Chapter 18

SITE NM-Q-23-58 (LA 110322)

Harding Polk II and Ardale R. Delena

Site NM-Q-23-58 is a small multicomponent habitation site with occupations during the Late Archaic, Pueblo II, and historic Navajo periods. The site is situated on a low rise within an area of low dunes and sandstone outcrops at an elevation of 2112 m (6930 ft). The site is located near the northern tip of a steeply rising narrow ridge of sandstone which eventually rises an elevation of 2321 m (7615 ft), 1.9 km (1.2 mi) to the south. The primary drainage for the site is an arroyo cut deeply into the sandstone bedrock 300 m (984 ft) to the west. The overstory at the site consists of a pinyon (*Pinus edulus*) and juniper (*Juniperus scopulorum*) woodland with Gambel oak (*Quercus gambelii*) in the northwest portion. The understory consists of various sparse grasses, Mormon tea (*Ephedra trifurca*), sagebrush (*Artemisia* spp.), wolfberry (*Symphoricarpos oreophilus*), broadleaf yucca (*Yucca* spp.), fourwing saltbush (*Atriplex canescens*), and prickly pear cactus (*Opuntia* spp.).

SURVEY DATA

The site was originally recorded by American Indian Cultural Consultants (AICC 1982) as N11-14. The site was then rerecorded by Zuni Cultural Resource Enterprise (ZCRE) in 1995 as part of the N11(2) road survey (Zimmerman and Abbott 1996). ZCRE recording activities included Brunton compass mapping, in-field artifact analyses, and photography. The in-field analyses included assessment of lithic artifact reduction and material identification, ceramic sherd identification, historic artifact identification, artifact counts, and gross surface distribution mapping of artifacts. ZCRE recorded the site as a moderately dense lithic and ceramic artifact scatter with one possible thermal feature manifested by a charcoal stain. Ceramics identified at the site included plain graywares (possibly Lino Gray), unidentified black-on-white wares, and plain whitewares. Lithic artifacts included chert and quartzite debitage and one gray chert side-notched projectile point. The possible thermal feature was manifested by a 1-m-diameter ash and charcoal stain. No evidence of architecture was apparent. Based on the ceramics the site was determined to represent a Pueblo I period occupation (AD 750 to 850). Limited erosion in the form of channel cutting was noted.

NATURE AND EXTENT TESTING

From 24 April to 8 May and 13 May 1997 personnel from ZCRE conducted Phase I Data Recovery testing to determine the nature, extent, and content of site NM-Q-23-58. Within the right-of-way test excavations, complete surface collection of all artifacts, and a redefinition of site boundaries were conducted. An initial cursory survey of the site revealed a broad, low-density artifact scatter and a charcoal stain feature. Subsurface investigations included hand excavation of four test units totaling 4 sq m and four backhoe trenches totaling 60 m (Figure 18.1).

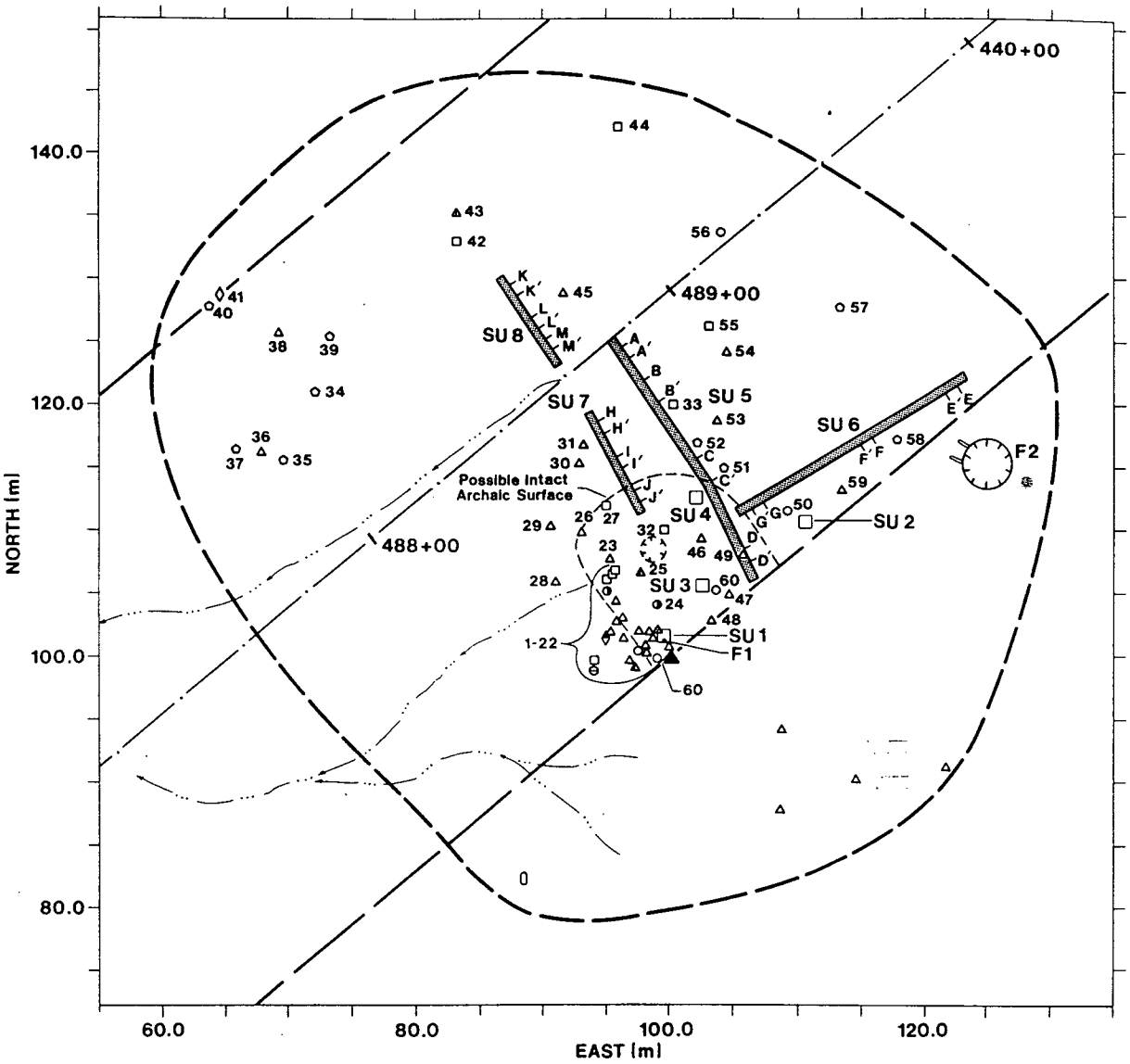


Figure 18.1. Site NM-Q-23-58, Nature and Extent Testing.

Surface Collection

Artifacts were collected from an area along approximately 40 m of the N11(2) right-of-way. A visual search of the site was conducted and each artifact pin-flagged. Since the artifact density was relatively low, all artifacts were point-plotted. The location of each artifact was shot in by transit, then the artifact was collected and recorded on a Field Specimen (FS) catalog sheet. Therefore each surface artifact in the right-of-way was assigned a single FS number.

A total of 62 artifacts were collected from 62 point locations at site NM-Q-22-58. Flaked stone comprised the bulk of the surface artifacts with lesser quantities of ceramics, bone, and historic glass and ceramics. Among the flaked stone were a number of tools, including two projectile points, a core, and a hammerstone. A full-grooved maul located outside the right-of-way, downslope and southwest of the datum, was the only ground stone artifact noted on the surface. A cluster of artifacts was noted within a 10-m-radius, 180° arc to the northwest of datum. This also corresponded with a low dropoff perpendicular to the centerline demarcating a area of more severe erosion. A less dense artifact scatter extended northward for approximately 40 m. A small low-density cluster of mostly historic artifacts was noted approximately 35 m northwest of datum.

Hand Excavation

Hand excavation of four test units (SU 1 to 4) encompassing 4 sq m was conducted in order to determine the extent, depth, and density of cultural deposits within the N11(2) right-of-way at site NM-Q-23-58. The location of the surface artifacts, both within and adjacent to the right-of-way, guided the placement of test units. All test units were excavated in arbitrary 10-cm levels and all soils were screened through 1/4-in hardware mesh. Soil descriptions were made using Munsell soil charts to identify soil color.

Study Unit 1

SU 1 was a 1-by-1-m unit located at grid coordinates N101, E99, just inside the eastern right-of-way boundary. This unit was placed in the densest portion of the surface artifact scatter. The placement of this unit within the artifact scatter was expected to have a high potential for yielding subsurface cultural deposits and features, and possibly subsurface architecture.

SU 1 was excavated 50 cm in five levels, and four soil strata were revealed (Figures 18.2 through Figure 18.4). Stratum I consisted of 5 cm of brown (10YR5/3), fine sand. No artifacts or other cultural materials were recovered from Stratum I. Stratum II consisted of up to 42 cm of brown (10YR4/3), sandy loam with light ash, charcoal, and some burned sandstone cobbles as well as some roots. Numerous rodent burrows were seen in the stratum. One flake and one rib bone fragment were recovered from this stratum. The south wall profile shows a cross-section of Feature 1. Stratum III consisted of up to 34 cm of yellowish brown (10YR5/6), sandy loam with roots and gravel. Numerous rodent burrows were seen in the stratum. No artifacts or other cultural materials were recovered from Stratum III. Stratum IV consisted of at least 4 cm of very pale brown (10YR7/3), fine sand. Stratum IV was not observed in the south wall profile. No artifacts or other cultural material were recovered from this stratum. Stratum V consisted of at least 10 cm of dark

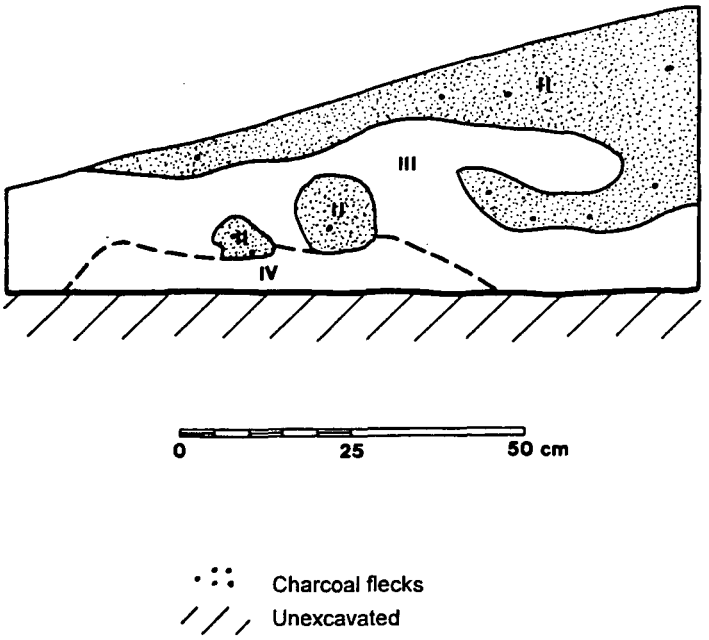


Figure 18.2. Site NM-Q-23-58, Study Unit 1, North Wall Profile.

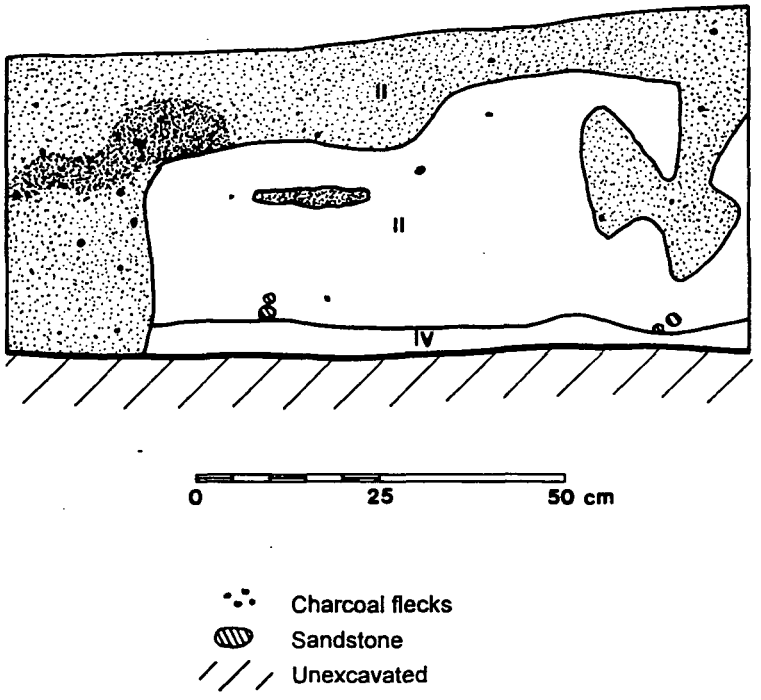


Figure 18.3. Site NM-Q-23-58, Study Unit 1, East Wall Profile.

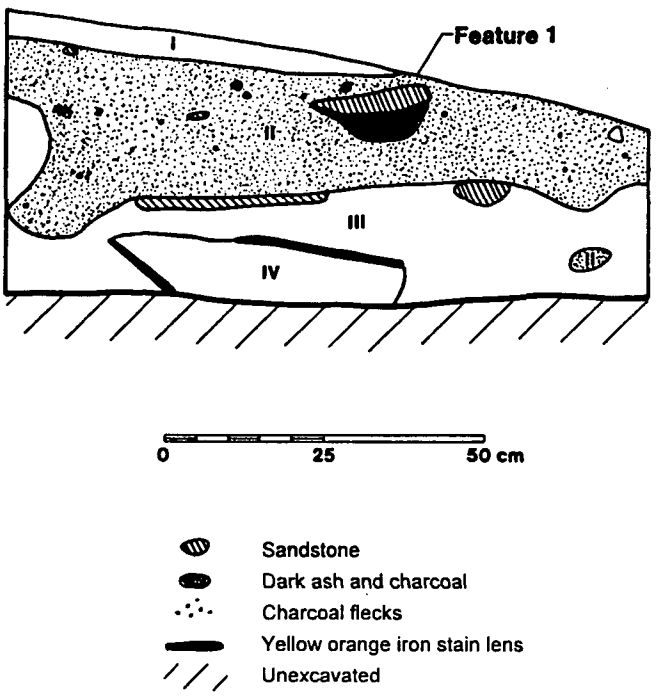


Figure 18.4. Site NM-Q-23-58, Study Unit 1, South Wall Profile Showing Feature 1.

gray (10YR4/1), sandy loam separated from Strata IV by caliche lens stained yellow-orange by ferric deposits. Stratum V was only present in the south wall profile. No artifacts or other cultural material were recovered from this stratum.

Two radiocarbon samples were taken from SU 1, one from Feature 1 and one from Stratum II, immediately above Feature 1. The Stratum II sample (FS 62, Beta-110380) yielded a 1 sigma calibrated date range of 1030 to 890 BC (conventional radiocarbon date 2820 ±70 BP). The Feature 1 sample (FS 66, Beta-110381) yielded a 1 sigma calibrated date range of 1400 to 1200 BC (conventional radiocarbon date 3050 ±70 BP).

Study Unit 2

SU 2 was a 1-by-1-m unit located at grid coordinates N110, E110 just inside the southeastern edge of the right of way. This unit was located uphill from, and at the eastern edge of, the light artifact scatter. This unit lay approximately halfway between the densest portion of the artifact scatter and the remains of a Navajo hogan. Wolfberry was noted growing in this location. Wolfberry is often seen as an indicator species growing in locations of buried cultural deposits.

SU 2 was excavated 60 cm in six levels, and four soil strata were revealed (Figure 18.5). Stratum I consisted of 4 to 8 cm of brown (10YR4/3) sandy loam with many roots and slight traces of charcoal flecking. One unidentified grayware jar sherd and one flake were recovered. Stratum

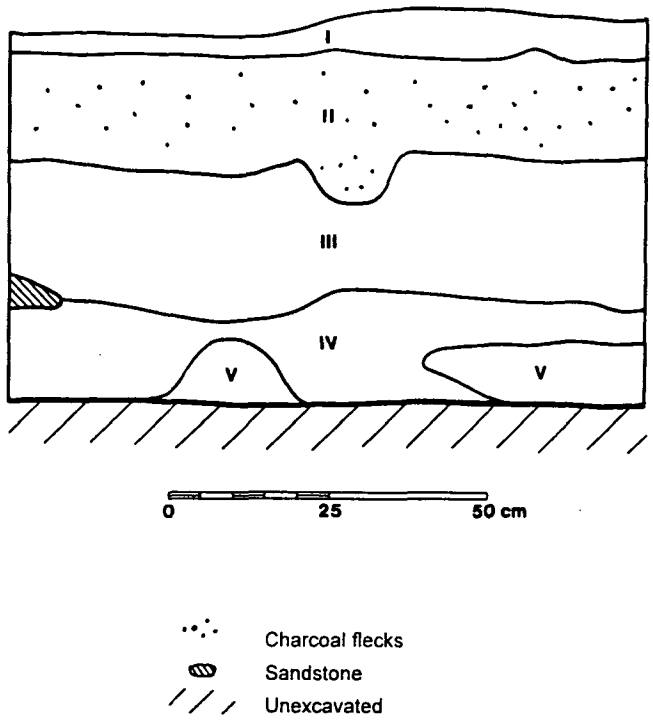


Figure 18.5. Site NM-Q-23-58, Study Unit 2, East Wall Profile.

II consisted of up to 24 cm of very dark grayish brown (10YR3/2), sandy loam with some roots and gravel (less than 10%), along with charcoal flecking. No artifacts or any other cultural material were noted in Stratum II. Stratum III consisted of up to 24 cm of dark yellowish brown (10YR3/4) sandy loam with very few roots and some gravel (less than 10%). One unidentified grayware jar sherd was recovered from Stratum III. Stratum IV consisted of 18 cm of light olive brown (2.5Y5/4), sandy clay loam with very few roots and gravel (less than 10%), along with some clay inclusions. No artifacts or any other cultural material were noted in Stratum IV. The base of Stratum IV was defined by a platy carbonaceous shale bedrock. Stratum V consisted of at least 11 cm of dark gray (10YR4/1), clay. No artifacts or other cultural material were recovered from this stratum.

Study Unit 3

SU 3 was a 1-by-1-m unit located at grid coordinates N105, E102, just inside the eastern edge of the right-of-way. The unit was placed in an area of a moderately dense artifact scatter. The placement of this unit was selected to test for more evidence of an ashy occupation layer away from the densest portion of the artifact scatter.

SU 3 was excavated 60 cm in six levels, and four soil strata were revealed (Figure 18.6). Stratum I consisted of 3 to 6 cm of tree duff mixed with dark brown (10YR3/3) sand. No artifacts or other cultural material were recovered from this stratum. Stratum II consisted of 9 to 15 cm of

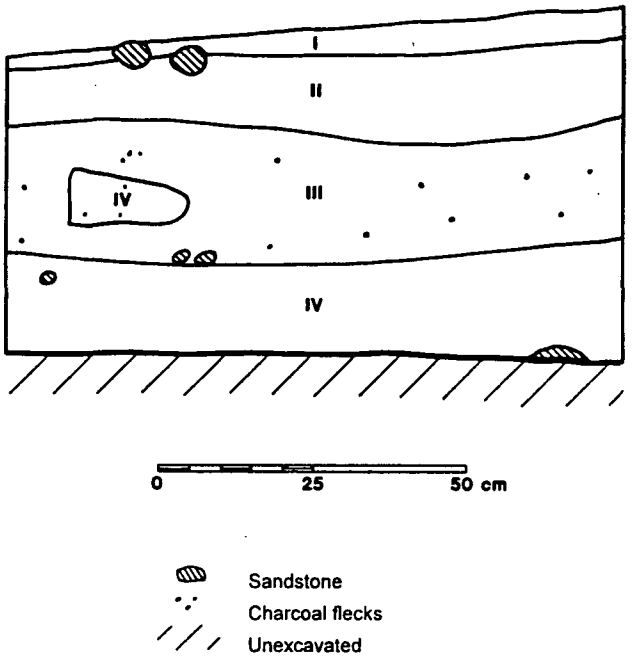


Figure 18.6. Site NM-Q-23-58, Study Unit 3, South Wall Profile.

brown (10YR4/3), sandy loam with some roots, gravel (10%), and traces of charcoal flecking. A few flakes were recovered from this stratum. Stratum III consisted of 19 to 24 cm of dark grayish brown (10YR4/2), sandy loam with gravel (25%), light charcoal flecking, and some roots. Flakes and a ground stone fragment were recovered from Stratum III. Stratum IV consisted of up to 20 cm of yellowish brown (10YR5/4), sandy loam with less than 10% gravel and some roots. No artifacts were recovered from Stratum IV.

Study Unit 4

SU 4 was a 1-by-1-m unit located at grid coordinates N112, E101.5. This unit was placed in an area of a moderate-density artifact scatter immediately adjacent to and southwest of backhoe trench SU 5. SU 4 was placed at this location to probe for the extent of a charcoal flecked layer seen in SU 5 (Stratum II).

SU 4 was excavated 50 cm in five levels, and four soil strata were revealed (Figure 18.7). Stratum I consisted of 2 to 8 cm of brown (10YR6/3) sand with gravel (10%) and some roots. A single unidentified grayware rim sherd was recovered from this stratum. Stratum II consisted of up to 30 cm of brown (10YR4/3) sandy loam with gravel (25%), traces of charcoal, and some roots. Flakes and some bone fragments were recovered from Stratum II. Stratum III consisted of 9 to 15 cm of brown (10YR5/3), sandy loam with 10% gravel, traces of charcoal, and some roots. One flake and some bone fragments were recovered from Stratum III. Stratum IV consisted of 16 cm of light

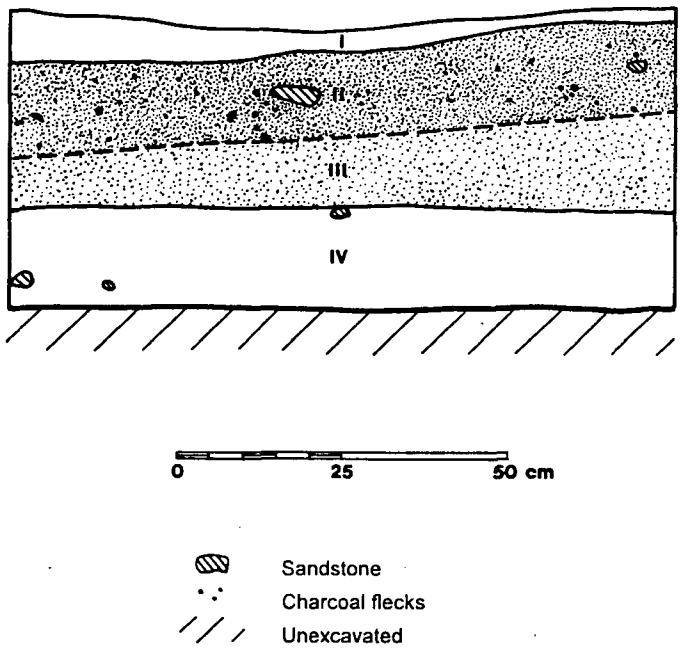


Figure 18.7. Site NM-Q-23-58, Study Unit 4, East Wall Profile.

olive brown (2.5Y5/3) sandy clay loam with 10% gravel and few roots. No artifacts or any other cultural material were present in Stratum IV. The flaked stone from this unit includes a biface fragment and a primary flake.

Backhoe Trench Excavation

The mechanical excavation of four trenches (SU 5 to 8) was conducted to explore for potential buried cultural deposits on site NM-Q-23-58. A backhoe with a 61-cm-wide (2-ft-wide) bucket was employed to excavate soil deposits deeper and over a broader area and in a shorter time span than could be practically completed by hand. Trench excavation was closely monitored by a ZCRE archaeologist. Excavation was halted whenever a closer inspection of the trench walls or trench bottom was deemed necessary by the monitor. The four backhoe trenches at site NM-Q-23-58 totaled 60 m in length. At least three representative soil profiles were drawn for each trench at site NM-Q-23-58 with a total of 13 profiles drawn.

Study Unit 5

SU 5 was 22 m long and had an average depth of 70 cm. SU 5 extended from grid coordinates N105.8, E106.6 northwestward to N125.2, E95.4, perpendicular to the centerline. The trench was placed between the centerline and the southeast edge of the right-of-way. Placement was influenced by the moderate artifact scatter on the site and a desire to explore the outer extent of an

charcoal flecked layer seen in SU 1, 2, and 3 (Stratum II). Four profiles (A-A', B-B', C-C', and D-D') were drawn of the northeast side of the trench (Figure 18.8). Profile A-A' was located at the northwest end of the trench, with Profile B-B' a short distance to the southeast, Profile C-C' near the middle of the trench, and Profile D-D' at the southeast end of the trench.

Profile A-A' was 1 m long and showed three strata. Stratum I consisted of 8 to 14 cm of brown (10YR4/3) sandy loam with some roots. Stratum II was not present in this profile. Stratum III consisted of 18 to 26 cm of very dark grayish brown (10YR3/2), sandy loam with some roots. Stratum IV consisted of 40 to 48 cm of light olive brown (2.5Y5/4), sandy clay loam with 50% gravel and less roots than in the previous stratum. Some natural sandstone cobbles were included in Stratum III.

Profile B-B' was 2 m long and showed four strata. Stratum I consisted of 4 to 10 cm of brown (10YR4/3) sandy loam with some roots. Stratum II consisted of 8 to 18 cm of very dark grayish brown (10YR3/2), sandy loam with charcoal flecking, roots, and sandstone gravel (less than 10%). Stratum III consisted of 12 to 16 cm of very dark grayish brown (10YR3/2), sandy loam with some roots. One flake was noted in Stratum III along with some slight traces of charcoal flecking. Stratum IV consisted of 28 to 40 cm of light olive brown (2.5Y5/4), sandy clay loam with 50% gravel deposits and few roots.

Profile C-C' was 2 m long and showed four strata. Stratum I consisted of 6 to 8 cm of brown (10YR4/3) sandy loam with some roots. Stratum II consisted of 12 to 18 cm of very dark grayish brown (10YR3/2), sandy loam with less than 10% sandstone gravel, roots, and charcoal flecking. Stratum III consisted of 10 to 20 cm of very dark grayish brown (10YR3/2), sandy loam with some roots and slight charcoal flecking. Stratum IV consisted of 16 to 34 cm of light olive brown (2.5Y5/4), sandy clay loam with 50% gravel and very few roots.

Profile D-D' shows three strata. Stratum I consisted of 16 to 24 cm of brown (10YR4/3) sandy loam with some roots. Stratum II consisted of 16 to 22 cm of very dark grayish brown (10YR3/2), sandy loam with sandstone gravel (less than 10%), traces of charcoal flecking, and roots. Stratum III was not present in this profile. Stratum IV consisted of 40 to 45 cm of light olive brown (2.5Y5/4), sandy clay loam with 50% gravel and very few roots.

Study Unit 6

SU 6 was 21 m long and had an average depth of 1 m. SU 6 extended from grid coordinates N111.4, E105.2 northeastward to N122.4, E123.4. Placement was influenced by a low-density artifact scatter, and by the circular depression (a possible hogan) just outside the right-of-way. Additionally the trench was dug to explore the northeastward extent of the charcoal flecked (Stratum II) layer seen in SU 1, 2, and 3. The trench was placed next to and almost parallel to the southeast edge of the right-of-way. Three 1-m-long profiles (E-E', F-F', and G-G') were drawn of the southeast side of the trench (Figure 18.9), at the northeast end, near the middle, and at the southwest end, respectively.

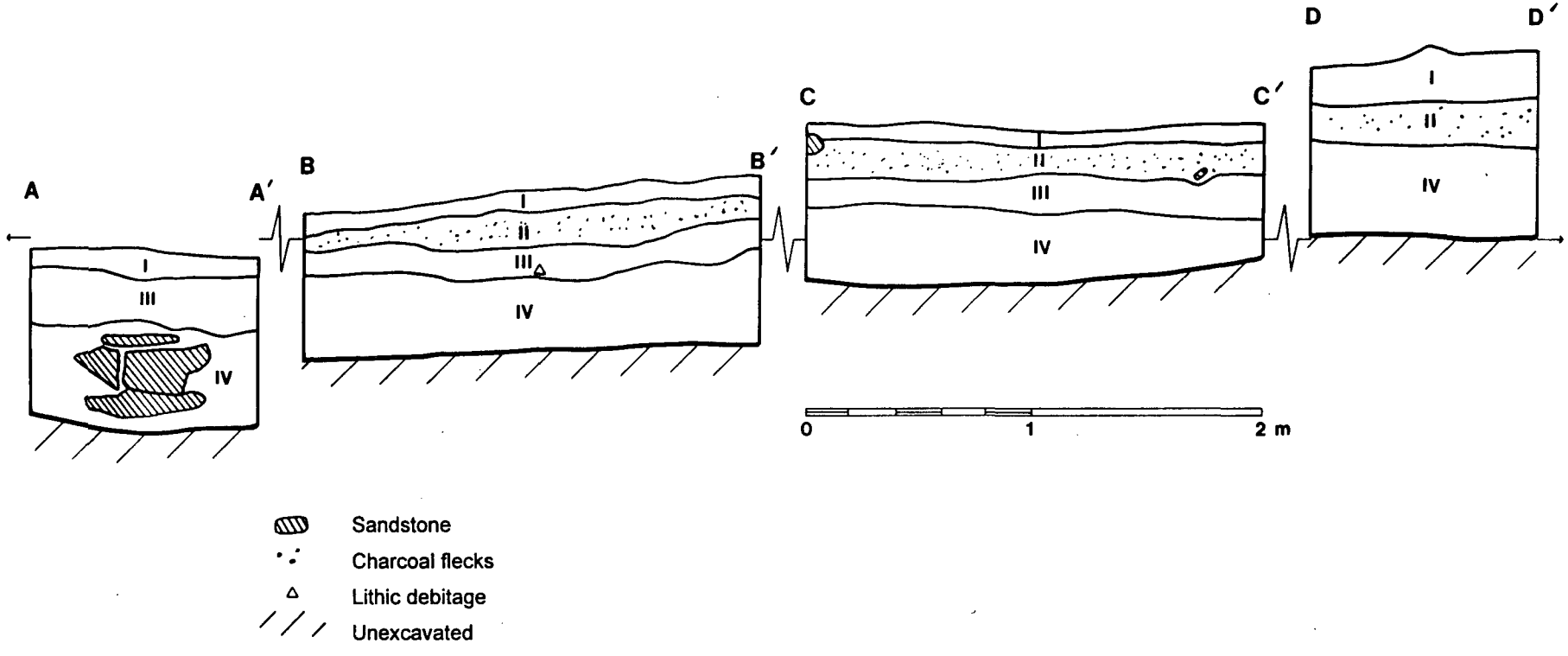


Figure 18.8. Site NM-Q-23-58, Study Unit 5, Northeast Wall Profiles A-A', B-B', C-C', and D-D'.

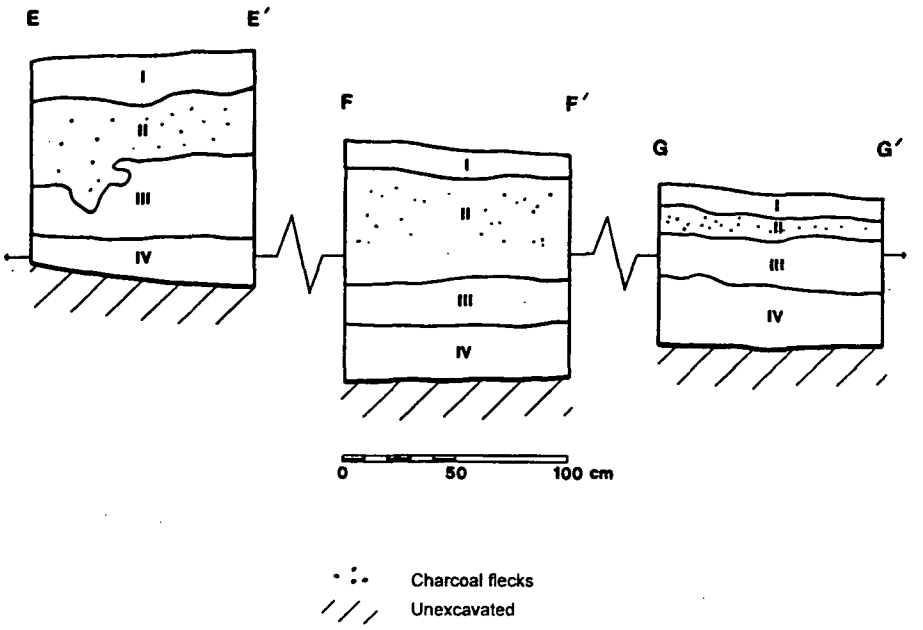


Figure 18.9. Site NM-Q-23-58, Study Unit 6, Southeast Wall Profiles E-E', F-F', and G-G'.

Profile E-E' shows four strata. Stratum I consisted of 16 to 22 cm of brown (10YR4/3) soft nonplastic sandy loam with some roots. Stratum II consisted of 29 to 50 cm of very dark grayish brown (10YR3/2), sandy loam with some roots and charcoal flecking. Stratum III consisted of 12 to 36 cm of very dark grayish brown (10YR3/2), sandy loam with some roots and light traces of charcoal flecking. Stratum IV consisted of 12 to 22 cm of light olive brown (2.5Y5/4), sandy clay loam with very few roots and 50% gravel.

Profile F-F' shows four strata. Stratum I consisted of 10 to 12 cm of brown (10YR4/3), sandy loam with some roots. Stratum II consisted of 46 to 52 cm of very dark grayish brown (10YR3/2), sandy loam with some roots along with charcoal flecking. Stratum III consisted of 18 to 22 cm of very dark grayish brown (10YR3/2), sandy loam with some roots and light traces of charcoal. Stratum IV consisted of 26 cm of light olive brown (2.5Y5/4), sandy clay loam with very few roots and 50% gravel.

Profile G-G' shows four strata. Stratum I consisted of 10 cm of brown (10YR4/3) sandy loam with some roots. Stratum II consisted of 8 to 14 cm of very dark grayish brown (10YR3/2), sandy loam with some roots and charcoal flecking. Stratum III consisted of 18 to 24 cm of very dark grayish brown (10YR3/2), sandy loam with some roots and light traces of charcoal flecking. Stratum IV consisted of 24 to 32 cm of light olive brown (2.5Y5/4), sandy clay loam with very few roots and 50% gravel.

Study Unit 7

SU 7 was 9 m long and had an average depth of 74 cm. SU 7 extended from grid coordinates N111.3, E97.8 northwestward to N119.6, E93.5. The trench was placed perpendicularly between the centerline and the southeast right-of-way boundary. Placement was influenced by the close proximity of the high-density artifact scatter approximately 4 m to the south and to explore the northwestern limits of Stratum II, a charcoal flecked layer seen in other portions of the site. Three 1-m-long profiles (H-H', I-I', and J-J') were drawn of the northeast side of the trench (Figure 18.10), near the northwest end, near the middle, and near the southeast end of the trench, respectively.

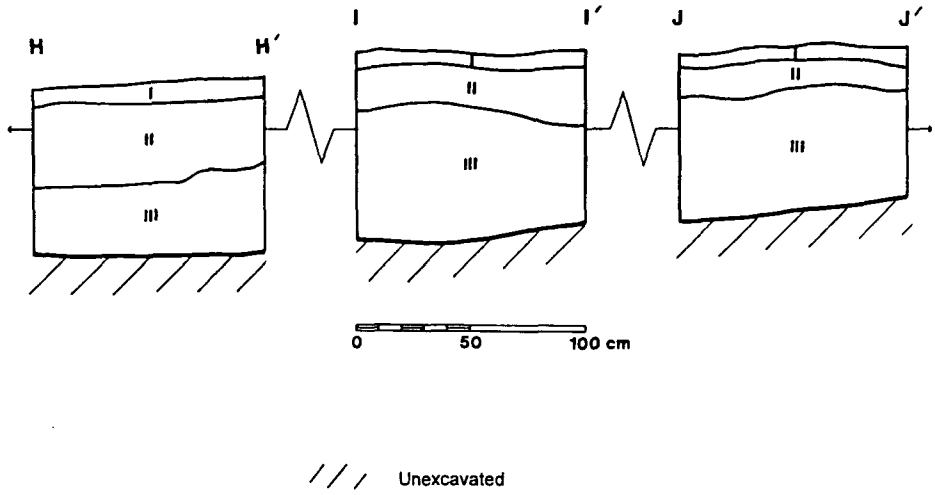


Figure 18.10. Site NM-Q-23-58, Study Unit 7, Northeast Wall Profiles H-H', I-I', and J-J'.

Profile H-H' shows three strata. Stratum I consisted of 8 cm of brown (10YR4/3) sandy loam with many roots and some gravel (less than 10%). Stratum II consisted of 28 to 36 cm of light olive brown (2.5Y5/4), sandy loam with 10% gravel and some roots. Stratum III consisted of 30 to 38 cm of light olive brown (2.5Y5/4), sandy loam with 50% sandstone gravel and very few roots.

Profile I-I' shows three strata. Stratum I consisted of 6 to 8 cm of brown (10YR4/3) sandy loam with many roots and some gravel (less than 10%). Stratum II consisted of 16 to 26 cm of light olive brown (2.5Y5/4), sandy loam with less roots and slightly more gravel than in the previous stratum. Stratum III consisted of 42 to 62 cm of light olive brown (2.5Y5/4), sandy loam with very few roots and 50% sandstone gravel.

Profile J-J' shows three strata. Stratum I consisted of 6 to 8 cm of brown (10YR4/3) sandy loam with many roots and some gravel (less than 10%). Stratum II consisted of 12 to 16 cm of light

olive brown (2.5Y5/4), sandy loam with less roots and slightly more gravel than in the previous stratum. Stratum III consisted of 46 to 54 cm of light olive brown (2.5Y5/4) sandy loam with very few roots and 50% sandstone gravel.

Study Unit 8

SU 8 was 8 m long and had an average depth of 70 cm. SU 8 extended from grid coordinates N123, E91.2 northwestward to N130.2, E86.6. SU was oriented southeast-to-northwest and was perpendicular to the centerline. Placement of this unit was influenced by the light artifact scatter on the site. Three 1-m-long profiles (K-K', L-L', and M-M') were drawn of the northeast side of the trench (Figure 18.11), one near the northwest end, one near the middle, and one near the southeast end of the trench, respectively.

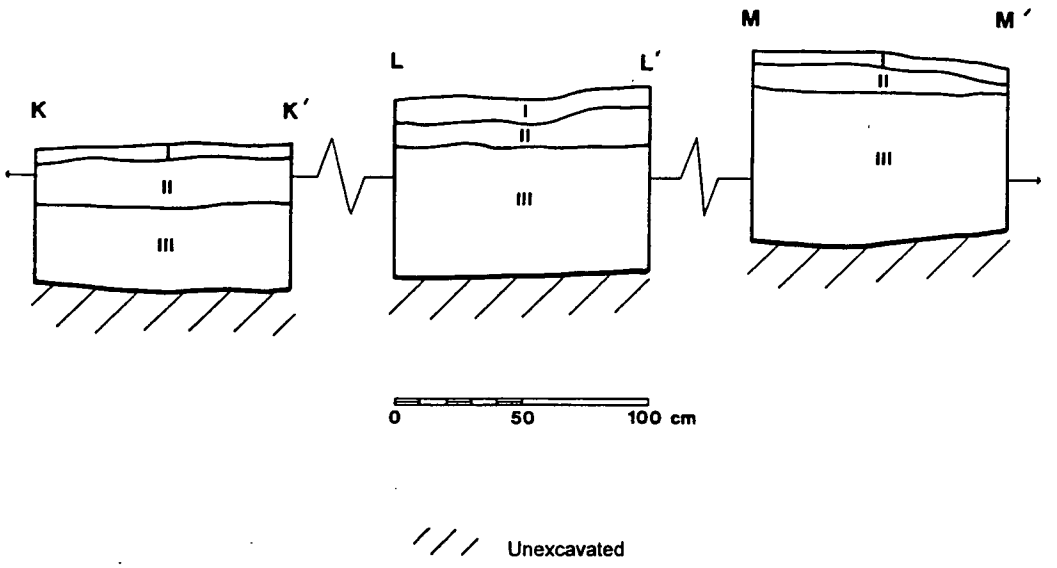


Figure 18.11. Site NM-Q-23-58, Study Unit 8, Northeast Wall Profile K-K', L-L', and M-M'.

Profile K-K' shows three strata. Stratum I consisted of 6 cm of brown (10YR4/3) sandy loam with some roots and sandstone gravel (less than 10%). Stratum II consisted of 16 to 20 cm of brown (10YR4/3), sandy loam with some roots and less than 10% sandstone gravel. Stratum III consisted of 30 to 36 cm of light olive brown (2.5Y5/4), sandy loam with very few roots and 50% sandstone gravel.

Profile L-L' shows three strata. Stratum I consisted of 8 to 10 cm of brown (10YR4/3) sandy loam with some roots and sandstone gravel (less than 10%). Stratum II consisted of 10 to 15 cm of

brown (10YR4/3), sandy loam with some roots and less than 10% sandstone gravel. Stratum III consisted of 52 cm of light olive brown (2.5Y5/4), sandy loam with very few roots and 50% sandstone gravel.

Profile M-M' shows three strata. Stratum I consisted of 6 cm of brown (10YR4/3) sandy loam with some roots and sandstone gravel (less than 10%). Stratum II consisted of 4 to 10 cm of brown (10YR4/3), sandy loam with roots and less than 10% sandstone gravel. Stratum III consisted of 54 to 62 cm of light olive brown (2.5Y5/4), sandy loam with very few roots and 50% sandstone gravel.

Features

Feature 1

Feature 1 was a circular ashy, charcoal flecked thermal feature. The center of the feature was located at grid coordinates N101, E99.56 and measured approximately 46 cm in diameter. The fill was comprised of ash, charcoal, and sandstone cobbles and was only 10 cm deep. No artifacts were recovered from Feature 1. The soil at the base of the feature exhibited very little burning. Feature 1 was contained within a matrix of brown sandy loam (Stratum II) with charcoal flecks; however the base of Feature 1 was defined by a distinctly different yellowish brown fine sand (Stratum III). The study unit exposed a cross-section of Feature 1 (Figure 18.4). The unit was bisected and the west side excavated farther to expose the full depth and profile of the feature (Figure 18.12). Both the northeast and northwest quarters of Feature 1 in SU 1 were recovered for flotation and radiocarbon analysis. The radiocarbon sample from Feature 1 yielded a 1 sigma calibrated date range of 1400 to 1200 BC (conventional radiocarbon age date of 3050 ±70 BP).

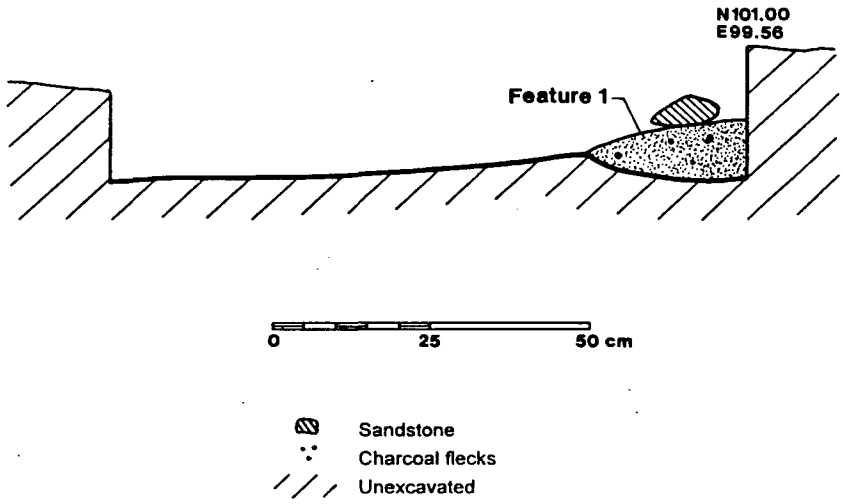


Figure 18.12. Site NM-Q-23-58, East-facing Profile of Feature 1.

Historic Hogan

A probable hogan was located just outside the right-of-way with a low-density artifact scatter extending into the right-of-way (Figure 18.1). The hogan was manifested by a 40-to-50-cm depression in the sandy dune. The depression was approximately 4 m in diameter. An entrance may be represented by the presence of two juniper logs over 1 m long, lying parallel and 1.25 m apart. Curiously, the apparent entrance was located on the west side of the hogan in contrast to the traditional east-side entrance. A concentration of charcoal and burned bone lay just outside the depression to the east, and there may have been an entrance on this side also. An ash dump was located on the east side of the depression, the traditional direction to expect hearth cleanings to be deposited. A blue Vicks' bottle and a steel can with an aluminum top and pull-tab opening were found in direct association with the hogan.

SUMMARY AND INTERPRETATION

Phase I Data Recovery testing of site NM-Q-23-58 resulted in the collection of 97 artifacts of which 52 were flaked stone, 13 were ceramics, 3 were groundstone, 17 faunal materials, and 12 were historic materials. Sixty-two artifacts were collected from surface contexts and 34 were collected from subsurface contexts. Feature 1 was bisected, and both northeast and northwest quarters were excavated separately and collected for flotation and radiocarbon analysis. The excavation units and backhoe trenches revealed an apparent occupation surface probably associated with Feature 1. The occupation surface is represented by the charcoal flecked Stratum II. The extent of the intact occupation surface (Figure 18.1) appeared limited due to erosion and deflation. The southwest portion of the site in particular was considerably eroded and deflated. From the stratigraphy, radiocarbon dates, and the artifact assemblage, two Late Archaic occupations an early Pueblo II period occupation, and a historic Navajo occupation are suggested.

Test excavation of site NM-Q-23-58 revealed that it is a small multicomponent habitation site. The investigation and analysis indicate occupations during the Late Archaic Armijo phase, Pueblo I/II, and historic Navajo periods. The dates from the two radiocarbon samples further support two Late Archaic occupations at this site. A calibrated 1 sigma date range of 1400 to 1200 BC was derived from Feature 1 and a calibrated 1 sigma date range of 1030 to 890 BC was derived from the stratum above the feature. Multiple occupations are also indicated by Strata I, II, and III in SU 4. The presence of prehistoric ceramics indicates a Puebloan occupation possibly during the early Pueblo II period (AD 900 to 1000) as inferred from black-on-white sherds (Chapter 25). The remains of a hogan and a low-density artifact scatter indicate a historic Navajo occupation probably during the second quarter of the twentieth century. Various cut junipers west of the hogan may date to the occupation of the hogan since they are located relatively close by, or to a more recent visit to this site as inferred from other more modern artifacts. Lastly, the possible installation of a telegraph, telephone or electric line through this area occurred some time after the mid-1890s.

The Archaic Armijo phase occupation of site NM-Q-23-58 was primarily identified by the two radiocarbon samples. Although there is an 80 year overlap in the two sigma range, two occupations are likely since the one sigma calibrated date ranges are separated by 170 years and the

calibrated intercept dates are 355 years apart. Feature 1 can be identified with the earlier Late Archaic occupation. An apparent occupation surface associated with a hearth (Feature 1) was defined by a compact yellowish stratum (Stratum III) which Feature 1 is excavated into. A charcoal flecked layer (Stratum II) above that may represent the more recent Late Archaic occupation layer. Numerous charcoal flecks, some up to 1 cm in diameter, were noted in Stratum II. Unburned sandstone from pebble to cobble size was also noted in this stratum. This occupation surface covers an area approximately 12 by 15 m northeast of the edge of the severest erosion. Although no prehistoric subsurface architecture was positively identified, a shallow depression in close proximity to SU 1 and 3 may have been a pitstructure.

Artifacts recovered from the site included various pieces of ground stone, flaked lithic tools, and bone. The ground stone included three slab fragments. The flaked stone included a variety of tools and flakes (Chapter 26). Of particular interest is a Los Pinos-style projectile point recovered from the surface (Figure 26.3). In addition, 1 biface, 5 blades, 2 cores, 35 flakes, and 1 hammerstone were recovered. Most of the flaked lithic artifacts were made from various cherts with lesser amounts of petrified wood and quartzite.

The site's topographic location matches Irwin-Williams' (1973:9) description of Armijo phase sites in the Arroyo Cuervo region as being on narrow floodplains on canyon floors near canyon heads. Cordell (1984:168)also notes that Archaic sites are located on deflated sand dunes. Vivian (1990:85) indicates that isolated hunting, gathering, and quarrying sites occurred as adjuncts to cliff-base and mesa-rim camps suggesting the possible function of this small site. Vivian (1990:85) expands on Irwin-William's fall-to-winter seasonality of the rockshelter base camps. Conversely, a small site such as NM-Q-23-58 may represent one of the small hunting and gathering sites occupied during the spring and summer. Irwin-Williams (1973:10) indicates that maize enters the floral inventory and consequently, more ground stone. Irwin-Williams also notes that the lithic assemblage has a wider range of tool classes. Although the assemblage at site NM-Q-23-58 is small the diversity is relatively wide.

The presence of prehistoric ceramics indicated at least one ancestral Pueblo occupation of the site. A low quantity of ceramics may have resulted from a relatively ephemeral presence. The majority of ceramics consisted of plain graywares or corrugated graywares, which were used for a relatively long span of time from the Pueblo I through Pueblo III periods. Three sherds were of a Pueblo I/II-style black-on-white wares. Their recovery from a small area may indicate a pot drop during the early Pueblo II period (Chapter 25). Unfortunately at this level of investigation the temporal affinity of the flaked and ground stone could not be identified.

Site NM-Q-23-58 also contains a historic Navajo occupation. The small quantity of historic material, as well as some of the faunal material, is likely related to a probable historic Navajo hogan. The historic material consisted of 11 pieces of glass and one ceramic sherd (Chapter 30). Additionally, the mandible of a juvenile *artiodactyla* (sheep or goat) was recovered. Since sheep were not present in prehistoric times, this would indicate that the animal's presence on this site relates to the historic occupation. Except for the green insulator glass, the historic material within the right-of-way was located near several sandstone boulders immediately west of the hogan.

Several other artifacts were noted in direct association with the hogan. These include a blue Vicks' bottle and a steel can with an aluminum top and pull-tab opening. These may reflect a later visitation to the site, possibly in connection with firewood procurement.

RECOMMENDATIONS

Site NM-Q-23-58 should be considered a significant archaeological site and data recovery investigation is recommended. A lithic artifact scatter with a remnant occupation surface and thermal feature define a Late Archaic component. A lithic artifact and sherd scatter indicate an ancestral Pueblo occupation during the early Pueblo II period. The remains of a hogan and artifact scatter define the historic Navajo occupation. Testing investigations demonstrated that, although portions of the site have been eroded and deflated, an intact Late Archaic surface remains, possibly representing two occupations during the Armijo phase. At least one feature was present and possibly others as inferred from shallow depressions in the terrain and dark stains in the trenches and excavation units. That intact occupation surface and features may provide valuable information concerning the Armijo phase of the Late Archaic period. Testing also revealed a possible early Pueblo II presence, albeit ephemeral. Data recovery may be able to refine the extent and nature of the Pueblo II period activities at this site and separate the materials of this component from others. Likewise, the identification of the historic Navajo component of this site should be further researched, particularly by ethnographic means, to determine its relationship and importance to the surrounding community.

Chapter 19

SITE NM-Q-23-59 (LA 110323)

Harding Polk II and Ardale R. Delena

Site NM-Q-23-59 is a small Ancestral Pueblo ceramic and lithic artifact scatter site situated on a low, cobble-strewn ridge overlooking an open plain at an elevation of 2121 m (6960 ft). The southeast edge of the site is bounded by the steeply cut bank of an arroyo. The site is located at the base of the north end of a steeply rising narrow ridge of sandstone which eventually rises an elevation of 2321 m (7615 ft), 1.9 km (1.2 mi) to the south. The area is drained by arroyos cut deeply into the sandstone bedrock 500 to 600 m (1641 to 1969 ft) to the west and east, respectively. Isolated juniper trees (*Juniperus scopulorum*) are scattered across the site with some pinyon (*Pinus edulus*) nearby. Other vegetation noted on the site consists of various sparse grasses (mostly grama [*Bouteloua* spp.]) and isolated sagebrush (*Artemisia* spp.), fourwing saltbush (*Atriplex canescens*), rabbitbrush (*Chrysothamnus* spp.), yucca (*Yucca* spp.), and prickly pear (*Opuntia* spp.) cacti.

SURVEY DATA

The site was recorded by Zuni Cultural Resource Enterprise (ZCRE) in 1995 as part of the N11(2) road survey (Zimmerman and Abbott 1996). ZCRE recording activities included Brunton compass mapping, in-field artifact analyses, and photography. The in-field analyses included assessment of lithic artifact reduction and material identification, ceramic identification, artifact counts, and gross surface distribution mapping of artifacts. ZCRE recorded the site as a moderately dense lithic and ceramic artifact scatter. Ceramics identified at the site included plain, clapboard, and indented corrugated graywares, Kiatuthlanna, Red Mesa, and Puerco black-on-white wares. Based on the ceramics the site was determined to represent a Pueblo II period ancestral Pueblo occupation (AD 900 to 1050). No substantial erosion or other disturbances were apparent.

NATURE AND EXTENT TESTING

From 21 to 24 April and 8 and 12 May 1997 personnel from ZCRE conducted Phase I Data Recovery testing to determine the extent and content of site NM-Q-23-59. Test excavations, complete surface collection of all artifacts, and a redefinition of site boundaries were conducted. An initial cursory survey of the site revealed only a broad, low-density artifact scatter inside the right-of-way. Subsurface investigations included hand excavation of three test units totaling 3 sq m. Five backhoe trenches totaling 62 m were excavated at this site (Figure 19.1).

Surface Collection

Artifacts were collected from an area along approximately 50 m of the N11(2) road right-of-way. A visual search of the site was conducted and each artifact pin-flagged. Artifacts were point-provenienced since it was a relatively low-density scatter. The location of each artifact was shot in by transit, then the artifact was collected and recorded on a Field Specimen (FS) catalog sheet. A

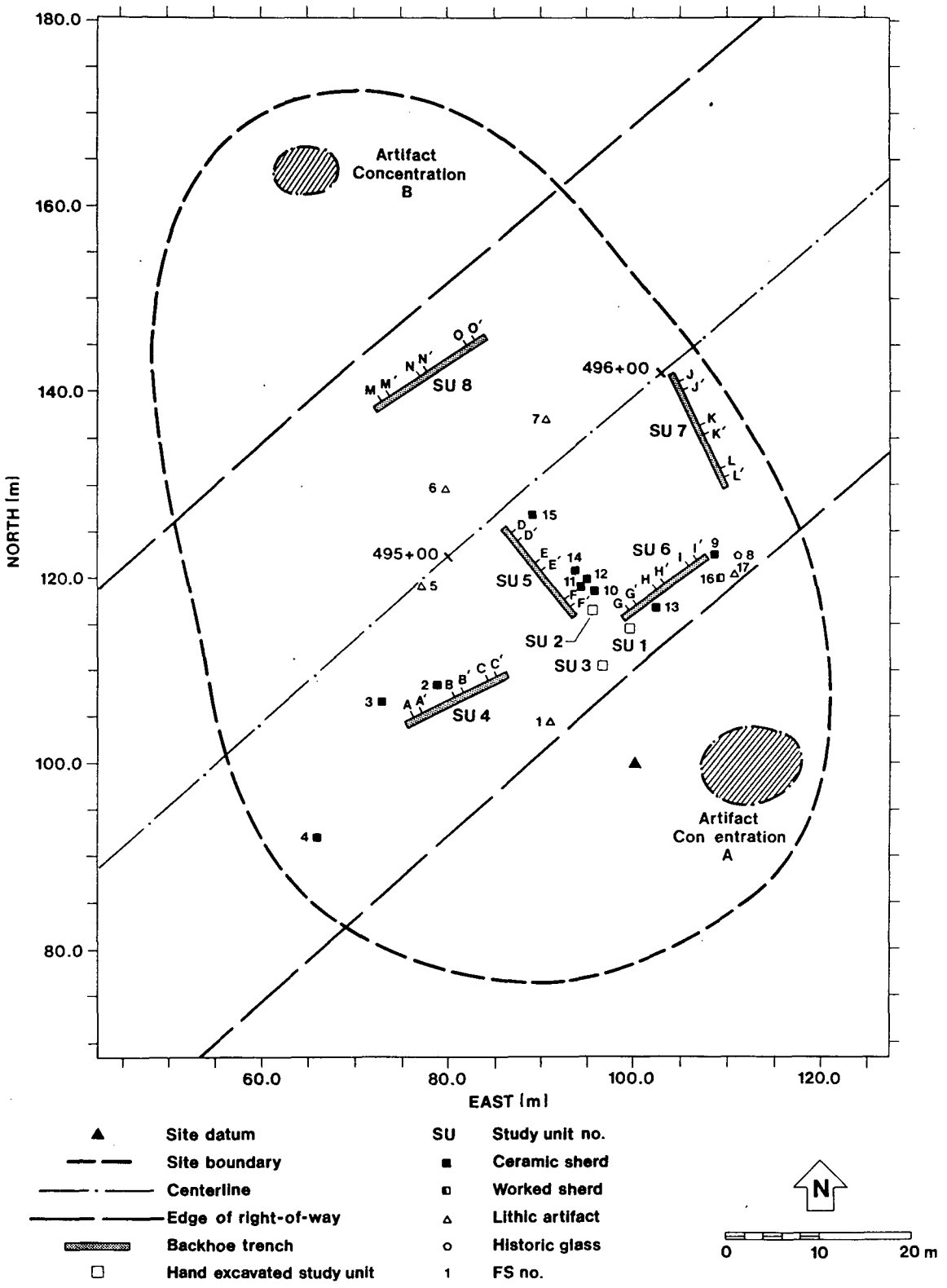


Figure 19.1. Site NM-Q-23-59, Nature and Extent Testing.

total of 19 artifacts were collected at site NM-Q-23-59 from 17 locations. The surface collection assemblage consisted of 11 ceramics, 5 flaked stone, and 3 historic artifacts. The historic artifacts consisted of three mendable glass bottle fragments.

In addition to the low-density artifact scatter within the right-of-way, two other artifact concentrations (A and B) were noted (Figure 19.1). Concentration A contained mostly ceramics, including utility and decorated wares. These concentrations likely represent undefined activity loci outside of the right-of-way.

Hand Excavation

Hand excavation of three test units (SU 1 to 3) encompassing 3 sq m was conducted in order to determine the extent, depth, and density of cultural deposits within the N11(2) right-of-way at site NM-Q-22-59. The location of the surface artifacts, both within and adjacent to the right-of-way, guided the placement of test units. All test units were excavated in arbitrary 10-cm levels and all soils were screened through 1/4-in hardware mesh. Soil descriptions were made using Munsell soil charts to identify soil color.

Study Unit 1

SU 1 was a 1-by-1-m unit located at grid coordinates N114, E99. The unit was located within a moderate-density artifact scatter, and 15 m northwest of artifact concentration A. This unit was placed within the artifact scatter to test for subsurface artifacts and features, possibly architectural in nature.

SU 1 was excavated 37 cm in three levels, and two soil strata were revealed (Figure 19.2). Stratum I consisted of 10 to 12 cm of pale brown (10YR6/3) sandy loam with some roots and a high sandstone gravel content (over 75%). Stratum II consisted of 27 to 29 cm of brown (10YR5/3) sandy loam with some roots and sandstone gravel (over 75%). No artifacts were collected nor were other cultural manifestations noted in the unit.

Study Unit 2

SU 2 was a 1-by-1-m unit located at grid coordinates N116, E95. The unit was located between backhoe trenches SU 5 and 6. The unit was placed within a moderate artifact scatter to test for subsurface artifacts and features, and possibly architectural features.

SU 2 was excavated 30 cm in three levels, and two soil strata were revealed (Figure 19.3). Stratum I consisted of 3 to 5 cm of pale brown (10YR6/3) sandy loam with some roots and gravel (less than 10%). Stratum II consisted of up to 34 cm of dark grayish brown (10YR4/2), sandy loam with very few roots and a lot of gravel (50%), along with some slight traces of charcoal flecking (less than 1%). No artifacts or other cultural material were observed in the unit.

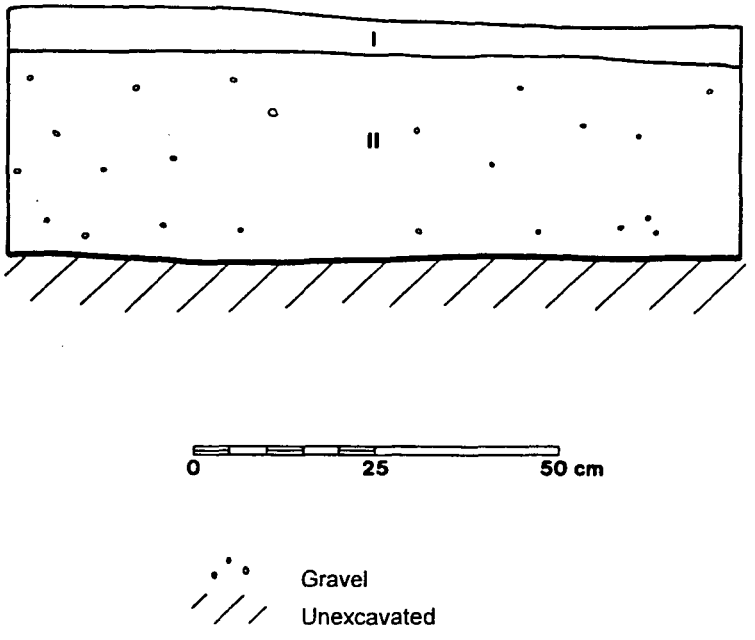


Figure 19.2. Site NM-Q-23-59, Study Unit 1, North Wall Profile.

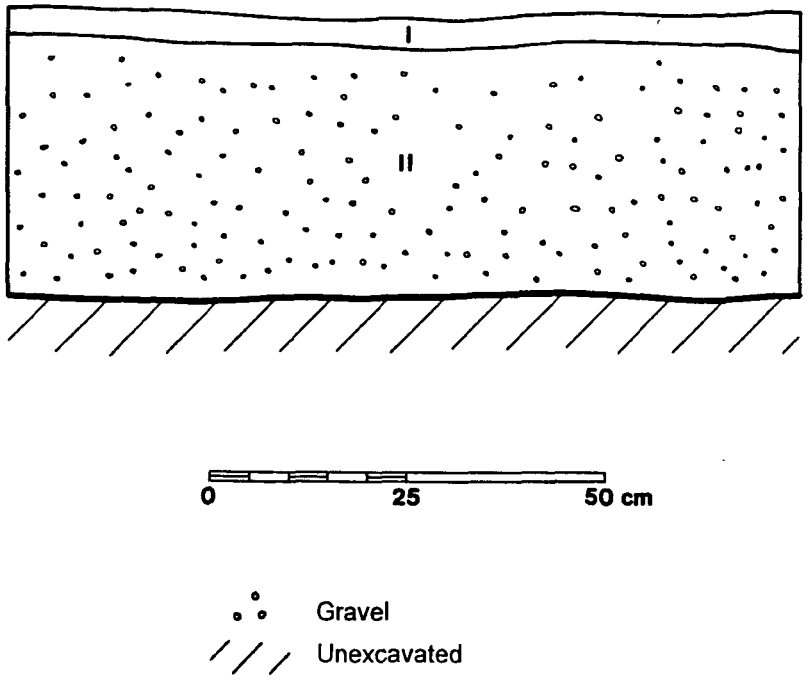


Figure 19.3. Site NM-Q-23-59, Study Unit 2, North Wall Profile.

Study Unit 3

SU 3 was a 1-by-1-m unit located at grid coordinates N110, E96. The unit was located at the southern perimeter of a moderate-density artifact scatter and 15 m from a high-density artifact scatter outside the right-of-way. The unit was also located on a slight slope.

SU 3 was excavated 35 cm in two levels, and two soil strata were revealed (Figure 19.4). Stratum I consisted of 3 to 7 cm of pale brown (10YR6/3), very fine sand with a few roots and some gravel (less than 10%). Stratum II consisted of up to 26 cm of dark grayish brown (10YR4/2), sandy loam with the same amount of roots as Stratum I, but with a much higher gravel content (over 75%), along with some slight inclusions of coal shale. No artifacts, features, or other cultural material were noted in the unit.

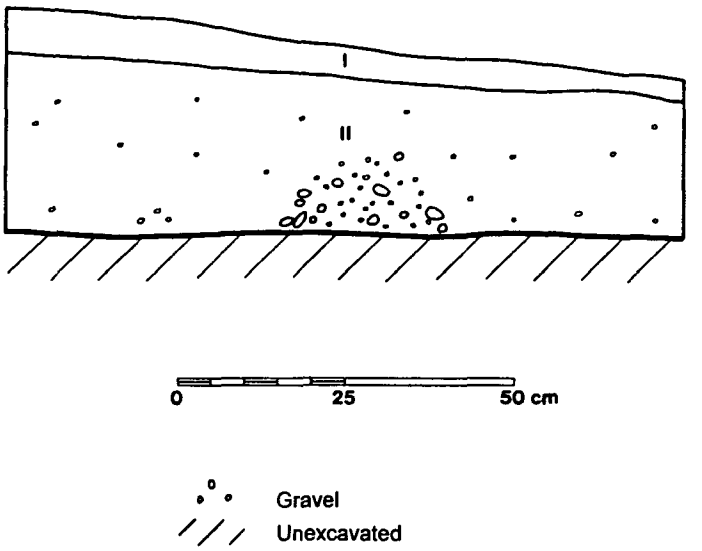


Figure 19.4. Site NM-Q-23-59, Study Unit 3, South Wall Profile.

Backhoe Trench Excavation

The mechanical excavation of five trenches (SU 4 to 8) was conducted to explore for potential buried cultural deposits on site NM-Q-23-59. A backhoe with a 61-cm-wide (2-ft-wide) bucket was employed to excavate soil deposits deeper and over a broader area and within a shorter time span than could be practically completed by hand. Trench excavation was closely monitored by a ZCRE archaeologist. Excavation was halted whenever a closer inspection of the trench walls or bottom was deemed necessary by the monitor. The five backhoe trenches at site NM-Q-23-59 totalled 62 m in length. Three 1-m-long representative soil profiles were drawn for each trench at site NM-Q-23-59. The trenches are described below.

Study Unit 4

SU 4 extended from grid coordinates N104, E75.5 northeastward to N109.6, E86.4. SU 4 was placed between the centerline and the southeast right-of-way boundary. Placement was influenced by a low-density scatter of artifacts. SU 4 was 12 m long with an average depth of 78 cm. Three 1-m-long profiles (A-A', B-B', and C-C') were drawn of the northwest side of the trench (Figure 19.5), one near the southwest end, one near the middle, and one near the northeast end, respectively. Profile A-A' shows three strata. Stratum I consisted of 8 cm of brown (10YR4/3) sandy loam with some roots and gravel (50%). Stratum II consisted of 11 to 17 cm of brown (10YR4/3), sandy loam with the same amount of roots and gravel (50%) as Stratum I. Stratum III consisted of up to 48 cm of dark grayish brown (2.5Y4/2), sandy loam with very few roots and a high gravel content (over 75%). Profile B-B' shows three strata. Stratum I consisted of 6 cm of brown (10YR4/3), sandy loam with some roots and gravel (50%). Stratum II consisted of 10 to 12 cm of brown (10YR4/3), sandy loam with some roots and 50% gravel. Stratum III consisted of up to 70 cm of dark grayish brown (2.5Y4/2), sandy loam with very few roots and a high gravel content (over 75%). Profile C-C' shows three strata. Stratum I consisted of 4 to 8 cm of brown (10YR4/3), sandy loam with some roots and gravel (50%). Stratum II consisted of 12 to 16 cm of brown (10YR4/3), sandy loam with some roots and 50% gravel. Stratum III consisted of up to 60 cm of dark grayish brown (2.5Y4/2), sandy loam with very few roots and a high gravel content (over 75%). No artifacts, features, or any other cultural material were noted in the trench.

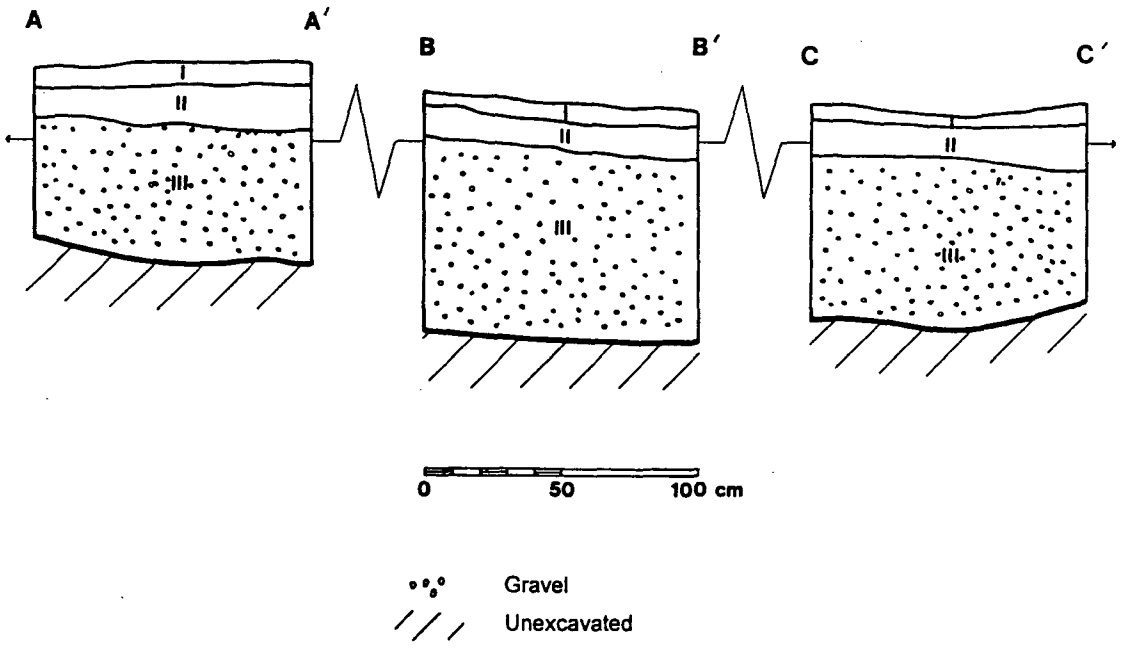


Figure 19.5. Site NM-Q-23-59, Study Unit 4, Northwest Wall Profile A-A', B-B', and C-C'.

Study Unit 5

SU 5 extended from grid coordinates N115.7, E93.7 northwestward to N125.4, E85.7. Placement was influenced by the low-density artifact scatter immediately to the east. In particular the scatter contained a number of ceramic sherds including black-on-white bowl sherds. SU 5 was 12 m long and had an average depth of 82 cm. Three 1-m-long profiles (D-D', E-E', and F-F') were drawn of the northeast side of the trench (Figure 19.6), one near the northwest end, one near the middle, and one near the southeast end of the trench, respectively. Profile D-D' shows three strata. Stratum I consisted of 8 to 16 cm of brown (10YR5/4) sand with very few roots and no gravel. Stratum II consisted of up to 33 cm of light brownish gray (10YR6/2), sandy loam with very few roots and some gravel (25%). Stratum III consisted of up to 52 cm of yellowish brown (10YR5/6) sandy loam with very few roots and much gravel (over 75%). Profile E-E' shows three strata. Stratum I consisted of 6 to 9 cm of brown (10YR5/4) sand with a few roots and no gravel. Stratum II consisted of 46 to 55 cm of light brownish gray (10YR6/2), sandy loam with a few roots and some gravel (10%). Stratum III consisted of 16 to 26 cm of yellowish brown (10YR5/6) sandy loam with very few roots and much gravel (over 75%). Profile F-F' shows three strata. Stratum I consisted of 8 to 11 cm of brown (10YR5/4) sand with very few roots and no gravel. Stratum II consisted of 30 to 35 cm of light brownish gray (10YR6/2), sandy loam with some roots and gravel (25%). Stratum III consisted of up to 39 cm of yellowish brown (10YR5/4) sandy loam with roots and gravel (over 75%). No subsurface features, artifacts, or other subsurface cultural deposits were noted in this trench.

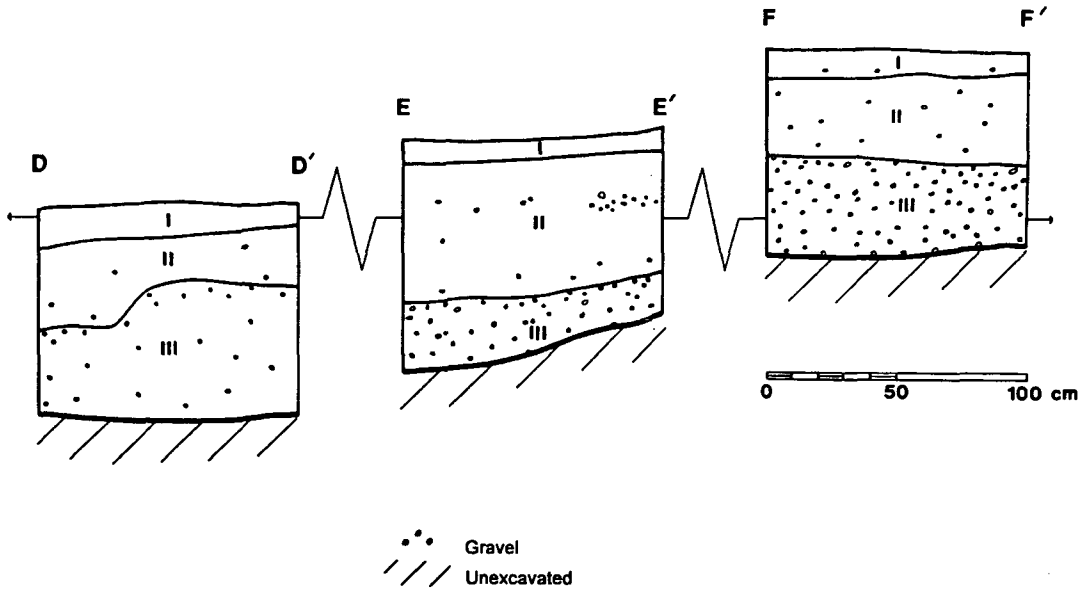


Figure 19.6. Site NM-Q-23-59, Study Unit 5, Northeast Wall Profiles D-D', E-E', and F-F'.

Study Unit 6

SU 6 extended from grid coordinates N115.6, E98.8 northeastward to N122.4, E107.9. Placement was influenced by the low-density artifact scatter in this area. SU 6 was 11 m long and had an average depth of 74 cm. Three 1-m-long profiles (G-G', H-H', and I-I') were drawn of the northwest side of the trench (Figure 19.7), one near the southwest end, one near the middle, and one near the northeast end of the trench, respectively. Profile G-G' shows four strata. Stratum I consisted of 8 to 16 cm of brown (10YR5/4) sand with very few roots and no gravel. Stratum II consisted of 4 to 6 cm of light brownish gray (10YR6/2), sandy loam with very few roots and no gravel. Stratum III consisted of up to 44 cm of yellowish brown (10YR5/6), sandy loam with very few roots and some gravel (25%). Stratum IV consisted of up to 35 cm of brown (10YR5/3) sandy loam with very few roots and some gravel (50%). Profile H-H' shows four strata. Stratum I consisted of 3 to 9 cm of brown (10YR5/4) sand with very few roots and no gravel. Stratum II consisted of 8 to 13 cm of light brownish gray (10YR6/2), sandy loam with very few roots and a small amount of gravel (less than 10%). Stratum III consisted of up to 42 cm of yellowish brown (10YR5/6), sandy loam with some roots and gravel (less than 10%). Stratum IV consisted of up to 18 cm of brown (10YR5/3) sandy loam with very few roots and gravel (over 75%). Profile I-I' shows four strata. Stratum I consisted of 4 cm of brown (10YR5/4) sand with very few roots and no gravel. Stratum II consists of 2 to 8 cm of light brownish gray (10YR6/2), sandy loam with very few roots and a small amount of gravel (less than 10%). Stratum III consisted of 34 to 44 cm of yellowish brown (10YR5/6), sandy loam with very few roots and gravel (less than 10%). Stratum IV consisted of up to 20 cm of brown (10YR5/3) sandy loam with very few roots and gravel (50%). No artifacts, features, or subsurface cultural deposits were noted in the trench.

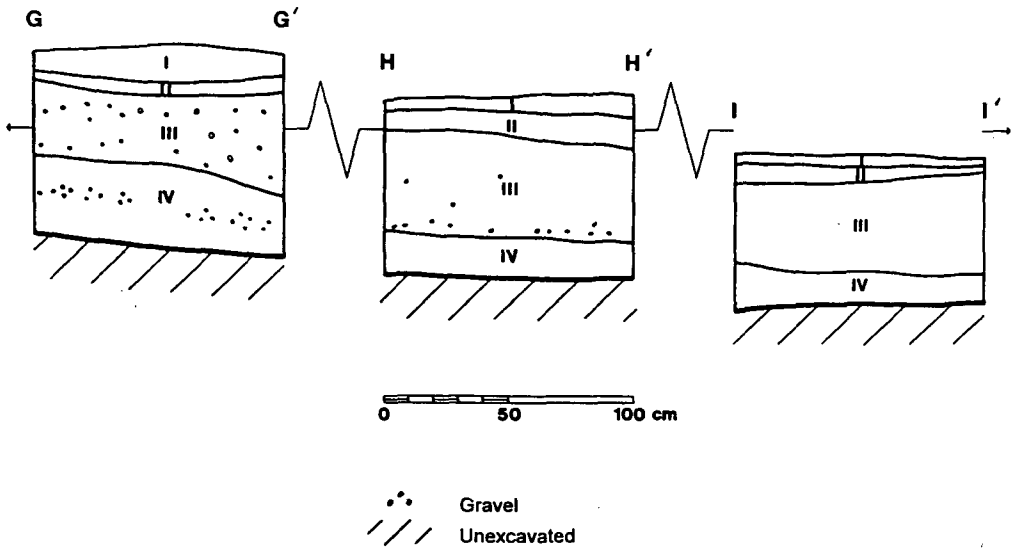


Figure 19.7. Site NM-Q-23-59, Study Unit 6, Northwest Wall Profiles G-G', H-H', and I-I'.

Study Unit 7

SU 7 extended from grid coordinates N129.7, E109.9 northwestward to N142.1, E104. SU 7 was placed at this location to determine if any subsurface cultural deposits lay in this area and if this area was related to a low-density artifact scatter located approximately 10 m to the southwest. SU 7 was 13 m long and had an average depth of 96 cm. Three 1-m-long profiles (J-J', K-K', and L-L') were drawn of the northeast side of the trench (Figure 19.8), near the northwest end, near the middle, and near the southeast end of the trench, respectively. Profile J-J' shows four strata. Stratum I consisted of 8 to 10 cm of yellowish brown (10YR5/4) sand with a few roots and no gravel. Stratum II consisted of 18 cm of light brownish gray (10YR6/2), sandy loam with a few roots and no gravel. Stratum III consisted of 16 to 35 cm of yellowish brown (10YR5/4), sandy loam with very few roots and no gravel. Stratum IV consisted of up to 42 cm of brown (10YR5/3), sandy loam with very few roots and no gravel. No artifacts, features, or cultural deposits were observed in Profile J-J'. Profile K-K' shows four strata. Stratum I consisted of 7 to 14 cm of yellowish brown (10YR5/4) sand with very few roots and no gravel. Stratum II consisted of up to 38 cm of light brownish gray (10YR6/2), sandy loam with very few roots and no gravel. Stratum III consisted of up to 52 cm of yellowish brown (10YR5/4), sandy loam with very few roots and no gravel. Stratum IV consisted of up to 27 cm of brown (10YR5/3), sandy loam with some roots and gravel (50%). No artifacts, features, or subsurface cultural deposits were noted in the profile. Profile L-L' shows three strata. Stratum I consisted of 8 to 10 cm of brown (10YR5/4) sand with very few roots and no gravel. Stratum II consisted of up to 50 cm of light brownish gray (10YR6/2), sandy loam with very few roots and no gravel. Stratum III consisted of 42 cm of brown (10YR5/3), sandy loam with very few roots and some gravel (25%). No artifacts, features, or other subsurface cultural deposits were noted in Profile L-L'.

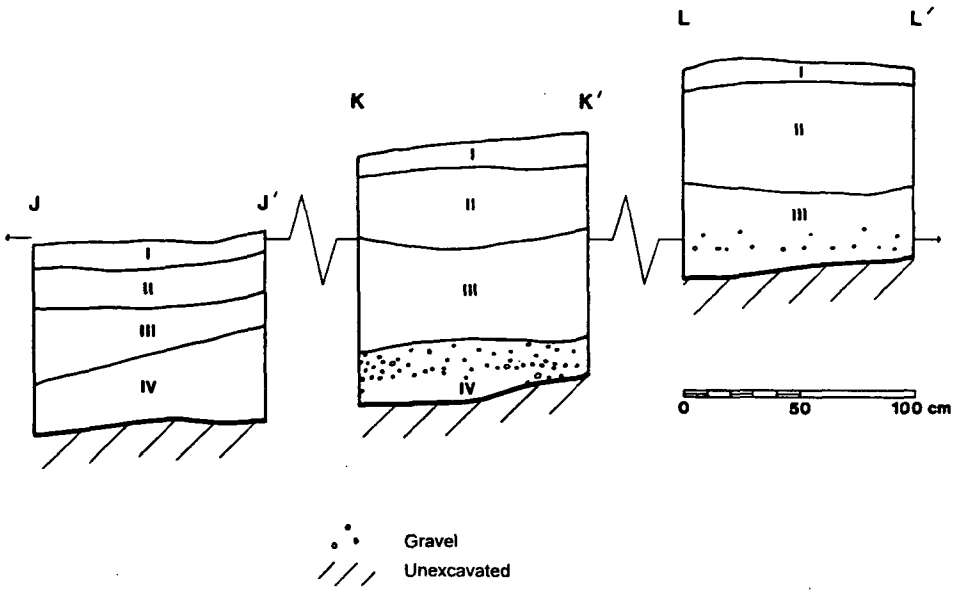


Figure 19.8. Site NM-Q-23-59, Study Unit 7, Northeast Wall Profiles J-J', K-K', and L-L'.

Study Unit 8

SU 8 extended from grid coordinates N138, E72.1 northeastward to N146.1, E84.2. SU 8 was placed at this location to test the area between artifact concentration B and the low-density artifact scatter within the right-of-way. SU 8 was 14 m long and had an average depth of 90 cm. Three 1-m-long profiles (M-M', N-N', and O-O') were drawn of the northwest side of the trench (Figure 19.9), near the southwest end, near the middle, and near the northeast end of the trench, respectively. Profile M-M' shows three strata. Stratum I consisted of 5 to 8 cm of dark grayish brown (2.5Y4/2), sandy loam with some roots and gravel (less than 10%). Stratum II consisted of 16 to 18 cm of dark grayish brown (10YR4/2), sandy loam with some roots and gravel (less than 10%). Stratum III consisted of up to 59 cm of olive brown (2.5Y4/3), sandy loam with very few roots and 50% gravel. No artifacts or subsurface cultural deposits were noted in the profile. Profile N-N' shows three strata. Stratum I consisted of 6 cm of dark grayish brown (2.5Y4/2), sandy loam with some roots and gravel (less than 10%). Stratum II consisted of 17 to 28 cm of dark grayish brown (10YR4/2), sandy loam with some roots and gravel (less than 10%). Stratum III consisted of up to 74 cm of olive brown (2.5Y4/3), sandy loam with very few roots and 50% gravel. No artifacts or cultural deposits were noted in the profile. Profile O-O' shows three strata. Stratum I consisted of 8 cm of dark grayish brown (2.5Y4/2), sandy loam with some roots and gravel (less than 10%). Stratum II consisted of 38 to 42 cm of dark grayish brown (10YR4/2), sandy loam with the same amount of roots and gravel (less than 10%) as Stratum I. Stratum III consisted of 28 to 40 cm of olive brown (2.5Y4/3), sandy loam with very few roots and 50% gravel. No artifacts, features, or other cultural deposits were noted in this profile.

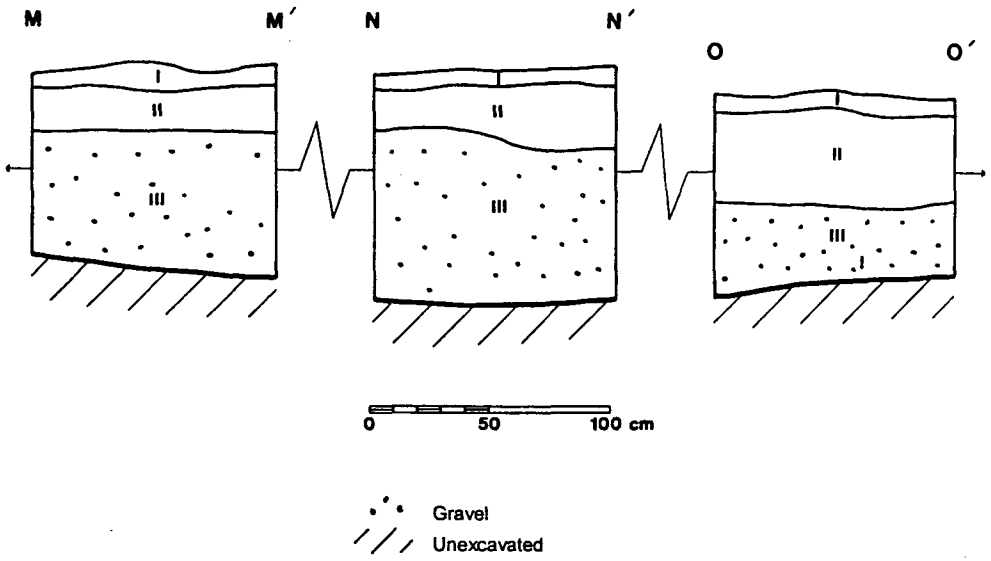


Figure 19.9. Site NM-Q-23-59, Study Unit 8, Northwest Wall Profiles M-M', N-N', and O-O'.

SUMMARY AND INTERPRETATION

Phase I Data Recovery testing of site NM-Q-23-59 resulted in the collection of 19 artifacts of which 11 were ceramics, 5 were flaked stone, and 3 were historic materials. No ground stone or faunal materials were recovered. All artifacts were collected from surface contexts. None of the test units yielded any cultural materials, or was any evidence of features, occupation surfaces, or cultural levels exposed in either the hand-excavated units or backhoe trenches. Two artifact concentrations were observed outside the right-of-way on either side of the moderate artifact scatter within the right-of-way.

