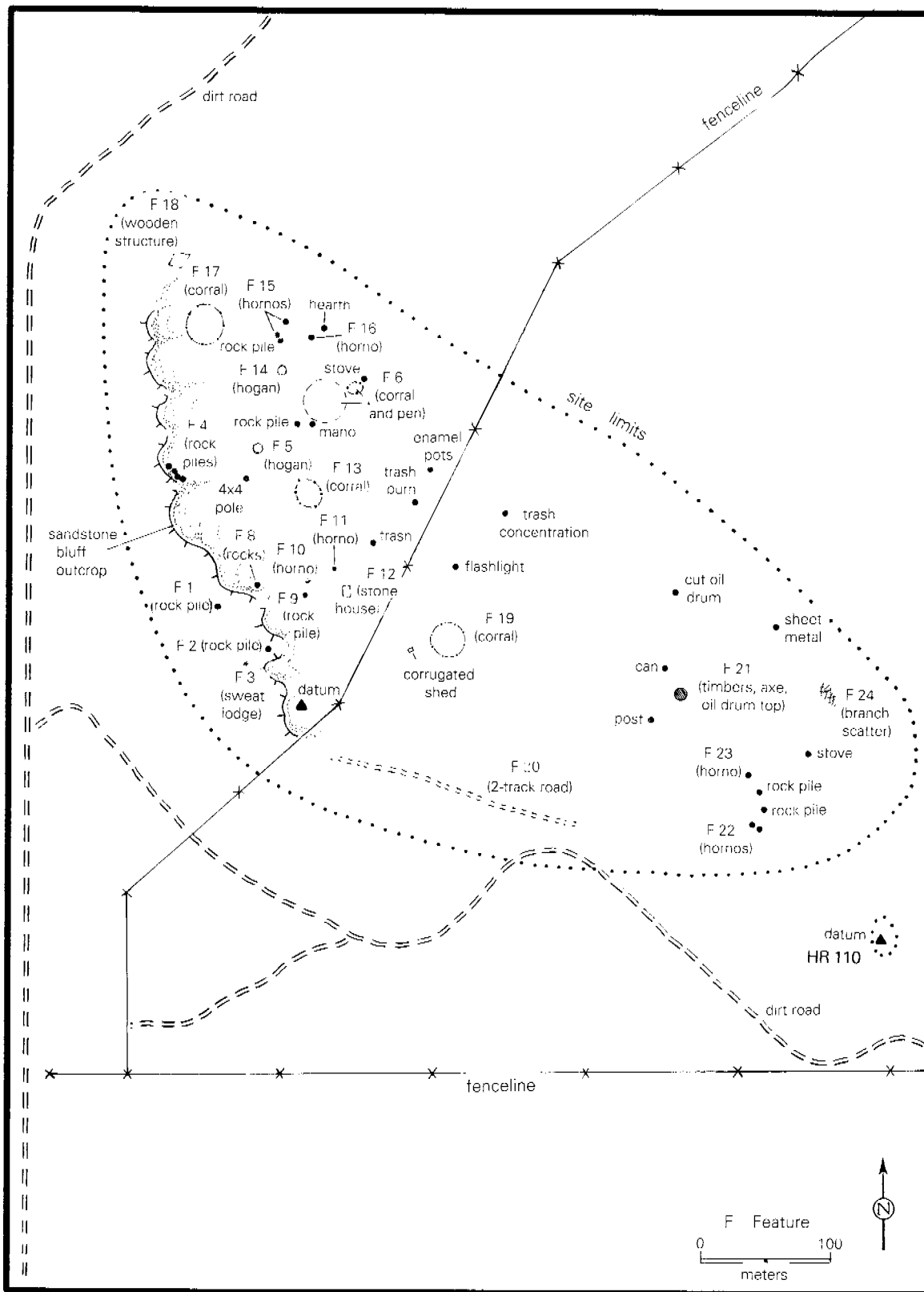


Figure 39. Plan of LA 70610.

sites (AS 4 through AS 12). Correll (1977) used one or two of these features at the north end as the basis for defining a site that was later designated LA 70610, although the site was never fully recorded in the Laboratory of Anthropology files. LA 70610 was relocated during the OAS survey and assigned field number HRI-109. All site information was updated, and the boundary of the site was expanded from Correll's definition to include all of the features identified by Brooks. A site form was completed, along with an electronic transit map of the area, and features and structures were photographed. No systematic in-field artifact analysis was conducted, but nonsystematic observations were made throughout the site to confirm the prior descriptions by Brooks (n.d.).

Table 59. Sites Recorded on Section 12, Private Land

Site number	Affiliation	Component	Features
LA 70610	Navajo	Recent	Stone hogans, stone house, sweat lodge, hornos, corrals, possible burial
LA 116122	Anasazi	Pueblo II	Roomblock, artifact scatter
LA 116123	Anasazi	Basketmaker III or Early Pueblo I	Rubble scatters, artifact scatter; significant disturbance
LA 116124	Anasazi	Pueblo I	Artifact scatter; some disturbance
LA 116125	Anasazi	Pueblo II	Single masonry room, hearth, artifact scatter
LA 116126	Anasazi	Basketmaker III or Early Pueblo I	Artifact scatter, hearth (?)
LA 116127	Anasazi	Late Pueblo I	Artifact scatter
LA 116128	Anasazi	Basketmaker III or Early Pueblo I	Roomblock, pit structure, midden
		Pueblo II	Artifact scatter
LA 116129	Anasazi	Pueblo II	Artifact scatter; surface disturbance
LA 116130	Anasazi	Pueblo II	Single masonry room, cist, artifact scatter

Residences are indicated by the remains of two stone hogans (Features 5 and 14), one rectangular stone house (Feature 12), and a scatter of milled lumber that represents a dismantled wooden structure (Feature 18). Most of the sandstone blocks and slabs of the stone structures have been scavenged since their abandonment, but Feature 5 has a wall segment that stands 2 m high (Photo 12). Four corrals (Features 6, 13, 17, and 19) were identifiable based on alignments of fencepost bases or on large circular areas of bare ground. Isolated post bases appear to be remnants of other livestock features such as pens. One saw-cut and two axe-cut and notched timbers at the east end of the site (Feature 21) are either remnants of livestock facilities or may be displaced elements of a wooden structure in this area.

Other residential features include a sweat lodge (Feature 3) and a series of stone hornos (Features 8, 9, 10, 11, 15, 16, 22, and 23) (Photo 13). Additional burned rock piles may be associated with sweat lodge use, or they are horno remnants (Features 1 and 2). Unburned rock piles could be masonry stockpiles from the dismantling of the structures or horno or structure remnants (Features 4 and 7). Faint traces of a two-track road segment can be seen along the southern margin of the site. This road predates road construction related to Mobil Oil's use of the section.



Photo 12. Feature 12, LA 70160.



Photo 13. Feature 23, LA 70160.

The final feature is a scatter of juniper and piñon branches. This scatter was identified by Brooks as the location of a historic burial (AS 12). Sheetwash has carried a thin layer of drilling mud over the ground surface in the area, but there has been no mechanical disturbance in the immediate vicinity. Between the time of Brooks's description and the OAS survey, the branch pile has been depleted and spread over a much larger area, but Brooks's original survey markers were relocated. An additional burial was described within the rectangular stone house by Mr. Becenti during a visit to Section 12 in August 1996. Neither of these burials is clearly discernable as a physical feature of the landscape, and their presence is identified only on the basis of ethnohistoric information. The possible burial locations are discussed in more detail as traditional cultural properties later in this report.

Historic trash is widely scattered across the site area. Discrete trash piles and trash burning areas were noted, and some isolated historic artifacts that occur outside of the site boundaries are probably related to the residential use of the site. Purple glass and hole-in-top cans are consistent with initiation of site occupation at the turn of the century, as supported by Brooks's ethnohistoric investigations. Earlier historic material culture tends to occur in the central and eastern portions of the site. Navajo Gray jar sherds with neck applique were noted in a trash area between one of the stone hogans and a corral (Features 5 and 13).

Some recent trash at the eastern end of the site is related to Mobil Oil's activities within the section. The most recent trash (car parts, food cans, coffee cans, and buckets) related to the occupation of LA 70160 is concentrated at the northern end of the site. This is consistent with Brooks's ethnohistoric research, which defines Feature 18 as a wooden house built in 1956 by a Navajo family that leased the land for a year. After 1956, residential use of the section by Navajo families ceased, and ownership eventually was transferred to Mobil Oil and then to the present owners.

#### *LA 116122*

LA 116122 is a single-component Anasazi residential site occupied during the Pueblo II period (Fig. 40). This site is on a gentle rise overlooking Indian Creek to the west. The setting is slightly deflated, but portions of a masonry roomblock and midden remain intact. This previously unrecorded site was located during the OAS survey and assigned field number HRI-101. Site information was recorded by completing a LA site record form, a compass map of the site area, photographs, and in-field analysis of all visible surface artifacts (Tables 60 and 61).

LA 116122 measures 55 by 48 m and consists of a 1 or 2 room, single-story masonry roomblock, an associated midden, and two small artifact concentrations. The structure was constructed of tabular sandstone slabs forming a rough L-shape in plan. The rubble area measures 5 by 3.5 m. A small concentration of ceramics is adjacent and to the north of the rubble scatter, and a midden lies to the south. The midden measures 16 by 25 m and consists of a moderately dense concentration of ceramics.

Another concentration of ceramics was located 20 m northwest of the rubble scatter. These artifacts were adjacent to a sandstone outcrop and are associated with a scatter of oxidized sandstone 1.5 m in diameter. This may represent a former hearth. The pottery types are representative of the late Pueblo II period, and the site appears to be a small habitation or extensively used fieldhouse.

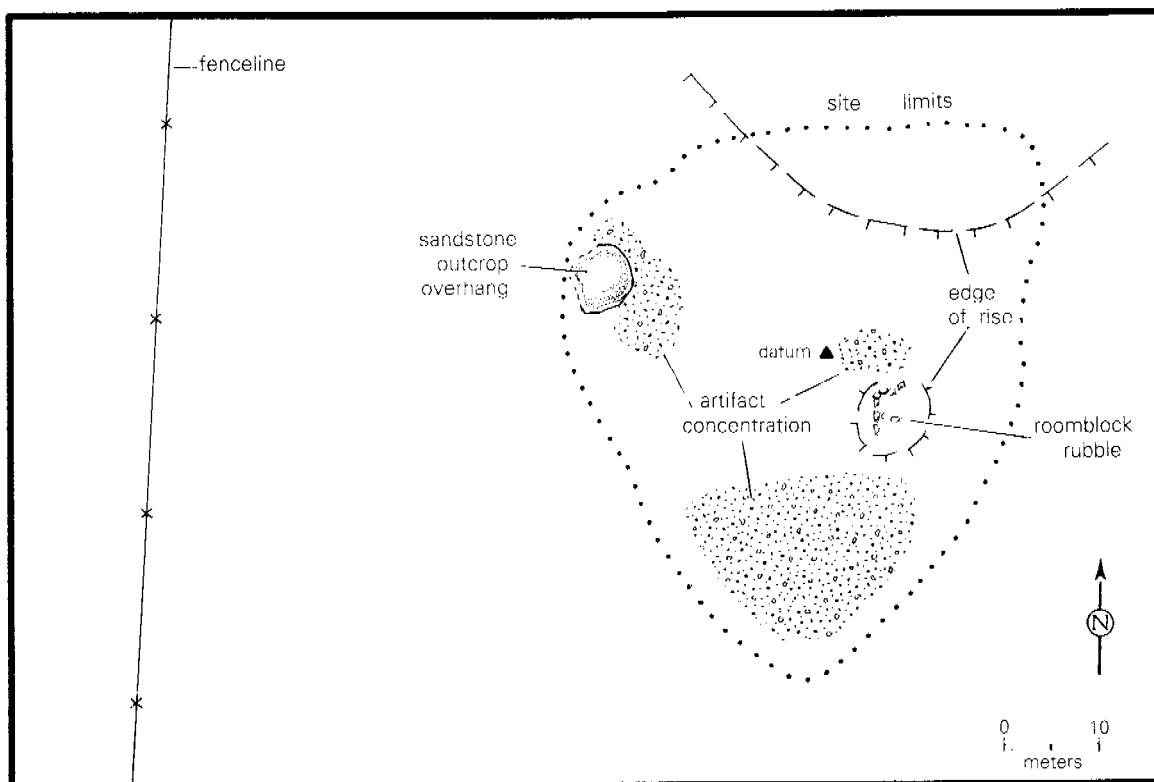


Figure 40. Plan of LA 116122.