Artifacts from site NM-Q-23-59 are interpreted as evidence of an early Pueblo II occupation. This assessment is based on the ceramics recovered from the site which include Red Mesa and Escavada whitewares, and corrugated graywares. From the small quantity and narrow variety of artifacts coupled with the total lack of subsurface features, this was a short-term limited activity site. A brief visit to the site around the turn of the twentieth century was indicated by several fragments of amethyst glass. This may represent sheepherding activities in this area.

RECOMMENDATIONS

It was determined that site NM-Q-23-59 does not contain significant cultural resources. After the testing investigations, the data potential for this site is considered exhausted. No further archaeological investigations are recommended.

Chapter 20

SITE NM-Q-23-60 (LA 38698)

Harding Polk II and Steve Lonjose

Site NM-Q-23-60 is a multicomponent Paleoindian, Late Archaic, Pueblo II, and historic Navajo site. The site consists of a ceramic and lithic artifact scatter with at least 15 features. The site is situated on a slight slope in an area of open dunes at an elevation of 2103 m (6900 ft). The site lies immediately west of an arroyo cut deeply into the sandstone bedrock. From the site the terrain rises steeply along a narrow ridge of sandstone which eventually rises to an elevation of 2321 m (7615 ft), 2.3 km (1.4 mi) to the southwest. A pinyon (*Pinus edulus*) and juniper (*Juniperus scopulorum*) woodland covers the area with sparse grasses, shrubs and cacti on the dunes. Other plants in the area include Mormon tea (*Ephedra trifurca*), sagebrush (*Artemisia* spp.), and rabbitbrush (*Chrysothamnus* spp.).

SURVEY DATA

The site was originally recorded by New Mexico State University as site NM-Q-23-60. The site was then rerecorded by Zuni Cultural Resource Enterprise (ZCRE) in 1995 as part of the N11(2) road survey (Zimmerman and Abbott 1996). ZCRE recording activities included Brunton compass mapping, in-field artifact analyses, and photography. The in-field analyses included assessment of lithic artifact reduction and material identification, ceramic identification, artifact counts, and gross surface distribution mapping of artifacts. ZCRE recorded the site as a moderately dense lithic and ceramic artifact scatter with possible subsurface architecture and a modern Navajo occupation area. Artifacts were particularly noted in deflated areas such as a drainage and a two-track road. Ceramics identified included indented corrugated graywares and what was then believed to be Lino Gray. Lithic artifacts were abundant and included a possible basalt Archaic projectile point fragment, an unidentifiable chert projectile point tip, and debitage of chert, basalt, and petrified wood. Debitage ranged from cortical flakes to biface thinning flakes. A single quartz mano with red ochre staining was also recorded. Based on the diagnostic lithic and ceramic artifacts the site was determined to represent a Basketmaker II to Pueblo I occupation. A historic Navajo component consisted of two loci of milled lumber and historic metal and glass. Portions of the site have sustained substantial erosion and deflation.

NATURE AND EXTENT TESTING

From 19 June to 4 August 1997 personnel from ZCRE conducted Phase I Data Recovery testing to determine the extent and content of site NM-Q-23-60. Within the right-of-way test excavations, complete surface collection of all artifacts, and a redefinition of site boundaries were conducted. Subsurface investigations included hand excavation of 12 test units totaling 18 sq m. Nineteen backhoe trenches were excavated at this site totaling 216.4 m (Figure 20.1).

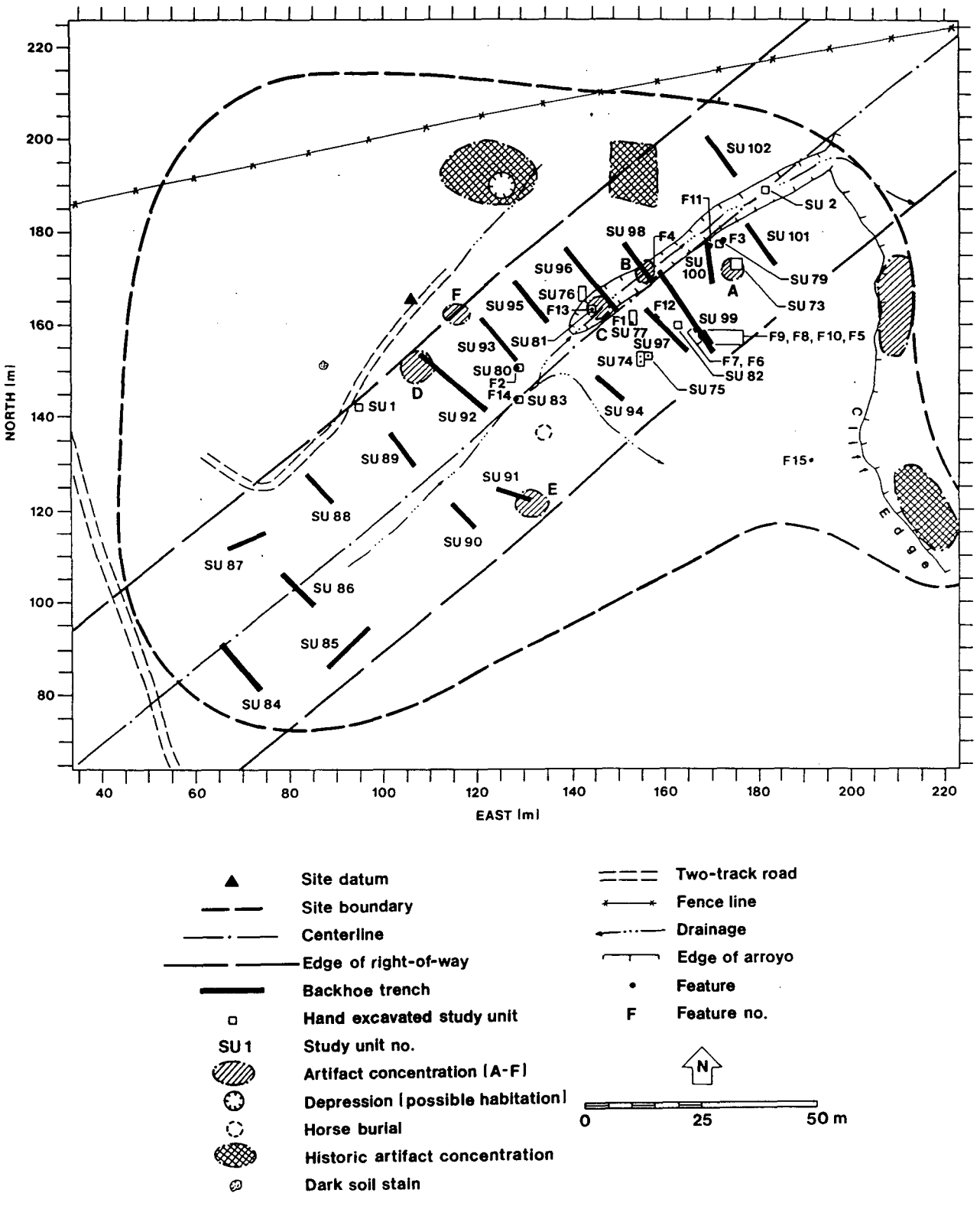


Figure 20.1. Site NM-Q-23-60, Nature and Extent Testing.

Surface Collection

Artifacts were collected from an area along 180 m of the N11(2) right-of-way encompassing approximately 8500 sq m. The surface collection area was defined on the northwest and southeast by the right-of-way boundary. The northeast end was bounded by a steep dropoff into a deep arroyo, and the southwest end was demarcated by a dirt two-track road. A visual search of the site was conducted and each artifact pin-flagged. Surface collection units of 100 sq m (10 by 10 m) were utilized. Artifacts were then collected and tabulated on Field Specimen (FS) catalog sheets. All artifacts from one collection unit were assigned a single FS number; however, artifacts of differing material types were grouped separately within the assigned FS number. Seventy-one collection units (SU 3-72 and 78) yielded artifacts at site NM-Q-23-60. In descending order of quantity, artifact types included flaked stone, ground stone, ceramic sherds, and faunal materials, with flaked stone far outnumbering the other classes of artifacts.

At least six concentrations of prehistoric artifacts were noted within the right-of-way. For purposes of identification they were labeled concentrations A through F. Concentration A included flaked stone, burned sandstone, and ground stone. Concentration B was comprised of flaked stone including a small serrated projectile point (Figure 20.2). Concentration C included dark stained soil with flaked stone, ground stone, sherds that were thought to be brownware, a polishing stone, and a ground slab basin metate. Generally these concentrations occurred in or along the drainage along the centerline and represent deflated deposits. A surficial dark soil stain was noted approximately 20 m west of concentration D, but since it was located outside the right-of-way, it was not investigated.

Figure 20.2. Site NM-Q-23-60, Possible San Jose Type Projectile Point and Biface.

While flaked lithic artifacts were present over almost the entire site, some patterns were noted, particularly concerning the other classes of artifacts. Based strictly on presence or absence several gaps in the distribution of flaked lithic artifacts were noted, particularly in the southwestern portion of the site. There appears to be a discontinuity of artifacts occurring at approximately the location of SU 88 perpendicular to the centerline. Southwest of the discontinuity only flaked lithic artifacts were recovered, with the exception of two pieces of ground stone. Immediately northeast of the discontinuity, and clustered around the datum, was a denser artifact scatter containing concentrations

D and F. This scatter was notable for its numbers of ceramics and ground stone. Interestingly, most of these ceramic sherds represent Protohistoric wares dating between 1630 and 1700 (Chapter 25). A second denser artifact scatter encompassed concentrations A, B, and C and lies eastward on the opposite side of the right-of-way. It should be noted that a drainage ran along the centerline and separated these two denser scatters. This second scatter is notable for the presence of faunal material, ground stone, and ceramics. While some of the ceramics in this area include Protohistoric wares, they also include plain and corrugated graywares. The flaked lithic assemblage in this area was denser than any other part of the site.

One lithic artifact in particular from the eastern dense scatter is worth noting. The basal portion of a fluted projectile point was recovered from near concentration A, near grid coordinates N160, E180. The flute occurs only on one side and is relatively short (Figure 20.3). One side of the base contains an inclusion which appears to have adversely affected the finished point. The point is made of a chert that is possibly Edwards chert, a type originating from central Texas. Based on the morphology, the fragment may represent a Clovis style point (ca. 9500 to 9000 BC).

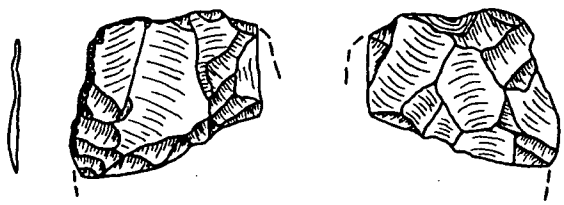


Figure 20.3. Site NM-Q-23-60, Clovis Style Projectile Point Base.

A second projectile point was recovered from concentration B along the centerline drainage. The point is a small serrated side-notched and bifurcated point that has been retouched. This point probably represents a San Jose type point (ca. 3000 to 1800 BC; Figure 20.2).

A historic Navajo artifact scatter is located at the northern portion of the site south of the barbed wire fence. The scatter is situated west of SU 102 and north of SU 95, 96, and 98. Although there is a broad artifact scatter, two concentrations, approximately 15 m apart, were noted, one to the east and one to the west. These included milled wood, soda and beer bottles, a metal bucket, and wire items. An old ill-defined corral is located in the eastern concentration and was manifested by scattered fence posts. A possible habitation structure, manifested by a shallow depression, was located in the western concentration. An old dirt two-track road that passes by the site datum may have provided access to the habitation. Ethnographic data indicate these structures and artifacts represent a sheep camp dating to the 1960s.

Another historic Navajo component consisted of a horse burial. The burial was located near the center of the site between SU 91 and 94. Many of the bones have since been scattered by erosion and animal scavenging. Enthographic data indicate that the burial was no more than 12 years old.

A scatter of artifacts was noted along the base of the cliff east of the northeast end of the site outside the right-of-way. Ground stone, ceramics, and thermal features were observed at the base of the cliff immediately south of the right-of-way boundary. These artifacts and features are mostly likely prehistoric in date. Approximately 20 m farther south where the sheer cliff breaks was another artifact scatter which included amethyst-colored glass. Features including masonry hogan remains and water control features were also noted at this location. These features and artifacts represent historic, and possibly Protohistoric, Navajo occupations.

Hand Excavation

Hand excavation of 12 test units (SU 1, 2, 73 through 77, and 79 through 83) encompassing 18 sq m was conducted in order to determine the extent, depth, and density of cultural deposits within the N11(2) right-of-way at site NM-Q-23-60. The total of 18 sq m was derived from eight 1-by-1-m units, three 2-by-1-m units, and one 2-by-2-m unit. The nature and location of artifact distributions and features, defined during the controlled surface collection, were used as guides for the placements of the 12 study units. All test units were excavated in arbitrary 10-cm levels and all soils were screened through 1/4-in hardware mesh. Soil descriptions were made using Munsell soil charts to identify soil color.

Study Unit 1

The southwest corner grid coordinates of SU 1 were N142, E93.5. This 1-by-1-m unit was placed in a surficial dark soil stain along the northern right-of-way boundary adjacent to a two-track road. SU 1 was excavated to a depth of 38 cm in three levels. A profile was drawn of the west wall and shows three strata (Figure 20.4). Stratum I was 2 cm of strong brown (7.5YR4/6) sand, with inclusions of sandstone gravels (5%), and root disturbances. Stratum II was 13 cm of dark brown (10YR3/3) sandy loam, with inclusions of sandstone gravels (5%) and root disturbance. Stratum III was 4 to 17 cm of a strong brown (7.5YR4/6) sandy loam, with inclusions of sandstone gravels and root disturbances. No cultural materials were recovered, nor were features defined in SU 1. The above-noted surficial stain was possibly natural.

Study Unit 2

The southwest corner grid coordinates of SU 2 were N188.98, E181.08. This 1-by-1-m unit was placed in a surficial dark soil stain along the proposed centerline near station 518+00 at the northeast end of the site. SU 2 was excavated to a depth of 30 cm in three levels. The north wall was profiled and showed three strata (Figure 20.5). Stratum I was a loose strong brown (7.5YR5/6) sand 3 to 7 cm thick, with inclusions of sandstone gravels (5%) and root disturbances. A piece of ground stone was recovered from Stratum I. Stratum II was a dark yellowish brown (10YR4/4) sandy loam 10 to 26 cm thick, with inclusions of charcoal, sandstone gravels (5%), and root

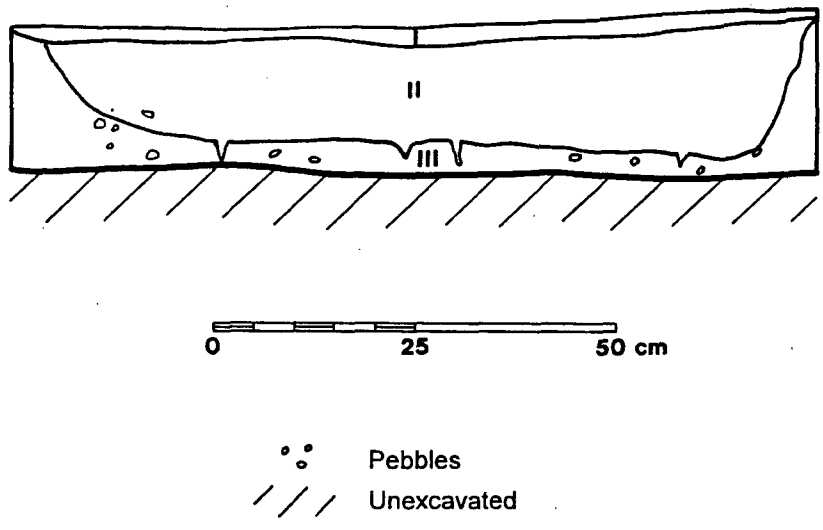


Figure 20.4. Site NM-Q-23-60, Study Unit 1, West Wall Profile.

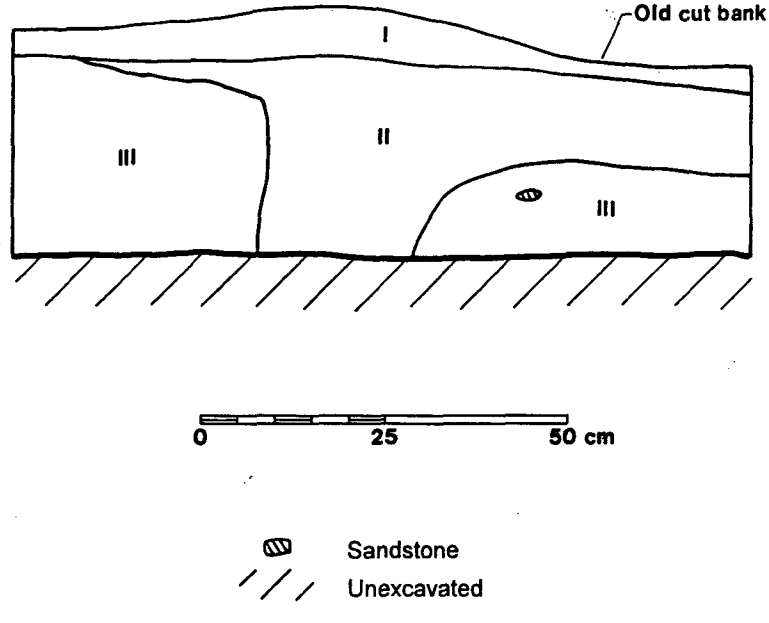


Figure 20.5. Site NM-Q-23-60, Study Unit 2, North Wall Profile.

disturbances. Stratum III was a strong brown (7.5YR5/6) sandy loam mottled with dark yellowish brown (10YR4/4) sandy loam, 11 to 25 cm thick, with inclusions of sandstone gravels and root disturbances. The surface stain did not appear to be cultural.

Study Unit 73

The southwest corner grid coordinates of SU 73 were N171.41, E174.47. This 2-by-2-m unit was placed within a dense artifact scatter (concentration A) that included lithic artifacts, burned sandstone, and ground stone. SU 73 was excavated to a depth of 50 cm in five levels. The west wall profile was drawn and exhibits three strata (Figure 20.6). Stratum I was 6 cm of dark yellowish brown (10YR3/4) loamy sand, with inclusions of natural sandstones (5%) and root disturbances. Flaked stone and ground stone were recovered from this stratum. Stratum II was 30 cm of a dark yellowish brown (10YR4/4) loamy sand, with inclusions of charcoal (1%), natural and burned sandstones (5%), and root disturbances. Stratum III was 20 cm of a brown (7.5YR5/4) sand, with inclusions of natural sandstone rocks (5%), roots, and rodent disturbance.

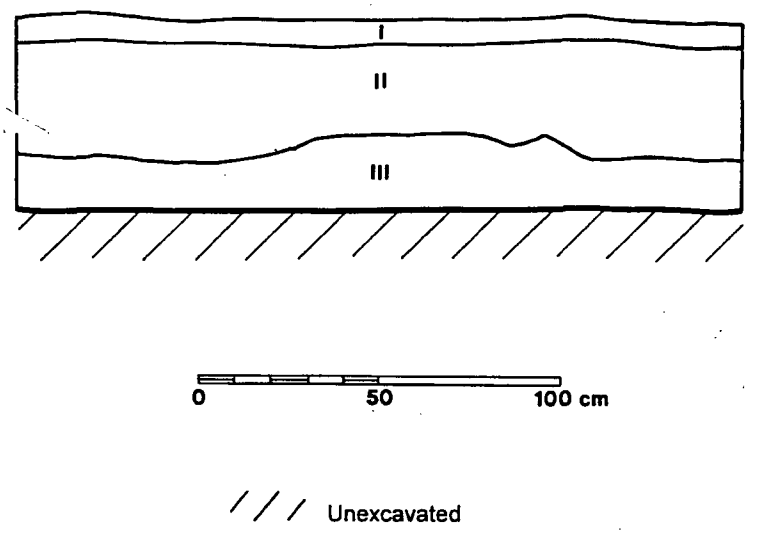


Figure 20.6. Site NM-Q-23-60, Study Unit 73, West Wall Profile.

Study Unit 74

The southwest corner grid coordinates of SU 74 were N151.27, E154.35. This 1-by-2-m unit was placed near a moderate surface artifact scatter including burned sandstone located east of the centerline and central drainage. SU 74 was excavated to a depth of 40 cm in 4 levels. The east wall profile was drawn showing three strata (Figure 20.7). Stratum I was a dark brown (10YR4/3) loamy sand 5 to 7 cm thick, with inclusions of natural sandstones (25%), burned sandstone (5%), and root

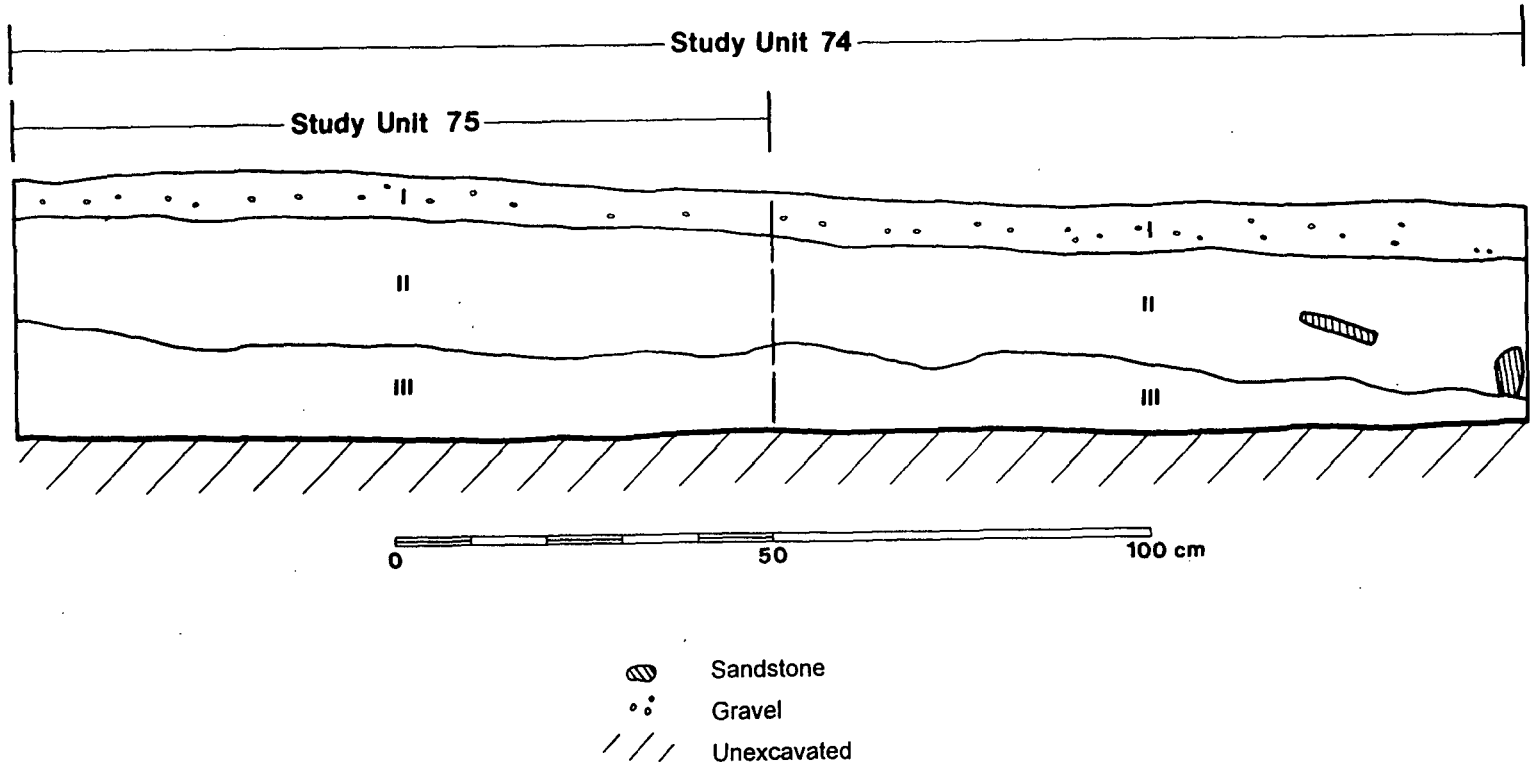


Figure 20.7. Site NM-Q-23-60, East Wall Profile of Study Unit 74 Showing Study Unit 75.

disturbances. Stratum II was a dark yellowish brown (10YR3/4) loamy sand 17 cm thick, with inclusions of charcoal (1%), burned sandstone rocks (10%), natural sandstone rocks, and root disturbances. Stratum III was a dark yellowish brown (10YR4/6) loamy sand 3 to 15 cm thick, with low inclusions of charcoal (1%), natural sandstone rocks (10%), and rodent disturbance. Ground stone and flaked stone were recovered from this unit. Two possible postholes (P1 and P2) were noted at the bottom of the unit (Figure 20.8); both were excavated and determined to be 8 and 10 cm in diameter respectively, and 4.5 and 14 cm deep respectively. Both tapered toward the bottom.

Study Unit 75

The southwest corner grid coordinates of SU 75 were N152.27, E155.35. This 1-by-1-m unit was placed east of the northern half of SU 74 and was excavated to determine if any more features such as postholes extended in this direction. SU 75 was excavated to a depth of 40 cm in one level and three strata were revealed (Figure 20.7). Stratum I consisted of a brown (10YR4/3) loamy sand at least 6 cm thick, with inclusions of burned sandstones, natural sandstones, and root disturbances. This is a continuation of Stratum I, a cultural layer, seen in SU 74. Stratum II was a dark yellowish brown (10YR3/4) loamy sand 17 cm thick, with inclusions of charcoal, natural sandstones, and root disturbances. Stratum III was a dark yellowish brown (10YR4/6) loamy sand 3 to 15 cm thick, with inclusions of charcoal, natural sandstones, and rodent disturbance. Ground stone and flaked stone were recovered from this stratum. These artifacts were associated with the lowermost stained layer seen in backhoe trenches SU 97 and 99. One possible posthole (P3) was defined at the base of Stratum III (Figure 20.8). Posthole 3 was 6-by-10-cm wide and 6-cm deep. The orientation of the posthole was angled at approximately 45° from vertical.

Study Unit 76

The southwest corner grid coordinates of SU 76 were N165.24, E142.38. This 1-by-2-m unit was placed on a gentle slope north of and upslope from artifact concentration C which included flaked stone and ground stone. SU 76 was excavated to a depth of 80 cm in eight levels. The west wall was profiled and shows six strata (Figure 20.9). Stratum I was a yellowish brown (10YR5/4) sand 6 cm thick, with (10%) root disturbances. Stratum II was a yellowish brown (10YR5/4) sand up to 17 cm thick, with inclusions of sandstone gravels (5%) and root disturbances. Stratum III was a dark yellowish brown (10YR4/4) sandy loam 8 to 14 cm thick, with inclusions of charcoal (0.5%), sandstone gravels, and root disturbances (10%). Several unburned sandstone slabs were noted in this stratum. Flaked lithic artifacts were recovered from this stratum. Stratum IV was a yellowish brown (10YR5/4) sandy loam 4 to 25 cm thick, mottled with dark soil. Inclusions of charcoal (1%), burned sandstone (5%), natural sandstone gravels, and root disturbances (5%) were noted. Stratum V consists of up to 27 cm of dark brown (10YR3/3) sandy loam. Stratum V was only noted at the southern end of the unit wedged between Strata IV and VI. No artifacts were recovered from it. Stratum V was a dark yellowish brown (10YR4/6) sandy loam 6 to 26 cm thick, with caliche deposits and root disturbances.

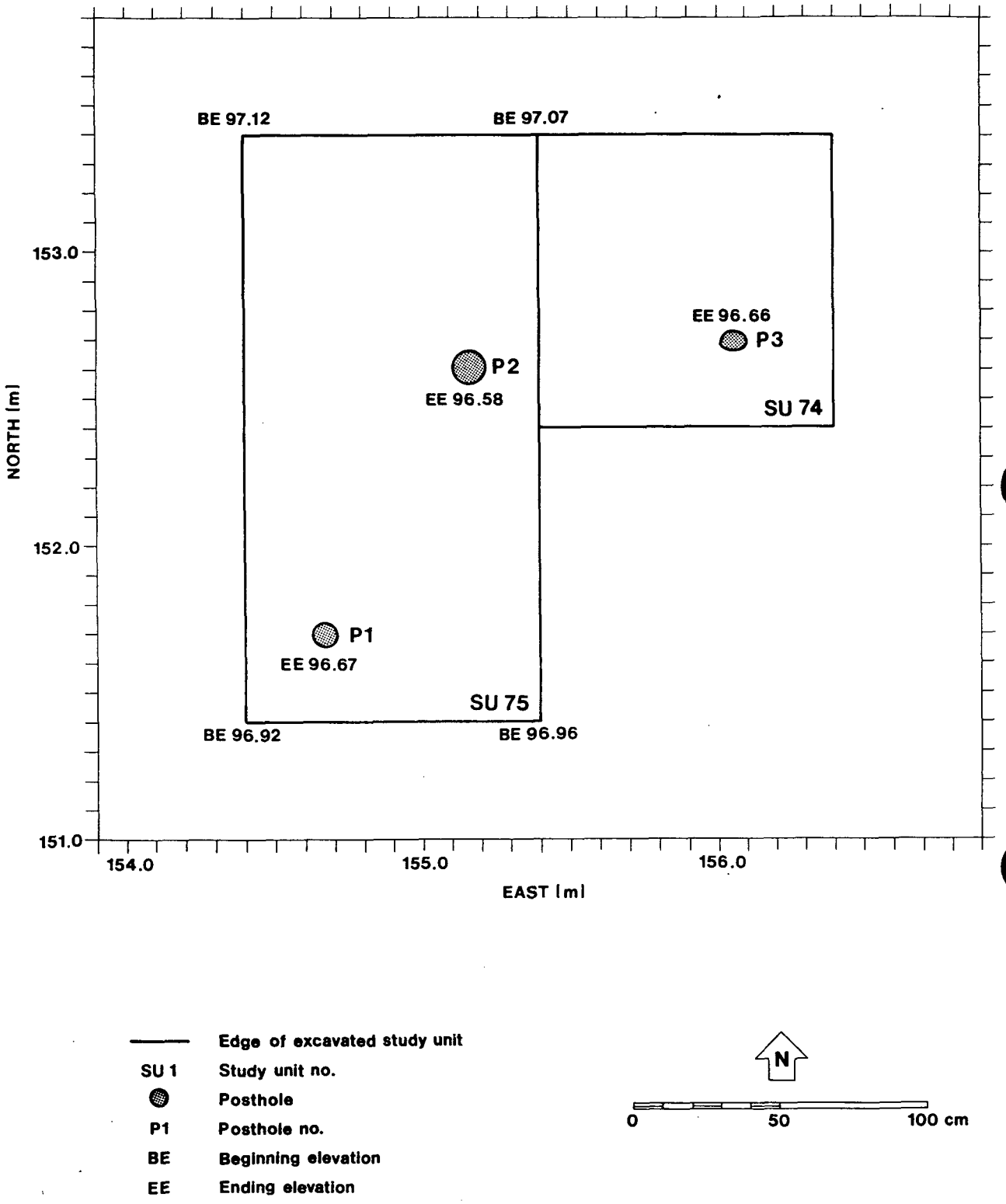


Figure 20.8. Site NM-Q-23-60, Study Units 74 and 75, Plan View Showing Postholes.

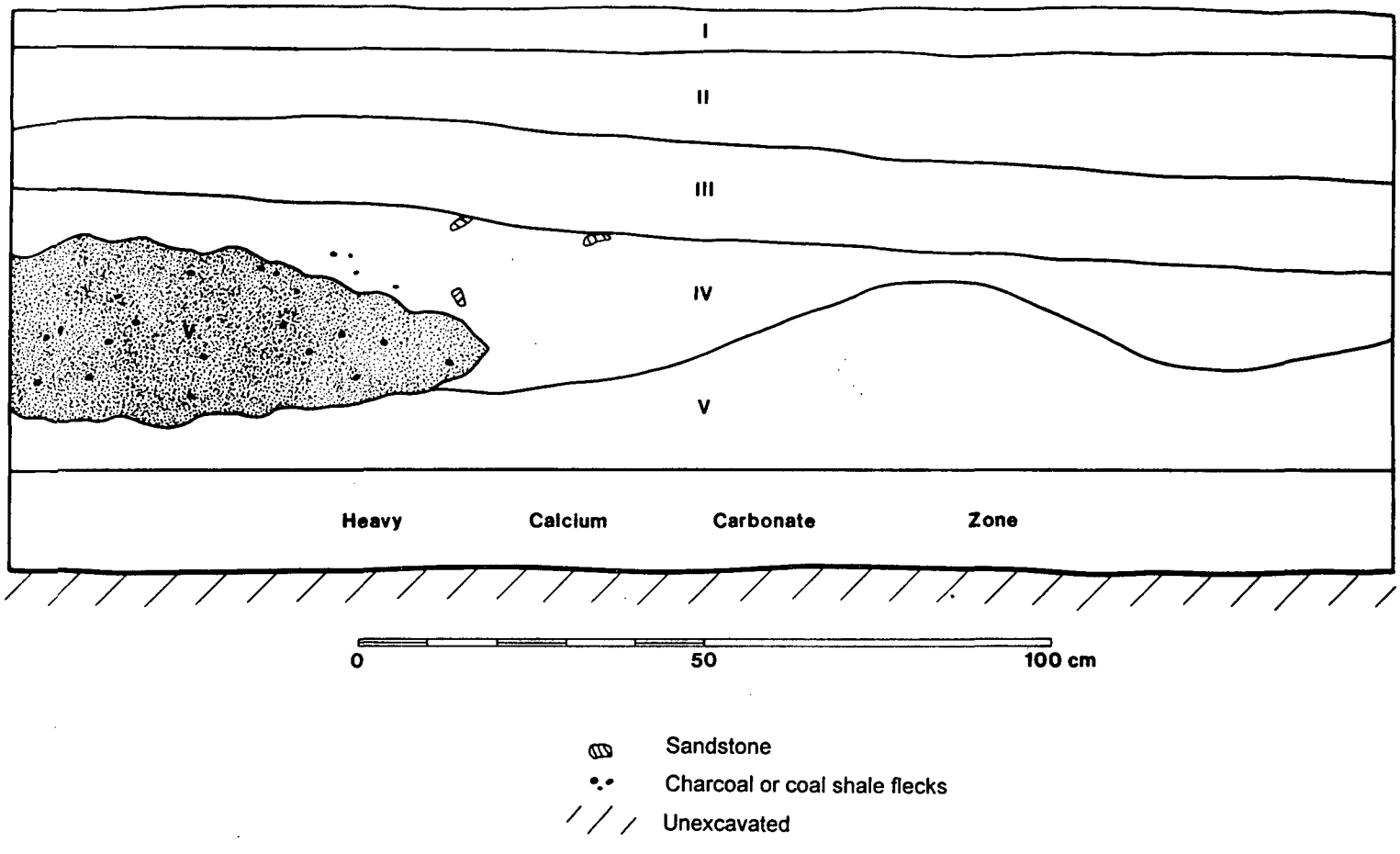


Figure 20.9. Site NM-Q-23-60, Study Unit 76, West Wall Profile.

Study Unit 77

The southwest corner grid coordinates of SU 77 were N160, E153. This 1-by-2-m unit was placed on a flat surface area of moderate artifact density southeast of concentration C to test whether other features or architecture were associated with the postholes in SU 74 and 75. SU 77 was excavated to a depth of 70 cm in seven levels. The west wall profile was drawn showing five strata (Figure 20.10). Stratum I was a brown (10YR4/3) loamy sand 4 cm thick, with 10% root disturbances. Stratum II was a dark yellowish brown (10YR3/4) loamy sand 14 to 19 cm thick, with 1% inclusion of burned sandstones, 10% inclusions of natural sandstone rocks, and root disturbances. Stratum III was a dark brown (10YR3/3) sandy loam up to 19 cm thick, with 5% inclusion of charcoal and 10% inclusion of sandstone rocks. Stratum IV was a dark yellowish brown (10YR4/4) loamy sand 18 to 34 cm thick, with 5% inclusions of charcoal, 10% inclusion of natural sandstone rocks, and root disturbances. A fragment of bone, possibly worked, was recovered from this stratum. Feature 1 was exposed at the bottom of Stratum IV. Stratum V was a strong brown (7.5YR4/6) sandy loam at least 23 cm thick, with a 75% inclusion of calcium carbonates, 10% inclusions of natural sandstone rocks, and root disturbances. Flaked stone, ground stone, and bone were recovered from Strata II to IV. Stratum II was associated with the uppermost stain seen in backhoe trench SU 97.

Study Unit 79

The southwest corner grid coordinates of SU 79 were N176.53, E171.35. This 1-by-1-m unit was placed over the west half of Feature 3, a circular rock alignment. Excavation in SU 79 was limited to the Feature 3 fill. The feature was excavated to a depth of 24 cm in four levels revealing three strata (described below). Stratum I was a yellowish brown (10YR5.4) loamy sand 2 cm thick, with few root disturbances. Stratum II was a dark yellowish brown (10YR3/2 to 10YR3/4) loamy sand up to 16 cm thick, with 0.5% light charcoal mottling and 5% root disturbances. Flaked lithic artifacts were recovered from Stratum II. Stratum III was a yellowish brown (10YR5/4) loamy sand 3 to 5 cm thick, with a few root disturbances. A possible occupation surface was defined at the bottom of Stratum III.

Study Unit 80

The southwest corner grid coordinates of SU 80 were N150, E128.7. This 1-by-1-m unit was placed over the east half of Feature 2, a circular thermal pit. Excavation in SU 80 was limited to the Feature 2 fill. The feature was excavated to a depth of 35 cm in four levels revealing two strata (described below). Stratum I was a dark yellowish brown (10YR4/4) loamy sand 5 cm thick, with few root disturbances. Stratum II was a dark yellowish brown (10YR4/4) loamy sand 20 to 34 cm thick, with inclusions of charcoal (5%), burned earth, calcium carbonates, sandstone rocks (10%), and root disturbances. Articulated bones of a jackrabbit (*Lepus* sp.) were recovered from the bottom of Feature 2 in this stratum. Flaked lithic artifacts were recovered from both strata. A possible occupation surface was revealed in the eastern half of the bottom of the unit.

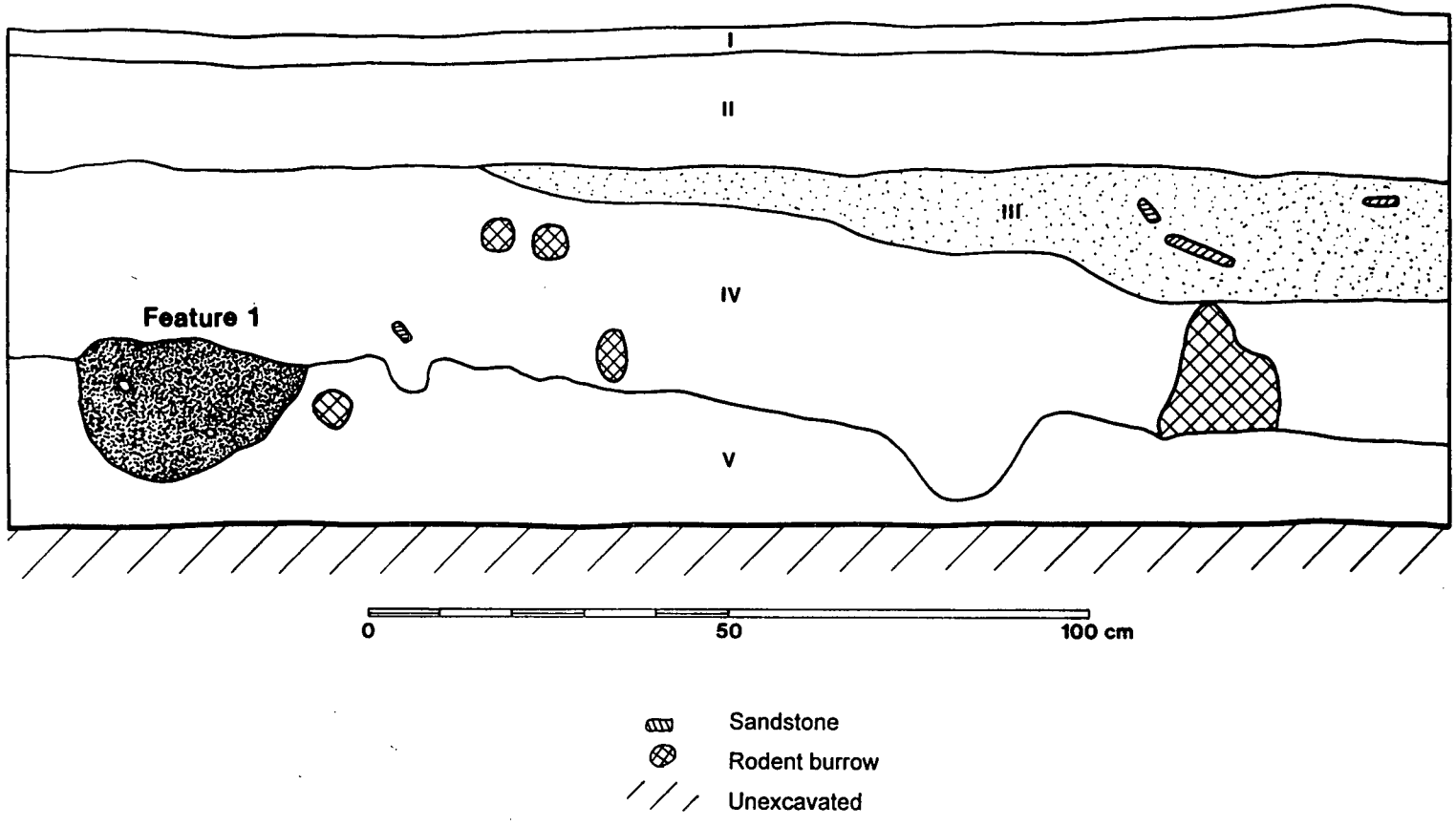


Figure 20.10. Site NM-Q-23-60, Study Unit 77, West Wall Profile Showing Feature 1.

Study Unit 81

The southwest corner grid coordinates of SU 81 were N162.89, E143.63. This 1-by-1-m unit was placed within an area of dark stained soil in artifact concentration C. SU 81 was excavated to a depth of 50 cm in three levels. The north wall profile was drawn showing three strata (Figure 20.11). Stratum I was a yellowish brown (10YR5/6) loamy sand 5 to 18 cm thick, with few root disturbances. Stratum II was a dark yellowish brown (10YR4/4) loamy sand 5 to 13 cm thick, with inclusions of charcoal (5%), natural sandstone gravel (10%), calcium carbonates (1%), and root disturbances. Stratum III was a dark yellowish brown (10YR3/3) loamy sand 5 to 17 cm thick, with inclusions of charcoal, calcium carbonates, sandstone rocks, and root disturbances. Flaked lithic artifacts were recovered from this unit. Feature 13, a dark soil stain, was noted at the bottom of the unit. The south half of the feature was excavated.

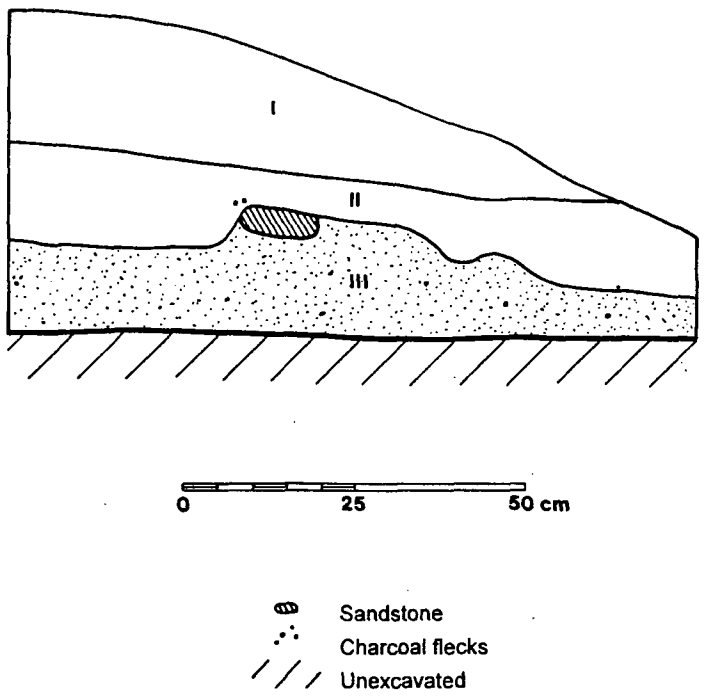


Figure 20.11. Site NM-Q-23-60, Study Unit 81, North Wall Profile.

Study Unit 82

The southwest corner grid coordinates of SU 82 were N158.87, E162.70. This 1-by-1-m unit was placed at this location to further test for subsurface cultural deposits. SU 82 was excavated to a depth of 90 cm in 9 levels. The north wall profile was drawn showing four strata (Figure 20.12). Stratum I was a brown (10YR5/3) loamy sand deposit 18 cm thick, with inclusions of tree roots and duff, and natural sandstone gravels (5%). Stratum II was a dark yellowish brown (10YR4/4) loamy

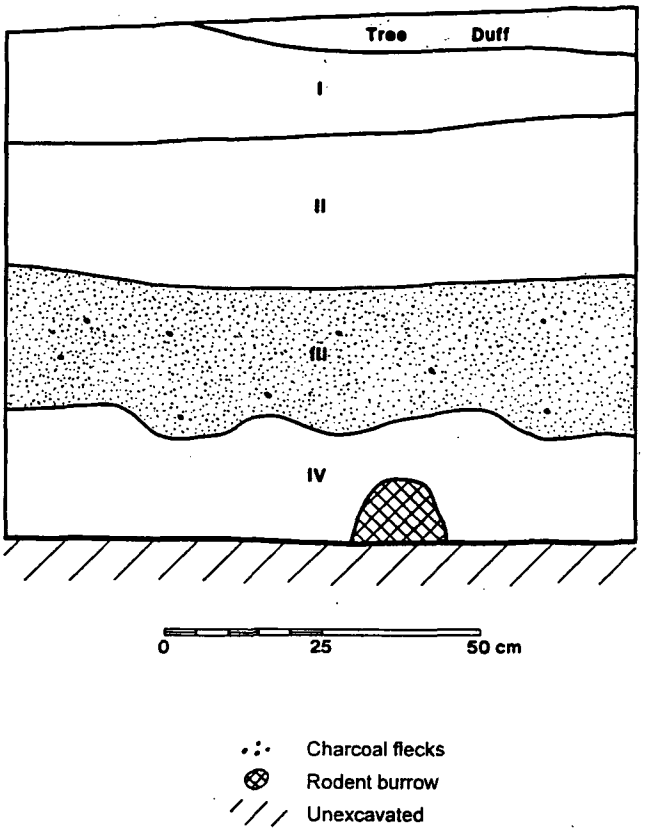


Figure 20.12. Site NM-Q-23-60, Study Unit 82, North Wall Profile.

sand 19 to 25 cm thick, with inclusions of natural sandstone gravels and root disturbances. Stratum III was a dark yellowish brown (10YR3/4) loamy sand 23 cm thick, with inclusions of charcoal, burned sandstones (5%), natural sandstone gravels (10%), and tree root disturbances. Stratum IV was a strong brown (7.5YR5/6) sandy loam with inclusions of charcoal (0.5%), calcium carbonates (5%), natural sandstone gravels, and tree root and rodent disturbances. Flaked lithic artifacts were recovered throughout this unit. A ceramic sherd was recovered from Stratum II, and ground stone and faunal material were recovered from Stratum IV.

Study Unit 83

The southwest corner grid coordinates of SU 83 were N143.5, E128.8. This 1-by-1-m unit was placed over the east half of Feature 14, a circular thermal pit located in the drainage coursing along the centerline. Excavation in SU 83 was limited to the Feature 14 fill. The feature was excavated to a depth of 28 cm in one level revealing one stratum (described below). Stratum I was a dark brown (10YR3/3) to dark yellowish brown (10YR4/6) sandy loam 25 cm thick, with inclusions of charcoal (5%), burned earth, natural sandstones (10%), and root disturbances. At the base of the unit the burned earth floor of Feature 14, a subrectangular thermal pit, was defined.

Backhoe Trench Excavation

The mechanical excavation of 19 trenches (SU 84 through 102) was conducted to explore for potential buried cultural deposits at site NM-Q-23-60. A backhoe with a 61-cm-wide (2-ft-wide) bucket was employed to excavate soil deposits deeper and over a broader area and in a shorter time than could be practically completed by hand. Trench excavation was closely monitored by a ZCRE archaeologist. Excavation was halted whenever a closer inspection of the trench walls or bottom was deemed necessary by the monitor. The 19 backhoe trenches at site NM-Q-23-60 totaled 216.4 m in length. At least one and a maximum of six representative soil profiles were drawn for each trench at site NM-Q-23-60. The trenches are described below.

In looking at the site map it will be noticed that two gaps in the backhoe trenches can be seen. One gap is between SU 91 and 94 and another gap is between SU 98 and 102. Trenching was not conducted in these areas at the request of the Navajo families affiliated with the site. The former gap is associated with the horse burial, the latter with a historic Navajo occupation area.

Study Unit 84

SU 84 was located at the southwestern extreme of the site, approximately 5 m west of the proposed centerline station 513+00. SU 84 extended from N81.48, E74.52 northwestward 13 m to N91.40, E66.33. Two 1-m-wide profiles (A-A' and B-B') were drawn of the northeast wall (Figure 20.13). Maximum depth was 1.25 m and three strata were identified. Stratum I was present on both profiles consisting of 4 to 6 cm of brown (10YR5/3) sand, with few root disturbances. Stratum II was present on both profiles and consisted of 30 to 40 cm of strong brown (7.5YR5/6) sandy loam, with a 5% inclusion of natural sandstone gravels and root disturbances. Stratum III was present in both profiles and consisted of 59 to 79 cm of very pale brown (10YR7/4) loamy sand, with a 5% inclusion of natural sandstone gravels, calcium carbonates, and root disturbances. No cultural materials were present.

Study Unit 85

SU 85 extended from N85.96, E88.53 northeastward 13 m to N94.55, E97.49. Two 1-m-wide profiles (C-C' and D-D') were drawn of the southeast wall (Figure 20.14). Maximum depth was 1.38 m and four strata were identified in the profiles. Stratum I was present in both profiles and consisted of 2 to 6 cm of brown (10YR5/3) sand, with a few root disturbances. Stratum II was present in both profiles and consisted of strong brown (7.5YR5/6) sandy loam, with few root disturbances. Stratum II was at least 53 cm thick in profile C-C' and 68 cm thick in profile D-D'. Stratum III was present in both profiles and consisted of light yellowish brown (10YR6/4) loamy sand, with a 5% inclusion of sandstone gravels and calcium carbonates. Stratum III was up to 80 cm thick in profile C-C' and was 12 to 33 cm thick in profile D-D'. Stratum IV was present in both profiles and consisted of very pale brown (10YR7/4) loamy sand, with a 5% inclusion of natural sandstone gravels and calcium carbonates. Stratum IV was 32 cm thick in profile C-C' and at least 10 to 38 cm thick in profile D-D'. No cultural materials were present.

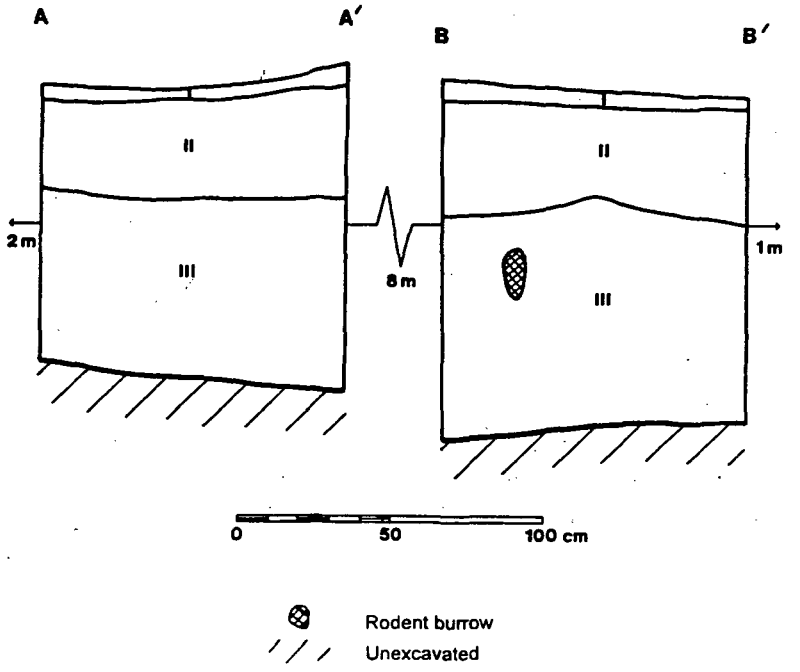


Figure 20.13. Site NM-Q-23-60, Study Unit 84, Northeast Wall Profiles A-A', and B-B'.

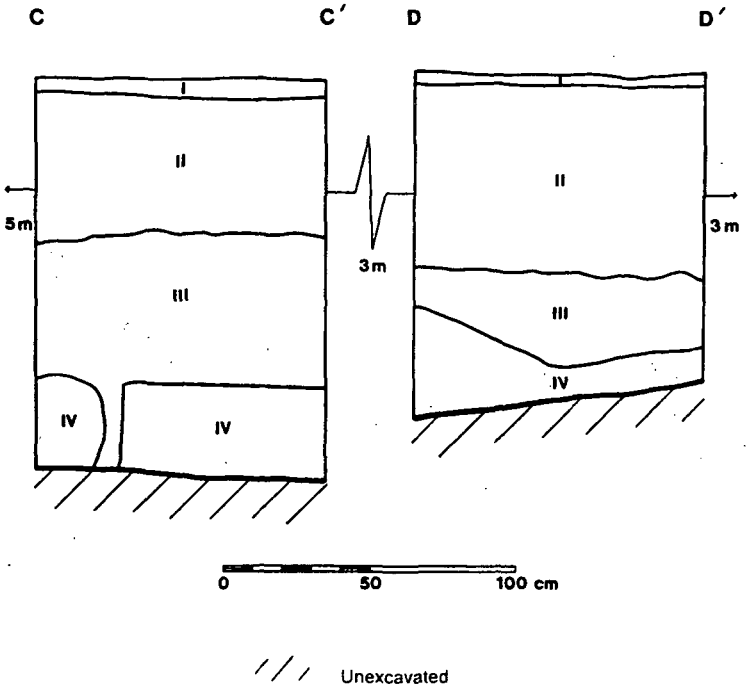


Figure 20.14. Site NM-Q-23-60, Study Unit 85, Southeast Wall Profiles C-C', and D-D'.

Study Unit 86

SU 86 was excavated perpendicularly across the proposed centerline. The trench extended from N99.56, E85.76 northwestward 10.3 m to N106.68, E79.04. Two 1-m-long profiles (E-E' and F-F') were drawn of the southwest wall (Figure 20.15). Maximum depth was 1.55 m, and four strata were identified. Stratum I was present in both profiles and consisted of brown (10YR5/3) sand, with very few root disturbances. Stratum I was 5 cm thick in profile E-E' and 9 cm thick in profile F-F'. Stratum II was present in both profiles and consisted of 10 cm of strong brown (7.5YR5/6) sandy loam, with a 5% inclusion of sandstone gravels and very few root disturbances. Stratum III was present in both profiles and consisted of light yellowish brown (10YR6/4) loamy sand, with a 5% inclusion of natural sandstone gravels and very few root disturbances. Stratum III was 6 to 10 cm thick in profile E-E' and 23 to 31 cm thick in profile F-F'. Stratum IV was present in both profiles and consisted of very pale brown (10YR7/4) loamy sand, with a 5% inclusion of natural sandstone gravels, a 50% inclusion of calcium carbonates, and very few root disturbances. Stratum IV was 92 cm thick in profile E-E' and at least 105 cm thick in profile F-F'. No cultural materials were present.

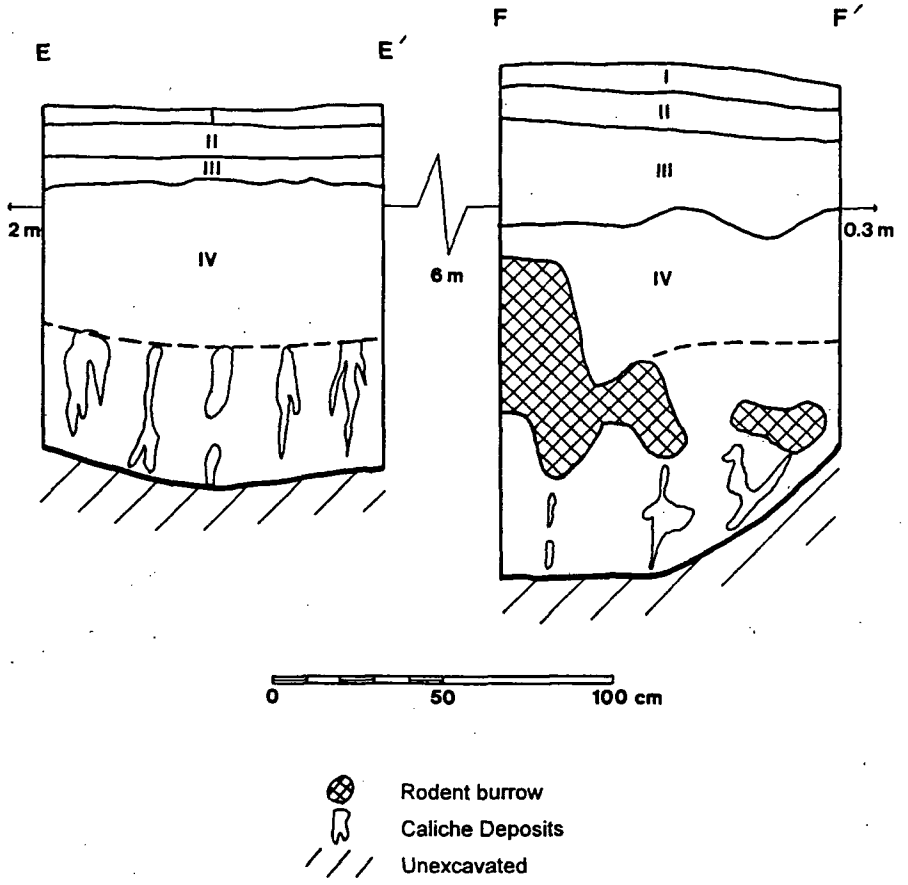


Figure 20.15. Site NM-Q-23-60, Study Unit 86, Southwest Wall Profiles E-E' and F-F'.

Study Unit 87

SU 87 extended from N111.29, E67.66 northeastward 10.2 m to N114.89, E75.70. Two 1-m-long wide profiles (profile G-G' and profile H-H') were drawn of the northwest wall (Figure 20.16). Maximum depth was 1.2 m and four strata were identified. Stratum I was present in both profiles and consisted of 4 to 12 cm of brown (10YR5/3) sand, with few root disturbances. Stratum II was present in both profiles and consisted of strong brown (7.5YR5/6) sandy loam, with very few root disturbances. Stratum II was 16 to 22 cm thick in profile G-G' and 11 to 17 cm thick in profile H-H'. Stratum III was present in both profiles and consisted of light yellowish brown (10YR6/4) loamy sand, with a 5% inclusion of sandstone gravels and very few root disturbances. Stratum III was 13 to 18 cm thick in profile G-G' and 8 to 14 cm thick in profile H-H'. Stratum IV was present in both profiles and consisted of a very pale brown (10YR7/4) loamy sand, with a 5% inclusion of natural sandstone gravels and a 5 to 10% inclusion of calcium carbonates. Stratum IV was at least 75 cm thick in profile G-G' and 57 cm thick in profile H-H'. No cultural materials were present.

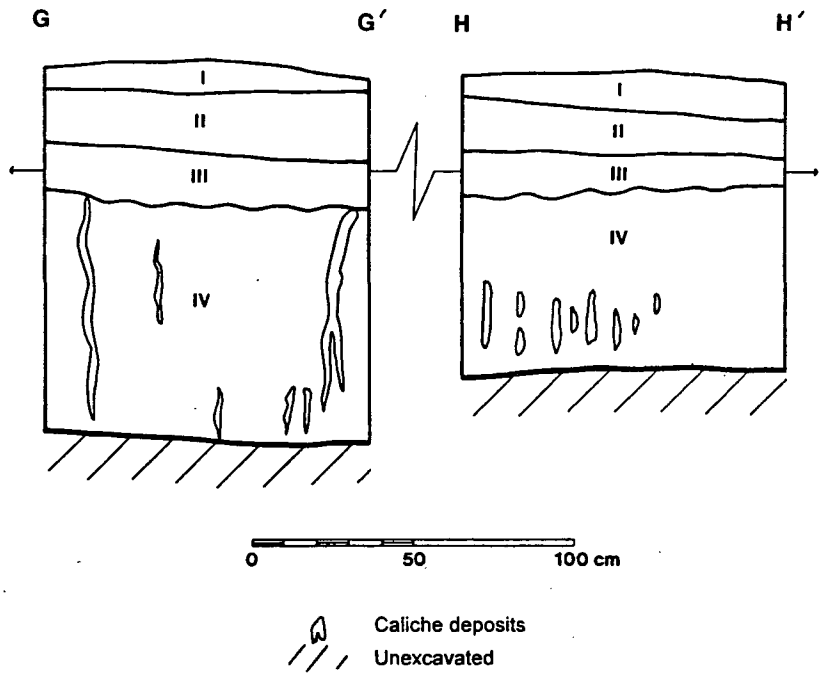


Figure 20.16. Site NM-Q-23-60, Study Unit 87, Northwest Wall Profiles G-G' and H-H'.

Study Unit 88

SU 88 extended from N121.75, E89.86 northwestward 8 m to N128.17, 84.81. Two 1-m-wide profiles (profile I-I' and profile J-J') were drawn of the northeast wall (Figure 20.17). Maximum depth was 83 cm, and four strata were identified. Stratum I was present in both profiles consisting of 4 to 10 cm of brown (10YR5/3) sand, with few root disturbances. Stratum II was

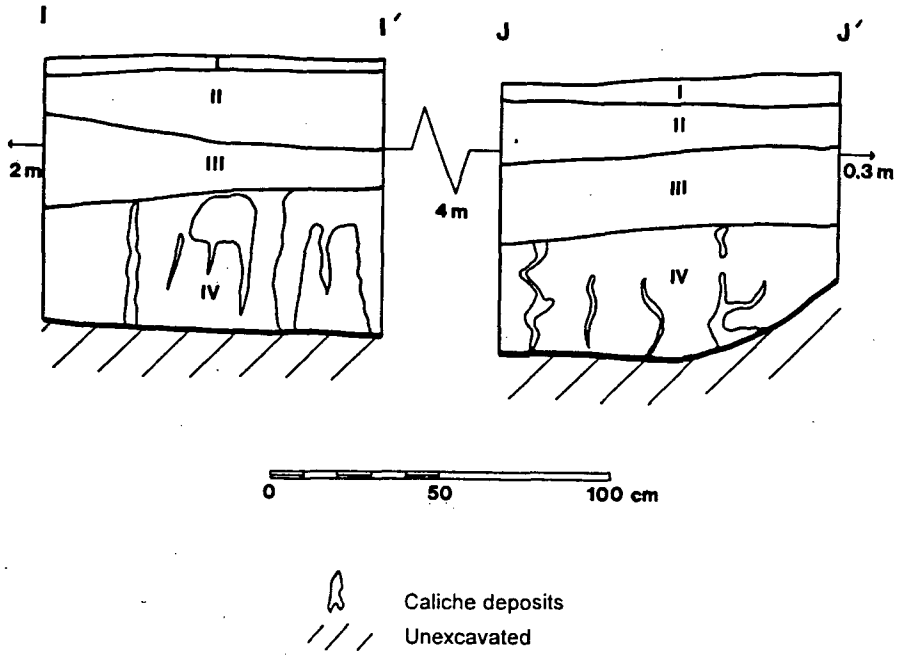


Figure 20.17. Site NM-Q-23-60, Study Unit 88, Northeast Wall Profiles I-I' and J-J'.

present in both profiles and consisted of 10 to 23 cm of strong brown (7.5YR5/6) sandy loam, with very few root disturbances. Stratum III was present in both profiles and consisted of a light yellowish brown (10YR6/4) loamy sand, with a 5% inclusion of sandstone gravels and very few root disturbances. Stratum III was at least 10 to 28 cm thick in profile I-I' and 23 cm thick in profile J-J'. Stratum IV was present in both profiles and consisted of at least 45 cm of very pale brown (10YR7/4) loamy sand, with inclusions of sandstone gravels, calcium carbonates (10 to 20%) and very few root disturbances. No cultural materials were present.

Study Unit 89

SU 89 extended from N129.97, E107.70 northwestward 9 m to N136.69, E102.08. Two 1-m-wide profiles (profile K-K' and profile L-L') were drawn of the northeast wall (Figure 20.18). Maximum depth was 1.34 m and four strata were identified. Stratum I was present in both profiles and consisted of 6 to 12 cm of brown (10YR5/3) sand, with few root disturbances. Stratum II was present in both profiles. Stratum II on profile K-K' exhibited a strong brown (7.5YR5/6) sandy loam and on profile L-L', a yellowish brown (10YR5/4) sandy loam, with a 25% inclusion of sandstone gravels and with few root disturbances. Stratum II was 16 to 28 cm thick in profile K-K' and 20 cm thick in profile L-L'. Stratum III was present in both profiles and consisted of at least 87 to 96 cm of light yellowish brown (10YR6/4) loamy sand, with a 5% inclusion of sandstone gravels, 20 to 100% calcium carbonates, and root and rodent disturbances. The quantity of caliche drops to approximately 2% in the bottom 25 cm of Stratum III. Stratum IV was present in both profiles and consisted of at least 11 cm of light gray (10YR7/2) clay loam, with inclusions of calcium carbonates. No cultural materials were present.

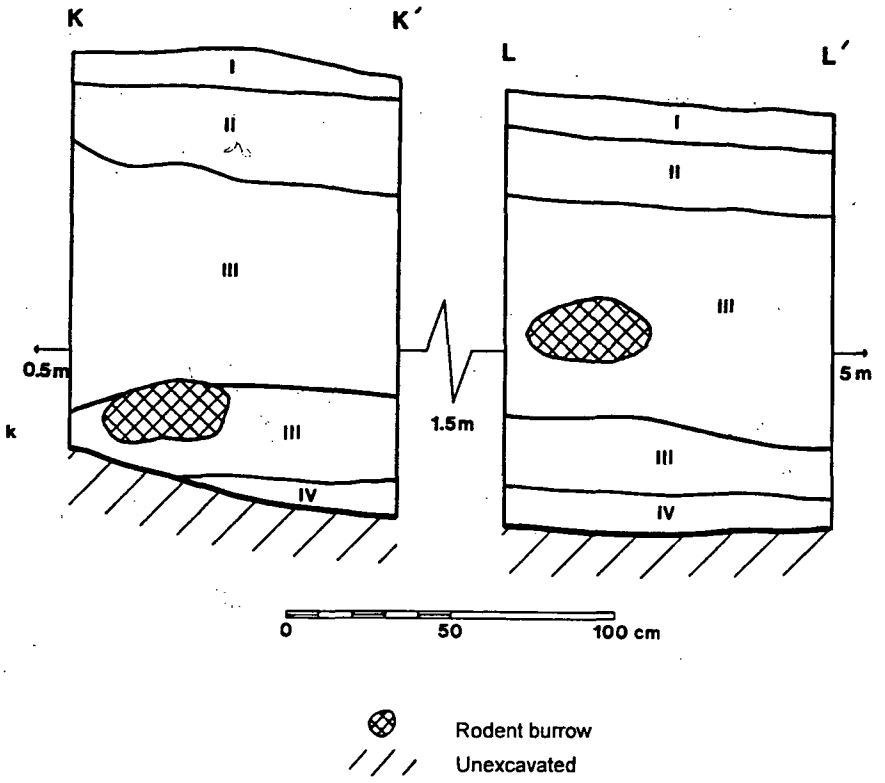


Figure 20.18. Site NM-Q-23-60, Study Unit 89, Northeast Wall Profiles K-K' and L-L'.

Study Unit 90

SU 90 extended from N116.15, E120.06 northwestward 7 m to N121.33, E115.31. Two 1-m-wide profiles (profile M-M' and profile N-N') were drawn of the northeast wall (Figure 20.19). Maximum depth was 1.43 m, and three strata were identified. Stratum I was present in both profiles and consisted of brown (10YR5/3) sand, with moderate root disturbances. Stratum I was 7 to 16 cm thick in profile M-M' and 11 to 24 cm thick in profile N-N'. Stratum II was present in both profiles and consisted of strong brown (7.5YR5/6) sandy loam, with moderate inclusions of sandstone gravels and very few root disturbances. Stratum II was 20 cm thick in profile M-M' and at least 17 to 28 cm thick in profile N-N'. Stratum III was present in both profiles and consisted of at least 104 cm of light yellowish brown (10YR6/4) loamy sand, with inclusions of sandstone gravels, calcium carbonates, and very few root disturbances. No cultural materials were present.

Study Unit 91

SU 91 extended from N122.26, E131.41 in artifact concentration E west-northwest 6.5 m to N124.57, E124.57. Two 1-m-wide profiles (profile O-O' and profile P-P') were drawn of the southwest wall (Figure 20.20). Maximum depth was 110 cm and three strata were identified. Stratum I was present in both profiles consisting of brown (10YR5/3) sand, with few root

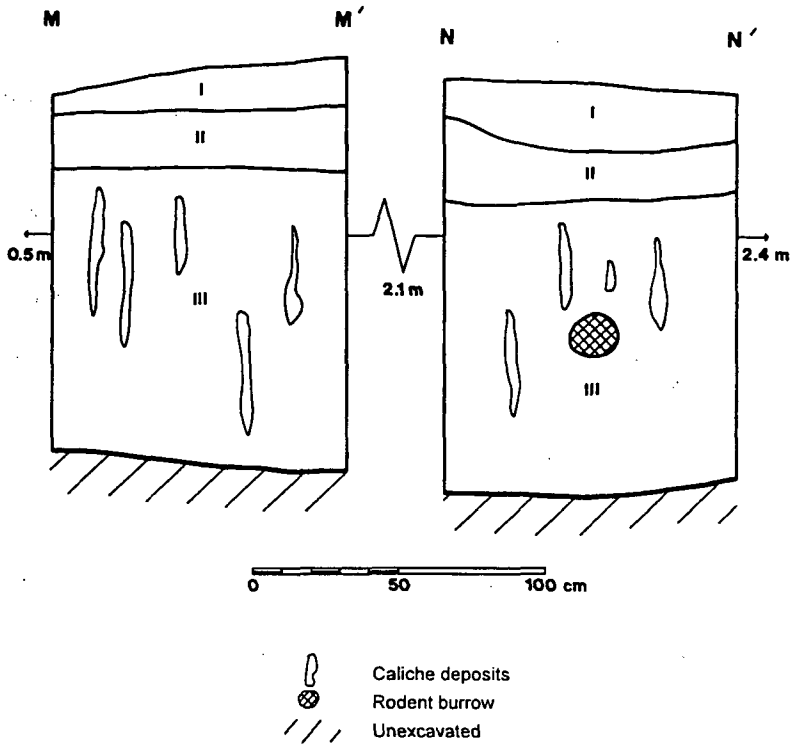


Figure 20.19. Site NM-Q-23-60, Study Unit 90, Northeast Wall Profiles M-M' and N-N'.

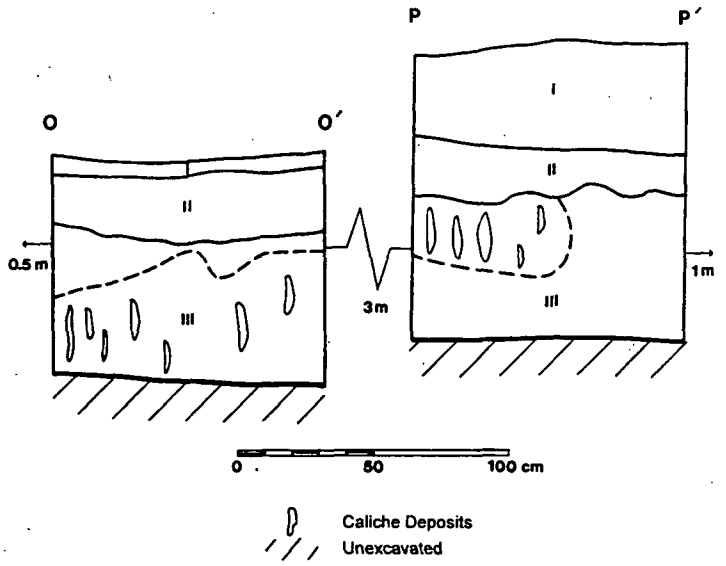


Figure 20.20. Site NM-Q-23-60, Study Unit 91, Southwest Wall Profiles O-O' and P-P'

disturbances. Stratum I was 6 cm thick in profile O-O' and up to 40 cm thick in profile P-P'. Stratum II was present in both profiles and consisted of strong brown (7.5YR5/6) sandy loam, with a few root disturbances. Stratum II was 17 to 26 cm thick in profile O-O' and 13 to 22 cm thick in profile P-P'. Stratum III was present in both profiles consisting of at least 50 cm of light yellowish brown (10YR6/4) loamy sand, with a 10% to 20% inclusion of calcium carbonates, less than 10% inclusions of sandstone gravels, and root disturbances. No cultural materials were present.

Study Unit 92

SU 92 extended from N141.68, E122.71 northwestward 18.8 m to N153.51, E108.95. The northwest end of the trench was located in a dense artifact scatter identified as concentration D. Two 1-m-wide profiles (profile Q-Q' and profile R-R') were drawn of the southwest wall (Figure 20.21). Maximum depth was 1.96 m; four strata were identified in profile Q-Q' and three strata were identified in profile R-R'. Stratum I was present in both profiles consisting of at least 7 cm of brown (10YR5/3) sands, with very few root disturbances. Stratum II was present in both profiles consisting of strong brown (7.5YR5/6) sandy loam, with inclusions of sandstone gravels and root disturbances. Stratum II was 14 to 20 cm thick in profile Q-Q' and up to 35 cm thick in profile R-R'. Stratum III was present in both profiles and consisted of at least 162 cm of yellowish brown (10YR6/4) loamy sand, with inclusions of natural sandstone gravels, calcium carbonates (up to 50%), and root disturbances. Stratum IV was only present on profile Q-Q' and consisted of at least 11 cm of very pale brown (10YR7/4) loamy sand, with inclusions of calcium carbonates. No cultural materials were present.

Study Unit 93

SU 93 extended from N151.55, E127.70 northwestward 11.3 m to N161.27, E121.70. The northwest end was near a small artifact scatter identified as concentration F. Two 1-m-wide profiles (profile S-S' and profile T-T') were drawn of the southwest wall (Figure 20.22). Maximum depth was 153 cm and four strata were identified. Stratum I was present in both profiles and consisted of brown (10YR5/3) sands, with few root disturbances. Stratum I was 5 cm thick in profile S-S' and 13 cm thick in profile T-T'. Stratum II was present in both profiles. Stratum II on profile S-S' consisted of a light yellowish brown (10YR6/4) sandy loam, and in profile T-T' consisted of a strong brown sandy loam, with a 10% inclusion of sandstone gravels, and root and rodent disturbances. Stratum II was 10 to 32 cm thick in profile S-S' and 4 to 18 cm thick in profile T-T'. Stratum III was present in both profiles and consisted of a light yellowish brown (10YR6/4) loamy sand, with a 10% inclusion of sandstone gravels, a 30% calcium carbonate inclusion, and very few root disturbances. Stratum III was up to 70 cm thick in profile S-S' and at least 20 to 50 cm thick in profile T-T'. Stratum IV was present in both profiles and consisted of a very pale brown (10YR7/4) loamy sand, with inclusions of calcium carbonates (30%) and a few root and rodent disturbances. Stratum IV was at least 60 cm thick in profile S-S' and 95 cm thick in profile T-T'. No cultural materials were present.

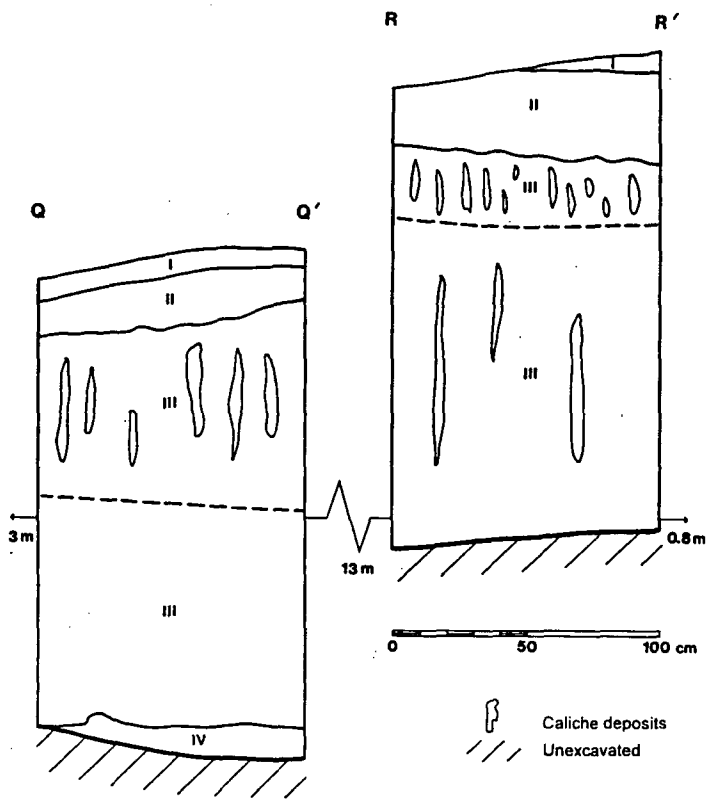


Figure 20.21. Site NM-Q-23-60, Study Unit 92, Southwest Wall Profiles Q-Q' and R-R'.

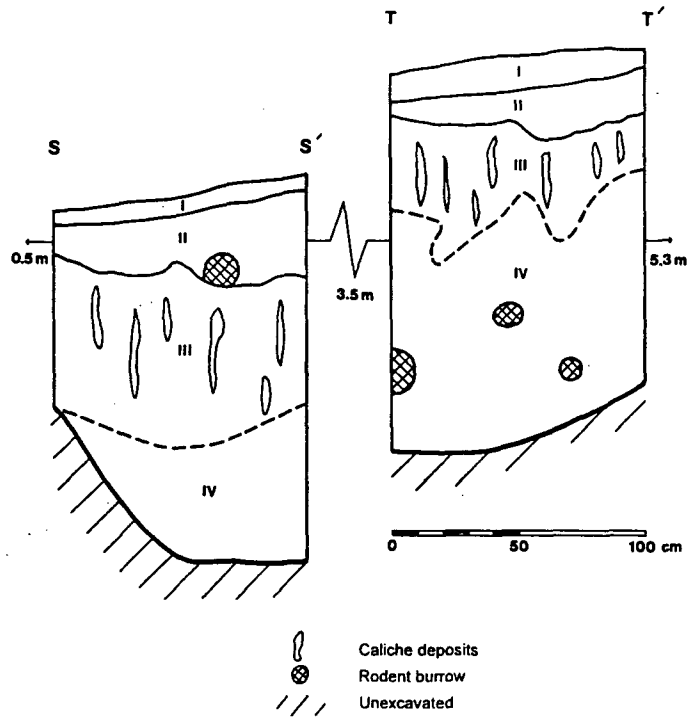


Figure 20.22. Site NM-Q-23-60, Study Unit 93, Southwest Wall Profiles S-S' and T-T'.

Study Unit 94

SU 94 extended from N144.25, E151.24 northwestward 7.2 m to N148.89, E146.17. Two 1-m-wide profiles (profile U-U' and profile V-V') were drawn of the southwest wall (Figure 20.23). Maximum depth was 1.25 cm and three strata were identified. Stratum I was present in both profiles and consisted of yellowish brown (10YR5/4) sand, with root disturbances. Stratum I was 12 to 23 cm thick in profile U-U' and 15 cm thick in profile V-V'. Stratum II was present in both profiles and consisted of 15 to 24 cm of yellowish brown (10YR5/4) loamy sand, with an inclusion of natural sandstone gravels and some root disturbances. Stratum III was present in both profiles and consisted of light yellowish brown (10YR6/4) loamy sand, with an inclusion of calcium carbonates (10%) and some root disturbances. Stratum III was at least 67 cm thick in profile U-U' and 87 cm thick in profile V-V'. No cultural materials were present.

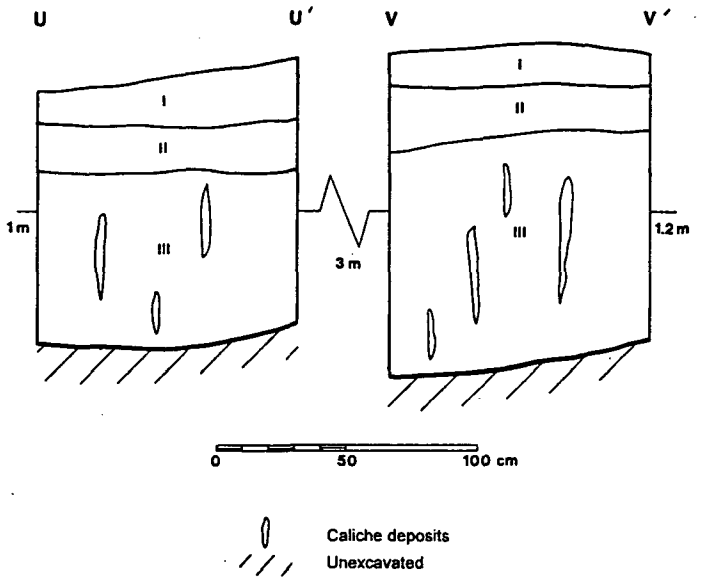


Figure 20.23. Site NM-Q-23-60, Study Unit 94, Southwest Wall Profiles U-U' and V-V'.

Study Unit 95

SU 95 extended from N160.57, E135.08 northwestward 12.3 m to N169.54, E128.10. One 3-m-wide profile (profile W-W') was drawn of the northeast wall (Figure 20.24). Maximum depth was 148 cm and four strata were identified. Stratum I consisted of at least 20 to 24 cm of yellowish brown (10YR5/4) sand, with few root disturbances. Stratum II consisted of 13 to 32 cm of strong brown (7.5YR5/6) sandy loam, with an inclusion of natural sandstone gravels and some root disturbances. Stratum III consisted of at least 43 to 55 cm of light yellowish brown (10YR6/4) loamy sand, with a mixture of calcium carbonates (30%) and few root disturbances. Stratum IV consisted of at least 46 cm of very pale yellow (10YR7/4) loamy sand, with very few root disturbances. No cultural materials were present.

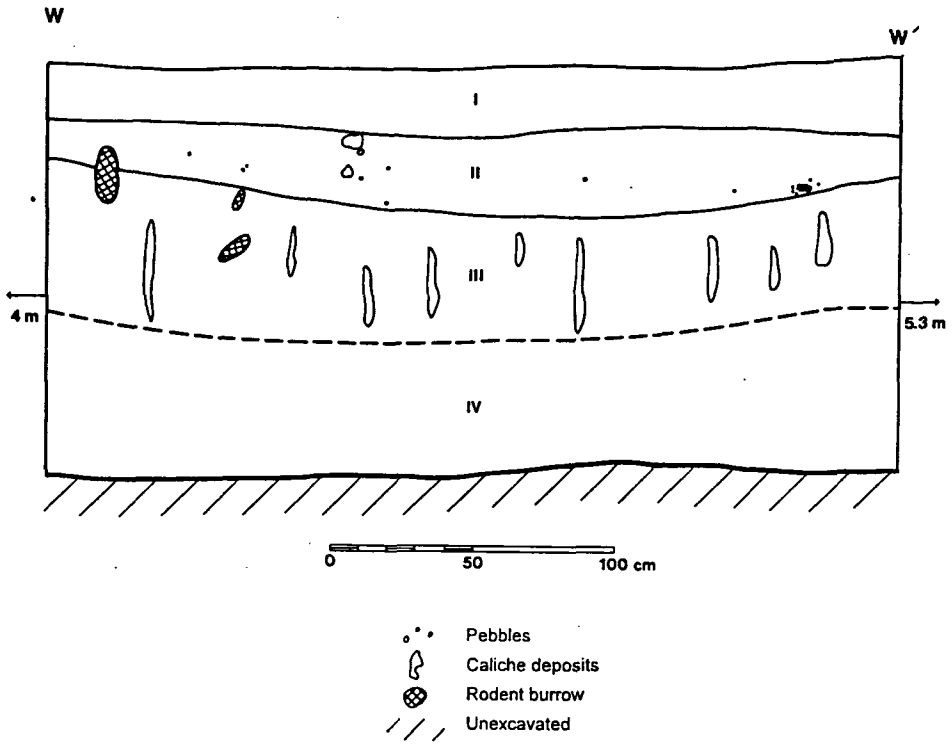


Figure 20.24. Site NM-Q-23-60, Study Unit 95, Northeast Wall Profile W-W'.

Study Unit 96

SU 96 extends from N163.01, E150.09 northwestward 17.3 m to N175.57, E138.93. The southeast end of the trench extended into artifact concentration C. One 1-m-wide profile (profile X-X') and one 2-m-wide profile (profile Y-Y') were drawn of the southwest wall (Figure 20.25). Maximum depth was 160 cm. Five strata were identified in profile X-X' which will be described first. Stratum I consisted of 5 cm of yellowish brown (10YR5/6) sand, with very few root disturbances. Stratum II consisted of up to 35 cm of strong brown (7.5YR5/6) sandy loam, with a less than 10% inclusion of sandstone gravels and some root disturbances. Stratum III consisted of up to 40 cm of light yellowish brown (10YR6/4) loamy sand, with a 30% calcium carbonate inclusion, less than 10% inclusion of sandstone gravels, and some root disturbances. Stratum IV consisted of 67 to 80 cm of very pale yellow (10YR7/4) loamy sand, with very few root disturbances. Stratum V consisted of at least 10 cm of light gray (10YR7/2) clay loam, with calcium carbonate inclusions. No cultural materials were noted.

Four strata were identified in Profile Y-Y'. Stratum I, like in Stratum I in profile X-X', consisted of yellowish brown (10YR5/4) sandy loam, with very few root disturbances. Stratum I was up to 25 cm thick. Stratum II consisted of up to 36 cm of yellowish brown (10YR5/4) sandy loam, with some root disturbances. A light ashy stain layer 10 cm thick by 94 cm long was noted in the

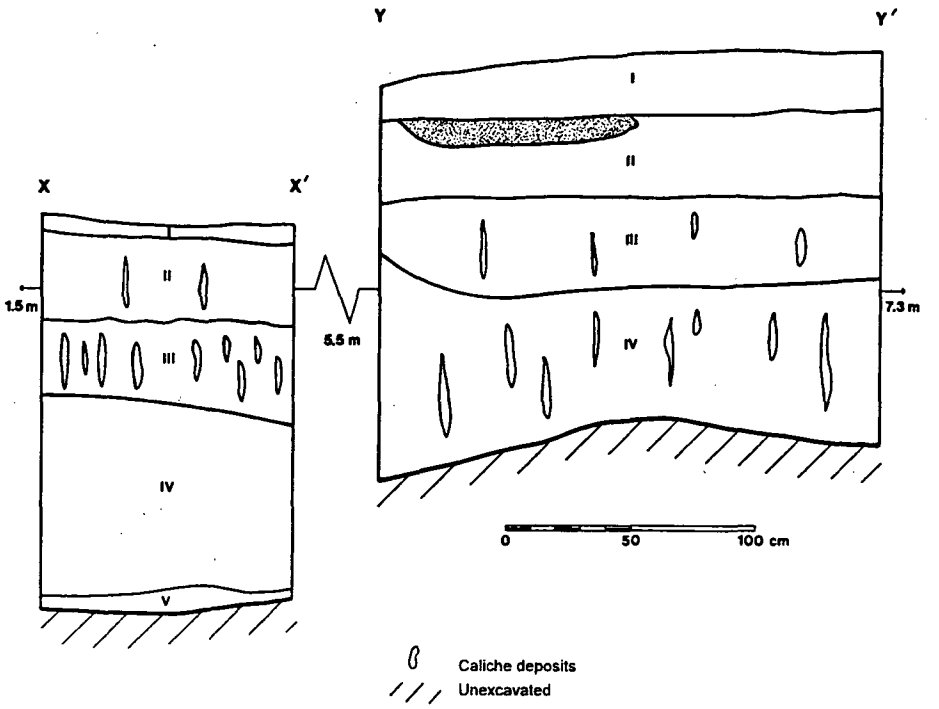


Figure 20.25. Site NM-Q-23-60, Study Unit 96, Southwest Wall Profile X-X' and Y-Y'.

sand, with a 10% calcium carbonate inclusion and a few root disturbances. Stratum III was up to 41 cm thick. Stratum IV, like Stratum III in profile X-X', consisted of light yellowish brown (10YR6/4) loamy sand, with a 20% inclusion of calcium carbonates. Stratum IV was at least 53 cm thick. No cultural materials were present.

Study Unit 97

SU 97 extended from N153.91, E165.07 northwestward 12.5 m to N163.05, E156.02. The trench was placed in this location to investigate the extent of subsurface cultural deposits observed in the nearby SU 77. Both entire trench walls were profiled (profiles Z-Z' and AA-AA'; Figures 20.26 and 20.27). Maximum depth was 191 cm and four strata were identified in both walls. Feature 12, an indeterminate pit feature, was observed in the northeast wall. Stratum I consisted of dark yellowish brown (10YR4/4) loamy sand, with a less than 10% inclusion of sandstone rocks and 10% root disturbances. Stratum I was 10 cm thick in profile Z-Z' and at least 10 to 28 cm thick in profile AA-AA'. No cultural material was present. Stratum II consisted of a very dark gray (10YR3/1) loamy sand mottled with dark brown (10YR3/3) loamy sand, with less than 10% charcoal mottling, some sandstone rocks, and a 10% root disturbance. Feature 12 was an extremely dark soil stain within Stratum II. Several flotation samples were collected from this stratum. Stratum II was 10 to 58 cm thick in profile Z-Z' and was at least 11 to 28 cm thick in profile AA-AA'. Stratum III was present in both profiles and consisted of both dark yellowish brown (10YR3/4) and very dark gray

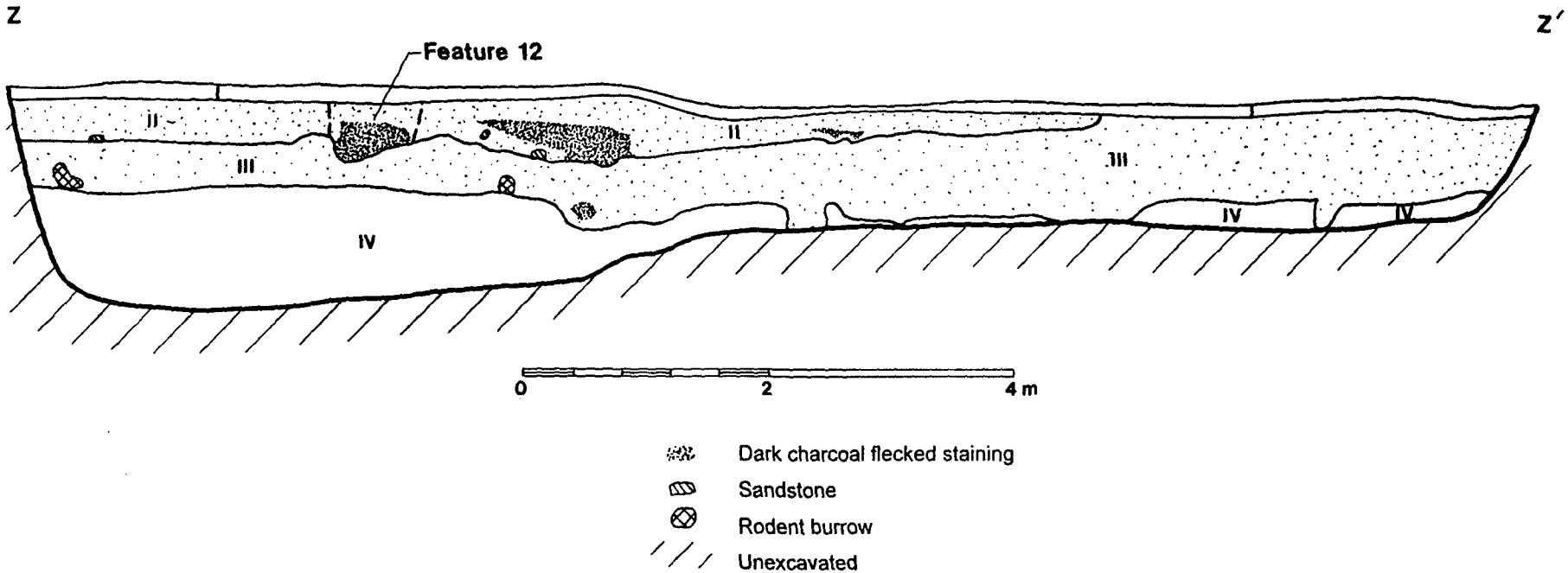


Figure 20.26. Site NM-Q-23-60, Study Unit 97, Northeast Wall Profile Z-Z' Showing Feature 12.

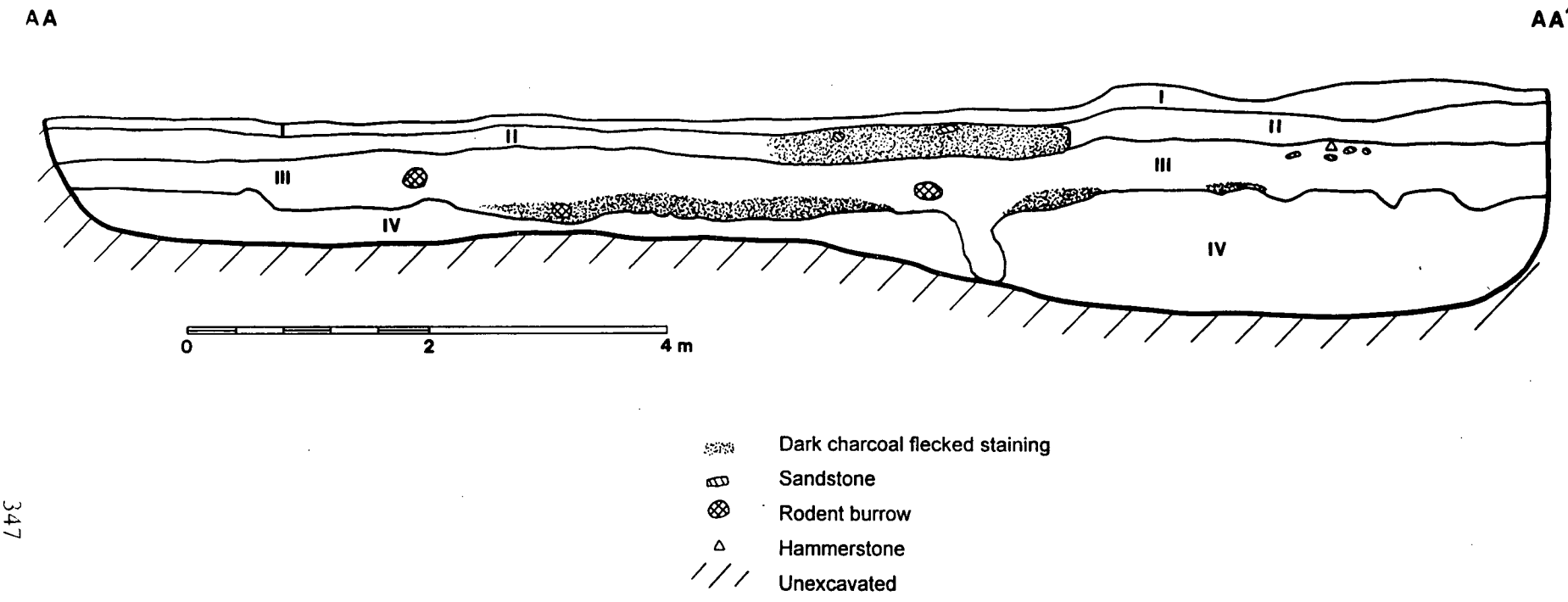


Figure 20.27. Site NM-Q-23-60, Study Unit 97, Southwest Wall Profile AA-AA'

(10YR3/1) loamy sand, with less than 10% charcoal mottling, a 25% inclusion of sandstone rocks, and less than 10% root and rodent disturbances. Flaked lithic artifacts were recovered from Stratum III. Stratum III was 20 to 75 cm thick in profile Z-Z' and 22 to 100 cm thick in profile AA-AA'. No cultural features were defined; however there was dark staining to suggest cultural activity. Flotation and radiocarbon samples were collected from the stain. The radiocarbon sample (FS 118, Beta-110376) yielded a calibrated intercept date of 380 BC with the one sigma calibrated range of 390 to 365 BC (conventional radiocarbon age date of 2290 ±40 BP). Stratum IV consisted of a dark yellowish brown (10YR4/6) loamy sand, with calcium carbonates comprising 75% of the matrix. Stratum IV was at least 10 to 100 cm thick in both profiles. No cultural material or features were present in this stratum.

Study Unit 98

SU 98 was located on the north-central part of the site and was placed within the boundaries of artifact concentration B. It was oriented southeast-to-northwest, beginning at the N11(2) centerline and crossing over the main drainage of site. The trench began at N168.73, E157.64 and extends northwestward 11 m to N177.44, E151.90 (Figure 20.28). One 2-m-wide profile of southwest wall (profile BB-BB') and one 1-m-wide profile of northeast wall (profile CC-CC') of the trench were

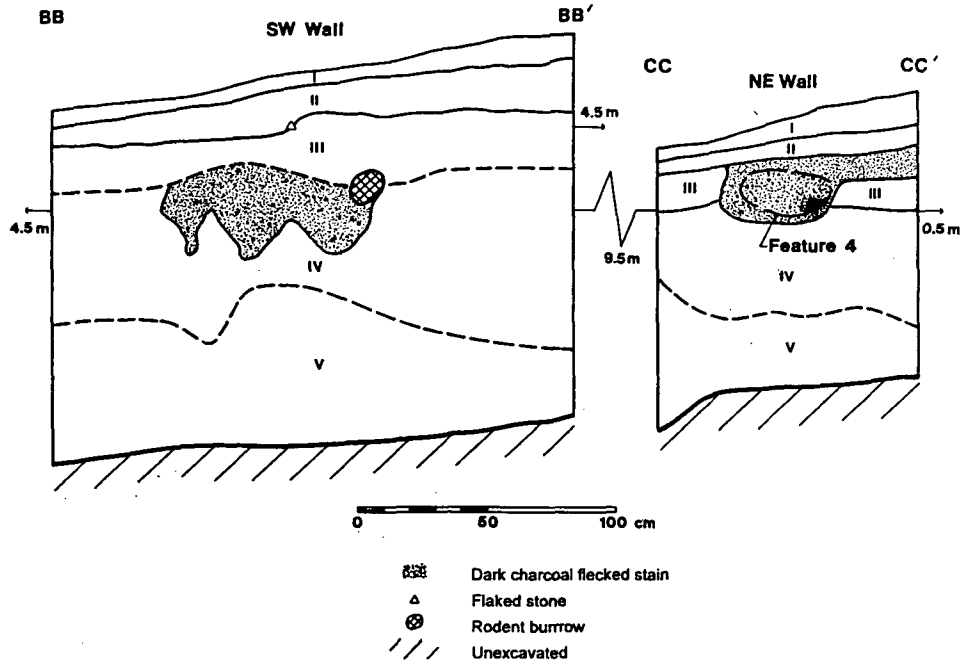


Figure 20.28. Site NM-Q-23-60, Study Unit 98, Southwest Wall Profiles BB-BB' and CC-CC' Showing Feature 4.

drawn. Maximum depth was 150 cm, and five strata were identified in each profile. Stratum I consisted of 4 to 12 cm of yellowish brown (10YR5/4) sand, with few root disturbances. Stratum II consisted of 5 to 18 cm of a sandy loam with less than 10% inclusion of natural sandstone gravels and few root disturbance. Stratum II in profile BB-BB' was yellowish brown (10YR5/4) and in profile CC-CC' was dark yellowish brown (10YR3/4). Two pieces of flaked stone debitage were recovered from the bottom of Stratum II in profile BB-BB'. Stratum III consisted of 10 to 30 cm of a strong brown (7.5YR5/6) sandy loam, with very few root disturbances. Feature 4 was defined within Stratum III as a dark soil stain (24 by 73 cm) flecked with charcoal in profile CC-CC'. Stratum IV consisted of 27 to 72 cm of a light yellowish brown (10YR6/4) loamy sand, with root disturbance. A dark charcoal flecked stain was noted in Stratum IV in profile BB-BB'. The stain was 75 cm long and up to 38 cm thick. Stratum V consisted of up to at least 25 cm of a very pale yellowish (10YR7/4) loamy sand, with 5% matrix of calcium carbonates and very few root disturbances. No cultural materials were present in the east wall profile.

Study Unit 99

SU 99 was located on the northeastern part of the site and was oriented southeast-to-northwest. This area was chosen in order to investigate the extent of subsurface deposits that had been previously observed within SU 77. The trench extended from N153.68, E171.70 northwestward 21 m to N171.82, E160.18 into artifact concentration B. Two 1-m-long and one 5-m-long profiles were drawn of each wall of the trench. From the northwest end the northeast wall profiles (Figure 20.29) were located at 1 to 2 m (profile DD-DD'), 9 to 10 m (profile EE-EE'), and 14 to 19 m (profile FF-FF'). From the southeast end of the trench the southwest wall profiles (Figure 20.30) were located at 3 to 8 m (profile GG-GG'), 11 to 12 m (profile HH-HH'), and 18 to 19 m (profile II-II'). Profiles of equal length were drawn from opposing sides of the trench. Maximum depth was 130 cm, and six strata were identified in both east and west walls.

The stratigraphy is described below. Stratum I was present on all six profiles and consisted of a dark yellowish brown (10YR4/4) loamy sand, with less than 10% inclusion of sandstone rocks and 20% root disturbances. Stratum I was 8 to 12 cm thick on the northeast wall profile and 7 to 10 cm thick on the southwest wall profile. No cultural material was present in Stratum I. Stratum II consisted of a dark yellowish brown (10YR3/4) loamy sand, with less than 10% inclusion of sandstone rocks and 20% root disturbance. A soil sample was collected from this profile. Stratum II was 12 to 55 cm thick. No cultural materials were present in Stratum II. Stratum III was only present in profiles FF-FF' and GG-GG' and consisted of a black (10YR2/1) loamy sand, with 25% inclusion of sandstones, less than 10% charcoal mottling, and root disturbances. Stratum III in profile FF-FF' was 12 to 50 cm thick and Features 5, 8, 9, and 10 were identified in it. A radiocarbon sample (FS 138, Beta-110374) from Feature 5 yielded calibrated intercept date of 390 BC with a one-sigma calibrated range of 400 to 380 BC (conventional radiocarbon age of 2330±40 BP). Stratum III was up to 85 cm thick in profile GG-GG' and Features 6 and 7 were identified in it. Several pieces of flaked stone were recovered from Stratum III in profile GG-GG'. Stratum IV was present on all profiles and consisted of a brown (10YR4/3) loamy sand with clumps of strong brown (7.5YR5/6) loamy sand, with less than 10% root and rodent disturbance. Stratum IV was 57 to 77 cm thick in profiles DD-DD' and EE-EE' and at least 30 to 70 cm thick in profile FF-FF'. Stratum IV was 70 to 77 cm thick in profiles HH-HH' and II-II' and up to 79 cm thick in profile GG-GG'. No cultural material or features were present.

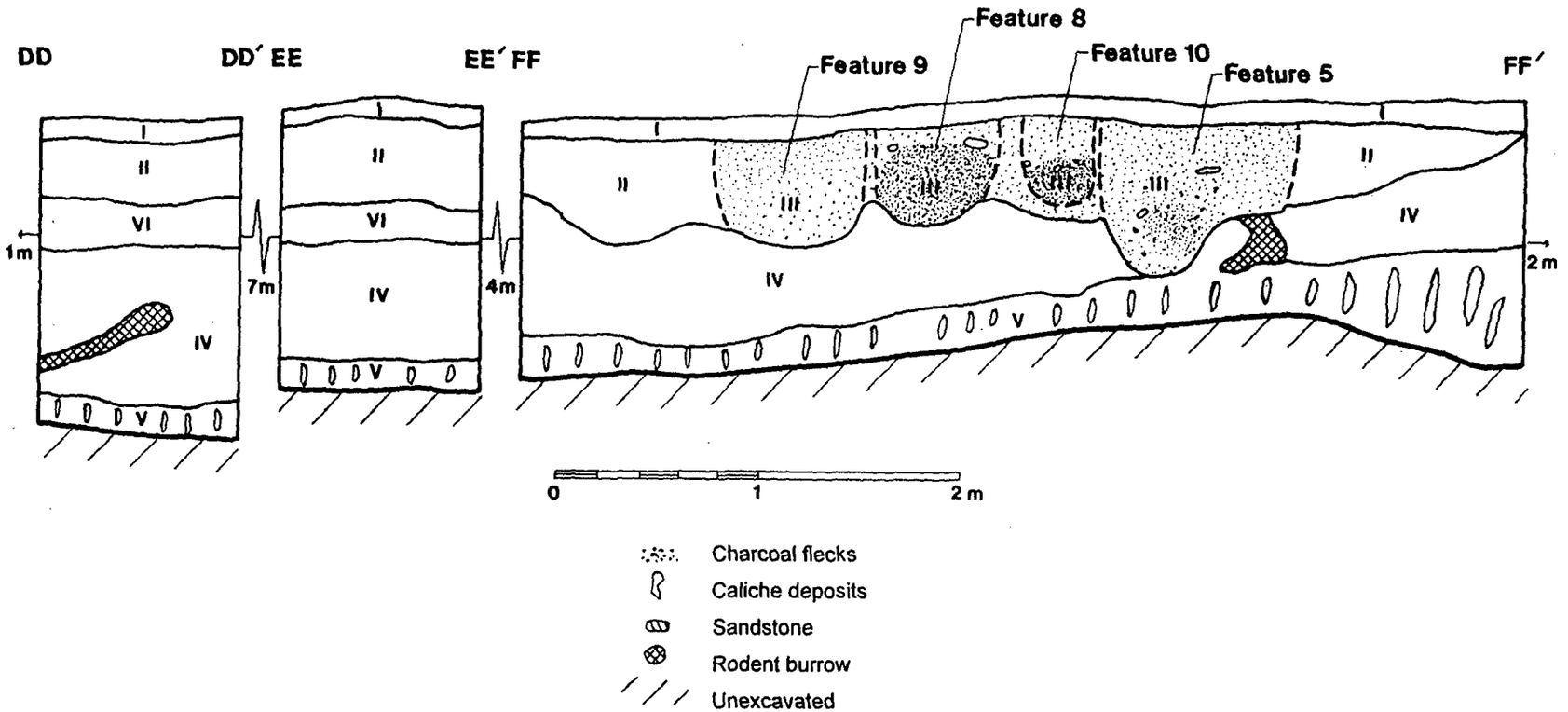


Figure 20.29. Site NM-Q-23-60, Study Unit 99, Northeast Wall Profiles DD-DD', EE-EE', and FF-FF' Showing Features 5, 8, 9, and 10.

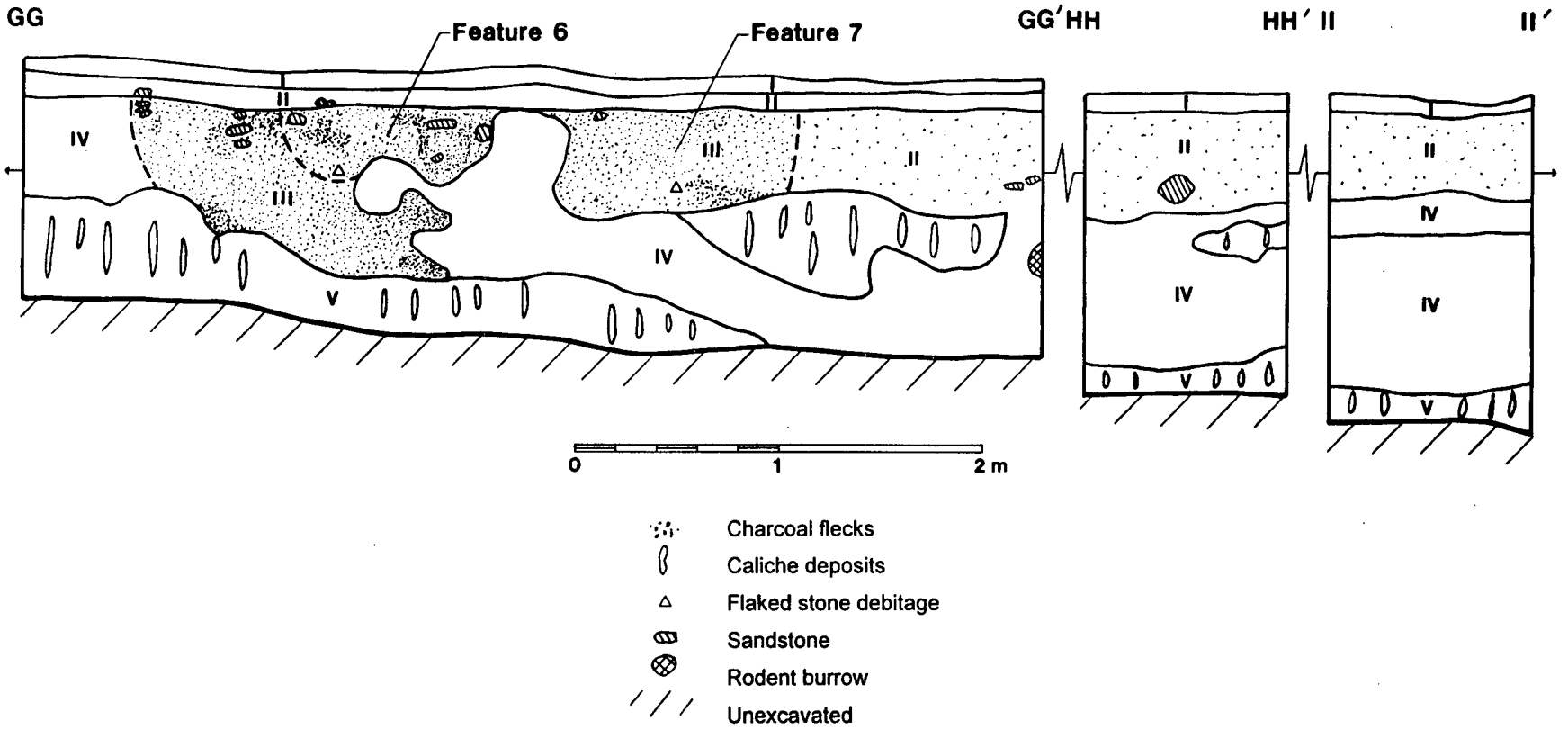


Figure 20.30. Site NM-Q-23-60, Study Unit 99, Southwest Wall Profiles GG-GG', HH-HH', and II-II' Showing Features 6 and 7.

Stratum V was present on all profiles and consisted of a dark yellowish brown (10YR4/4) loamy sand, with a 75% inclusion of calcium carbonates and less than 10% root disturbance. Stratum V was at least 17 cm thick in profiles DD-DD' and EE-EE' and up to 57 cm thick in profile FF-FF'. Stratum V was up to 22 cm thick in profiles HH-HH' and II-II' and at least 49 cm thick in profile GG-GG'. No cultural material or features were present in Stratum V. Stratum VI was present in profiles DD-DD', EE-EE', and II-II' and consisted of a dark yellowish brown (10YR4/4) loamy sand, with less than 10% root disturbance. Stratum VI was sandwiched between Strata II and IV. Stratum VI was 20 to 23 cm thick in profiles DD-DD' and EE-EE' and 16 to 21 cm thick in profile II-II'. No cultural material or features were present in Stratum VI.

Study Unit 100

SU 100 was located in the northeast part of the site west of artifact concentration A. The trench extended from N168.71, E171.02 northward 7 m to N177.26, E169.45. A 1-m-wide profile (profile JJ-JJ') was drawn of the north end of the east side of the trench (Figure 20.31) and a 7-m-long profile (profile KK-KK') was drawn of the south end of the west wall of the trench. Maximum depth was 130 cm, and five strata were identified.

The stratigraphy is described below. Stratum I was present in both profiles consisting of a dark yellowish brown (10YR4/4) loamy sand, with less than 10% inclusion of natural sandstone rocks and 10% root disturbance. Stratum I was 6 cm thick in profile JJ-JJ' and 8 to 12 cm thick in profile KK-KK'. No cultural material or features were present. Stratum II was present in both profiles and consisted of 18 to 32 cm of a brown (10YR4/3) loamy sand, with 10% root disturbance. Stratum III was present in both profiles and consisted of a dark yellowish brown (10YR4/4) loamy sand, with less than 10% root disturbance. Stratum III was 30 cm thick in profile JJ-JJ' and 20 to 40 cm thick in profile KK-KK. No cultural material or features were present in Stratum III. Stratum IV was present on both profiles and consisted of a dark brown (10YR3/3) loamy sand, with 10% root disturbance. Stratum IV was 22 to 38 cm thick on the west wall profile and 30 cm thick on the east wall profile, and exhibited a dark charcoal lens, which was designated as Feature 11. A sediment sample was collected from Feature 11. Stratum V was present on both profiles and consisted of a dark yellowish brown (10YR4/4) loamy sand, with 50% calcium carbonate inclusions. Stratum V was at least 29 cm thick in profile KK-KK' and 20 cm thick in profile JJ-JJ'. No cultural material or features were present in Stratum V.

Study Unit 101

SU 101 was located in the northeast part of the site 6 m northeast of artifact concentration A. The trench extended from N172.33, E184.35 northwestward 10.5 m to N181.45, E177.95. A 10.5-m-long profile of entire northeast wall of the trench was drawn. Maximum depth was 136 cm and five strata were identified (Figure 20.32). Stratum I consisted of 5 to 18 cm of a dark yellowish brown (10YR4/4) loamy sand, with less than 10% inclusion of natural sandstone gravels and 10% root disturbances. Stratum II consisted of 8 to 20 cm of a dark yellowish brown (10YR3/4) loamy sand, with 10% root disturbance. Stratum III consisted of 14 to 32 cm of a dark yellowish brown (10YR3/6) loamy sand, with less than 10% root and rodent disturbance. Stratum IV consisted of 14 to 30 cm of a dark brown (10YR3/3) loamy sand. Two soil samples were collected from the northwest end of the

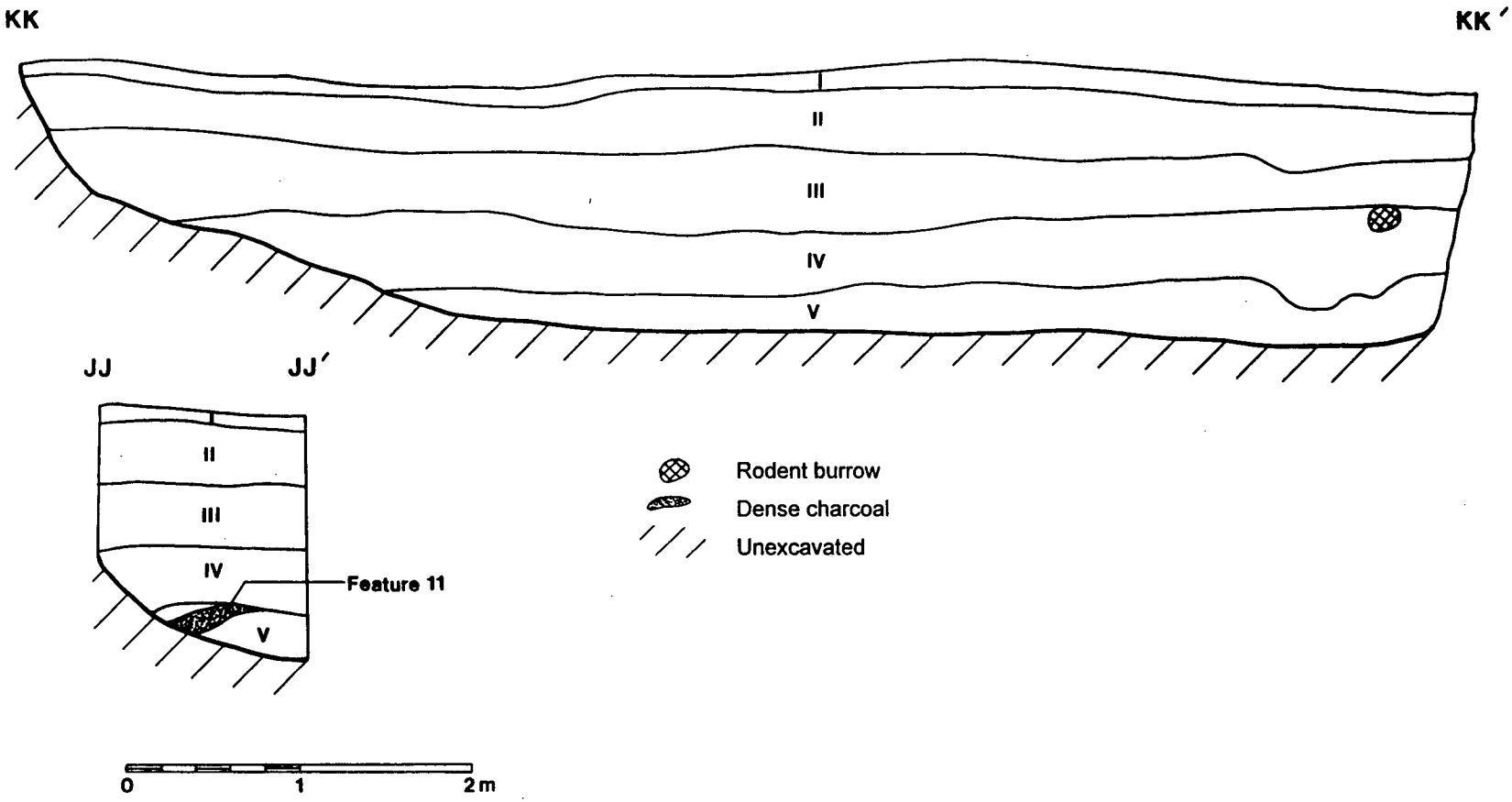


Figure 20.31. Site NM-Q-23-60, Study Unit 100, West Wall Profile KK-KK' and East Wall Profile JJ-JJ' Showing Feature 11.

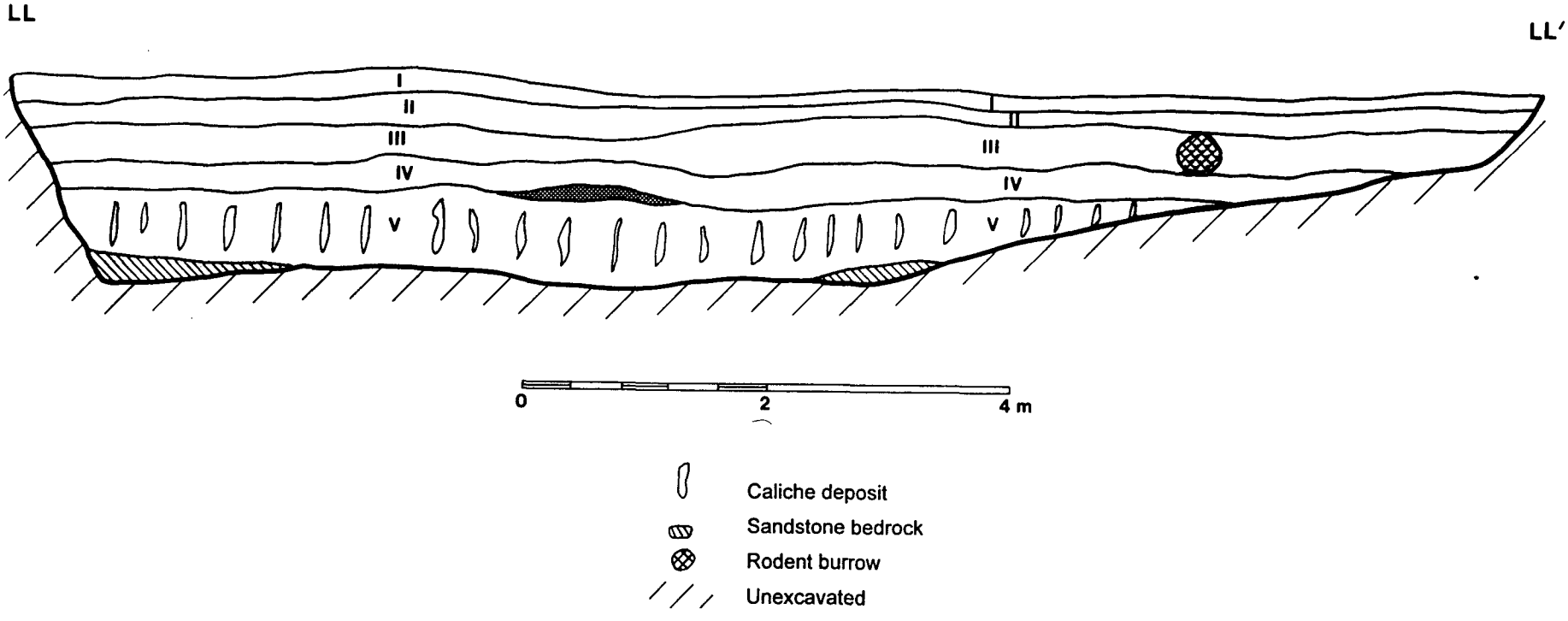


Figure 20.32. Site NM-Q-23-60, Study Unit 101, Northeast Wall Profile LL-LL'.

trench. Stratum V consisted of at least 30 to 60 cm of a yellowish brown (10YR5/6) loamy sand, with a 75% mixture of calcium carbonates. Inclusions of a compact dark yellowish brown (10YR3/6) similar to Stratum III loamy sand were noted between Stratum IV and V. Natural sandstone bedrock was noted in two locations at the base of the trench. No cultural material or features were noted in the trench wall.

Study Unit 102

SU 102 was the northeasternmost trench at the site. The trench extends from N191.82, E175.76 northwestward 10.5 m to N200.98, E169.77. A 10.5 m long profile of entire northeast wall of the trench was drawn. Maximum depth was 1.7 m and five strata were identified (Figure 20.33). Stratum I consisted of 10 to 16 cm of a dark yellowish brown (10YR4/4) loamy sand, with less than 10% inclusion of natural sandstone gravels and 10% root disturbance. Stratum II consisted of 17 to 38 cm of a dark yellowish brown (10YR3/4) loamy sand, with less than 10% inclusion of natural sandstone gravels and 10% root disturbance. Stratum III consisted of 48 to 80 cm of a dark yellowish brown (10YR3/6) loamy sand, with less than 10% inclusion of natural sandstone gravels and less than 10% root and rodent disturbance. Stratum IV consisted of 10 to 27 cm of a very dark grayish brown (10YR3/2) loamy sand, with less than 10% charcoal inclusion, 25% mixture of calcium carbonates, and less than 5% root and rodent disturbance. A soil sample was collected from Stratum IV. Stratum V consisted of up to 70 cm of a yellowish brown (10YR5/4) loamy sand, with 75% inclusion of calcium carbonates, and less than 5% root and rodent disturbance. Stratum V rests on sandstone bedrock. No cultural material or features were noted in the trench wall.

Features

Feature 1

The grid coordinates for the center of Feature 1 were N160.25, E153. Feature 1 was a small earthen basin-shaped pit of undetermined function. The feature averaged 32 cm in diameter and 16 cm in depth (Figure 20.10). The pit was exposed in Stratum IV of SU 77. The feature was excavated into a layer of strong brown sandy loam. One cultural stratum was present in the feature. The feature fill contained charcoal and a slight mixture of noncultural sediments. No artifacts were recovered from the feature.

Feature 2

The grid coordinates for the center of Feature 2 were N150.4, E128.7. Feature 2 was a circular bell-shaped thermal pit averaging 86 cm in diameter and 30 cm in depth (Figure 20.34). The feature was manifested on the surface near the southeast end of backhoe trench SU 93. SU 80, and hand-excavated unit, was established to further investigate and define the feature. Only the east half of Feature 12 was excavated. The interior of Feature 2 was bounded by a 2-cm-thick band of reddish brown burned earth. Two strata were identified in the profile. Stratum I consisted of 5 cm of a dark yellowish brown (10YR4/4) loamy sand, with root disturbance. Stratum II consisted of up to 34 cm of a dark yellowish brown (10YR4/4) loamy sand, with charcoal mottling and inclusions of burned earth with caliche. Several unmodified sandstone cobbles were noted in the fill. The articulated remains of a jackrabbit (*Lepus* sp.) were recovered from this feature (Figure 20.35).

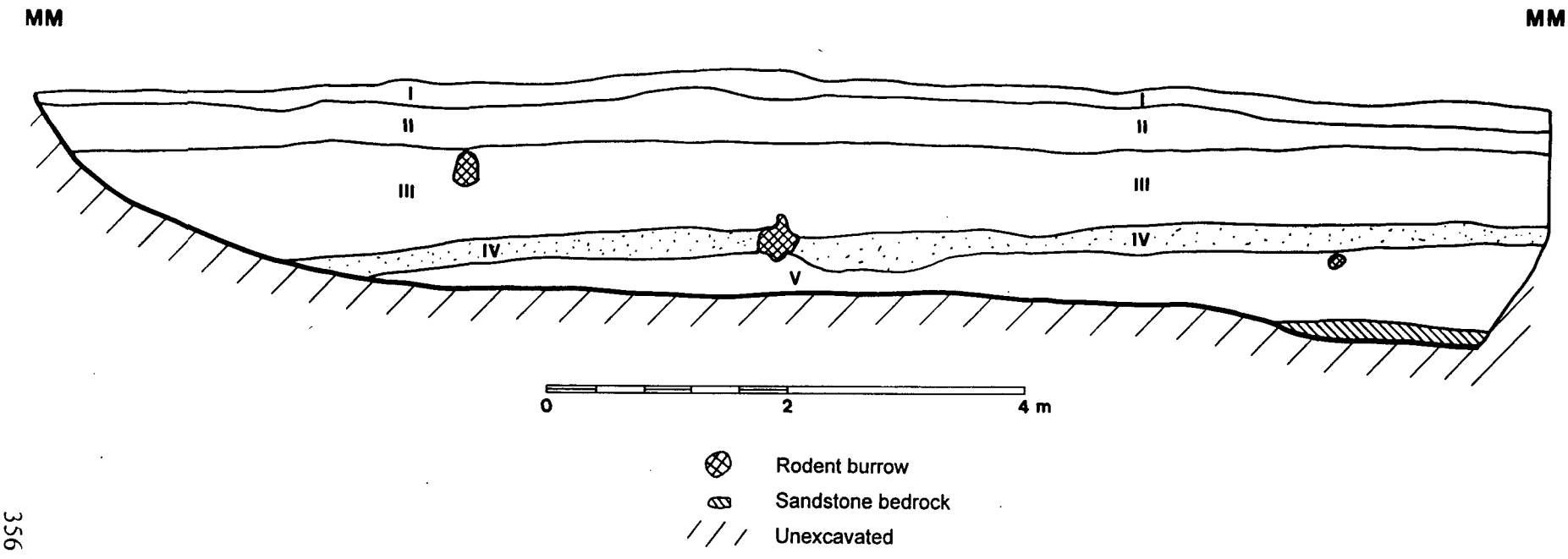


Figure 20.33. Site NM-Q-23-60, Study Unit 102, Northeast Wall Profile MM-MM'.

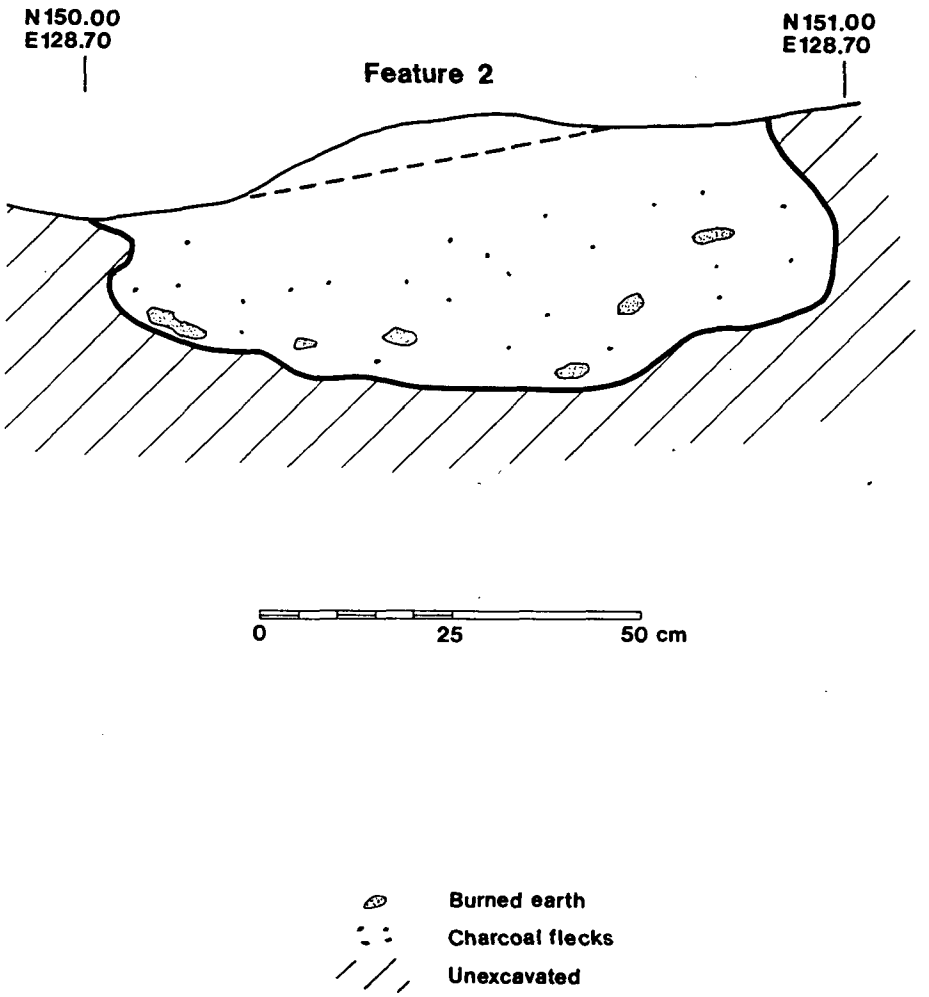


Figure 20.34. Site NM-Q-23-60, Study Unit 80, West Wall Profile, Feature 2.

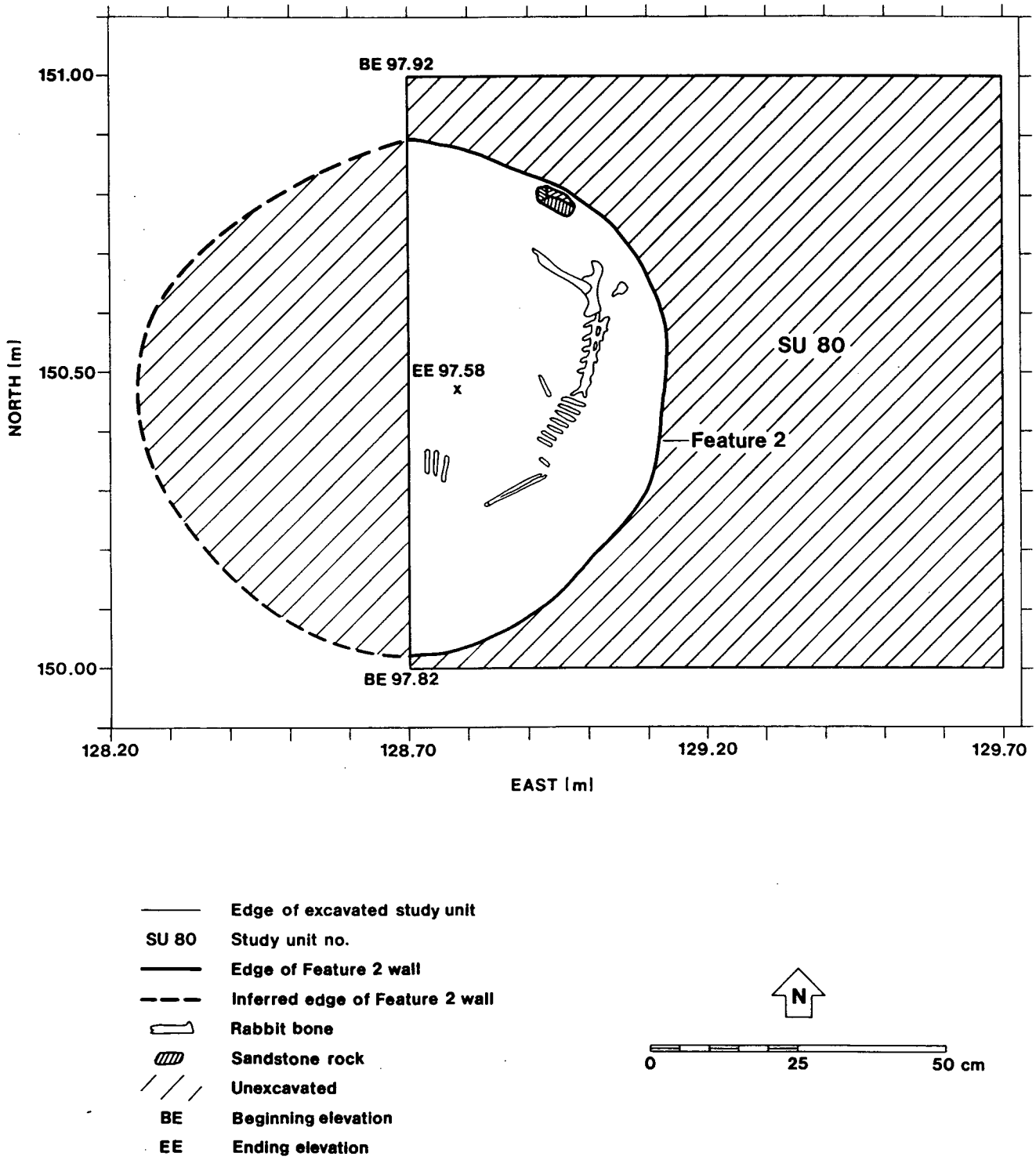


Figure 20.35. Site NM-Q-23-60, Plan View of Feature 2 Showing Study Unit 80.

Feature 3

The grid coordinates for the center of Feature 3 were N177.23, E172.45. Feature 3 was an oval slab-lined pit averaging 1 by 1.2 m across and 24 cm in depth (Figures 20.36 and 20.37). This probable roasting pit was manifested on the surface. SU 79, a hand-excavated unit, was established to further investigate and define the feature. Only the west half of the feature was excavated. Three strata were present within this feature. Strata I and III were yellowish brown (10YR5/4) loamy sand. Stratum II was mottled with very dark yellowish brown (10YR3/2) loamy sand. Stratum I was 2 cm thick, Stratum II was 16 cm thick, and Stratum III was 3 to 5 cm thick. Slight inclusions of charcoal, dark ashy deposits, and some burned sandstone rocks were dispersed throughout the feature. A single flaked lithic artifact was recovered from the feature.

Feature 4

The grid coordinates for the center of Feature 4 were N169.55, E157.07. Feature 4 was a small indeterminate earthen pit averaging 42 cm in diameter and 24 cm in depth (Figure 20.28). The pit was identified in the northeast wall 14 cm below the ground surface during backhoe trench excavation of SU 98. The feature fill contained a dark charcoal lens mottled with slight mixture of noncultural sediments. No artifacts were recovered from the feature. Some flaked stone was recovered from the area directly above the pit in artifact concentration B. One sediment sample was collected from the feature.

Feature 5

The grid coordinates for the center of Feature 5 were N156.5, E169.19. Feature 5 was an indeterminate earthen pit averaging 75 cm in diameter and 56 cm in depth (Figure 20.29). The pit was identified 10 cm below the ground surface in the northeast wall of backhoe trench SU 99. The feature fill contained charcoal and sandstone rocks. No artifacts were recovered from the feature. Some artifacts were recovered from the surrounding surface area above the pit. A radiocarbon sample was analyzed yielding a calibrated intercept date of 390 BC and a one-sigma range of 400 to 380 BC (conventional radiocarbon age date of 2330±40BP).

Feature 6

The grid coordinates for the center of Feature 6 were 157.08, E168.07. Feature 6 was an indeterminate earthen pit averaging 104 cm in diameter and 37 cm in depth (Figure 20.30). The pit was identified 15 cm below the ground surface in the southwest wall of backhoe trench SU 99. The feature fill contained few flecks of charcoal and sandstone rocks. One flake was recovered from the feature.

Feature 7

The grid coordinates for the center of Feature 7 were N158.36, E169.27. Feature 7 was an indeterminate earthen pit averaging 113 cm in diameter and 53 cm in depth (Figure 20.30). Feature 7 was located 40 cm north of Feature 6. The pit was identified 15 cm below the ground surface in the

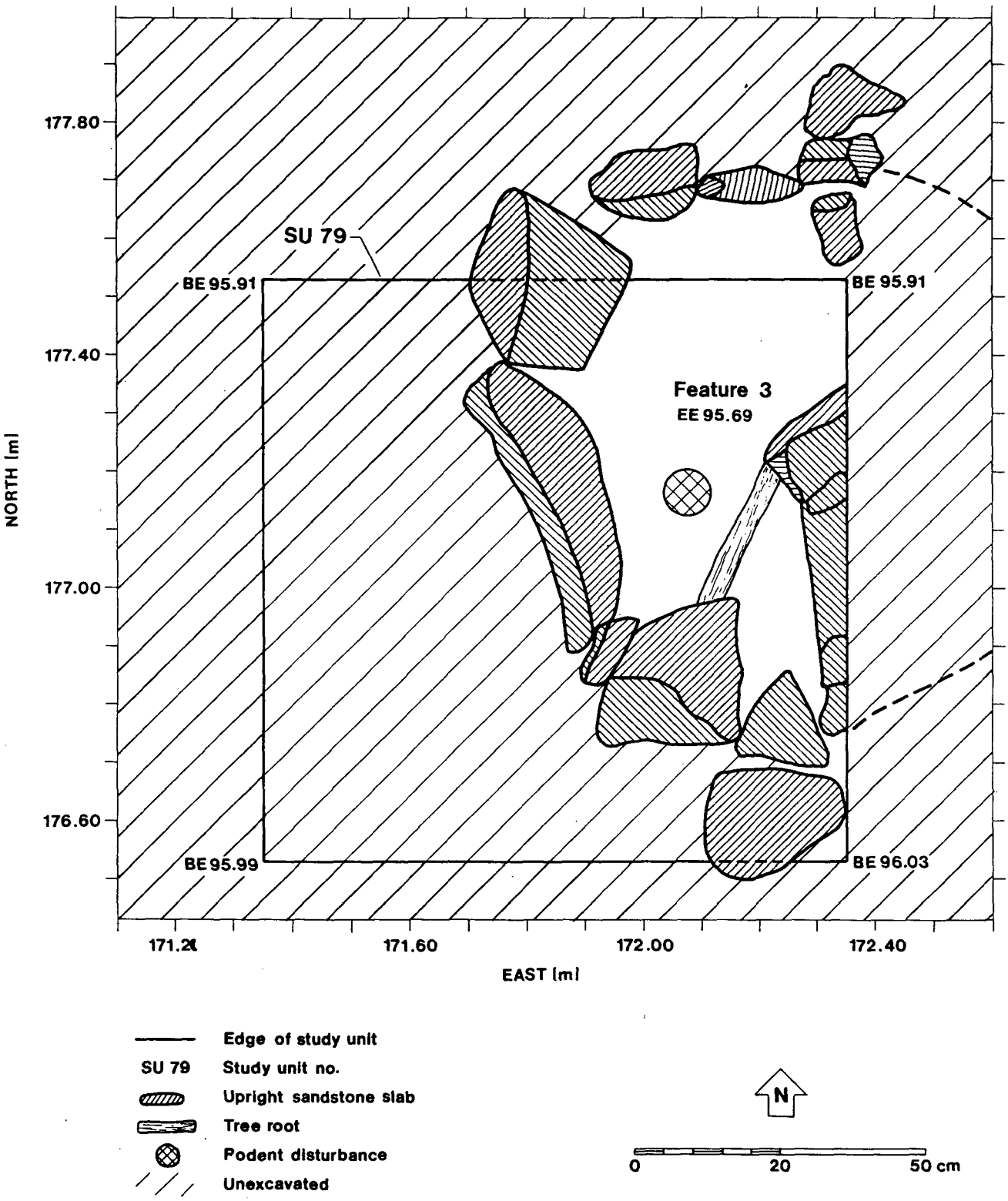


Figure 20.36. Site NM-Q-23-60, Plan View of the West Half of Feature 3 Showing Study Unit 79.

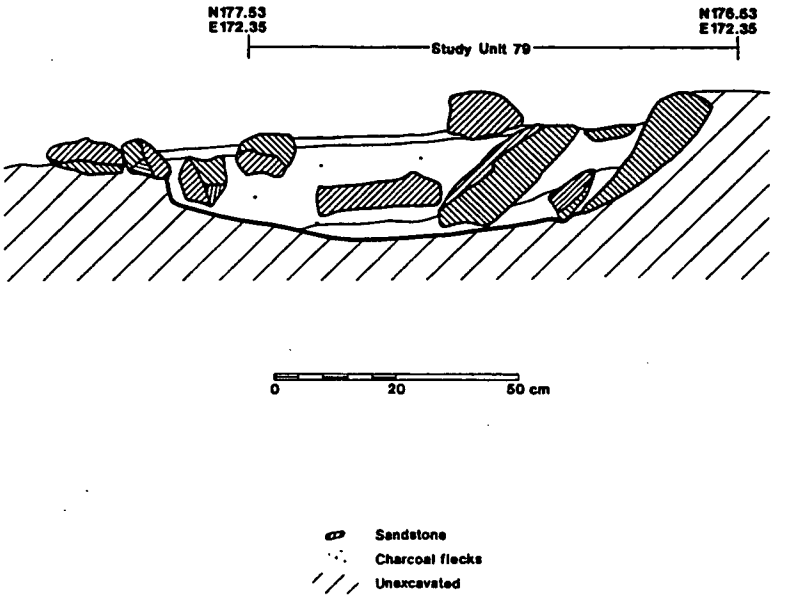


Figure 20.37. Site NM-Q-23-60, West-facing Profile of Feature 3 Showing Study Unit 79.

southwest wall of backhoe trench SU 99. One cultural stratum was present within this feature. The feature fill consisted of a black loamy sand with less than 10% charcoal and less than 5% natural sandstone rocks. No artifacts were recovered from Feature 7. The northern edge of the feature was not well defined and could not be precisely determined.

Feature 8

The grid coordinates for the center of Feature 8 were N157.79, E168.4. Feature 8 was an indeterminate earthen pit approximately 63 cm in diameter and 50 cm in depth (Figure 20.29). Feature 8 was located north of Feature 5. The pit was identified 10 cm below the ground surface in the northeast wall of backhoe trench SU 99. One cultural stratum was present within this feature. The feature fill consisted of black loamy sand with less than 10% charcoal with inclusions of natural sandstone rocks. No artifacts were recovered from the feature.

Feature 9

The grid coordinates for the center of Feature 9 were N158.69, E167.96. Feature 9 was an indeterminate basin-shaped earthen pit approximately 72 cm in diameter and 53 cm in depth (Figure 20.29). Feature 9 was located 5 cm north of Feature 8. The feature was identified 10 cm below the ground surface in the northeast wall of backhoe trench SU 99. One cultural stratum was present within this feature. The feature fill contained black loamy sand with less than 10% charcoal. No artifacts were recovered from the feature.

Feature 10

The grid coordinates for the center of Feature 10 were N156.95, E168.96. Feature 10 was a small indeterminate earthen pit averaging 35 cm and 42 cm in depth (Figure 20.29). Feature 10 was located in between Features 5 and 8. The feature was identified 10 cm below the ground surface in the northeast wall of backhoe trench SU 99. One cultural stratum was present within the feature. The feature contained black loamy sand with less than 10% charcoal and inclusions of small sandstone rocks. No artifacts were recovered from the feature.

Feature 11

The grid coordinates for the center of Feature 11 were N174.53, E168.06. Feature 11 was a small indeterminate earthen pit averaging 34 cm in diameter and 10 cm in depth (Figure 20.31). The pit was identified 96 cm below the ground surface during backhoe trench excavation of SU 100. One cultural stratum was present within this feature. The feature fill consisted of a dark charcoal lens 5 cm thick overlain by noncultural sediments 5 cm thick. No artifacts were recovered from the feature.

Feature 12

The grid coordinates for the center of Feature 12 were N160.97, E157.81. Feature 12 was an indeterminate earthen pit averaging 74 cm in diameter and 48 cm deep (Figure 20.26). The pit was exposed in the northeast wall of a backhoe trench (SU 97) and lay 10 cm below ground surface. Two strata was present in this feature. The lower feature fill contained black loamy sand with less than 10% charcoal and was about 30-cm thick. The upper fill was a very dark gray loamy sand with less charcoal. No artifacts were noted in the feature. A few artifacts were recovered from the surrounding surface area above the feature.

Feature 13

The grid coordinates for the center of Feature 13 were N163.19, E144.05. Feature 13 was a shallow circular thermal pit approximately 45 by 55 cm and 8 cm in depth (Figure 20.38). The pit was identified 50 cm below the ground surface during hand excavation of SU 81. The south half of the feature was excavated. One cultural stratum was present within this feature. The feature fill contained dark brown (10YR3/3) loamy sand 8 cm thick with a 1% inclusion of charcoal and a 5% inclusion of caliche with few root disturbances. The floor of the feature consisted of hard compacted earth with caliche. No artifacts were recovered from the feature; however, a few flaked lithic and ground stone artifacts were recovered from the level immediately above the feature.

Feature 14

The grid coordinates for the center of Feature 14 were N143.97, E128.80. Feature 14 was a subrectangular thermal earthen pit 51 by 62 cm and 27 cm deep (Figure 20.39). Feature 14 was located in a main drainage in the center part of the site. The feature was manifested on the surface and SU 83 was established to further investigate and define the feature. The east half of the feature was excavated. One cultural stratum was present within this feature. The feature fill contained dark brown

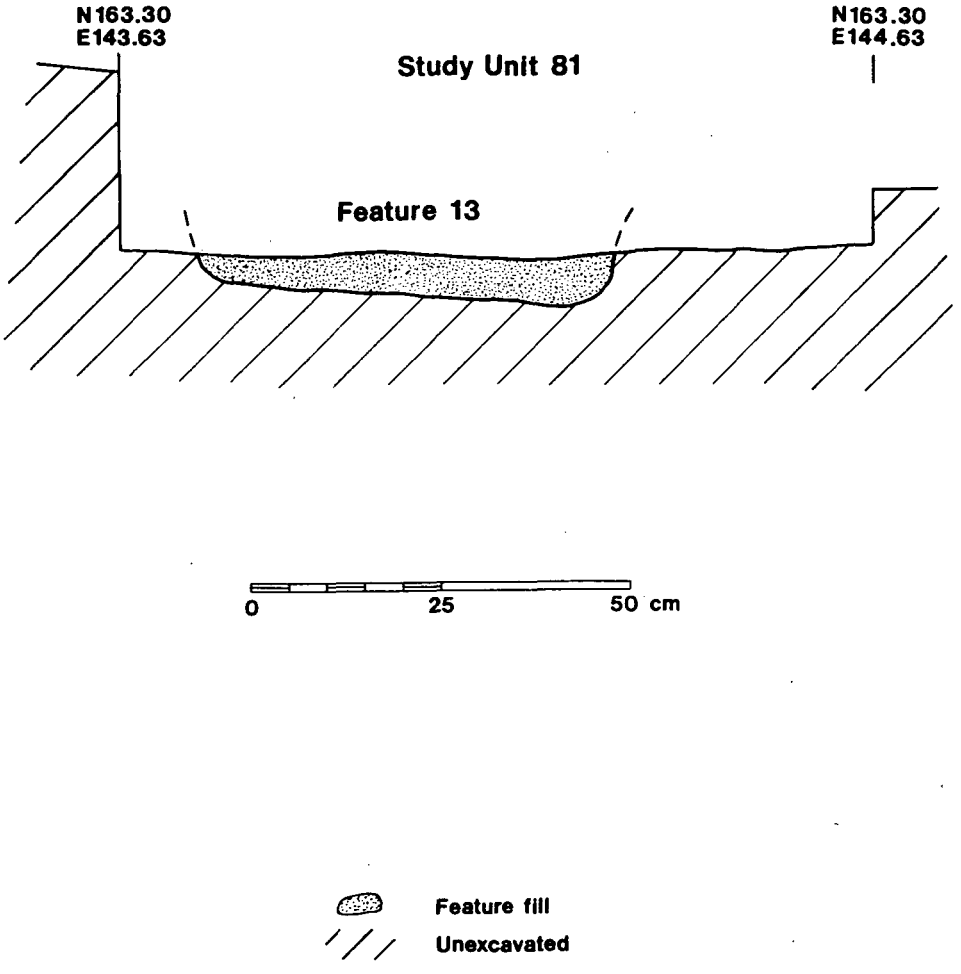


Figure 20.38. Site NM-Q-23-60, Study Unit 81, South-facing Profile of Feature 13.

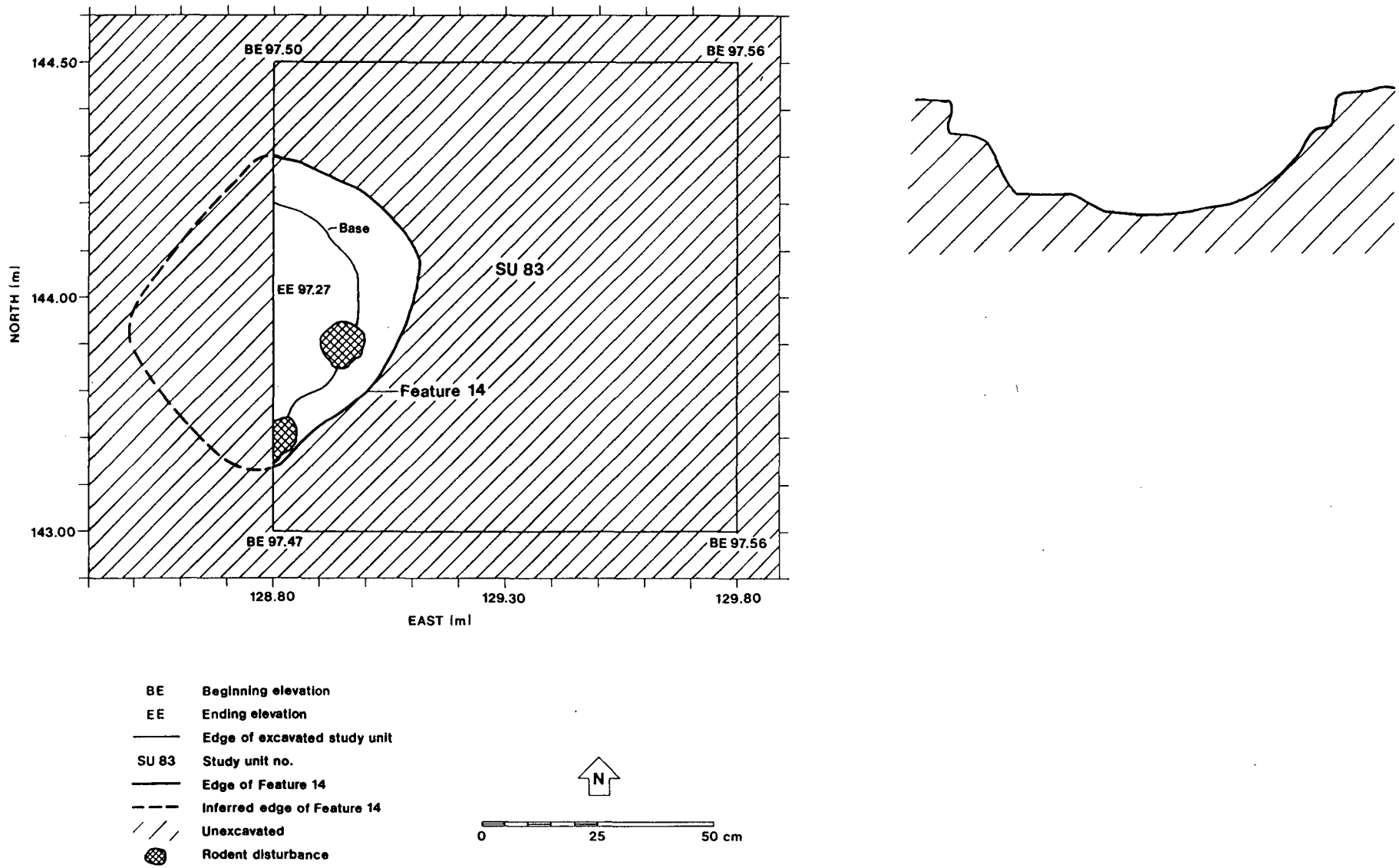


Figure 20.39. Site NM-Q-23-60, Plan View and Cross Section of Feature 14 Showing Study Unit 83.

(10YR3/3) and dark yellowish brown (10YR4/6) sandy loam with 5% charcoal, less than 10% small sandstone rocks, and 10% root disturbance. The feature had a highly burned earthen floor with a slight inclusion of caliche. No artifacts were present in the feature.

Feature 15

Feature 15 was a small concentration of sandstone cobbles 90 by 95 cm (Figure 20.40) manifested on the surface. The feature was located at N130, E192.5, outside the right-of-way in the northeast part of the site. No artifacts were present in the feature. The function and age of the feature could not be determined at this level of investigation.

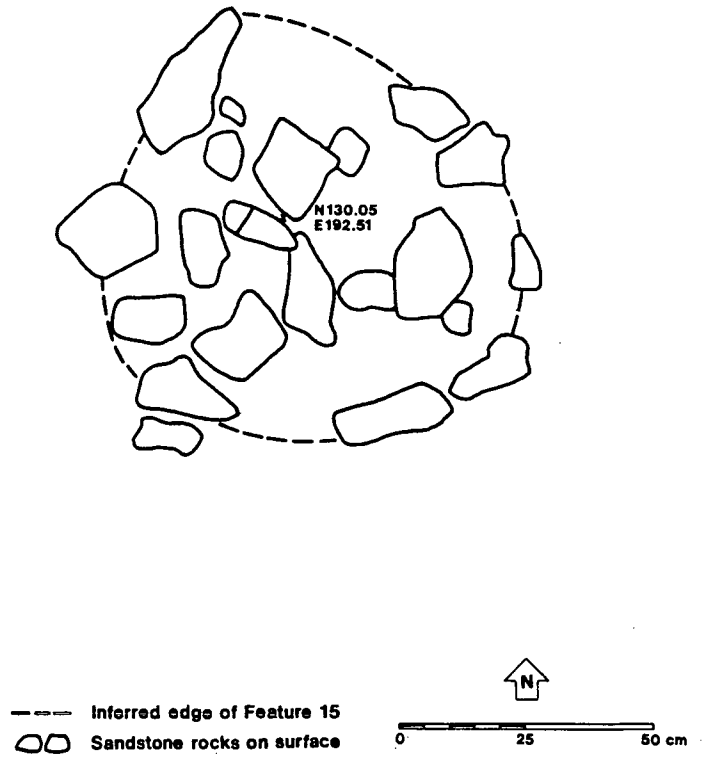


Figure 20.40. Site NM-Q-23-60, Plan View of Feature 15.

SUMMARY AND INTERPRETATION

Phase I Data Recovery testing of site NM-Q-23-60 resulted in the collection of 837 artifacts of which 510 were flaked stone, 241 were faunal materials, 49 were prehistoric ceramics, 36 were ground stone, and 1 was historic. Fifteen features and possibly three occupation surfaces were recorded within the right-of-way. Based on the results from the various analyses occupations dating

to the Clovis phase of the Paleoindian period, possibly the San Jose and En Medio phases of the Late Archaic period, the Pueblo II period, the Protohistoric Navajo period, and the Historic Navajo period are represented at this site.

The Paleoindian period occupation was identified only by a single fluted projectile point fragment representing a Clovis phase tool. More intensive and careful investigations may be able to separate the Paleoindian material and features, if there are any, from the rest of the material at the site.

The Late Archaic period occupation was represented by charcoal flecked soil containing a number of features (Features 1 through 10 and 12 through 14). The Late Archaic dates were derived from radiocarbon analysis and typing of a diagnostic projectile point. SU 97 exhibits two charcoal flecked layers, one above the other (Strata II and III) likely representing two Late Archaic occupations. A number of the features appeared to extend into the soil horizon beneath it which Thompson identifies as Qe1, a late Pleistocene deposit described in Chapter 24.

One Late Archaic projectile point was recovered from the eastern portion of the site (Figure 20.2) possibly indicating two Late Archaic occupations. The point was a small serrated point (San Jose type) providing a temporal marker for an occupation during the San Jose phase of the Late Archaic (3000 to 1800 BC). This component probably represented a seasonal habitation. The San Jose phase is also characterized by large chopping tools, basin-shaped ground slabs, and biscuit manos (Irwin-Williams 1973:8), all of which were present in the assemblage from this site.

A second Late Archaic period occupation was represented by a cultural stratum with a number of pit features, including three thermal features (Features 2, 3, and 14). Two radiocarbon dates were obtained from Stratum III of SU 97 and the bottom of Feature 5 in SU 99 at approximately the same depth below ground surface. These samples yielded calibrated intercept dates of 380 and 390 BC, respectively. The one sigma date ranges for both samples was less than 25 years. This date corresponds well with the geomorphologist's assessment that the stratum dates to approximately 50 BC (2000 BP; Chapter 24). This date conflicts with the survey assessment of a Basketmaker III period occupation at this site. However, that determination was derived from a field evaluation of a pottery type believed to be Lino Gray; the pottery in fact, is Dinetah Gray, substantially different in its date range. Macrobotanical samples from this stratum did not yield any cultigens (Chapter 28) whose presence would be expected in a Basketmaker III occupation. None of the pit features exhibited morphology of Basketmaker III pitstructures. In terms of artifacts, there was a lot of burned sandstone that probably relates to this occupation. The location of this component in the eastern portion of the site can be identified by the surface manifestation of ground stone and faunal material. Based on the radiocarbon date this occupation likely dates to the Late Archaic En Medio phase. From the darkness of the ashy cultural layer and the number of features, an intensive occupation is suggested. This level of investigation could not determine whether or not it was a seasonal occupation. There may be two separate activity areas during this occupation.

A Pueblo II occupation was represented by the presence of eight sherds from that time period. Four of the sherds are Red Mesa Black-on-white. Although some of the flaked stone from the site likely dates to this occupation, it is impossible to differentiate them at this level of investigation. No

features or architecture relating to this occupation could be identified. The lack of clear data relating to this occupation precludes a determination of the function of this component; however, it may represent a limited-activity occupation.

A Protohistoric Navajo occupation was defined at site NM-Q-23-60 by the presence of a variety of protohistoric ceramics. The ceramics include Dinetah Graywares, Hawikuh Polychrome, Jeddito Black-on-yellow, and other indeterminate painted Puebloan wares. Although no features could be specifically tied to this occupation, the ceramics were clustered around the areas of artifact concentrations D and F. Numerous pieces of ground stone were recovered from this same area. Other additional dark stains were noted west of this location; they may represent other features or structures. From the ceramics, the Protohistoric component represents an occupation prior to 1750 and more likely between 1630 and 1700. The assemblage of artifacts is believed to reflect a habitation site. The variety of ceramic artifacts indicates trade with other cultural groups, including the Zuni and Hopi. It should also be noted that the cluster of features, masonry structures, and artifacts below the cliff and outside the right-of-way may be contemporaneous to this occupation.

A historic Navajo occupation was identified at this site during the survey. A variety of milled wood and metal artifacts were noted at the northern end of the site. An apparent corral was also identified. Ethnographic interviews indicated the site was used as a sheep camp during the 1960s. The informants also indicated that at that time their children collected prehistoric artifacts from other locations, brought them here, and redeposited them. It is unlikely that this activity should substantially alter the assessment of the occupations at site NM-Q-23-60. The informants also stated that they buried a pony at the site within the past 10 years. Its location is noted on the site map and some of the bones have since been scattered by animal scavenging.

RECOMMENDATIONS

Site NM-Q-23-60 is considered significant and archaeological mitigation is recommended. The site contains significant cultural materials relating to several periods of human occupation in this area. Of particular interest is the base of a fluted point which may have resulted from Paleoindian occupation of this area. The site contains two different Late Archaic components which can provide comparative studies to see how the site occupants dealt with differing environmental conditions. Although the Pueblo II period occupation is rather ephemeral, data recovery investigations may reveal a more substantial occupation and thus provide information regarding function of the site during this period. The Protohistoric occupation will provide important information regarding the changes brought about by the influx of another cultural group in this area. Additionally, the Protohistoric component will provide data concerning the early period of Navajo occupation in this area.

This site offers the opportunity to look at the utilization of a single location over a broad span of time with different cultural groups, subsistence strategies, and climatic and environmental conditions over that time period. The importance of this site cannot be overstated: it contains more cultural components than any other site on this project, and thus it contains the greatest potential for providing a wide range of data concerning human behavior in this area.

Chapter 21

SITE NM-Q-23-62 (LA 110325)

Jerome Zunie

Site NM-Q-23-62 is located on shallow dunes in a wide valley bottom. The elevation of the site is 2084 m (6837 ft) above mean sea level. A Plains and Great Basin Grassland biotic community is present in the vicinity of the site area. Vegetation cover within and around the site consists of broom snakeweed (*Gutierrezia sarothrae*), Indian ricegrass (*Oryzopsis hymenoides*), ring muhly (*Muhlenbergia torreyi*), Russian thistle (*Salsola kali tenuifolia*), cactus (*Opuntia*), and other dropseed grasses.

SURVEY DATA

Site NM-Q-23-62 was previously recorded by the American Indian Cultural Consultants (AICC 1982) and was rerecorded by Zuni Cultural Resource Enterprise in 1995 (Zimmerman and Abbott 1996) as part of the N11(1&2) realignment road survey. ZCRE recording activities included Brunton compass mapping, in-field artifact analyses, and photography. In-field analyses included lithic artifact reduction and material identification, artifact counts, and surface distribution mapping of artifacts. Site NM-Q-23-62 was recorded as an Anasazi stone-lined cist or bin with a ceramic and lithic artifact scatter. From the lithic assemblage and the presence of Lino Gray and plainwares on the site, a Basketmaker III occupation was suggested.

NATURE AND EXTENT TESTING

From 23 June to 5 August 1997 personnel from ZCRE conducted Phase I Data Recovery testing for content and extent of site NM-Q-23-62. A redefinition of the site and a complete surface collection of all artifacts within the right-of-way were conducted prior to subsurface investigation. Subsurface investigations included hand excavation of 12 1-by-1-m test units and backhoe excavation of 27 trenches totaling 392 m. Site boundaries were expanded northward and southward, resulting in a total area of approximately 195 m north-to-south by 77 m east-to-west (Figure 21.1a and b).

Surface Collection

Surface artifacts were collected within 4-by-4-m units. The collected artifacts were then tabulated on Field Specimen (FS) catalog sheets. Artifacts of similar types were collected together and assigned FS numbers as a unit within each 4-by-4-m collection area from site NM-Q-23-62. Figure 21.2a and b show the surface distribution of artifacts collected from site NM-Q-23-62. Exactly 91 FS bags of artifacts were collected. The artifact scatter was concentrated in the road cut bank. It appears that the road maintenance of N11 has been largely responsible for visibility of artifacts on this site. Site NM-Q-23-62 has been severely disturbed by road grading and vehicle traffic along the existing road N11.

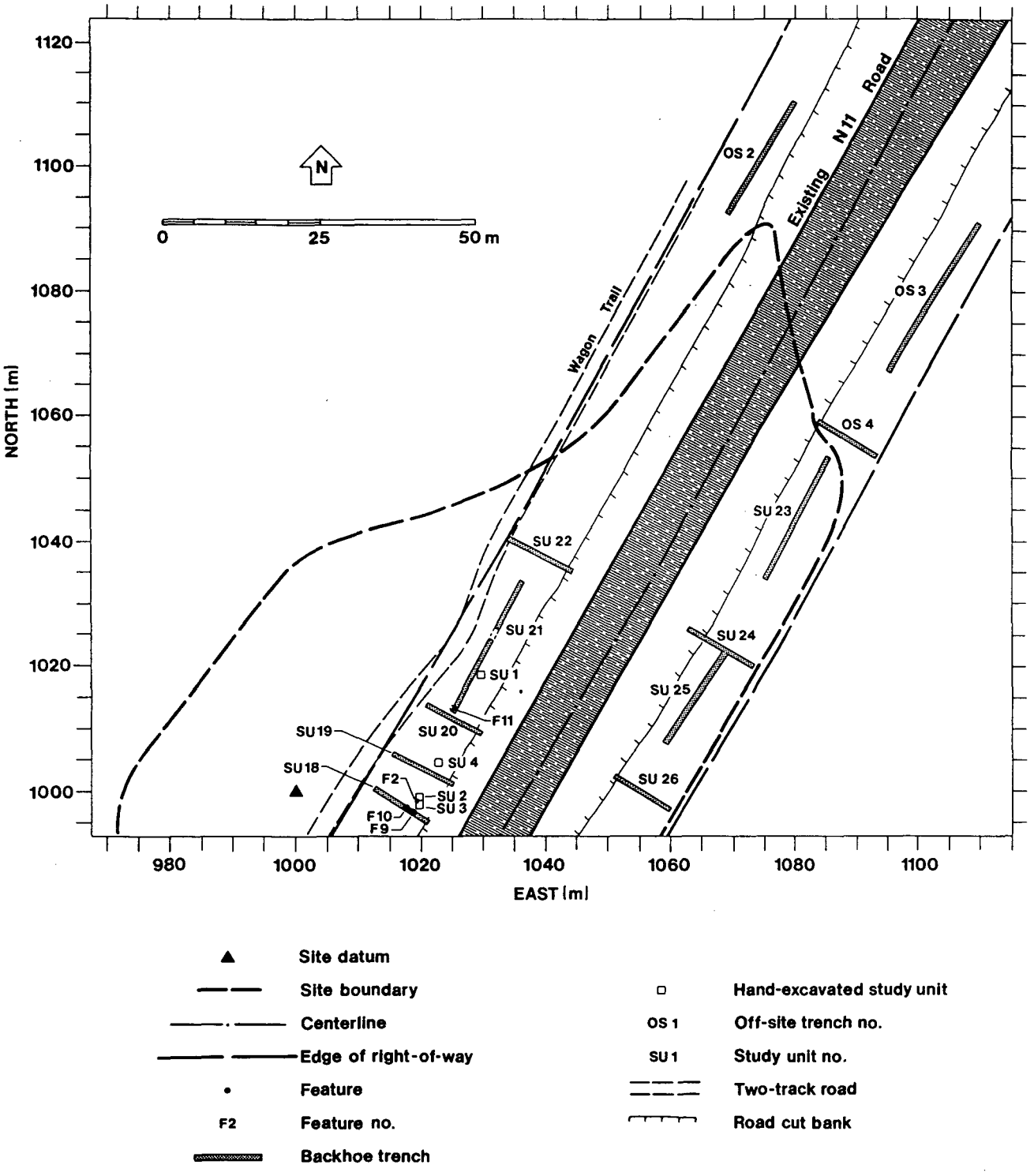


Figure 21.1a. Site NM-Q-23-62, Nature and Extent Testing, Northern Portion.

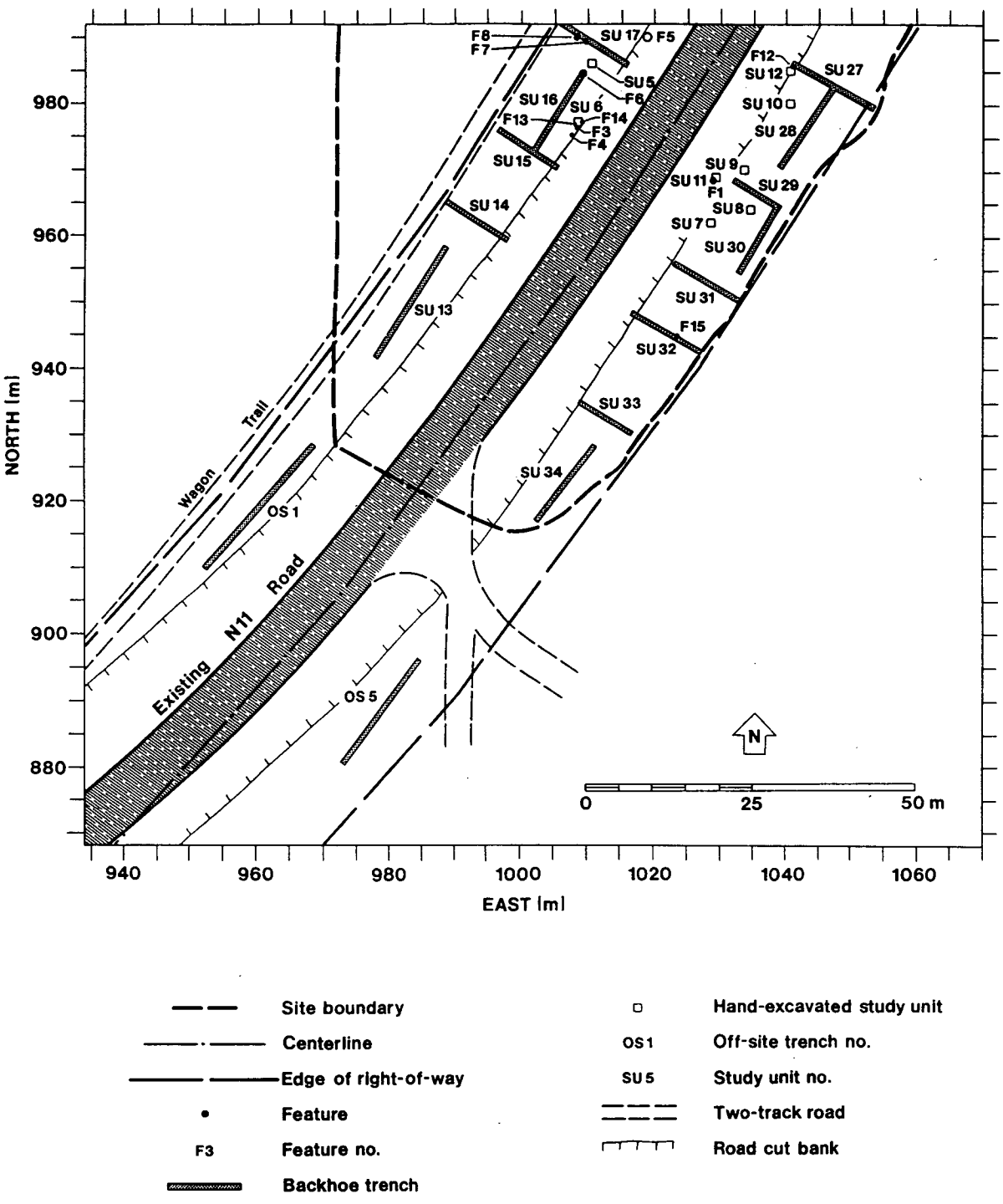


Figure 21.1b. Site NM-Q-23-62, Nature and Extent Testing, Southern Portion.