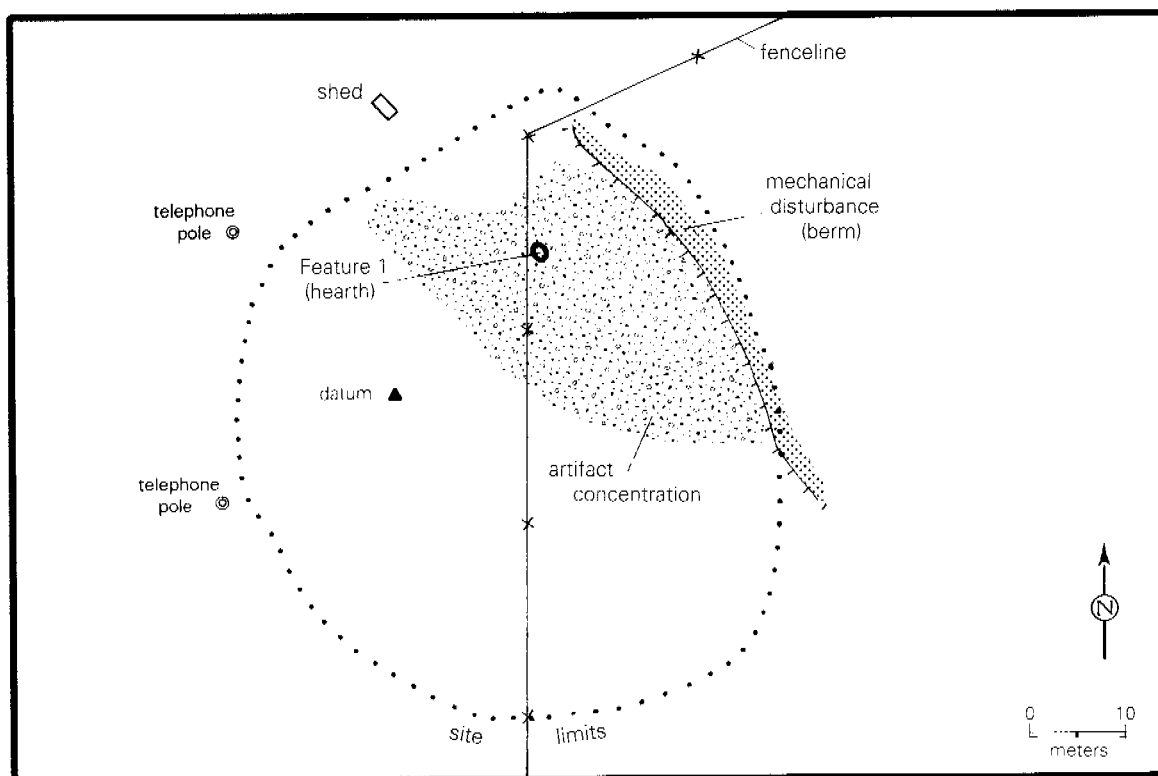


Figure 41. Plan of LA 116123.



Table 60. LA 116122 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	26
Pueblo II Corrugated	1
Pueblo II-III Corrugated	1
Corrugated Gray	23
Anasazi White Ware	
Red Mesa Black-on-white	1
Gallup Black-on-white	3
Mineral painted white ware (late)	4
Organic painted white ware (late)	3
Unpainted white ware	5
Anasazi Red Ware	
Wingate Black-on-red	2
White Mountain Redware, painted	1
Total	70

Table 61. LA 116122 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Early stage biface	Red jasper, dendritic (thermally altered)	Fine	Fragment	0	
	Early stage biface	Red jasper	Fine	Fragment	0	
	Angular debris	Pink silicified wood	Fine		0	

### LA 116123

LA 116123 is a single-component Anasazi artifact scatter with evidence of Basketmaker III or Early Pueblo I occupations (Fig. 41). This site is on a gentle rise overlooking Indian Creek to the west. The setting is slightly deflated, with evidence of extensive mechanical disturbance over all but the east margin of the site. This previously unrecorded site was located during the OAS survey and assigned field number HRI-102. Site information was recorded by completing an LA site record form, a compass map of the site area, photographs, and in-field artifact analysis. In-field analysis was conducted by recording all visible surface artifacts (Table 62).

Table 62. LA 116123 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Lino Gray	4
Neckbanded Gray	1
Plain Gray	280
Corrugated Gray	2
Anasazi White Ware	
La Plata Black-on-white	1
White Mound Black-on-white	4
Gallup Black-on-white	1
Total	293

LA 116121 measures 68 by 55 m and consists of a dense scatter of artifacts and sandstone spalls. Artifacts and oxidized sandstone spalls are abundant throughout the site and represent the dispersed remains of multiple hearths or structures. The volume of possible structural rubble and pottery is consistent with the amount of debris generated at long-term residential sites of this early period. There is no evidence for pit structure depressions, but these may have been obscured by surface disturbance.

The cultural features appear to have been uncovered by the development of nearby building foundations. This mechanical disturbance removed approximately 0.1 to 0.3 m of the surface soil, exposing the cultural features and deposits. Although the surface of the site has been scraped, the visible cultural features appear to be in place, and subsurface deposits appear to be intact. Cultural material is not visible on the surface beyond the zone of disturbance, suggesting that intact portions of the site may remain to the east of the site boundary, covered by colluvium from the uplands to the northeast.

### LA 116124

LA 116124 is a single-component Anasazi site with evidence of a Pueblo I occupation (Fig. 42). This site is on a south-facing gentle ridge overlooking Indian Creek to the southwest. The site is

in a slightly deflated setting with evidence of mechanical disturbance. This site was originally recorded by Brooks, who described it as an artifact scatter and possible hearth (AS 3). LA 116124 was relocated during the OAS survey and assigned field number HRI-103. All site information was updated. This included a site form, a complete compass map of the area, photographs of features and structures, and in-field artifact analysis. In-field analysis was conducted by recording all visible surface artifacts (Tables 63 and 64).

Table 63. LA 116124 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Lino Gray	1
Plain Gray	52
Corrugated Gray	1
Anasazi White Ware	
White Mound Black-on-white	2
Total	56

Table 64. LA 116124 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Core flake	Red jasper	Fine	Complete	0	Multifacet

LA 116124 measures 23 by 24 m and consists of a low-density artifact scatter and sandstone spalls. Ceramic and lithic artifacts were identified in four clusters within the site area. A concentration of sandstone spalls may be the feature Brooks recorded as a hearth, but this concentration appears to be a natural outcrop. A green T-post was placed in the site to mark its location for Mobil Oil. Although the pottery assemblage is somewhat diverse, the lack of feature or structure evidence argues against habitation use, and the site was probably seasonally occupied.

#### *LA 116125*

LA 116125 is a single-component Anasazi site with evidence of a Pueblo II occupation (Fig. 43). This site is on a south-facing gentle ridge overlooking Indian Creek to the southwest. The site is in a slightly deflated setting with evidence of livestock disturbance of the ground surface. Originally recorded by Brooks, this site was described as an artifact scatter, a possible field house, and a possible hearth (AS 2). LA 116125 was relocated during the OAS survey and assigned field number HRI-104. All site information was updated. This included a site form, a compass map of the area, photographs of features and structures, and in-field analysis of all visible surface artifacts (Tables 65 and 66).

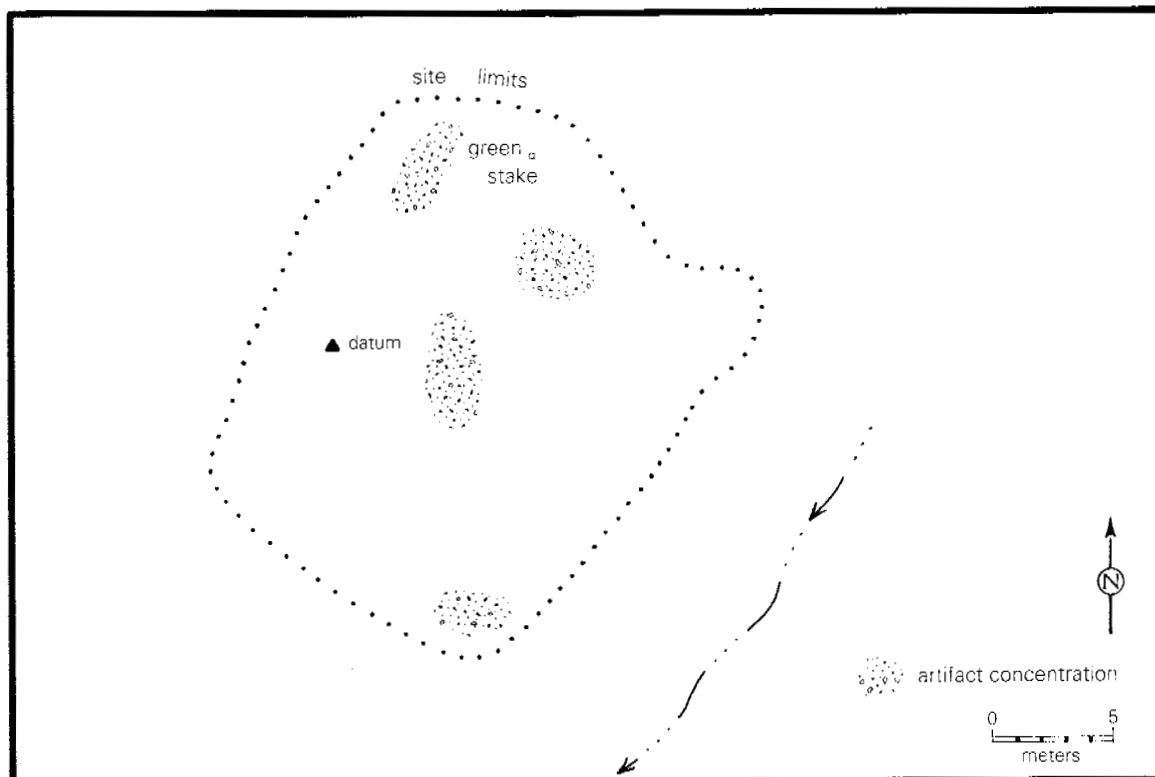


Figure 42. Plan of LA 116124.

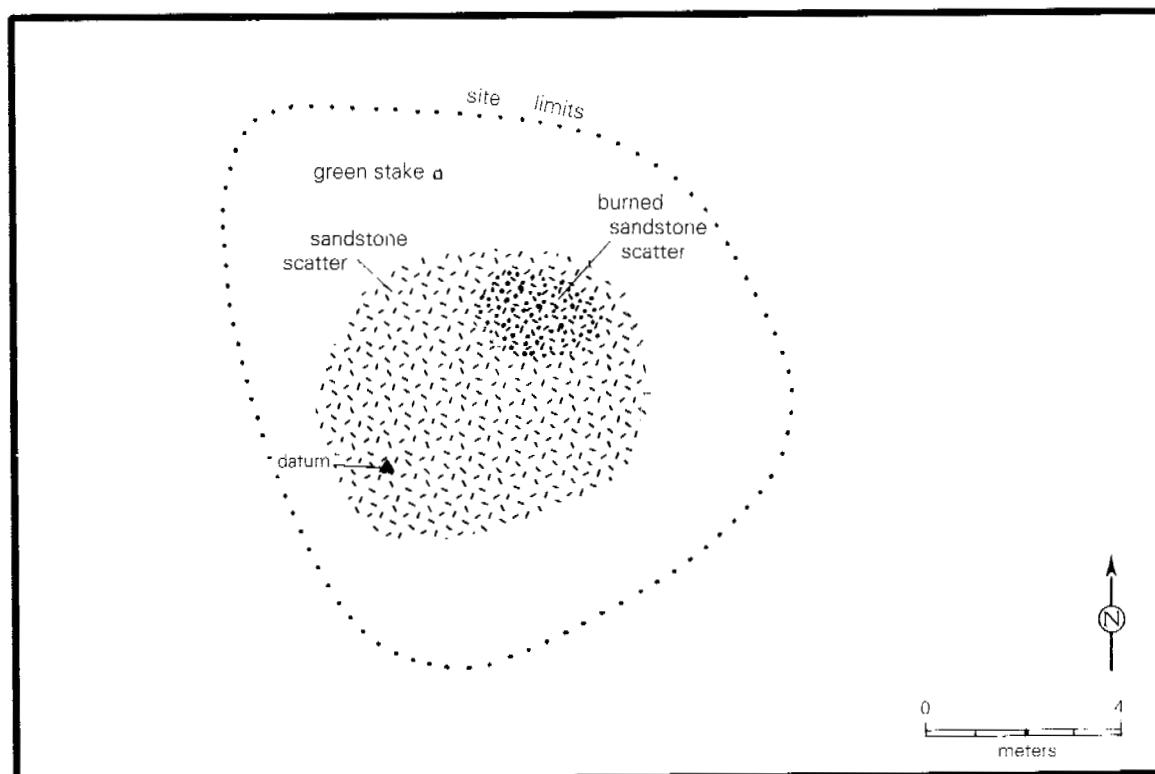


Figure 43. Plan of LA 116125.

Table 65. LA 116125 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Lino Gray	1
Pueblo III Corrugated Rim	1
Corrugated Gray	3
Anasazi White Ware	
Red Mesa Black-on-white	2
Gallup Black-on-white	1
Mineral painted black-on-white (late)	3
Unpainted white ware	1
Total	12

Table 66. LA 116125 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Core flake	Gray fingerprint chert	Fine	Complete	0	Multifacer
	Core flake	Multicolored chert	Fine	Fragment	0	

LA 116125 measures 11.5 by 12 m and consists of a low-density scatter of artifacts and oxidized sandstone spalls. Artifacts are sparsely scattered over the site area and include both ceramics and lithics. A 7 m diameter scatter of tabular sandstone fragments is near the center of the site. This concentration may represent a small masonry structure, but no visible rock alignments were identified. A 2.5 m area of oxidized sandstone spalls was recorded at the northeast end of the rubble scatter, probably representing a hearth or other thermal feature. No charcoal or ash were observed. A green T-post at the north margin of the site was used to mark the site for Mobile Oil. This site is more substantial than LA 116124, and it probably represents a Pueblo II seasonal residence or field station.

#### *LA 116126*

LA 116126 is a single-component Anasazi site with evidence of a Basketmaker III or early Pueblo I occupation (Fig. 44). This site is on a south-facing gentle ridge overlooking Indian Creek to the southwest. The site is in a slightly deflated setting, exacerbated by grazing. This site was originally recorded by Brooks (n.d.) and described as an artifact scatter and possible hearth (AS 1). LA 116124 was relocated during the OAS survey and assigned field site number HRI-105. Documentation consisted of a site form, a compass map of the area, photographs, and in-field analysis of all visible surface artifacts (Tables 67 and 68).

Table 67. LA 116126 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	7
Total	7

Table 68. LA 116126 Flaked and Ground Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Angular debris	Gray chert	Glassy		0	
	Indet. ground stone	Sandstone	Medium	Fragment		
	Slab metate	Sandstone	Medium	Fragment		

LA 116126 measures 18 by 21 m and consists of a low-density artifact scatter. Artifacts are sparse over the site area and consist of ceramics, lithics, and ground stone fragments. A scatter of sandstone spalls may be the feature Brooks recorded as a hearth, but the scatter appears to be a natural outcrop. A green T-post was used to mark the site for Mobil Oil. The artifact assemblage is unusually diverse in the absence of architectural evidence, and the site may be a repeatedly occupied camp.

#### *LA 116127*

LA 116127 is a single-component Anasazi site with evidence of a late Pueblo I or early Pueblo II occupation (Fig. 45). This site is within a south-facing shallow drainage overlooking Indian Creek to the west. The site is in a slightly deflated setting with evidence of mechanical disturbance. This previously unrecorded site was located during the OAS survey and assigned field number HRI-106. Site information was recorded by completing a LA site record form, a compass map of the site area, photographs, and in-field analysis of all visible surface artifacts (Tables 69 and 70).

LA 116127 measures 23 by 48 m and consists of a low-density artifact scatter with one concentration of ceramics. A dense concentration of ceramics is at the east end of the site. These sherds may represent one or possibly two plain gray utility ware jars. A bladed drainage ditch, oriented north-south, crosses the east end of the site. This ditch appears to be associated with the Mobil Oil drilling-mud disposal area, which is to the south and east. This site is similar to LA 116126 in that the artifact assemblage is diverse enough to suggest repeated or long-term use, but there is no evidence of habitation architecture.

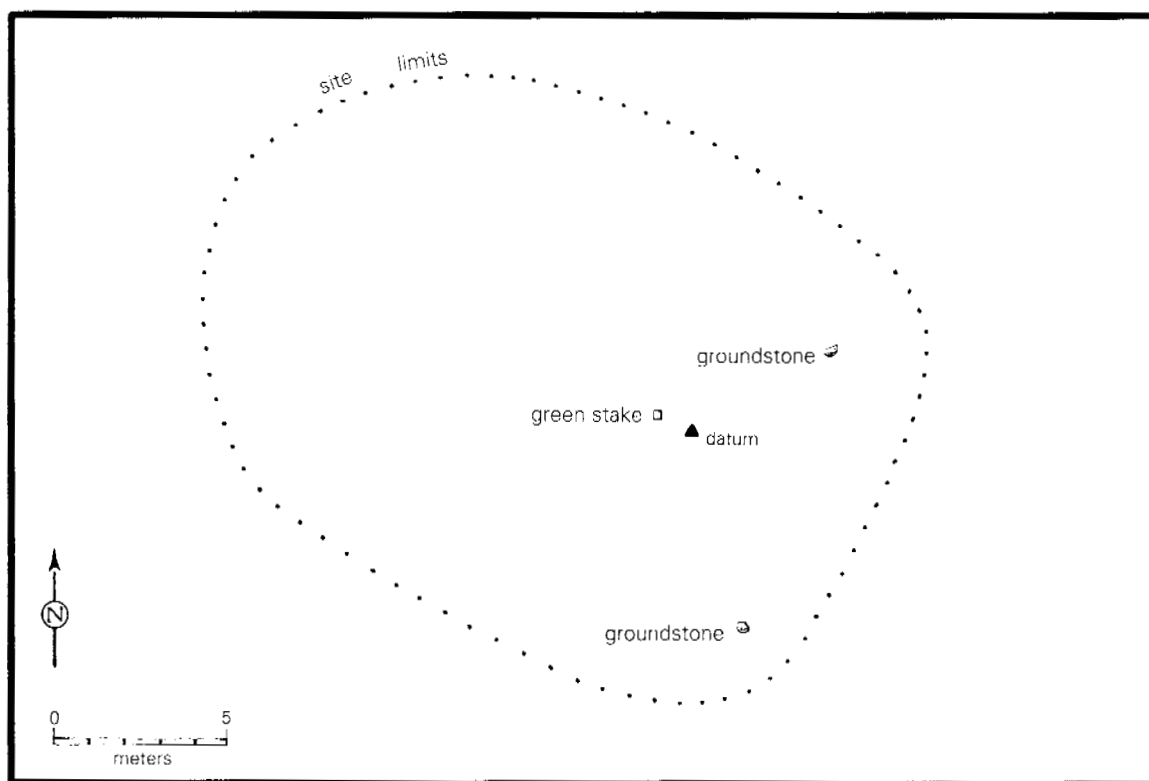


Figure 44. Plan of LA 116126.

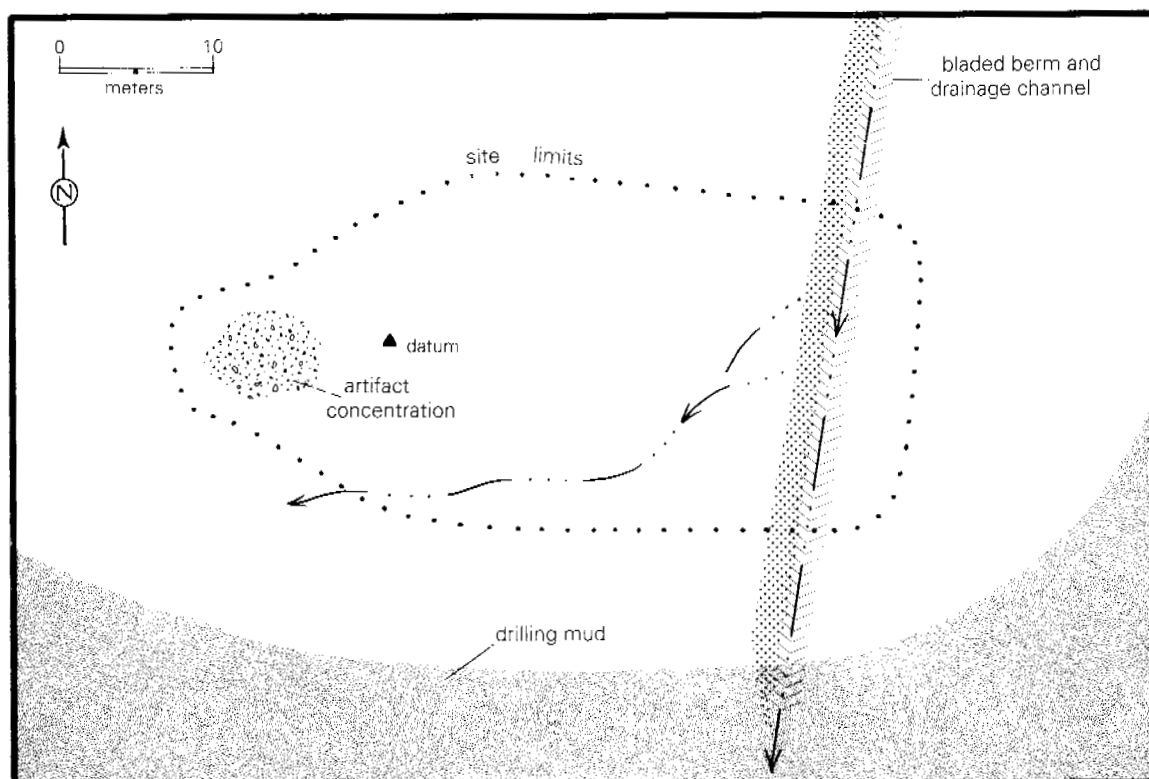


Figure 45. Plan of LA 116127.

Table 69. LA 116127 Ceramic Observations

Pottery type	Entire site (count)
Anasazi gray ware	
Neckbanded Gray	11
Plain Gray	24
Anasazi White Ware	
Kana'a Black-on-white	1
Unpainted white ware	1
Total	37

Table 70. LA 116127 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Entire site	Early stage biface	Red jasper	Fine	Distal ½	0	

*LA 116128*

LA 116128 is a multiple-component site with evidence of Basketmaker III or early Pueblo I and Pueblo II Anasazi occupations (Fig. 46). This site was originally recorded by Brooks (n.d.) and described as numerous up-right slabs representing one or two rooms and/or hearths and a possible pit structure (AS 14). The site was relocated during the OAS survey and assigned field number HRI-107. Site information was updated, included a site form, compass map, photographs, and in-field analysis of artifacts in five areas of the site (Tables 71 and 72).

LA 116128 is on a low, south-facing ridge approximately 5 m above the floodplain and 15 m below the crest of the ridge to the north. The site overlooks the broad Indian Creek valley to the west. It measures 70 by 70 m and includes intact portions of a roomblock, slab-lined features, and a midden. Large areas of the site are stabilized by vegetation, but other portions are slightly deflated, accelerated by grazing.

The Basketmaker III or early Pueblo I component at LA 116128 consists of two slab-lined roomblocks (Features 4 and 5), five slab-lined cists (Features 1,2,3,6, and 7), a possible pit structure, and a midden. The component is organized as a loose crescent of surface rooms open to the south with a shallow depression in the center and sheet midden to the south. Slab-lined features occur in arcs along the edges of the shallow depression.

The surface rooms are constructed of articulated upright tabular sandstone slabs that form two blocks of contiguous rooms. These roomblocks were one room deep and two to three rooms long. The clearly defined portion of Feature 4 measures 3.5 m long and 1.0 m wide, and Feature 5 measures 6 m long. The features (1, 2, 3, and 6) to the south of the rooms were also constructed



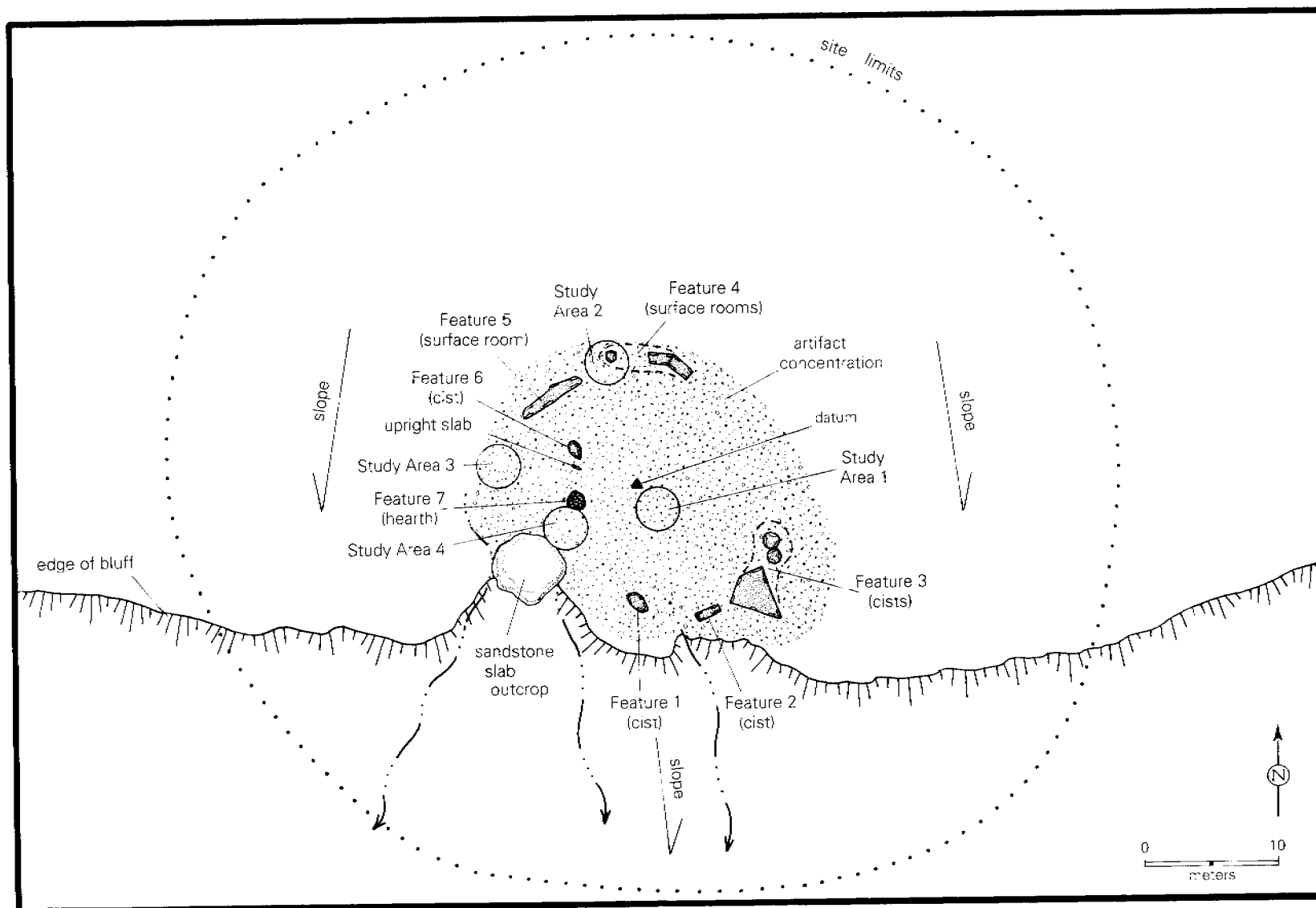


Figure 46. Plan of LA 116128.