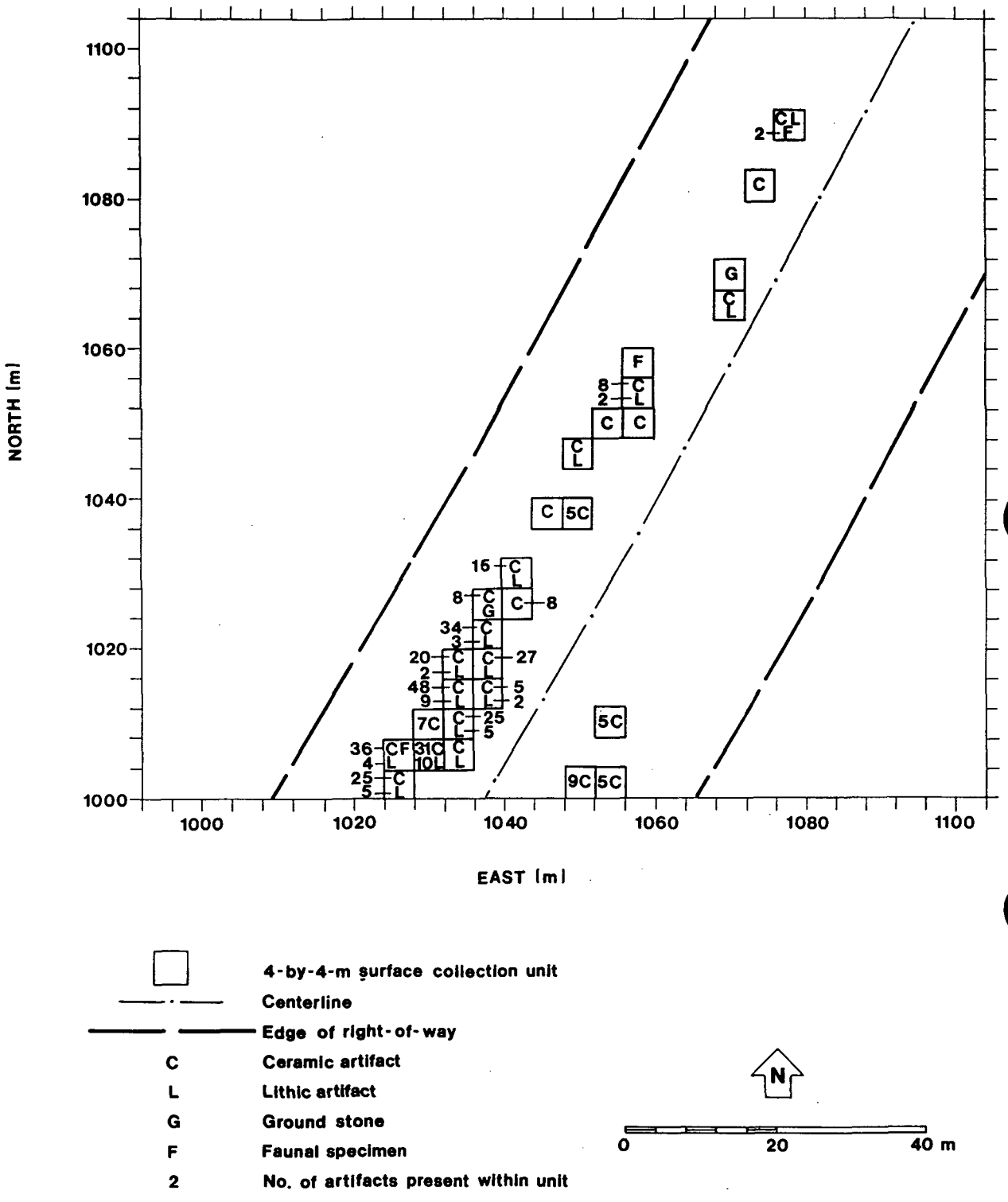


Figure 21.2a. Site NM-Q-23-62, Surface Artifact Distribution, Northern Portion.

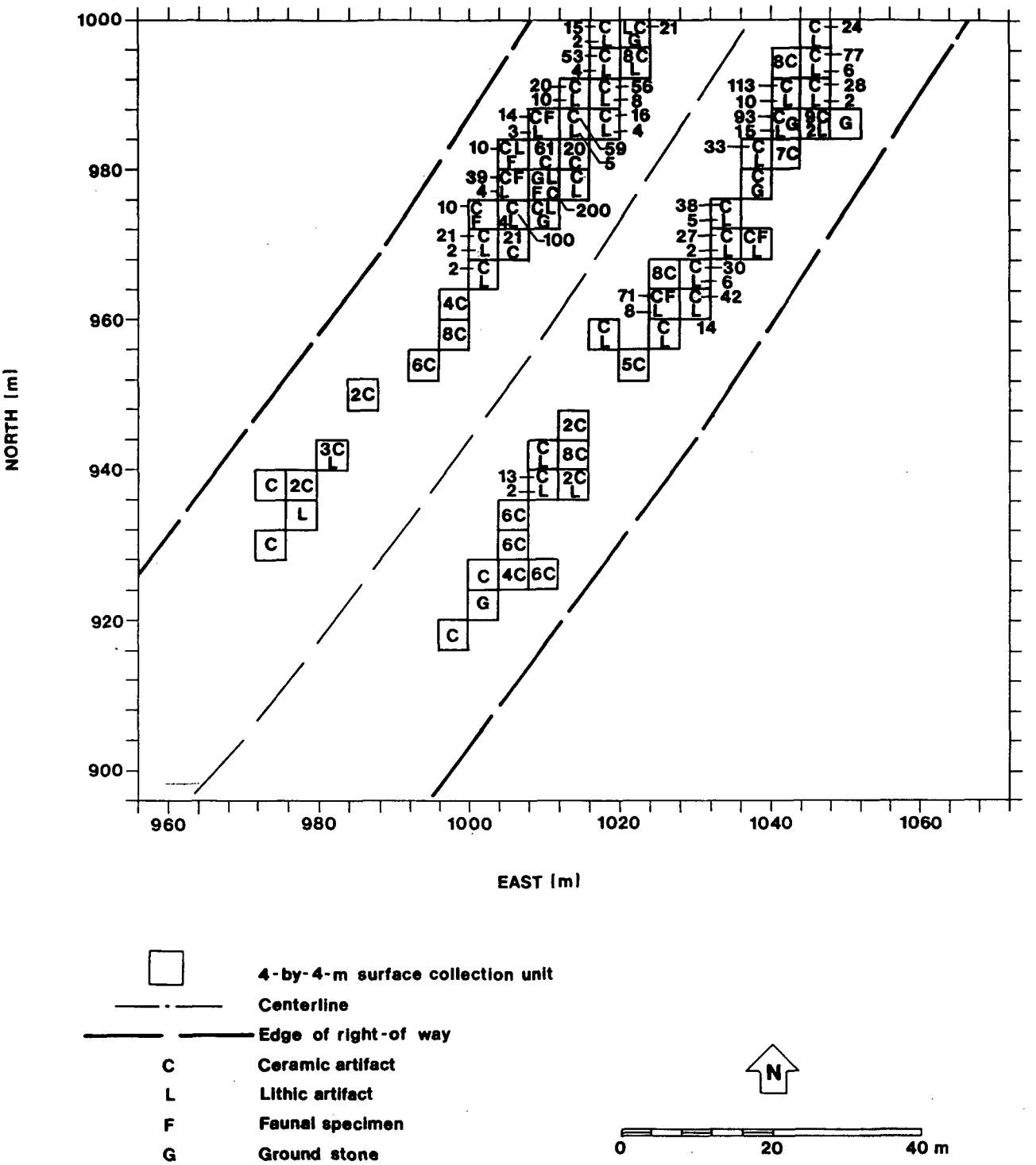


Figure 21.2.b. Site NM-Q-23-62, Surface Artifact Distribution, Southern Portion.

Hand Excavation

Hand excavation of 12 1-by-1-m study units was conducted in order to determine the nature and depth of cultural deposits on site NM-Q-23-62. The distribution map generated from the controlled surface collection was used as a guide for placement of the 12 study units. All test units were excavated in arbitrary 10-cm levels and all sediment deposits were screened through 1/4-in hardware mesh. A Munsell soil chart was used to identify soil color within each level.

Study Unit 1

SU 1 was located west of the existing N11 road near the middle of the site. The southwest grid coordinates of SU 1 were N1018, E1029. This study unit was placed in a dune area of low artifact densities away from the disturbance of road maintenance in order to establish the presence of possible buried deposits. SU 1 was excavated to a depth of 51 cm (five levels) below the ground surface. Three strata were identified within the unit. One 1-m-long profile of the west wall is illustrated for SU 1 (Figure 21.3). Stratum I was 21 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 9 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum III was 41 cm thick and consisted of yellowish brown (10YR5/6) fine sand.

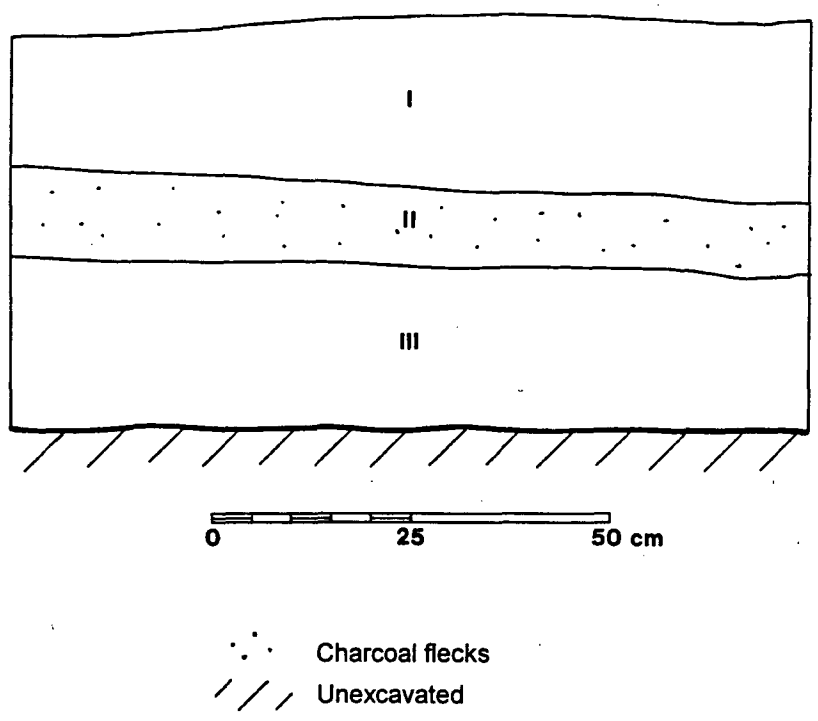


Figure 21.3. Site NM-Q-23-62, Study Unit 1, West Wall Profile.

One ceramic sherd was recovered from Level 1. Ceramics, flaked stone, and ground stone were recovered from Level 2. Ceramics and flaked stones were recovered from Level 3, and a single ceramic sherd was recovered from Level 4.

Study Unit 2

SU 2 was located on the west side of the existing N11 roadway near the middle of the site. The southwest grid coordinates of SU 2 were N998, E1019.1. SU 2 was placed in a dune area of high artifact densities and on the edge of the road disturbance in order to establish the presence of possible buried deposits. SU 2 was excavated to a depth of 20 cm (two levels) below the ground surface. Two strata were identified within the study unit. One 2-m-long profile of the west wall was illustrated for SU 2 and 3 (Figure 21.4). Stratum I was 10 cm thick and consisted of yellowish brown (10YR5/6) very fine sand. Stratum II was 15 cm thick and consisted of dark yellowish brown (10YR3/6) sandy clay.

Ceramic artifacts were recovered from both Levels 1 and 2. A hearth (Feature 2) was identified at the base of Level 2. Feature 2 is an earthen hearth that was basin shaped and measured approximately 58 cm in diameter (Figure 21.5). The area surrounding the hearth had rodent disturbance.

Study Unit 3

SU 3 was located west of the existing N11 roadway near the middle of the site. The southwest grid coordinates of SU 3 were N997, E1019. SU 3 was placed adjacent to SU 2 to the south to explore the extent of Feature 2. SU 3 was excavated to a depth of 20 cm (two levels) below the ground surface. Two strata were identified within the the study unit and were identical to those described for SU 2. A 2-m-long profile of the west wall was illustrated for SU 2 and 3 (Figure 21.4).

Ceramic and flaked stone artifacts were recovered from Level 2. The south half of the hearth (Feature 2) was identified at the base of Level 2.

Study Unit 4

SU 4 was located west of the existing N11 roadway near the middle of the site. The southwest grid coordinates of SU 4 were N1004, E1022. SU 4 was placed in dune area with high artifact densities. SU 4 was excavated to a depth of 40 cm (four levels) below the ground surface. Two strata were identified within the study unit. One 1-m-long profile of the west wall was illustrated for SU 4 (Figure 21.6). Stratum I was 12 cm thick and consisted of light yellowish brown (10YR6.4) sand. Stratum II was 26 cm thick and consisted of yellowish brown (10YR5/6) sand. Artifacts were recovered from Levels 1 through 3.

Artifacts from Level 1 included ceramics, flaked stone, and faunal remains. Level 2 artifacts included ceramics and flaked stone. Artifacts recovered from Level 3 decreased in number and only included ceramics and flaked stone. No features or cultural materials were recovered from Level 4 and excavation was terminated for SU 4.

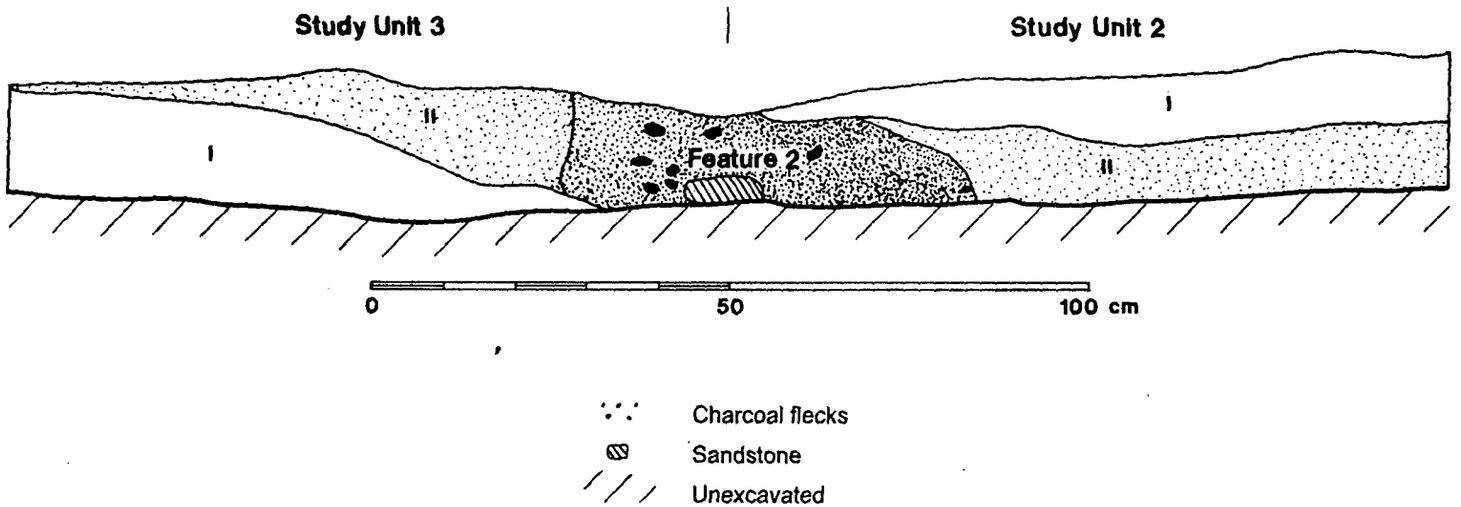


Figure 21.4. Site NM-Q-23-62, Study Units 2 and 3, West Wall Profile.

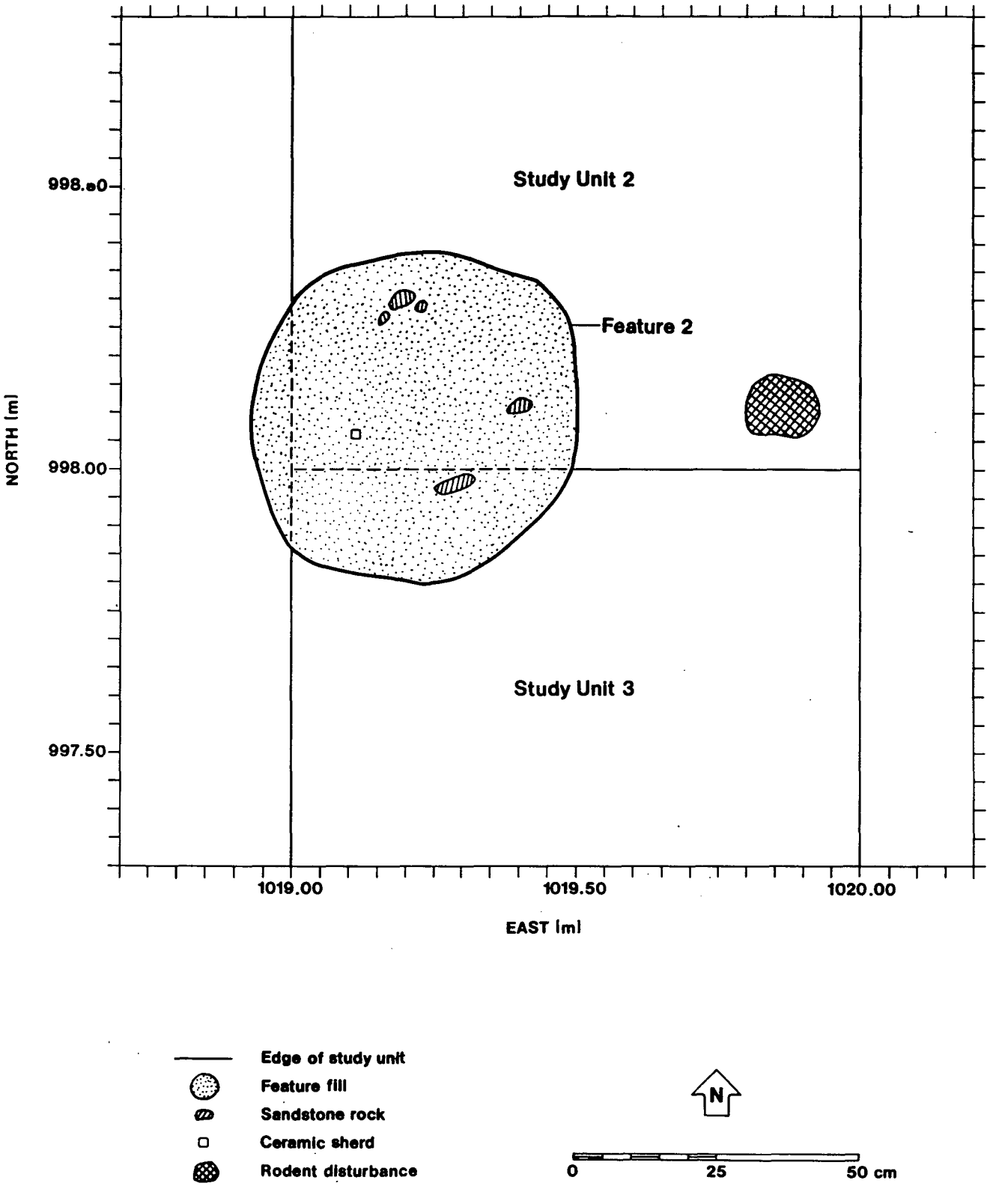


Figure 21.5. Site NM-Q-23-62, Plan View of Feature 2 Showing Study Units 2 and 3.

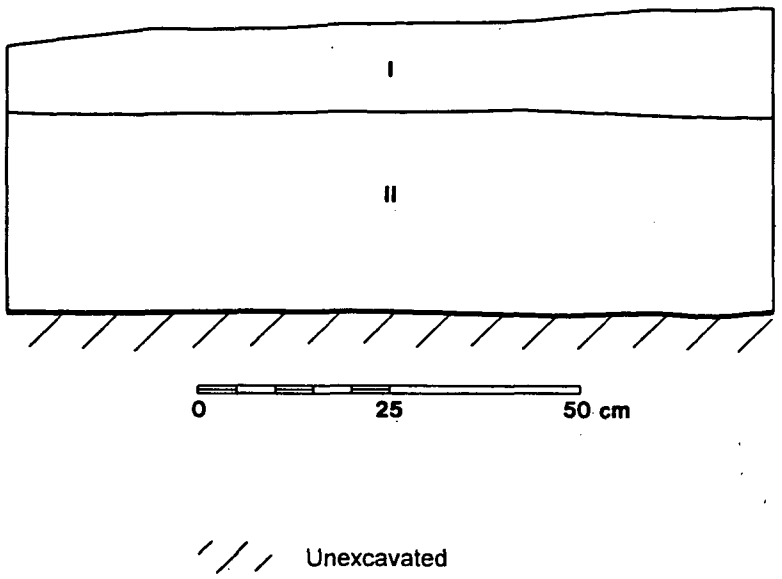


Figure 21.6. Site NM-Q-23-62, Study Unit 4, West Wall Profile.

Study Unit 5

SU 5 was located west of the existing N11 roadway near the middle of the site. The southwest grid coordinates of SU 5 were N986, E1010. SU 5 was established in a dune area with high artifact densities and in a charcoal-stained area. SU 5 was excavated to a depth of 30 cm (three levels) below the ground surface. Two strata were identified within the study unit and a single representative 1-m-long profile of the west wall was illustrated for SU 5 (Figure 21.7). Stratum I was 15 cm thick, consisted of light yellowish brown (10YR6/4) sand, and exhibited evidence of rodent disturbance. Stratum II was 14 cm thick, consisted of yellowish brown (10YR5/6) sand and exhibited evidence of rodent disturbance.

Artifacts were recovered from Levels 1 and 2. Level 1 artifacts included ceramics and flaked stone. Level 2 artifacts included ceramics and flaked stone. No cultural materials or features were identified at the base of Level 3 and excavation of SU 5 terminated.

Study Unit 6

SU 6 was located on the west edge of the existing N11 road near the middle of the site. The southwest grid coordinates for SU 6 were N978, E1008. This study unit was placed in an area of high artifact densities and near a circular area of diffuse charcoal staining. SU 6 was excavated to a depth of 40 cm (four levels) below the ground surface. Two features were identified within the study unit (Features 13 and 14). Feature 13 was a possible posthole measuring approximately 17 cm in diameter and 23 cm in depth. Feature 14 was a small pit and measured approximately 25 cm in diameter and 20 cm in depth; it was basin-shaped in the profile. One stratum was identified

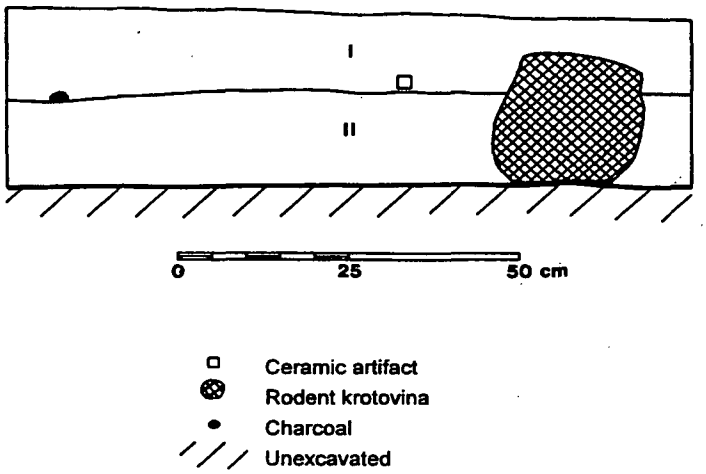


Figure 21.7. Site NM-Q-23-62, Study Unit 5, West Wall Profile.

within the study unit and two 1-m-long profiles of the east and west walls were illustrated showing Features 13 and 14 (Figures 21.8 and 21.9, respectively). Stratum I was 30 cm thick and consisted of yellowish brown (10YR5/6) sandy loam.

Artifacts were recovered from Levels 1 through 3. Artifacts from Level 1 included only ceramics. Artifacts from Level 2 increased in numbers and consisted of ceramics only. Artifacts in Level 3 decreased to only a few ceramics. Level 4 was sterile of artifacts and excavation of SU 6 was terminated.

Areas to the south and southeast of SU 6 were explored to further define the boundaries of the shallow and diffuse circular charcoal stain. Two additional features (3 and 4) were identified. Feature 3 was a possible posthole measuring 30 cm in diameter and 24 cm in depth and had rodent disturbance. Feature 4 was a ceramic storage cist measuring approximately 43 by 49 cm and approximately 34 cm in depth. One projectile point and numerous pieces of ceramics were recovered from Feature 4. The area of the diffuse charcoal stain was most likely a storage cist that was destroyed by the continuous road maintenance. A plan view of the area was illustrated to show the locations of these features and SU 6 (Figure 21.10).

Study Unit 7

SU 7 was located 2 m east of the existing N11 roadway at the southeast section of the site. The southwest grid coordinates for SU 7 were N962, E1028. This study unit was placed in a dune area away from the disturbance by the road maintenance in order to establish the presence of possible buried deposits. SU 7 was excavated to a depth of 50 cm (five levels) below the ground surface. Two strata were identified within the study unit. A single representative 1-m-long profile

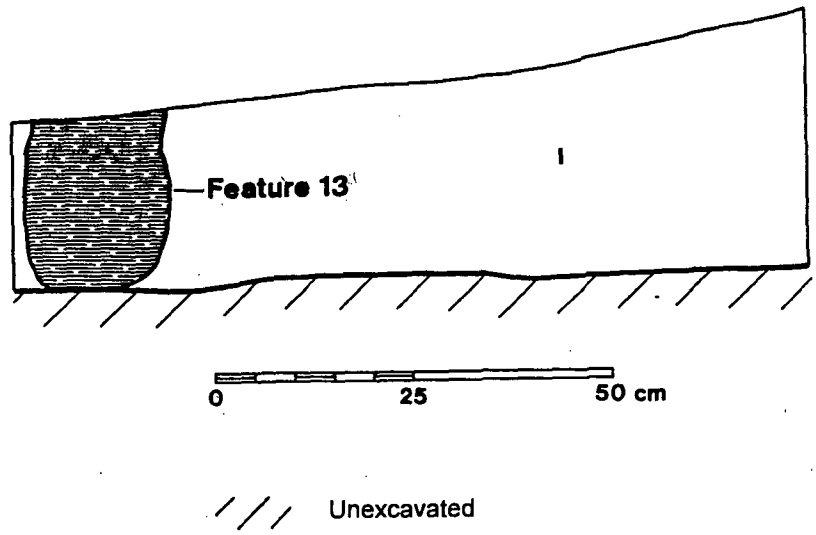


Figure 21.8. Site NM-Q-23-62, Study Unit 6, West Wall Profile Showing Feature 13.

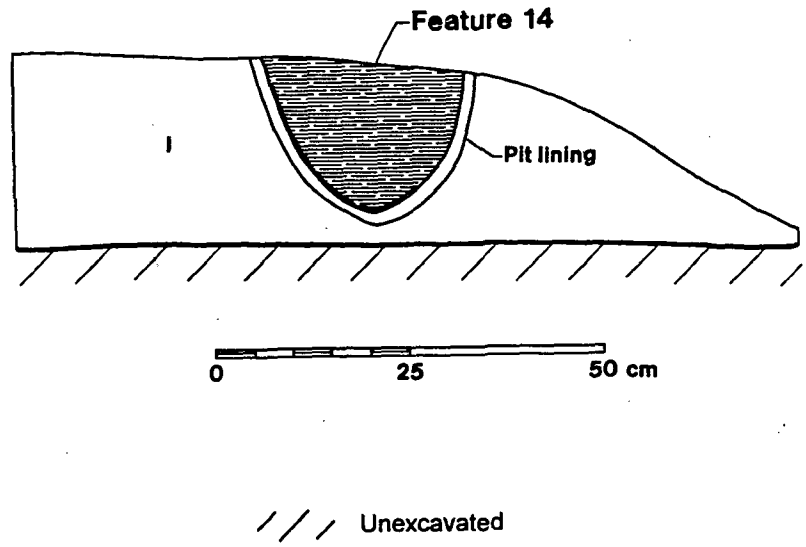


Figure 21.9. Site NM-Q-23-62, Study Unit 6, East Wall Profile Showing Feature 14.

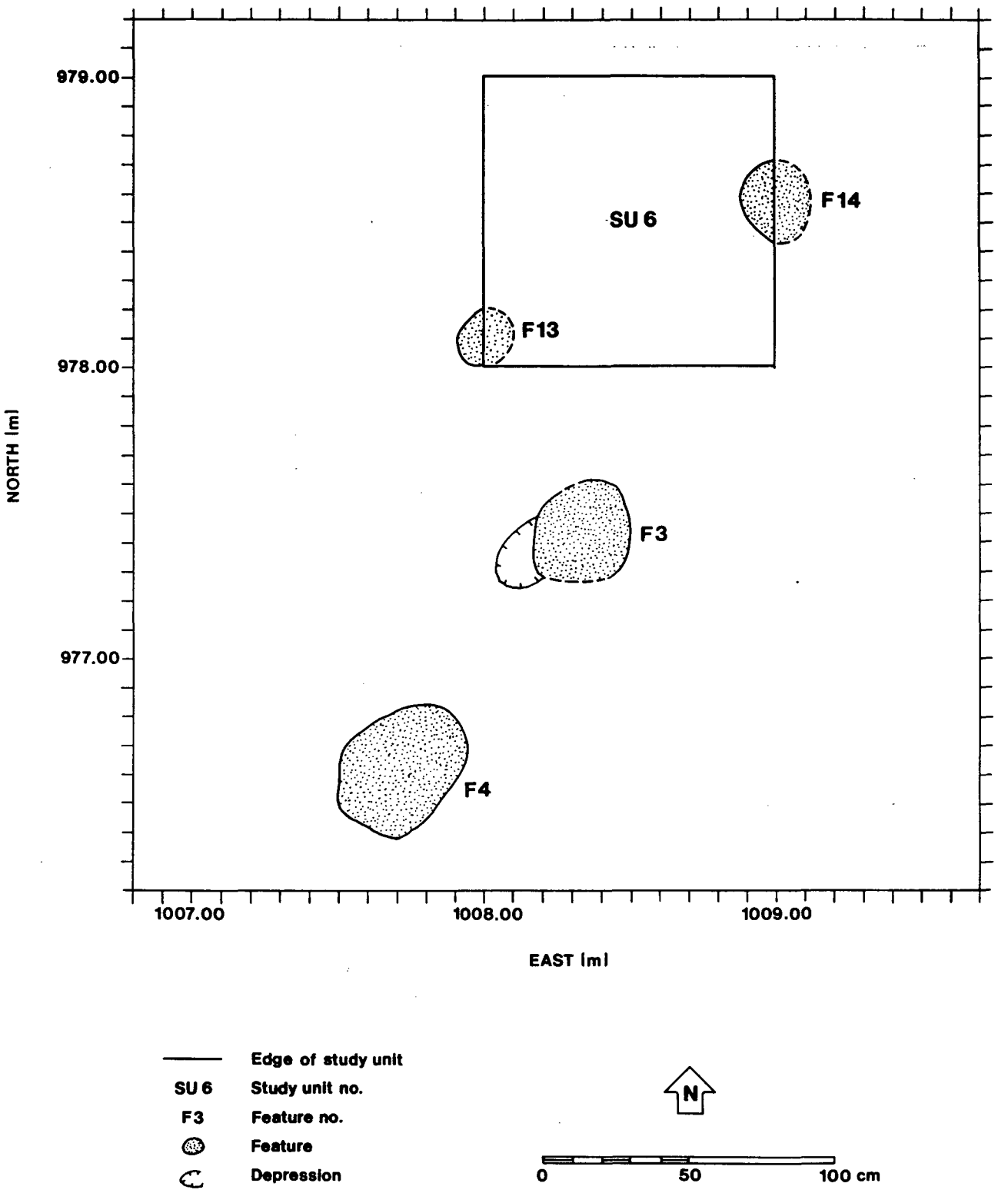


Figure 21.10. Site NM-Q-23-62, Plan View of Feature 3, 4,13, and 14 Showing Study Unit 6.

(Figure 21.11) of the west wall was illustrated for SU 7. Stratum I was 22 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum II was approximately 32 cm thick and consists of dark yellowish brown (10YR3/6) sand. The boundary between stratum I and II was irregular.

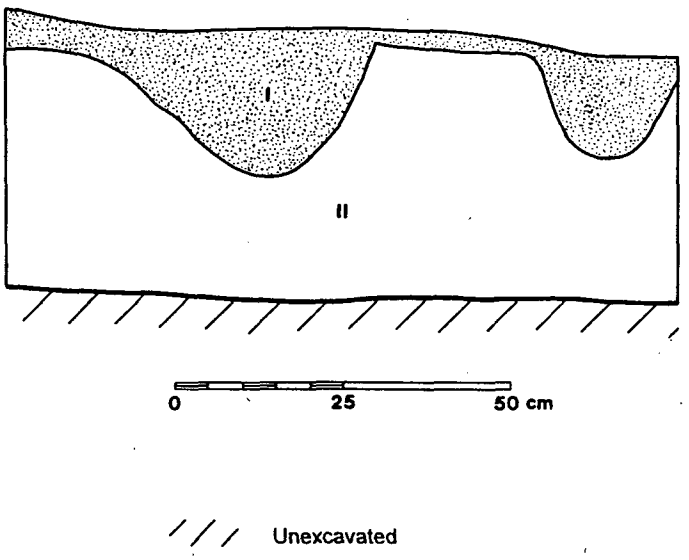


Figure 21.11. Site NM-Q-23-62, Study Unit 7, West Wall Profile.

Artifacts were recovered from Levels 1 through 3. Level 1 artifacts included ceramics, flaked stone, and fauna. Artifacts from Levels 2 and 3 consisted only of ceramics. Both Levels 4 and 5 had sterile deposits and excavation of SU 7 was terminated.

Study Unit 8

SU 8 was located 6 m east of the east cut bank of the existing N11 roadway and at the southeast part of the site. The southwest grid coordinates for SU 8 were N964, E1034. This study unit was placed in a dune area of light artifact densities in order to establish the presence of possible buried deposits. SU 8 was excavated to a depth of 1.47 m (15 levels) below the ground surface. Three strata were identified within the study unit. A single representative 1-m-long profile (Figure 21.12) was illustrated of the south wall of SU 8. Stratum I was 40 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 72 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum III was 35 cm thick and consisted of yellowish brown (10YR5/6) sand.

Artifacts were recovered from Levels 2 and 5 through 12. Artifacts for these levels consisted primarily of ceramics and flaked stone. Levels 13 through 15 were sterile of cultural deposits and excavation of SU 8 was terminated.

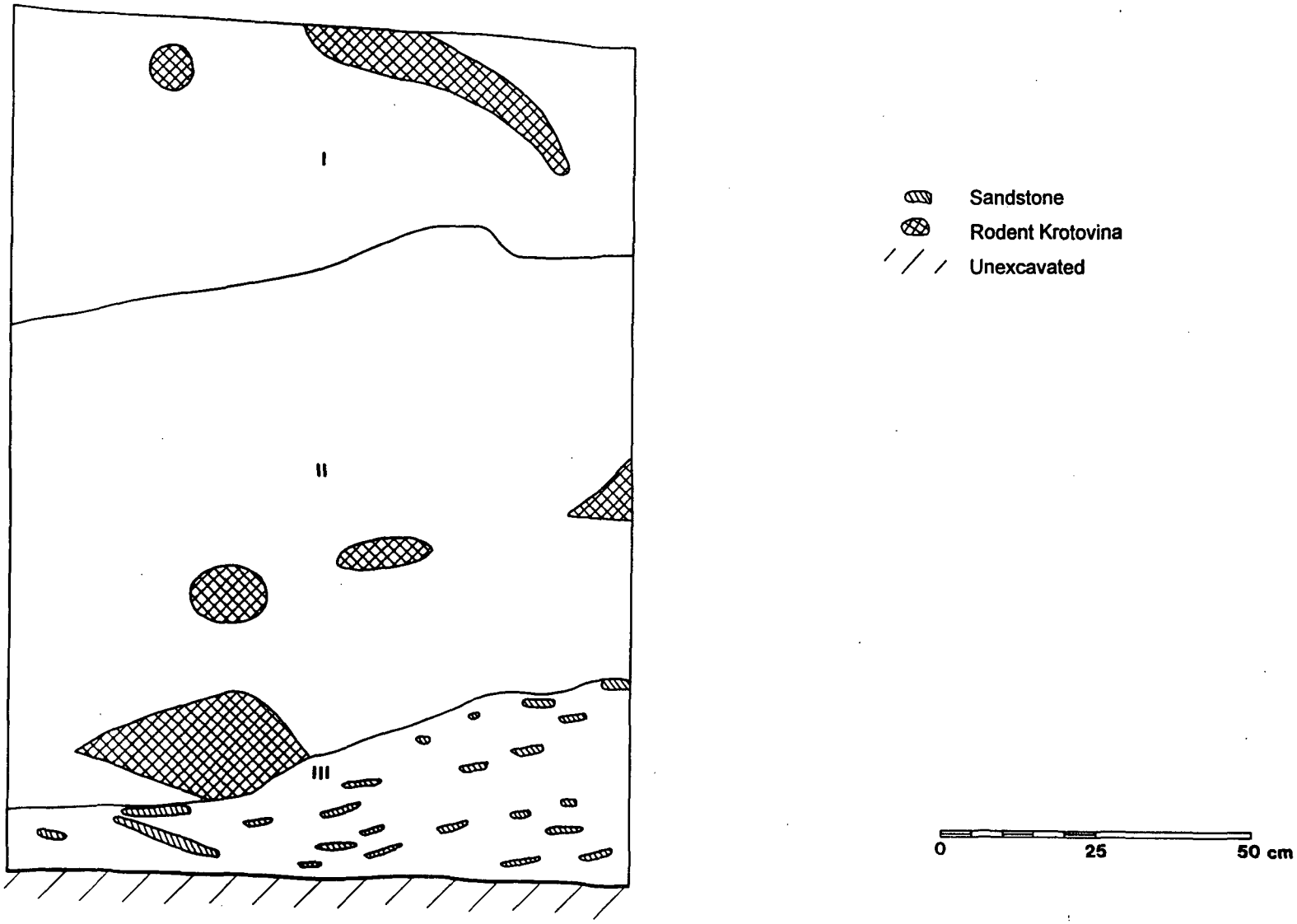


Figure 21.12. Site NM-Q-23-62, Study Unit 8, South Wall Profile.

Study Unit 9

SU 9 was located 1 m from the east edge of the cut bank of the existing N11 roadway near the middle of the site. The southwest grid coordinates for SU 9 were N970, E1033. This unit was placed in a dune area of high artifact densities to establish the presence of possible buried deposits. SU 9 was excavated to a depth of 60 cm (six levels) below the ground surface. Three strata were identified within the unit and a single representative 1-m-long profile (Figure 21.13) of the east wall was illustrated for SU 9. Stratum I was 12 cm thick and consisted of dark yellowish brown (10YR4/6) sandy clay. Stratum II was 45 cm thick and consisted of dark yellowish brown (10YR3/6) very fine sand. Stratum III was 12 cm thick and consisted of yellowish brown (10YR5/6) very fine sand.

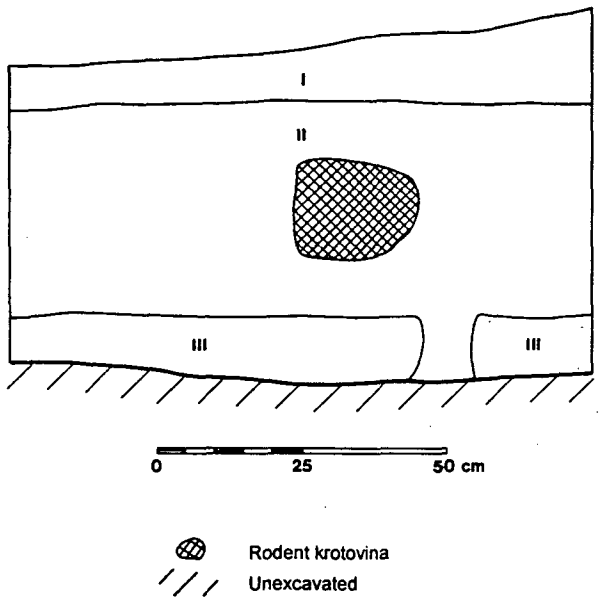


Figure 21.13. Site NM-Q-23-62, Study Unit 9, East Wall Profile.

Artifacts were recovered from Levels 2 through 5. Artifacts from Level 2 consisted of only ceramics. Level 3 had the highest counts of artifacts which consisted of ceramics and flaked stone. At Level 4 artifact counts decreased and included ceramic, flaked stone and unmodified stone. Artifacts from Level 5 diminished to only a few ceramics and flaked stone. No artifacts were recovered from Level 6 and excavation of SU 9 was terminated.

Study Unit 10

SU 10 was located 2 m from the eastern edge of the existing N11 roadway cut bank near the middle of the site. The southwest grid coordinates for SU 10 were N980, E1041. This study unit was placed in a dune area of light artifact densities to establish the presence of buried deposits. SU 10 was excavated to a depth of 70 cm (seven levels) below the ground surface. Four strata were

identified within the study unit and a single representative 1-m-long profile (Figure 21.14) of the south wall was illustrated for SU 10. Stratum I was 12 cm thick and consisted of brownish yellow (10YR6/6) sand. Stratum II was 19 cm thick and consisted of yellowish brown (10YR5/6) very fine sand. Stratum III was 9 cm thick and consisted of dark brown (10YR3/3) fine sand. Stratum IV was 30 cm thick and consisted of dark yellowish brown (10YR4/6) sandy loam.

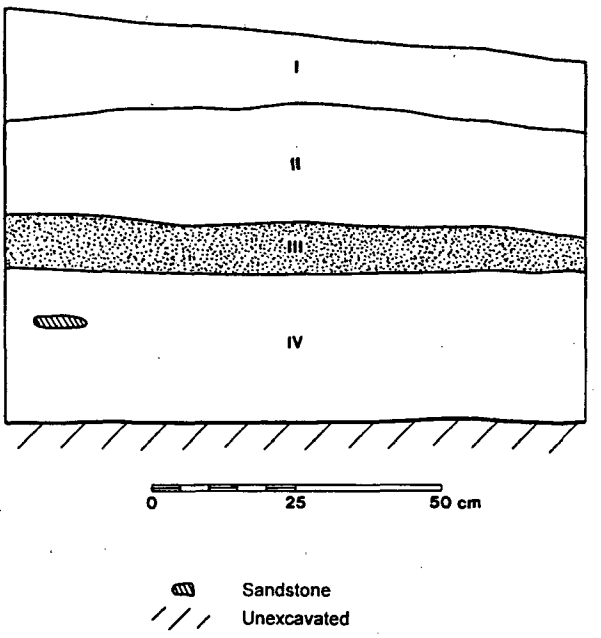


Figure 21.14. Site NM-Q-23-62, Study Unit 10, South Wall Profile.

Artifacts were recovered from Levels 1 and 3 through 6. Artifacts recovered from Level 1 only consisted of a few ceramic sherds. There were no artifacts from Level 2. Artifacts recovered from Level 3 only consisted of a few flaked stone items. Artifacts from Level 4 included ceramics and flaked stone, with an increase in the ceramic artifacts. Level 5 artifacts included ceramics and flaked stone; both artifact types decreased in number. At Level 6 artifact counts decreased sharply to only a few ceramics and flaked stone items. Level 7 was sterile of cultural deposits and excavation of SU 10 was terminated.

Study Unit 11

SU 11 was located on the cut bank of the existing N11 roadway near the middle of the site. The southwest grid coordinates for SU 11 were N969.10, E1028.60. This unit was located within the road maintenance disturbance area and on the northeast quarter of Feature 1. Feature 1 was a stone-lined storage cist measuring approximately 1.36 m in diameter. SU 11 was excavated 18 cm

(in one level) below the surface of the feature. Two strata were identified within Feature 1 (Figure 21.15). One 75-cm-long profile of the west wall was illustrated for SU 11 and was representative of the entire unit. Stratum I was 11 cm thick and consisted of yellowish brown sand. Stratum II was 1.5 cm thick and consisted of light yellowish brown sandy clay loam. Sandstone lining was of irregular shaped slabs ranging in thickness from 4 to 8 cm.

Artifacts recovered from the fill of the feature consisted of only ceramics. Excavation of SU 11 was terminated at the base of Feature 1.

Study Unit 12

SU 12 was located on the east cut bank of the existing N11 roadway near the middle of the site. The southwest grid coordinates for SU 12 were N985, E1040.50. This unit was placed over the southern half of Feature 12 in order to establish the nature and depth of the feature. Feature 12 was a hearth measuring 80 by 70 cm. The southern half of Feature 12 was excavated 20 cm (two levels) below the ground surface of the feature. A plan view and a cross section of the feature were illustrated (Figure 21.16). Two strata was identified within Feature 12. Stratum I was 5 cm thick and consisted of brown (10YR5/3) sand. Stratum II was 6 cm thick and consisted of very dark brown sand.

Artifacts recovered from Level 1 included ceramics and flaked stones. No artifacts were recovered from Level 2, the fill within the feature. Feature 12 had severe disturbance by the continuous road maintenance.

Backhoe Trench Excavation

The mechanical excavation of 27 trenches was conducted in order to investigate the possibility of buried cultural deposits on site NM-Q-23-62. Excavated backhoe trenches were variable in length and depth, ranging from 8 m to 28.4 m in length and 0.73 m to 2.10 m in depth. For safety reasons, trenches over 2 m deep were backfilled 1 m before profiles were illustrated by ZCRE personnel. A total of 392 m of backhoe trenching was completed on this site. Profiles were illustrated for each trench in 1-m-wide to 4-m-wide sections. At least one representative profile was illustrated for each trench. The artifact distribution map generated from the controlled surface collection was used as a guide for placement of the backhoe trenches.

On-site Trenches

Study Unit 13. SU 13 was located west of the existing N11 roadway in the southwestern portion of the site. SU 13 commenced at grid coordinates N941.95, E977.86 and extended northeast to N958.56, E989.58. This trench was placed in an area of low artifact density within a dune area. SU 13 was 20 m in length and had an average depth of 1.10 m. SU 13 was recorded as an on-site trench.

Two 1-m-long profiles of the west wall were illustrated for SU 13. Only one profile located 2 m north from the south end of the west trench wall was illustrated (Figure 21.17) and is

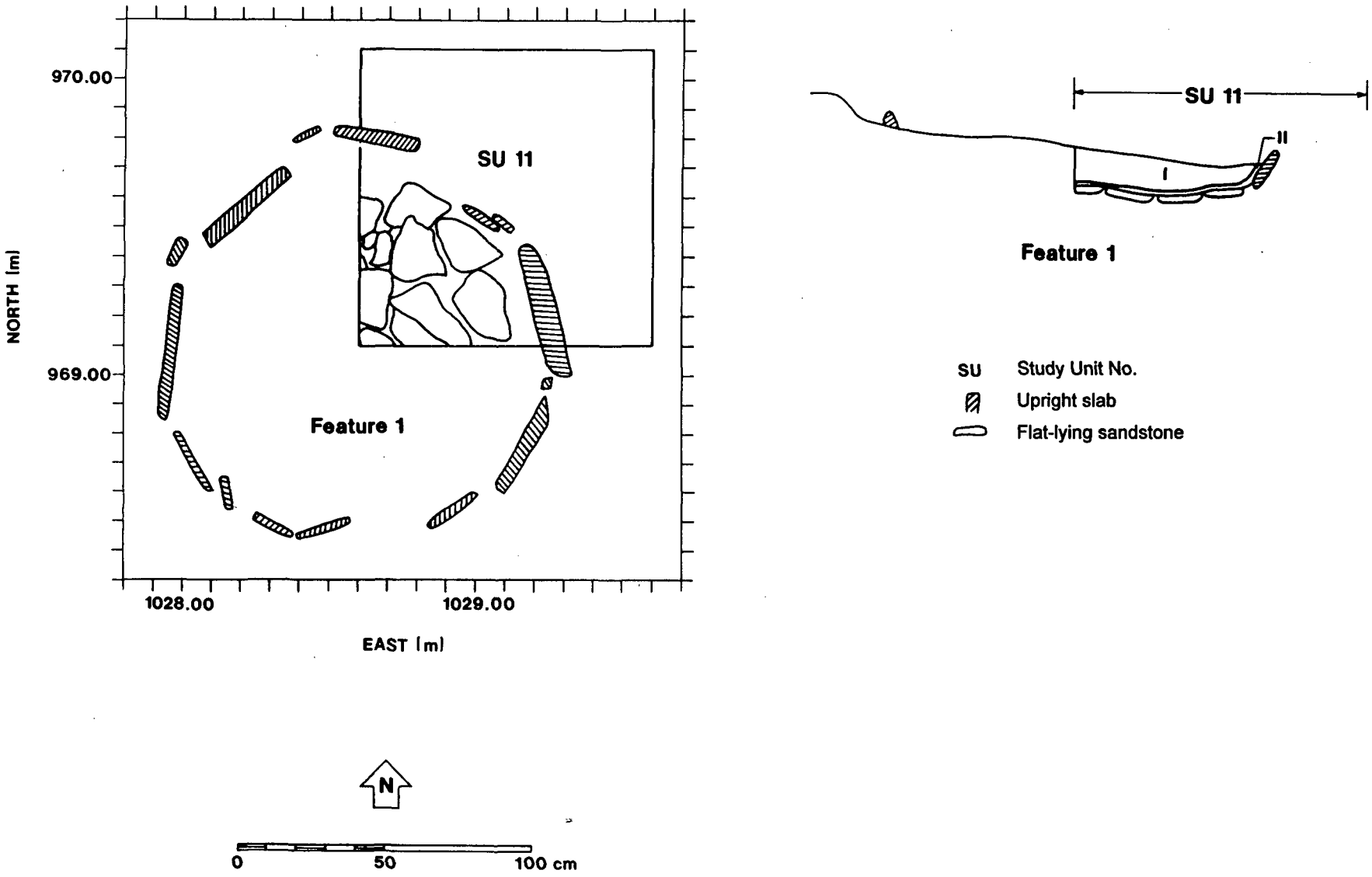
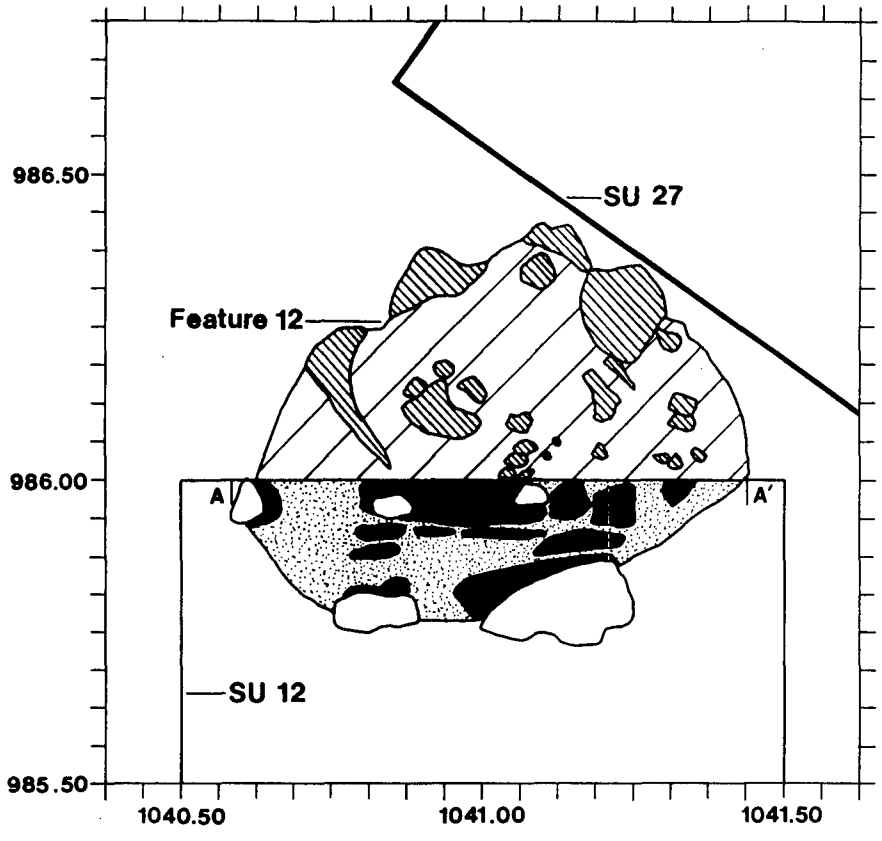
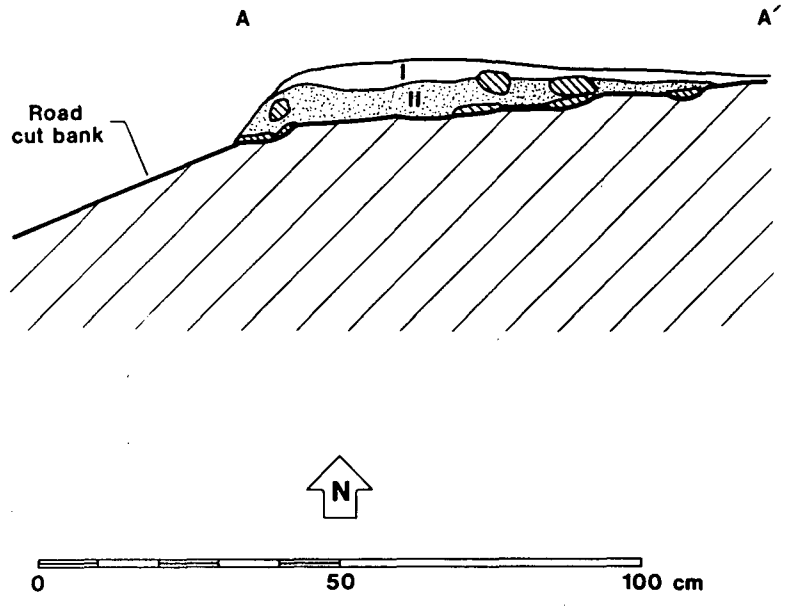


Figure 21.15. Site NM-Q-23-62, Plan View and East-facing Profile of Feature 1 Showing Study Unit 11.





Edge of hand excavated unit
SU 12 Study unit no.
Edge of backhoe trench
Feature 12 f II
Sandstone rocks
Level 1 rocks
Level 2 rocks
Unexcavated

Figure 21.16. Site NM-Q-23-62, Plan View and Cross Section of Feature 12 Showing Study Units 12 and 87.

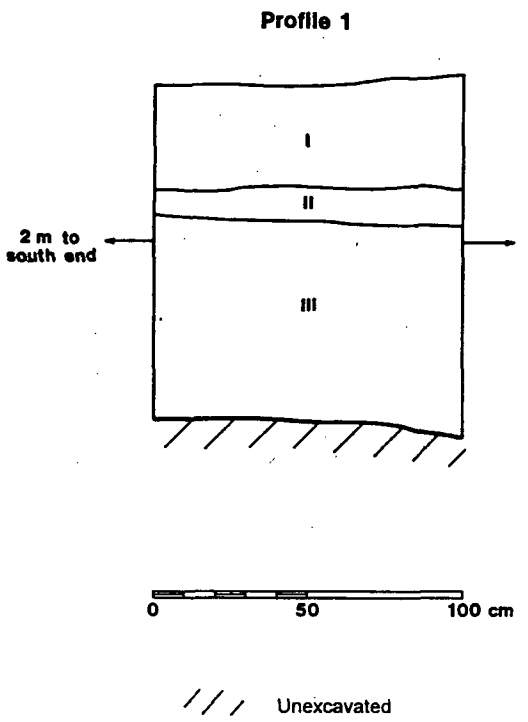


Figure 21.17. Site NM-Q-23-62, Study Unit 13, West Wall Profile.

representative of the entire trench. Four strata were identified within SU 13. Stratum I was 27 cm thick and consisted of light yellowish brown (10YR6/4) sand with weak structure. Stratum II was 11 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum III was 66 cm thick and consisted of very pale brown (10YR7/3) cobbly sand. No cultural materials or features were identified within SU 13.

Study Unit 14. SU 14 was located west of the existing N11 roadway at the southwestern section of the site. SU 14 was located at grid coordinates N965.58, E988.46 and extended southeastward to N959.49, E997.72. This trench was placed in an area of low artifact density within a dune area. SU 14 was 11 m in length and had an average depth of 1.04 m. SU 14 was recorded as an on-site trench.

One 1-m-long profile located 7 m from the west end of the north trench wall was illustrated (Figure 21.18) and is representative of the entire trench. Four strata were identified within the trench. Stratum I was 17 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 14 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum III was 50 cm thick and consisted of yellowish brown (10YR5/8) sand. Stratum IV was 21 cm thick and consisted of light gray (10YR7.2) sandstone. No cultural materials or features were identified within SU 14.

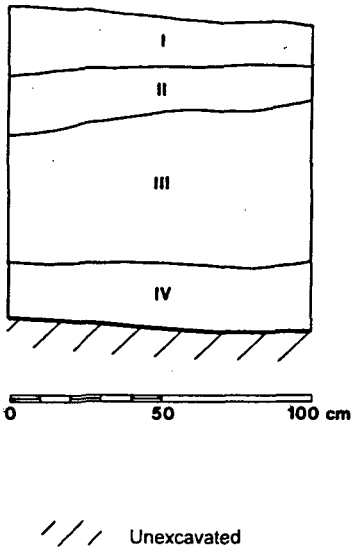


Figure 21.18. Site NM-Q-23-62, Study Unit 14, North Wall Profile.

Study Unit 15. SU 15 was located west of the existing N11 roadway at the southwest portion of the site. SU 15 commenced at grid coordinates N976.61, E996.73 and extended southeastward to N970.49, E1005.56. This trench was placed in an area of low artifact density in a dune area. SU 15 was 10.8 m in length and had an average depth of 1.67 m. SU 14 was recorded as an on-site trench.

One 1-m-long profile located on the south wall 6 m from the west end of the trench was illustrated (Figure 21.19) and was representative of the entire trench. Four strata were identified within SU 15. Stratum I was 18 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum I was a cultural stratum that was present throughout the site. Stratum II was 95 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum III was 35 cm thick and consisted of yellowish brown (10YR5/8) sand. Stratum IV was 23 cm thick and consisted of very pale brown (10YR7/3) sandstone bedrock. No artifacts or features were identified within SU 15.

Study Unit 16. SU 16 was located west of the existing N11 roadway in the south half of the site. SU 16 commenced at grid coordinates N972.73, E1001.71 and extended northeastward to N984.62, E1009.00. This trench was placed in an area of moderate artifact density within a dune deposits. SU 16 was 13.4 m in length and had an average depth of 1.7 m. SU 16 was recorded as an on-site trench.

One 1-m-long profile located 1-m from the south end of the east trench wall was illustrated (profile 1, Figure 21.20) to represent the trench stratigraphy. Five strata were identified within SU 16. Stratum I was 19 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II,

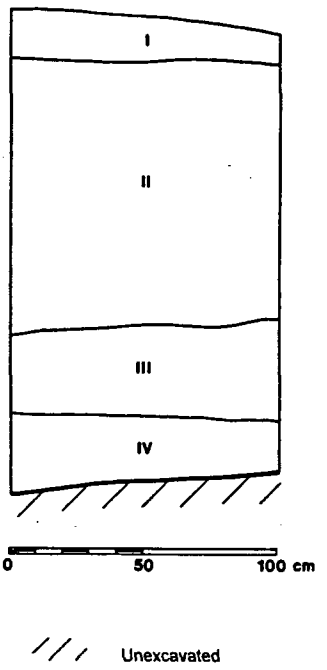


Figure 21.19. Site NM-Q-23-62, Study Unit 15, South Wall Profile.

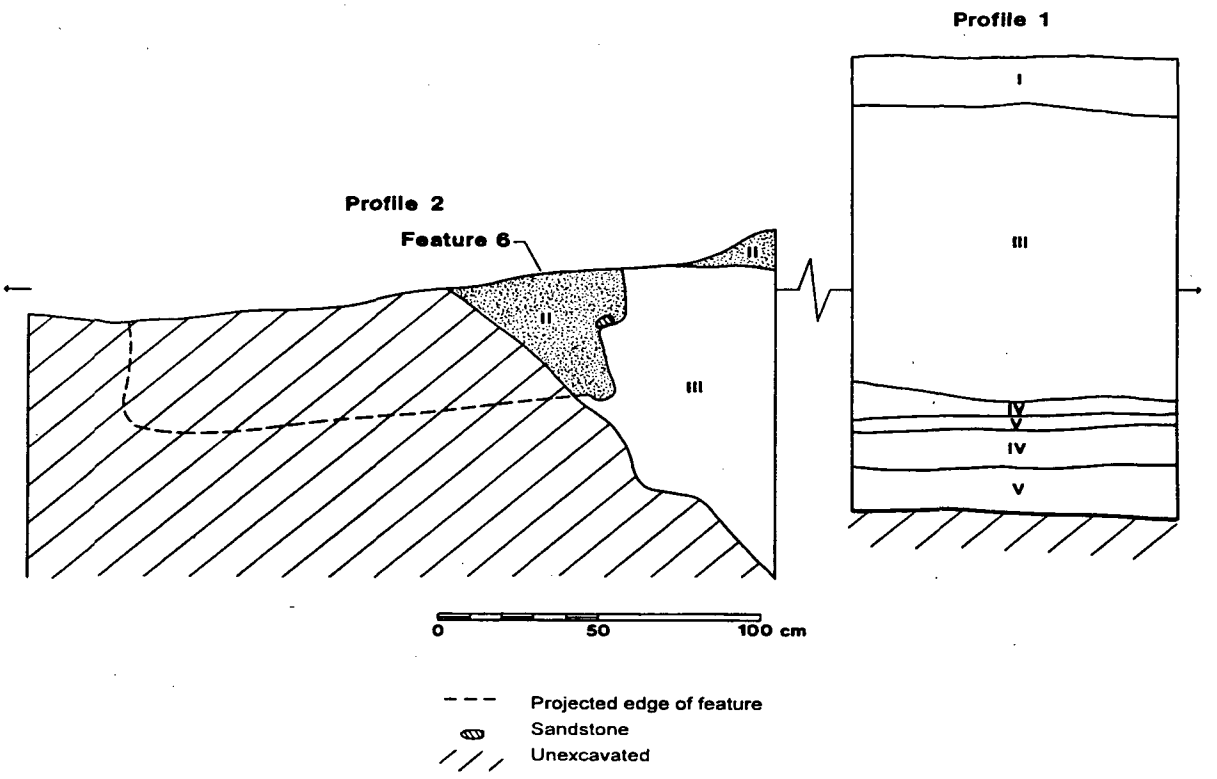


Figure 21.20. Site NM-Q-23-62, Study Unit 16, East Wall Profiles Showing Feature 6.

the dark yellowish brown (10YR4/6) cultural stratum, was absent at the south end of the trench. Stratum III was 1.12 m thick and consisted of yellowish brown (10YR5/6) sand. Stratum IV varied in thickness from 6 to 15 cm and consisted of yellowish brown (10YR5/8) sand. Stratum V varied in thickness from 5 to 19 cm and consisted of very pale brown (10YR7/3) stony sand.

One feature (Feature 6) was identified at the north end of the trench. Feature 6 was a possible storage cist/roasting pit that was approximately 1.78 m in diameter and at least 80 cm deep. The boundaries of the feature were well defined, showing a dark yellowish brown fill. Artifacts recovered within the fill of the feature included ceramics and faunal remains. One 2.3-m-long profile was illustrated of Feature 6 on the west wall of the trench (Figure 21.21), and another (profile 2, Figure 21.20) was recorded on the east wall. Stratum IIa is feature fill and consisted of dark yellowish brown (10YR3/4) sand. The projected pit outline is shown by the dash lines.

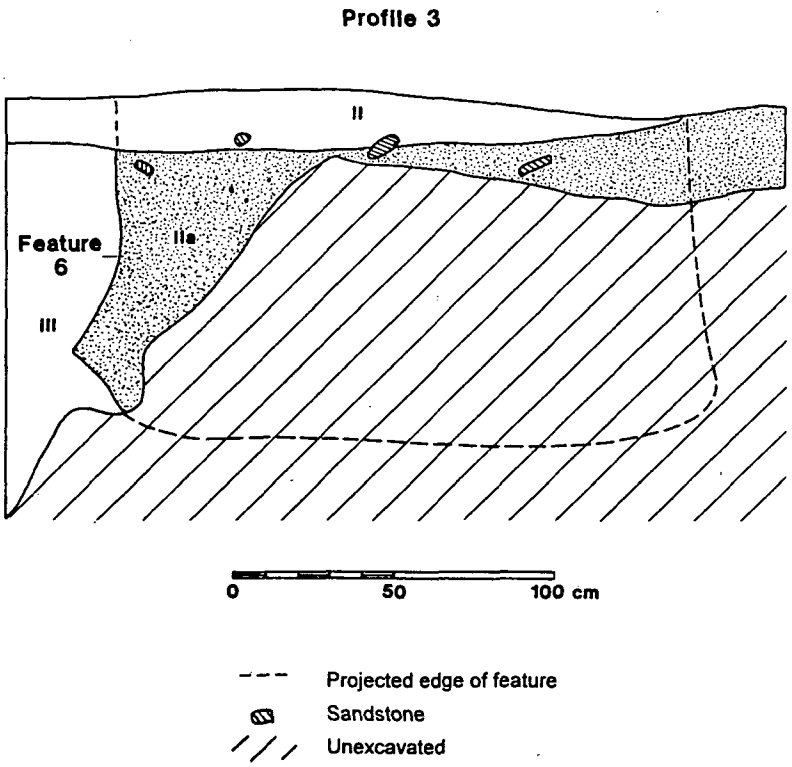


Figure 21.21. Site NM-Q-23-62, Study Unit 16, West Wall Profile Showing Feature 6.

Study Unit 17. SU 17 was located west of the existing N11 roadway in the southern half of the site. SU 17 commenced at grid coordinates N986.33, E1016.24 and extended northwestward to N992.29, E1006.24. This trench was placed in an area of moderate artifact density and within a dune area. SU 17 was 10.6 m in length and had an average depth of 1.27 m. SU 17 was recorded as an on-site trench.

One 4-m-long profile located 1.5 m from the northwest end to the middle of the south trench wall was illustrated (Figure 21.22). Three strata were present within SU 17. Stratum I was 12 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II varied in thickness from 6 to 59 cm. It consisted of dark yellowish brown (10YR4/6) sand. Stratum III was 1.12 m thick and consisted of yellowish brown (10YR5/6) sand.

Two features were identified within SU 17. Feature 7 was a probable storage cist measuring 76 cm in diameter with well-defined boundaries and dark yellowish brown fill. Feature 8 was a probable storage cist measuring 1.14 m in diameter with well-defined boundaries and fill consisting of dark yellowish brown sand. Both features were within Stratum II.

Study Unit 18. SU 18 was located west of the N11 roadway near the middle of the site. SU 18 commenced at grid coordinates N1000.14, E1012.40 and extended southeastward to N994.82, E1020.98. This trench was placed in an area of moderate artifact density and within a dune deposit. SU 18 was recorded as an on-site trench. SU 18 was 10.2 m in length and had an average depth of 1.25 m. SU 18 was recorded as an on-site trench.

One 4-m-long profile located from the east end of trench to the middle of the north trench wall was illustrated (Figure 21.23). Three strata were present within SU 18. Stratum I was 18 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 18 cm thick and consisted of dry dark brown (10YR3/3) sand. Stratum IIa varied in thickness from 9 to 20 cm and consisted of dark yellowish brown (10YR3/6) sand. Stratum III was 84 cm thick and consisted of light yellowish brown (10YR6/4) sand.

Two features were defined near the east end of SU 18. Feature 9 was an earthen hearth measuring approximately 70 cm in diameter and at least 36 cm in depth. Feature 10 was a probable earthen storage cist/roasting pit and measured approximately 1.06 m in diameter with an unknown depth. Backhoe excavation stopped on top of the feature to avoid destruction of the feature. Features 9 and 10 were 40 cm apart and approximately 1.5 m south of Feature 2.

Study Unit 19. SU 19 was located west of the existing N11 near the middle of the site. SU 19 commenced at grid coordinate N1000.91, E1024.94 and extended northwestward to N1005.67, E1015.30. This trench was placed in a high-density artifact scatter and in an area of dune deposits. SU 19 was recorded as an on-site trench. SU 19 was 10.8 m in length and had an average depth of 1.46 m.

Two profiles were drawn of SU 19. Profile 1 is located 2.5 m from the west end of the north trench wall. Profile 2 is located 3.7 m from the east end of the north trench wall (Figure 21.24). Five strata were present within SU 19. In profile 1, Stratum I was 6 cm thick and consisted of light yellowish brown (10YR6.4) sand. Stratum II was 20 cm thick and consisted of dark brown (10YR3/3) sand. Stratum IIa was 15 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum III was 1.07 m thick and consisted of yellowish brown (10YR5/6) sand with evidence of calcium carbonation. Stratum IV was a pocket within Stratum IIa and was 9 cm thick. It consisted of hard yellowish red (5YR5/6) loamy sand. In profile 2, Stratum I varied in thickness from 10 to 15 cm and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 8 cm thick

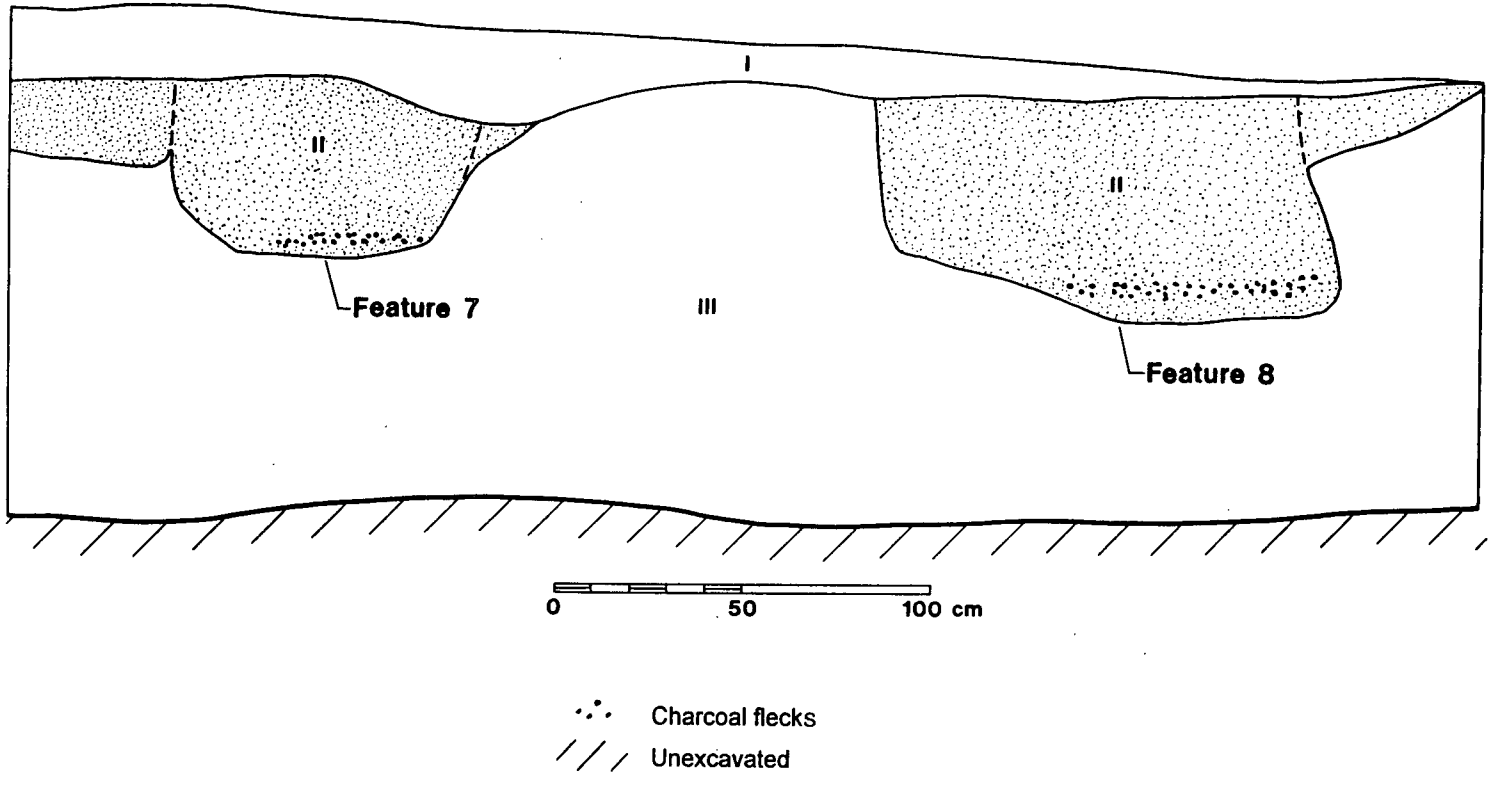


Figure 21.22. Site NM-Q-23-62, Study Unit 17, South Wall Profile Showing Features 7 and 8.

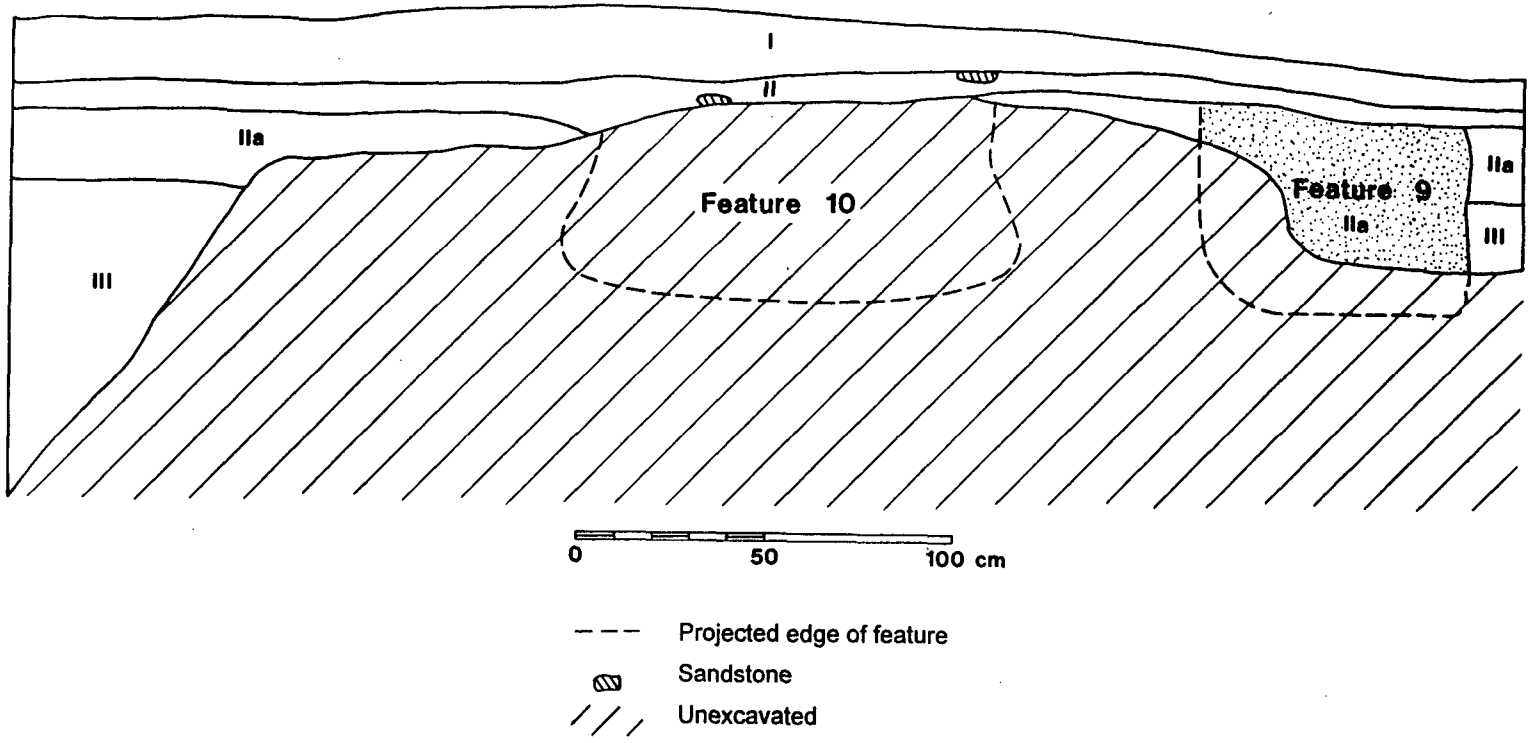


Figure 21.23. Site NM-Q-23-62, Study Unit 18, North Wall Profile Showing Features 9 and 10.

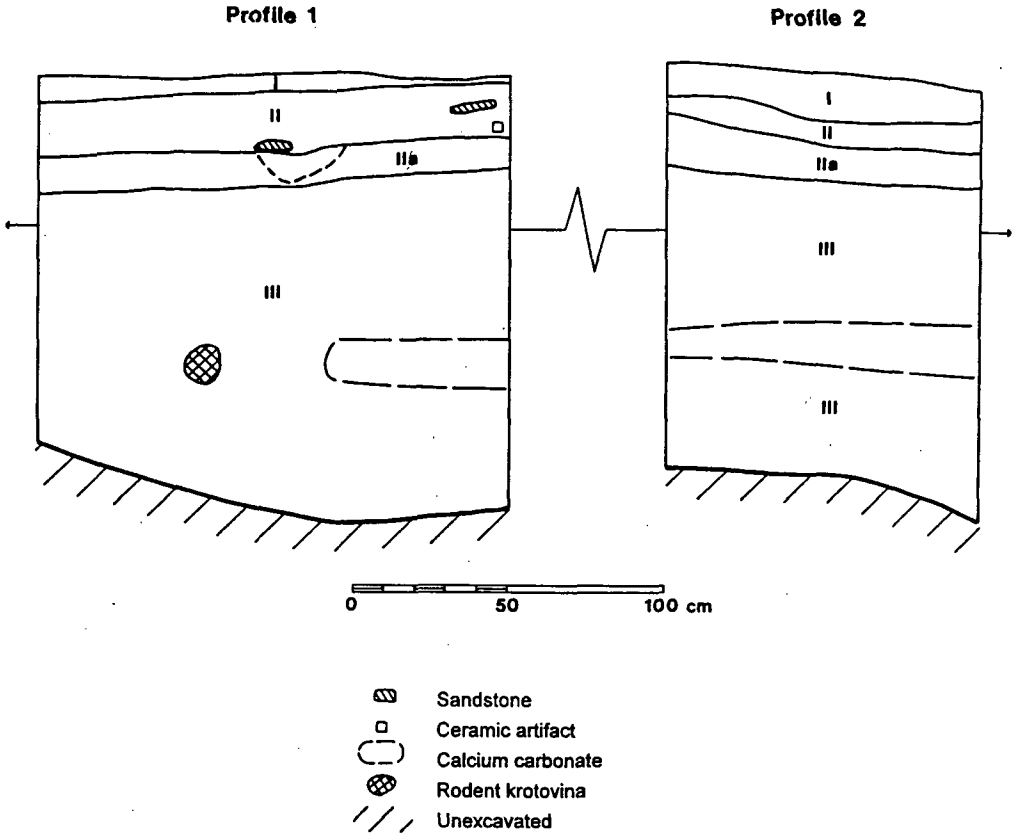


Figure 21.24. Site NM-Q-23-62, Study Unit 19, North Wall Profiles.

and consisted of dark brown (10YR3/3) sand. Stratum IIa was 12 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum III was 1.95 m thick and consisted of yellowish brown (10YR5/6) sand with evidence of calcium carbonation. No features were identified within SU 19.

Study Unit 20. SU 20 was located at the middle of the site, west of the existing N11 road. SU 20 extended from grid coordinates N1009.11, E1029.70 northwestward to N1013.72, E1020.76. This trench was placed in an area of moderate artifact density and within heavy dune deposits. SU 20 was recorded as an on-site trench. SU 20 was 10.2 m in length and had an average depth of 1.63 m.

One 1-m-long profile located 3 m from the west end of the north trench wall was illustrated (Figure 21.25). Four strata were present within SU 20. Stratum I is absent from SU 20 stratigraphy. Stratum II was 10 cm thick and consisted of dark yellowish brown (10YR4/6) very fine sand. Stratum III was 35 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Stratum IV was 83 cm thick and consisted of brownish yellow (10YR6/6) loamy coarse sand. Stratum V was 36 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. No artifacts or features were identified within the trench. Stratum II was identified as a cultural stratum that was present through the site.

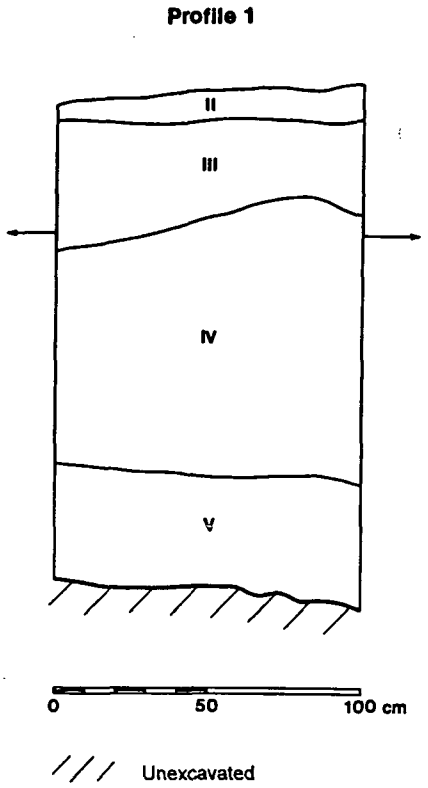


Figure 21.25. Site NM-Q-23-62, Study Unit 20, North Wall Profiles.

Study Unit 21. SU 21 was located at the middle of the site, west of the existing N11 road. SU 21 extended from grid coordinates N1012.61, E1025.10 and extended northeastward to N1033.50, E1036.13. This trench was placed in an area of moderate artifact density and within light dune deposits. SU 21 was recorded as an on-site trench. SU 21 was 23.6 m in length and had an average depth of 1.2.

One 1-m-long profile located 7 m from the south end of the west trench wall was illustrated (Figure 21.26) to represent the entire trench. Five strata were present within SU 21. Stratum I was 16 cm thick and consisted of light yellowish brown (10YR6.4) sand. Stratum II was 12 cm thick and consisted of dark brown (10YR3/3) sand. Stratum IIa was 38 cm thick and consisted of dark yellowish brown (10YR3/4) sand. Stratum III was 46 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum IV was 20 cm thick and consisted of very pale brown (10YR7/3) sandstone bedrock.

Two features (Feature 11 and Burial 3) were identified within SU 21. Feature 11 was located at the southern end of SU 21 (Figure 21.27). Strata descriptions in the profile are same as above. Feature 11 was an earthen hearth measuring approximately 45 cm in diameter and was 22 cm below the surface. The other feature was a human burial (Burial 3) located near the middle of the east trench wall, 30 cm below surface. Burial 3 is described in the Confidential Appendix D.

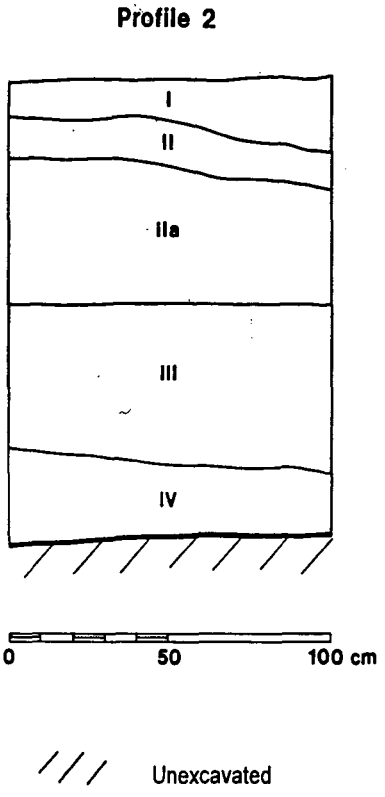


Figure 21.26. Site NM-Q-23-62, Study Unit 21, West Wall Profile.

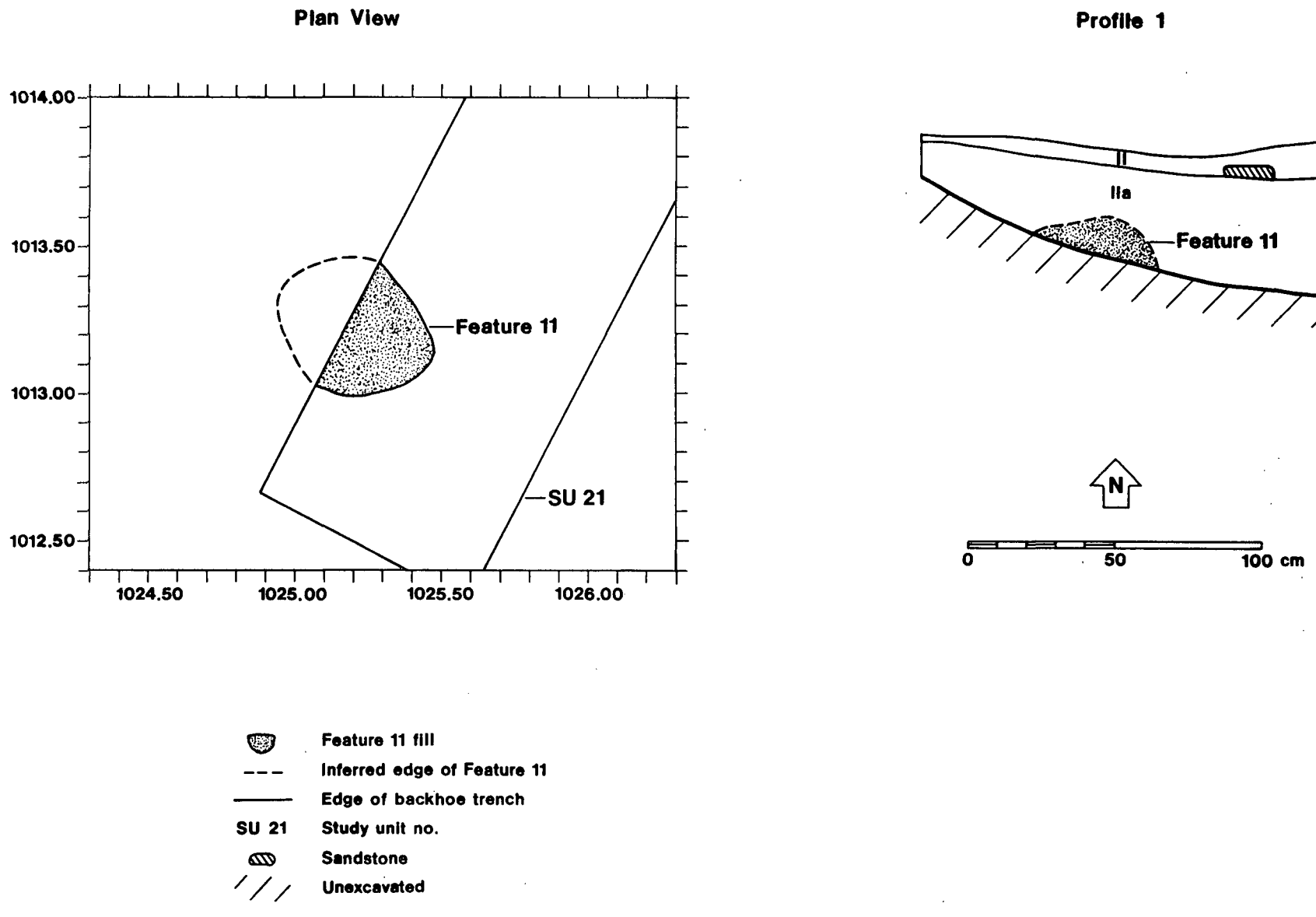


Figure 21.27. Site NM-Q-23-62, Study Unit 21, West Wall Profile and Plan View of Feature 11.