of upright sandstone slabs. Except for Feature 3, these features appear to represent cists.

Feature 3 is to the east of the architectural portion of the site and consists of three groups of articulated slabs. This feature may represent several cists or a noncontiguous row of rooms. One slab at this feature is perforated by a 10 cm hole, which may be a cultural or a natural feature of the stone.

Table 71. LA 116128 Ceramic Observations

Pottery type	Area 1 (count)	Area 2 (count)	Area 3 (count)	Area 4 (count)	Eastern site margin (count)
Anasazi Gray Ware					
Lino Gray	10				1
Plain Gray	43	30	31	74	21
Pueblo II-III Corrugated Rim			1		
Corrugated Body	4		1		25
Anasazi White Ware					
La Plata Black-on-white			1		
White Mound Black-on-white	1			1	
Red Mesa Black-on-white					1
Escavada/Puerco Black-on-white					1
Mineral painted white ware (late)	1				1
Unpainted white ware					1
Anasazi Red Ware					
San Juan Red Ware	2				2
Total	61	30	34	75	53

Table 72. LA 116128 Flaked Stone Artifact Descriptions

Site portion	Artifact type	Material type	Material texture	Portion	Dorsal cortex (%)	Platform type
Area 1	Core flake	White chert	Glassy	Complete	0	Single facet
Area 2	Angular debris	Silicified wood	Fine		0	
Eastern site margin	Hammerstone	Silicified wood	Fine	Complete as tool	0	
	Core flake	Purple quartzite	Medium	Fragment	0	
	Core flake	Purple jasper	Fine	Complete	0	Multifacet

The rooms and cists are arranged around a very shallow depression approximately 5 m in diameter; this is probably a pit structure depression. A moderately dense scatter of artifacts encompasses the entire area of the structures and features, and increasing artifact density toward the southern margin of this scatter defines the sheet midden associated with this component. The vast majority of surface artifacts are sherds, but there were a few stone artifacts. The architectural and the gray and white ware pottery associated with component are consistent with a Basketmaker III or early Pueblo I occupation date, and the two San Juan Red Ware sherds suggest that the occupation extended into the late eighth or early ninth century.

The Pueblo II component at the site is defined by the presence of Pueblo II pottery types within the site boundary. The frequency of these later ceramics is greatest at the east end of the site. The Pueblo II component does not appear to be associated with any of the features. Instead, these artifacts appear to represent use of the site area as a short-duration camp or field station without permanent shelter.

#### *LA 116129*

LA 116129 is a single-component site with evidence of a Pueblo II Anasazi occupation (Fig. 47). This site is set within the floodplain of Indian Creek. The geomorphic setting for the site is stable, but the majority of the site surface has been bladed, destroying the integrity of surface deposits. The blading has left numerous parallel berms, but there is no evidence that the disturbance extends to any depth. Surface features, if present, have been eliminated, and surface artifacts have been moved, probably elongating the site in a north-south direction but not affecting the east-west dimensions of the site.

This previously unrecorded site was located during the OAS survey and assigned field number HRI-108. Site information was recorded by completing a site record form, compass map of the site area, photographs, and in-field analysis. In-field analysis was conducted by recording all visible artifacts within the entire site area (Table 73).

Table 73. LA 116129 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Lino Gray	1
Plain Gray	4
Pueblo II Corrugated Rim	1
Corrugated Gray	17
Anasazi White Ware	
Unpainted white ware	2
Total	25

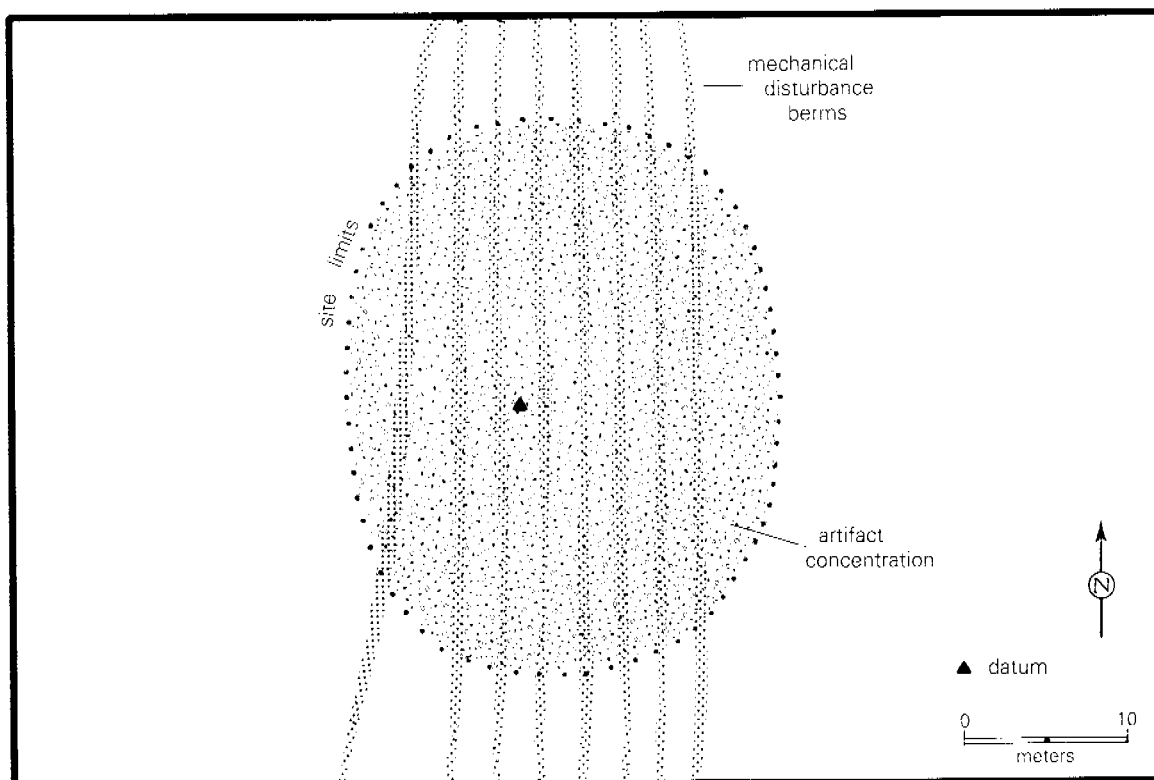


Figure 47. Plan of LA 116129.

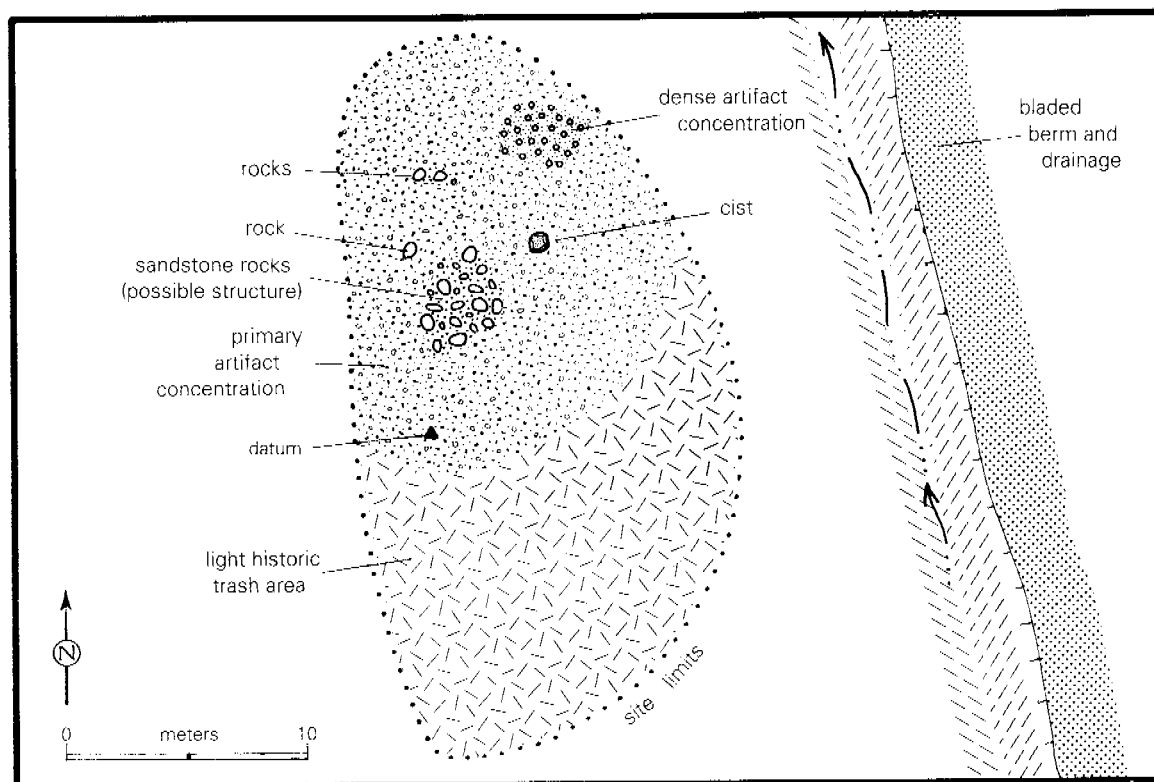


Figure 48. Plan of LA 116130.

LA 116129 consists of a low-density artifact scatter that measures 40 by 30 m. Pottery types indicate a Pueblo II component. No architectural rubble was noted, but a small amount of oxidized sandstone may reflect the predisturbance presence of one or more hearths. This site appears to be similar in structure to LA 116125, LA 116127, and the Pueblo II component at LA 116128. It is more likely to be a temporary camp or field station than a habitation.

#### *LA 116130*

LA 116130 is a single-component site with evidence of a Pueblo II Anasazi occupation (Fig. 48). This site is on a north-facing gentle ridge overlooking Indian Creek to the northwest. The site is in a slightly deflated setting, with sheetwash accelerated by livestock trampling. Just east of the site is the edge of the Mobil Oil drilling-mud disposal area. A drainage berm has been bladed between the site and the disposal area, and no cultural material was present in the exposure of subsurface material. This site was originally recorded by Brooks (n.d.), who described it as an artifact scatter associated with a possible surface room and hearth (AS 13).

LA 116130 was relocated during the OAS survey and assigned field number HRI-110. All site information was updated, including a site form, a compass map of the area, photographs, and in-field analysis of all visible surface artifacts (Table 74). The site is to the east of the extensive historic Navajo settlement within the section, and it is also adjacent to the Mobil Oil drilling-mud disposal area. A light scatter of historic trash lies to the south and overlaps the site boundary slightly, but all of the datable material is recent and appears to relate to the Mobil Oil use of the area rather than the pre-1950s Navajo occupation.

Table 74. LA 116130 Ceramic Observations

Pottery type	Entire site (count)
Anasazi Gray Ware	
Plain Gray	3
Corrugated Gray	6
Anasazi White Ware	
Gallup Black-on-white	4
Escavada-Puerco Black-on-white	3
Unpainted white ware	2
Total	18

LA 116130 measures 28 by 15 m and consists of a moderately dense artifact scatter, an area of sandstone rubble, and a slab-lined cist. The sandstone rubble concentration, within a 5 by 4 m area near the center of the site, is the masonry room previously recorded by Brooks (n.d.). Approximately 2.5 m to the northeast is a small slab-lined cist that has been exposed by erosion since Brooks's original description. This feature is constructed of four upright sandstone slabs and is rectangular in plan. The artifacts and probable architectural features of the site represent a fieldhouse used in the late Pueblo II period.

## *Traditional Cultural Properties*

Janet E. Spivey and Eric Blinman

The early Navajo use of Section 12 is unknown (Brooks n.d.), but around the turn of the century, Section 12 became the residence of the Kin Yaah Yazzie family. Later, Paul Yazzie owned the land, and then Ollie Charley. Brooks reports that Mr. Charley sold Section 12 to the Burnham trading post family, who subsequently sold it to the Mobile Oil Corporation.

Interviews concerning traditional cultural properties and the results of documentary research about traditional sites in the region are presented in detail in the Background for the Cultural Resources Inventory and Methods sections of this report. Substantive results regarding traditional uses of the Section 12 Crownpoint Irrigation Site are summarized in Table 75.

None of the chapter officials or traditional practitioners identified any traditional cultural properties within the private land of Section 12. However, the possible presence of burials is an issue within the section. Expressed concerns with the project as a whole related to general questions of safety, especially during the transport of mining products along the highways in the region.

Specific information on historic Navajo burials within Section 12 is provided by Brooks (n.d.) and Mr. Becenti. Brooks described Feature 24 (AS 12) within LA 70610 as a low mound, and her burial description form notes that juniper and piñon branches are loosely piled on the feature. The OAS survey could not detect a mound at the location, but the branch scatter was relocated. A thin layer of gray sediment has been washed down over the feature area from the Mobil Oil drilling-mud disposal area to the southeast. Brooks's unnamed consultants identified the feature as the burial site of Kinya'aani Yahzi, who died about 1910. Mr. Yahzi is said to have been a prosperous stockman who had political influence as a *na'taani nez*, or "peace chief." During a visit to Section 12 with OAS archaeologist Eric Blinman, Mr. Becenti was not able to identify the location of the burial, but he referred to stories of its presence in the vicinity.

Brooks also mentions Feature 12 (AS 8) as another possible burial site within LA 70610. Feature 12 is the remains of a rectangular stone house. Brooks speculates that the unfinished or incomplete appearance of the surviving masonry and the collapsed appearance of one wall segment may have resulted from intentional destruction over a burial within the house. During Mr. Becenti's visit to Section 12 and following an examination of the house, he concurred with Brooks's interpretation.

These possible burials were investigated as part of the OAS ethnohistoric research. The circumstances surrounding Feature 24 are contradictory. Traditional practitioners from Dalton Pass, Becenti, and Crownpoint stated in the OAS consultations that Kinya'aani Yahzi (Yazzie) died in 1936 or 1938 and was buried in a cemetery. Paul Yazzie, grandson of Kinya'aani Yazzie, stated in a February 1997 interview with Ben House that his grandfather was buried in the Crownpoint Cemetery. Paul Yazzie was 10 years old when his grandfather died in 1935. His grandfather had become very sick and may have died of pneumonia. Kinya'aani Yazzie lived about two miles southwest of Crownpoint at that time. The Public Health Service provided a wooden coffin, and Kinya'aani Yazzie was buried in the Crownpoint Cemetery.

Accounts of a burial in the stone house (Feature 12) are also contradictory. Traditional practitioners from the Becenti, Dalton Pass, and Crownpoint Chapters who were interviewed by

Table 75. Summary of Traditional Cultural Property Results, Crownpoint Irrigation Site, Section 12, Private Land

Consultant	Affiliation	Concerns
Ernest C. Becenti, Sr.	Church Rock Chapter; former chapter president; traditional practitioner	No known traditional uses; one or more historic burials are be present within LA 70610
Jean Mariano	Mariano Lake Chapter; traditional practitioner	No known traditional uses
Bennie Y. Begay	Pinedale Chapter; former chapter vice president; traditional practitioner	No known traditional uses
Jim Charley	Smith Lake Chapter; traditional practitioner	No known traditional uses
Tom Shorty	Becenti Chapter; traditional practitioner	No known traditional uses
Lincoln Perry	Crownpoint Chapter; traditional practitioner	No known traditional uses
William E. Raymond	Little Water Chapter; former chapter secretary; traditional practitioner	No known traditional uses
Charles Long	Crownpoint Chapter president	No known traditional uses
Confidential	Dalton Pass Chapter; traditional practitioner	No known traditional uses
George Tolth	Little Water Chapter; council delegate	No known traditional uses
Bennie Enrico <sup>1</sup>	Little Water Chapter president	No known traditional uses
Thomas Barbone <sup>1</sup>	Little Water Chapter vice president	No known traditional uses
Ken Tapaha	Little Water Chapter manager	No known traditional uses
Henry Tom <sup>1</sup>	Mariano Lake Chapter president	No known traditional uses
Harry Hubbard <sup>1</sup>	Becenti Chapter president	No known traditional uses
Harrison Morgan	Dalton Pass Chapter president	No known traditional uses

<sup>1</sup>Defers to the traditional practitioners who have been consulted.

Table 76. National Register Eligibility Summary, Crownpoint Irrigation Site, Section 12,  
Private Land

Site Number	Description	Eligibility recommendation	Comments
LA 70610	Historic Navajo residences and livestock features, ranging in age from the turn-of-the-century through the 1950s; two possible burial locations	Eligible, criterion d	Substantial site; excellent condition
LA 116122	Anasazi, Pueblo II small habitation site	Eligible, criterion d	Small site; some erosion but otherwise in good condition
LA 116123	Anasazi, Basketmaker III or Early Pueblo I habitation site	Eligible, criterion d	Moderate-sized site; portions of the site surface have been affected by mechanical scraping but subsurface deposits remain intact; subsurface materials may be present outside of the site area to the east
LA 116124	Anasazi, Pueblo I temporary camp or limited activity site	Eligible, criterion d	Small site; subsurface deposits are substantially intact
LA 116125	Anasazi, Pueblo II seasonal residence or field station	Eligible, criterion d	Small site; some livestock damage and erosion but otherwise in good condition
LA 116126	Anasazi, Basketmaker III or Early Pueblo I camp site	Eligible, criterion d	Small site; some surface erosion but in good condition
LA 116127	Anasazi, Late Pueblo I or Early Pueblo II camp site	Eligible, criterion d	Small site; minor surface erosion and one bladed drainage ditch, but otherwise in good condition
LA 116128	Anasazi, Basketmaker III or Early Pueblo I habitation, Pueblo II limited activity	Eligible, criterion d	Moderate-sized site; good condition
LA 116129	Anasazi, Pueblo II artifact scatter	Potentially eligible	Small site; surface is bladed; presence of subsurface materials is unknown
LA 116130	Anasazi, Pueblo II field house	Eligible, criterion d	Small site; some surface erosion; structures and features in moderate condition



the OAS ethnohistorian stated that a neighbor had removed some of the stones and lumber for personal use and that this would not have happened if a death had occurred in the house. The neighbor's use of materials from the house may explain its unfinished appearance.

The various sources of information cannot confirm the presence of burials within the two features of LA 70610. However, there is insufficient reason to assume that they do not include burials, and they should be treated as if burials are present.

### *Facility Plans and Recommendations*

No specific facility plans have been developed for the private land of Section 12, but the categorical uses have been identified as irrigation and drilling-mud disposal. Irrigation would entail construction of buried pipelines, water-spreading devices, and access and maintenance roads. Drilling-mud disposal would entail access roads and a broad area for spreading the mud. Irrigation is intended to spread water at rates that do not generate runoff or erosion, and the risk of ground disturbance is small outside the immediate area of the irrigation device. Roads, pipelines, sprinkler systems, and spreading areas will entail ground disturbance within delimited areas.

Cultural resources within the section consist of 72 IOs and 10 archaeological sites. Two possible historic Navajo burial locations are the only traditional cultural properties within the section, and they are within one of the archaeological sites. We believe that survey level description exhausts the majority of the information potential of all but possibly one of the IOs. The possible exception is IO 36, the building stone quarry. The quarry is an isolated feature, and no artifacts are associated with it, but it may provide a unique record of activity associated with the historic Navajo use of the section.

Nine of the ten archaeological sites are eligible for inclusion in the *National Register of Historic Places* on the basis of their potential to contribute information to our understanding of regional or local history or prehistory (Table 76). These eligible sites include the only traditional cultural properties that would be eligible for inclusion in the *National Register*. One site, LA 116129, is potentially eligible. The site surface has been bladed, apparently as a result of past drilling-mud disposal activity, but intact subsurface deposits may be present. IO 36, the historic building stone quarry, is potentially eligible for inclusion in the *National Register*, but more detailed recording would exhaust its information potential.

We recommend that all of the archaeological sites be avoided during the planning and construction of irrigation and drilling-mud disposal facilities. If avoidance is not possible, testing may be required to determine the eligibility of LA 116129, and data recovery plans would have to be prepared and executed for the other sites within the section. IO 34 is in a geomorphic location that is not suitable for any of the currently identified uses of Section 12. However, if proposed facility construction includes this location, we recommend that additional descriptions of this IO be completed. All testing and data recovery will require compliance with the provisions of NAGPRA and state laws and regulations concerning the treatment of cultural properties and human remains.

Although we have confidence in the site boundaries as defined by the OAS survey, there is the potential for undetected subsurface cultural resources outside of these boundaries. We recommend that any ground-disturbing activities with Section 12 be monitored by a qualified archaeologist in the vicinities of the archaeological sites. This monitoring zone is defined by proximity to known

archaeological sites (both within Section 12 and within adjacent sections) and by local geomorphic settings within which archaeological sites might be expected (Fig. 49). Considerable areas of Section 12 are free of eligible cultural resources (also indicated in Fig. 49), and we recommend that these areas be given first consideration during facility planning and design. We also recommend that the irrigation facility be monitored annually by a qualified archaeologist to determine whether unanticipated erosion poses any threat to eligible cultural resources outside of the developed irrigation facility.

In addition to monitoring, protective measures should be taken prior to the start of facility construction. Regardless of specific construction plans, protective fencing (hog wire topped with barbed wire) should be installed at the boundary of LA 70610. This historic Navajo site is in excellent condition. It includes two possible burial locations, and it would be susceptible to indirect impacts once the section was opened to regular access by construction and maintenance personnel. If construction or facility development approaches within 100 feet of any of the other archaeological sites, we recommend that protective fences be placed at or outside of site boundaries. Protective fencing should remain in place through the construction, operation, and restoration phases of mine operations within the section.

The construction and operation of irrigation and drilling-mud disposal facilities within Section 12 poses a risk of indirect impacts to cultural resources. In addition to the fencing of LA 70610, all construction and mining personnel will be given formal orientations concerning the protection of cultural resources within Section 12. These orientations will include a review of federal and state laws and regulations and HRI policy regarding the protection of cultural resources. HRI policy will include prohibition of collection, excavation, and defacement of cultural resources, as well as a prohibition of non-work-related access to adjacent lands. Employees, contractors, and visitors violating the policy of nondisturbance and noncollection will be disciplined.