Study Unit 22. SU 22 was located near the middle of the site, west of the existing N11 road. SU 22 extended from grid coordinates N1035.24, E1044.17 and extended northwestward to N1040.37, E1034.37. This trench was placed in an area of light artifact density and in a dune area. SU 22 was recorded as an on-site trench. SU 22 was 11.2 m in length and had an average depth of 1.15 m.

One 1-m-long representative profile located 5 m from the west end of the north trench wall was illustrated for SU 22 (Figure 21.28). Five strata were present within SU 22. Stratum I was 9 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 23 cm thick and consisted of dark brown (10YR3/3) sand. Stratum IIa was 28 cm thick and consisted of dark yellowish brown (10YR3/4) sand. Stratum III was 36 cm thick and consisted of light yellowish brown (10YR6/4) coarse sand. Stratum IV was 19 cm thick and consisted of very pale brown (10YR7/3) sandstone bed rock. No artifacts or features were identified within SU 22.

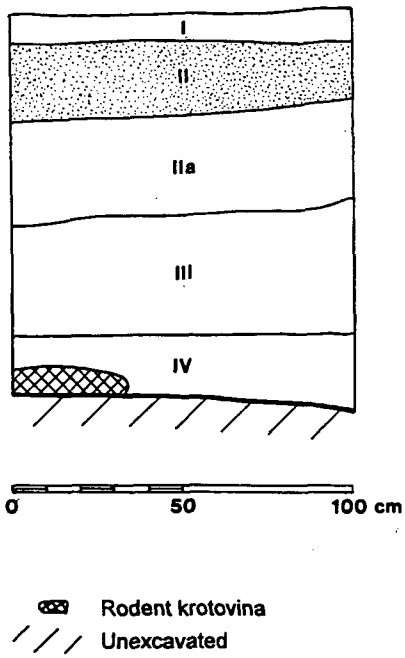


Figure 21.28. Site NM-Q-23-62, Study Unit 22, North Wall Profile.

Study Unit 23. SU 23 was located in the northeast part of the site, east of the existing N11 road. SU 23 extended from grid coordinates N1034.19, E1074.99 and extended northeastward to N1051.38, E1085.25. This trench was placed in an area of light artifact density and in an area of heavy dune deposits. SU 23 was recorded as an on-site trench. SU 23 was 22.2 m in length and had an average depth of 1.68 m.

Two profiles were drawn for SU 23. Profile 1 located 7 m from the south end of the east trench wall was illustrated for SU 23 (Figure 21.29) and is representative of the entire trench. Three strata were identified within SU 23. Stratum I was 1.08 m thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 48 cm thick and consisted of dark yellowish brown (10YR4/4) sand. Stratum II was a culturally stained layer that was present throughout the site. Stratum III was 14 cm thick and consisted of very pale brown sandstone bedrock. No artifacts or features were identified within SU 23.

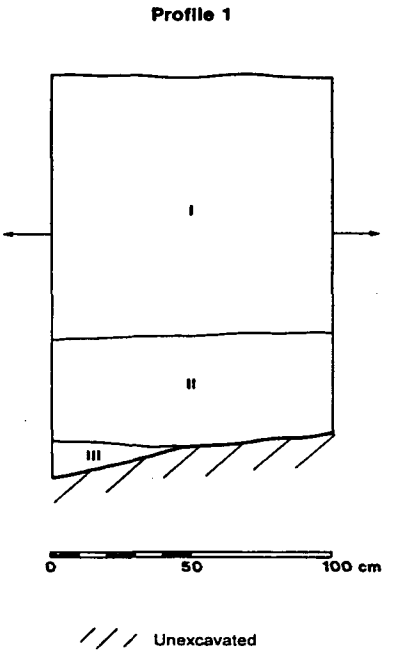


Figure 21.29. Site NM-Q-23-62, Study Unit 23, East Wall Profile.

Study Unit 24. SU 24 was located in the northeast part of the site, east of the existing N11 road. SU 24 extended from grid coordinates N1019.89, E1073.25 northwestward to N1025.20, E1062.14. This trench was placed in an area of light artifact density and in an area of heavy aeolian deposits. SU 24 was recorded as an on-site trench. SU 24 was 12 m in length and had an average depth of 1.64 m.

One 1-m-long representative profile located 4 m from the west end of the north trench wall was illustrated for SU 24 (Figure 21.30). Four strata were identified within SU 24. Stratum I was 70 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 7 cm thick and consisted of dark yellowish brown (10YR3/6) sand that was weak in structure. This stratum was the cultural layer that was present throughout the site. Stratum III was 12 cm thick and consisted of yellowish brown sand. Stratum IV was 75 cm thick and consisted of light yellowish brown (10YR6/4) sandy loam. Calcium carbonation and evidence of rodent disturbance were present within this stratum. No cultural materials or features were identified within SU 24.

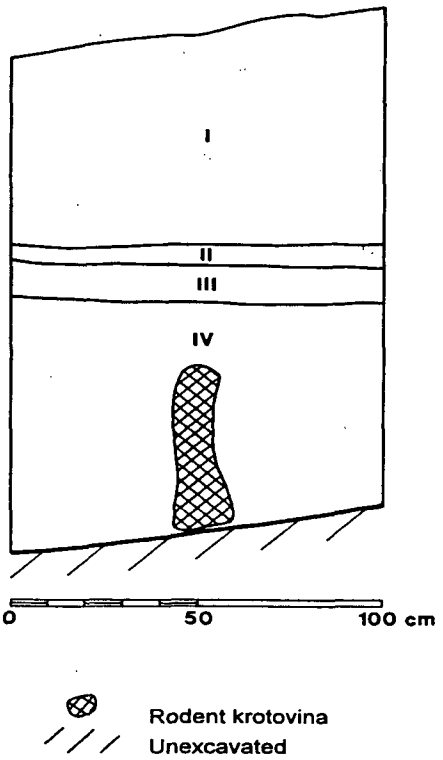


Figure 21.30. Site NM-Q-23-62, Study Unit 24, North Wall Profile.

Study Unit 25. SU 25 was located at the northeast part of the site, east of the existing N11 road. SU 25 extended from grid coordinates N1007.96, E1059.08 northeastward to N1021.35, E1068.35. This trench was placed in an area of light artifact density and in an area of heavy aeolian deposits. SU 25 was recorded as an on-site trench. SU 25 was 17.4 m in length and had an average depth of 2.10 m.

Two profiles were drawn for SU 25. Only one 1-m-long profile located 2 m from the north end of the west trench wall was illustrated for SU 25 (Figure 21.31). Four strata were identified within SU 25. Stratum I was 76 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 10 cm thick and consisted of dark yellowish brown (10YR3/6) sand. This stratum was the cultural layer that was present throughout the site. Stratum III was 14 cm thick and consisted of yellowish brown (10YR5/8) sand. Stratum IV was 48 cm thick and consisted of light yellowish brown (10YR6/4) sand. No cultural materials or features were identified within SU 25.

Study Unit 26. SU 26 was located at the middle of the site, east of the existing N11 road. SU 26 extended from grid coordinates N996.88, E1059.70 northwestward to N1002.22, E1050.99. This trench was placed in an area of light artifact density and in heavy aeolian deposits. SU 26 was recorded as an on-site trench. SU 26 was 10.2 m in length and had an average depth of 1.61 m.

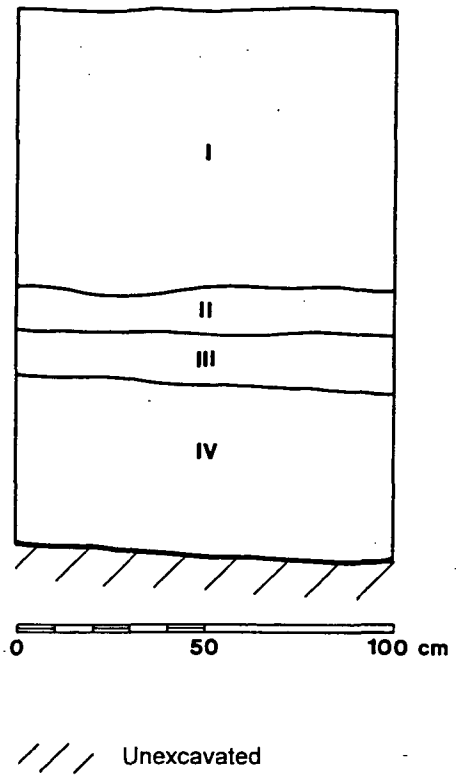


Figure 21.31. Site NM-Q-23-62, Study Unit 25, West Wall Profile.

One 1-m-long representative profile located at the middle and on the north trench wall was illustrated for SU 26 (Figure 21.32). Four strata were identified within SU 26. Stratum I was 79 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 18 cm thick and consisted of yellowish brown (10YR5/8) sand. Stratum III was 48 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum IV was 16 cm thick and consisted of very pale brown bedrock. No cultural materials or features were identified within SU 26.

Study Unit 27. SU 27 was located at the middle of the site, east of the existing N11 road. SU 27 extended from grid coordinates N979.64, E1053.85 northwestward to N986.94, E1041.34. This trench was placed in an area of light artifact density and in an area of heavy aeolian deposits. SU 27 was recorded as an on-site trench. SU 27 was 14.4 m in length and had an average depth of 1.38 m.

One 1-m-long representative profile located 7 m from the west end of the north trench wall was illustrated for SU 27 (Figure 21.33). Five strata were identified within SU 27. Stratum I was 59 cm thick and consisted of light yellowish brown sand. Stratum II was 9 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum III was 21 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum IV was 35 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum V was 13 cm thick and consisted of sandstone bedrock.

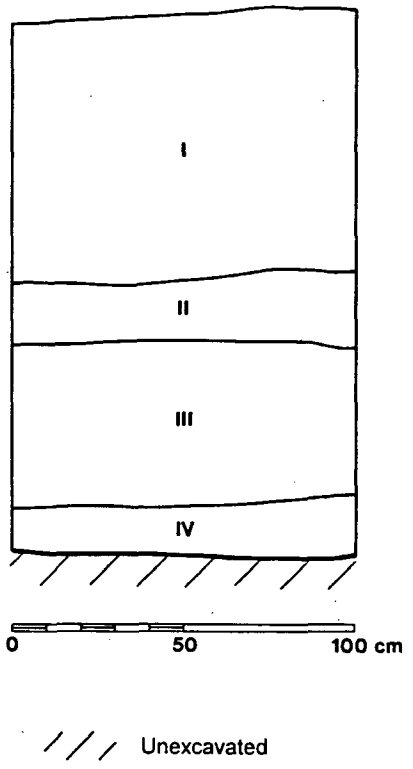


Figure 21.32. Site NM-Q-23-62, Study Unit 26, North Wall Profile.

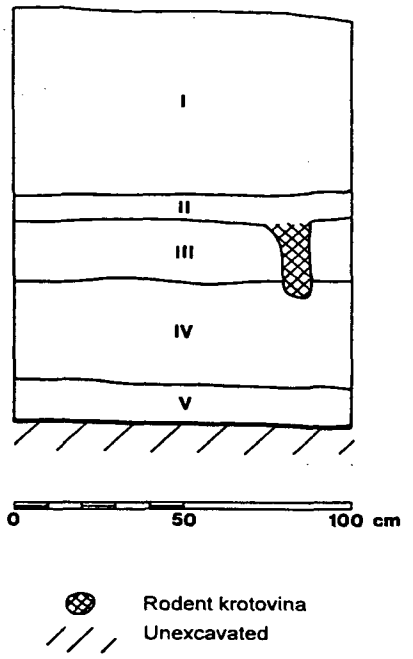


Figure 21.33. Site NM-Q-23-62, Study Unit 27, North Wall Profile.

One feature (Feature 12) was identified at the northwest end of the trench. This feature was a small earthen hearth. Feature 12 was further investigated by excavation of SU 12.

Study Unit 28. SU 28 was located at the middle of the site, east of the existing N11 road. SU 28 extended from grid coordinates N970.80, E1039.24 northeastward to N983.75, E1047.94. This trench was placed in an area of light artifact density and in an area of heavy aeolian deposits. SU 28 was recorded as an on-site trench. SU 28 was 14.6 m in length and had an average depth of 1.58 m.

Two profiles were drawn for SU 28. Only one 1-m-long profile located 1.2 m from the north end of the east trench wall was illustrated for SU 28 (Figure 21.34). Five strata were identified. Stratum I was 63 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 10 cm thick and consisted of dark yellowish brown (10YR3/6) sand. This stratum was a cultural layer that was present throughout the site. Stratum III was 18 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum IV was 41 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum IV had evidences of calcium carbonation. Stratum V was 26 cm thick and consisted of very pale brown (10YR7/3) sandstone bedrock. No cultural materials or features were identified within SU 28.

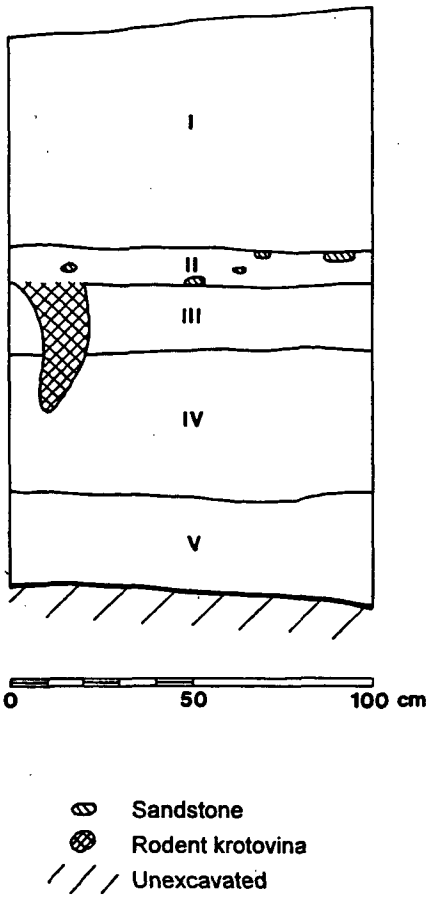


Figure 21.34. Site NM-Q-23-62, Study Unit 28, East Wall Profile.

Study Unit 29. SU 29 was located at the middle of the site, east of the existing N11 road. SU 29 extended from grid coordinate N964.59, E1039.92 northwestward to N968.89, E1032.09. This trench was placed in an area of moderate artifact density and in an area of heavy aeolian deposits. SU 29 was recorded as an on-site trench. SU 29 was 8 m in length and had an average depth of 1.34 m.

One 1-m-long profile located 5 m from the west end on the north trench wall was illustrated for SU 29 (Figure 21.35) and was representative of the entire trench. Three strata were identified within SU 29. Stratum I was 56 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 78 cm thick and consisted of dark yellowish brown (10YR4/6) sand. This stratum was a cultural stained layer that was present throughout the site. Stratum III was 15 cm thick and consisted of very pale brown (10YR7/3) sandstone bedrock. No cultural materials or features were identified within SU 29.

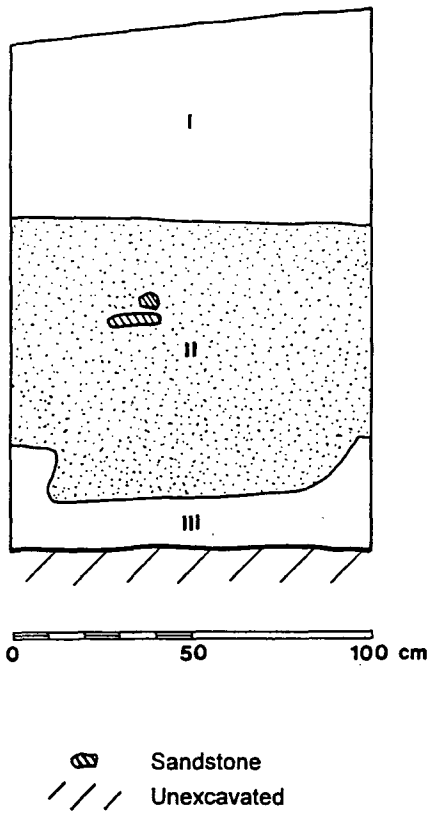


Figure 21.35. Site NM-Q-23-62, Study Unit 29, North Wall Profile.

Study Unit 30. SU 30 was located in the southeast part of the site, east of the existing N11 road. SU 30 extended from grid coordinates N954.93, E1032.67 northeastward to N965.94, E1039.28. This trench was placed in an area of moderate artifact density and in an area of heavy aeolian deposits. SU 30 was recorded as an on-site trench. SU 30 was 11.2 m in length and had an average depth of 1.48 m.

One 1-m-long representative profile located 7 m from the south end of the west trench wall was illustrated for SU 30 (Figure 21.36). Three strata were identified within SU 30. Stratum I was 63 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 73 cm thick and consisted of dark yellowish brown (10YR4/6) sand. This stratum was the cultural layer that was present throughout the site. Stratum III was 14 cm thick and consisted of very pale brown (10YR7/3) sandstone. No cultural materials or features were identified within SU 30.

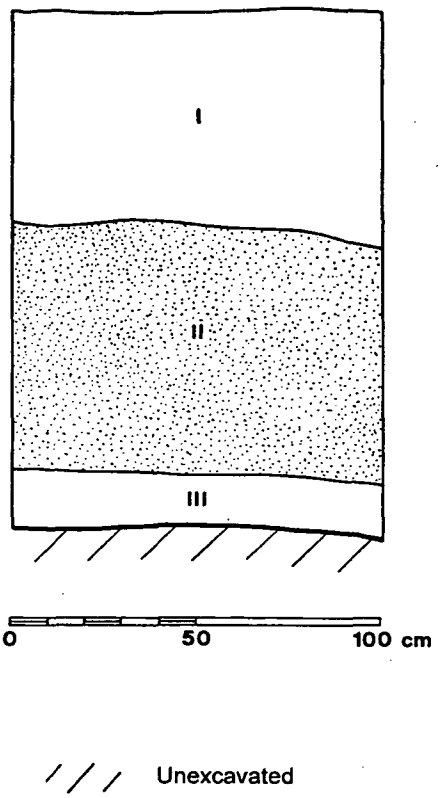


Figure 21.36. Site NM-Q-23-62, Study Unit 30, West Wall Profile.

Study Unit 31. SU 31 was located in the southeastern part of the site, east of the existing N11 road. SU 31 extended from grid coordinate N950.41, E1032.69 northwestward to N956.01, E1023.02. This trench was placed in an area of moderate artifact density and in an area of heavy aeolian deposits. SU 31 was recorded as an on-site trench. SU 31 was 11.2 m in length and had an average depth of 1.50 m.

Two profiles were drawn for SU 31. Only one 2.5-m-long profile located 5.5 m from the west end of the north trench wall is shown for SU 31 (Figure 21.37) and it was representative of the entire trench profile. Four strata were identified within SU 31. Stratum I was 46 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 26 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum III was 18 cm thick and consisted of yellowish brown (10YR5/8) fine sand. Stratum IV was 48 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. No cultural materials or features were identified with the SU 31 trench.

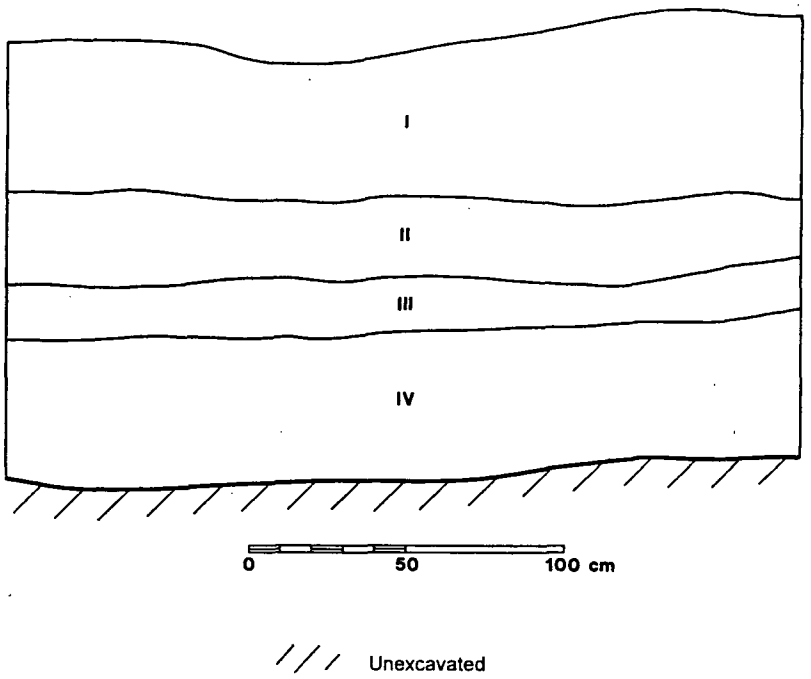


Figure 21.37. Site NM-Q-23-62, Study Unit 31, North Wall Profile.

Study Unit 32. SU 32 was located in the southeastern part of the site, east of the existing N11 road. SU 32 extended from grid coordinates N942.78, E1026.74 northwestward to N948.55, E1016.66. This trench was placed in an area of light artifact density and in an area of heavy aeolian deposits. SU 32 was recorded as an on-site trench. SU 32 was 11.44 m in length and had an average depth of 1.38 m.

One 1-m-long representative profile located 7.2 from the west end of the north trench wall was illustrated for SU 32 (Figure 21.38). Five strata were identified within SU 32. Stratum I was 42 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 5 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Feature 15 was identified within this stratum. Stratum III was 15 cm thick and consisted of yellowish brown (10YR5/8) sand. Stratum IV was 33 cm thick and consisted of light yellowish brown (10YR6/4) coarse sand. Stratum V was 43 cm thick and consisted of very pale brown (10YR7/3) cobbly sandstone bedrock.

A small pit outline was identified on the north wall of the trench. Feature 15 measured 80 cm across and was 36 cm below the surface. The function of the pit is unknown, but it was most likely a storage cist.

Study Unit 33. SU 33 was located in the southeastern part of the site, east of the existing N11 road. SU 33 extended from grid coordinates N930.14, E1016.75 northwestward to N934.14, E1009.00. This trench was placed in an area of light artifact density and in an area of heavy aeolian deposits. SU 33 was recorded as an on-site trench. SU 33 was 9.2 m in length and had an average depth of 1.37 m.

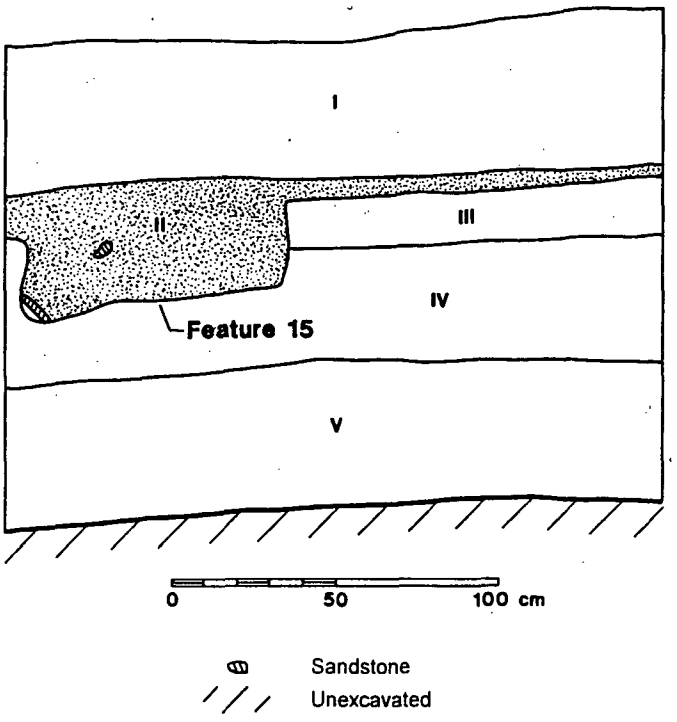


Figure 21.38. Site NM-Q-23-62, Study Unit 32, North Wall Profile Showing Feature 15.

One 2-m-long representative profile located 3 m from the west end on the south trench wall was illustrated for SU 33 (Figure 21.39). Four strata were identified within SU 33. Stratum I was 26 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 17 cm thick and consisted of dark yellowish brown (10YR4/4) sandy loam. Stratum IIa was 16 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum III was 78 cm thick and consisted of light gray (10YR7.2) sandy clay loam. No cultural materials or features were identified within SU 33.

Study Unit 34. SU 34 was located in the southern part of the site, east of the existing N11 road. SU 34 extended from grid coordinates N917.04, E1002.26 northeastward to N928.61, E1011.31. This trench was placed in an area of low artifact density and heavy aeolian deposits. SU 34 was recorded as an on-site trench. SU 34 was 14.4 m in length and had an average depth of 73 cm.

One 1-m-long representative profile located 6 m from the north end and on the west trench wall was illustrated for SU 34 (Figure 21.40). Three strata were identified within SU 34. Stratum I was 14 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Stratum II was 16 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum II was a cultural layer that was present throughout the site. Stratum III was 43 cm thick and consisted of light gray (10YR7/2) shale. No cultural materials or features were identified within SU 34.

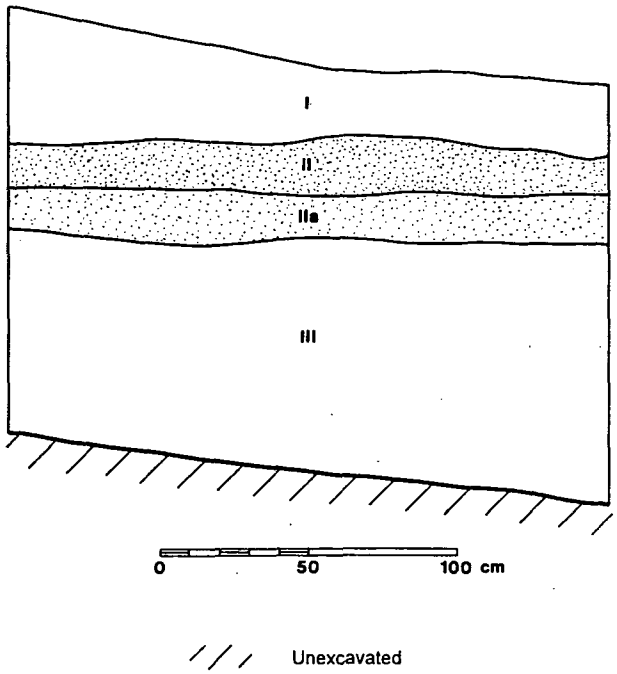


Figure 21.39. Site NM-Q-23-62, Study Unit 33, South Wall Profile.

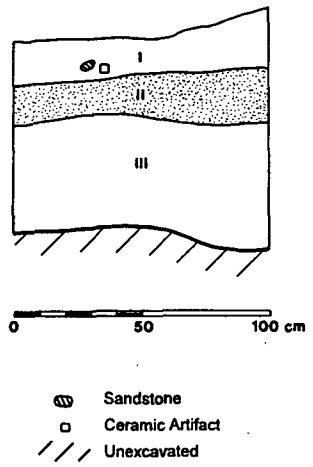


Figure 21.40. Site NM-Q-23-62, Study Unit 34, West Wall Profile.

Off-Site Trenches

Off-site Trench 1. Off-site Trench 1 was located south of the site boundary, west of the existing N11 road. Off-site Trench 1 extended from grid coordinates N909.45, E952.33 to N928.28, E968.45. This trench was placed in an area of moderate aeolian deposits. Off-site Trench 1 was 24.8 in length and had an average depth of 1.04 m.

Two 1-m-long profiles were drawn for Off-site Trench 1. Only one 1-m-long profile located 4.8 m from the north end of the east trench wall is illustrated for Off-site Trench 1 (Figure 21.41) and was representative of the entire trench. Three strata were identified within Off-site Trench 1. Stratum I was 15 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 45 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum III was 44 cm thick and consisted of sandstone bedrock. No cultural materials or features were identified within Off-site Trench 1.

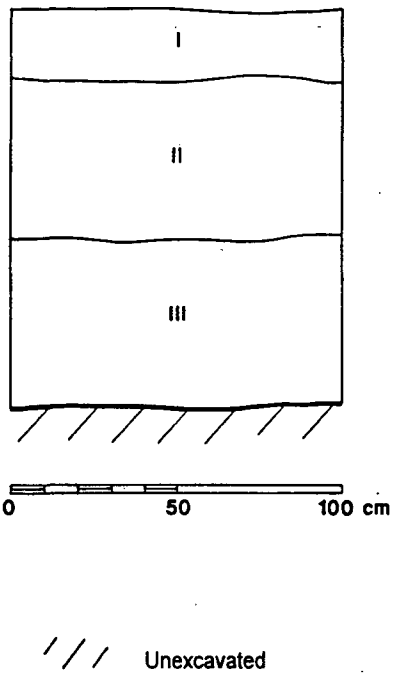


Figure 21.41. Site NM-Q-23-62, Off-site Trench 1, East Wall Profile.

Off-site Trench 2. Off-site Trench 2 was located north of the site boundary, west of the existing N11 road. Off-site Trench 2 extended from grid coordinates N1093.05, E1069.00 to N1111.79, E1079.88. This trench was placed in an area of light aeolian deposits. Off-site Trench 2 was 20.8 m in length and had an average depth of 1.32 m.

Two 1-m-long profiles were drawn for Off-site Trench 2. Only one 1-m-long profile located 3 m from the south end of the east trench wall was illustrated (Figure 21.42) and was representative of the entire trench. Four strata were identified. Stratum I was 27 cm thick and consisted of yellowish brown (10YR5/4) very fine sand. Stratum II was 9 cm thick and consisted of dark yellowish brown (10YR3/4) fine sand. Stratum III was 58 cm thick and consisted of light yellowish brown (10YR6/4) clay. Stratum IV was 37 cm thick and consisted of pale brown (10YR6/3) fine sand. No cultural materials or features were identified within Off-site Trench 2.

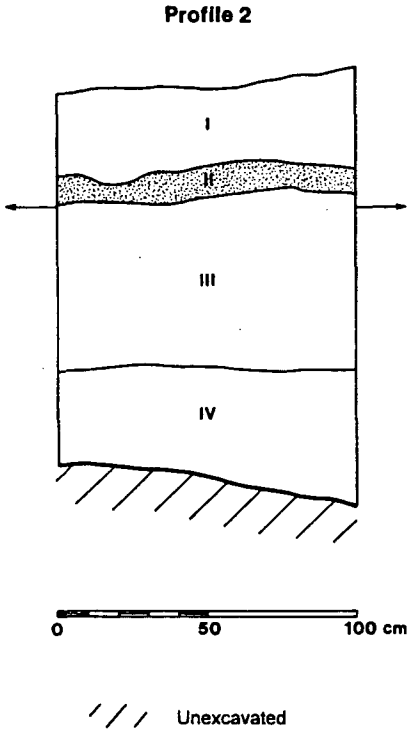


Figure 21.42. Site NM-Q-23-62, Off-site Trench 2, East Wall Profile.

Off-site Trench 3. Off-site Trench 3 was located northeast of the site boundary, east of the existing N11 road. Off-site Trench 3 extended from grid coordinates N1067.51, E1094.94 to N1091.86, E1109.97. This trench was placed in an area of heavy aeolian deposits. Off-site Trench 3 was 28.4 m in length and had an average depth of 1.17 m.

Two 1-m-long profiles were drawn for Off-site Trench 3. Only one 1-m-long profile located 9.4 m from the north end of the east trench wall is illustrated for Off-site Trench 3 (Figure 21.43) and is representative of the entire trench. Four strata were identified. Stratum I was 54 cm thick and consisted of light yellowish brown (10YR6.4) sand. Stratum II was 20 cm thick and consisted of dark

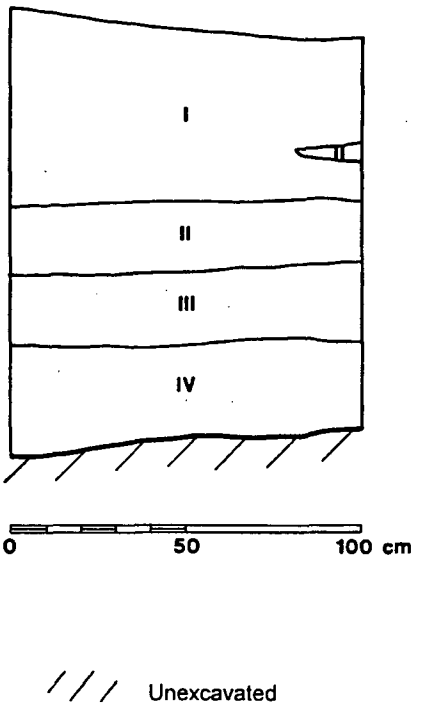


Figure 21.43. Site NM-Q-23-62, Off-site Trench 3, East Wall Profile.

yellowish brown (10YR3/6) sand. This stratum was interbedded within Stratum I. Stratum III was 28 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum IV was 22 cm thick and consisted of very pale brown (10YR7/3) sandstone bedrock. No cultural materials or features were identified within Off-site Trench 3.

Off-site Trench 4. Off-site Trench 4 was located north of the site boundary, east of the existing N11 road. Off-site Trench 4 extended from grid coordinates N1053.71, E1092.86 to N1059.31, E1083.50. This trench was placed in an area of heavy aeolian deposition. Off-site Trench 4 was 11 m in length and had an average depth of 1.52 m.

One 1-m-long profile located 5 m from the west end of the north wall was illustrated for Off-site Trench 4 (Figure 21.44). Four strata were identified within Off-site Trench 4. Stratum I was 69 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 12 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum III was 66 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum IV was 5 cm thick and consisted of very pale brown (10YR7/3) sandstone bedrock. No cultural materials or features were identified within Off-site Trench 4.

Off-site Trench 5. Off-site Trench 5 was located south of the site boundary, east of the existing N11 road. Off-site Trench 5 extended from grid coordinates N880.50, E973.13 to N895.62, E984.52. Off-site Trench 5 was 19 m in length and had an average depth of 94 cm.

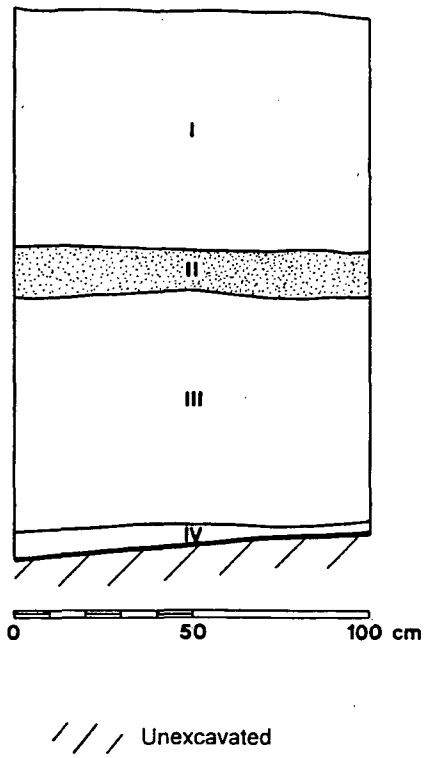


Figure 21.44. Site NM-Q-23-62, Off-site Trench 4, North Wall Profile.

One 1-m-long profile located 11 m from the south end of the west wall was illustrated for Off-site Trench 5 (Figure 21.45). Three strata were identified. Stratum I was 37 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum II was 23 cm thick and consisted of brownish yellow (10YR6/6) fine sand. Stratum III was 34 cm thick and consisted of light yellowish brown (10YR6/4) sandstone bedrock. No cultural materials or features were identified within Off-site Trench 5.

Features

Feature 1

The center of Feature 1 was located approximately at grid coordinates N969.10, E1028.6. The feature, measuring 1.36 m in diameter with a depth of 8 cm was a stone-lined storage pit. This feature had been truncated by road construction and continued road maintenance. Only 10% of the feature was intact. A flotation sample, pollen sample, and charcoal for a radiocarbon date were collected from the northeast quarter of the feature. The radiocarbon sample yielded a calibrated late Basketmaker II date of AD 340 to 530 (FS 125, Beta 110382, 1 sigma). Pollen samples yielded a wide variety of economically important plants: a member of the mustard family, cholla, prickly pear cactus, Cheno-ams, purslane, squash/pumpkin, and maize. Further investigation of Feature 1 has moderate potential for recovery of several classes of artifacts as well as additional contexts well suited to investigation via flotation sampling.

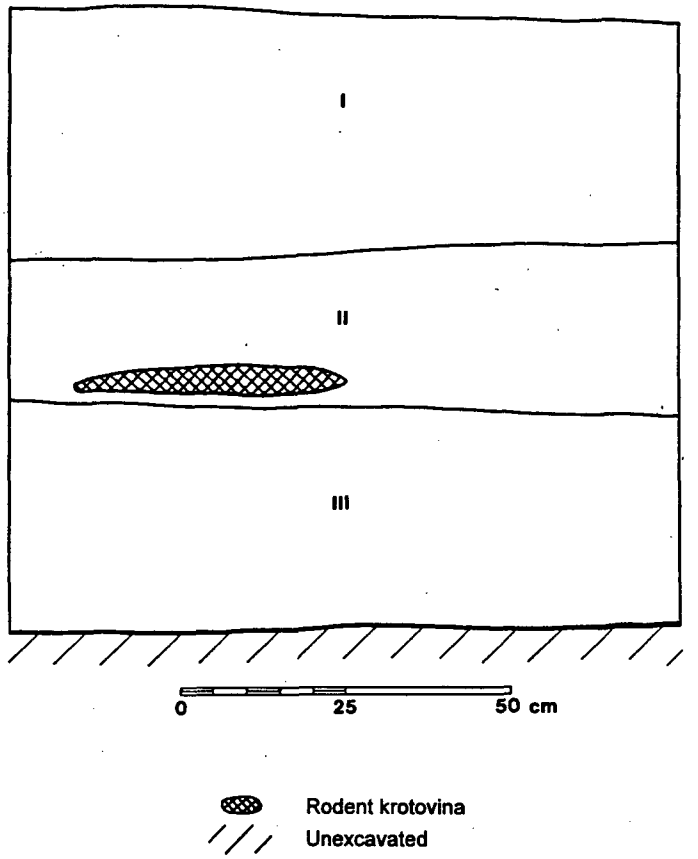


Figure 21.45. Site NM-Q-23-62, Off-site Trench 5, West Wall Profile.

Feature 2

The center of Feature 2 was located approximately at grid coordinates N998, E1019.1. This feature was a basin-shaped hearth measuring 50 cm in diameter and 11 cm in depth. Feature 2 was identified during the excavation of SU 2 and 3. Both flotation and waterscreen samples were collected from the feature fill. Artifacts recovered from the feature fill only consisted of ceramics. Further investigation of Feature 2 has moderate potential for recovery of several artifacts as well as additional context well suited for study via flotation sampling.

Feature 3

The center of Feature 3 was located approximately at grid coordinates N976.4, E1008.2. This feature was interpreted as a posthole measuring about 30 cm in diameter and 25 cm in depth. This feature was exposed by road maintenance. A flotation sample was collected from the feature. The investigative potential of Feature 3 has been exhausted.

Feature 4

The center of Feature 4 was located approximately at grid coordinates N975.6, E1007.5. This feature was a buried storage vessel measuring 43 cm east-to-west by 49 cm north-to-south and 34 cm in depth. The storage vessel was completely fragmented. This feature was exposed by road maintenance. The entire vessel was collected as a flotation and waterscreen sample. Artifacts included ceramics and one side-notched projectile point. The investigative potential of Feature 4 has been exhausted.

Feature 5

The center of Feature 5 was located approximately at grid coordinates N990.7, E1018.2. This feature was a probable storage/burial measuring 1.24 m in diameter with an unknown depth. This feature was identified during surface collection and was exposed by road maintenance. Because of the large quantity of fragmented bones on the surface and the probability that the feature contained a burial, NNHPD recommended that the feature be investigated during the next data recovery phase of the site. ZCRE mapped and covered the feature to prevent further erosion by the natural elements. Because of the confidentiality of Feature 5, this feature was not plotted on the map.

Feature 6

The center of Feature 6 was located approximately at grid coordinates N984.98, E1009.2. This feature is interpreted as a probable storage/roasting pit. It measured approximately 1.78 m in diameter and about 80 cm in depth. The feature was identified during the excavation of backhoe trench SU 16. A flotation sample and charcoal sample for a radiocarbon date were collected from the feature. The radiocarbon sample yielded a calibrated early Basketmaker II date of AD 130 to 330 (FS 151, Beta 110383, 1 sigma). Further investigations within Feature 6 have high potential for recovery of all artifact classes as well as additional contexts well suited for study via flotation sampling.

Feature 7

The center of Feature 7 was located approximately at grid coordinates N987.5, E1010. This feature was a probable earthen storage pit measuring about 76 cm in diameter and 49 cm in depth. It was found approximately 60 cm below the surface. This feature was identified during the excavation of backhoe trench SU 17. Because of the limited testing, the plan view layout of Feature 7 remains unknown. The cultural fill within the feature consisted of charcoal-stained sand with inclusions of small charcoal flecks. No artifacts were recovered from the feature. Further investigations within the feature have a high potential for recovery of all classes of datable artifacts and exposure of context well suited to study via flotation sampling.

Feature 8

The center of Feature 8 was located approximately at grid coordinates N990.6, E1008.3. The feature was interpreted as a probable earthen storage bin measuring 1.14 m in diameter and 60 cm in depth. It was found approximately 10 cm below the surface. The feature was identified during the

excavation of backhoe trench SU 17. Because of limited testing, the plan view layout of Feature 8 remains unknown. The fill of the feature consisted of charcoal-stained sands with inclusions of tiny charcoal flecks. Further investigations within the feature have high potential for recovery of all classes of datable artifacts and exposure of contexts well suited to study via flotation sampling.

Feature 9

The center of Feature 9 was located approximately at grid coordinates N996.3, E1018.3. It was an earthen hearth measuring approximately 70 cm in diameter and at least 36 cm deep. It was approximately 10 cm below the surface. This feature was identified during the excavation of backhoe trench SU 18. The cultural fill within the feature consisted of very dark charcoal-stained sand with inclusions of fire-cracked rock. No artifacts were recovered from the feature. No flotation sample was collected prior to backfilling of SU 18. Further investigations within the feature have high potential for recovery of all classes of datable artifacts and exposure of contexts well suited to study via flotation sampling.

Feature 10

The center of Feature 10 was located approximately at grid coordinates N997.3, E1017.3. This feature is interpreted as a probable storage pit or a roasting pit measuring 1.06 m in diameter with an unknown depth; it was 22 cm below the surface. This feature was identified during the excavation of backhoe trench SU 18. The cultural fill within the feature consisted of very dark charcoal-stained sand with inclusions of ceramics and fire-cracked rock. No artifacts were recovered or flotation sample collected prior to backfilling of SU 18. Further investigations have a high potential for recovery of all classes of datable artifacts, as well as exposure of contexts well suited to study via flotation sampling.

Feature 11

The center of Feature 11 was located approximately at grid coordinates N1013.2, E1025.2. This feature was a small earthen hearth measuring 45 cm in diameter; its depth is unknown depth and it was found 22 cm below the surface. This feature was identified during the excavation of backhoe trench SU 21. The fill of the feature consisted of dark charcoal-stained sand. No artifacts were recovered or flotation sample collected prior to backfilling of SU 21. Further investigations have a moderate potential for recovery of several classes of datable artifacts as well as exposure to contexts well suited to study via flotation sampling.

Feature 12

The center of Feature 12 was located approximately at grid coordinates N986, E1041.4. This feature was a remnant of a stone-lined hearth measuring up to 80 cm in diameter, with a depth of 6 cm. Feature 12 was identified during the excavation of backhoe trench SU 27, and a hand-excavated unit (SU 12) was placed over the south half of the feature. This feature was truncated by road maintenance. A flotation sample was collected from the feature. No artifacts were collected from within the feature fill. Further investigation of Feature 12 has moderate potential for recovery of datable artifacts as well as exposure to contexts well suited to study via flotation sampling.

Feature 13

The center of Feature 13 was located approximately at grid coordinates N977.1, E1008. This feature was a posthole measuring 17 cm in diameter, with a depth of 23 cm. This feature was identified during the hand excavation of SU 6. The fill of the feature consisted of dark stained sand. No flotation sample was collected prior to backfilling of SU 6. Further investigation has a moderate potential for recovery of datable artifacts as well as exposure of contexts well suited to study via flotation sampling.

Feature 14

The center of Feature 14 was located approximately at grid coordinates N977.5, E1009. This feature was a basin-shaped small pit measuring 25 cm in diameter and 20 cm in depth. This feature was lined with compacted sandy loam and the fill consisted of dark stained sand. Feature 14 was identified during the hand excavation of SU 6. No flotation sample was collected prior to backfilling of SU 6. Further investigation of this feature has moderate potential for recovery of all classes of datable artifacts as well as exposure of contexts well suited to study via flotation sampling.

Feature 15

The center of Feature 15 was located approximately at grid coordinates N944.8, E1023.8. This feature is interpreted as a probable storage pit measuring 80 cm in diameter and a depth of 36 cm. It was approximately 40 cm below the surface. This feature was identified during the excavation of backhoe trench SU 32. Fill of the feature consisted of dark charcoal-stained sand. No flotation sample was collected prior to backfilling of SU 32. Further investigation of Feature 15 has a high potential for recovery of all classes of datable artifacts as well as exposure of contexts well suited to study via flotation sampling.

SUMMARY AND INTERPRETATION

Phase I Data Recovery testing at site NM-Q-23-62 included a redefinition of the site, a complete surface collection of all artifacts within the right-of-way, and hand excavation of 10 1-by-1-m test units. Two features were excavated, SU 11 was excavation of the northeast quarter of Feature 1. SU 12 was excavation of the southern half of Feature 12. And machine excavation of 22 trenches within the site boundary totaling 288 m in length. In addition, five off-site trenches totaling 104 m were excavated.

The observed characteristics of the ground surface over the site indicate that about 30% of the site has been moderately to severely disturbed by road construction and continued road maintenance. Stratigraphic and sediment information collected from test units and backhoe trenches show that the western portion of the cultural deposit is comparatively shallower than the eastern portion of the site where aeolian deposition is greater than 50 cm. It is inferred that any previously occurring culture-bearing deposits were removed during the initial construction of N11. The eastern portion of the site has experienced an increased rate of windblown deposits of silts and sand as a result of road construction and continued road maintenance.

Natural Stratigraphy

A reconstruction of the natural stratigraphy present across the site was completed with information recovered from each of the 12 units and 27 backhoe trenches. This resulted in the identification of five major strata. Stratum I is recently deposited loose aeolian sands ranging from 10 cm to 50 cm in thickness. This deposits are about 50 cm thick on the east side of the existing road and near the cultural horizon west of the existing road. Stratum II is loamy sand ranging in depth from 30 to 50 cm and has cultural staining. Stratum IIa is a layer of loose sand that ranges from 50 to 75 cm and is not present throughout the entire site. Stratum III is 50 cm to 95 cm and consists of slightly hard sandy loam to sandy clay loam. Stratum IV is soft sandstone bedrock.

Cultural Deposits

A total of 3239 ceramic artifacts, 264 flaked stone artifacts, 14 ground stone artifacts, and 24 faunal specimens were recovered from site NM-Q-23-62. The original feature (Feature 1) recorded and defined by ZCRE during the 1996 survey was relocated. One feature was found during surface collection, and subsurface investigations resulted in the identification of a burial and 13 additional features.

Site NM-Q-23-62 is a Late Basketmaker II/Early Basketmaker III site consisting of at least seven probable storage pits, one buried storage vessel, four thermal hearths, two postholes and one unknown feature. Because of the sampling interval between trenches and test units, there may be as many as 3 pitstructures, 17 storage pits, 8 hearths, 4 postholes and other undefined features. These estimates take into account the observed clustering of storage pits and hearths in the area west of the existing road.

The ceramic assemblage from site NM-Q-23-62 includes a number of identified types which are believed to date to Basketmaker III (AD 500). From the large percentage of gray/brownware and the evidence of Tohatchi Red and Tohatchi Red-on-brown ceramics, a specific date to the late AD 500s is suggested.

The chipped stone and ground stone assemblage from site NM-Q-23-62 shows a selection of locally available materials for the majority of the artifacts. Chert was the dominant material followed by petrified wood, obsidian, and Chinle chert. Obsidian is the only material that would have been brought in from one of four probable sources: the Gila region to the southwest, San Fransico Peak region to the west, Mount Taylor to the southeast and the Jemez region to the northeast. Other raw materials include chalcedony, Washington Pass chert, hematite, quartzite, sandstone, and siltstone. The ground stone assemblage was dominated by sandstone and quartzite.

The faunal assemblage recovered from site NM-Q-23-62 primarily consists of fragmented specimens identified to the categories of small and large mammal. Badger, deer, and wild turkey occur in low frequency. A small number of various rodent bones complete the assemblage.

The botanical assemblage from site NM-Q-23-62 consists of pinyon pine and juniper. The economically important plants include a member of the mustard family, cholla, prickly pear cactus, Cheno-ams, purslane, squash/pumpkin, and maize.

Using chronometric data derived from radiocarbon analysis, a maximum range of occupation from AD 70 to 600 is suggested. This date is earlier than that estimated from the ceramic assemblage; possibly there was a Late Basketmaker II occupation also.

RECOMMENDATIONS

Site NM-Q-23-62 contains significant cultural materials and features. During the testing phase, an additional 14 features were identified. Feature 1 yield a radiocarbon date of an early Basketmaker II date of AD 340 to 530. Feature 6 also yielded an early Basketmaker II date of AD 130 to 330. These 15 features are within right-of-way of the proposed road construction of N11 and will be impacted. Further work for data recovery of Site NM-Q-23-62 is recommended.

Chapter 22

SITE NM-Q-23-63 (LA 110326)

Jerome Zunie

Site NM-Q-23-63 is located on a small rise within profound aeolian deposition in a wide valley bottom. The elevation of the site is 2082 m (6830 ft) above mean sea level. A Plains and Great Basin Grassland biotic community is present in the vicinity of the site area. Vegetation cover within and around the site consists of a sparse scatter of oneseed juniper (*Juniperus monosperma*), broom snakeweed (*Gutierrezia sarothrae*), Indian ricegrass (*Oryzopsis hymenoides*), ring muhly (*Muhlenbergia torreyi*), Russian thistle (*Salsola kali tenuifolia*), cactus (*Opuntia spp.*), and other dropseed grasses.

SURVEY DATA

Site NM-Q-23-63 was previously recorded by the American Indian Cultural Consultants in 1982 (AICC 1982) and was rerecorded by Zuni Cultural Resources Enterprise in 1995 (Zimmerman and Abbott 1996) as part of the N11(1&2) road realignment survey. ZCRE recording activities included Brunton compass mapping, in-field artifact analyses, and photography. In-field analyses included ceramic typology and tabulations. Site NM-Q-23-63 was recorded as an Anasazi ceramic scatter. From the presence of Lino Gray, White Mound Black-on-white, and unidentified black-on-whites, a Basketmaker to Pueblo I occupation was inferred for site. One charcoal stain was defined for site NM-Q-23-63 (Zimmerman and Abbott 1996).

NATURE AND EXTENT TESTING

On 2 May to 19 June 1996 personnel from ZCRE conducted Phase I Data Recovery testing for content and extent at site NM-Q-23-63. A redefinition of the site and a complete surface collection of all artifacts within the right-of-way were conducted prior to subsurface investigation. Subsurface investigations included hand excavation of 11 1-by-1-m test units, west half of Feature 3, and backhoe excavation of 12 trenches totaling 151.80 m. In addition, one 20.4-m-long trench outside of the site perimeter and within the right-of-way was excavated (Figure 22.1a and b).

Surface Collection

Artifact distributions throughout the site were moderate. Surface artifacts were collected within 4-by-4-m collection units. The collected artifacts were then tabulated on Field Specimen (FS) catalog sheets. Artifacts of similar types were collected together and assigned FS numbers as a unit within each 4-by-4-m collection unit. Figure 22.2a and b show the surface distribution of artifacts collected from the site. Exactly 42 FS bags of artifacts were collected. The artifact scatter was concentrated in the road cut bank. It appears that the road maintenance of N11 has been largely responsible for visibility of artifacts on this site. Site NM-Q-23-63 has been severely disturbed by road grading and vehicle traffic along the existing N11 road.

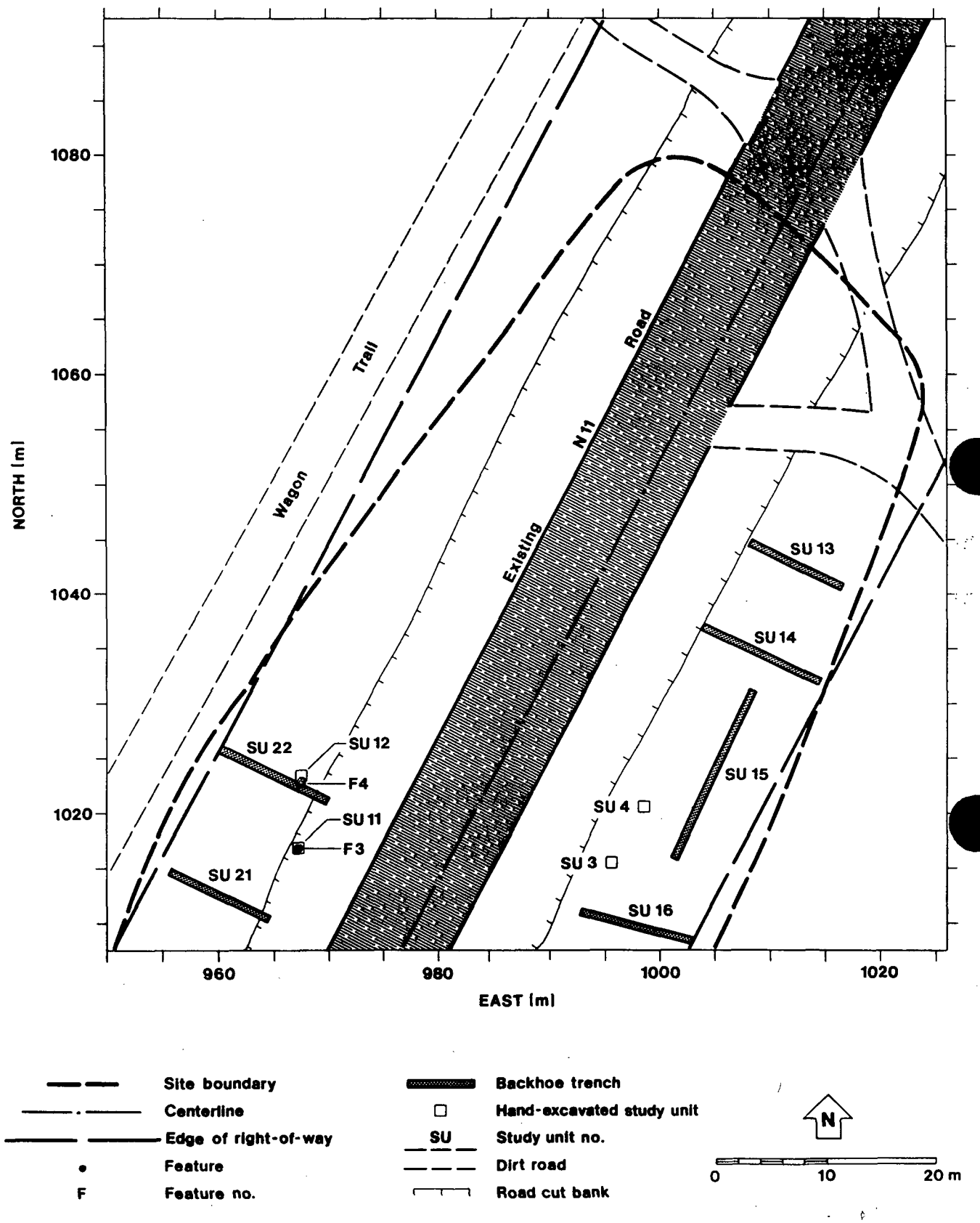


Figure 22.1a. Site NM-Q-23-63, Nature and Extent Testing, Northern Portion.

EXHIBIT 5

Archaeological Nature and Extent
Testing At Seventeen Sites
Along Navajo Route 11(A)1,
Mariano Lake To Navajo Route 9

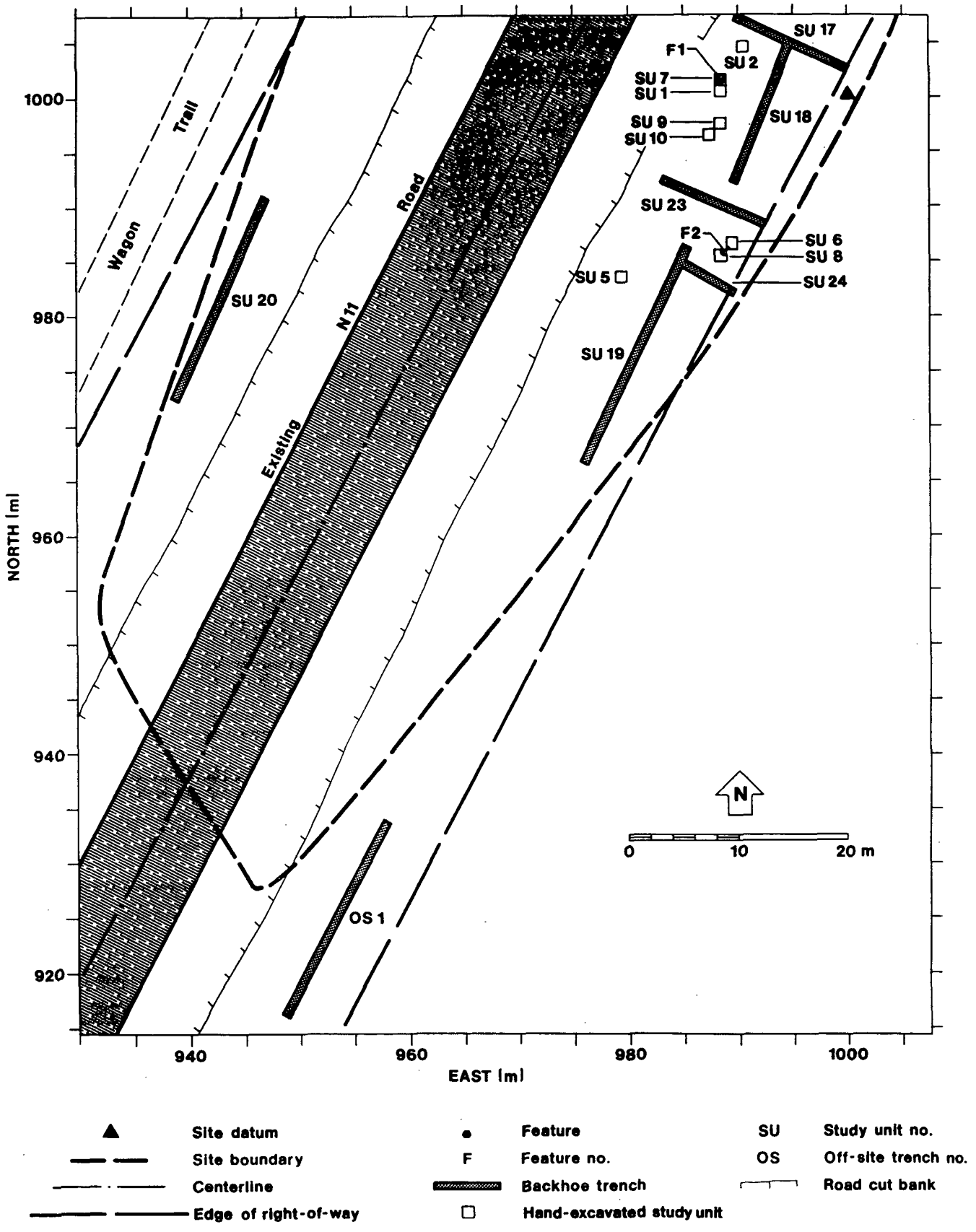


Figure 22.1b. Site NM-Q-23-63, Nature and Extent Testing, Southern Portion.

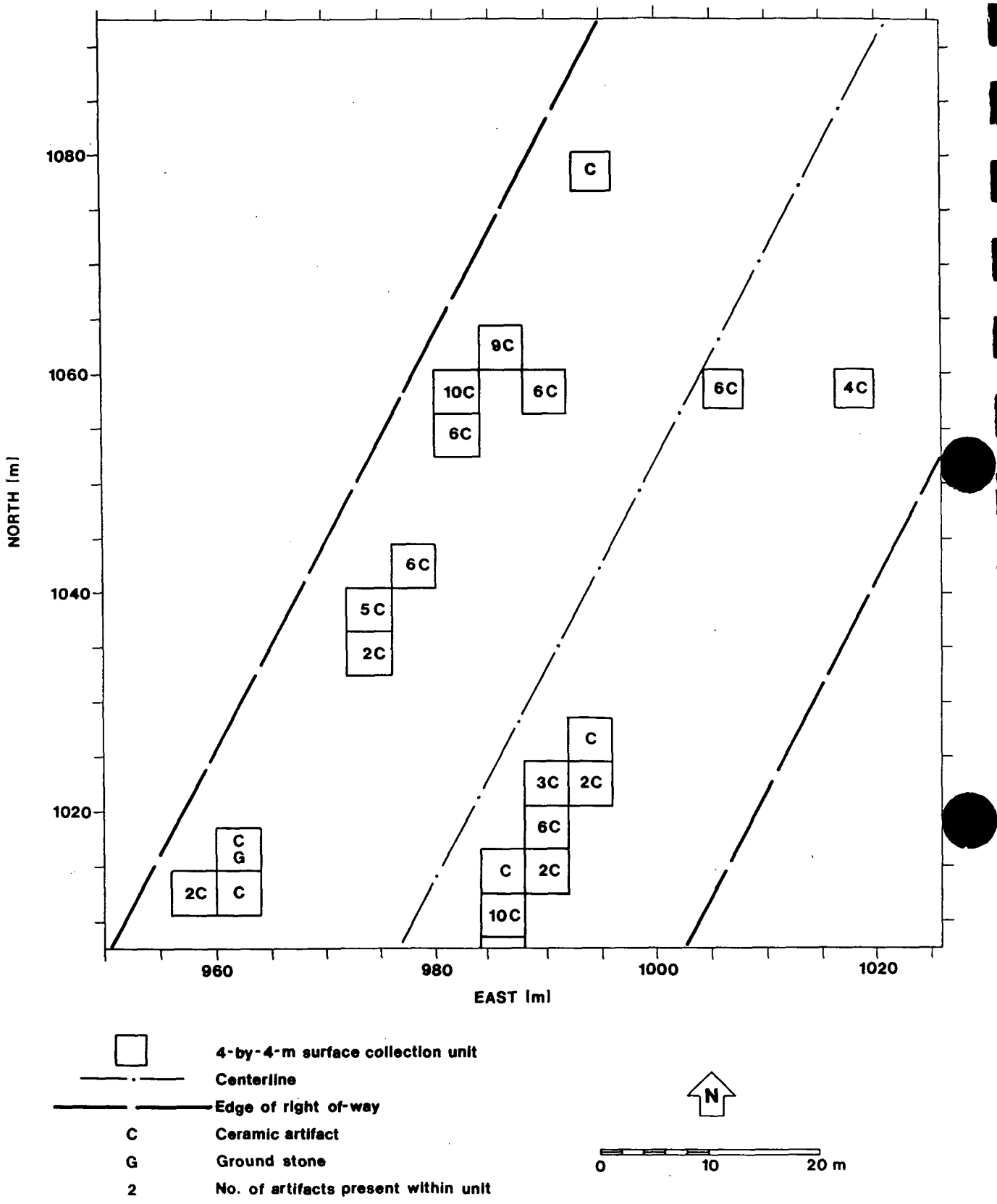


Figure 22.2a. Site NM-Q-23-63, Nature and Extent Testing, Northern Portion.

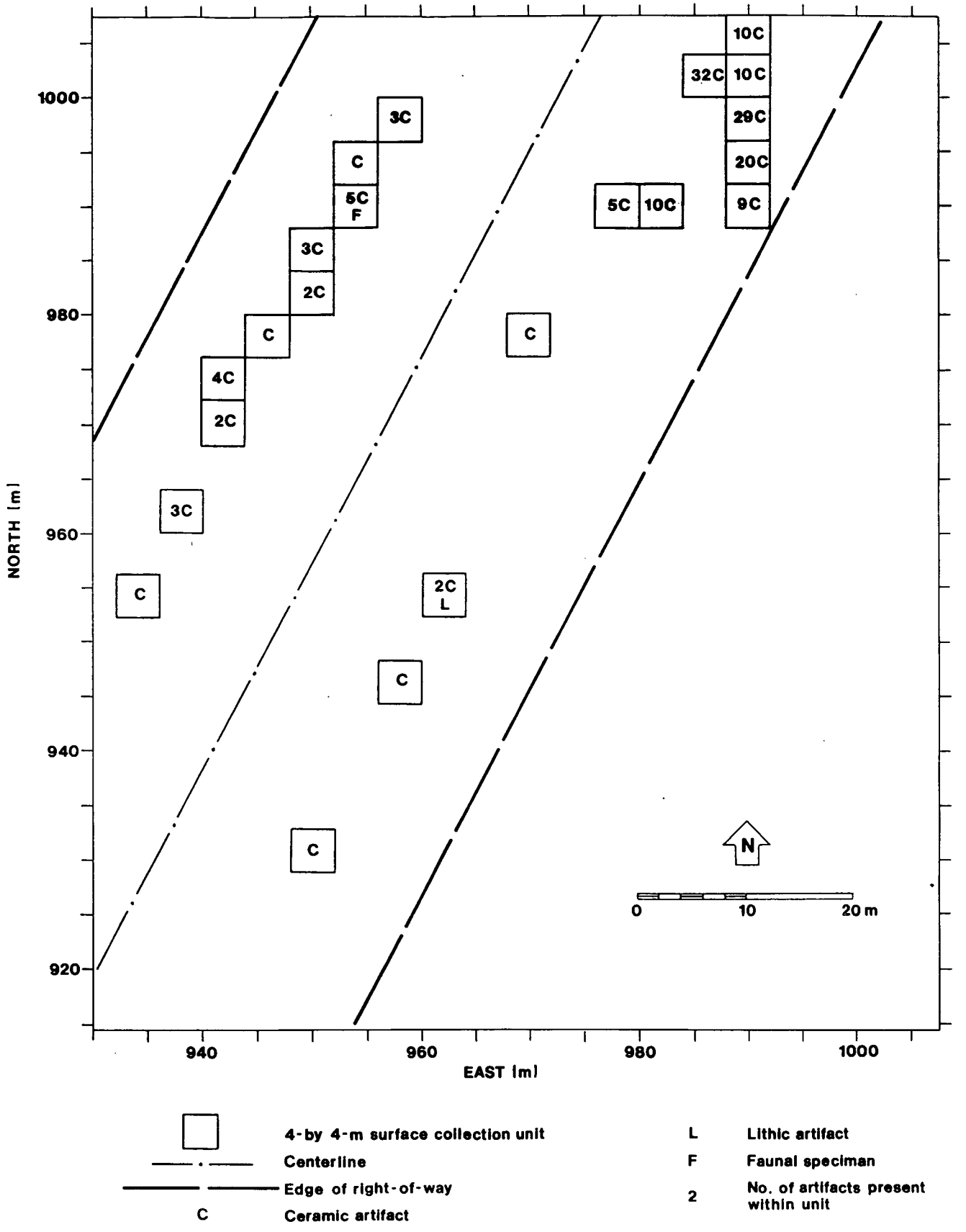


Figure 22.2b. Site NM-Q-23-63, Nature and Extent Testing, Southern Portion.

Hand Excavation

Hand excavations of 11 1-by-1-m study units and excavation of the west half of Feature 3 were conducted in order to determine the nature and depth of cultural deposits on site NM-Q-23-63. The artifact distribution map generated from the controlled surface collection was used as a guide for placement of the 12 study units. All test units were excavated in arbitrary 10-cm levels and all sediments were screened through 1/4-in hardware mesh. In profiles, strata depths were measured at the center of the profile wherever possible.

Study Unit 1

SU 1 was located within the eastern edge of the right-of-way, east of the existing N11. The southwest grid coordinates of SU 1 were N1000, E988. This unit was placed within a moderate artifact concentration area with profound aeolian deposition. SU 1 was excavated to a depth of 80 cm (eight levels) below the ground surface (Figure 22.3). Sediments consisted of three strata. Stratum I was 37 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 19 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum III was 20 cm thick and consisted of yellowish brown (10YR5/6) sand with inclusions of charcoal flecks. Stratum II and III were the feature fill of Feature 1. Stratum IV was 37 cm thick and consisted of yellowish brown (10YR5/6) sand.

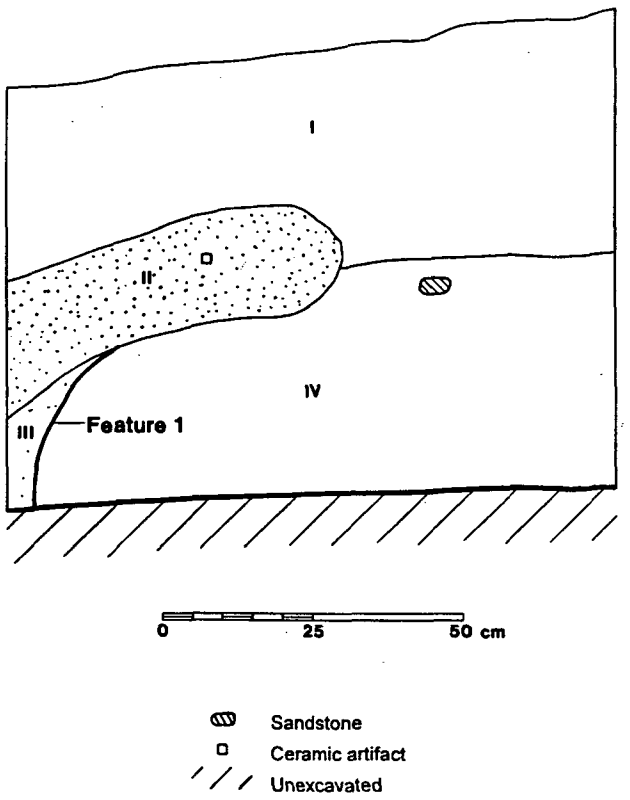


Figure 22.3. Site NM-Q-23-63, Study Unit 1, East Wall Profile Showing Feature 1.

Artifacts were recovered from Levels 3 to 8. Level 3 artifacts consisted of only ceramics. Level 4 excavations recovered ceramics and flaked stone. Level 5 yielded ceramics, flaked stone, and faunal remains. Level 6 contained ceramics, flaked stone, and ground stone. Level 7 had ceramics and an obsidian flake. Artifacts decreased to only one ceramic sherd at Level 8. At the base of Level 8 a pit outline (Feature 1) was defined and SU 7 was established to further explore and define the pit outline.

Study Unit 2

SU 2 was located within the eastern edge of the right-of-way, east of the existing N11. The southwest grid coordinates of SU 2 were N1004, E990. This unit was placed within a moderate artifact concentration area with profound aeolian deposits. SU 2 was excavated to a depth of 70 cm (seven levels) below the ground surface. Sediments consisted of four strata (Figure 22.4). Stratum I was 17 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 21 cm thick and consisted of yellowish brown (10YR5/3) fine sand. Stratum III was 16 cm thick and consisted of brown (10YR5/3) very fine sand. Stratum IV was 23 cm thick and consisted of yellowish brown (10YR5/6) loamy coarse sand.

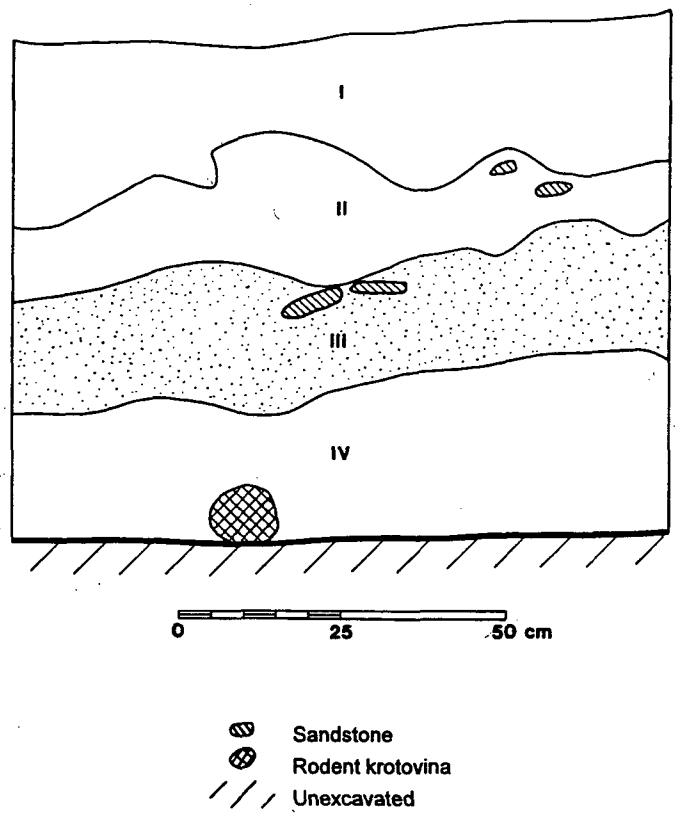


Figure 22.4. Site NM-Q-23-63, Study Unit 2, East Wall Profile.

Artifacts were recovered from Levels 3 to 6. Artifacts recovered from Level 3 consisted only of a few ceramics. Artifact densities increased at Level 4 and consisted of ceramics and flaked stone. At Level 5 artifact density increased slightly and included ceramics, flaked stone, faunal remains, and shell. The density of artifacts deceased sharply at Level 6 to only a few ceramics and a flaked stone. No artifacts or features were defined in Level 7 and excavation of SU 2 was terminated.

Study Unit 3

SU 3 was located near the eastern edge of the existing N11, inside the eastern edge of the right-of-way. The southwest grid coordinates of SU 3 were N1015, E995. This unit was placed in an area of moderate artifact density and profound aeolian deposition. SU 3 was excavated to a depth of 80 cm (eight levels) below ground surface. Sediments in SU 3 consisted of three strata (Figure 22.5). Stratum I was 46 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 22 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum III was 11 cm thick and consisted of yellowish brown (10YR5/8) sand.

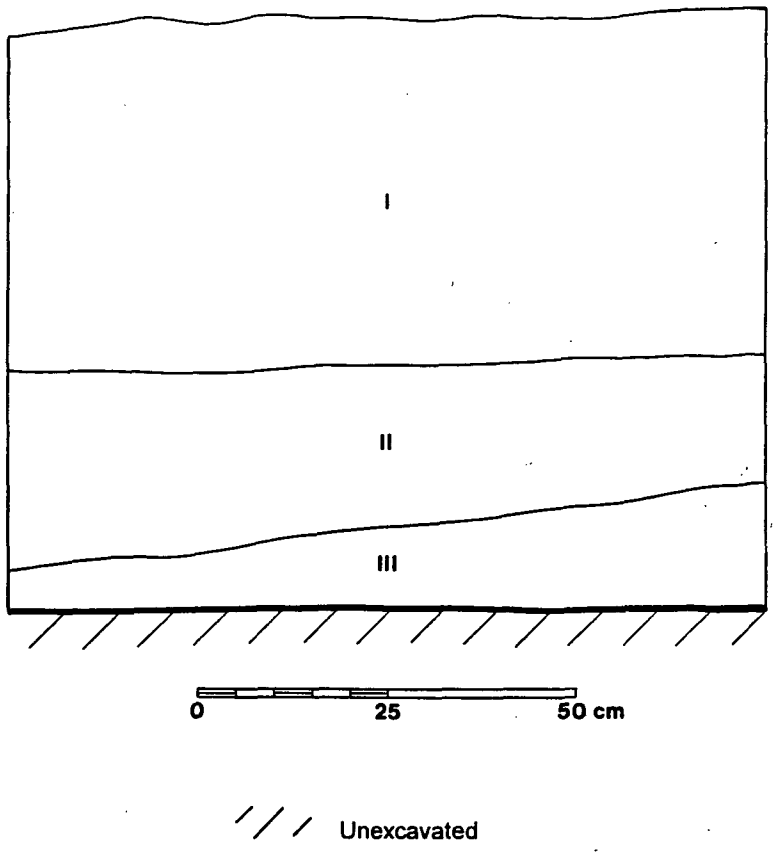


Figure 22.5. Site NM-Q-23-63, Study Unit 3, East Wall Profile.

Artifacts were recovered from Levels 5 through 7. Artifacts recovered from Level 5 consisted of ceramics. Level 6 and 7 artifacts included ceramics and flaked stone. No cultural materials or features were defined at Level 8 and excavation was terminated for SU 3.

Study Unit 4

SU 4 was located east of the existing N11 road in the northeastern portion of the site. The southwest grid coordinates of SU 4 were N1020, E998. This unit was placed in an area of light artifact density and profound aeolian deposits. SU 4 was excavated to a depth of 80 cm (eight levels) below ground surface. Sediments consisted of three strata (Figure 22.6). Stratum I was 40 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 20 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum III was 11 cm thick and consisted of yellowish brown (10YR5/8) sand, with evidence of calcium carbonate.

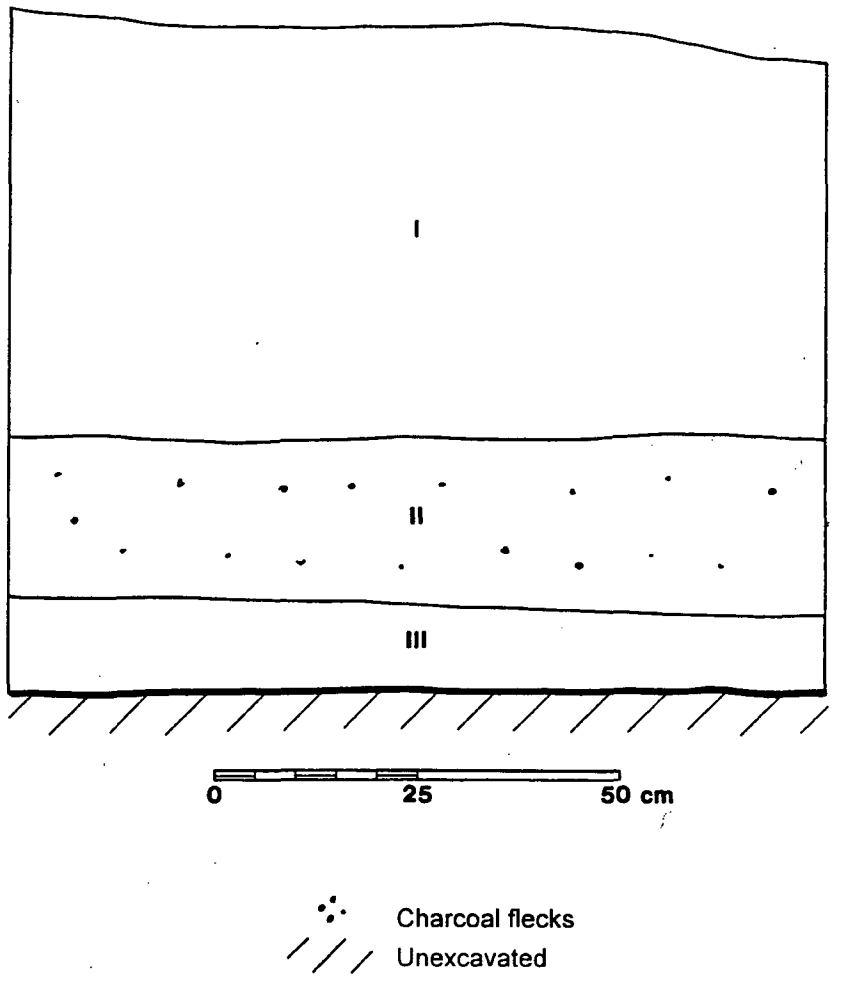


Figure 22.6. Site NM-Q-23-63, Study Unit 4, South Wall Profile.

Ceramic artifacts were recovered from Levels 5 and 7. No cultural materials or features were defined at Level 8 and excavation was terminated for SU 4.

Study Unit 5

SU 5 was located in the southeastern portion of the site, east of the existing N11 road. The southwest grid coordinates of SU 5 are N983, E979. This unit was placed in an area of light artifact density and profound aeolian deposits. SU 5 was excavated to a depth of 90 cm (nine Levels) below the ground surface. Sediment in SU 5 consisted of three strata (Figure 22.7). Stratum I was 39 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 25 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum III was 13 cm thick and consisted of yellowish brown (10YR5/4) sand.

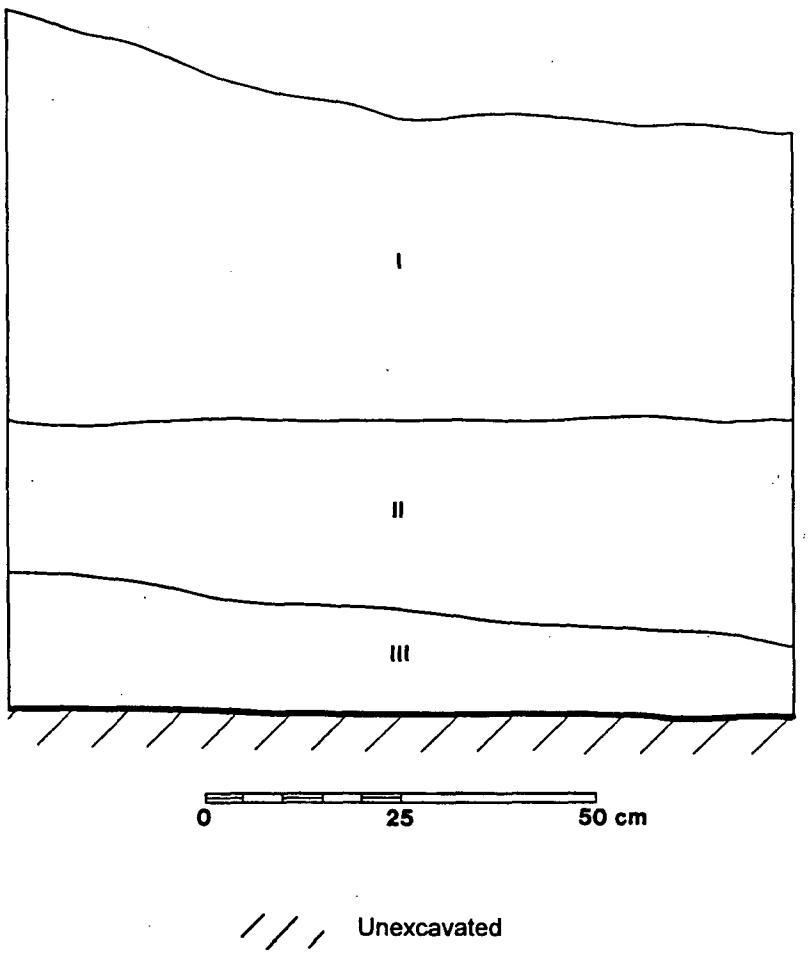


Figure 22.7. Site NM-Q-23-63, Study Unit 5, South Wall Profile.

Artifacts were recovered from Levels 5 through 8 and within Stratum II. Level 5 artifacts consisted of only one ceramic sherd. Artifacts from Level 6 consisted only of a few ceramics. Artifacts in Level 7 consisted of ceramics and flaked stone. Artifacts from Level 8 consisted of ceramics only. No cultural materials or features were defined at Level 9 and excavation was terminated for SU 5.

Study Unit 6

SU 6 was located near the eastern edge of the right-of-way, east of the existing N11 roadway. The southwest grid coordinates of SU 6 are N986, E989. This unit was placed in an area of light artifact density and profound aeolian deposits. SU 6 was excavated to a depth of 90 cm (nine Levels) below the ground surface. Sediments from SU 6 consisted of five strata (Figure 22.8). Stratum I was 27 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 8 cm thick and consisted of yellowish brown (10YR5/8) fine sand. Stratum III was 21 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Stratum IV was 19 cm thick and consisted of dark yellowish brown (10YR4/6) loamy coarse sand. Stratum V was 12 cm thick and consisted of yellowish brown (10YR5/8) loamy coarse sand.

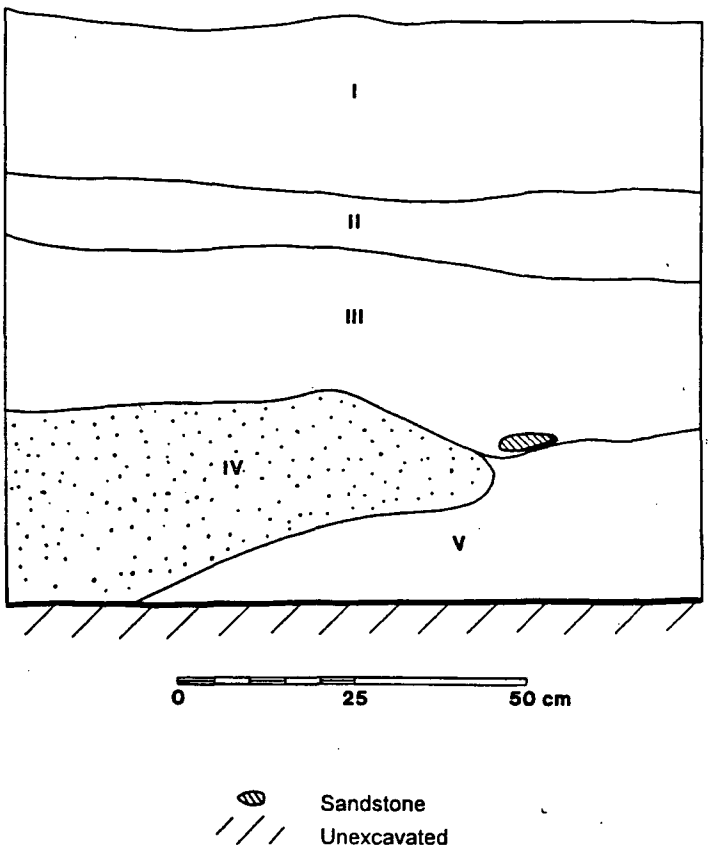


Figure 22.8. Site NM-Q-23-63, Study Unit 6, West Wall Profile.