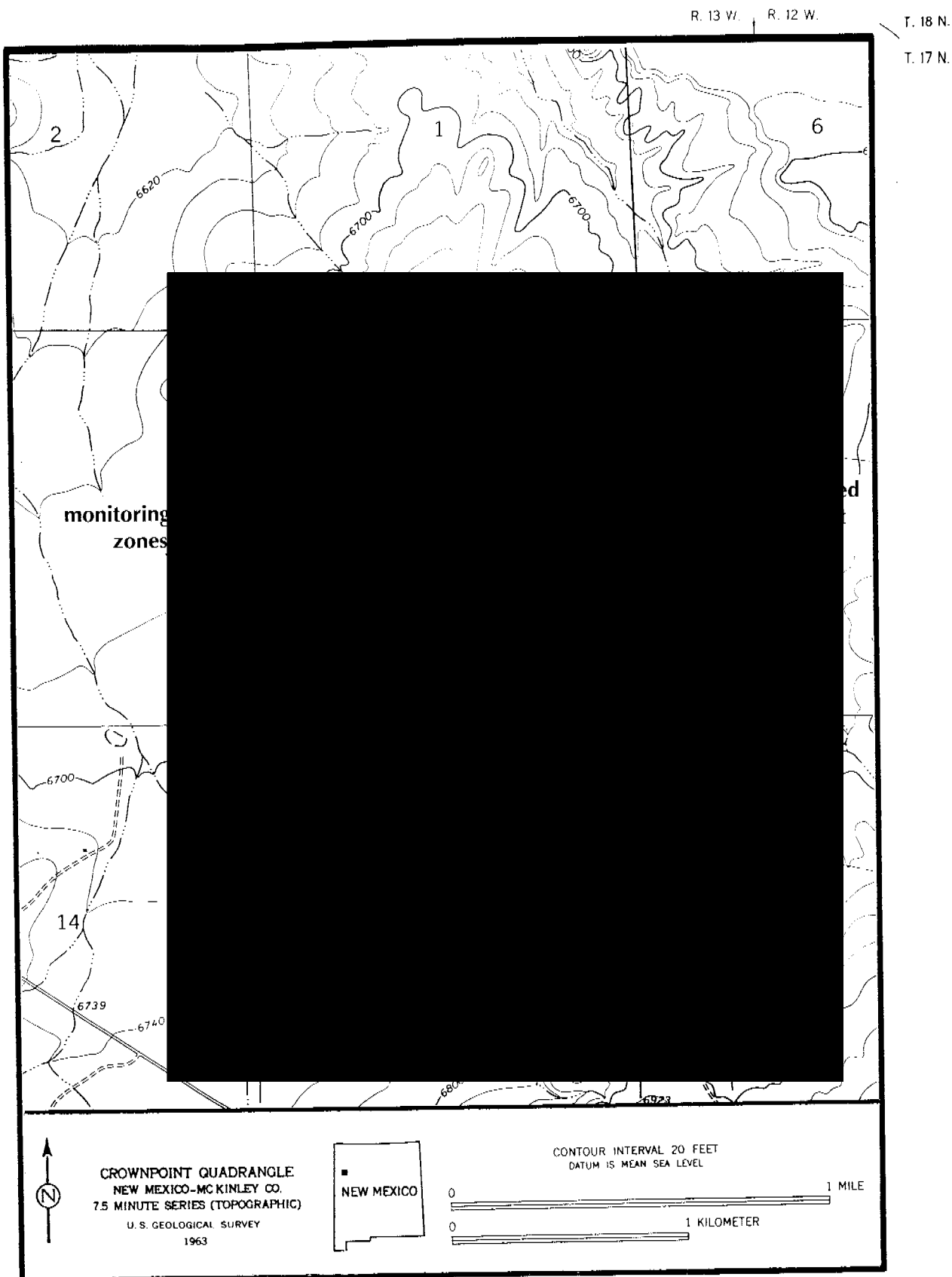


Figure 49. Potential development areas within Section 12.

## SUMMARY OF FINDINGS AND RECOMMENDATIONS

The Nuclear Regulatory Commission has called for cultural resources inventories of mining and support facilities that are included in HRI's first five-year development plan. These facilities include the Church Rock Site, the location of a proposed well field and satellite processing facility; and the Crownpoint Irrigation Site (Section 12), the location of water-spreading and drilling-mud disposal facilities. Inventory at the Church Rock Site included archaeological survey of approximately 173 acres of private land, 335 acres of BLM land, and 200 acres of Navajo Nation land. All of the Church Rock Site was included in the OAS survey, although some portions had been exempted due to recent prior survey. Inventory at the Crownpoint Irrigation Site included archaeological survey of approximately 640 acres of private land. Both development sites were the subject of ethnohistoric research to identify any traditional cultural properties within the proposed development areas.

### *The Church Rock Site*

The archaeological inventory at the Church Rock Site encountered 14 previously recorded and 18 newly recorded sites. One site that had been previously recorded within the Church Rock Site was found to be mislocated, lying outside of the project area to the east. Twelve sites are on private land, twenty sites are on BLM land, and no sites are on Navajo Nation land. A single Late Archaic component was identified, and two sites include petroglyphs of unknown prehistoric affiliation. Most sites (23 of 32) have Anasazi components, and most of these (18 of 22) have Middle or Late Pueblo II components. Only five early Anasazi components (Basketmaker III or Early Pueblo I) were detected, although the relocated site just outside of the Church Rock Site also dates to this period. Only one Early Pueblo II component was identified, but others may be masked by the later Pueblo II components at some of the more substantial Anasazi sites. Navajo components are present at 14 of the 32 sites, and four historic components are probably related to Navajo occupation of the area. Six of the Navajo components are Gobernador phase occupations, and the remainder range from the turn of the century through the 1990s.

No traditional cultural properties were identified within the Church Rock Site by chapter officials, traditional practitioners, or local residents. A modern Navajo burial plot is present on BLM land within the project area, but according to BLM policies, its management falls within the context of land-use regulations rather than traditional cultural properties.

### *Private Land Cultural Resources*

Well field and satellite processing facilities are planned for the private land portion of the Church Rock Site. The proposed construction zone overlaps with 11 of the 12 sites, all of which are eligible for inclusion in the *National Register of Historic Places* based on their potential contributions to knowledge of local and regional history and prehistory. We recommend avoidance of these cultural resources, with the installation of protective fencing whenever construction plans call for ground disturbance within 100 feet of site boundaries. If avoidance of cultural resources is not possible, data recovery plans will be developed and implemented, consistent with the requirements of NAGPRA and state laws and regulations that cover the treatment of cultural resources and human remains. Because of the possibility of undetected subsurface cultural resources in some portions of the construction zone (see Fig. 16), ground-disturbing activities within those portions will be monitored by a qualified archaeologist.

### *BLM Land Cultural Resources*

No specific construction plans have been proposed for the BLM portion of the Church Rock Site, and the cultural resources information is intended for use in planning future development. Of the 20 archaeological sites that were identified on BLM land, three are historic and not eligible for inclusion in *National Register of Historic Places*. Five sites are potentially eligible, and 12 sites are eligible for inclusion. The potentially eligible and eligible cultural resources should be avoided during the development of future mining facilities. The modern Navajo burial plot also should be avoided. Protective barriers should be installed if any proposed construction features are placed within 100 feet of eligible or potentially eligible cultural resources. If any of these resources cannot be avoided, potentially eligible sites will require limited testing and reevaluation, while data recovery plans will be prepared and executed for any of the eligible resources. All testing and data recovery will be carried out in compliance with NAGPRA and federal laws, regulations, and policies concerning the treatment of cultural resources and human remains. Because of the possibility of undetected subsurface cultural resources in some portions of BLM land (see Fig. 36), ground-disturbing activities within those portions should be monitored by a qualified archaeologist.

### *Navajo Nation Cultural Resources*

Well field construction is planned for Navajo Nation land within the Church Rock Site. No cultural resources that are eligible for the *National Register of Historic Places* are present within the proposed construction zone. There are eligible cultural resources adjacent to some portions of Navajo Nation land, and because of the possibility of undetected cultural resources in those areas, construction activities within those portions (see Fig. 37) should be monitored by a qualified archaeologist. If any cultural resources are discovered during monitoring, they will be treated in compliance with NAGPRA, federal laws and regulations, and Navajo Nation regulations and policies concerning the treatment of cultural resources and human remains.

### *Crownpoint Irrigation Site, Section 12*

The archaeological inventory of the private land of Section 12 encountered six previously recorded and four newly identified cultural resources. No resources date before the Anasazi period, and most sites (9 of 10) have Anasazi components. Of these, Basketmaker III or Early Pueblo I components are present at four sites, there is one Late Pueblo I component, and Pueblo II components are present at five sites. One site has an extensive historic Navajo component, with elements dating from the turn of the century through the 1950s. The surface of one site has been affected by mechanical disturbance, and its eligibility for inclusion in the *National Register of Historic Places* is uncertain since we do not know whether subsurface cultural deposits are present and intact. All of the other sites are eligible for inclusion based on their potential to contribute information to the understanding of local and regional history and prehistory.

No traditional cultural properties were identified within Section 12 by chapter officials, traditional practitioners, or local residents. Two historic Navajo burials may be present within the section, but accounts are somewhat contradictory. If the burials are present, they are within the boundaries of the large Navajo site, and their locations will be protected in that context.

No specific construction plans have been proposed for Section 12, but the intended use of this area is for the spreading of drilling mud and for irrigation with reclaimed water. Application rates

for irrigation water are intended to be below the volume that would cause a significant threat of erosion outside of the area of application. The cultural resources information is intended for use in planning project developments. We recommend avoidance of the cultural resources during development planning. Eligible resources are absent in large areas of the section (see Fig. 49), and these areas are recommended as preferred development locations. If avoidance is not possible, testing of the one potentially eligible site would be required, and data recovery plans and treatments will be required for all eligible sites, consistent with the requirements of NAGPRA and state laws and regulations that cover the treatment of cultural resources and human remains. Because of the possibility of undetected subsurface cultural resources in some portions of the section (see Fig. 49), ground-disturbing activities within those portions should be monitored by a qualified archaeologist. Protective fencing is recommended for the large Navajo site (LA 70610) to minimize the risk of inadvertent direct or indirect impacts. Protective fencing will be installed around the other eligible sites if facility construction is planned within 100 feet of their boundaries. In addition, annual monitoring is recommended to evaluate whether unanticipated erosion from the irrigation facility poses a risk to the integrity of any eligible cultural resources.

### *Indirect Impacts*

Construction and mining operations pose a risk of indirect impacts to cultural resources within and adjacent to both the Church Rock and Crownpoint Sites. All on-site construction and mining personnel will be given formal orientations concerning the protection of cultural resources. These orientations will include a review of federal, state, and Navajo tribal laws and regulations regarding the protection of cultural resources. HRI policy will include prohibition of collection, excavation, and defacement of cultural resources, as well as a prohibition of non-work-related access to adjacent lands within the development sites. Employees, contractors, and visitors violating the policy of nondisturbance and noncollection will be disciplined.

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## APPENDIX 1: CERAMIC PROCEDURES AND INTERPRETATIONS

by C. Dean Wilson

This report describes procedures and results of ceramic analyses during the archaeological inventory of proposed Hydro Resources, Inc. (HRI), mining facilities. More than 2,700 sherds from 21 sites were analyzed during surveys of the Church Rock Site near Church Rock, New Mexico, and more than 700 sherds from nine sites were analyzed during surveys of the Crownpoint Irrigation Site, Section 12, near Crownpoint, New Mexico.

The primary goal of ceramic field analysis was to determine the period of occupation for each site or component. Field analysis of ceramics consisted of coding typological categories and vessel form for all sherds examined. Sherds were not collected during analysis but were left where they were found. Small (less than 1 by 1 cm) corners were broken from a small sample of sherds and placed into bags with a slip recording type and vessel form. These samples were later analyzed in the lab, during which temper type and refired color were recorded.

Previously defined ceramic categories were employed when possible so that data recorded during the HRI surveys would be comparable to those described during studies conducted in surrounding areas (Brugge 1981; Franklin 1983; Goetze and Mills 1993; Lang 1983; Marshall 1991; Post 1993; Toll and McKenna 1987; Windes 1977, 1984; Wilson 1995). Sherds were placed into several distinct traditions and ware groups including Cibola Gray Ware, Cibola White Ware, White Mountain Redware, Historic Pueblo, and Navajo Utility. Sherds placed into these traditions were next assigned to specific types based on surface treatments or design styles known to be temporally significant.

### *Cibola Tradition*

Both the Church Rock and Crownpoint areas are within the very large region where Cibola tradition ceramic types dominate Anasazi sites dating to all periods. Sherds were assigned to Cibola tradition types based on the presence of sand and sherd temper, light pastes, mineral paint, and in some cases by stylistic traits. Cibola Gray Ware and Cibola White Ware types dominate assemblages occurring over a very wide geographic area including most of the southern Anasazi region.

Unfortunately, the nature of in-field ceramic analysis prevented the characterization of paste and temper in a manner allowing consistent determination of ceramic tradition. Examination of 200 samples of Anasazi gray and white ware sherds from Basketmaker III and Pueblo II sites indicated that all contained sand, sherd, or sherd and sand temper. In the white ware sherds, these tempers were found within the low-iron pastes that are indicative of the Cibola tradition. Based on these observations sherds were assigned to Cibola tradition types during the field analysis despite the lack of microscopic paste observations. Nonlocal white ware or gray ware sherds that may have been recognized by paste or temper characteristics could not be recognized during the field analysis, but such sherds are usually only a small proportion of assemblages in these areas. Surface treatments and design styles observed during field analysis were also consistent with Cibola White Ware and Cibola Gray Ware types.

### *Cibola Gray Wares*

Gray ware types were usually identified by the presence of white to gray pastes and the absence of polished or painted decorations. The great majority of gray ware sherds from all Anasazi sites recorded during the present study were light gray to white, and samples tended to fire to white or buff colors in oxidation conditions indicating the use of clays low in iron content. Gray ware sherds from sites dating to all Anasazi periods were tempered with sand.

The great majority of utility wares from sites examined during the HRI survey are similar to those noted elsewhere at sites throughout the Cibola region.

*Lino Gray* occurs primarily on Basketmaker III and Pueblo I sites and refers to unpolished gray ware rim sherds which have been completely smoothed on both surfaces. This category is equivalent to Plain Rim Gray as defined in other studies. It was only assigned to rim sherds, because body sherds from vessels of this type could also have been derived from the bodies of neckbanded or neck-corrugated vessels.