Excavations of SU 6 recovered artifacts from Levels 5 through 9. Artifacts from Level 5 consisted of only a flaked stone. Artifacts from Level 6 consisted of only a few ceramics. Ceramics and flaked stone were recovered from Level 7. Artifacts from Level 8 consisted of ceramics only. Artifacts from Level 9 consisted of ceramics and flaked stone and were confined to a small rodent-disturbed area. At the base of Level 9 evidence of rodent disturbance was present at the southwest corner of the test unit while the rest of the unit had sterile matrix. Excavation of SU 6 was terminated at Level 9.

Study Unit 7

SU 7 was located within the eastern right-of-way, east of the existing N11 roadway. The southwest grid coordinates of SU 7 were N1001, E988. This unit was placed north of SU 1 to further explore a possible buried feature defined within SU 1. SU 7 was excavated to a depth of 94 cm (9.4 levels) below the ground surface. Sediments from SU 7 consisted of four strata (Figure 22.9). Stratum I was 36 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 33 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum III was 25 cm thick and consisted of yellowish brown (10YR5/6) sand with inclusions of charcoal flecks. Stratum IV was 9 cm thick and consisted of yellowish brown (10YR5/6) sand.

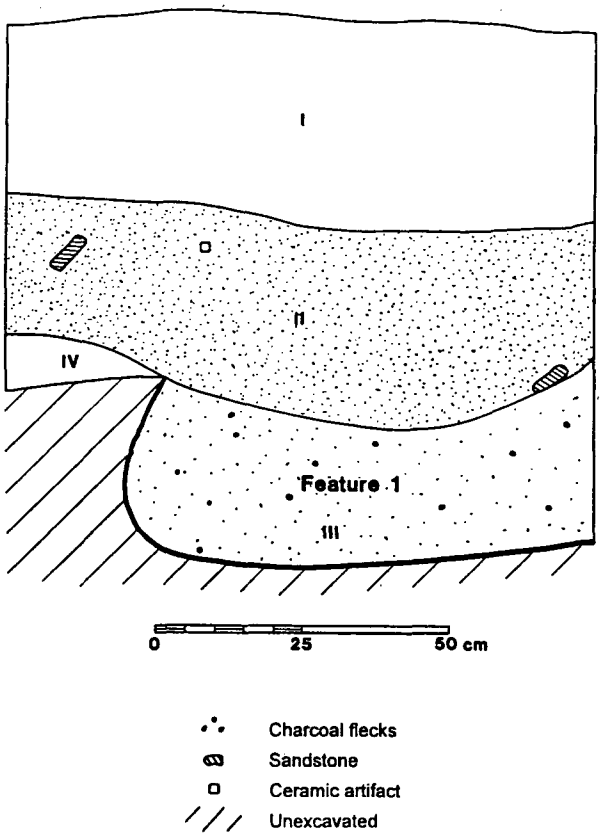


Figure 22.9. Site NM-Q-23-63, Study Unit 7, West Wall Profile Showing Feature 1.

Artifacts were recovered from Levels 3 through 9 of SU 7. Artifacts from Level 3 consisted of only a few ceramics. There was a slight increase of ceramics at Level 4. At Level 5 artifacts recovered included a large amount of ceramics and only a few flaked stones. Artifacts from Level 6 consisted of ceramics, flaked stone, ground stone, and faunal specimens. The artifact density decreased at Level 7 to only a few ceramics, flaked stones, and faunal remains. Artifacts from Level 8 consisted of ceramics, flaked stone, ground stone, and faunal remains. At Level 9 artifacts decreased to only a few ceramics and faunal specimens. Feature 1 was defined in SU 7 and 1. Feature 1 was an earthen bell-shaped storage bin 69 cm below the ground surface; it was approximately 1.05 m in diameter at the top and 1.15 m at the bottom.

Study Unit 8

SU 8 was located near the eastern edge of the right-of-way, east of the existing N11 roadway. The southwest grid coordinates of SU 8 are N985, E988. This unit was placed diagonally adjacent to SU 6 to explore Stratum IV, the yellowish stratum that was defined in SU 6. SU 8 was excavated to a depth of 1 m (10 levels) below the ground surface. Sediments in this study unit consisted of five strata (Figure 22.10). Stratum I was 25 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 13 cm thick and consisted of dark yellowish brown (10YR5/4) sand. Stratum III was 8 cm thick and consisted of yellowish brown (10YR5/4) very fine sand. Stratum IV was 13 cm thick and consisted of yellowish brown (10YR5/6) loamy coarse sand. Stratum V was 28 cm thick and consisted of dark yellowish brown (10YR3/6) loamy coarse sand.

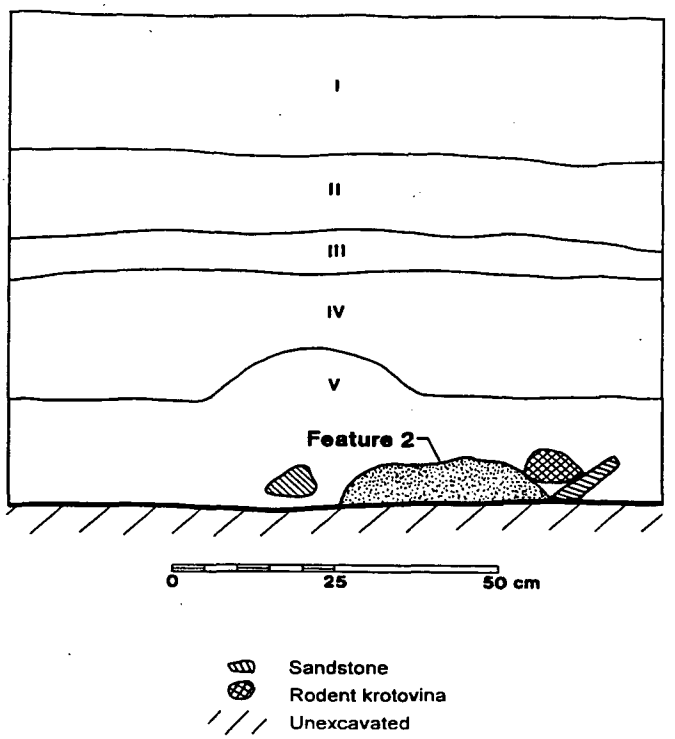


Figure 22.10. Site NM-Q-23-63, Study Unit 8, North Wall Profile Showing Feature 2.

Artifacts were recovered from Levels 6 through 10 of SU 8. Artifacts from Level 6 were few and consisted of ceramics and flaked stone. Artifacts recovered from Level 7 consisted of ceramics, flaked stone, and unmodified stone. Artifact density was at its highest at Level 8 and consisted of ceramics, flaked stone, and ground stone. Artifact numbers decreased at Level 9 to only a few ceramics, flaked stone, and faunal remains. At Level 10 only a ceramic sherd and a flaked stone were recovered. At the base of Level 10 a posthole or possible vent shaft feature was defined (Feature 2). Feature 2 was approximately 1 m below the ground surface and was 50 cm in diameter. Feature fill consisted of charcoal-stained soil with inclusions of ceramics, flaked stone, ground stone, and an upright sandstone slab.

Study Unit 9

SU 9 was located near the middle of the site, east of the existing N11 roadway. The southwest grid coordinates of SU 9 were N997, E989. This unit was placed in an area of profound aeolian deposition and light artifact density. SU 9 was excavated to a depth of 80 cm (eight levels) below the ground surface. Sediments in SU 9 consisted of two strata (Figure 22.11). Stratum I was 56 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 24 cm thick and consisted of gray (10YR6/1) sandy clay loam.

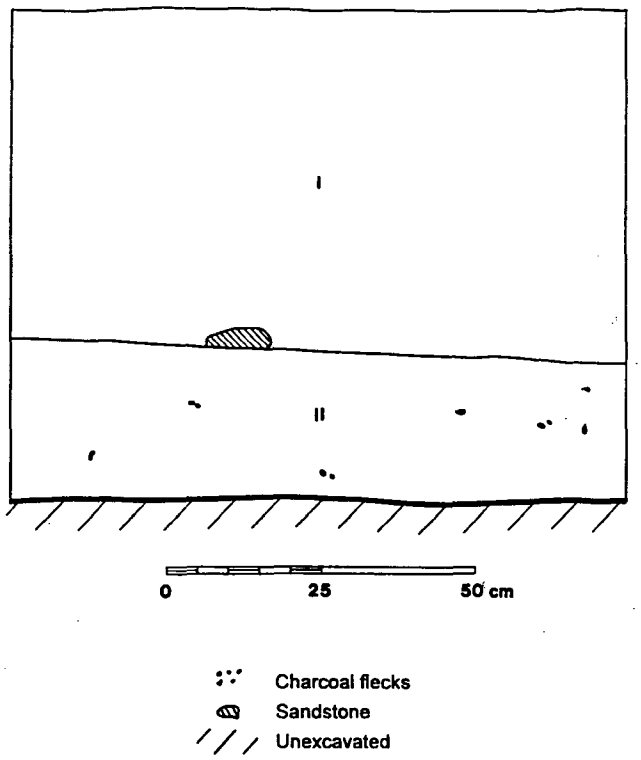


Figure 22.11. Site NM-Q-23-63, Study Unit 9, East Wall Profile.

Artifacts were recovered from Levels 5 through 8 of SU 9. Ceramics were the only artifacts that were recovered from Levels 5 and 6. Ceramics and flaked stone were recovered from Level 7. Artifacts were recovered from the upper 4 cm of Level 8 and only consisted of ceramics and flaked stone. No artifacts or features were defined at the base of Level 8 and excavation of SU 9 was terminated.

Study Unit 10

SU 10 was located at the middle of the site, east of the existing N11 roadway. The southwest grid coordinates for SU 10 were N996, E988. This unit was placed in an area of profound aeolian deposits and light artifact densities. SU 10 was excavated to a depth of 98 cm (10 levels) below the ground surface. Sediments in SU 10 consisted of three strata (Figure 22.12). Stratum I was 50 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 15 cm thick and consisted of light brownish gray (10YR6/2) sand. Stratum III was 12 cm thick and consisted of yellowish brown (10YR5/6) sand.

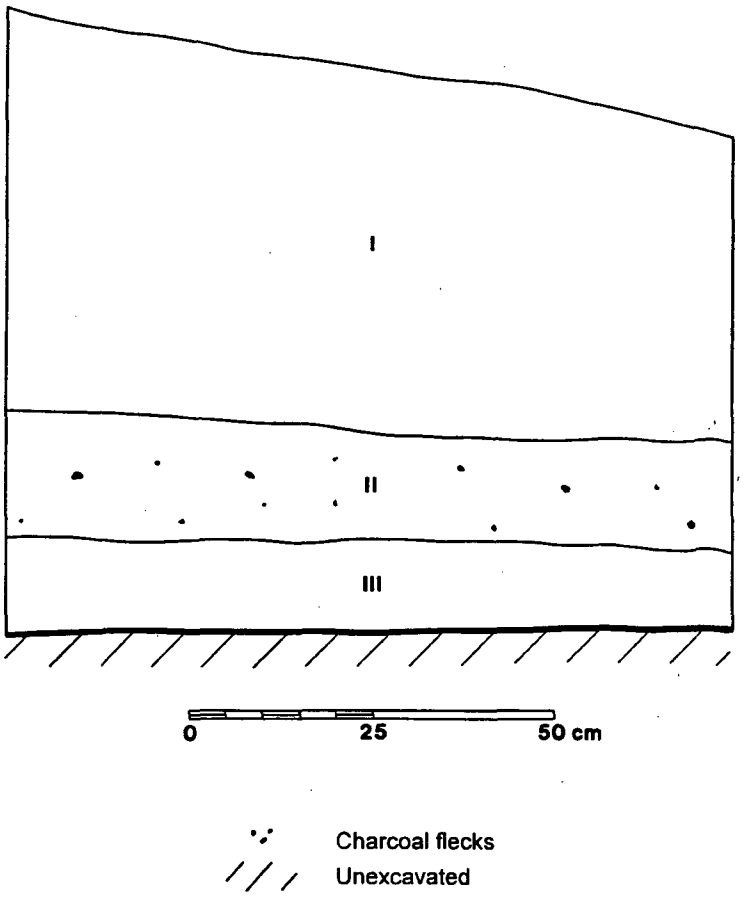


Figure 22.12. Site NM-Q-23-63, Study Unit 10, South Wall Profile.

Artifacts were recovered from Levels 1 and 5 through 10 of SU 10. Artifacts from Level 1, 5, and 6 only consisted of ceramics. Artifacts recovered from Level 7 consisted of ceramics and flaked stone. Ceramics were the only artifacts recovered from Levels 8, 9, and 10. No features were defined at the base of Level 10 and excavation of SU 10 was terminated.

Study Unit 11

SU 11 was located near the western edge of the existing N11 road cut bank, within the western right-of-way edge. The southwest grid coordinates for SU 11 were N1016.5, E966.7. This unit was placed in an area of light artifact density and in an area where a hearth feature had been disturbed by road maintenance. SU 11 was the excavation of the west half of the thermal hearth feature. The west half of Feature 3 was excavated to a depth of 16 cm (one level) below the ground surface. Sediments in the feature fill consisted of two strata (Figure 22.13). Stratum I was 12 cm thick and consisted of yellowish brown (10YR5/4) fine sand. Stratum II was 4 cm thick and consisted of very dark brown (10YR2/2) sand that had weak structure.

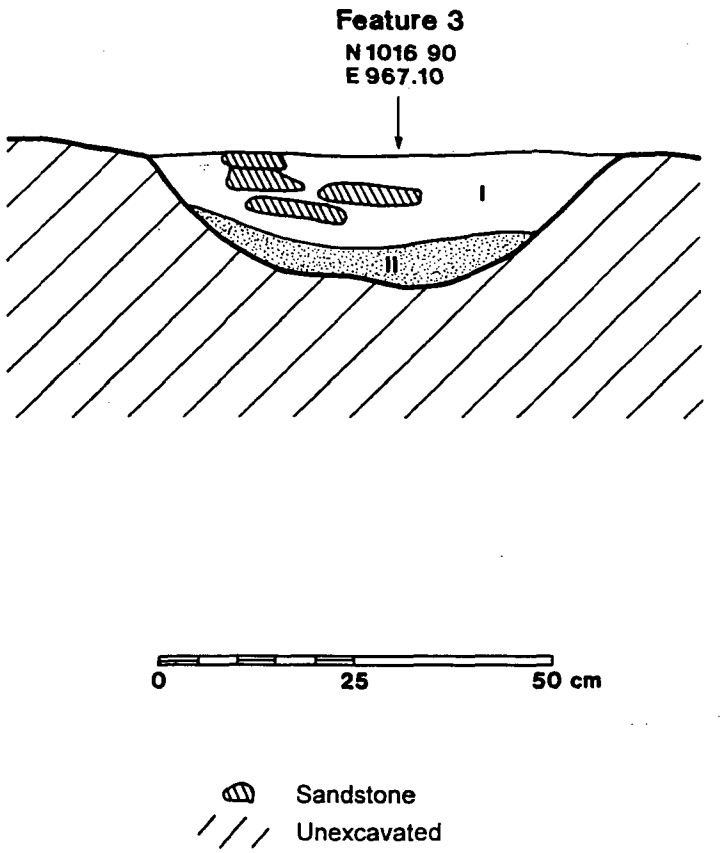


Figure 22.13. Site NM-Q-23-63, Study Unit 11, West-facing Profile of Feature 3.

Artifacts recovered from the feature fill consisted of a few ceramic sherds and a ground stone fragment. Feature 3 is an earthen hearth 60 cm in diameter and 16 cm deep. Fire-cracked rocks were present near the base of the hearth and soils at the base were oxidized indicating a prolonged use of the hearth.

Study Unit 12

SU 12 was located within the western right-of-way edge, just outside the west edge of the existing N11 roadway cutbank. The southwest grid coordinates for SU 12 were N1023, E967. This unit was placed over a charcoal stain exposed during mechanical excavation of SU 22. SU 12 was excavated to a depth of 60 cm (six levels) below the ground surface. Sediments in SU 12 consisted of two strata (Figure 22.14). Stratum I was 25 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 22 cm thick and consisted of dark yellowish brown (10YR4/6) sand with inclusions of charcoal flecks.

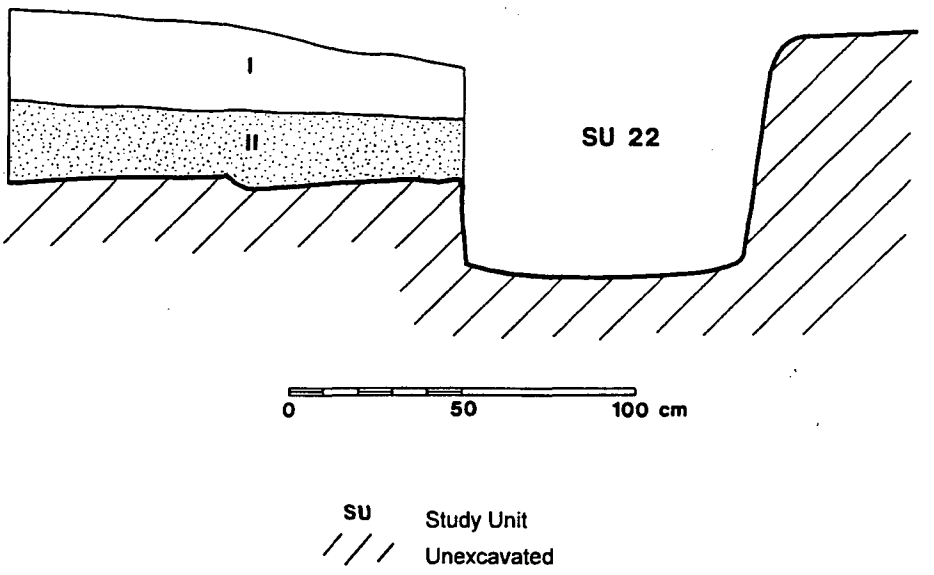


Figure 22.14. Site NM-Q-23-63, Study Unit 12, East Wall Profile.

Very few artifacts were recovered from levels 1 and 4 (only one ceramic sherd in each level). A shallow basin hearth feature (Feature 4) was defined at Level 5 of SU 12. Feature 4 was approximately 81 cm east-to-west and 73 cm north-to-south, and 25 cm below the ground surface. The depth of the basin hearth is approximately 26 cm. The southern half of the feature was truncated by mechanical excavation of SU 22.

Backhoe Trench Excavation

The mechanical excavation of 13 trenches was conducted in order to investigate the possibility of buried cultural deposits on site NM-Q-23-63, as well as outside the site perimeter. At least one representative profile was drawn for each trench. Trench profiles were drawn in 1-m-wide or 2-m-wide segments. The artifact distribution map generated from controlled surface collection was used as a guide for placement of the backhoe trenches. Trench width was a standard 70 cm. Twelve on-site trenches totaling 151.8 m were excavated on site NM-Q-23-63. The average depth of these trenches was 1.19 m. One off-site trench, 20.4 m long, was excavated outside the site boundary.

On-site Trenches

Study Unit 13. SU 13 was located at the northeastern part of the site, east of the existing N11 roadway. SU 13 extended from grid coordinates N1044.74, E1008.29 southeastward 9.2 m to N1040.80, E1016.48. This trench was placed in an area of light artifact density and profound aeolian deposits. SU 13 was recorded as an on-site trench. One 1-m-long profile was drawn of SU 13. This profile was located 4 m from the west end of the north trench wall (Figure 22.15). This profile included four strata. Stratum I was 50 cm thick and consisted of light yellowish brown (10YR6/4) sand with many inclusions of roots. Stratum II was 25 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum III was 25 cm thick and consisted of yellowish brown (10YR5/4) fine sand. Stratum IV was 33 cm thick and consisted of light gray (10YR7/1) sandy clay. No cultural materials were recovered nor were features defined within SU 13.

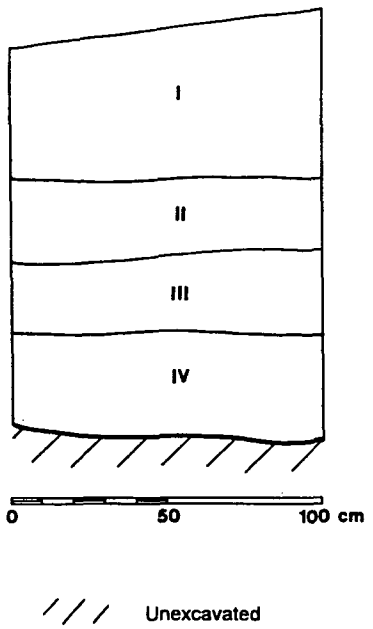


Figure 22.15. Site NM-Q-23-63, Study Unit 13, North Wall Profile.

Study Unit 14. SU 14 was located in the northeastern part of the site, east of existing N11 roadway. SU 14 extended from grid coordinates N1037.26, E1004.25 southeastward 11.8 m to N1032.30, E1014.72. This trench was placed in an area of light artifact density and profound aeolian deposits. SU 14 was recorded as an on-site trench. One 1-m-long profile was drawn of SU 14. This profile was located 4 m from the west end and on the south trench wall (Figure 22.16). This profile included four strata. Stratum I was 69 cm thick and consisted of light yellowish brown (10YR6/4) very fine sand. Stratum II was 21 cm thick and consisted of dark yellowish brown (10YR4/6) very fine sand. Stratum III was 34 cm thick and consisted of light gray (10YR7/1) sandy clay loam. Stratum IV was 24 cm thick and consisted of white (10YR8/1) very fine sand. No cultural materials were recovered nor were features defined within SU 14.

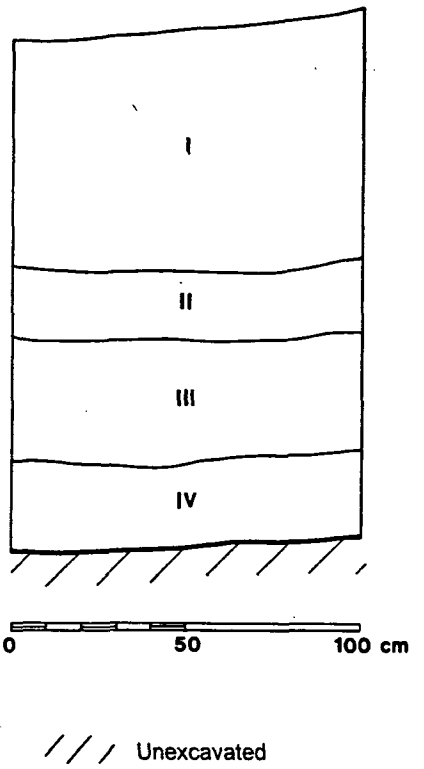


Figure 22.16. Site NM-Q-23-63, Study Unit 14, South Wall Profile.

Study Unit 15. SU 15 was located in the northeastern part of the site, east of the existing N11 roadway. SU 15 extended from grid coordinates N1016.45, E1001.29 northeastward 16.8 m to N1031.22, E1008.69. This trench was placed in an area of very light artifact density and profound aeolian deposits. SU 15 was recorded as an on-site trench. Two 1-m-long profiles were drawn of SU 15. Only one profile located 6.5 m from the south end of the east trench wall is shown (Figure 22.17).

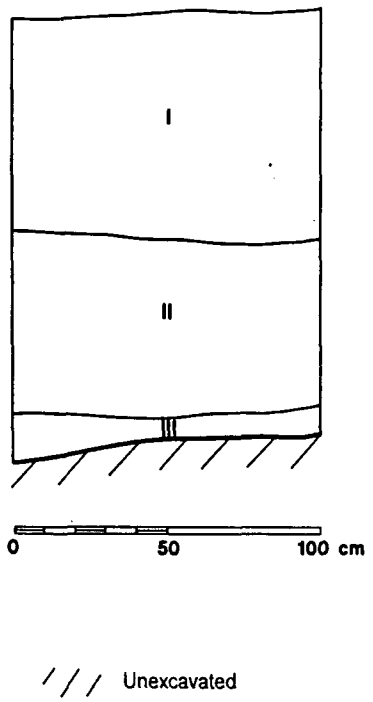


Figure 22.17. Site NM-Q-23-63, Study Unit 15, East Wall Profile.

Three strata were present within this profile. Stratum I was 68 cm thick and consisted of light yellowish brown (10YR6/4) very fine sand. Stratum II was 52 cm thick and consisted of yellowish brown (10YR5/6) very fine sand. Stratum III was 6 cm thick and consisted of white (10YR8/1) sandy clay loam. No cultural materials or features were found within SU 15.

Study Unit 16. SU 16 was located near the middle of the site, east of the existing N11 roadway. SU 16 extended from grid coordinates N1011.69, E993.25 southeastward 10.6 m to N1008.34, E1003.37. This trench was placed in an area of light artifact density and profound aeolian deposits. SU 16 was recorded as an on-site trench. One 1-m-long profile was drawn of SU 16. This profile was located 4 m from the west end of the south trench wall and was representative of the entire trench profile (Figure 22.18). Three strata were present within the trench. Stratum I was 58 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 24 cm thick and consisted of yellowish brown (10YR5/4) sand. Stratum III was 43 cm thick and consisted of dark yellowish brown (10YR4/6) sand with presence of calcium carbonation and a few roots. No cultural material or features were found within SU 16.

Study Unit 17. SU 17 was located at the middle of the site, east of the existing N11 roadway. SU 17 extended from grid coordinates N1002.48, E1000.30 northwestward 11.20 m to N1007.05, E990.29. This trench was placed in an area of moderate artifact density and profound aeolian deposits. SU 17 was recorded as an on-site trench. Two profiles were drawn of SU 17. Only one

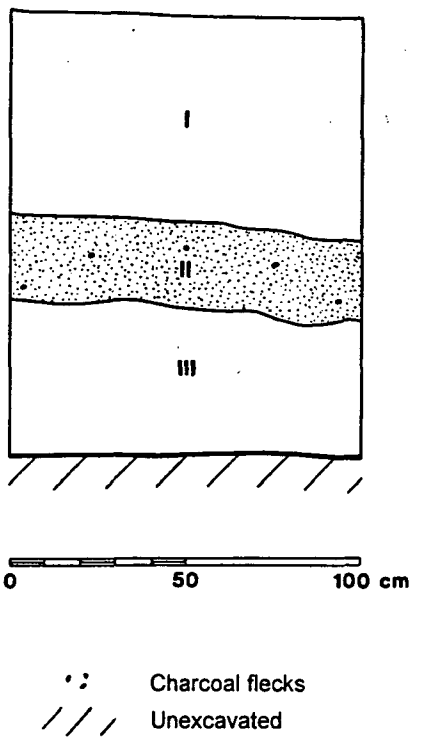


Figure 22.18. Site NM-Q-23-63, Study Unit 16, South Wall Profile.

2-m-long profile located 1 m from the west end of the north trench wall is shown and it is representative of the entire trench profile (Figure 22.19). Four strata were present within the SU 17 trench. Stratum I was 21 cm thick and consisted of light yellowish brown (10YR6/4) very fine sand. Stratum II varied in thickness from 12 to 28 cm and consisted of yellowish brown (10YR5/6) very fine sand. Stratum III varied in thickness from 18 to 36 cm and consisted of very dark grayish brown (10YR3/2) fine sand. Stratum IV varied in thickness from 30 to 50 cm and consisted of yellowish brown (10YR5/8) sandy clay loam with inclusions of few roots. No cultural materials or features were found within SU 17.

Study Unit 18. SU 18 was located at the middle of the site, east of the existing N11 roadway. SU 18 extended from grid coordinates N1005.52, E995.69 southwestward 13.4 m to N992.83, E989.76. This trench was placed in an area of moderate artifact density and profound aeolian deposits. SU 18 was recorded as an on-site trench. One 2-m-long profile was drawn of SU 18. This profile was located 3.5 m from the south end of the west trench wall and was representative of the entire trench (Figure 22.20). Four strata were present within SU 18. Stratum I was 44 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 36 cm thick and consisted of yellowish brown (10YR5/4) sand. This stratum had an irregular boundary. Stratum III was 36 cm thick and consisted of yellowish brown (10YR5/8) sand with broken boundary between Stratum II and III. Stratum IV was 52 cm thick and consisted of light yellowish brown (10YR6/4) sand. No cultural materials or features were found within SU 18.

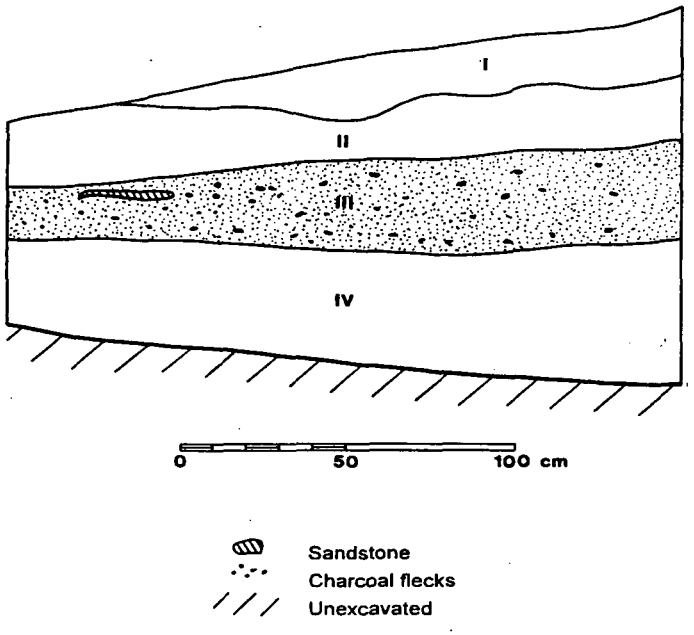


Figure 22.19. Site NM-Q-23-63, Study Unit 17, North Wall Profile.

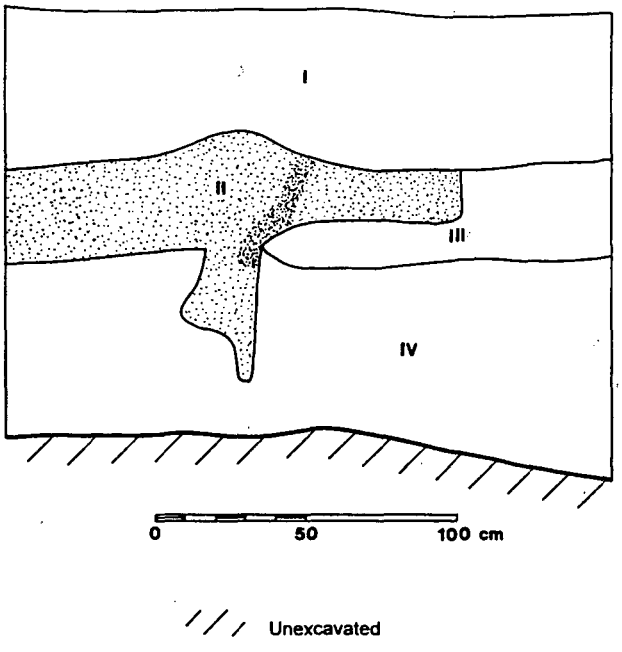


Figure 22.20. Site NM-Q-23-63, Study Unit 18, West Wall Profile.

Study Unit 19. SU 19 was located in the southeast part of the site, east of the existing N11 roadway. SU 19 extended from grid coordinates N986.23, E985.49 southwestward 21.8 m to N966.62, E976.19. This trench was placed in an area of light artifact density and profound aeolian deposits. SU 19 was recorded as an on-site trench. One 1-m-long profile was drawn of SU 19. This profile was located 16 m from the north end of the east trench wall and was representative of the entire trench (Figure 22.21). Four strata were present within SU 19. Stratum I was 30 cm thick and consisted of light yellowish brown (10YR6/4) very fine sand. Stratum II was 24 cm thick and consisted of yellowish brown (10YR5/6) very fine sand. Stratum III was 37 cm thick and consisted of yellowish brown (10YR5/4) fine sand with inclusions of very few gravels and roots. Stratum IV was 48 cm thick and consisted of white (10YR8/1) sandy clay with inclusions of very few gravels. No cultural materials or features were found within SU 19.

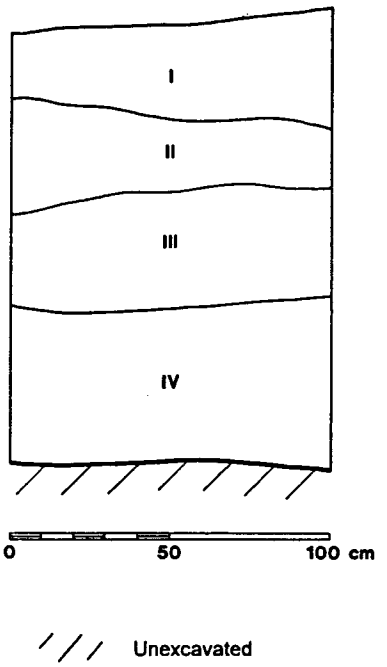


Figure 22.21. Site NM-Q-23-63, Study Unit 19, East Wall Profile.

Study Unit 20. SU 20 was located in the southwest part of the site, west of the existing N11 roadway. SU 20 extended from grid coordinates N972.34, E937.88 northeastward 20.4 m to N991.17, E947.23. This trench was placed in an area of light artifact density. SU 20 was recorded as an on-site trench. One 1-m-long profile was drawn of SU 20. This profile was located 10 m from the south end of the west trench wall and was representative of the entire trench (Figure 22.22). Three strata were present within SU 20. Stratum I was 30 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 36 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Stratum III was 22 cm thick and consisted of pale yellow (2.5Y7/3) sandstone bedrock. No cultural materials or features were found within SU 20.

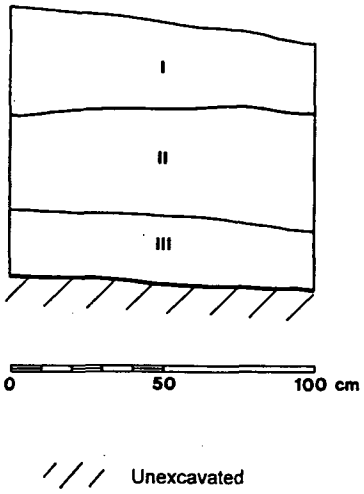


Figure 22.22. Site NM-Q-23-63, Study Unit 20, West Wall Profile.

Study Unit 21. SU 21 was located at the middle of the site, west of the existing N11 roadway. SU 21 extended from grid coordinates N1010, E964.43 northwestward 9.8 m to N1014.75, E955.90. This trench was placed in an area of light artifact density and mechanical disturbance by road maintenance. SU 21 was recorded as an on-site trench. One 1-m-long profile was drawn of SU 21. This profile was located 7 m from the west end of the north trench wall and was representative of the entire trench (Figure 22.23). Stratum I was 24 cm thick and consisted of light yellowish brown (10YR6/4) very fine sand. Stratum II was 19 cm thick and consisted of yellowish brown (10YR5/4) fine sand. Stratum III was 33 cm thick and consisted of light olive brown (2.5Y5/3) sandstone bedrock. No cultural materials or features were found within SU 21.

Study Unit 22. SU 22 was located at the middle of the site, west of the existing N11 roadway. SU 22 extended from grid coordinates N1021.22, E969.69 northwestward 11 m to N1026.14, E959.74. This trench was placed in an area of light artifact density and aeolian deposits. SU 22 was recorded as an on-site trench. One 1-m-long profile was drawn of SU 22. This profile was located 7.5 m from the west end of the north trench wall (Figure 22.24). Stratum I was 40 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 16 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum II was 12 cm thick and consisted of light olive brown (2.5Y5/3) sandstone bedrock. One feature (Feature 4) was defined within SU 22.

Study Unit 23. SU 23 was located near the middle of the site, east of the existing N11 roadway. SU 23 extended from grid coordinates N987.82, E993.11 northwestward 10.4 m to N992.25, E983.75. This trench was placed in an area of light artifact density and aeolian deposits. SU 23 was recorded as an on-site trench. One 1-m-long profile was drawn of SU 23. This profile was located 5 m from the west end of the north trench wall and was representative of the entire trench (Figure 22.25). Stratum I was 57 cm thick and consisted of light yellowish brown (10YR6/4) fine

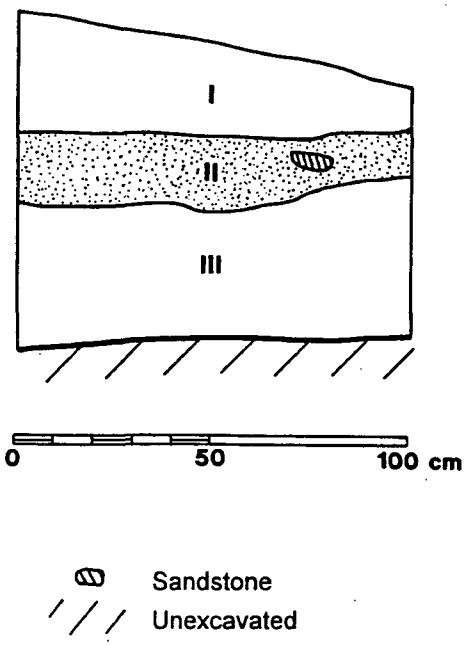


Figure 22.23. Site NM-Q-23-63, Study Unit 21, North Wall Profile.

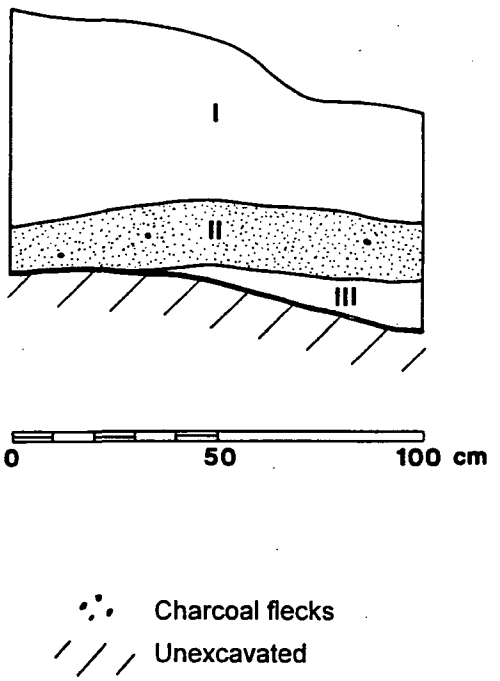


Figure 22.24. Site NM-Q-23-63, Study Unit 22, North Wall Profile.

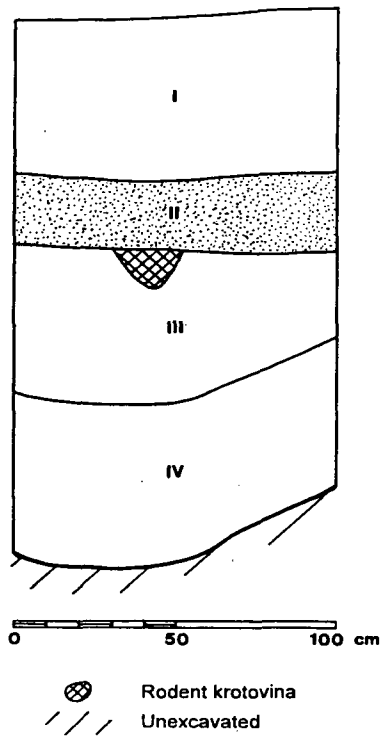


Figure 22.25. Site NM-Q-23-63, Study Unit 23, North Wall Profile.

sand. Stratum II was 23 cm thick and consisted of yellowish brown (10YR5/4) fine sand. Stratum III was 55 cm thick and consisted of yellowish brown (10YR5/6) sandy loam. Stratum IV was 55 cm thick and consisted of yellowish brown (10YR5/8) sandy clay loam with evidence of calcium carbonation. No cultural materials or features were found within SU 23.

Study Unit 24. SU 24 was located near the middle of the site, east of the existing N11 roadway. SU 24 extended from grid coordinates N985.28, E985.02 southeastward 5.4 m to N982.74, E989.85. This trench was placed in an area of light artifact density and perpendicular to SU 19. SU 24 was recorded as an on-site trench. One 1-m-long profile was drawn of SU 24. This profile was located 1 m from the west end of the north trench wall and was representative of the entire trench (Figure 22.26). Stratum I was 32 cm thick and consisted of light yellowish brown (10YR6/4) very fine sand. Stratum II was 20 cm thick and consisted of yellowish brown (10YR5/6) very fine sand. Stratum III was 23 cm thick and consisted of dark yellowish brown (10YR3/6) sandy loam. Stratum IV was 40 cm thick and consisted of yellowish brown (10YR5/8) sandy clay loam. One lithic artifact was found within Stratum III and no features were defined within SU 24.

Off-site Trench

Off-site Trench 1 was located 3 m southeast of the southeastern site perimeter, east of the existing N11 roadway. Off-site Trench 1 extended from grid coordinates N933.58, E958.21 southwestward 20.4 m to N915.90, E948.84. This trench was placed outside the perimeter of the site

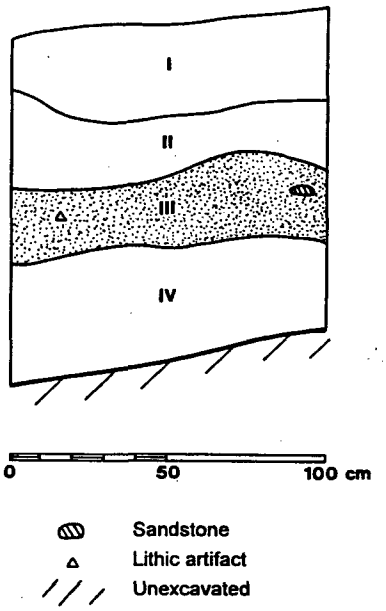


Figure 22.26. Site NM-Q-23-63, Study Unit 24, North Wall Profile.

in order to investigate possible buried cultural deposits. Three strata were present within Off-Site Trench 1. One 1-m-long profile was drawn. This profile was located 9 m from the south end of the west trench wall and was representative of the entire trench (Figure 22.27). Stratum I was 64 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 9 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum III was 31 cm thick and consisted of pale yellow (2.5Y7/3) sandstone. No cultural materials or features were found within Off-site Trench 1.

Features

An interpretive summary of the features within the right-of-way follows, and represents a compilation of all recovered data from the variety of surface and subsurface contexts identified for each feature.

Feature 1

The center of Feature 1 was located at grid coordinates N1001.40, E988.45. The feature is interpreted as a earthen bell-shaped storage pit measuring 1.05 m in diameter and 30 cm deep and is 60 cm below the surface. Feature 1 was identified during excavation of SU 1 and 7. The fill of the feature is defined by charcoal-stained soil with inclusions of ceramics, flaked and ground stone, and faunal specimens. A flotation sample, pollen sample, and charcoal samples for a radiocarbon date were collected from the feature. The radiocarbon sample (FS 75) yielded a calibrated Late Basketmaker III date of AD 695 to Pueblo II AD 1030 (Beta 110384, 2 sigma). Future investigations in the vicinity of Feature 1 have high potential for recovery of cultural material. The presence of datable items including ceramics, faunal specimens, charred fuel wood, and seeds is likely.

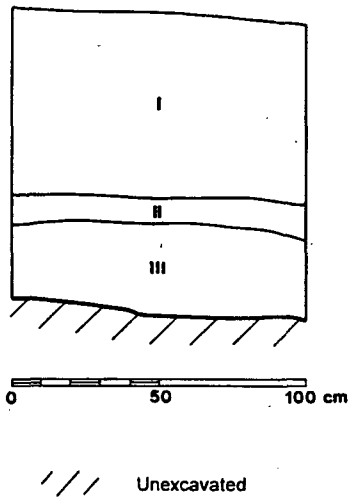


Figure 22.27. Site NM-Q-23-63, Off-site Trench 1, West Wall Profile.

Feature 2

The center of Feature 2, a deeply buried posthole or possible vent shaft, was located at grid coordinates N985.65, E988.60. Feature 2 measured 86 cm east-to-west and 73 cm north-to south and 25 cm below surface. The feature was identified during excavation of SU 8 and 6. It was defined by the presence of charcoal-stained soil with an upright sandstone slab. Although ceramics and flaked stone were recovered within the fill of the feature, no artifacts were associated on the surface. The feature has a high potential of exposure of all classes of artifacts and possibly a habitation structure with datable items including ceramics, faunal specimens, lithic artifacts, charred wood, and seeds.

Feature 3

The center of Feature 3, a shallow basin hearth, was located at grid coordinates N1016.90, E967.15. The feature, measuring approximately 60 cm in diameter, had been truncated by road maintenance. The feature was identified during investigation of a charcoal stain in SU 11. Feature 3 was defined by a circular charcoal stain and a scatter of associated fire-cracked rock. Ceramics and ground stone were recovered from within the feature.

A flotation sample and charcoal sample for a radiocarbon date were collected from the west half of feature. The radiocarbon sample yielded a calibrated Late Archaic date of 1030 BC to Pueblo I 810 (Beta 110385, 2 sigma). Although the hearth was truncated by the road maintenance, future investigations in the vicinity of Feature 3 have a high potential for recovery of cultural material. The presence of datable items including ceramics, charred wood, and seeds is likely.

Feature 4

The center of Feature 4, an earthen basin hearth, was located at grid coordinates N1023, E967.45. The feature measured approximately 86 cm east-to-west by 73 cm north-to-south and was 25 cm below the surface. The feature was identified during excavation of backhoe trench SU 22, and further defined in hand-excavated SU 12. Feature 4 was defined as a circular area of charcoal-stained soil. No artifacts were recovered within Feature 4 during field investigations.

A flotation sample was collected from the interior of the east half of the feature. Although the hearth was truncated during the excavation of SU 22, future investigations in the vicinity of Feature 4 have a high potential for recovery of cultural materials. The presence of datable cultural material including ceramics, faunal specimens, charred wood, and seeds is likely.

SUMMARY AND INTERPRETATION

Phase I Data Recovery testing activities at site NM-Q-23-63 included a redefinition of the site, a complete surface collection of all artifacts within the right-of-way, hand excavation of 11 1-by-1-m units, half of feature was dug and machine excavation of 13 trenches totaling 172.2 m in length.

The observed characteristics of the ground surface over the site area indicate that about 40% of the site has been moderately to severely disturbed by road construction and continued road maintenance. Information recovered from hand-excavated units and backhoe trenches indicated that the direct and indirect results of mechanical disturbances to the site are present in these areas to depths between 20 and 50 cm below the surface. Thus some previously occurring cultural deposits were probably removed during the initial construction of N11. Minimal ground disturbance has also occurred in the vicinity of SU 1 through 10 and Features 1 and 2. Subsurface investigations indicate that the natural stratigraphy and landscape in this area has not been significantly altered.

Natural Stratigraphy

A reconstruction of the natural stratigraphy present across the site area was completed with information recovered from each of the 12 hand-excavated units and 13 backhoe trenches. This resulted in the identification of four major natural strata. Stratum I consists of loose aeolian sands ranging in thickness from 20 cm to 69 cm. It is widely distributed. Modern refuse is present throughout this stratum in SU 3 and 4 at the edge of the road cut bank indicating that its deposition began after the initial construction of N11. Stratum II consists of loose fine to very fine sands ranging in thickness from 8 cm to 33 cm. It is intermittently distributed and a large percentage of artifacts recovered in the hand-excavated units were from this stratum. This stratum was present in SU 1 and 7, capping Feature 1. Stratum III consists of loose to slightly hard sand ranging in thickness from 7 cm to 55 cm. It is widely distributed. It is exposed partially in SU 3 with evidence of calcium carbonation. In SU 1 and 7 Feature 1 is excavated into Stratum IV. Stratum IV consists of slightly hard loamy coarse sand to sandy clay ranging in thickness from 13 cm to 33 cm. It is only exposed in SU 2, 6, 7, and 8 of the hand-excavated units and intermittently throughout the site. It extends below the floor of the trenches. Stratum V is only exposed in SU 6 and 8 of the hand excavated units. This stratum consists of slightly hard loamy coarse sand.

Cultural Deposits

Artifacts recovered during surface collection from site NM-Q-23-63 included ceramics, flaked and ground stone, and faunal specimens. The majority of the artifacts were collected along the cut bank of the east edge of the existing N11, near the area of Feature 1. A charcoal stain defined by ZCRE in 1995 was relocated. Subsurface investigations also resulted in the identification of four features (Features 1 through 4).

Site NM-Q-23-63 is a multicomponent Late Archaic to Basketmaker III site that contains one bell-shaped storage pit, one posthole, and two thermal features. Because of the sampling intervals between backhoe trenches and test units as many as two pitstructures are projected for the site, as are four storage pits, six thermal features, and four other features. These estimates take into account the distribution of features on the site.

The ceramic assemblage from site NM-Q-23-63 is comprised primarily of Basketmaker III types. Some Pueblo I and II ceramic types, two Navajo Gray Wares were also present on the surface of the site. Basketmaker III types included gray-, brownwares, a single Mogollon Brown Ware, La Plata Black-on-white, and White Mound Black-on-white. The Pueblo I and II ceramics include Kana-a Neckbanded, Abajo Red-on-orange, Red Mesa, Escavada, and Gallup black-on-white. A small group potentially late Pueblo I to Pueblo II are considered intrusive due to the close proximity of NM-Q-23-63 to the Muddy Water Great House.

The chipped stone and ground stone assemblage from site NM-Q-23-63 reflects a selection of locally available raw materials, except for obsidian, for the majority of the artifacts. Raw materials represented among the flaked stone artifacts include Chinle chert, petrified wood, chert, obsidian, quartzite, chalcedony, Washington Pass chert, and sandstone. Ground stone artifacts consisted primarily of sandstone raw material. One piece of yellow ochre was also analyzed from the site.

The faunal assemblage recovered from NM-Q-23-63 primarily consists of fragmented specimens identified to the categories of small and large mammals. Jackrabbit and unspecified artiodactyla occur in low frequency. One kangaroo rat bone complete the assemblage.

The botanical assemblage from NM-Q-23-63 consists of pinyon pine and juniper. Other economically important plants included: prickly pear cactus, Cheno-ams, purslane, globemallow, squash/pumpkin, and maize.

Chronometric data derived from radiocarbon analysis allow the inference of a maximum range of occupation from BC 1030 to AD 810. This range is earlier than estimated from the ceramic assemblage, and would extend the occupation to the Late Archaic period.

RECOMMENDATIONS

Site NM-Q-23-63 contains Late Archaic hearth and Basketmaker III ceramics. Four features were identified during Phase I Data Recovery testing at site NM-Q-23-63. Radiocarbon recovered from Feature 3 indicate the time period to be in the Late Archaic (1030 to 810 BC). Further data recovery work is needed for site NM-Q-23-63 in order to explore the data potential of the discovered features before the proposed road improvements take place.

Chapter 23

SITE NM-Q-23-64 (LA 110327)

Jerome Zunie

Site NM-Q-23-64 is located on deep dunes in a wide valley bottom. The elevation of the site is 2073 m (6800 ft) above mean sea level. A Plains and Great Basin Grassland biotic community is present in the vicinity of the site area. Vegetation cover within and around the site consists of a sparse scatter of oneseed juniper (*Juniperus monosperma*), broom snakeweed (*Gutierrezia sarothrae*), Indian ricegrass (*Oryzopsis hymenoides*), ring muhly (*Muhlenbergia torreyi*), Russian thistle (*Salsola kali tenuifolia*), cactus (*Opuntia*), and other grass plants.

SURVEY DATA

Site NM-Q-23-64 was previously recorded by the American Indian Cultural Consultants (AICC 1982) and was rerecorded by Zuni Cultural Resources Enterprise in 1995 (Zimmerman and Abbott 1996) as part of the N11 (1&2) realignment road survey. ZCRE recording activities included lithic artifact reduction and material identification, artifact counts, and surface distribution mapping of artifacts. Site NM-Q-23-64 was recorded as an Anasazi ceramic and lithic artifact scatter with a feature. From the lithic artifacts and the presence of Lino Gray and possible White Mound Black-on-white ceramics on the site, a Basketmaker III to Pueblo I occupation was suggested.

NATURE AND EXTENT TESTING

From 21 April to 29 May 1997 personnel from ZCRE conducted Phase I Data Recovery testing for content and extent of site NM-Q-23-64. A redefinition of the site and a complete surface collection of all artifacts within the right-of-way were conducted prior to subsurface investigation. Subsurface investigations included hand excavation of 10 1-by-1-m test units and backhoe excavation of 16 on-site trenches totaling 211 m. In addition three off-site trenches totaling 34.5 m were excavated. Site boundaries were expanded to the northward and southward, resulting in a total area of approximately 377 m north-to-south by 87 m east-to-west (Figure 23.1a and b).

Surface Collection

Surface artifacts were collected within 5-by-5-m units. The collected artifacts were then tabulated on Field Specimen (FS) catalog sheets. Artifacts of similar types were collected together and assigned FS numbers as a unit within each 5-by-5-m collection unit from site NM-Q-23-64. Figure 23.2a and b shows the surface distribution of artifacts collected from the site. Exactly 115 FS bags of artifacts were collected. The artifact scatters were concentrated in the road cut bank. It appears that the road maintenance of N11 has been largely responsible for visibility of artifacts on this site. Site NM-Q-23-64 has been severely disturbed by road grading and vehicle traffic along the existing road N11.

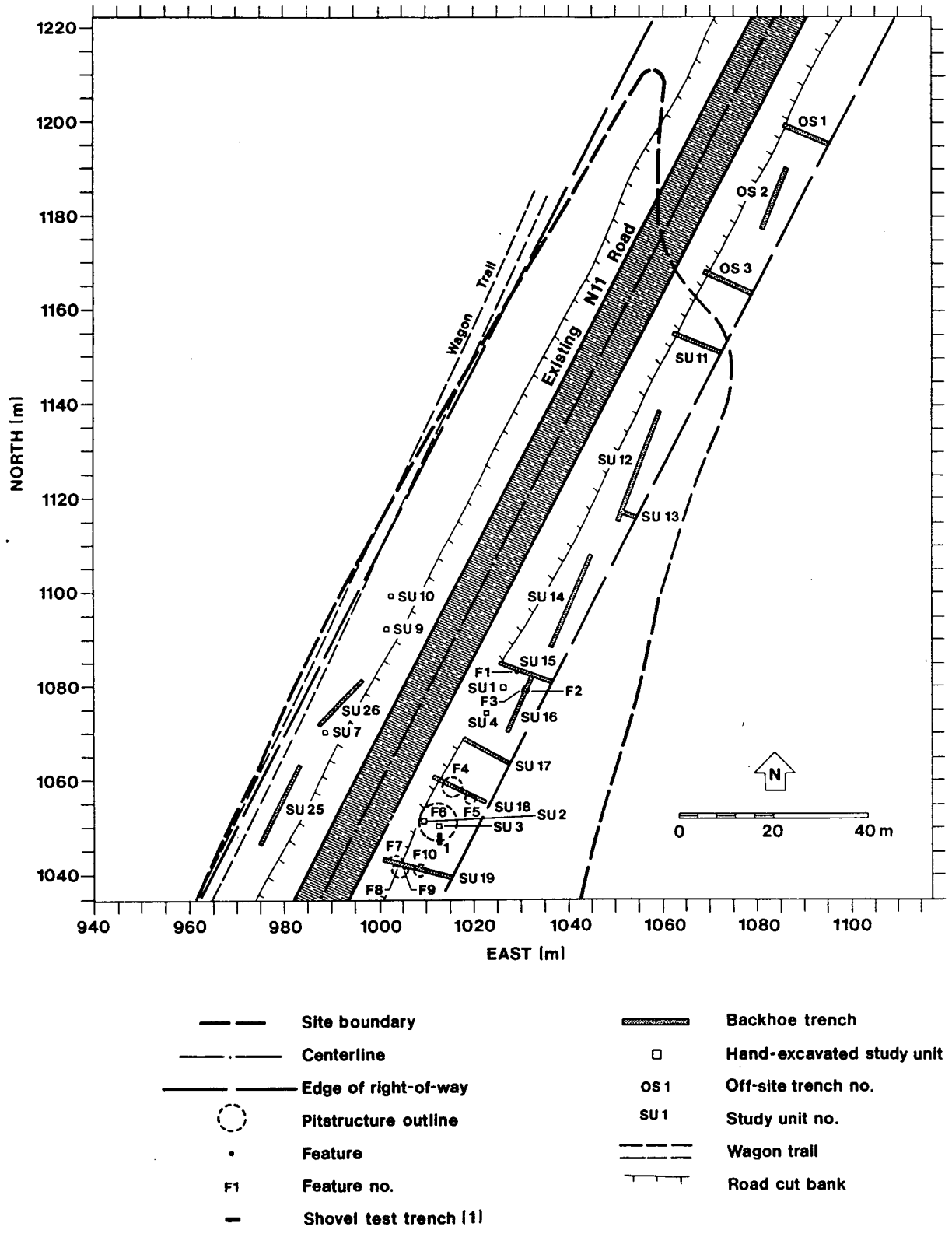


Figure 23.1a. Site NM-Q-23-64, Nature and Extent Testing, Northern Portion.

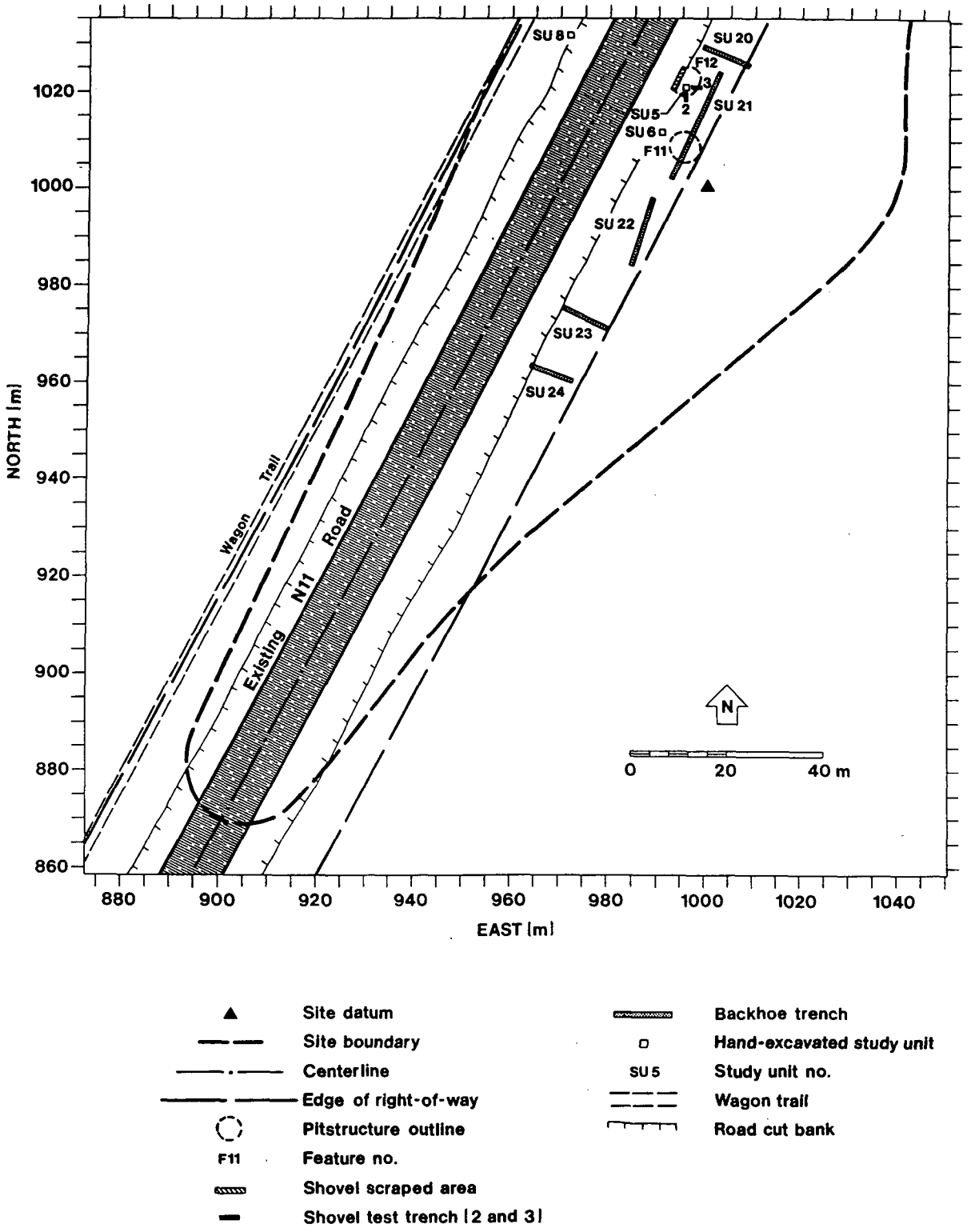


Figure 23.1b. Site NM-Q-23-64, Nature and Extent Testing, Southern Portion.

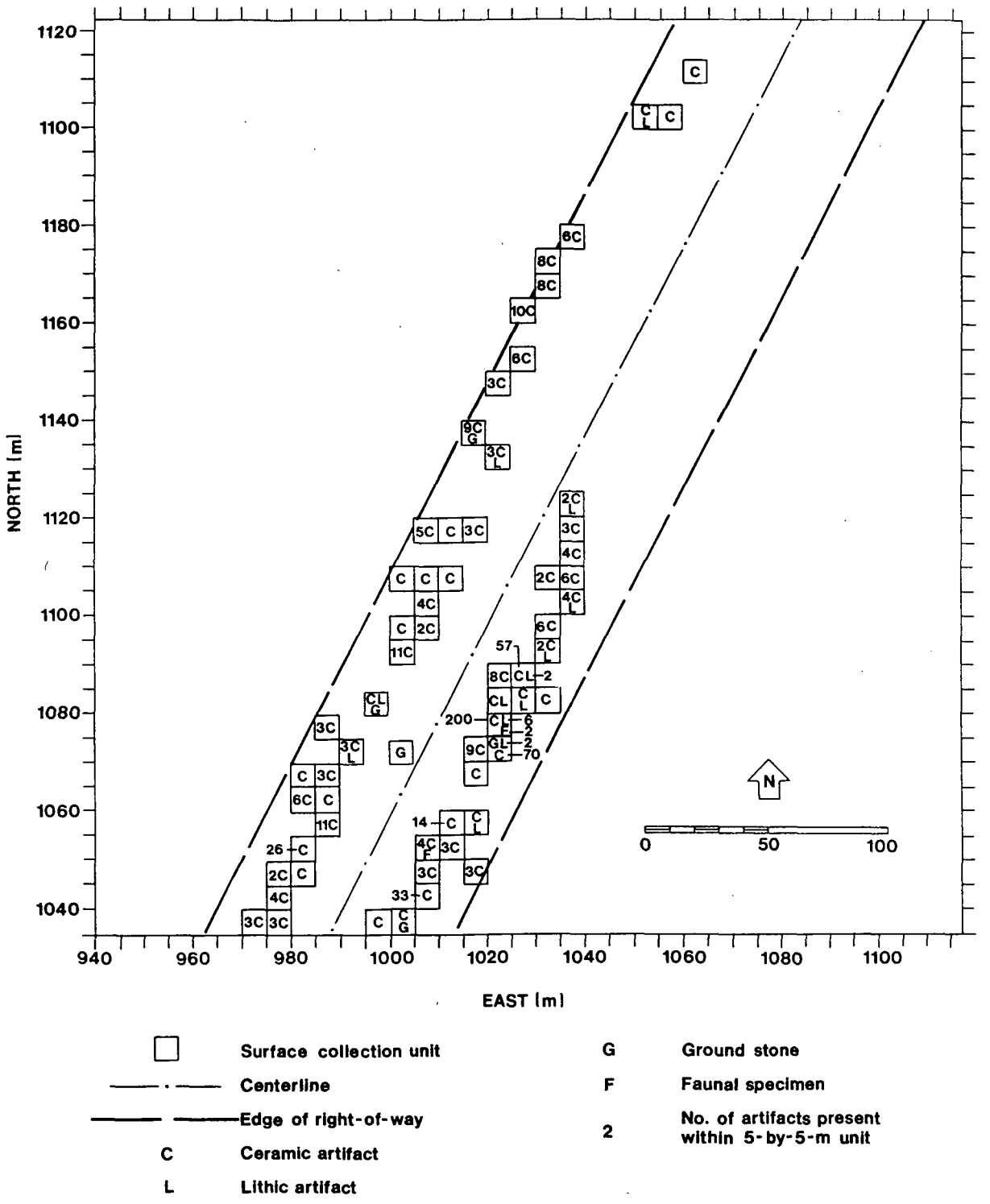


Figure 23.2a. Site NM-Q-23-64, Surface Artifact Distribution, Northern Portion.

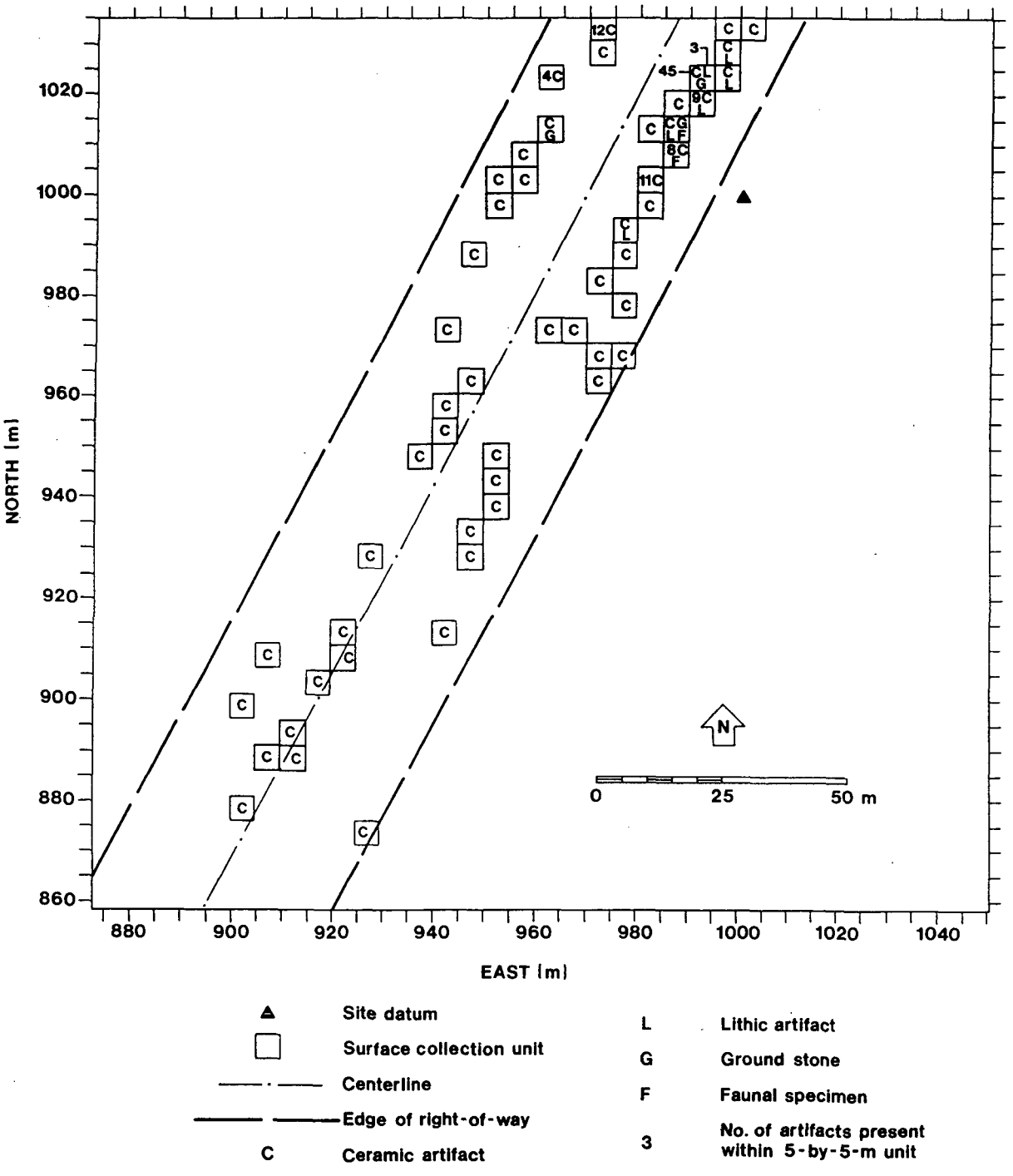


Figure 23.2b. Site NM-Q-23-64, Surface Artifact Distribution, Southern Portion.

Hand Excavation

Hand excavation of 10 1-by-1-m study units was conducted in order to determine the nature and depth of cultural deposits on site NM-Q-23-64. The artifact distribution map generated during controlled surface collection was used as a guide for the placement of the 10 test units. Test units were excavated in arbitrary 10-cm levels and all sediments were screened through 1/4-in hardware mesh.

Study Unit 1

SU 1 was located within the eastern right-of-way, on the east edge of the existing N11. The grid coordinates for the southwest corner of SU 1 were N1079.00, E1026.00. This unit was placed in an area of high artifact density. SU 1 was also located in an area of minimal ground disturbance, between the area disturbed by road construction and the area disturbed by wind erosion.

SU 1 was excavated in 11 levels to a depth of 1.10 m below the surface. Three strata were present in SU 1 (Figure 23.3). Stratum I ranged from 3 to 22 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was about 10 cm thick and consisted of dark yellowish brown (10YR4/4) fine sand. Stratum III was 80 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand with very few roots.

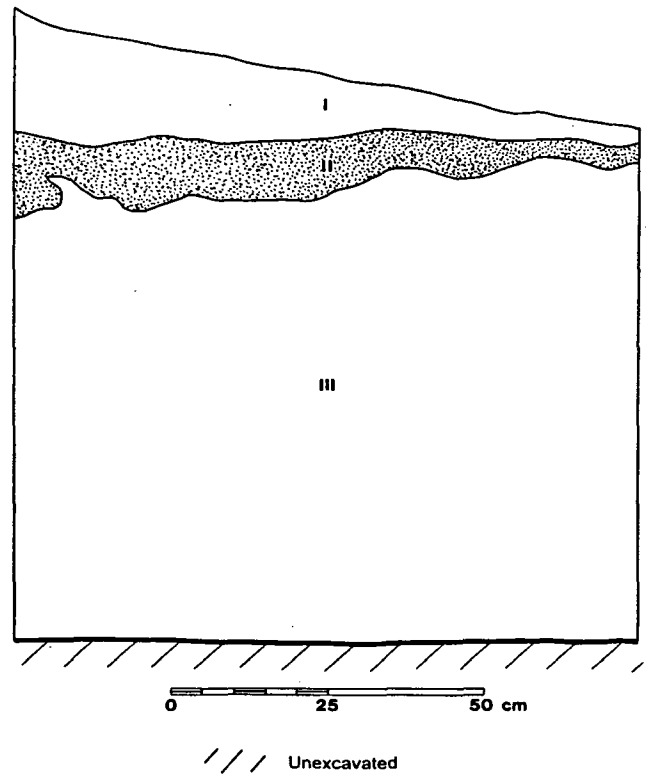


Figure 23.3. Site NM-Q-23-64, Study Unit 1, South Wall Profile.

Artifacts were recovered from Levels 1 through 5 and 7 through 11. Cultural materials recovered from Level 1 included very few ceramics and flaked stone. Artifacts from Level 2 consisted of ceramics and flaked stone. At Level 3 only ceramics were recovered. Artifacts dropped to only two ceramics at Level 4. Ceramic artifacts were recovered from Level 5, which also revealed rodent disturbance. Only one artifact, a ceramic sherd, was recovered from Level 7. Level 8 artifacts consisted of two ceramics. At Level 9 a few ceramics were found. Rodent disturbance was present at this level. At Level 10 only ceramics and a faunal specimen were recovered. At Level 11, only a faunal specimen was recovered from a rodent krotovina.

Study Unit 2

SU 2 was located within the eastern right-of-way, on the east edge of the existing N11 cut bank. The grid coordinates of the southwest corner of SU 2 were N1051, E1009. This unit was placed in an area of high artifact density and profound aeolian deposits.

SU 2 was excavated 10 levels to a depth of 1 m. Two strata were present in SU 2 (Figure 23.4). Stratum I was 41 cm thick and consisted of light yellowish brown (10YR6/4) very fine sand. The presence of modern trash 40 cm below surface indicates very recent deposition. Stratum II was 59 cm thick and consisted of dark yellowish brown (10YR4/4) fine sand with inclusions of charcoal flecks, fire-cracked rock, daub, and very few roots. Rodent disturbance was present near the bottom of Stratum II.

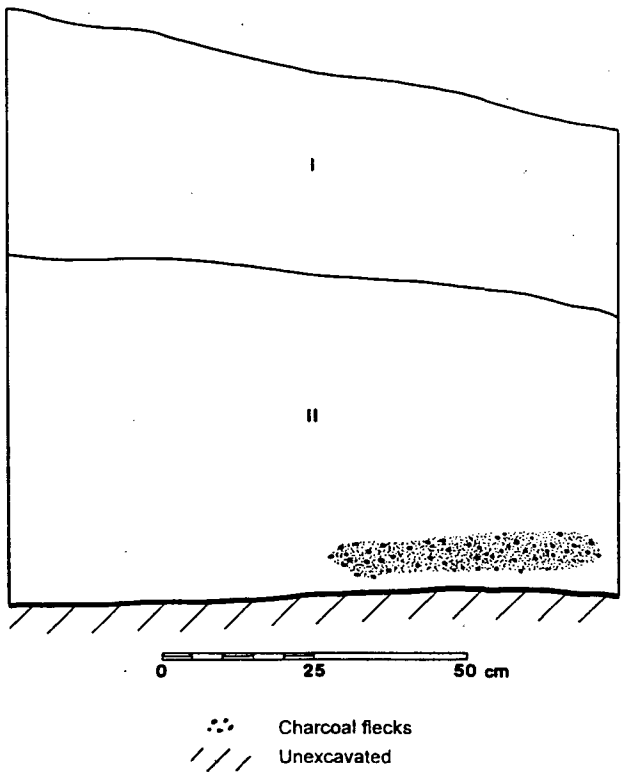


Figure 23.4. Site NM-Q-23-64, Study Unit 2, West Wall Profile.

Artifacts were recovered from Level 2, and Levels 4 through 10. Artifacts recovered from Level 2 consisted of very few ceramics. Level 4 artifacts consisted of a few ceramics and flaked stone. Artifact recovery increased at Level 5 and included ceramics and flaked stone. At Level 6 artifacts consisted of ceramics, flaked stone, and faunal specimens. Level 7 artifacts only consisted of ceramics. Artifacts recovered from Level 8 consisted of ceramics, flaked stone, and faunal specimens. Level 9 artifacts included ceramics, flaked stone, and faunal specimens. Artifacts recovered from Level 10 included ceramics, flaked stone, ground stone, and faunal remains.

Excavation of SU 2 was terminated due to the discovery of a burial 1 m west of the test unit in the road cut bank. Feature 6 a pitstructure outline was defined by shovel scrapping of the roadcut bank.

Study Unit 3

SU 3 was located near the east cut bank of N11 and within the eastern edge of the right-of-way. The southwest grid coordinates for SU 3 were N1050, E1012. This unit was placed in this area to continue investigations of the cultural deposits after SU 2 was terminated by discovery of a nearby burial.

SU 3 was excavated 16 levels to a depth of 2.24 m. Level 16 was a 50-by-50 cm exploratory "window" (the southwest 1/4 of the unit) to define a floor feature and was excavated 74 cm. Seven strata were present in SU 3 (Figure 23.5). Stratum I was 38 cm thick and consisted of light yellowish brown (10YR6/4) windblown fine sand. Stratum II was 18 cm thick and consisted of yellowish brown (10YR5/4) fine sand. Stratum III was 37 cm thick and consisted of yellowish brown (10YR5/4) sand. Stratum IV was 50 cm thick and consisted of yellowish brown (10YR5/8) fine sand. Stratum V was 46 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum VI was 13 cm thick and consisted of yellowish brown (10YR5/4) clay loam. Stratum VII was 5 cm thick and consisted of yellowish brown (10YR5/8) silty clay loam.

Artifacts were recovered from Levels 2 through 16 of SU 3. Artifacts consisted of ceramics only from Level 2. Artifacts recovered from Level 3 consisted of ceramic and flaked stone. Level 4 artifacts consisted of ceramics, flaked stone, and ground stone. Only ceramic artifacts were recovered from Level 5. Artifacts recovered from Level 6 included ceramics and flaked stone. Level 7 artifacts consisted of ceramics and faunal specimens. Artifacts recovered from Level 8 consisted of ceramics and flaked stone. Ceramics, flaked stone, and faunal specimens were recovered from Level 9. Artifacts from Levels 10, 11, 12, and 13 consisted of ceramics and faunal specimens. Level 14 artifacts consisted of ceramics, flaked stone, and faunal specimens. Artifacts recovered from Level 15 included ceramics, faunal specimens, and a vegetal specimen (corn cob fragment). Artifacts from Level 16 consisted of ceramics, flaked stone, unmodified stone, and faunal specimens.

Excavation of SU 3 was terminated after a floor of a pitstructure was defined. The outline of the pitstructure (Feature 6) was also defined in the road cut bank.

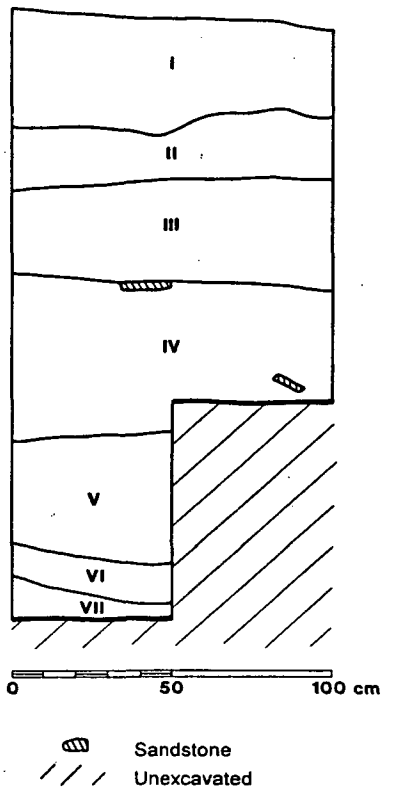


Figure 23.5. Site NM-Q-23-64, Study Unit 3, West Wall Profile.

Study Unit 4

SU 4 was located within the eastern right-of-way, near the east edge of the existing N11 cut bank. The grid coordinates of the southwest corner of SU 4 were N1074, E1022. This unit was placed in an area of moderate artifact density and least amount of disturbance by road maintenance.

SU 4 was excavated in eight levels to a depth of 80 cm below surface. Three strata were present in SU 4 (Figure 23.6). Stratum I ranged from 2 to 14 cm in thickness and consisted of light yellowish brown (10YR6/4) windblown very fine sand. Stratum II was 57 cm thick and consisted of dark yellowish brown (10YR4/4) very fine sand. Stratum III was 10 cm thick and consisted of yellowish brown (10YR5/6) silt.

Artifacts were recovered from Levels 1 through 6. Artifacts recovered from Level 1 consisted of only ceramics. The highest density of artifacts were recovered from Level 2 and consisted of ceramic and flaked stone. Levels 3, 4, 5, and 6 artifacts consisted of only ceramics.

Excavation of SU 4 was terminated when no artifacts or features were defined in Levels 7 and 8.

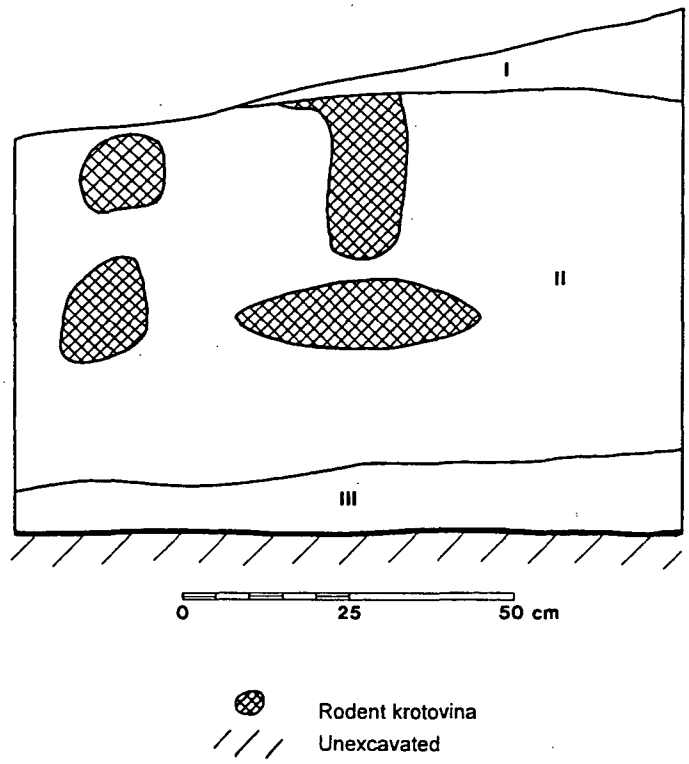


Figure 23.6. Site NM-Q-23-64, Study Unit 4, East Wall Profile.

Study Unit 5

SU 5 was located within the eastern right-of-way, near the east edge of the existing N11 road cut bank. The grid coordinates of the southwest corner of SU 5 were N1020, E995. This unit was placed in an area of high artifact density and in profound aeolian deposits.

SU 5 was excavated in 13 levels to a depth of 1.3 m below the surface. In Level 13, only the southeast 1/4 of the unit was excavated. Six strata were present in SU 5 (Figure 23.7). Stratum I ranged from 15 to 28 cm thick and consisted of yellowish brown (10YR6/4) fine sand. Stratum II was 7 cm thick and consisted of brown (10YR4/3) fine sand. Stratum III was 41 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum IV was 30 cm thick and consisted of dark yellowish brown (10YR4/6) coarse sand. Stratum V was 2 cm thick and consisted of yellowish brown (10YR5/6) coarse sand. This stratum was identified as a floor of a pitstructure (Feature 12). Stratum VI was 31 cm thick and consisted of yellowish brown (10YR5/4) coarse sand.

Artifacts were recovered from Levels 1 through 12 of SU 5. Artifacts recovered from Level 1 consisted of a few ceramics and flaked stone. Level 2 artifacts consisted of only a couple of ceramics. Artifacts recovered from Level 3 consisted of only ceramics. Artifact recovery increased

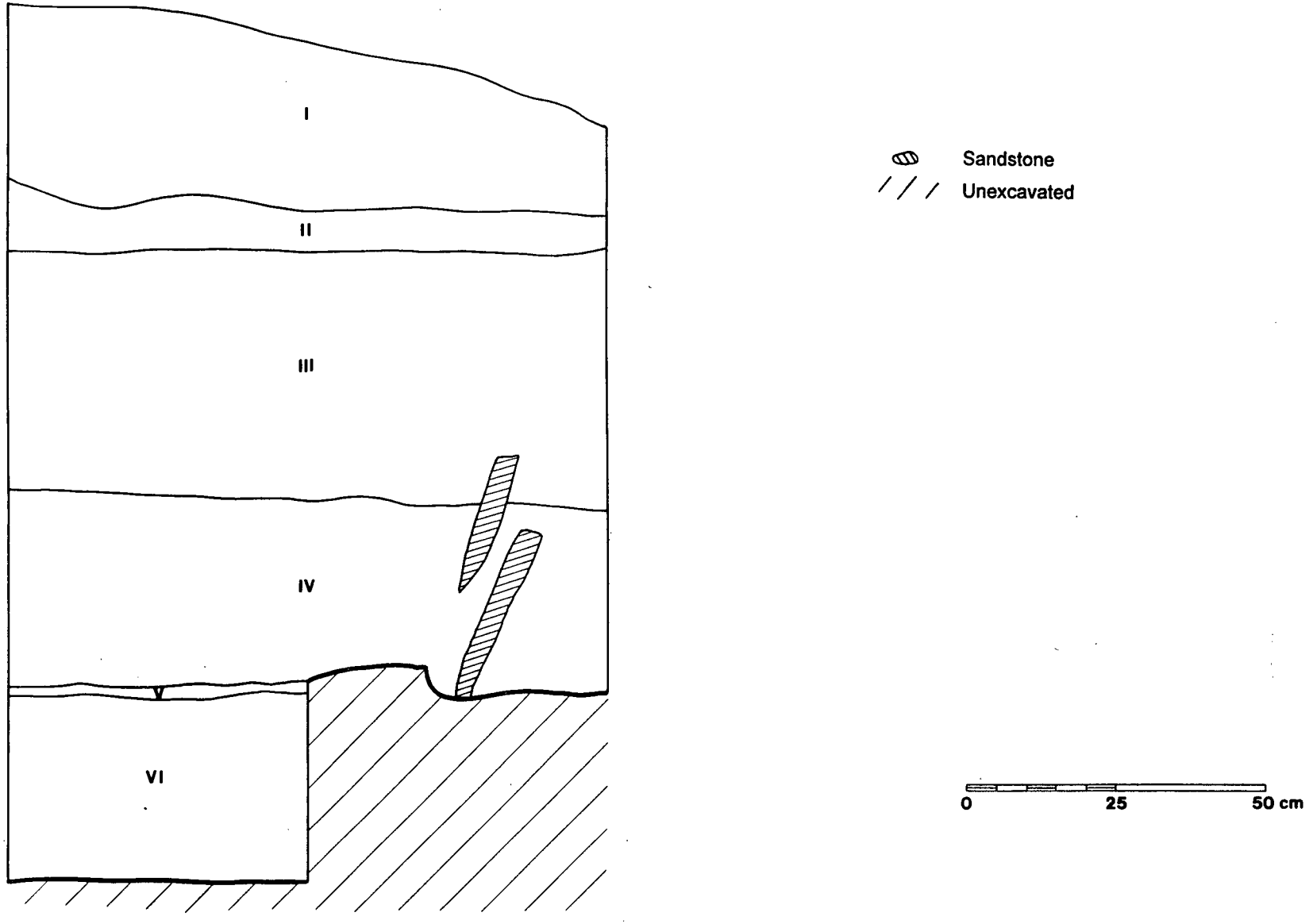


Figure 23.7. Site NM-Q-23-64, Study Unit 5, South Wall Profile.

slightly at Level 4 where ceramics and a carved stone fetish were found. Artifact densities were high at Level 5; ceramic, ground stone, and unmodified stone were recovered. Artifact densities decreased at Level 6 where only a few ceramics and flaked stone were found. At Level 7 artifact densities were lowest; only a faunal specimen was recovered. Level 8 artifacts consisted only of a few ceramics. Level 9 artifacts included ceramics, flaked stone, and a worked shell. Artifacts recovered from Level 10 consisted of a few ceramics only. At Level 11 artifact numbers increased slightly, and recovered items consisted of ceramics and ground stone. Only a few ceramics were recovered from Level 12.

No artifacts were recovered from Level 13, below the floor of the pitstructure, and excavation of SU 5 was terminated.

Study Unit 6

SU 6 was located along the eastern right-of-way, near the east edge of the existing N11 road cut bank. The grid coordinates for the southwest corner of SU 6 were N1011, E990. This unit was placed in an area of light artifact density and in profound aeolian deposits.

SU 6 was excavated in six levels to a depth of 60 cm below the surface. Two strata were present in SU 6 (Figure 23.8). Stratum I ranged from 10 to 27 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Modern trash was recovered in this stratum indicating recent deposition. Stratum II was 33 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand.

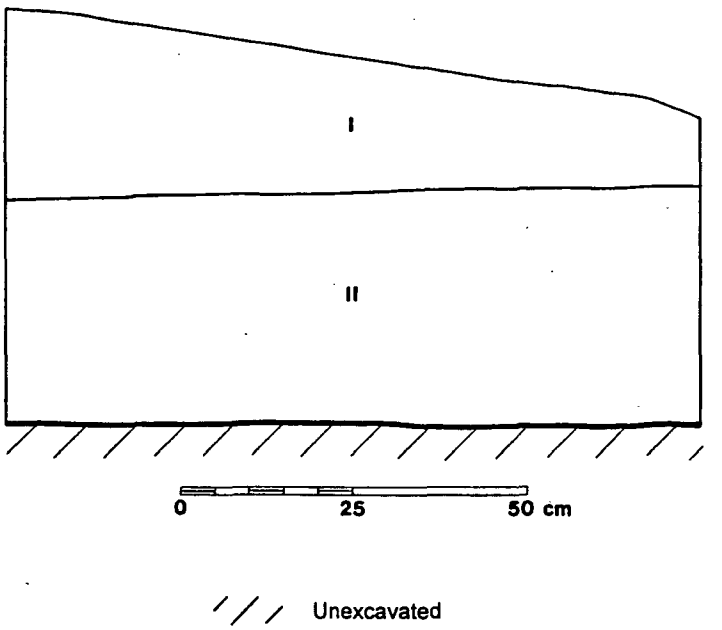


Figure 23.8. Site NM-Q-23-64, Study Unit 6, South Wall Profile.

Artifacts were recovered from Levels 3 and 4. Artifacts recovered from Level 3 consisted of only ceramics. Level 4 artifacts consisted of ceramics, flaked stone, and ground stone.

No artifacts or features were defined in Levels 5 and 6, therefore excavation of SU 6 was terminated.

Study Unit 7

SU 7 was located along the western right-of-way, west of the existing N11 road. The grid coordinates of the southwest corner of SU 7 were N1070, E988. This unit was placed in an area of light artifact density as well as least amount of disturbance by road maintenance.

SU 7 was excavated in four levels to a depth of 40 cm below the surface. Three strata were present within SU 7 (Figure 23.9). Stratum I was 8 cm thick and consists of light yellowish brown (10YR6/4) fine sand. Stratum II was 20 cm thick and consisted of yellowish brown (10YR5/4) sand. Stratum III was 12 cm thick and consisted of dark yellowish brown (10YR4/6) sand.

No artifacts or features were defined within SU 7 and excavation was terminated.

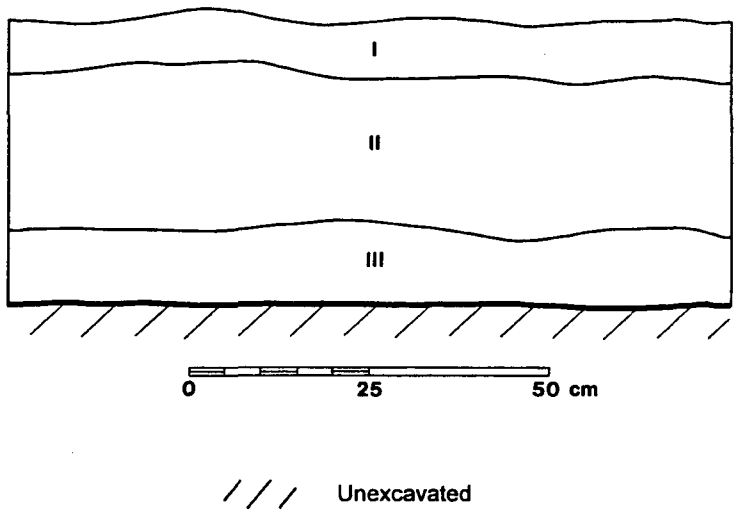


Figure 23.9. Site NM-Q-23-64, Study Unit 7, West Wall Profile.

Study Unit 8

SU 8 was located within the western right-of-way, on the west edge of the existing N11 road cut bank. The grid coordinates of the southwest corner of SU 8 were N1031, E971. This unit was placed in an area of light artifact density and severe ground disturbance by road maintenance.

SU 8 was excavated in six levels to a depth of 60 cm below the surface. Four strata were present within SU 8 (Figure 23.10). Stratum I ranged from 3 to 9 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 9 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Stratum III was 28 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Calcium carbonate and a very few roots were also present. Stratum IV was 14 cm thick and consisted of brownish yellow (10YR6/6) gravel with calcium carbonation.

No artifacts or features were defined and excavation of SU 8 was terminated.

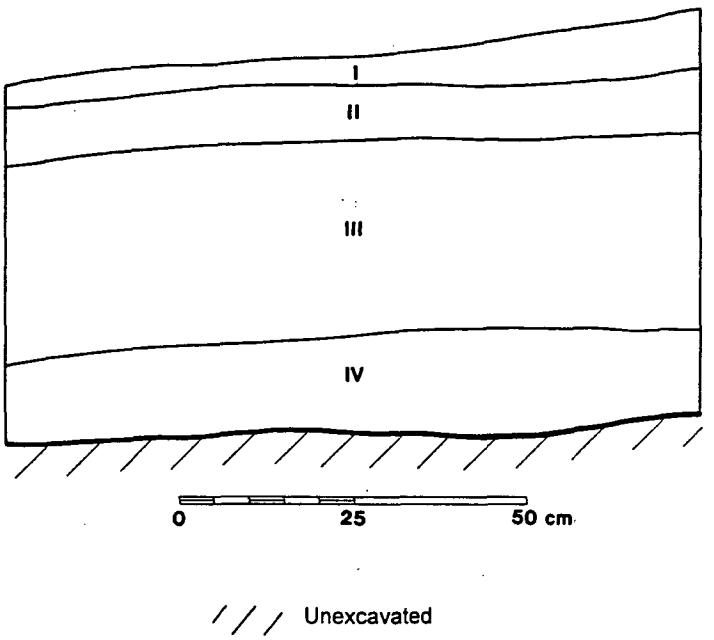


Figure 23.10. Site NM-Q-23-64, Study Unit 8, West Wall Profile.

Study Unit 9

SU 9 was located within the western edge of the right-of-way, west of the existing N11 road. The grid coordinates of the southwest corner of SU 9 were N1092, E1001. This unit was placed in an area of light artifact density and aeolian deposition.

SU 9 was excavated in 11 levels to a depth of 1.1 m below the surface. Four strata were present in SU 9 (Figure 23.11). Stratum I was 29 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 8 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum III was 20 cm thick and consisted of yellowish brown (10YR5/4) loamy coarse sand. Stratum IV was 53 cm thick and consisted of yellowish brown (10YR5/6) clay.

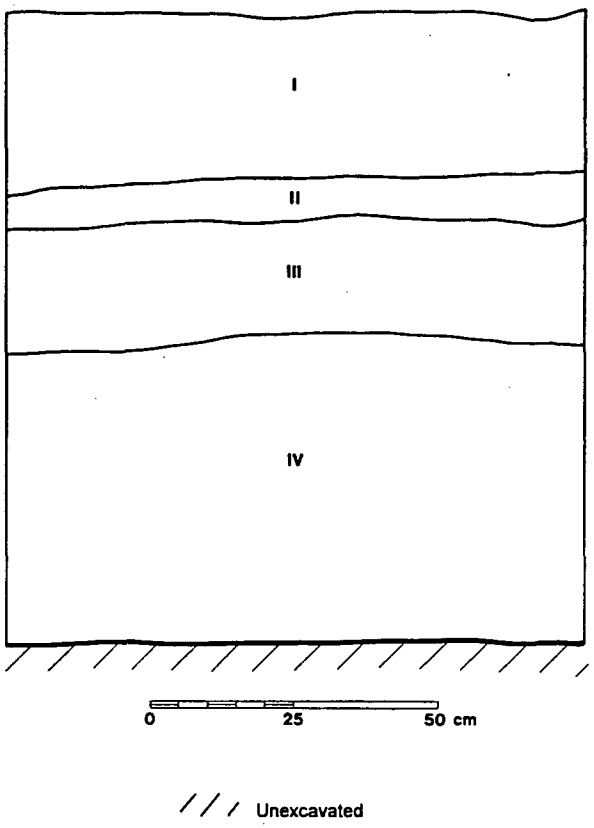


Figure 23.11. Site NM-Q-23-64, Study Unit 9, North Wall Profile.

Artifacts were recovered from Levels 3 through 10. Only ceramics were recovered from Levels 3, 4, 5, and 6. In Levels 7, 8, 9, and 10, only one ceramic sherd was found in each level.

No artifacts were found or features defined in Level 11 and excavation of SU 9 was terminated.

Study Unit 10

SU 10 was located between the western edge of the right-of-way and the west edge of the existing N11 road. The grid coordinates of the southwest corner of SU 10 were N1099, E1002. This unit was placed in area of very light artifact density and profound aeolian deposition.

SU 10 was excavated in eight levels to a depth of 80 cm below the surface. Four strata were present in SU 10 (Figure 23.12). Stratum I was 28 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 10 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum III was 22 cm thick and consisted of dark yellowish brown (10YR4/4) sand. Stratum IV was 20 cm thick and consisted of yellowish brown (10YR5/4) sand.

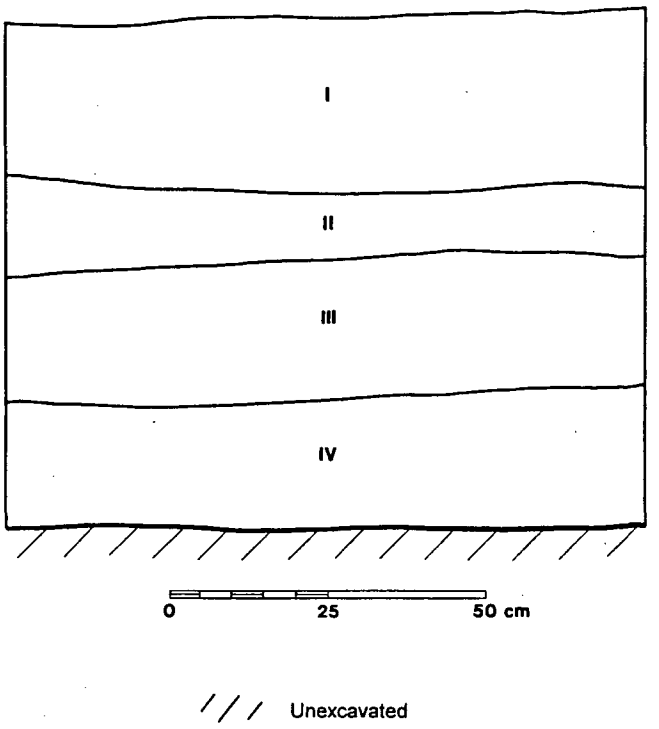


Figure 23.12. Site NM-Q-23-64, Study Unit 10, North Wall Profile.

Artifacts were recovered from Levels 4 and 5. Level 4 artifacts consisted of ceramics. Only one sherd was recovered from Level 5.

No artifacts were found or features defined in Levels 6 through 8 and excavation of SU 10 was terminated.

Backhoe Excavation

On-site Trenches

Mechanical excavation of 16 trenches was conducted in order to investigate the possibility of buried cultural deposits on site NM-Q-23-64. These trenches were designated SU 11 through 26 (Figure 23.1). Trenches were typically 70 cm wide, with an average depth of 1.76 m. A total of 211 m of backhoe trenching was completed on the site, and 34.5 m of trenches were dug off-site within the right-of-way. The artifact distribution map generated during the controlled surface collections was used as a guide for placement of the backhoe trenches.

Study Unit 11. SU 11 was located in the northeast portion of the site, east of the existing N11 road. SU 11 extended from grid coordinates N1150.89, E1072.36, northwestward 10.5 m to N1155.50, E1062.85. This 1.71-m-deep trench was placed in an area of very light artifact density and in an area of the site with profound aeolian deposition.

One 1-m-long profile was drawn of SU 11 (Figure 23.13). This profile section was located 5 m from the west end of the south trench wall and was representative of the entire trench profile. Six strata were present within SU 11. Stratum I was 81 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 7 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum III was 23 cm thick and consisted of yellowish brown (10YR5/6) sand with inclusions of very few roots. Stratum IIa was 10 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum IV was 22 cm thick and consisted of dark yellowish brown (10YR3/4) sand. Stratum V was 28 cm thick and consisted of yellowish brown (10YR5/8) gravelly sand.

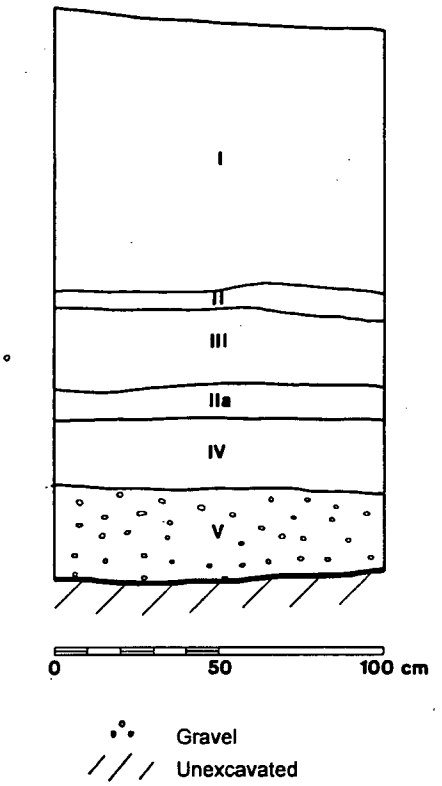


Figure 23.13. Site NM-Q-23-64, Study Unit 11, South Wall Profile.

The profile of SU 11 illustrates the natural stratigraphy and three cultural strata (Stratum II, IIa, and IV) present in this area of the site. No cultural materials were recovered or features defined within SU 11.

Study Unit 12. SU 12 was located in the northeast portion of the site, east of the existing N11 road. SU 12 extended from grid coordinates N1115.32, E1050.52, northeastward 20 m to N1138.19, E1059.86. This 1.52-m-deep trench was placed in an area of very light artifact density and in an area that had undergone little ground disturbance.

Two 1-m-long profiles were drawn of SU 12. Only one, located along the east trench wall and 4 m from the south end of the trench, is illustrated (Figure 23.14). Five strata were present within SU 12. Stratum I was 75 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 9 cm thick and consisted of dark yellowish brown (10YR3/4) sand. Stratum IIa was 7 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum III was 34 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum IV was 18 cm thick and consisted of yellowish brown (10YR5/8) sandstone bedrock.

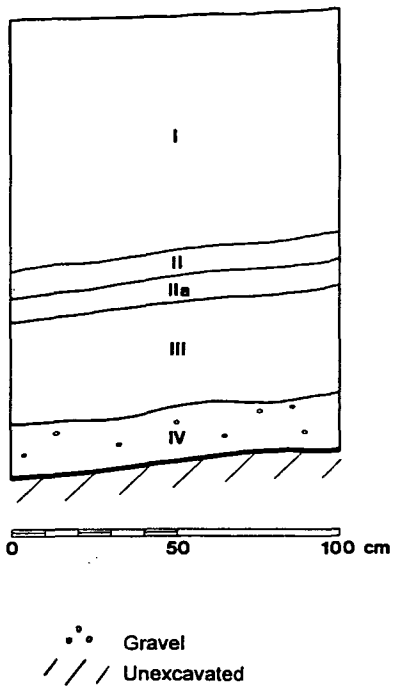


Figure 23.14. Site NM-Q-23-64, Study Unit 12, East Wall Profile.

The profile of SU 12 illustrates the natural stratigraphy and cultural stratigraphy that are present in this part of the site. No cultural materials were recovered or features defined within SU 12.

Study Unit 13. SU 13 was located in the northeast part of the site, east of the existing N11 road. SU 13 extended from grid coordinates N1116.9, E1051.54, southeastward 3 m to N1115.27, E1055.29. This 1.48-m-deep trench was placed in an area of very light artifact densities and in an area of profound aeolian deposits.

One 1-m-long profile was drawn of SU 13 (Figure 23.15). This profile was located 2 m from the west end of the south trench wall and was representative of the entire trench. Five strata were present within SU 13. Stratum I was 76 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 6 cm thick and consisted of dark yellowish brown (10YR3/4) sand.

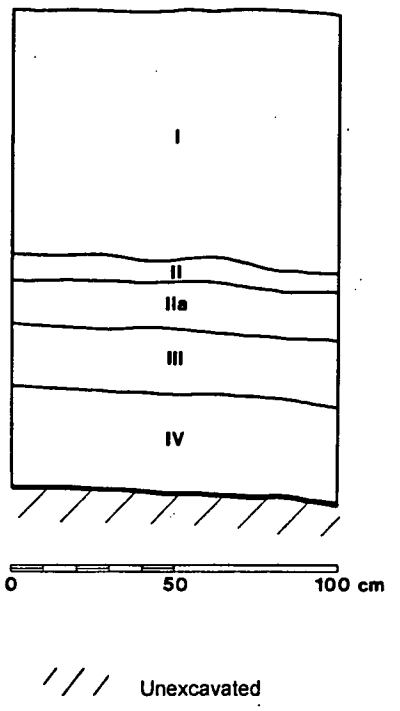


Figure 23.15. Site NM-Q-23-64, Study Unit 13, South Wall Profile.

The profile of SU 13 illustrates the natural stratigraphy and cultural stratigraphy that are present in this portion of the site. No cultural materials were recovered or features defined within SU 13.

Study Unit 14. SU 14 was located in the northeast part of the site, east of the existing N11 road. SU 14 extended from grid coordinates N1088.55, E1035.94, northeastward 21 m to N1107.49, E1044.46. This 1.85-m-deep trench was placed in an area of light artifact density and very little ground disturbance.

Two 1-m-long profiles were drawn of SU 14. Only one profile, located along the east trench wall and 4 m from the north end of the trench, is illustrated (Figure 23.16). Five strata were present within SU 14. Stratum I was 70 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 6 cm thick and consisted of brown (10YR4/3) sand. Stratum IIa was 16 cm thick and consisted of dark yellowish brown (10YR3/6) fine sand. Stratum III was 22 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum IV was 50 cm thick and consisted of yellowish brown (10YR5/8) gravelly sand.

The profile of SU 14 illustrates the natural stratigraphy and the cultural stratigraphy that are present in this portion of the site. No cultural materials were recovered or features defined within SU 14.

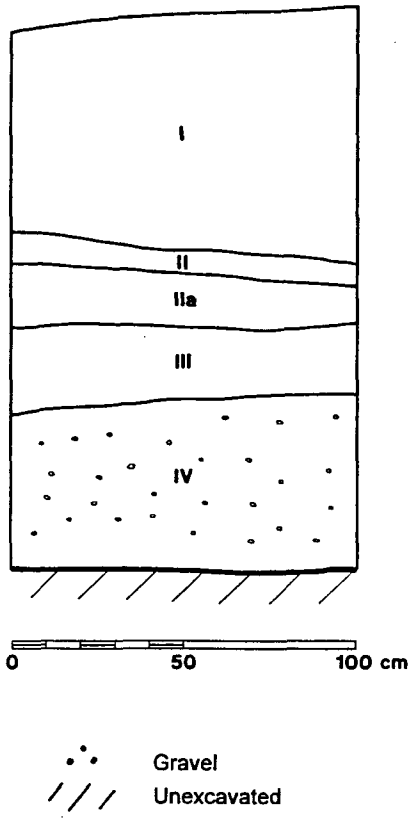


Figure 23.16. Site NM-Q-23-64, Study Unit 14, East Wall Profile.

Study Unit 15. SU 15 was located near the middle of the site, east of the existing N11 road. SU 15 extended from grid coordinates N1085.09, E1025.54, southeastward 12 m to N1081.07, E1036.47. This 2.02-m-deep trench was placed in an area of light artifact density and profound aeolian deposits.

Two 1-m-long profiles were drawn of SU 15 (Figure 23.17). These profiles were located 4.5 m from the east end and 3.5 m from the west end of the south trench wall. Six strata were present within SU 15. Stratum I ranged from 28 to 42 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II ranged from 10 to 37 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum IIa ranged from 10 to 44 cm thick and consisted of dark yellowish brown (10YR4/4) sand. Stratum III was 12 cm thick and was only present in Profile 2. It consisted of yellowish brown (10YR5/4) sand. Stratum IV ranged from 28 to 78 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum V ranged from 28 to 58 cm thick and consisted of yellowish brown (10YR5/8) gravelly sand. Stratum VI was 24 cm thick and was only present in Profile 1. It consisted of light gray (10YR7/2) very coarse sand.

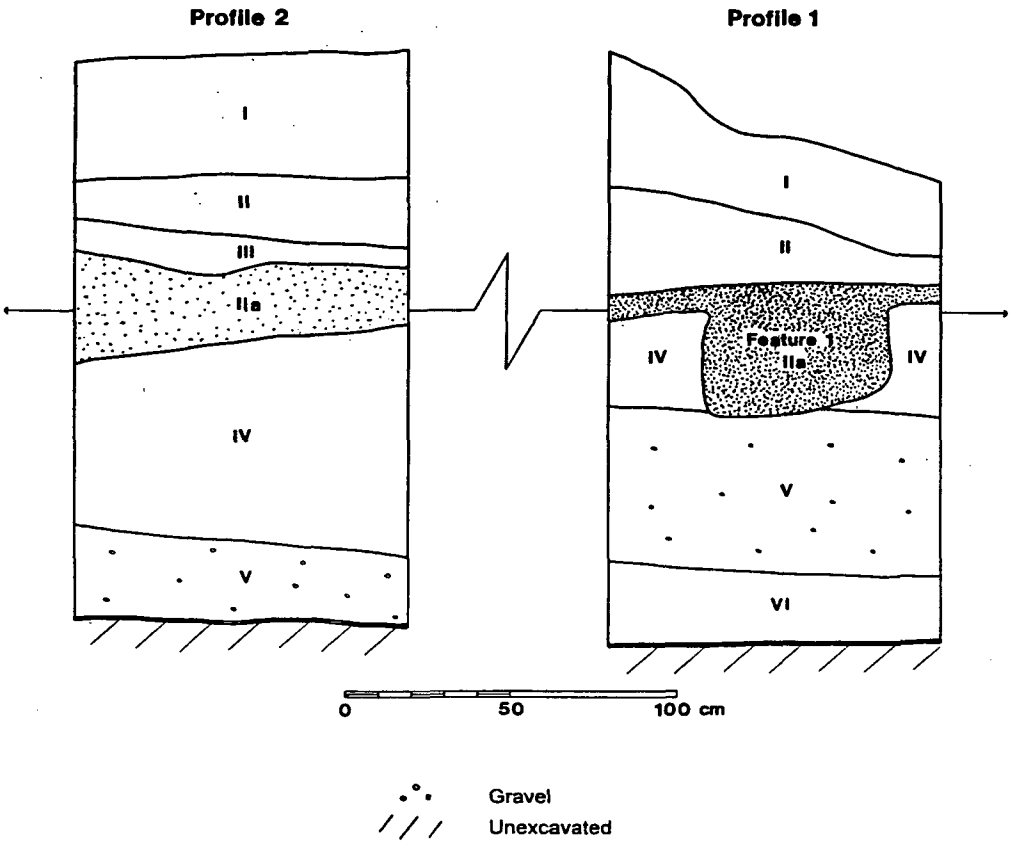


Figure 23.17. Site NM-Q-23-64, Study Unit 15, South Wall Profile Showing Feature 1.

The profiles of SU 15 illustrate natural stratigraphy and cultural stratigraphy that are present in this portion of the site. One feature (Feature 1) was defined in the south trench wall and near the west end of the trench. This feature was a small pit measuring 55 cm wide and 36 cm in depth. Its function is unknown.

Study Unit 16. SU 16 was located near the middle of the site, east of the existing N11 road. SU 16 extended from grid coordinates N1070.41, E1027.18, northeastward 12.5 m to N1082.86, E1032.46. This 1.97-m-deep trench was placed in an area of light artifact density and little ground disturbance.

Two 3-m-long profiles were drawn of SU 16 (Figure 23.18 and 23.19). This profiles were located 7 m from the south end of the east and west trench walls, respectively. Six strata were present within SU 16. Stratum I ranged from 40 to 54 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was only present in profile 2 of the east trench wall. It was 18 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Stratum III was 16 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum IIIa ranged from 20 to 32 cm thick and consisted of dark yellowish brown (10YR3/4) sand. Stratum IV ranged from 86 to 103 cm thick

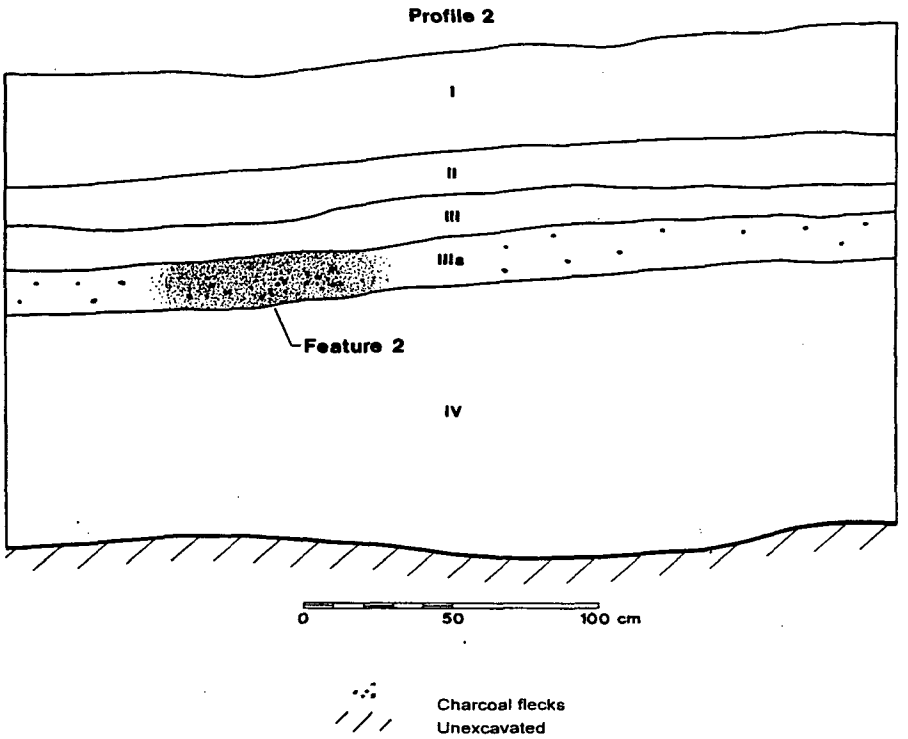


Figure 23.18. Site NM-Q-23-64, Study Unit 16, East Wall Profile Showing Feature 2.

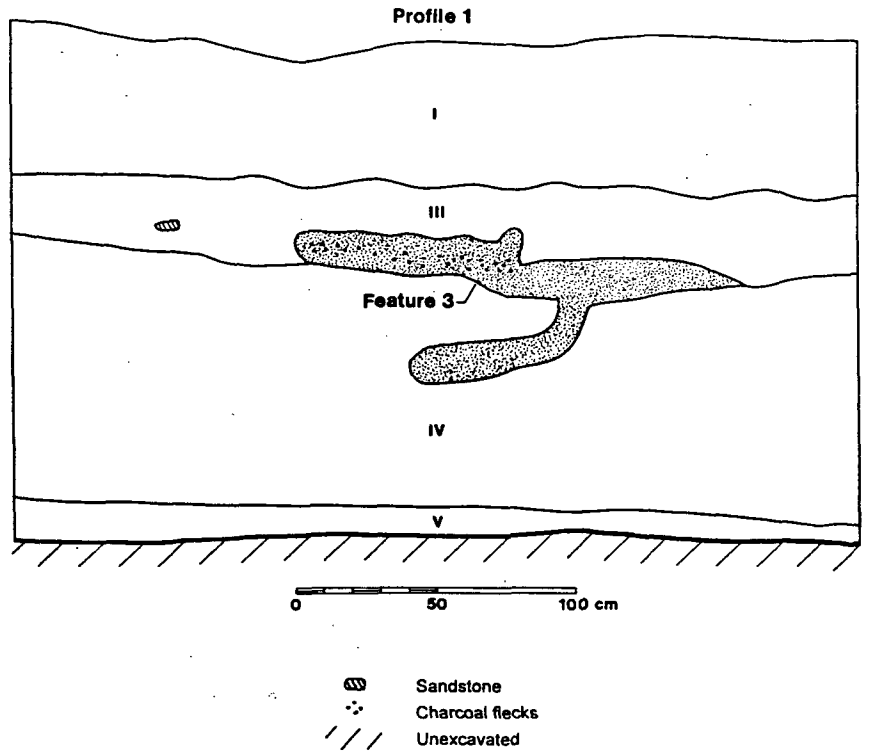


Figure 23.19. Site NM-Q-23-64, Study Unit 16, West Wall Profile Showing Feature 3.

and consisted of brownish yellow (10YR6/6) very coarse sand. Stratum V was 11 cm thick and consisted of yellowish brown (10YR5/8) coarse sand. This stratum was only present in Profile 1 on the west trench wall.

The profiles of SU 16 illustrate the natural stratigraphy and the cultural stratigraphy of this part of the site. Two features were defined within SU 16. Feature 3 was a very dark charcoal stain measuring 80 cm long and 15 cm thick. This feature is on the west trench wall. Feature 2 was on the east trench wall and was a very dark charcoal stain. It measured 71 cm long and 20 cm thick.

Study Unit 17. SU 17 was located at the middle of the site, east of the existing N11 road. SU 17 extended from grid coordinates N1063.64, E1027.72, northwestward 11 m to N1069.00, E1017.5. This 2.12-m-deep trench was placed in an area of light artifact density and profound aeolian deposition.

One 1-m-long profile was drawn of SU 17 (Figure 23.20). This profile was located 6 m from the west end of the north trench wall and was representative of the entire trench. Six strata were present within SU 17. Stratum I was 24 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 12 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum IIa was 11 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum III was 1.1 m thick and consisted of light yellowish brown (10YR6/4) sand. Stratum IV was 13 cm thick and consisted of yellowish brown (10YR5/8) gravelly sand. Stratum V was 42 cm thick and consisted of light gray (10YR7/2) coarse sand.

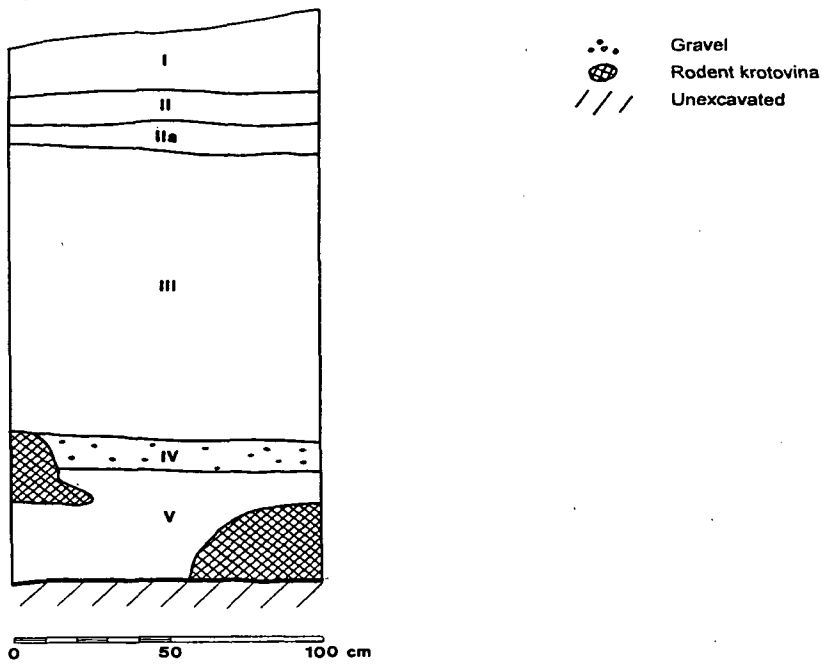


Figure 23.20. Site NM-Q-23-64, Study Unit 17, North Wall Profile.

The profile of SU 17 illustrates the natural stratigraphy and the cultural stratigraphy that is present in this part of the site. No cultural materials were recovered or features defined within SU 17.

Study Unit 18. SU 18 was located at the middle of the site, east of the existing N11 road. SU 18 extended from grid coordinates N1060.72, E1013.95, southeastward 12.5 m to N1055.69, E1023.54. This 1.78-m-deep trench was placed in an area of moderate artifact density and little ground disturbance.

Two profiles were drawn of SU 18. Only one 9-m-long profile of the south trench wall is illustrated (Figure 23.21) and was representative of the entire trench. Five strata were present within SU 18. Stratum I was 34 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Pockets of this stratum were present in the fill of Feature 4. Stratum II ranged from 12 to 14 cm thick and consisted of dark yellowish brown (10YR3/6) sand. Stratum III was 8 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum IV was 1.28 m thick and consisted of dark grayish brown (10YR4/2) coarse sand with inclusions of cultural materials. This stratum was a cultural deposition within Features 4 and 5. Stratum V ranged from 1.15 m to 1.36 m thick and consisted of brownish yellow sand. Both Features 4 and 5 were excavated into this stratum.

The profile of SU 18 illustrates the natural stratigraphy and the cultural features present in this part of the site. Two features were defined within SU 18. Feature 4 was located at the west end of the trench and was a pitstructure with a hard compact sand floor, a wing wall near the east side, and a bench in the west side of the structure. Feature 5 was at the east end of the trench and was a possible antechamber to the pitstructure.

Study Unit 19. SU 19 was located at the middle of the site, east of the existing N11 road. SU 19 extends from grid coordinates N1044.66, E1000.50, southeastward 14.5 m to N1039.73, E1016.49. This 1.86-m-deep trench was placed in an area of moderate artifact density and in an area that had undergone very little ground disturbance.

Two profiles, one 10-m-long profile of the north trench wall and one 6-m-long profile of the south trench wall were drawn of SU 19 (Figure 23.22 and 23.23, respectively). Five strata were present within SU 19. Stratum I ranged from 24 to 39 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 35 cm thick and consisted of dark yellowish brown (10YR3/6) coarse sand. This stratum was the upper fill of Feature 10. Stratum IIa ranged from 40 to 94 cm thick and consisted of dark yellowish brown (10YR4/6) coarse sand with and inclusions of cultural materials. This stratum was present in the lower fill of Feature 10 and was the entire fill of Feature 7 as well as most of the Feature 8 and 9 fill. Stratum III ranged from 84 cm to 1.5 m thick and consisted of brownish yellow (10YR6/6) coarse sand. Stratum IV was 50 cm thick and consisted of light yellowish brown (10YR6/4) sand. This stratum was only present in the west end of the north trench wall profile. Stratum V was 7 cm thick and consisted of yellowish brown (10YR5/4) coarse sand. This stratum was only present in the fill of Feature 8.

The profiles of SU 19 illustrate the natural stratigraphy and the cultural features buried in this part of the site. Four features were defined within SU 19. Feature 7 was a pitstructure located at the

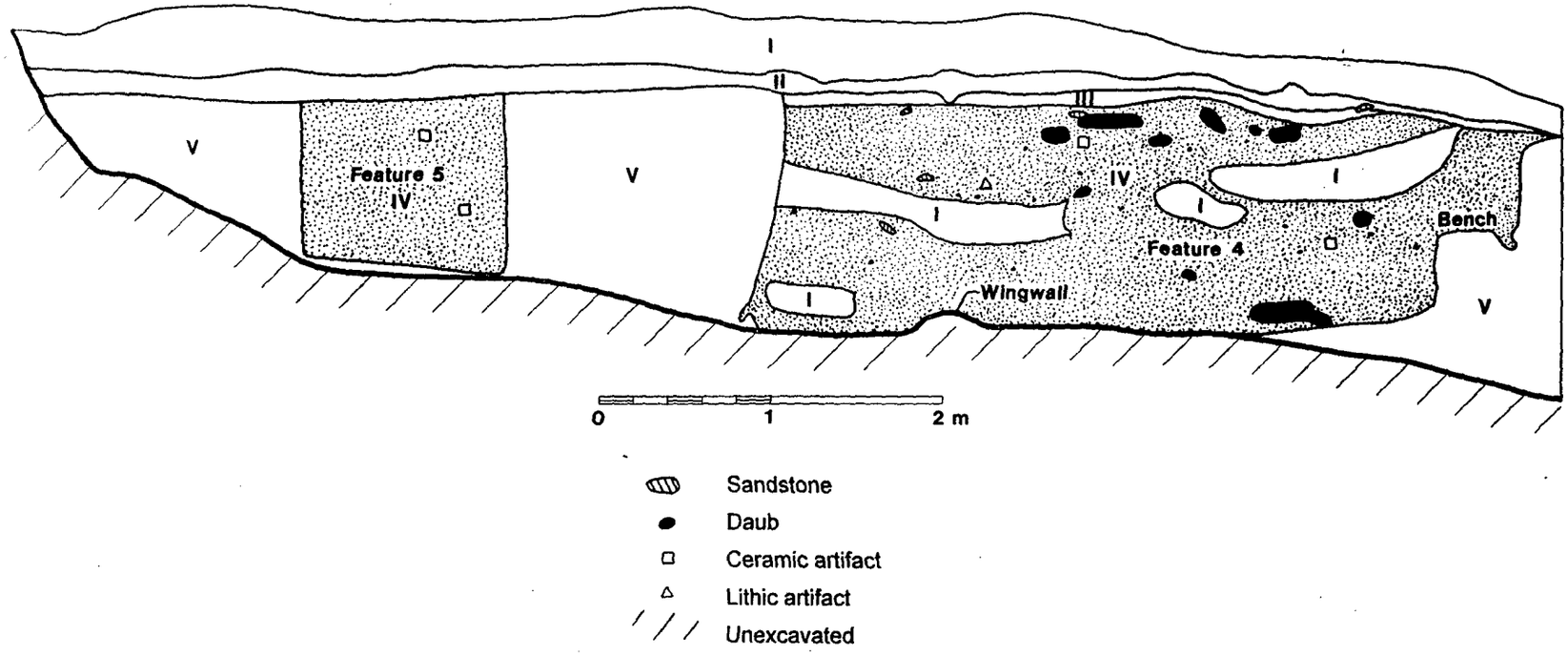


Figure 23.21. Site NM-Q-23-64, Study Unit 18, South Wall Profile Showing Features 4 and 5.

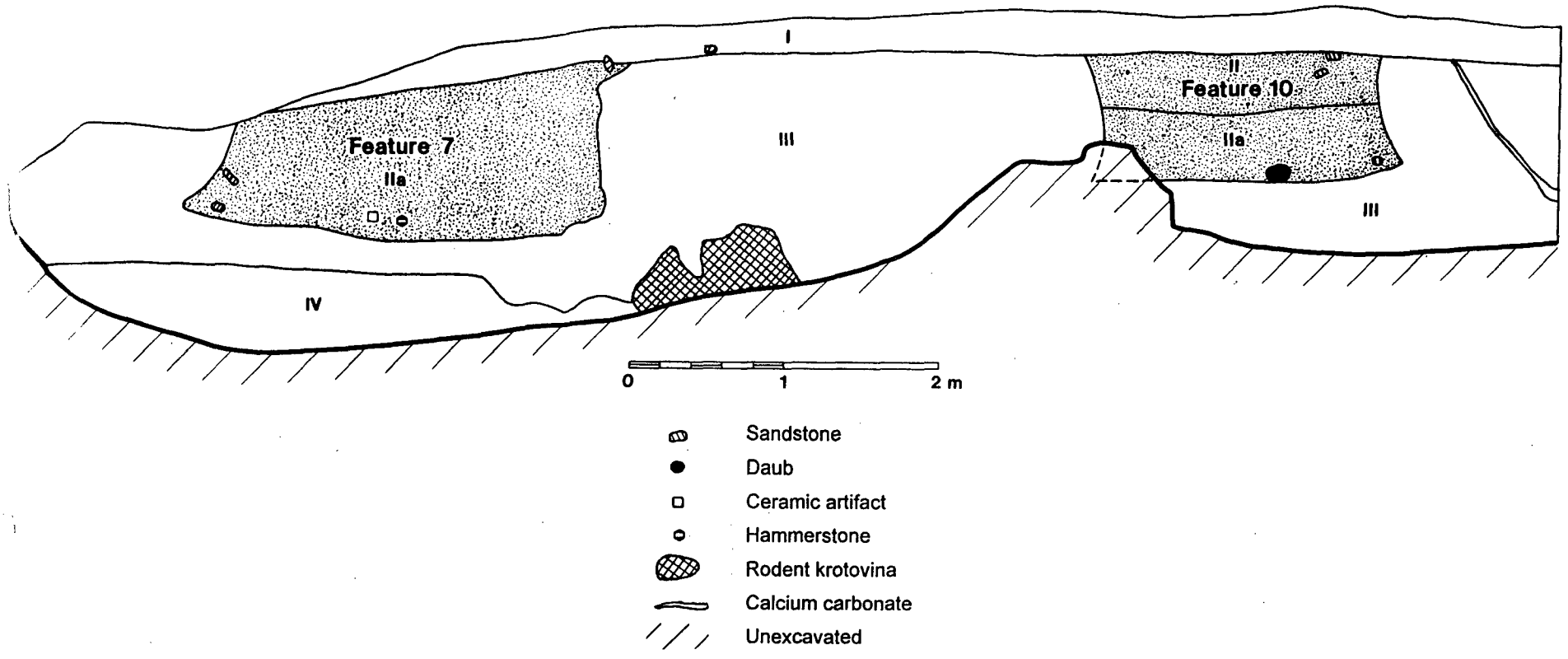


Figure 23.22. Site NM-Q-23-64, Study Unit 19, North Wall Profile Showing Features 7and 10.

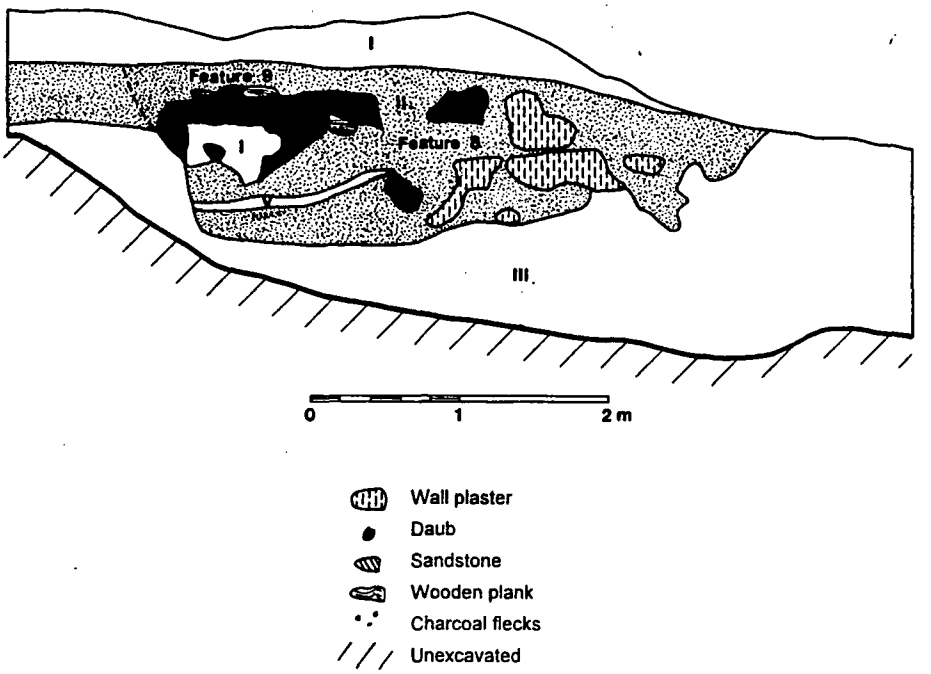


Figure 23.23. Site NM-Q-23-64, Study Unit 19, North Wall Profile Showing Features 8 and 9.

west end of SU 19. Feature 8 was a pitstructure also located at the west end of the trench. Feature 9 was a hearth located at the east end of Feature 8 and was approximately 32 cm below the surface. Feature 10 was a 1.9 m at top and about 2 m at the base and was a bell-shaped storage pit.

Study Unit 20. SU 20 was located near the middle of the site, east of the existing N11 road. SU 20 extended from grid coordinates N1028.98, E1001, southeastward 10.5 m to N1025.06, E1008.63. This 1.57-m-deep trench was placed in an area of light artifact density and little ground disturbance.

One 1-m-long profile was drawn of SU 20 (Figure 23.24). This profile was located 5 m from the westend of the north trench wall and was representative of the entire trench. Four strata were present within SU 20. Stratum I was 34 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 14 cm thick and consisted of dark yellowish brown (10YR4/4) sand. Stratum III was 22 cm thick and consisted of yellowish brown (10YR5/4) sand. Stratum IV was 87 cm thick and consisted of yellowish brown (10YR5/8) coarse sand.

The profile of SU 20 illustrates the natural and cultural stratigraphy present in this part of the site. No cultural materials were recovered or features defined within SU 20.

Study Unit 21. SU 21 was located near the middle of the site, east of the existing N11 road. SU 21 extended from grid coordinates N1002.38, E992.83, northeastward 23.5 m to N1023.82, E1002.92. This 2.10-m-deep trench was located in an area of very light artifact density and deep aeolian deposits.

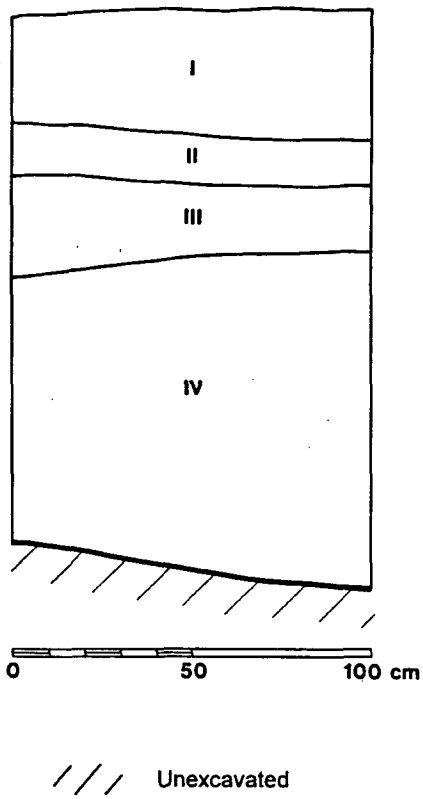


Figure 23.24. Site NM-Q-23-64, Study Unit 20, North Wall Profile.

Two 7-m-long profiles were drawn of SU 21. Only one profile located on the east trench wall is illustrated (Figure 23.25) and was representative of the entire trench. Five strata were present within SU 21. Stratum I was 45 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II ranged from 13 to 20 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum III was 24 cm thick and consisted of yellowish brown (10YR5/6) coarse sand with inclusions of charcoal flecks. Stratum IV was 1.06 m thick and consisted of light yellowish brown (10YR6/4) coarse sand with inclusions of charcoal flecks, ceramics, and sandstone building material. This stratum was the fill of Feature 11. Stratum V was 70 cm thick and consisted of brownish yellow (10YR6/6) very coarse sand.

The profile of SU 21 illustrates the natural stratigraphy and a cultural feature that is buried in this part of the site. Feature 11 was an earthen pitstructure buried 84 cm below the surface, with a floor, bench, posthole and a southern recess bench. The structure was approximately 6.2 m across.

Study Unit 22. SU 22 was located in the southeastern portion of the site, east of the existing N11 road. SU 22 extended from grid coordinates N984.86, E984, northeastward 9.5 m to N996.88, E989.45. This 1.8-m-deep trench was placed in an area of very light artifact density and least amount of ground disturbance.

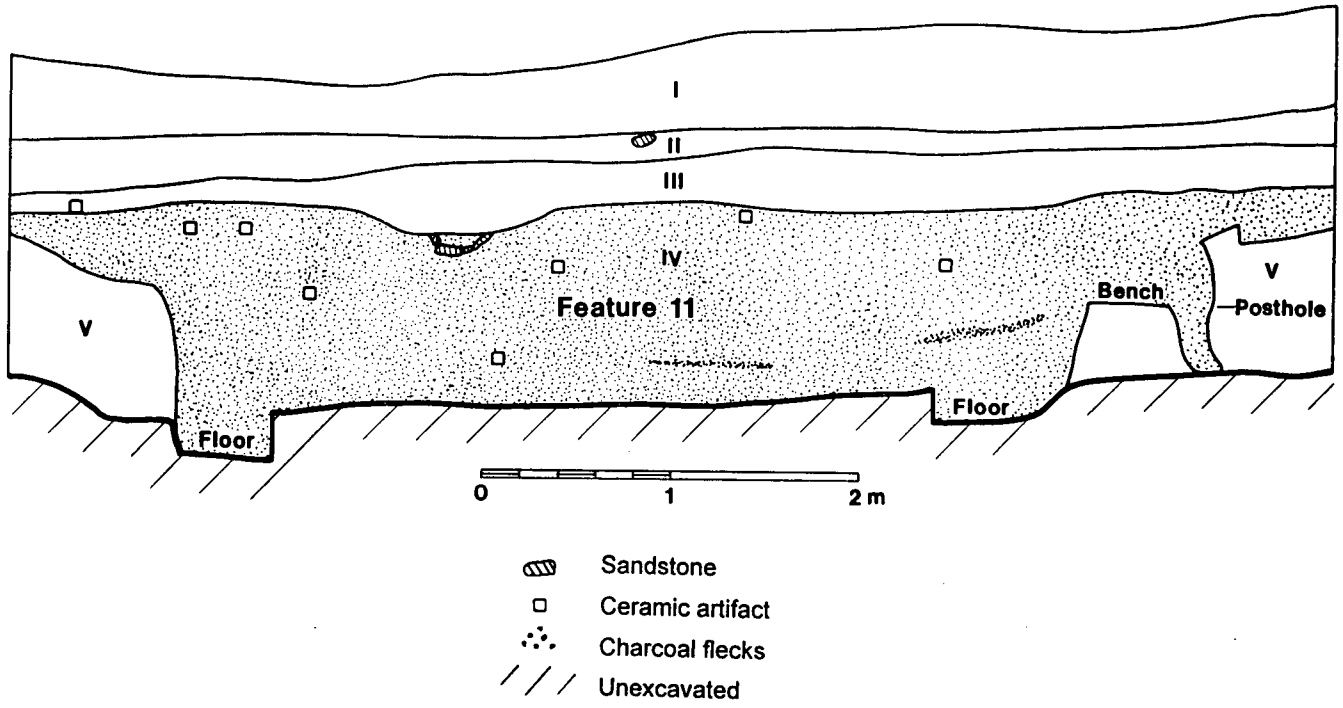


Figure 23.25. Site NM-Q-23-64, Study Unit 21, East Wall Profile Showing Feature 11.

One 1-m-long profile was drawn of SU 22 (Figure 23.26). This profile was located 5 m from the south end of the east trench wall and was representative of the entire trench. Four strata were present within SU 22. Stratum I was 28 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 18 cm thick and consisted of yellowish brown (10YR5/8) fine sand. Stratum III was 10 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum IV was 1.24 m thick and consisted of light yellowish brown (10YR6/4) coarse sand.

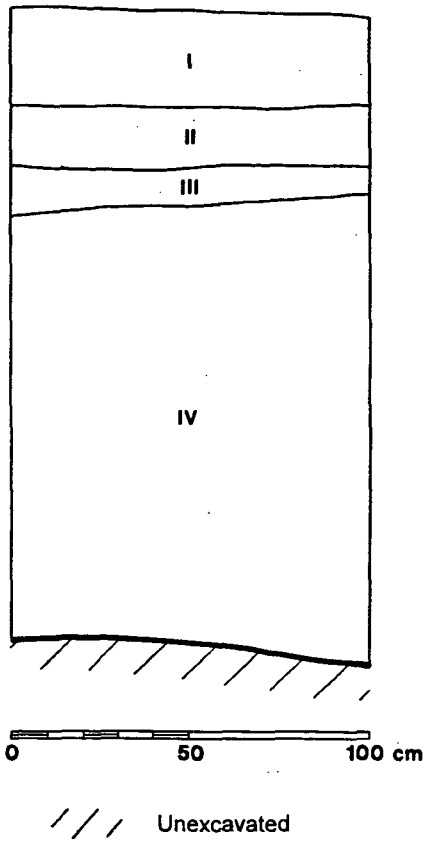


Figure 23.26. Site NM-Q-23-64, Study Unit 22, East Wall Profile.

The profile of SU 22 illustrates natural and cultural stratigraphy that is present in this portion of the site. No cultural materials were recovered or features defined within SU 22.

Study Unit 23. SU 23 was located at the southeastern portion of the site, east of the existing N11 road. SU 23 extends from grid coordinates N975.5, E970.00, southeastward 10 m to N971.91 E979.00. This 1.8-m-deep trench was placed in an area of very light artifact density and very little ground disturbance.

One 1-m-long profile was drawn of SU 23 (Figure 23.27). This profile was located 3 m from the west end of the north trench wall and was representative of the entire trench profile. Stratum I

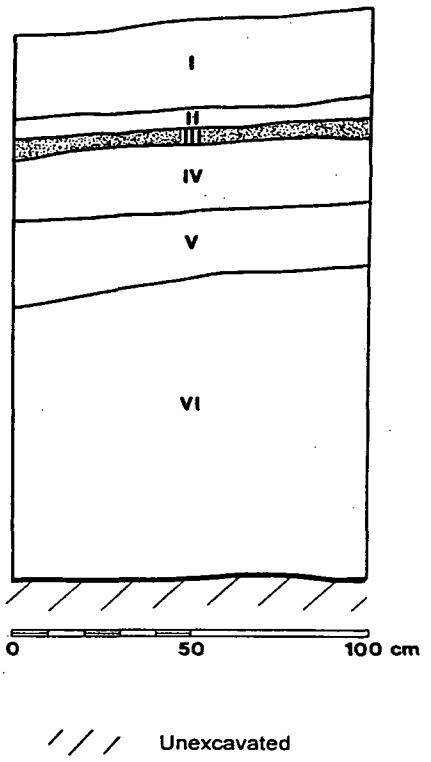


Figure 23.27. Site NM-Q-23-64, Study Unit 23, North Wall Profile.

was 28 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 6 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Stratum III was 6 cm thick and consisted of yellowish brown (10YR5/4) sand. Stratum IV was 22 cm thick and consisted of dark yellowish brown (10YR4/6) coarse sand. Stratum V was 22 cm thick and consisted of yellowish brown (10YR5/8) coarse sand. Stratum VI was 96 cm thick and consisted of brownish yellow (10YR6/6) very coarse sand with inclusions of micro roots.

The profile of SU 23 illustrates the natural and cultural stratigraphy in this part of the site. No cultural materials were recovered or features defined within SU 23.

Study Unit 24. SU 24 was located in the southeastern portion of the site, east of the existing N11 road. SU 24 extended from grid coordinates N963.53, E963.5, southeastward 9 m to N960.25, E972. This 1.58-m-deep trench was placed in an area of very light artifact density and least amount of ground disturbance.

One 1-m-long profile was drawn of SU 24 (Figure 23.28). This profile was located 4 m from the west end of the south trench wall and was representative of the entire trench profile. Five strata were present within SU 24. Stratum I was 25 cm thick and consisted of loose light yellowish brown (10YR6/4) fine sand. Stratum II is 16 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Stratum III is 8 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum IV is 21 cm thick and consisted of dark yellowish brown (10YR4/6) coarse sand.. Stratum V is 88 cm thick and consisted of brownish yellow (10YR6/6) very coarse sand.

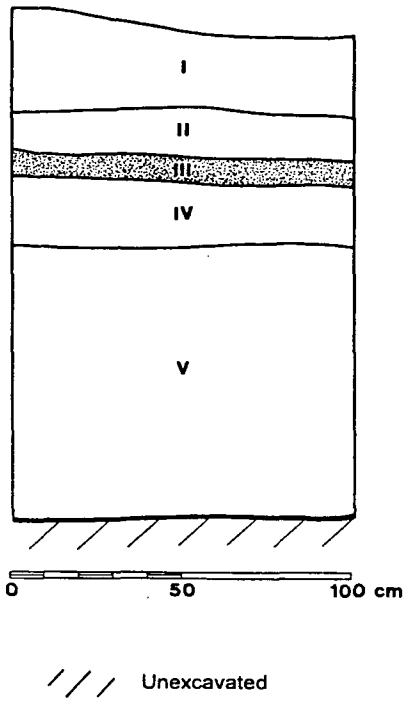


Figure 23.28. Site NM-Q-23-64, Study Unit 24, South Wall Profile.

The profile of SU 24 illustrates the natural and cultural stratigraphy that is present in this portion of the site. No cultural materials were recovered or features defined, within SU 24.

Study Unit 25

SU 25 is located at the middle of the site, west of the existing N11 road. SU 25 extends from grid coordinates N1047.57, E974.88, northward 18.5 m to N1063.62, E983.10. This 1.35 m deep trench was placed in an area of light artifact density and in an area of least amount of ground disturbance.

One 1-m-long profile was drawn of SU 25 (Figure 23.29). This section of profile is located 8 m from the south end of the west trench wall and is representative of the entire trench profile. Four strata are present within SU 25. Stratum I is 20 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 7 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum III was 14 cm thick and consisted of dark yellowish brown (10YR4/6) coarse sand. Stratum IV was 94 cm thick and consisted of brownish yellow (10YR6/6) very coarse sand with calcium carbonation.

The profile of SU 25 illustrates the natural and cultural stratigraphy that is present in this portion of the site. No cultural materials were recovered or features defined within SU 25.

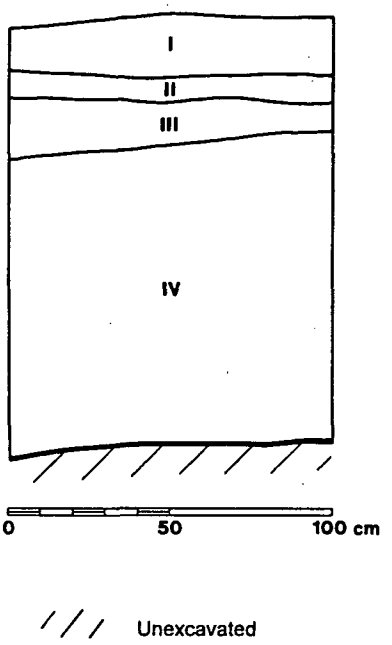


Figure 23.29. Site NM-Q-23-64, Study Unit 25, West Wall Profile.

Study Unit 26. SU 26 was located at the middle of the site, west of the existing N11 road. SU 26 extended from grid coordinates N1072.0, E987.0, northeastward 13 m to N1081.5, E996.5. This 1.53-m-deep trench was placed in an area of light artifact density and least amount of ground disturbance.

One 1-m-long profile was drawn of SU 26 (Figure 23.30). This profile was located 6 m from the south end of the west trench wall and was representative of the entire trench profile. Four strata were present within SU 26. Stratum I was 13 cm thick and consisted of light yellowish brown (10YR6/4) sand. Stratum II was 26 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Stratum III was 15 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum IV was 99 cm thick and consisted of brownish yellow (10YR6/6) fine sand with evidence of calcium carbonation.

The profile of SU 26 illustrates the natural and cultural stratigraphy that is present in this portion of the site. No cultural materials were recovered or features defined within SU 26.

Off-site Trenches

Off-site Trench 1. Off-site Trench 1 was located north of the site and east of the existing N11 road. Off-site Trench 1 extended from grid coordinates N1199.08, E1086.45, southeastward 9 m to N1195.99, E1095.06. This 1.59-m-deep trench was located within an area of deep aeolian deposits. This location was chosen in order to investigate whether any subsurface features exist north of the site boundary.

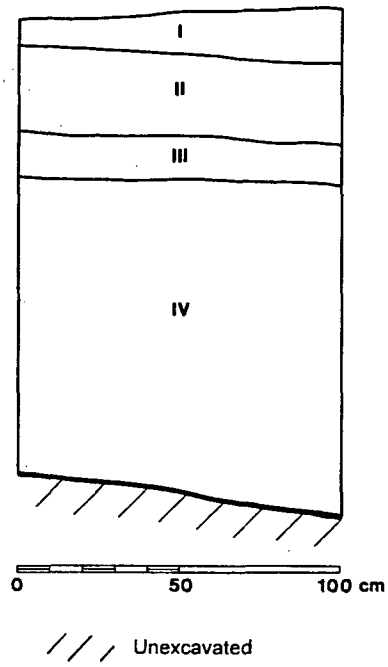


Figure 23.30. Site NM-Q-23-64, Study Unit 26, West Wall Profile.

One 1-m-long profile was drawn of Off-site Trench 1 (Figure 23.31). This profile was located 3 m from the west end of the north trench wall and was representative of the entire trench profile. Five strata were present within Off-site Trench 1. Stratum I was 40 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 34 cm thick and consisted of yellowish brown (10YR5/6) fine sand. Stratum III was 23 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum IV was 31 cm thick and consisted of yellowish brown (10YR5/6) sandy loam. Stratum V was 30 cm thick and consisted of yellowish brown (10YR5/8) gravelly sand.

The profile of Off-site Trench 1 illustrates the natural and cultural stratigraphy that is present north of the site boundary. No cultural materials were recovered or features defined within Off-site Trench 1.

Off-site Trench 2. Off-site Trench 2 was located north of the site boundary, east of the existing N11 road. Off-site Trench 2 extended from grid coordinates N1177.31, E1080.70, northeastward 14 m to N1190.19, E1086.72. This 1.59-m-deep trench was located in an area of deep aeolian deposits. This location was chosen in order to investigate whether any subsurface features exist north of the site boundary.

One 1-m-long profile was drawn of Off-site Trench 2 (Figure 23.32). This profile was located 5 m from the south end of the east trench wall and was representative of the entire trench profile. Five strata were present within Off-site Trench 2. Stratum I was 58 cm thick and consisted of light yellowish brown (10YR6/4) fine sand. Stratum II was 37 cm thick and consisted of

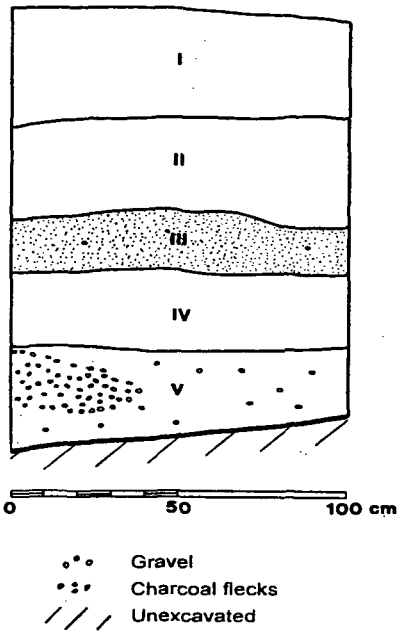


Figure 23.31. Site NM-Q-23-64, Off-site Trench 1, North Wall Profile.

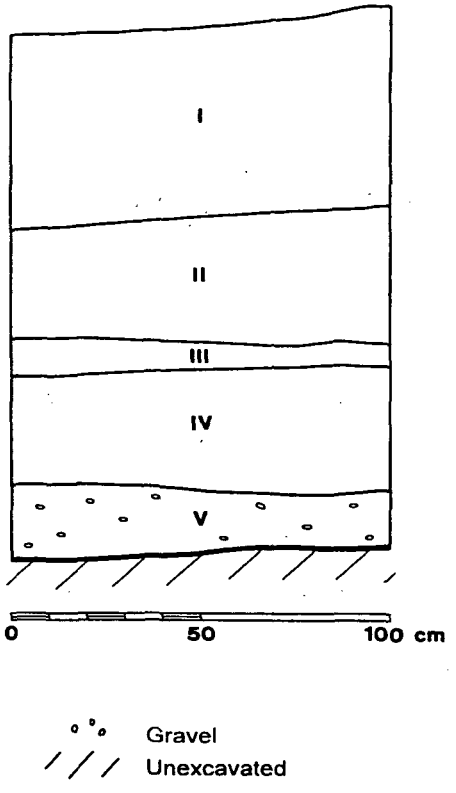


Figure 23.32. Site NM-Q-23-64, Off-site Trench 2, East Wall Profile.

yellowish brown (10YR5/6) fine sand. Stratum III was 9 cm thick and consisted of dark yellowish brown (10YR4/6) fine sand. Stratum IV was 35 cm thick and consisted of yellowish brown (10YR5/6) sandy loam. Stratum V was 20 cm thick and consisted of yellowish brown (10YR5/8) gravelly sandstone bedrock.

The profile of Off-site Trench 2 illustrates the natural stratigraphy that is present north of the site boundary. No cultural materials were recovered or features defined within Off-site Trench 2.

Off-site Trench 3. Off-site Trench 3 was located north of the site boundary, east of the existing N11 road. Off-site Trench 3 extended from grid coordinates N1168.35, E1069.30, southeastward 11.5 m to N1163.12, E1079.19. This 1.58-m-deep trench was placed in an area of deep aeolian deposits. This location was chosen in order to investigate whether any subsurface features exist north of the site boundary.

One 1-m-long profile was drawn of Off-site Trench 3 (Figure 23.33). This profile was located 6 m from the west end of the south trench wall and was representative of the entire trench wall. Five strata were present within Off-site Trench 3. Stratum I was 86 cm thick and consisted

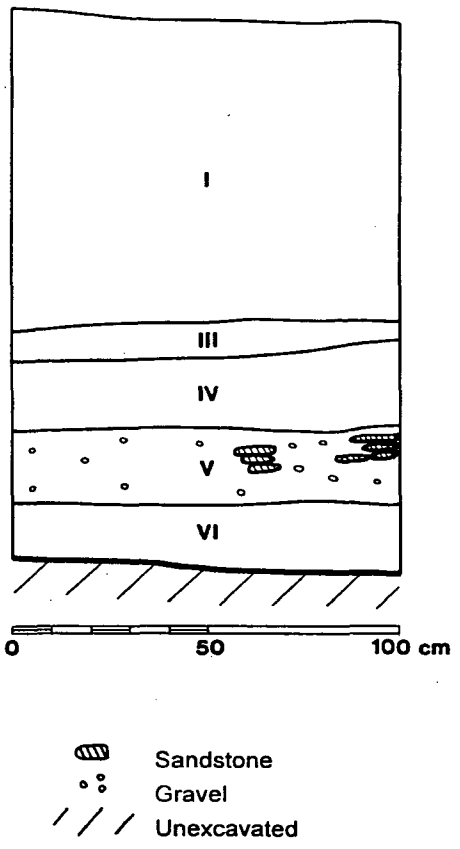


Figure 23.33. Site NM-Q-23-64, Off-site Trench 3, South Wall Profile.

of light yellowish brown (10YR6/4) fine sand. Stratum II was absent in this trench profile. Stratum III was 11 cm thick and consisted of dark yellowish brown (10YR4/6) sand. Stratum IV was 21 cm thick and consisted of yellowish brown (10YR5/6) sand. Stratum V was 22 cm thick and consisted of yellowish brown (10YR5/8) gravelly sand. Stratum VI was 18 cm thick and consisted of light gray (10YR7/2) sandstone bedrock.

Shovel Scraping

Approximately 4 to 10 cm of loose windblown sand was shovel scraped from the road cut bank located at grid coordinates N1020, E992.5 northeast to N1025, E995. This 1-m-by-5-m area was shovel scraped in order to determine the western boundaries of Feature 12 (Figure 23.1). After scrapping approximately 8 to 10 cm of overburden, Feature 12 western boundary was defined.

Shovel Trenching

Shovel Trench 1

Shovel Trench 1 was located in the middle part of the site, east of the existing N11 road. Trench 1 extended from grid coordinates N1047, E1012.5, northward 2 m to N1049, E1012.5. This trench was 25 cm in width. This shovel trench was placed in this area to determine the southern boundary of a pitstructure (Feature 6). This trench was excavated to a depth of 40 to 50 cm in Stratum I consisting of light yellowish windblown sand to Stratum III consisting of brownish yellow sterile sand. Within Stratum III a clear break consisting of dark yellowish brown sand was defined as the southern boundary of Feature 6 (Figure 23.1). Sediments from the shovel trench were not screened and no artifacts were observed.

Shovel Trench 2

Shovel Trench 2 was located in the middle part of the site, east of the existing N11 road. Shovel Trench 2 extended from grid coordinates N1018, E995 north 1.5 m to N1019.5, E995. This 40-cm-deep and 25-cm-wide shovel trench was placed in this area to determine the southern boundary of a pitstructure (Feature 12). Shovel Trench 2 was excavated to a depth of 40 cm in Stratum I consisting of windblown sand to Stratum III consisting of slightly hard brownish yellow sterile sand. The southern boundary of Feature 12 was identified by dark yellowish brown sand. Ground stone metate fragments were identified within the dark yellowish brown sand and were left intact. Sediments from the shovel trench were not screened and no artifacts were observed within the sediments.

Shovel Trench 3

Shovel Trench 3 was located in the middle part of the site, east of the existing N11 road. Shovel Trench 3 extended from grid coordinates N1020.5, E996.5, east 2 m to N1020.5, E998. This 40-cm-deep and 25-cm-wide trench was placed in this area to determine the eastern boundary of Feature 12. Shovel Trench 3 was excavated to a depth of 40 cm in Stratum I consisting of light

yellowish brown windblown sand to Stratum III, a yellowish brown sterile sand. The eastern boundary of Feature 12 (Figure 23.1) was identified as a dark yellowish brown sand. Sediments from the shovel trench were not screened.

Features

Feature 1

The center of Feature 1 was located approximately at grid coordinates N1083, E1029. The feature, measuring about 55 cm at the top and 36 cm in depth, was an undefined shallow pit. Because of limited testing, the total size of Feature 1, plan view layout, and function remain unknown. Feature 1 was about 49 cm below surface. The cultural fill within the feature consisted of charcoal-stained sand with inclusions of small charcoal flecks. No artifacts were recovered from the feature.

Feature 2

The center of Feature 2 was located approximately at grid coordinates N1078.5, E1031.5. The feature, measuring 71 cm long and 20 cm thick, was an irregular-shaped dark charcoal stain. Because of limited testing, the total size of Feature 2, plan view layout, and function are unknown. Feature 2 was approximately 70 cm below the surface and was identified during the excavation of backhoe trench SU 15. No artifacts were recovered from the feature.

Feature 3

The center of Feature 3 was located approximately at grid coordinates N1079, E1030.5. This feature, measuring 80 cm long and 15 cm thick, was an oblong dark charcoal stain 70 cm below the surface. Because of limited testing, Feature 3's total size, plan view layout, and function are unknown. This feature was identified during the excavation of backhoe trench SU 16. The cultural fill within the feature contains charcoal-stained sands with inclusions of small charcoal flecks. No artifacts were recovered from the feature.

Feature 4

The center of Feature 4 was located approximately at grid coordinates N1059, E1015. This pitstructure was characterized by the presence of a bench, wingwall, and a prepared floor of very fine sandy loam just above the sandstone bedrock. The floor had been excavated down 1.8 m below today's surface and appeared 4.24 m wide in profile. The structure, which was not burned (at least as observed in the trench), was identified during the excavation of backhoe trench SU 18. Three cultural strata were present within the feature.

A flotation sample, pollen sample, and charcoal for radiocarbon dating (Appendix B) were obtained approximately 10 cm above the floor within the trench wall. The radiocarbon sample (FS 209) yielded a calibrated Late Basketmaker II date of AD 210 to 560 (Beta-110387, 2 sigma). Further investigations within and in the vicinity of Feature 4 have a high potential for recovery of

all classes of artifacts as well as additional contexts well suited to study via flotation sampling. More internal features are likely, as well as datable items suited to resolving the chronological relationships between Feature 4 and the remainder of the site.

Feature 5

The center of Feature 5 was located approximately at grid coordinates N1057, E1019.5. This earthen pit, measuring 1 m deep by 1.16 m across, was 42 cm below the surface. It was located in the eastern portion of backhoe trench SU 18 (Figure 23.21). Because of limited testing, the architectural layout of Feature 5 remains unknown. This earthen pit is likely the antechamber to the pitstructure (Feature 4). No waterscreen samples were collected from this feature prior to backfilling of SU 18.

Further investigations within and in the vicinity of Feature 5 have a high potential for recovery of all classes of datable artifacts as well as exposure of contexts well suited to study via flotation samples.

Feature 6

Feature 6 was located at N1051.5, E1012, and consisted of a pitstructure measuring about 8 m in diameter. The structure was defined as a result of hand excavation in SU 2 and 3 and Shovel Trench 1. The excavation of SU 3 defined the presence of a sandstone floor 2.1 m below the present surface. Seven cultural strata were present within the feature (Figure 23.5). One burial was associated with the upper strata of the pitstructure and was located near the western boundary of the feature within the existing roadway.

Feature 6 was tested via waterscreen sample (Chapter 28) and pollen sample (Chapter 29). Further investigation is likely to reveal internal features as well as allow recovery of all classes of datable artifacts and exposure of contexts well suited to study via flotation samples.

Feature 7

The center of Feature 7 was located at grid coordinates N1043, E1003. This feature was a bell-shaped earthen pit measuring 2.3 m across at the top and 2.7 m across at the bottom and 1.1 m in depth. This pit was defined during the excavation of backhoe trench SU 19. One cultural stratum was present within the feature. Because of the limited testing, Feature 7's layout and function remain unknown. No waterscreen sample was collected prior to backfilling of SU 19. Further investigation has a high potential for recovery of all classes of datable artifacts and exposure of contexts well suited to study via flotation samples.

Feature 8

The center of Feature 8 was located at grid coordinates N1042.5, E1004, in backhoe trench SU 19 (Figure 23.23). It was an earthen pitstructure at least 2.7 m in diameter, with a maximum

depth of 1.2 m. The pitstructure was characterized by the presence of a floor and a plaster wall. Feature 8 was identified during backhoe trenching. The backhoe trench truncated the northern edge of the feature. Feature 8 appeared to be superimposed into an earlier pitstructure at least 4 m in diameter. Because of limited testing the architectural layout remains unknown. No waterscreen samples were collected prior to backfilling of SU 19. Further investigation during data recovery has a high potential for recovery of material from all artifact classes, as well as the discovery of contexts well suited to study via flotation samples. Internal features are likely, as is the presence of datable items including wooden structural members, fired clay hearth collars, and charred seeds. Three cultural strata were present within the feature. One feature was defined within the upper strata of the pitstructure fill (Feature 9, Figure 23.23).

Feature 9

The center of Feature 9 was located at grid coordinates N1041.5, E1005, in backhoe trench SU 19 (Figure 23.23). It was a shallow hearth at least 56 cm in diameter and 8 cm deep located 32 cm below the surface. A charred wooden plank was present at the base of the feature. No waterscreen sample was taken prior to backfilling of SU 19. Further investigation has a moderate potential for recovery of material from several artifact classes as well as discovery of contexts suited for flotation sampling.

Feature 10

The center of Feature 10 was located at grid coordinates N1041.5, E1008. It was an earthen bell-shaped storage pit measuring 1.9 m in diameter at the top and about 2 m in diameter at the base of the pit. Feature 10 was buried 22 cm below the surface. Two cultural strata were present within the fill of the pit. No waterscreen sample was collected prior to backfilling of backhoe trench SU 19. Further investigation has moderate potential for recovery of material from several artifact classes as well as discovery of contexts suited for flotation sampling.

Feature 11

The center of Feature 11 was located at grid coordinates N1008, E995. It was an earthen pitstructure at least 6.2 m in diameter with a maximum depth of 1.3 m. It was characterized by the presence of a prepared floor of fine sandy loam, a bench, posthole, and a southern recess bench. One cultural strata was present within the pitstructure fill. Feature 11 was identified during the backhoe trenching of SU 21.

Flotation and pollen samples were removed from Feature 11. Further investigations within Feature 11 during the next data recovery phase have a high potential for the recovery of materials from all classes, as well as discovery of contexts well suited to study via flotation sampling. Interior features are known to exist and more are quite likely. Datable materials are known to exist and more are likely, including charred seeds, wooden structural members, and fired clay hearth collars.

Feature 12

The center of Feature 12 was located at grid coordinates N1022, E995.5. This feature is interpreted as a pitstructure at least 6 m in diameter. Feature 11 was defined during the hand excavation of SU 5 and excavation of Shovel Trenches 2 and 3. Four strata were present within the pitstructure fill. Ceramics, a stone fetish and ground stone were recovered from the screen during the excavation of SU 5.

Feature 12 was tested by flotation and pollen samples collected from 10 cm above the floor on the unit wall. A charcoal sample for a radiocarbon date (Appendix B) was collected from the screen from Level 7. The radiocarbon sample (FS 173, Beta-110386) yielded a 2 sigma calibrated Early Basketmaker date of AD 65 to 350. Pollen samples identified pinyon (*Pinus* sp.) and juniper (*Juniperus* sp.), spruce (*Picea* sp.), Douglas fir (*Pseudotsuga* sp.) and large amounts of *Zea mays*. The elevated *Zea mays* and recovery of ground stone indicate that the pitstructure (Feature 12) may have been used as a milling area.

Further investigations within Feature 12 have a high potential for recovery of material from all artifact classes, as well as the discovery of contexts well suited to study via flotation sampling. Interior features are likely as is the presence of datable items including wooden structural members, fired clay hearth collars, and charred seeds.

SUMMARY AND INTERPRETATION

Phase I Data Recovery activities at site NM-Q-23-64 included a redefinition of the site, a complete surface collection of all artifacts within the right-of-way, hand excavation of 10 1-by-1-m test units and machine excavation of 19 trenches totaling 245.5 m in length. In addition, 10 cm of loose windblown deposits were removed by shovel scraping on the eastern cut bank of the N11 road and 5.5 m of shovel trenching was conducted within the site boundaries.

The observed characteristics of the ground surface over the site area indicated that most of the site has been moderately to severely disturbed. The entire hillslope in the central portion of the site, within the right-of-way, has been removed or truncated by the initial construction of the N11 road. The western portion of the site has been moderately disturbed by continued road maintenance. The eastern portion, east of the N11 road, was the only portion of the site that appears to be undisturbed.

Stratigraphic and sediment information recovered from hand-excavated units and backhoe trenches indicated that in these investigated areas the direct and indirect results of mechanical disturbances to the site are present in these areas from 30 cm to 1.5 m below ground surface, especially on the cut bank east of N11 in the vicinity of SU 1 to SU 6. It is believed that previously occurring culture-bearing deposits were removed during the initial construction of N11. The eastern portion of the site has experienced an increased rate of windblown deposits of silts and sand as a result of road construction and continued road maintenance.

Natural Stratigraphy

A reconstruction of the natural stratigraphy present across the site was completed with information recovered from each of the 10 test units and 19 backhoe trenches. Because of the large size of the site, this stratigraphic reconstruction has been broken up into two portions: (1) the eastern part comprised of SU 1 through 6 and SU 11 through 24, and Off-site Trenches 1 through 3; and (2) the western part comprised of SUs 7, 8, 9, 10, 25, and 26 (Figure 22.2). Each of these will be discussed.

Seven major strata were identified in the backhoe trenches in the eastern portion of the site. Stratum I consists of aeolian sands ranging in thickness from 28 to 81 cm. The thicker sediments are present in the northern part. Stratum II consists of aeolian loamy sand ranging in thickness from 6 to 50 cm. These sediments are present throughout the site and where features are found. Stratum IIa consists of alluvial sandy loam ranging in thickness from 7 to 44 cm. This stratum is capping Feature 1 in SU 15. Stratum III consists of alluvial sands ranging in thickness from 22 to 78 cm. This stratum is thicker toward the middle of the site. Stratum IV consists of sterile alluvial sandy clay loam deposits ranging in thickness from 18 to 68 cm. Stratum V consists of alluvial gravels ranging in thickness from 11 to 58 cm. Stratum VI consists of soft sandstone bedrock.

Four major strata were identified in the backhoe trenches and hand-excavated units in the western portion of the site. Stratum I consists of aeolian sands ranging in thickness from 3 to 28 cm. Stratum II consists of aeolian sands ranging in thickness from 8 to 26 cm. Stratum III consists of aeolian sands ranging in thickness from 14 to 28 cm. Stratum IV consists of sterile alluvial deposits ranging in thickness from 20 to 99 cm.

Cultural materials (ceramics, faunal specimens, ground stone, and flaked stone) and features (pitstructures, hearths, and burials) were associated with four of the strata. Stratum II, IIa, and III were capping the features, and features were excavated into Stratum IV. Feature 2 also found within IIIa in SU 16.

Cultural Deposits

A total of 1948 ceramic artifacts, 79 flaked stone artifacts, 59 faunal specimens, and 20 ground stone artifacts were recovered from site NM-Q-23-64. The original feature (Feature 1) recorded and defined by ZCRE during 1996 survey was not relocated, thus Feature 1 was redesignated to another feature encountered during the testing phase. Subsurface investigations resulted in the identification of 12 features, and a burial was located within the cut bank of the existing N11 roadway.

Site NM-Q-23-64 is a Basketmaker III habitation site consisting of at least five known pitstructures, four probable storage pits, two other features, one hearth, and one burial. Because of the sampling interval between backhoe trenches, as many as 8 pitstructures are projected for the site, as are 16 additional storage pits and 4 other undefined features. These estimates take into account the observed clustering of structures and other features in the area at the east edge of the existing road.

The ceramic assemblage from site NM-Q-23-64 includes a number of identified types that date to late Basketmaker III (AD 600 to 700). The majority of Basketmaker III types are identified as plain gray. A small amount of identified Pueblo II sherds were found in the surface contexts. These sherds are most likely intrusive to the site considering the close proximity of site NM-Q-23-64 to the Muddy Water Great House.

The chipped stone and ground stone assemblage from site NM-Q-23-64 displays a selection of locally available materials for the majority of the artifacts. Chert and Chinle chert were the dominant types in the assemblage. Other raw materials in the assemblage included obsidian, petrified wood, and quartzite. The Ground stone assemblage was dominated by sandstone raw material. Other materials included quartzite and a coyote fetish made with jadeite material.

The faunal assemblage recovered from site NM-Q-23-64 primarily consists of fragmented specimens identified to the categories of small and large mammals. Cottontails and unspecified rabbits occur in low frequencies. A small number of various rodent bones complete the assemblage.

The botanical assemblage from site NM-Q-23-64 consists of pinyon pine, juniper, spruce, and Douglas fir trees. Chicory tribe, mustard, prickly pear cactus, cholla cactus, beeweed, various grasses, globemallow, cattail, squash, and maize were common among the edible taxa.

Using the chronometric data derived from radiocarbon analysis, a maximum range of occupation from AD 65 to 560 is suggested. This range is earlier than that estimated from the ceramic assemblage, thus a Late Basketmaker II occupation may be present as well.

RECOMMENDATIONS

Site NM-Q-23-64 was recorded as an Ancestral Pueblo ceramic and lithic scatter with one feature. During Phase I Data Recovery excavations, 12 features were identified. These features included charcoal stains, a hearth, undetermined pits, and pitstructures are within the right-of-way of the proposed road improvements of N11. Further work on these features are needed before construction activities for road improvements to take place.

SECTION III

ANALYSES

Chapter 24

GEOMORPHIC OBSERVATIONS

Kate Thompson

INTRODUCTION

This chapter describes the results of geomorphic and stratigraphic observations made in conjunction with archaeological testing of seven sites (NM-Q-27-13 [LA 110304], NM-Q-22-52 [LA 110315], NM-Q-23-58 [LA 110322], NM-Q-23-60 [LA 38698], NM-Q-23-62 [LA 110325], NM-Q-23-63 [LA 110326], and NM-Q-23-64 [LA 110327]). Field observations are based on a series of backhoe trenches excavated on the sites. Characterization of the sediments and soil is based solely on field descriptions.