*Plain Gray* includes all unpolished gray body sherds. This type occurs at sites dating to all Anasazi periods, but it is the dominant type at sites dating to the Basketmaker III and Pueblo I periods. Body sherds were not classified as Lino Gray because these could have originated from the lower portions of neckbanded, neck-coiled, or neck-corrugated forms.

*Neckbanded Gray* is equivalent to Kana'a Gray as used in other studies, and it refers to sherds exhibiting wide unobliterated coils near the neck or rim. Coils are relatively wide, and there is very little overlap between coils. This type is mainly associated with Pueblo I components.

*Clapboarded Gray* is equivalent to Coconino Gray as used in other studies, and it refers to sherds exhibiting narrow unobliterated coils near the neck or rim. Coils are moderately wide, often narrower than Neckbanded Gray, and usually wider than unindented corrugations. There is a distinct overlap between coils. This type is associated with Late Pueblo I or Early Pueblo II components.

*Corrugated Gray* refers to gray ware sherds exhibiting very thin overlapping coils, usually covering the entire vessel surface. The coils are usually evenly spaced, narrow, and indented. The majority of gray wares from sites dating to the Pueblo II and Pueblo III period exhibit corrugated treatments.

*Pueblo II Corrugated Rim* refers to corrugated rim sherds exhibiting rim eversion of less than 30 degrees.

*Pueblo II-III Corrugated Rim* refers to corrugated rim sherds exhibiting rim eversion from 30 to 55 degrees.

*Pueblo III Corrugated Rim* refers to corrugated rim sherds exhibiting rim eversion greater than 55 degrees.

### *Cibola White Wares*

Most decorated Cibola white ware types exhibit a thick brown to black mineral paint. Cibola white wares have white to gray pastes, and they are often but not always slipped. Prior to A.D.

1000, most Cibola white wares were tempered with sand, but most were tempered with sherd during later periods. The great majority of Cibola White wares from HRI sites have light gray to white pastes and surfaces. The pastes fire to buff colors when exposed to oxidation firing atmospheres, indicating the use of low iron clays.

*Unpainted white ware* refers to unpainted sherds with at least one polished surface. Such sherds could have been derived from the unpainted portions of most Cibola White Ware vessels.

*La Plata Black-on-white* is the earliest Cibola white type and is usually found on Basketmaker III sites. La Plata Black-on-white is usually unpolished or slightly polished and decorated with mineral paint. It is usually tempered with quartz sand. Designs are usually arranged in isolated groups of two or three elements or elements are pendant from the rim. Design motifs include thin lines, solid or open triangles, ticks, and flags, and dots or basket stitch motifs (Z's and I's) can fill spaces.

*White Mound Black-on-white* refers to white wares produced in the Cibola area during the Pueblo I period (Gladwin 1945). Surfaces are usually unslipped, unpolished, and tempered with sand. Designs are executed with mineral pigments. Design elements include thin to medium parallel lines or chevrons that may be embellished with ticked lines or triangles.

Later ceramic types dating to the Pueblo II period are usually distinguished from earlier types by the presence of polished and slipped surfaces and sherd temper. Painted sherds exhibiting late characteristics, but not displaying designs or treatments indicative of a specific type, are placed into categories based on associated pigment. Categories used during the present study include *mineral painted white ware (late)* and *organic painted white ware (late)*.

*Red Mesa Black-on-white* refers to ceramics exhibiting styles found throughout the Colorado Plateau during the early Pueblo II period. Temper may be sand, sherd, or sherd and sand. Designs consist of multiple parallel lines (sometimes embellished with triangles or ticked lines), ribbons with squiggle hatchure, and scrolls. Painted designs are often well executed, and numbers of elements often occur together in fairly complex patterns.

*Escavada-Puerco Black-on-white* describes sherds exhibiting a range of painted styles that are classified as Puerco Black-on-white or Escavada Black-on-white in other studies. Distinctions between Puerco Black-on-white and Escavada Black-on-white are somewhat confusing and vague. As used here, these categories include a range of solid design styles employed during the later part of the Pueblo II and early Pueblo III periods. Design styles often include triangles, parallel lines and chevrons.

*Gallup Black-on-white* refers to sherds exhibiting Pueblo II surface manipulation and hatchured designs. Lines in earlier forms of Gallup Black-on-white tend to be wider spaced than those associated with later forms of this type.

In a few cases, sherds with Pueblo II technological characteristics and thin lines were too small to confidently assign them Escavada-Puerco Black-on-white or Gallup Black-on-white. These sherds were classified as *Pueblo II Black-on-white*.

*Reserve Black-on-white* refers to sherds and vessels with designs of opposed solid and hatched elements, generally organized into all-over designs. Hatched elements are usually wider than solid elements. Elements include scrolls, broad lines, triangles, and sawteeth.

*Chaco-McElmo Black-on-white* refers to organic-painted sherds exhibiting early Pueblo III styles and surface treatments. Decorations are generally applied with an organic pigment. Painted decorations are almost always organized in a single band. A commonly occurring design within this type consists of a series of broad rectilinear lines in bands parallel to the rim. Other designs include ribbons filled with straight hatchure, dots, triangles, stepped triangles, dots, diamonds, and ticked lines. Framing lines may be present but usually are relatively thin.

#### *White Mountain Redwares*

White Mountain Redwares represent the dominant trade ware occurring at Pueblo II sites recorded during the HRI survey. White Mountain Redware types reflect a specialized technology that developed in a fairly restricted area of the southern Anasazi (Carlson 1970). White Mountain Redwares were produced within a fairly limited area in west-central New Mexico and east-central Arizona, but they were widely traded throughout much of the Southwest. They are characterized by a white, gray, or orange sherd tempered paste, covered by a distinctive thick dark red slip. Surfaces are well polished, and painted decorations are usually executed in a black organic (early) or mineral (late) paint, although polychrome effects are sometime achieved through the additional use of a white clay paint. White Mountain Redware types identified during the present study include the following:

*White Mountain Redware, unpainted*, refers to unpainted White Mountain Redware sherds.

*White Mountain Redware, painted*, refers to painted White Mountain Redware sherds that do not display temporally distinctive painted decorations.

*Puerco Black-on-red* exhibits dark red to bright red slips. Designs consist almost exclusively of solid triangles, broad lines, checkerboards, and parallel lines.

*Wingate Black-on-red* exhibits dark red to bright red slips. Designs consist primarily of hatched elements, sometimes with opposed solid elements.

#### *Other Prehistoric Traditions*

The only sherds identified during the survey that obviously originated outside of the Cibola region were three examples of *Reserve Smudged*. These sherds exhibited a brown paste and fine temper apparently reflecting the use of self-tempered volcanic clays of the Mogollon region. The bowl sherd interiors were highly polished and smudged black.

#### *Navajo Period Ceramic Types*

A small number of sherds exhibited characteristics of protohistoric and historic Southwestern pottery traditions. All of the Navajo ceramics are the striated variety of Dinétah Gray, although a few could represent the later Navajo Gray type. Historic Puebloan sherds all appear to be Western Pueblo (Zuni-Acoma) in origin, including polychromes, a red slipped ware, and utility wares were identified.

*Dinétah Gray (Striated Utility)* is the dominant type of the early Navajo components. Surfaces



are unpolished, and decorations are extremely rare. Most interior and exterior vessel surfaces are very rough, bumpy, and pitted. Distinct striations or scoring often occurs on exterior surfaces. Dinétah Gray vessels are often thinner-walled than Anasazi pottery. Paste texture is often silty. Sherds are usually soft, and often crumble easily. Surface color is usually dark gray or black but is occasionally brown or red. The paste cross section is usually dark gray to black, and sometimes dark brown, red, or gray. These characteristics indicate Dinétah Gray vessels were fired in highly reducing atmospheres at relatively low temperatures. Sand is usually dominant temper in Dinétah Gray.

A small number of Puebloan types were associated with the historic Navajo occupations. These included thick sherds decorated in red and black matte paint that were assigned to a *Zuni-Acoma Polychrome* category. Red-slipped historic Puebloan sherds not exhibiting decorations were assigned to an *indeterminate red* category. Other sherds from historic sites exhibited buff or tan surfaces similar to historic Puebloan types. These were assigned to a *Polished Tan* category.

### *Ceramic Dating*

The main objective of ceramic field analysis was to determine the period of occupation represented by a given site or component. These ceramic date estimates provide information concerning settlement patterns for the surveyed localities. Data from ceramic studies in a number of areas of the San Juan Basin and Upper San Juan region form the basis for a ceramic dating scheme applicable for both the Church Rock and Crownpoint areas (Goetze and Mills 1993; Marshall 1991; Toll and McKenna 1987; Windes 1977, 1984). These studies indicate a similar sequence of ceramic change over a broad area of the Anasazi. Type assemblages form the basis for the recognition of various ceramic dating periods.

The basic sequence of ceramic change noted for both the San Juan Basin and Upper Puerco River is presented in terms of the Pecos Classification. This sequence is modified from previous studies (Goetz and Mills 1993; Windes 1977) and presented in Table A1.1. The presence of a combination of types indicative of a particular dating period is used to assign the collection to that period. The occurrence of a suite of types not associated with a single dating period results in the assignment of the collection to more than one period.

The pottery assemblages recorded during the HRI survey indicate a long sequence of occupation by Anasazi groups as well as reoccupations by Navajo groups in both the Church Rock and Crownpoint survey areas. Trends across the sites are strong enough that both periods of occupation and hiatuses in occupation are well defined.

Three major and one minor occupation periods are represented in the ceramic assemblages. The Basketmaker III or Early Pueblo I components were recognized based on the dominance of Plain Gray body sherds, Lino Gray, and the occasional presence of Neckbanded (Kana'a Gray), La Plata Black-on-white, and White Mound Black-on-white. In contrast, the Pueblo II components were dominated by Corrugated Gray and Plain Gray sherds in similar amounts, as well as later polished and slipped white wares, including Red Mesa Black-on-white, Escavada-Puerco Black-on-white, and Gallup Black-on-white. Mixed Anasazi components were identified by the presence of early sherds such as La Plata Black-on-white on sites otherwise dominated by corrugated utility and late white ware sherds or by the presence of a few corrugated or late types on sites otherwise dominated by Plain Gray and early white wares. A minor Early Pueblo II occupation of the survey areas is reflected in an assemblage of Plain Gray, neck decorated utility wares, and Red Mesa

Black-on-white. Navajo sites were identified by the presence of Dinétah Gray (Striated Utility), Pueblo Matte polychromes, and historic Pueblo utility wares. The calendar dating of this assemblages is weak. The sites lack historic artifacts and yet their Puebloan pottery types would suggest a nineteenth-century age. These occupations may be either shortly before or after the A.D. 1860 boundary, and they appear to reflect a Gobernador phase style of land use.

### *Church Rock Site Occupations*

Archaeological resources within the Church Rock Site are associated with 28 distinct ceramic bearing components (Table A1.2). No site assemblages included evidence of the earliest pottery in the region (Basketmaker II), but five sites have ceramic components dating to the late sixth, seventh, or early eighth centuries (Basketmaker III through Early Pueblo I). Although these two periods can be distinguished by pottery, the sample sizes required are too large to expect for most site survey collections. Two of these are single components, whereas three sites also contain Pueblo II types. Most of the Basketmaker III–Early Pueblo I components are small, consisting of artifact scatters or isolated rooms and possible pithouses. It is possible that the sites without visible surface features may include pithouses not noticeable on the surface. These components are found in locations similar to those of Pueblo II sites, but early sites tend to be smaller and more widely scattered. While neckbanded sherds indicate that these sites may have been occupied as late as the first half of the ninth century, there is no evidence of a late Pueblo I occupation. This indicates an occupational hiatus in Church Rock Site area during most of the ninth and early tenth century prior to the major Pueblo II occupation.

Most Church Rock area sites have evidence of occupation during the Pueblo II period. All but two of the Pueblo II components have a suite of types indicating an occupation in the later half of this period, or sometime during the eleventh or twelfth centuries. The exceptions are areas sampled at LA 26159 and LA 88878. One collection area at LA 26159 was dominated by Red Mesa Black-on-white, and the cooking jar sherds at LA 88878 included narrow Clapboarded Gray. Other portions of both site assemblages indicate a Late Pueblo II occupation as well.

The sites with Late Pueblo II ceramic components form a large community at the edge of the Puerco River floodplain and the base of the canyon wall. These sites include substantial roomblocks at LA 26158, LA 26159, LA 26160, LA 26163, LA 26164, and LA 116114. Most of the other sites are much smaller artifact scatters or small structures located close to the large pueblos. Two Pueblo II sites were identified on benches in the canyon wall, and two were on the large flat bench about 400 feet above the floodplain edge. These sites are contemporary within the precision of ceramic dating, and they represent closely interacting groups similar to the Pueblo II community documented a few miles upstream along the Puerco River Valley (Marshall 1994).

In addition these Anasazi components, a small number of Navajo and Puebloan sherds were recovered from three early Navajo structures. Ceramics are primarily striated examples of Dinétah Gray, were rare at all of the Navajo sites, and they were absent at one. All but one of the Navajo sites were located on small benches or slopes within the large unnamed tributary canyon to the Puerco River. Three of these sites are on the east-facing slopes of the canyon, and one is on a west-facing slope. Euroamerican artifacts were absent at all of these sites, and flaked lithic artifacts were present at one. Mike Marshall (1993) identified the historic Puebloan sherds at two sites as either Ashiwi Polychrome or Kiapkwa Polychrome. In the absence of historic artifacts, these pottery types probably represent Navajo occupations sometime between the early eighteenth century and the close of the nineteenth century.

### *Crownpoint Irrigation Site Occupations*

More than 700 sherds were analyzed from 9 of the 10 sites within Section 12 near Crownpoint, New Mexico. Five of the sites recorded from section 12 exhibited ceramics indicating Basketmaker III or Early Pueblo I components (Table A1.3). The possibility that some sites could date as late as the Early Pueblo I period is indicated by the presence of Kana'a Neckbanded, San Juan Red Wares, and White Mound Black-on-white. A range of sites types are represented, including one site (LA 116128) with a series of upright-slab rooms, a possible pithouse, and a variety of extramural features. Another site (LA 116123) may be a small habitation, and the other three sites represent scatters of Basketmaker III or Early Pueblo I ceramics. Given the size and favorable location of LA 116128, this site probably represents the focus of occupation in this area. If the smaller sites identified during this survey are contemporaneous, they may represent limited activity loci associated with this site.

The absence of sites dating to the Late Pueblo I or Early Pueblo II periods indicates a hiatus in the occupation of Section 12. Five sites from Section 12 exhibited ceramic types indicating an occupation during the Late Pueblo II period. These include one site with a small amount of architectural rubble and light midden development, and two sites consisting of small surface features and artifact concentrations. The other two sites are artifact scatters. These five sites are all small for Pueblo II sites, and they appear to have served as fieldhouses or field stations for settlements that were outside of the section. Section 12 is just outside of the Muddy Waters Greathouse Community (Marshall et al. 1979), and the Section 12 sites probably represent seasonal activities associated with the occupants of this greathouse community.

The other site identified during this study (LA 70610) is a large historic Navajo habitation occupied from just before the turn-of-the-century through the 1950s. While historic artifacts are abundant, native ceramics were limited to 15 Navajo Gray utility ware sherds from a single vessel.

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Table A1.1. Ceramic Dating Periods Used in the HRI Survey

Dating period	Span	Ceramic types
Late Basketmaker II	A.D. 300-550	Adamana Brown, Obelisk Gray
Basketmaker III	A.D. 550-750	Lino Gray, Gray Body, La Plata B/w, White Mound B/w
Early Pueblo I	A.D. 750-825	Lino Gray, Gray Body, Neckbanded Gray, La Plata B/w, White Mound B/w, Early San Juan Red Wares
Late Pueblo I	A.D. 825-925	Gray Body, Neckbanded Gray, Clapboarded Gray, Neckcoiled Gray, White Mound B/w, Kiatuthlanna B/w, Red Mesa B/w
Early Pueblo II	A.D. 925-1000	Gray Body, Neckcoiled Gray, Neck Corrugated Gray, Corrugated Body, Pueblo II Corrugated Rim, Red Mesa B/w, low frequencies of Escavada-Puerco B/w and Gallup B/w, Deadmans B/r
Late Pueblo II	A.D. 1000-1125	Gray Body, Corrugated Body, Pueblo II Corrugated Rim, Pueblo II-III Corrugated Rim, Gallup B/w, Chaco B/w, Escavada-Puerco B/w, low frequencies of Red Mesa B/w, Wingate B/r, and Puerco B/r
Early Pueblo III	A.D. 1125-1225	Corrugated Body, Pueblo II-III Corrugated Rim, Pueblo III Corrugated Rim, Escavada-Puerco B/w, Chaco-McElmo B/w, McElmo B/w, Reserve B/w, Wingate B/r, Puerco B/r, St. Johns B/r
Late Pueblo III	A.D. 1125-1300	Corrugated Body, Pueblo III Corrugated, Chaco-McElmo B/w, McElmo B/w, Mesa Verde B/w, Tularosa B/w, St. Johns B/r, St. Johns Polychrome
Early Navajo	A.D. 1690-1860	Usually no Euro-American historic artifacts, Dinétah Gray, Jemez B/W
Historic Navajo	1860-present	Euro-American historic artifacts, Navajo Gray, Dinétah Gray, Historic Pueblo matte painted wares, buff utility wares

Table A1.2. Ceramic Dating of Components from the Church Rock Site

Component	Site	Association
Basketmaker III	LA 26159	Artifact scatter
	LA 116111	Scattered features and artifacts
	LA 116114	Artifact scatter in highly disturbed area
	LA 116121	Artifact scatter
	LA 117314	Artifact scatter
Early Pueblo II	LA 88878	Artifact scatter
	LA 26159	Early component associated with certain roomblocks and midden areas
Late Pueblo II	LA 26158	Roomblock with kiva and associated middens
	LA 26159	Roomblocks with kivas and associated middens
	LA 26160	Roomblocks with kiva and associated middens
	LA 26163	Roomblocks with kiva and associated middens
	LA 26164	Highly disturbed and buried roomblocks with associated middens
	LA 88872	Room on shelter and artifact scatter
	LA 88873	Hearth and artifact scatter
	LA 88874	Room and midden
	LA 88878	Artifact scatter
	LA 116112	Possible feature and artifact scatter
	LA 116114	Highly disturbed area, probably roomblocks and middens
	LA 116116	Artifact scatter
	LA 116117	Artifact scatter
	LA 116119	Artifact scatter
	LA 116120	Feature and artifact scatter
	LA 117314	Feature and artifact scatter
Early Navajo	LA 88871	Small structure and midden
	LA 88875	Hogan and midden
	LA 88876	Small structure and artifact scatter
	LA 88877	Small structure

Table A1.3. Ceramic Dating of Components from the Crownpoint Irrigation Site,  
Section 12

Component	Site	Association
Basketmaker III-Early Pueblo I	LA 116123	Features and associated middens
	LA 116124	Artifact scatter
	LA 116126	Artifact scatter
	LA 116127	Artifact scatter
	LA 116128	Early roomblock and probable pit house depression.
Late Pueblo II	LA 116122	Field house and artifact concentration
	LA 116125	Features and artifact scatter
	LA 116128	Late component consisting of artifact scatter
	LA 116129	Artifact scatter
	LA 116130	Feature and associated artifacts
Historic Navajo	LA 70610	Large historic Navajo site consisting of hogans, corrals, and ovens



## APPENDIX 2: WOOD SAMPLING PLAN FOR NAVAJO SITES

Eric Blinman

The Bureau of Land Management (BLM), Farmington District, requires the collection of tree-ring samples as part of survey documentation of Dinétah and Gobernador phase Navajo sites. Many of these sites include hogan and sweat lodge remains, and the information content of the surviving wood is subject to continual deterioration through weathering. Tree-ring sample collection requires specialized equipment and benefits from experience, and collection was not attempted by OAS survey personnel. Instead, a specialized sample collection program will be undertaken in the spring of 1997 under the direction of Tom Windes. This sample collection program will treat wood on Navajo sites on both BLM and private land at the Church Rock Site (Section 8, T16N, R16W).

Eight of the Navajo sites recorded within Section 8 have or may have wood that is suitable for sampling. Six of these are on BLM land and 2 are on private land owned by Hydro Resources, Inc. (HRI).

LA 26162 is on BLM land and consists of a single sweat lodge. A second sweat lodge was removed by road construction between the time of original site recording (Ford and DeHoff 1977) and revisitation (Marshall 1993). The sweat lodge is partially collapsed and disarticulated within its stone-lined pit. An estimated 20 axe-cut timbers are present, primarily juniper, but also some piñon. The condition of the timbers is poor, and not all may be suitable for sampling.

LA 88871 is on private land and consists of masonry room footings and an artifact scatter. The appearance, setting, and associated ceramics of the site suggest that it may be relatively early in the Navajo occupation of the area. No timbers are associated with the site, and no axe-cut trees were noted in the vicinity during the original survey. However, no intensive search of the area was conducted. There are no other Navajo or historic sites in the immediate vicinity of the site, and if axe-cut trees can be located, they may help narrow the range of the site chronology. An intensive survey will be conducted, and trees will be sampled if any are located.

LA 88875 is on private land and consists of the collapsed and partially disarticulated remains of a cribbed log hogan and its associated midden. The timbers are primarily juniper but include some piñon elements. Ends are axe-cut, and the stump of an axe-cut tree lies within the site boundaries. Some of the wood is in poor condition, so that only some of the estimated 30 elements will be sampled.

LA 88877 is on BLM land and consists of a small stone crib with several small timbers. A scatter of branches is adjacent to the crib and was interpreted by Marshall (1993) as the remains of a hogan. There is a substantial rotted trunk element within the branch scatter, and these pieces of wood may be disarticulated deadfall rather than Navajo architectural remnants. The crib is associated with three or four axe-cut limbs, but no axe-cut ends were detected within the adjacent branch scatter.

LA 116113 is on BLM land and consists of historic trail segments. Included in these segments are several features that incorporate wood. One of these features is a gate constructed of branches at the trail head. The branches appear to be scavenged deadfall, and we do not recommend tree-ring sampling of this feature. A probable trailside shrine consists of pile of branches and stones,

and the branches could be sampled. We recommend that the wood in this feature be evaluated for sampling, depending on wood condition and whether or not the branches appear to be scavenged deadfall or cut wood.

LA 116115 is on BLM land and consists of a small combined masonry and log structure. Fewer than 10 timbers are present, and some have been supported off of the ground surface and appear to be in good condition.

LA 116118 is on BLM land and consists of a sweat lodge and associated hearth and discard features. Other features on the site may be related to either Anasazi or Navajo use of the site. The sweat lodge elements are substantially intact, although sediment has filled in most of the pit and has covered the butt ends of most of the branch elements. The lodge incorporates an estimated 30 branches; most are juniper and some are piñon.

LA 117314 is on BLM land and is a multiple component site with late Archaic, Anasazi, and Navajo components. A small masonry alignment appears to be a Navajo room, and it incorporates an axe-cut tree stump. A number of axe-cut trees are in the immediate vicinity. This site does not provide an opportunity to date any structures, but it does appear to have been a procurement area for branches that would have been used in construction elsewhere. Sampling will focus on these axe-cut trees.

One Navajo site (LA 70610) within the private land of the Crownpoint Irrigation Site, Section 12, includes a single sweat lodge with surviving wooden elements (Feature 3). Although this site could be sampled for tree-ring dating, we recommend against sampling the structure. The sweat lodge is substantially intact with some colluvial filling of the underlying pit. The ages of the associated residential components span the very late nineteenth century through the 1950s, and no earlier components are present at the site. Although dating of this structure would place it accurately within this span, there is no guarantee that the juniper elements will provide a date, and the feature would have to be substantially dismantled to collect the samples. This site is in excellent condition as a whole, and it provides archetypal examples of a wide range of early twentieth-century Navajo structure and feature types. Given the relatively limited information gain from tree-ring dates from this feature, the loss of the structural integrity of this feature is inappropriate.

Tree-ring dating has met with mixed success in the greater Gallup, New Mexico, area. Juniper growth tends to be heavily influenced by local and edaphic moisture conditions, and many juniper samples do not carry a strong regional climatic signature and cannot be dated. Greater success has occurred with piñon and ponderosa pine samples. Juniper dominates the archaeological wood and also is the most common tree on the landscape today. Piñon is also present in the Navajo structural remains and is present on the modern landscape in moderate quantities. Although no ponderosa pine elements were identified on survey, a few ponderosa pine stumps were noted within the lower elevations of Section 8, and standing ponderosa pine trees are within the section at the upper end of the major unnamed tributary canyon that heads north of the majority of the Navajo sites. Possible strategies to enhance the probability of dating the samples were discussed with Laboratory of Tree-Ring Research personnel and with Tom Windes. In order to maximize the possibility of dating the structural elements, especially the juniper, samples will be collected from living and axe-cut trees in the vicinity of the sites as well as from the structural elements on the sites. Given the relatively narrow time depth expected (A.D. 1700-1920), this will improve the chances of cross-dating based on local climatic factors, although it will not overcome variability due to edaphic factors.

The sampling process will be documented to specifications laid out in the BLM Farmington District Guidelines on Collecting Tree-Ring Samples. All trees and architectural elements will be photographed and mapped in detail using an electronic transit prior to sampling. Each element, whether sampled or not, will be described in terms of its size, architectural role, cultural modifications, and condition. Particular attention will be paid to observations that will help interpret dating results. To the extent possible, sampled timbers will be replaced in their original positions, preserving the visual features of the sites. Samples will be submitted to the Laboratory of Tree-Ring Research for analysis and dating. A complete report of the sampling effort will be prepared as an addendum to this inventory report.

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