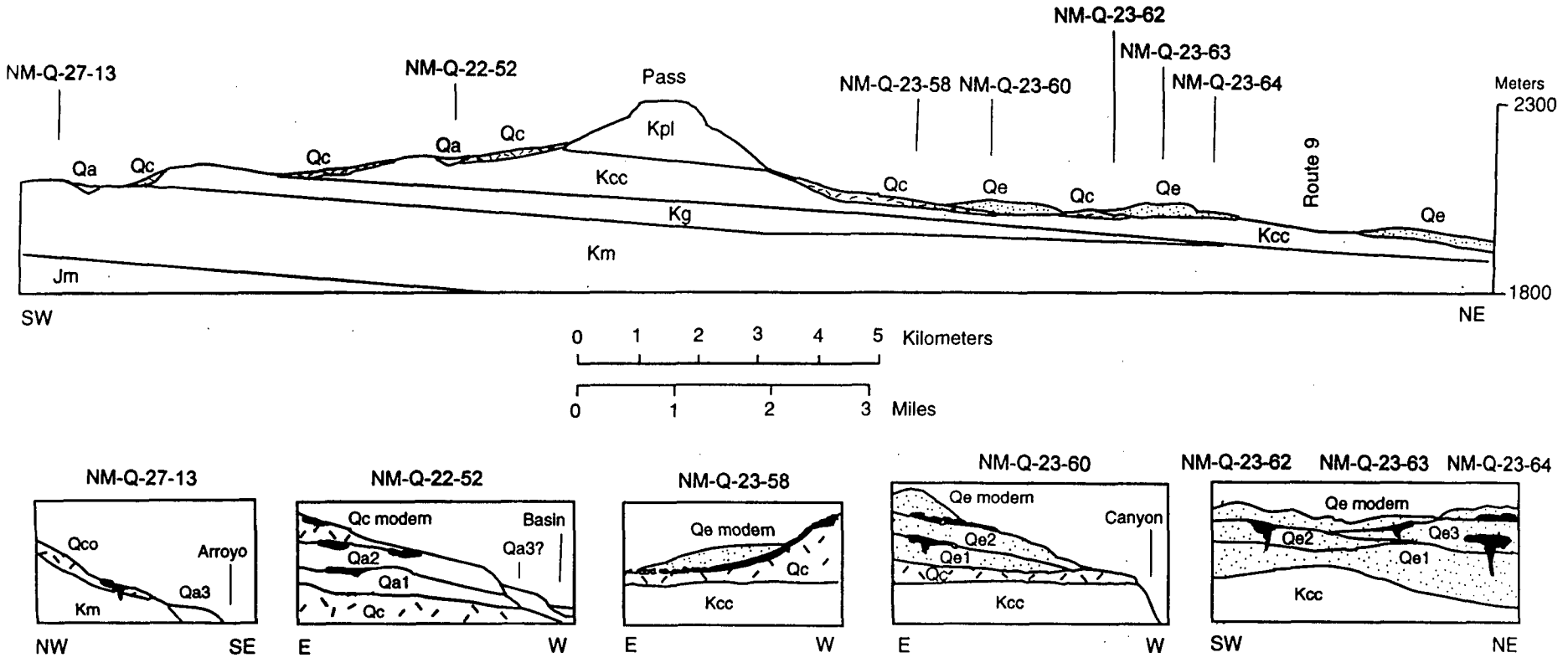
Backhoe trenches were selected for observation based on the most complete stratigraphic sequences and presence of cultural horizons. Recording was based on narrow 1- to 2-m vertical profiles placed to capture the thickest and most complete sequence of deposits exposed in each trench. Profiles were recorded using criteria outlined in Machette (1985) and Birkeland (1984). Horizon designations follow Soil Survey Staff (1970), with the following exception: numerical prefixes are used to indicate all identified discontinuities within the aeolian and alluvial deposits (the suffix "b" for buried is not used). Profiles were described for selected trenches at each site and summarized in this report as they relate to cultural occupation surfaces.

Depositional units identified in the field vary across the study area. Some archeological sites are situated in accumulated eolian sands while others lie within alluvial or colluvial deposits. To correlate similar units from one site to another, stratigraphy observed in the project area is designated numerically along with the type of Quaternary deposit. In this area, Qe designates Quaternary aeolian sand, Qa designates Quaternary alluvium, and Qc designates Quaternary colluvium. Numeric identifiers (Qe1, Qe2, etc.) increase in number from oldest unit to youngest. Therefore, stratigraphic units which indicate periods of stability within the subsurface landscape can be approximated in age and thus correlated throughout the project area.

GEOLOGY, GEOMORPHOLOGY, AND SOILS OF THE STUDY AREA

Physical Setting

The seven sites span a 7.5-km (12-mi) section of diverse terrain in the southern Colorado Plateau (Figure 24.1). Sites are distributed north and south of a drainage divide (east of Dalton Pass) that separates the Chaco River to the north from the Puerco River to the south. North side drainages flow north forming Indian Creek which joins the Chaco River and forms the upper reaches of the San Juan Basin. The south side of the divide comprises the headwaters of the Puerco River which flows west to join the Little Colorado River in Arizona.



KEY

Quaternary

Cultural horizon or feature

Qe **Aeolian Deposits**
Qe1 - Late Pleistocene to early Holocene; Qe2 - Mid-Holocene; Qe3 - Late Holocene; Qe modern - Historic

Qa **Alluvial Deposits**
Qa1 - Mid-to-Late Holocene; Qa2 - Late Holocene; Qa3 - Protohistoric to Historic

Qc **Colluvial Deposits**
Intermixed talus and slope wash which grade into alluvial deposits and in places underlie aeolian deposits.
Qco - Older colluvium that forms part of ancient pediment; Qc modern - Historic

Cretaceous

Kpl **Point Lookout Sandstone**

Kcc **Crevasse Canyon Formation**
Interbedded sandstone and shale; coal unit

Kg **Gallup Sandstone**

Km **Mancos Shale**

Jurassic

Jm **Morrison Formation**

Figure 24.1. Geologic Cross Section Through the Study Area (Southwest to Northeast) With Detailed Quaternary Geology of Each Site.

The geologic formations of the southern Colorado Plateau in New Mexico are composed of late Cretaceous sedimentary rocks capped by a veneer of Quaternary materials (Figure 24.1). Cretaceous materials were deposited 135 million years ago when the region was covered by a shallow sea that stretched from the Arctic to the Gulf of Mexico (Beaumont et al. 1976). Once the sea regressed, it left layers of sedimentary deposits that were uplifted during the Rocky Mountain Orogeny and subsequently dissected by river systems. The result is a regional geomorphology composed of high plains, plateaus, and mesas deeply incised by canyons. Elevations range from 2300 m (7546 ft) above mean sea level on the Continental Divide to 2000 m (6562 ft) in the Chaco River basin to the north and 2200 m (7218 ft) in the Puerco River basin to the south. The ecoregion is dominated by pinyon (*Pinus* spp.) and juniper (*Juniperus* spp.) woodlands with lesser areas of Great Basin sagebrush (*Artemisia* spp.) and blackbrush (*Coleogyne* spp.) vegetation (Bailey 1994). The climate of this region is semiarid with an average annual precipitation of 18 to 40 cm (7.1 to 15.7 in; Tuan et al. 1973). Winter precipitation typically is long in duration and light in intensity whereas summer precipitation is usually short in duration and intense. Summer temperatures are hot but rarely exceed 38°C (100.4°F), and winter temperatures are rather cool, averaging 5°C (41°F). This climate supports a grassland and desert scrub plant community at the north end of the study area with Mormon tea (*Ephedra* spp.) and Indian ricegrass (*Oryzopsis hymenoides*) commonly growing on aeolian deposits. A somewhat wetter climate due to higher elevations supports the pinyon and juniper plant community on the flanks of mesas and south of the pass.

Geology

The dominant geologic formation in the north end of the study area is the Crevasse Canyon Formation of Upper Cretaceous age. This formation is exposed throughout much of the study area, with the Point Lookout Sandstone capping mesas that mark the pass (Figure 24.1). The lithology of the Crevasse Canyon Formation consists of carbonaceous shale, siltstone, and claystone with thin discontinuous coal beds. In places, a resistant sandstone member of the Crevasse Canyon Formation is exposed in drainages and forms prominent cliffs. North of the study area, the Mancos Shale forms the bedrock surface and is mantled by Quaternary age aeolian deposits that are related to the Chaco dune field (Wells et al. 1990).

Just south of the divide lie somewhat diverse lithologies. Beds dip gently from southwest to northeast (Figure 24.1), exposing various lithologic contacts at the surface. The dominant formation near the top and north of the pass is the Crevasse Canyon Formation. Progressing further south toward Mariano Lake, the Gallup Sandstone and Mancos Shale push their way to the surface.

The Quaternary geology also varies on each side of the pass. Most of the area north of the pass is overlain by Quaternary sediments that consist predominate of late Pleistocene to mid-Holocene aeolian sand sheets (Figure 24.1). Further to the south at higher elevations, the influence of wind dies off and alluvial and colluvial deposits dominate surface morphology. In general, the pass marks a transition area between exposed alluvium to the south and the veneer of aeolian sand to the north.

Aeolian Geomorphic History

Based upon regional similarities in the degree of soil development and radiocarbon dates obtained from the nearby Chaco dune field (Wells et al. 1990), the most significant period of aeolian deposition occurred during the latest Pleistocene. This deposit (Qe1) is the thickest unit and forms the basal unit in the dune field at the northern end of the study area (Figure 24.1). It underlies all cultural horizons and displays weak to moderate argillic (Bt) and Stage II calcic (Bk) horizons. This unit is buried by more recent Holocene aeolian sand that can be traced regionally across the Chaco dune field.

Unit Qe1 marks a major bounding surface of regional and climatic importance. Apparent stability of this unit and the amount of soil development correlates with conclusions drawn by Hall (1977) and Frelund (1984). The great depths of leaching in unit Qe1 is interpreted as evidence that many of the deposits were stabilized prior to mid-Holocene drier conditions. Topographic characteristics of the dune are believed to indicate a morphology of sand-sheet deposition, which depends upon the presence of limited sand supply and moist ground conditions. Dune morphology such as this reflects a more mesic environment typical of the latest Pleistocene in this region (Wells et al. 1990).

A younger, more ephemeral unit (Qe2) is preserved in a few places where it once formed the surface of prehistoric occupation. The period of deposition of unit Qe2 could be attributed to mid-Holocene aridity. Paleobotanical records indicate that vegetation responded to increasing aridity starting at 5800 BP (3850 BC) which was sustained until approximately 2200 BP (250 BC) in the Chaco River drainage (Frelund 1984; Hall 1977). Soil in this unit probably started to develop during changes related to the early Neoglacial of mid-Holocene time. Recent studies document evidence for a change in climate during the Neoglacial in the southwestern United States. For example, basal radiocarbon dates of 3900 to 3700 BP (1950 to 1750 BC) correspond to a period of neoglaciation in the San Juan Mountains to the north (Andrews et al. 1975). According to Hall (1977) ponderosa (*Pinus ponderosa*) forests in the mountains adjacent to Chaco Canyon had begun to expand their range by 2200 BP (250 BC).

The younger aeolian deposits (Qe3) in the study area typically display little evidence of pedogenesis, and Qe3 is the unit in which Puebloan people were living. The development of weak vesicular horizons and the destruction of sedimentary structures in some profiles constitute the only visible evidence of soil development. According to Wells et al. (1990) this unit is younger than 1500 BP (AD 450). Probably deposition started just before Puebloan occupation, and thus is directly associated with prehistoric cultural materials. This time coincides with the major expansion of pinyon woodlands in the Chaco area about 850 years ago (AD 1100). The typical lack of soil development associated with unit Qe3 indicates that aeolian deposits have lacked stability over the past thousand years to enable prolonged pedogenesis.

Unit Qe3 is covered in many areas by dunes of protohistoric to historic age (Qe modern), which likely correlate in time with arroyo-cutting events around the turn of the century. This deposit forms a thin veneer across most of the study area north of the pass.

Alluvial Geomorphic History

Sites located near to and south of the pass are situated on pediment surfaces that interfinger with alluvial terraces (Figure 24.1). The deposits range in age from mid-Holocene to historic and are linked to the alluvial record along drainages of the Colorado Plateau. The late Pleistocene to early Holocene alluvial record is absent throughout much of the Colorado Plateau. However, periods of alluviation have been documented in drainages linked to the Colorado River, where sedimentation regularly alternated with erosion during the last four millennia (Dean 1994; Hereford et al. 1993). This resulted in a somewhat complex geomorphic expression of alluvial terraces in the southern Colorado Plateau.

About 5800 years ago (3850 BC), pinyon and ponderosa forests rapidly diminished in abundance and range due to mid-Holocene aridity. This generated sedimentation and alluvial deposition as reflected in the Gallo alluvium of the San Juan Basin (Hall 1977) and lower Tsegi alluvium in northeastern Arizona (Hack 1942). This period of alluviation is referred to as Qal in the study area. Based on soil development and stratigraphic position, this deposit presumably correlates with mid-Holocene sedimentation. Aridity lasted until about 2400 years ago (450 BC), when ponderosa pines encroached on lower elevations (Dean 1994; Hall 1977).

A period of erosion began about 2400 BP (450 BC) and lasted until 2200 BP (250 BC), after which the next alluvial cycle began (Qa2). Alluvium documented in Chaco Canyon (Hall 1977) started to accumulate around AD 850 and prevailed until after the end of the Bonito phase, about AD 1200. Runoff from the head of the Chaco drainage basin spread over pediment surfaces and accumulated in flat alluvial valleys. Other research in portions of the San Juan basin collectively show rising alluvial groundwater levels, floodplain accretion, increased effective moisture, and a widening of the farmable belt in southwestern Colorado during the AD 900 to 1150 interval (Dean 1994). This period of alluvial fill correlates with the upper Tsegi alluvium in northeastern Arizona, and typically marks the surfaces of Basketmaker through Pueblo II occupation within the southern Colorado Plateau.

Beginning around AD 1200, climate change and increased runoff started to erode the alluvium of Puebloan age, and within 50 years the large pueblos of Chaco Canyon were abandoned. Partial infilling of these channels started about AD 1300 to 1400 (Qa3) at the time when pinyon woodlands expanded to their present-day range (Dean 1994; Hall 1977). The last erosional period started in 1860, carving Chaco Wash, Tsegi Canyon, and many other arroyos throughout the Southwest.

Soils in the Area

Dune Soils

Most of the dune soils in this area are locally interbedded with fluvial gravels and typically possess weakly to moderately developed soils. Soil thickness ranges from about 1 to 1.5 m over weathered Cretaceous bedrock. Dune soils typically exhibit an AC-2A-2Bt-2Bk-Cr profile developed from yellowish brown fine sand (modern layer AC) that grades down to reddish yellow

loamy fine sand. The surface horizon AC indicates a modern veneer of dune sand that mainly covers the east side of the road. From a bottle found buried in the sand, it is suggested that the sand blew in since the road was cut in the 1950s.

The 2A horizon indicates a buried cultural surface that was once stable. The 2Bt describes the subsurface horizon that has been stable long enough for clay to have been transported and accumulated over at least 5000 years. The 2Bk indicates calcium carbonate accumulation and ranges from developed Stage I to Stage II. This stage of carbonate development supports that subsurface aeolian deposits have remained stable since the mid-Holocene.

Alluvial Soils

Many soils on the south side of the pass are developed from alluvium that overlies pediment gravels. Observations at several sites typically revealed a young fluvial soil overlying a somewhat older cambic soil developed in either alluvium or colluvium. Soil thickness ranges from 2 m on alluvial terraces to less than 1 m on colluvial slopes. These soils generally exhibit an AC-2A-2Bw-2Ck profile developed from dark brown loam with lenses of imbricated gravels. Calcium carbonate development in the Ck has not advanced beyond Stage I morphology. With the exception of the top AC horizon, the subsurface alluvial soil appears to be correlative with Chaco Canyon and Tsegi periods of alluviation.

GEOARCHEOLOGY OF SITES

Site NM-Q-27-13

This site is located on a thin layer of colluvium that directly overlies the Mancos Shale. This colluvium is very stable and forms part of the ancient pediment that flanks many of the mesas in this area. Archeological features are located both on the surface and just subsurface, and they were excavated into the underlying Mancos Shale. Features have been subsequently filled with slopewash that has accumulated to 10 cm thick over the past several hundred years.

A series of gullies cut through the area and drain to a prominent headcut of an arroyo located downslope about 7 m. This arroyo feeds a nearby canyon that forms the upper reaches of the Puerco River. Soil profiles exhibited in the arroyo cutface display a well-developed mollic A horizon at the surface and a subsurface cambic horizon (Bw). The profile is calcareous throughout all horizons, and thus indicates a stable surface for at least a few hundred years. A young, 5-ft-tall Douglas fir (*Pseudotsuga* sp.) has germinated on the north slope of the arroyo, and appears to be at least 40 years old. From this is inferred headcutting and initiation of the arroyo system just before the turn of the century, which correlates with other cycles of arroyo-cutting around AD 1890.

Site NM-Q-22-52

This site is located on an alluvial terrace on the south side of the pass and borders a small basin that forms the headwaters of the Puerco River (Figure 24.1). Soils on the upper terrace are deep (>1.5 m) and have developed from approximately six flood events expressed as AC horizons stacked on top of each other (Table 24.1). Two buried A horizons (2A and 3A) are influenced by

Table 24.1. Profile Description for Site NM-Q-22-52.

Unit	Horizon	Depth (cm)	Color	Texture	Description
Qc modern	AC	0 to 30	10YR 4/3 moist 5/3 dry	Sandy loam	Two layers of colluvial slope wash; lenses of organics and gravels common
Qa3					Forms inset terrace below sites
Qa2	2A	30 to 50	10YR 3/2 moist 5/2 dry	Silty clay loam	Staining from cultural occupation (Pueblo II?)
	2AC2	50 to 85	10YR 4/3 moist 5/3 dry	Sandy loam with clay lenses	Horizon consists of 4 flood sands separated by clay lenses; fine gravel lenses dispersed throughout horizon
Qa1	3A	85 to 110	10YR 4/2 moist 5/2 dry	Silt loam	Staining from cultural occupation (Basketmaker III?)
	3Bk	110 to 150	7.5YR 5/6 moist 6/6 dry	Sandy clay loam	Weakly developed calcic horizon; sedimentary structures visible
	3C	150 to 180	7.5YR 5/6 dry	Sandy loam	Calcic horizon, Stage II carbonate
	3C2	180 to 200			Streambed gravel; clasts imbricated from north to south
	3C3	200 to 210+		Loamy sand	Massive sand with Stage II carbonate

cultural activity, possibly reflecting two short periods of stability. The oldest is probably of Basketmaker II or III age as indicated by the buried A (3A) with its associated B and C horizons. The more recent cultural horizon (2A) is probably of Pueblo II origin since it lies just subsurface. Pueblo III artifacts can be found upslope where they lie directly on the surface.

Site NM-Q-23-58

This site is located on an alluvial fan of the nearby mesa just southwest of site NM-Q-23-60 (Figure 24.1). Vegetation consists of juniper with sage and cliffrose (*Cowanian mexicana*). Upslope of the site are a scatter of Pueblo I artifacts and a midden that appears to have washed downslope. Soils are shallow (<1 m) to bedrock and are fresh in appearance. They are characteristic of fluvial entisols with a typical A-C1-C2-C3 profile.

The midden deposit can be traced downslope to several of the trenches that expose the charcoal-stained horizon. This layer becomes increasingly diffuse as one progresses downslope, contesting that it was derived from the upslope site. The midden deposit rests on horizons of colluvial wash that are shallow to bedrock. This signifies periodic surface flow that slowly transported the midden downslope over a period of 1000 years. Subsequently, dune sand covered parts of the site in historic time, burying it by only 10 cm.

Site NM-Q-23-60

This site is situated near a prominent canyon that forms the headwaters of Indian Creek. This area marks a transition zone between the pinyon and juniper ecotone to the south and the grasslands to the north. Vegetation consists of pinyon, juniper, sage, fourwing saltbush (*Atriplex canescens*), *Ephedra*, rabbitbrush (*Chrysothamnus* sp.), and Indian ricegrass. Features are located in stratified dune sand that overlies a pediment surface. As a result, slope wash and small rills have recently dissected the dunes, exposing subsurface cultural materials. This site is significant as it contains at least three occupation levels, including a Navajo occupation located on the surface.

The most deeply buried cultural horizon (3A) forms the top of unit Qe1 (Table 24.2) and is overlain by a moderately developed cambic horizon (2Bw). This cultural activity may greatly predate Basketmaker and is likely Archaic. The unit overlying the Archaic cultural horizon has physical characteristics that places it within the time of Qe2 deposition, and it is probably at least 2000 years old.

The near-surface cultural horizon (2A) has a rock-lined feature (SU 79) that defines the sharp contact between Qe2 below and this horizon. Presumably this horizon occupies a thin segment of Qe3, which has been obscured by cultural activity or has been somewhat eroded at this site. The uppermost dune layer shows well-defined cross beds and is fresh in appearance with a thin, discontinuous A horizon forming at the top. It was probably laid down from 100 to 300 years ago as indicated by the historic Navajo features on the surface.

Table 24.2. Profile Description for Site NM-Q-23-60.

Unit	Horizon	Depth (cm)	Color	Texture	Description
Qe modern	AC	0-30	2.5YR 5/3 moist 6/3 dry	Sand	Long cross beds evident
Qe3	----	--------	----------	----------	Only present in 2 upslope trenches
Qe2	2A	30 to 50	10YR 4/3 moist	Loamy sand	Staining from cultural occupation (Basketmaker III?)
	2Bw	50 to 85	10YR 4/4 moist 5/4 dry	Sandy loam	Strong cambic horizon; 2% increase in clay
Qe1	3A	85 to 110	----------	Loamy sand	Staining from cultural occupation (Archaic?)
	3Btk1	110 to 150	7.5YR 5/6 moist 6/6 dry	Sandy clay loam	Argillic/calcic horizon
	3Btk2	150 to 180+	7.5YR 5/6 dry	Sandy loam	Calcic horizon, Stage II carbonate

Site NM-Q-23-62

This site and its associated features lie within the hummocky topography of sand sheets that formed in latest Pleistocene to mid-Holocene times. On the east side of the road where locally active sand has been mounded, *Salsola* marks a prominent vegetation line of recent disturbance. Native vegetation consists of sagebrush, rabbitbrush, and Indian ricegrass, with some juniper. Cultural horizons are buried under about 50 cm of modern dune sand on the east side of the road, but lie on or near the surface on the west side.

All trenches revealed the basal aeolian unit (Qe1) that accumulated in the latest Pleistocene. This is indicated by the weakly developed argillic (3Bt) and the moderately well-developed calcic (3Bk) horizon (Table 24.3). Unit Qe2 generally overlies Qe1, but appears irregularly throughout the trenches. Apparently, this unit was truncated in many places throughout the region. Stability is attested in Qe2 by the abundance of krotovinas (animal burrows) and by a weakly developed argillic (2Bt) horizon (SU 15, 16). This horizon probably started forming about 5000 years ago with its cycle ending about 1000 years ago. Presumably, cultural remnants located on top of Qe2 should predate Chaco Puebloan occupation. Unit Qe3 was observed only in one trench (SU 24), where it is faintly stained by amorphous charcoal and sharply overlies unit Qe1.

The cultural horizon at this site appears to be bracketed by the top of Qe2 and the base of Qe3. From the stratigraphic sequence, the cultural horizon is likely contemporaneous with Basketmaker II or III. A scoured surface forms the contact between Qe3 and the modern sand above. This might have resulted from a cycle of devegetation or a dry period since Qe3 was deposited. Modern sand blankets the cultural horizon on the east side of the road. A roadcut made in the 1950s was exposed to the fetch of the wind, which carried sediment to the lee side. Where the modern sand is missing, cultural features lie on or very near the surface.

Site NM-Q-23-63

The same general scenario as that seen at site NM-Q-23-62 exists for this site (Table 24.3). However, unit Qe2 was missing in many trenches and appears to have been laterally truncated. Therefore, cultural horizons are bracketed by units Qe1 and Qe3. Unit Qe3 appeared in each of the trenches, and is characterized by a cambic (Bw) horizon that may show the initial stages of soil development. It rests unconformably on unit Qe1, and its lower boundary generally forms a sharp contact between the two units. As indicated by the incipient stage of rubification (redding of soil), the Bw horizon of unit Qe3 probably started forming 1000 years ago. It remained stable until at least 100 years ago when the next dune sand covered the area. Krotovinas filled with organic material commonly mark the thin C horizon that overlies the Bw (SU 17, 18, 19, 20). This provides evidence of a stable surface for at least 50 years, until the most modern dune covered the east side of the road.

Based upon the stratigraphic position of the cultural horizon, features seem to be contemporaneous with those at site NM-Q-23-62, and are presumably of Basketmaker II to III age. The deposit in which the cultural horizons are located appears to have been stable for hundreds of years. Then after AD 1800, a change in vegetation cover mobilized sand sheets in the area. This correlates with other studies that report many arroyos began forming within one or two decades of AD 1880 (Hereford 1987).

Table 24.3. Generalized Profile Description at Sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64.

Unit	Horizon	Depth (cm)	Color	Texture	Description
Qe modern	AC	0 to 30	2.5YR 5/3 moist 6/3 dry	Sand	Long cross beds evident
Qe3	Bw	30 to 50	10YR 4/4 moist 5/4 dry	Loamy sand	Staining from cultural occupation evident in portions of horizon
Qe2	2Bt	50 to 75	----------	Sandy loam	Unit missing in many places
Qe1	3A	75 to 110	Charcoal stained	Loamy sand	Cultural horizon unconformably overlain by Qe3 above
	3Bt	110 to 150	7.5YR 4/4 moist 4/6 dry	Sandy loam to sandy clay loam	Argillic horizon
	3Bk	150 to 180	7.5YR 5/6 dry		Calcic horizon, Stage II carbonate
Cretaceous Shale	Cr	180+	----------	----------	Soft bedrock

Site NM-Q-23-64

This site has a somewhat more complex cultural and stratigraphic history, and profiles should be detailed further in the next data recovery phase. The two cultural horizons observed in SU 19 likely predate the Pueblo III features on the surface. The basal feature, a pitstructure, was subsequently infilled with aeolian sand, and the top of which lies a more recent cultural horizon. This horizon is fairly continuous throughout the trench.

The unit which the buried pitstructure penetrates is a calcic soil (2Bk) developed from poorly sorted alluvium and forms the basal unit in several of the trenches (SU 14, 18, 26). The basal alluvium is overlain by unit Qe3 which infills the pitstructure feature. Soil development in Qe3 is expressed by Bw and Bk horizons with Stage I carbonate development (Table 24.3). The pitstructure's stratigraphic position and the small amount of soil development above the pitstructure place cultural occupation around Basketmaker III time.

The top cultural horizon probably formed in the upper Qe3 unit and contains clasts with thin coatings of carbonate. Carbonate development of this sort indicates a stable surface for at least 500 years (Birkeland 1984), since the inception of unit Qe3 1000 years ago. About 30 cm of loose sand (Qe modern) covers the cultural horizon which places occupation around Pueblo II time, but it could be as young as Pueblo III.

CONCLUSIONS

Archaic, Basketmaker, and Pueblo occupation periods seem to be present throughout the region. Although the Archaic horizon (site NM-Q-23-60) is not deeply buried, it exhibits the greatest amount of soil development covering a feature or cultural horizon. It is suggested that the Archaic horizon predates the Pueblo period by at least 1000 years and could be as old as 3000 BP (1050 BC).

The depositional environment following this time is likely related to a period of climatic change starting in AD 700 (Davis 1994) and followed by climatic stability (AD 900 to 1300). This period marks the Little Climatic Optimum in the San Juan Mountains (Petersen 1994) and the Medieval Warm Period (Dean 1994). In the zenith of Pueblo II time, from AD 1000 to 1100, the region was characterized by a relatively long growing season and by a potential dry farming zone that was twice as wide as present. From low temporal variability in dendroclimate studies, a pattern is suggested of slightly wetter winters and summers, with possibly a less intense monsoon season.

The onset of this depositional period, around AD 700, provided a surface for Basketmaker habitation and activity. At most sites, Basketmaker occupation is well buried, and in several sites the horizon underlies a Pueblo II occupation level which occurs just subsurface. Stability for some time is suggested from the small amount of soil development associated with the Pueblo II surface, and this stability probably lasted until the end of the Little Climatic Optimum and the onset of the Little Ice Age around AD 1200 to 1300 (Davis 1994; Dean 1994; Petersen 1994). A sharp contact or scour line was observed between units Qa3 or Qe3 and Qe or Qa modern at several sites. This provides a clue that a period of erosion following AD 1200 correlates with a phase of arroyo-cutting

believed to have instigated abandonment of many pueblos by AD 1250. Furthermore, cut-and-fill was observed in the upper portion of alluvium containing Puebloan artifacts at site NM-Q-22-52, testifying to periods of terrace dissection and subsequent infilling.

The most recent Holocene events are depicted in the modern aeolian and alluvial deposits. Generally fresh-appearing dune sand covers the prehistoric horizons, and appears to range in age from about 300 years to present. This sand slowly started to accumulate sometime in the Little Ice Age, which marked a cooler, drier climate than present, up until the mid-AD 1800s when warmer, wetter conditions returned to the region (Petersen 1994). Recent alluvial deposits are inset against older terrace levels which contain prehistoric artifacts. The last period of alluvial deposition predates turn-of-the-century arroyo-cutting. Presently, younger terraces are being dissected as a result of base-level changes in downstream river channels (site NM-Q-27-13). Such erosion will soon spread to older river terraces that contain prehistoric sites, as headcuts work their way upslope.

Chapter 25

CERAMIC ANALYSIS

Lori Stephens Reed and Joell Goff

INTRODUCTION

During test excavations at sites along the proposed N11(1&2) road, 7564 ceramic artifacts were recovered from 14 sites. These assemblages include temporal components dating from the Basketmaker III to late Pueblo II and Protohistoric periods (Table 25.1). The three Basketmaker III sites have the largest assemblages. Based on the ceramic types, site NM-Q-23-62 (LA 110325) appears to date earlier than the other two Basketmaker III sites, and probably dates no later than AD 600. Sites NM-Q-23-63 (LA 110326) and NM-Q-23-64 (LA 110327) have similar ceramic assemblages and probably date between AD 600 and 700. Other than a small number of neckbanded and Kiatuthlanna Black-on-white sherds in the Pueblo II assemblages, there is no evidence of a Pueblo I component at any of the sites. Nine sites have assemblages dating to the Pueblo II period (between AD 900 and 1150). Sites NM-Q-23-57 (LA 110320) and NM-Q-23-58 (LA 110322) have similar assemblages with Red Mesa Black-on-white, plain gray sherds, and no evidence of corrugated grayware. Based on this configuration of rough-sort types, these three sites probably date between AD 900 and 1000. In contrast, sites NM-Q-27-13 (LA 110304) and NM-Q-23-59 (LA 110323) include corrugated grayware, but lack Gallup Black-on-white, thus it is suggested that the assemblages date between AD 975 and 1025. The remaining five Pueblo II sites (NM-Q-22-48 [LA 110311], NM-Q-22-52 [LA 110315], NM-Q-22-53 [LA 110316], NM-Q-22-54 [LA 110317], and NM-Q-23-56 [LA 110319]) have predominately corrugated grayware and Gallup Black-on-white, and a date range between AD 1000 and 1150 is suggested. One site, NM-Q-23-60 (LA 38698), has an assemblage comprised predominantly of Protohistoric Navajo and Puebloan ceramic types along with a few intrusive early Pueblo II types. Based on the presence of Dinetah Gray and Hawikuh Polychrome, the Protohistoric assemblage probably dates between AD 1630 and 1700. Finally, site NM-Q-23-55 (LA 110318) is temporally identified as unknown based on the presence of only two plain gray sherds. Plain gray sherds are commonly associated with Basketmaker III through Pueblo III assemblages, negating their use as diagnostic indicators.

This chapter outlines the methods employed in analysis of the ceramic assemblage, explains the typological nomenclature used to classify the sherds, presents the results of the analysis for each site assemblage, and addresses the research potential of each site based on the ceramic data. In general, the variety of ceramic types and temporal range of occupation indicate that this group of sites has excellent potential for exploring ceramic technology, function, and style for the Basketmaker III and Pueblo II periods. Also, the single Protohistoric Navajo site affords an opportunity to study Navajo ceramic technology, explore contact and exchange between Navajo and Puebloan groups, and make comparisons between the site NM-Q-23-60 assemblage and ceramic assemblages from the Dinetah region.

Table 25.1. Summary of Ceramic Assemblages from the N11(1&2) Road Testing Sites.

Site No.	Period	Ceramic Date Range	Count	Weight (g)
NM-Q-27-13	Late Pueblo II	AD 975 to 1025	161	520.4
NM-Q-22-48	Late Pueblo II	AD 1000 to 1150	108	461.6
NM-Q-22-52	Late Pueblo II	AD 1000 to 1150	305	1778.6
NM-Q-22-53	Late Pueblo II	AD 1000 to 1150	358	848.7
NM-Q-22-54	Late Pueblo II	AD 1000 to 1150	157	700.9
NM-Q-23-55	Unknown	Unknown	2	34.7
NM-Q-23-56	Late Pueblo II	AD 1000 to 1150	221	1765.2
NM-Q-23-57	Early Pueblo II	AD 900 to 1000	12	70.1
NM-Q-23-58	Early Pueblo II	AD 900 to 1000	13	47.7
NM-Q-23-59	Early Pueblo II	AD 975 to 1025	11	69.2
NM-Q-23-60	Protohistoric*	AD 1630 to 1700	49	203.5
NM-Q-23-62	Basketmaker III	AD 550 to 650	3239	8778.8
NM-Q-23-63	Basketmaker III*	AD 600 to 700	980	3678.3
NM-Q-23-64	Basketmaker III*	AD 600 to 700	1948	6613.4
Total			7564	25,571.1

*Assemblage includes a small percentage of intrusive sherds.

METHODS

Analysis of the ceramics from tested sites along the proposed N11(1&2) road proceeded with a three-phase approach. During the first phase, sherds within a single Field Specimen (FS) collection number were placed within two categories: those large enough for analysis and those too small for analysis. Sherds identified as too small are less than 2 by 2 cm in size. These sherds are classified as "not examined," counted and weighed, assigned lot numbers, and bagged separately within each FS bag. The remaining sherds were considered large enough to receive rough-sort analysis and were grouped into lots based on similar attributes. Lot numbers were assigned consecutively within an FS bag and each lot had a tag identifying the rough-sort type and count. During the rough-sort phase, seven attributes were recorded for each lot within an FS. In addition to the FS number and lot number, the recorded attributes include ceramic ware, rough-sort type, vessel form, vessel portion, count, weight, and comments. These seven rough-sort attributes are described in more detail below. Upon completion of the rough-sort phase, sherds from each site identified as typeable during the rough sort were selected for assignment of series and traditional ceramic type. The rough-sort tag for each lot bag receiving further analysis included the traditional ceramic type highlighted in yellow. All data were entered directly into a Paradox 5.0 data table and then exported to an Excel 7.0 worksheet for production of summary tables. The numeric coding system used to record the rough-sort and traditional type data are presented in Appendix C.

Ceramic Ware

Ceramic ware was recorded for each sherd large enough to receive a rough-sort type. Ware categories were assigned based on the traditional ware, series, and type system devised by Colton

and Hargrave (1937). Based primarily on paste color, paste texture, and surface treatment, sherds were placed into ware designations, including gray, brown, gray/brown, white, red, yellow, and glazewares.

Rough-sort Type

Based on the ware designation, surface treatment, and painted design style, sherds were placed into rough-sort types (Appendix C). These types consist of broad categories following the general temporal trends in ceramic technology and style identified for prehistoric and Protohistoric pottery in the northern Southwest (Goetze and Mills 1993; Goff and Reed 1996; Lucius and Breternitz 1992). In this system of classification (modified to some extent for this particular assemblage), grayware was grouped into rim and body sherd categories that reflect changes in rim morphology and surface treatment. Plain gray rims were identified as Lino style, wide neckbanded (band width >10 mm) rims were identified as Kana-a style, narrow neckbanded (band width <10 mm) rims were identified as Tohatchi style, and corrugated rims were grouped into three styles based on rim eversion. However, only Mancos style (erect corrugated) rims were recorded in the N11 assemblage. Grayware body sherds were identified as plain gray, banded gray, polished gray, or corrugated gray. Gray/brownware sherds were categorized by surface treatment into plain and polished varieties. Although not as clearcut as other ware categories, redware was categorized by broad trends in surface and paste color, paint color, surface treatment, and design style. Most of the redware sherds from the N11 assemblage were classified as Basketmaker III slipped red. Whiteware sherds were classified primarily by painted design style and secondarily by surface treatment. In addition to the broad stylistic categories for whiteware (e.g., La Plata, Red Mesa, and Gallup black-on-white), several other rough-sort types were used to classify sherds with indeterminate design styles. Sherds with a slipped surface and no evidence of a painted design were typed as "slipped white." Painted sherds having an indeterminate fragment of a painted design were typed as "indeterminate black-on-white." Sherds that have enough painted design to classify under a broad temporal period, but not enough to assign a specific style, were classified as Basketmaker III/Pueblo I, Pueblo I/II, or Pueblo II/III black-on-white. Finally, several miscellaneous categories were used to classify sherds as Mogollon Brown Ware, Protohistoric Navajo Gray Ware, Zuni Glaze Ware, Jeddito Yellow Ware, and Protohistoric Puebloan utility.

Vessel Form

Based on sherd curvature, vessel portion, and surface treatment, sherds were classified as originating from bowls, jars, effigies, pipes, and other forms. Body sherds generally were classified within broad categories of bowls and jars, based on the presence or absence of paint and the degree of surface treatment. Rim sherds, on the other hand, provide more information with which to assign specific vessel shapes. Jar rims may be placed into several categories including wide-mouthed jars, seed jars, and ollas. Wide-mouthed jars are characterized by a wide rim orifice that is approximately the same size as the maximum vessel diameter. A seed jar has a short, globular shape with no neck and an orifice that is significantly smaller than the maximum vessel diameter. Ollas, on the other hand, are large vessels that have long, narrow necks and narrow orifices significantly smaller than the maximum vessel diameter. Additional vessel types that may be encountered include pitchers, ladles, effigies, pinch pot, and other specialized forms. Most frequently, Navajo vessels consist of

wide-mouthed jars that were used for food preparation and storage. Anasazi vessels, on the other hand, include a wider range of forms. Identification of vessel form is an important attribute for characterizing the functional aspects of a ceramic assemblage.

Vessel Portion

Under the vessel portion category, sherds were assigned rim, neck, body, base, and appendage designations. Rim sherds are identified by the presence of the rim lip. Neck sherds are generally identified for ollas which have a distinctive curvature. Body sherds are identified by the absence of a rim lip and a consistent convex shape. Sherds from the base of a vessel generally are thicker than other vessel portions, have a flattened area for sitting on a flat surface, or have distinctive use-wear marks resulting from repeated scraping of the vessel base on a hard surface. Sherds with evidence of a handle, lug, or applique were identified as appendage under vessel portion. Finally, sherds that did not fit any of the specific vessel portions were placed in an "other" category. A good example of pieces placed into the "other" category is a group of clay fragments from site NM-Q-23-62 that are not from a ceramic vessel, but rather appear to be from a clay cover or seal possibly placed over a cist.

Count and Weight

All sherds within a lot were counted and weighed in grams as a group. Sherd counts alone can be misleading depending on the size of the sherds and may result in an over- or underestimation of potential vessel numbers. Weight provides a means of evaluating the interpretative potential of sherd counts and of compensating for the inadequacy of sherd counts in accurately representing the actual quantity of ceramics.

Comments

A "comments" field was included in the testing phase ceramic data base to record any additional observations noted during analysis. The comments column was used to identify, for example, sherds that conjoin and sherds that evidence fugitive red pigment, sooting, drill holes, or worked edges. Also, for sherds that have appendages, a more specific description of the appendage was provided in the comments. Individual vessels and assignment of vessel numbers were recorded only in cases for which sherds representing a single vessel were obvious. For site NM-Q-23-60, identification of individual vessels was undertaken as a means of confidently assigning rough-sort and traditional ceramic types. For site NM-Q-23-62, several FS bags had large numbers of sherds easily identified as comprising single vessels. In these two cases, vessel numbers were assigned and included in the comments field. Because identifying individual vessels is generally time-consuming, it was not undertaken for any of the other assemblages. Data recorded in the comments may be useful for identifying sherds with additional research potential that may be selected for more analysis during the next data recovery phase.

Traditional Ceramic Type

Upon completion of the rough-sort phase, a sample of sherds was selected for assignment of traditional ceramic types. All sherds identified as typeable during the rough-sort phase and

assigned stylistically specific rough-sort types (e.g., Red Mesa Black-on-white, plain gray rim [Lino style], erect corrugated gray rim [Mancos style], or La Plata Black-on-white) were selected for traditional ceramic type analysis. In addition, all redware sherds and gray/brownware rims were selected for traditional ceramic type analysis. Based on the rough-sort type, surface treatment, paint type (if applicable), and temper, sherds in the sample were placed into traditional types. Recording of temper and paint type was not included in the testing phase analysis, but rather was subsumed under the series and type designations. For example, mineral-painted, sand-tempered (also sandstone- and crushed sherd-tempered) sherds were assigned to the Cibola tradition and typed on the basis of surface treatment and painted design styles. The following section on ceramic typology outlines the basic strategy employed during the N11 testing phase for assigning ceramic types and placing sites within general temporal ranges.

CERAMIC TYPOLOGY

The ceramic typology employed during analysis of the N11 testing assemblage follows the traditional ware, series, and type classification initially devised by Colton and Hargrave (1937). Since that time, the traditional ceramic typology for the northern Southwest has been continually expanded and refined. For assignment of traditional types under the Cibola series, the analysis follows the typology set forth by Windes and McKenna (1989) and McKenna and Toll (1984). Identification and classification of Obelisk Utility and the gray/brownware tradition follows that outlined by Reed et al. (1997) and Hays-Gilpin et al. (1998). The small number of sherds belonging to the Northern San Juan (Mesa Verde) tradition are typed based on descriptions presented by Blinman and Wilson (1989) and Breternitz et al. (1974). Mogollon Brown Ware is identified following the descriptions presented by Wendorf (1953). Finally, the Protohistoric sherds are assigned ceramic types based on the descriptions of Navajo Gray Ware presented by Brugge (1963, 1981), descriptions of Jeddito Yellow Ware presented by Colton (1956), and descriptions of Zuni Glaze Ware and Puebloan Utility Ware presented by Dittert and Plog (1980).

With regard to the temporal placement of ceramic assemblages based on the ceramic typology, a number of broad diachronic trends in ceramic technology and style were employed. During the Basketmaker III period, ceramic assemblages, for the most part, were homogenous and isolation of short temporal spans of less than 100 years based on ceramic cross dating and mean dating is difficult. The ratio of grayware to gray/brownware and the relative frequency of painted sherds, however, is a useful measure for identifying early versus late Basketmaker III assemblages. Following the recent work of Wilson and Blinman (1994), Skibo and Blinman (1996), and Reed et al. (1997), the interpretation of Basketmaker ceramic technology and resource use is undergoing change. Briefly, the gray, white, and redware technologies characteristic of late Basketmaker III through Pueblo III assemblages appear to have their roots in a pan-Southwestern brownware technology. A growing number of sites across the Colorado Plateau have yielded evidence of locally produced brownware vessels dating between AD 200 and 500 (Reed et al. 1997). This brownware technology, at least on the Colorado Plateau, was focused on alluvial clays that were in many cases self-tempered with silt or fine sand. Between AD 500 and 600 in many areas of the Colorado Plateau, potters began experimenting more extensively with geologic clays and adding coarse-grained temper to the raw clays (Reed et al. 1997). In general, clay resources on the Colorado Plateau are of sedimentary origin and, as such, are technically redeposited clays, as opposed to

residual clays that form in situ from native stone (Rice 1987:37). The age of the clay source, however, determines its classification as alluvial or geologic. Clays originating from ancient sedimentary deposits (geological contexts) are broadly classified as geologic clays and those from more recent, redeposited context are classified as alluvial clays. Alluvial clays generally contain greater amount of organic and aplastic inclusions, have higher iron and content, and are readily available in drainages (Rice 1987; Wilson and Blinman 1993).

The term gray/brownware has been proposed for classification of sherds having a brownish paste color, silty paste texture, friable paste fracture, and intentionally added, coarse-grained temper (Reed et al. 1997). Many assemblages dating to the AD 500s are characterized by a visible transition in vessel surface and paste color from brownish to the more characteristic gray, increasing addition of temper, and increasing size of temper grains. It appears that potters during this time were looking beyond the standard brownware recipe and searching for clays and temper to produce sturdier, more thermal-resistant ceramic vessels. By the early AD 600s, the transition in resource selection was complete and assemblages postdating AD 600 have a greater ratio of grayware to gray/brownware. Thus, Basketmaker III assemblages may be placed into early and late designations based on this relative threshold in technology which occurred at roughly AD 600. For the N11 testing assemblage, site NM-Q-23-62 is the only site having a ceramic assemblage with a pre-AD 600 typological configuration.

Very few sherds in the N11 testing assemblage were assigned to Pueblo I types and none of the assemblages appear to date to the Pueblo I period. Although White Mound Black-on-white was identified in two of the Basketmaker III assemblages, the type does not indicate a Pueblo I component and is commonly identified in late Basketmaker III assemblages. The same is true of Kiatuthlanna Black-on-white, a late Pueblo I type, commonly identified in early Pueblo II assemblages. Gallup Black-on-white and Dogoszhi-style hatching in general, however, is a temporal indicator of assemblages dating after AD 1000 (Goff and Reed 1996a; Hays-Gilpin et al. 1998; Reed and Hensler 1996b). For the N11 testing assemblages, the presence of Gallup black-on-white is interpreted as indicating a post-AD 1000 assemblage.

Grayware types were generally long-lived, but also may be utilized as a chronometric tool in identifying at least two temporal thresholds. The first threshold occurs between approximately AD 800 and 850, when neckbanding became a common grayware surface treatment. Wide neckbanded (band width >10 mm) types generally indicate assemblages dating between AD 800 and 900, although wide neckbanding occurs in smaller numbers after AD 900. Narrow neckbanding (band width <10 mm) is seen in late Pueblo I assemblages, but was most prevalent in the early to middle AD 900s. By about AD 975, neck-corrugated vessels became common but recently have been interpreted as an extremely short-lived style (Hays-Gilpin et al. 1998; Pierce 1996; Reed and Hensler 1996b). It appears that neck-corrugated vessels are present in assemblages dating only between AD 975 and 1000 and frequently are difficult to identify without sherds having both smoothed and corrugated surface treatments at the point just below the neck. Because narrow neckbanded vessels commonly are identified in assemblages having corrugated sherds, the ratio of smoothed sherds to corrugated sherds may be deceiving if narrow neckbanded sherds are not considered. There appears to be a short temporal span between AD 975 and 1025 during which corrugated, neckbanded, and Red Mesa Black-on-white vessels occur in assemblages lacking Gallup

Black-on-white. Two sites (NM-Q-27-13 and NM-Q-23-59) appear to date to the AD 975 to 1025 period. The remaining Pueblo II sites have assemblages with abundant Gallup Black-on-white sherds and corrugated sherds, from which is inferred a post-AD 1000 occupation.

The single Protohistoric assemblage (site NM-Q-23-60) includes Jeddito Black-on-yellow, Hawikuh Polychrome, Dinetah Gray, and Puebloan utility ware. Because Jeddito Black-on-yellow has a long temporal span (AD 1325 to 1600), it is generally not a good temporal indicator on Protohistoric Navajo sites (Reed and Reed 1992). Hawikuh Polychrome, on the other hand, has a relatively short temporal span (AD 1630 to 1680; Dittert and Plog 1980) and along with the Dinetah Gray sherds provides a means of placing the site in a temporal context.

CERAMIC ASSEMBLAGES

The following discussion presents the ceramic data for each site along the proposed N11(1&2) road yielding ceramic artifacts during the testing phase. For the 10 sites (NM-Q-27-13, NM-Q-22-52, NM-Q-23-54, NM-Q-23-56, NM-Q-23-57, NM-Q-23-58, NM-Q-23-60, NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64) that will be recommended for further investigation during the next data recovery phase, the research potential of each site pertaining to the ceramic data is discussed. Monitoring of two sites (NM-Q-22-48 and NM-Q-22-53) will be recommended during construction activities. The research potential of the sites is also discussed. Five sites (NM-Q-27-15, NM-Q-22-45, NM-Q-22-51, NM-Q-23-55, and NM-Q-23-59) will not be recommended for further excavations and the research potential of the ceramic assemblages is exhausted through this analysis and interpretation.

Site NM-Q-27-13

A total of 161 ceramic artifacts weighing 520.4 g were recovered from site NM-Q-27-13 during the testing phase. From the exfoliated condition of the majority of sherds in this assemblage, it is suggested that at least one of the excavated features was used as a kiln. The remaining sherds include predominate Pueblo II period types identified as corrugated gray and Escavada or Pueblo I/II black-on-white. Based on the large number of corrugated grayware and Pueblo I/II-style whiteware, the assemblage probably dates to the middle Pueblo II period. Also, considering that corrugated grayware occurs predominate in post-AD 1000 assemblages, the site NM-Q-27-13 assemblage probably does not date much earlier than AD 1000. The absence of Gallup black-on-white, however, supports a pre-AD 1025 assemblage.

As indicated in Table 25.2, approximately 60% of the sherds from site NM-Q-27-13 are exfoliated fragments. Many (n=78) of the exfoliated fragments were recovered in and around Feature 2 and probably represent a single vessel. Based on data obtained from the annual Kiln Conference at the Crow Canyon Archaeological Center in Cortez, Colorado and recent research on prehistoric kiln construction and technology (Blinman 1992; Brisbin 1993; Purcell 1993; Swink 1993), exfoliated and bloated sherd fragments are commonly found in kiln features. It is probable that these fragments are the remains of cover sherds placed over the pots as protection during firing. Cover sherds probably were used during multiple firings until they became fragmented, bloated, and exfoliated. The exfoliated fragments from site NM-Q-27-13 are classic examples of discarded cover

Table 25.2. Summary of Rough-sort Types from Site NM-Q-27-13.

Rough-sort Type	Count n	Count %	Weight (g) g	Weight (g) %
Grayware				
Plain gray rim (Lino style)	1	0.6	5.1	1.0
Indeterminate gray rim	2	1.2	11.9	2.3
Plain gray	8	5.0	24.8	4.8
Banded gray	2	1.2	10.9	2.1
Corrugated gray	33	20.5	146.0	28.1
Whiteware				
Escavada Black-on-white	1	0.6	5.1	1.0
Pueblo I/II Black-on-white	12	7.5	39.5	7.6
Indeterminate black-on-white	1	0.6	1.9	0.4
Not examined				
Too small	5	3.1	13.7	2.6
Exfoliated cover sherds	96	59.6	261.5	50.2
Total	161	100.0	520.4	100.0

sherds similar to those identified in and around other kiln features (Brisbin 1993; DeMar and Wilcox 1995; Purcell 1993). The remaining five sherds classified as "not examined" are too small for analysis and are not part of the exfoliated cover sherd assemblage.

Sherds large and complete enough to assign rough-sort types indicate that the site dates to the middle Pueblo II period. Corrugated gray is the most commonly identified rough-sort type, followed by Pueblo I/II Black-on-white. One rim sherd is identified as a plain gray rim (Lino style), but does not necessarily indicate an earlier component. Banded gray and plain gray sherds also are present in the assemblage. One Escavada Black-on-white sherd is identified in the whiteware assemblage, also indicating a Pueblo II period assemblage. Unfortunately, most of the whiteware sherds lack enough design to assign more stylistically specific rough-sort types. Based on surface treatment and the small amount of design present on these sherds, however, a broad stylistic designation of Pueblo I/II Black-on-white was assigned to 12 sherds.

Vessel form and portion data for the site NM-Q-27-13 assemblage indicate, in general, that all of the grayware sherds are from jars and the whiteware sherds are from both jars and bowls (Table 25.3). All of the plain and corrugated gray body sherds are from jars and the banded gray sherds include one from the body portion of a jar and one from the neck portion of a jar. The three grayware rims appear to originate from wide-mouthed jars. Although one rim sherd was identified was a plain gray rim (Lino style), it is not uncommon for corrugated sherds to have extremely wide fillets that could be assigned a plain gray rim designation if the fillet is a fragment. During this analysis, plain rims larger that 4 cm from the rim lip to the bottom of the sherd were assigned a rough sort type of plain gray rim (Lino style).

Table 25.3. Vessel Form and Portion for Rough-sort Types from Site NM-Q-27-13.

	Bowl				Jar (unspecified)				Wide-mouthed jar			
	Body		Rim		Body		Neck		Rim		Total	
Rough-sort Type	n	%	n	%	n	%	n	%	n	%	n	%
Grayware												
Plain gray rim (Lino style)	-	-	-	-	-	-	-	-	1	100.0	1	100
Indeterminate gray rim	-	-	-	-	-	-	-	-	2	100.0	2	100
Plain gray	-	-	-	-	8	100.0	-	-	-	-	8	100
Banded gray	-	-	-	-	1	50.0	1	50.0	-	-	2	100
Corrugated gray	-	-	-	-	33	100.0	-	-	-	-	33	100
White Ware												
Escavada Black-on-white	-	-	1	100.0	-	-	-	-	-	-	1	100
Pueblo I/II Black-on-white	4	33.3	1	8.3	7	58.3	-	-	-	-	12	100
Indeterminate black-on-white	1	100.0	-	-	-	-	-	-	-	-	1	100
Total	5	8.3	2	3.3	49	81.7	1	1.7	3	5.0	60	100

Whiteware from site NM-Q-27-13 includes sherds from both jars and bowls. The Escavada Black-on-white sherd is from the rim portion of a bowl. The Pueblo I/II Black-on-white sherds include four bowl body fragments, one bowl rim fragment, and seven jar body fragments. The single sherd identified as indeterminate black-on-white is from the body portion of a bowl.

Three sherds were selected for assignment of traditional ceramic types. The single plain gray rim (Lino style) is identified as Lino Gray of the Cibola tradition, the jar neck fragment with narrow neckbands is identified as Tohatchi Neckbanded, and the Escavada Black-on-white sherd is typed as Escavada Black-on-white. Based on the large number of corrugated sherds along with Escavada Black-on-white and Tohatchi Neckbanded, site NM-Q-27-13 probably dates between AD 975 and 1025.

The research potential of this site for contributing to our understanding of ceramic production in the San Juan Basin is excellent. McKenna and Windes (1995) indicate that evidence for pottery production in Chaco Canyon is not overwhelming and very few kiln features have been identified in the central San Juan Basin. Thus, the kiln features from site NM-Q-27-13 have great potential for identifying Pueblo II period ceramic resource utilization and understanding ceramic firing technology in an area where few opportunities have been available for studying Pueblo II pottery kilns.

Site NM-Q-22-48

During testing at site NM-Q-22-48, 108 sherds weighing 461.6 g were recovered. Of these, 24 are too small or are exfoliated on one or more surfaces (Table 25.4). Rough-sort types include commonly identified Pueblo II styles, such as Red Mesa, Gallup black-on-white, and erect corrugated rim (Mancos style). The eight sherds selected for traditional ceramic type analysis are identified as Pueblo II Coolidge All-over Corrugated, Red Mesa, and Gallup black-on-white. Based on the rough-sort and traditional ceramic types, the site probably dates to the late Pueblo II period (AD 1000 to 1150).

Table 25.4. Summary of Rough-sort Types from Site NM-Q-22-48.

	Count		Weight	
Rough-sort Type	n	%	g	%
Grayware				
Erect corrugated rim (Mancos style)	1	0.9	16.6	3.6
Indeterminate gray rim	2	1.9	17.3	3.8
Plain gray	7	6.5	29.1	6.3
Corrugated gray	47	43.5	207.9	45.0
Whiteware				
Red Mesa Black-on-white	1	0.9	2.9	0.6
Gallup Black-on-white	6	5.6	73.6	15.9
Pueblo I/II Black-on-white	5	4.6	32.3	7.0
Indeterminate Black-on-white	12	11.1	40.2	8.7
Slipped white	3	2.8	20.4	4.4
Not Examined				
Too small or exfoliated	24	22.2	21.3	4.6
Total	108	100.0	461.6	100.0

As shown in Table 25.4, the majority (53%) of the assemblage is grayware, 25% is whiteware, and 22% of the sherds are too small or exfoliated. Grayware sherds include indeterminate gray rims, corrugated gray, and plain gray. Whiteware sherds include Gallup, Red Mesa, Pueblo I/II black-on-white, and indeterminate black-on-white. Unfortunately, the site NM-Q-22-48 assemblage includes few typeable whiteware sherds with over half of the whiteware assemblage classified as indeterminate black-on-white and slipped white.

From the vessel form and portion data, it appears that the majority (86%) of sherds are from jars; bowl sherds comprise only 11% of the assemblage (Table 25.5). The erect corrugated rim (Mancos style) and one of the indeterminate gray rims are large enough to assign a more specific shape of wide-mouthed jar. Most of the remaining grayware sherds, however, are from the body portion of jars. The whiteware assemblage shows a more even distribution of vessel forms with both bowls and jars represented. The Red Mesa Black-on-white sherd is from a jar and the Gallup Black-on-white sherds include portions of both bowls and jars.

Eight sherds from site NM-Q-22-48 are included in the traditional ceramic type sample and are all identified as Cibola series. This small group of typeable sherds includes one Pueblo II Coolidge All-over Corrugated, one Red Mesa Black-on-white, and six Gallup Black-on-white. These data support the initial impression of site NM-Q-22-48 as a late Pueblo II assemblage.

In summary, the ceramic assemblage from site NM-Q-22-48 appears to represent a single component dating between AD 1000 to 1150. Rough-sort data indicate an assemblage dominated by corrugated gray and Gallup Black-on-white. The sample selected for traditional ceramic type analysis supports this interpretation. The eight typeable sherds are all Cibola series, including Gallup and Red Mesa black-on-white, and Pueblo II Coolidge All-over Corrugated.

Site NM-Q-22-52

A total of 305 sherds weighing 1778.6 g were recovered during testing at site NM-Q-22-52. Of this assemblage, 90 sherds are identified as too small or are exfoliated on one or more surfaces. These sherds are not assigned rough-sort types and are not discussed further. The remaining 215 sherds are assigned rough-sort types, including stylistic classifications of Kiatuthlanna, Red Mesa, Escavada, and Gallup black-on-white, and erect corrugated rim (Mancos style). Forty-eight sherds are identified as typeable and are included in the traditional ceramic type analysis. Based on the rough-sort and traditional ceramic types, site NM-Q-22-52 dates to the late Pueblo II period (AD 1000 to 1150).

Based on the rough-sort analysis, the majority (49%) of sherds from site NM-Q-22-52 are grayware, 22% are whiteware, and 29% are unexamined (Table 25.6). The bulk (n=101) of the grayware assemblage consists of corrugated gray sherds. The remaining grayware sherds include plain gray rims (Lino style), erect corrugated rims (Mancos style), indeterminate gray rims, plain gray, polished gray, and banded gray. The whiteware assemblage consists of Kiatuthlanna, Red Mesa, Escavada, Gallup, Pueblo I/II, and indeterminate black-on-white, and slipped whiteware sherds. Most of the typeable ceramics (n=25) are Gallup Black-on-white. Not included in Table 25.6 are two raw clay samples weighing 2.6 g and 0.1 g, respectively. The small amount of the clay samples recovered may limit further analysis during the next data recovery phase.

Table 25.5. Vessel Form and Portion for Rough-sort Types from Site NM-Q-22-48.

	Bowl				Indeterminate		Jar (unspecified)				Wide-mouthed Jar		Total	
	Body		Rim		Body		Body		Rim		Rim			
Rough-sort Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grayware														
Erect corrugated rim (Mancos style)	-	-	-	-	-	-	-	-	-	-	1	100.0	1	100
Indeterminate gray rim	-	-	-	-	-	-	-	-	1	50.0	1	50.0	2	100
Plain gray	-	-	-	-	1	14.3	6	85.7	-	-	-	-	7	100
Corrugated gray	-	-	-	-	-	-	47	100.0	-	-	-	-	47	100
White Ware														
Red Mesa Black-on-white	-	-	-	-	-	-	1	100.0	-	-	-	-	1	100
Gallup Black-on-white	2	33.3	-	-	-	-	4	66.7	-	-	-	-	6	100
Pueblo I/II Black-on-white	-	-	-	-	-	-	5	100.0	-	-	-	-	5	100
Indeterminate black-on-white	5	41.7	1	8.3	-	-	6	50.0	-	-	-	-	12	100
Slipped white	1	33.3	-	-	-	-	2	66.7	-	-	-	-	3	100
Total	8	9.5	1	1.2	1	1.2	71	84.5	1	1.2	1	2.4	84	100

Table 25.6. Summary of Rough-sort Types from Site NM-Q-22-52.

Rough-sort Type	Count		Weight	
	n	%	g	%
Grayware				
Plain gray rim (Lino style)	2	0.7	8.9	0.5
Erect corrugated rim (Mancos style)	5	1.6	87.4	4.9
Indeterminate gray rim	3	1.0	13.0	0.7
Plain gray	27	8.9	195.9	11.0
Polished gray	1	0.3	3.9	0.2
Banded gray	9	3.0	96.1	5.4
Corrugated gray	101	33.1	694.9	39.1
Whiteware				
Kiatuthlanna Black-on-white	2	0.7	11.1	0.6
Red Mesa Black-on-white	12	3.9	100.0	5.6
Escavada Black-on-white	1	0.3	16.1	0.9
Gallup Black-on-white	25	8.2	303.8	17.1
Pueblo I/II Black-on-white	17	5.6	105.8	5.9
Indeterminate black-on-white	8	2.6	35.2	2.0
Slipped white	2	0.7	14.4	0.8
Not examined				
Too small or exfoliated	90	29.5	92.1	5.2
Total	305	100.0	1778.6	100.0

The majority (87%) of the rough-sort types (Table 25.7) consisted of jar sherds, followed by bowl sherds (12%), and two ladle fragments (1%). As expected, grayware sherds predominate from jars, but, unfortunately, none of the rim sherds are large enough to assign a more specific jar shape (e.g., seed jar, wide-mouthed jar, or olla). Whiteware sherds include a more varied distribution of vessel forms, and it is suggested that whiteware vessels may have been used in more functionally specific activities. The two ladle fragments are both whiteware, one of which is typed as Gallup Black-on-white. In addition, two plain gray sherds from the same vessel have recessed handles.

A sample of 48 sherds was selected for further analysis. Traditional type classification indicates that all the sherds in the sample are Cibola series. Table 25.8 summarizes the traditional ceramic types that were identified. The types include Lino Gray, Tohatchi Neckbanded (a banded neck portion), Pueblo II Coolidge All-over Corrugated, Kiatuthlanna, Escavada, Gallup, and Red Mesa Black-on-white. Given the high percentage of Gallup, and Red Mesa Black-on-white, and Pueblo II Coolidge All-over Corrugated, a late Pueblo II assemblage (AD 1000 to 1150) is suggested.

Table 25.7. Vessel Form and Portion for Rough Sort Types from Site NM-Q-22-52.

	Bowl				Jar (unspecified)								Ladle				Total	
	Body		Rim		Appendage		Base		Body		Neck		Rim		Appendage		Body			
Rough-sort Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grayware																				
Plain gray rim (Lino style)	-	-	2	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	100
Erect corrugated rim (Mancos style)	-	-	-	-	-	-	-	-	-	-	-	-	5	100.0	-	-	-	-	5	100
Indeterminate gray rim	-	-	-	-	-	-	-	-	-	-	-	-	3	100.0	-	-	-	-	3	100
Plain gray	-	-	-	-	2	7.4	1	3.7	24	88.9	-	-	-	-	-	-	-	-	27	100
Polished gray	-	-	-	-	-	-	-	-	1	100.0	-	-	-	-	-	-	-	-	1	100
Banded gray	-	-	-	-	-	-	1	11.1	7	77.8	1	11.1	-	-	-	-	-	-	9	100
Corrugated gray	-	-	-	-	-	-	-	-	97	96.0	4	4.0	-	-	-	-	-	-	101	100
Whiteware																				
Kiatuthlanna Black-on-white	-	-	1	50.0	-	-	-	-	1	50.0	-	-	-	-	-	-	-	-	2	100
Red Mesa Black-on-white	5	41.7	1	8.3	-	-	-	-	4	33.3	1	8.3	1	8.3	-	-	-	-	12	100
Escavada Black-on-white	1	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100
Gallup Black-on-white	3	12.0	3	12.0	-	-	-	-	15	60.0	1	4.0	2	8.0	-	-	1	4.0	25	100
Pueblo I/II Black-on-white	5	29.4	1	5.9	-	-	-	-	9	52.9	1	5.9	-	-	1	5.9	-	-	17	100
Indeterminate black-on-white	2	25.0	1	12.5	-	-	-	-	5	62.5	-	-	-	-	-	-	-	-	8	100
Slipped white	1	50.0	-	-	-	-	-	-	1	50.0	-	-	-	-	-	-	-	-	2	100
Total	17	7.9	9	4.2	2	0.9	2	0.9	164	76.3	8	3.7	11	5.1	1	0.5	1	0.5	215	100

Table 25.8. Summary of Ceramic Series and Type for a Sample of Sherds from Site NM-Q-22-52.

Ceramic Type	n	%
Cibola Gray Ware		
Lino Gray	2	4.2
Tohatchi Neckbanded	1	2.1
Pueblo II Coolidge All-over Corrugated	5	10.4
Cibola White Ware		
Kiatuthlanna Black-on-white	2	4.2
Red Mesa Black-on-white	12	25.0
Escavada Black-on-white	1	2.1
Gallup Black-on-white	25	52.1
Total	48	100.0

In summary, the ceramic assemblage from site NM-Q-22-52 consists of a single component dating between AD 1000 and 1150. The vast majority of the ceramics are grayware of which most are from utility vessels, and all of the typeable sherds are identified as Cibola series. The decorated ceramics include both bowls and jars. This site has excellent potential for exploring a number of research issues related to Pueblo II ceramic production, technology, function, and exchange.

Site NM-Q-22-53

A total of 358 sherds weighing 848.7 g were recovered during testing at site NM-Q-22-53. Of these, 146 are too small or have one or more exfoliated surfaces. These sherds are not included in the discussion of the assemblage. The remaining 212 sherds were assigned rough-sort types, of which 16 were assigned temporally diagnostic styles, including Red Mesa, Escavada, and Gallup black-on-white, plain gray rim (Lino style), and narrow neckbanded rim (Mancos style). The group of 16 diagnostic sherds are assigned traditional ceramic types and all are identified as Cibola series. Based on the rough-sort and traditional ceramic types, site NM-Q-22-53 probably dates to the late Pueblo II period (AD 1000 to 1150).

Grayware sherds include plain gray rims (Lino style), narrow neckbanded rims (Mancos style), indeterminate gray rims, corrugated gray, narrow banded, polished gray, and plain gray (Table 25.9). Plain gray and corrugated gray sherds dominate the assemblage. The decorated assemblage consists of Red Mesa, Escavada, Gallup, Pueblo I/II, and indeterminate black-on-white ceramics.

Vessel form and portion data (Table 25.10) indicate that the majority (89%) of sherds are from jars, followed by bowl fragments (9%), indeterminate vessel forms with appendages (1%), and a single body sherd from a ladle (1%) (Table 25.10). As expected, the assemblage is comprised predominate of plain and corrugated jar body sherds. Unfortunately, the six grayware rims are not large enough to assign a more specific jar shape (e.g., seed jar, wide-mouthed jar, or olla). The single grayware bowl sherd is polished gray and is probably from the unpainted portion of a decorated vessel. Similar to the assemblage from site NM-Q-22-52, Red Mesa Black-on-white

Table 25.9. Summary of Rough-sort Types from Site NM-Q-22-53.

Rough-sort Type	Count		Weight	
	n	%	g	%
Grayware				
Plain gray rim (Lino style)	1	0.3	7.5	0.9
Narrow neckbanded rim (Mancos style)	1	0.3	1.1	0.1
Indeterminate gray rim	4	1.1	11.5	1.4
Plain gray	81	22.6	287.9	33.9
Polished gray	1	0.3	3.1	0.4
Banded gray	18	5.0	38.3	4.5
Corrugated gray	66	18.4	174.0	20.5
Whiteware				
Red Mesa Black-on-white	5	1.4	28.0	3.3
Escavada Black-on-white	1	0.3	9.5	1.1
Gallup Black-on-white	8	2.2	61.8	7.3
Pueblo I/II Black-on-white	12	3.4	47.6	5.6
Indeterminate Black-on-white	12	3.4	35.1	4.1
Slipped white	2	0.6	22.3	2.6
Not examined				
Too small or exfoliated	146	40.8	121.0	14.3
Total	358	100.0	848.7	100.0

Table 25.10. Vessel Form and Portion for Rough-sort Types from Site NM-Q-22-53.

	Bowl				Indeterminate		Jar (Unspecified)						Ladle		Total	
	Body		Rim		Appendage		Body		Neck		Rim		Body			
Rough-sort Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grayware																
Plain gray rim (Lino style)	-	-	-	-	-	-	-	-	-	-	1	100.0	-	-	1	100
Narrow neckbanded rim (Mancos style)	-	-	-	-	-	-	-	-	-	-	1	100.0	-	-	1	100
Indeterminate gray rim	-	-	-	-	-	-	-	-	-	-	4	100.0	-	-	4	100
Plain gray	-	-	-	-	2	2.5	78	96.3	1	1.2	-	-	-	-	81	100
Polished gray	1	100.0	-	-	-	-	-	-	-	-	-	-	-	-	1	100
Banded gray	-	-	-	-	-	-	18	100.0	-	-	-	-	-	-	18	100
Corrugated gray	-	-	-	-	-	-	66	100.0	-	-	-	-	-	-	66	100
Whiteware																
Red Mesa Black-on-white	1	20.0	-	-	-	-	3	60.0	-	-	-	-	1	20.0	5	100
Escavada Black-on-white	-	-	-	-	-	-	1	100.0	-	-	-	-	-	-	1	100
Gallup Black-on-white	5	62.5	2	25.0	-	-	1	12.5	-	-	-	-	-	-	8	100
Pueblo I/II Black-on-white	5	41.7	1	8.3	-	-	6	50.0	-	-	-	-	-	-	12	100
Indeterminate black-on-white	4	33.3	1	8.3	-	-	7	58.3	-	-	-	-	-	-	12	100
Slipped white	-	-	-	-	-	-	1	50.0	1	50.0	-	-	-	-	2	100
Total	16	7.5	4	1.9	2	0.9	181	85.4	2	0.9	6	2.8	1	0.5	212	100

sherds are primarily from jars and Gallup Black-on-white sherds are primarily from bowls. This distribution of whiteware vessel forms may indicate functional differences between the two types, but a larger sample is required to confidently assess functional differences in the assemblage.

All 16 sherds selected for traditional type analysis are assigned to the Cibola series, a pattern similar to the other Pueblo II sites in the project area. These 16 sherds include 1 Escavada, 8 Gallup, 5 Red Mesa black-on-white, 1 Tohatchi Neckbanded, and 1 Lino Gray. Considering the large number of Gallup Black-on-white and corrugated gray sherds, this group of ceramic types is believed to be an assemblage dating after AD 1000.

Based on the rough-sort and traditional type analysis, the ceramic assemblage from site NM-Q-22-53 probably represents a single component dating between AD 1000 to 1150. All of the typeable sherds are identified as Cibola series. The noticeable lack of Chuska series pottery from site NM-Q-22-53 and other Pueblo II sites in the project area represents a research issue that will be explored in greater detail during the next data recovery phase. This site in conjunction with other Pueblo II assemblages in the project area has excellent potential for exploring ceramic production, technology, function, and exchange.

Site NM-Q-22-54

During testing at site NM-Q-22-54, 157 ceramic artifacts weighing 700.9 g were recovered. Of these, 54 sherds weighing 43.7 g are too small or have one or more exfoliated surfaces. These sherds are not included in the discussion of the assemblage that follows. The remaining 103 sherds are assigned rough-sort types. Only eight sherds are considered typeable and are assigned traditional ceramic types. Based on the rough-sort and traditional types (primarily corrugated gray, Red Mesa, Reserve, and Gallup Black-on-white) the assemblage dates to the late Pueblo II period (AD 1000 to 1150).

The assemblage includes 76% grayware and 24% whiteware (Table 25.11). Grayware sherds from site NM-Q-22-54 include indeterminate gray rims, plain gray, polished gray, banded gray, and corrugated gray. None of the grayware rims are large enough or have enough surface area to confidently assign a stylistic designation. Corrugated gray, however, is the most prevalent rough-sort type, supporting a late Pueblo II assemblage. Whiteware includes Gallup, Red Mesa, Escavada/Gallup, Pueblo I/II, and indeterminate black-on-white, and slipped white. These painted styles are commonly identified in late Pueblo II assemblages along with corrugated gray vessels.

Sherds from jars comprise roughly 95% of the ceramic assemblage, most of which are from body portions (Table 25.12). Grayware sherds are dominated by jar body sherds and the three indeterminate gray rims lack enough surface area to assign a form more specific than jar (unspecified shape). In contrast, the whiteware assemblage includes both bowls and jars. Similar to the other Pueblo II assemblages, whiteware jar sherds occur more frequently than bowl sherds. The significance of gray- and whiteware vessel shapes in relation to functional differences will be explored in more detail during the next data recovery phase. Nonetheless, based on this small sample of sherds and similar patterns seen in the other Pueblo II assemblages, differences in vessel function may occur among whiteware types. One of the Gallup Black-on-white body sherds has an indeterminate drill hole and will be examined in more detail during the next data recovery phase.

Table 25.11. Summary of Rough-sort Types from Site NM-Q-22-54.

Rough-sort Type	Count		Weight	
	n	%	g	%
Grayware				
Indeterminate gray rim	3	1.9	14.0	2.0
Plain gray	16	10.2	80.6	11.5
Polished gray	1	0.6	9.2	1.3
Banded gray	5	3.2	10.3	1.5
Corrugated gray	53	33.8	314.0	44.8
Whiteware				
Red Mesa Black-on-white	1	0.6	15.0	2.1
Escavada/Gallup Black-on-white	3	1.9	33.0	4.7
Gallup Black-on-white	4	2.5	75.1	10.7
Pueblo I/II Black-on-white	9	5.7	48.5	6.9
Indeterminate black-on-white	7	4.5	54.1	7.7
Slipped white	1	0.6	3.4	0.5
Not examined				
Too small or exfoliated	54	34.4	43.7	6.2
Total	157	100.0	700.9	100.0

Table 25.12. Vessel Form and Portion for Rough-sort Types from Site NM-Q-22-54.

	Bowl				Jar (Unspecified)								Total	
	Body		Rim		Base		Body		Neck		Rim			
Rough-sort Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grayware														
Indeterminate gray rim	-	-	-	-	-	-	-	-	-	-	3	100.0	3	100
Plain gray	-	-	-	-	-	-	16	100.0	-	-	-	-	16	100
Polished gray	-	-	-	-	-	-	1	100.0	-	-	-	-	1	100
Banded gray	-	-	-	-	-	-	5	100.0	-	-	-	-	5	100
Corrugated gray	-	-	-	-	1	1.9	52	98.1	-	-	-	-	53	100
Whiteware														
Red Mesa Black-on-white	-	-	1	100.0	-	-	-	-	-	-	-	-	1	100
Escavada/Gallup Black-on-white	-	-	-	-	-	-	3	100.0	-	-	-	-	3	100
Gallup Black-on-white	1	25.0	-	-	-	-	3	75.0	-	-	-	-	4	100
Pueblo I/II Black-on-white	2	22.2	-	-	-	-	4	44.4	3	33.3	-	-	9	100
Indeterminate Black-on-white	1	14.3	-	-	-	-	6	85.7	-	-	-	-	7	100
Slipped white	-	-	-	-	-	-	1	100.0	-	-	-	-	1	100
Total	4	3.9	1	1.0	1	1.0	91	88.3	3	2.9	3	2.9	103	100

The sample of sherds selected for traditional type analysis indicate that all are Cibola series. The eight sherds in the traditional type sample include one Red Mesa, four Gallup, and three Reserve black-on-white. The occurrence of these ceramics types supports a late Pueblo II assemblage.

The ceramic assemblage from site NM-Q-22-54 consists of a single component probably dating between AD 1000 to 1150. The sherds selected for traditional type analysis are all identified as Cibola series. There is a noticeable absence of Chuska series sherds, possibly resulting from different trade networks from those evident in other areas of the San Juan Basin and in Chaco Canyon. The significance of this pattern in Pueblo II assemblages will be explored in greater detail during the next data recovery phase.

Site NM-Q-23-55

During testing of site NM-Q-23-55, two plain gray body sherds weighing 34.7 g were recovered. They represent the remains of two different jars. Both sherds have sand temper and were assigned to the Cibola tradition, but were not assigned a traditional ceramic type. For the most part, grayware body sherds are untypeable and traditional ceramic types are assigned only to grayware rims. Thus, these two sherds are nondiagnostic and could date anytime between the Basketmaker III and Pueblo III periods (AD 600 to 1300).

Site NM-Q-23-56

A total of 221 ceramic artifacts weighing 1765.2 g were recovered during testing at site NM-Q-23-56. Of these, 23 are too small or have one or more exfoliated surfaces. These sherds are not included in the discussion of the assemblage that follows. The remaining 198 sherds are assigned rough-sort types, including erect corrugated rim (Mancos style), Red Mesa, Escavada, and Gallup Black-on-white, and Pueblo I/II black-on-red. A sample of 28 sherds was selected for traditional ceramic type analysis. Based on the presence of corrugated gray, Red Mesa, Escavada, and Gallup Black-on-white, indeterminate White Mountain Red Ware, and Bluff Black-on-red, site NM-Q-23-56 dates to the late Pueblo II period (AD 1000 to 1150).

The majority (80%) of the grayware ceramics consist of corrugated gray rim and body sherds (Table 25.13). The two corrugated rim sherds were identified as Mancos-style erect corrugated rims with little or no rim eversion. In addition, indeterminate gray rim, narrow banded, plain gray, and polished gray sherds are present. Two of the corrugated sherds have appendages, including an indeterminate handle stub and a lug. The decorated assemblage includes primarily Gallup, Pueblo I/II, and indeterminate black-on-white, along with a handful of Red Mesa and Escavada black-on-white sherds. Compared to the other late Pueblo II assemblages, site NM-Q-23-56 is one of the few with redware sherds, including two Pueblo I/II black-on-red. Not included in Table 25.13 is a raw clay sample weighing 0.1 g. The small size of the sample may limit further analysis during the next data recovery phase.

Based on the vessel form and portion data (Table 25.14), the majority (83%) of sherds are from jars, followed by bowl sherds (16%) and two ladle fragments (1%). None of the grayware rims have enough surface area to confidently assign a more specific vessel shape (e.g., seed jar, wide-

Table 25.13. Summary of Rough-sort Types from Site NM-Q-23-56.

Rough-sort Type	Count		Weight	
	n	%	g	%
Grayware				
Erect corrugated rim (Mancos style)	2	0.9	39.8	2.3
Indeterminate gray rim	2	0.9	10.1	0.6
Plain gray	15	6.8	98.7	5.6
Polished gray	2	0.9	12.8	0.7
Banded gray	10	4.5	62.3	3.5
Corrugated gray	113	51.1	991.7	56.2
Whiteware				
Red Mesa Black-on-white	2	0.9	16.5	0.9
Escavada Black-on-white	2	0.9	80.1	4.5
Gallup Black-on-white	19	8.6	158.6	9.0
Pueblo I/II Black-on-white	13	5.9	93.7	5.3
Indeterminate black-on-white	13	5.9	146.7	8.3
Slipped white	3	1.4	13.6	0.8
Redware				
Pueblo I/II Black-on-red	2	0.9	13.8	0.8
Not examined				
Too small or exfoliated	23	10.4	26.8	1.5
Total	221	100.0	1765.2	100.0

Table 25.14. Vessel Form and Portion for Rough-sort Types from Site NM-Q-23-56.

	Bowl				Jar (Unspecified)						Ladle		Total	
	Body		Rim		Body		Neck		Rim		Body			
Rough-sort Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grayware														
Erect corrugated rim (Mancos style)	-	-	-	-	-	-	-	-	2	100.0	-	-	2	100
Indeterminate gray rim	-	-	-	-	-	-	-	-	2	100.0	-	-	2	100
Plain gray	-	-	-	-	14	93.3	-	-	-	-	1	6.7	15	100
Polished gray	1	50.0	1	50.0	-	-	-	-	-	-	-	-	2	100
Banded gray	1	10.0	-	-	9	90.0	-	-	-	-	-	-	10	100
Corrugated gray	-	-	-	-	107	94.7	6	5.3	-	-	-	-	113	100
Whiteware														
Red Mesa Black-on-white	-	-	1	50.0	1	50.0	-	-	-	-	-	-	2	100
Escavada Black-on-white	-	-	-	-	2	100.0	-	-	-	-	-	-	2	100
Gallup Black-on-white	6	31.6	3	15.8	10	52.6	-	-	-	-	-	-	19	100
Pueblo I/II Black-on-white	6	46.2	3	23.1	4	30.8	-	-	-	-	-	-	13	100
Indeterminate black-on-white	5	38.5	1	7.7	5	38.5	-	-	1	7.7	1	7.7	13	100
Slipped white	2	66.7	-	-	1	33.3	-	-	-	-	-	-	3	100
Redware														
Pueblo I/II Black-on-red	1	50.0	-	-	1	50.0	-	-	-	-	-	-	2	100
Total	22	11.1	9	4.5	154	77.8	6	3.0	5	2.5	2	1.1	198	100

mouthed jar, or olla). As expected, the whiteware assemblage includes a greater variety of vessel forms, but the frequency of whiteware jars is similar to other Pueblo II assemblages in the project area. Whiteware sherds are almost evenly divided between jars and bowls. The two ladle fragments include one decorated and one plain gray piece. Finally, the redware sherds include one bowl and one jar fragment.

Based on the traditional type analysis, the assemblage includes types from both the Cibola and Northern San Juan traditions. The two grayware sherds selected for further analysis are identified as Pueblo II Coolidge All-over Corrugated. Whiteware sherds include 19 Gallup jar sherds, 2 Escavada, and 1 Red Mesa black-on-white. The two redware sherds include one indeterminate black-on-red of the White Mountain Red Ware series and one Bluff Black-on-red of the San Juan Red Ware series. In general, White Mountain Red Ware is present in San Juan Basin assemblages after AD 1025 and is a good temporal marker for late Pueblo II assemblages (Carlson 1970). Similar to the other Pueblo II assemblages, Chuska series ceramics are noticeably absent, but trade ware from north and south of the project area is indicated by the redware sherds.

In summary, the ceramic assemblage from site NM-Q-23-56 probably dates between AD 1000 and 1150. This temporal range is based on the large percentage of sherds identified as corrugated gray and Gallup Black-on-white. Also, the presence of a White Mountain Red Ware sherd supports a post-AD 1000 occupation. Ceramic traditions identified during the traditional type analysis include Cibola and Northern San Juan types. The White Mountain Red Ware sherd is included in the Cibola tradition, but represents an imported vessel from the southern Cibola region. Along with the White Mountain Red Ware sherd, the high percentage of corrugated gray and Gallup Black-on-white sherds further supports a late Pueblo II assemblage. As mentioned above, the noticeable absence of Chuska series ceramics from this and other Pueblo II assemblages in the project area is an interesting phenomenon. During the next data recovery phase, the significance of this absence and the implications for exchange of ceramic vessels will be explored.

Site NM-Q-23-57

A total of 12 ceramic artifacts weighing 70.1 g were recovered during testing at site NM-Q-23-57. All of the sherds were analyzed during the rough-sort phase, but only one sherd had sufficient painted design to assign stylistic and traditional types. Based on the presence of Red Mesa Black-on-white and the lack of corrugated grayware and Gallup Black-on-white, site NM-Q-23-57 probably dates to the early Pueblo II period (AD 900 to 1000).

Based on the rough-sort phase, the assemblage includes plain gray, Red Mesa, Pueblo I/II, and indeterminate black-on-white (Table 25.15). The lack of grayware rims precludes the assignment of more specific stylistic types, nevertheless, the absence of corrugated gray sherds is compatible with a pre-AD 1000 assemblage. The only sherd selected for traditional type analysis is the single Red Mesa Black-on-white. As expected, this sherd was typed as Red Mesa Black-on-white of the Cibola series based on temper, paint type, and design style. All of the sherds are from jars, and it is inferred that the assemblage consists of storage and cooking vessels rather than serving vessels (Table 25.16). Additional sherds recovered during the next data recovery phase will provide a larger data set with which to better address questions of temporal placement and vessel function.

Table 25.15. Summary of Rough-sort Types from Site NM-Q-23-57.

Rough-sort Type	Count n	Count %	Weight (g) g	Weight (g) %
Grayware				
Plain gray	9	75.0	59.3	84.6
Whiteware				
Red Mesa Black-on-white	1	8.3	7.3	10.4
Pueblo I/II Black-on-white	1	8.3	2.9	4.1
Indeterminate black-on-white	1	8.3	0.6	0.9
Total	12	100	70.1	100

Table 25.16. Vessel Form and Portion for Rough-sort Types from Site NM-Q-23-57.

Rough-sort Type	Jar (Unspecified) Body n	Body %	Neck n	Neck %	Total n	Total %
Grayware						
Plain gray	6	66.7	3	33.3	9	100
Whiteware						
Red Mesa Black-on-white	-	-	1	100.0	1	100
Pueblo I/II Black-on-white	1	100.0	-	-	1	100
Indeterminate black-on-white	1	100.0	-	-	1	100
Total	8	66.7	4	33.3	12	100

In summary, the ceramic assemblage from site NM-Q-23-57 consists of a single component probably dating between AD 900 to 1000. All of the sherds probably are of the Cibola tradition and the only typeable sherd is Red Mesa Black-on-white. Further research at this site during the next data recovery phase will provide additional data to explore ceramic production, technology, function, and style during the early Pueblo II period. Considering the small number of early Pueblo II sites in the project area, site NM-Q-23-57 has the potential to provide comparative data relevant to the later Pueblo II assemblages and developments influencing changes in ceramic technology and style.

Site NM-Q-23-58

A total of 13 ceramic artifacts weighing 47.7 g were recovered during testing at site NM-Q-23-58. The rough-sort data indicate that none of the white- or grayware sherds are typeable (Table 25.17). From the presence of corrugated sherds, however, the assemblage probably dates later than AD 975. Characteristic of many Pueblo II assemblages, all of the whiteware sherds are from bowls and the grayware sherds are from jars (Table 25.18). Although none of the sherds are typeable and are not assigned traditional ceramic types, a cursory examination of temper and paint type indicate that all of the sherds are Cibola series.

Table 25.17. Summary of Rough-sort Types from Site NM-Q-23-58.

Rough-sort Type	Count		Weight	
	n	%	g	%
Grayware				
Indeterminate gray rim	1	7.7	3.6	7.5
Plain gray	7	53.8	28.9	60.6
Corrugated gray	2	15.4	8.4	17.6
Whiteware				
Pueblo I/II Black-on-white	2	15.4	3.5	7.3
Indeterminate black-on-white	1	7.7	3.3	6.9
Total	13	100.0	47.7	100.0

Table 25.18. Vessel Form and Portion for Rough-sort Types from Site NM-Q-23-58.

Rough-sort Type	Bowl		Jar (Unspecified)				Total	
	Body		Body		Rim			
	n	%	n	%	n	%	n	%
Grayware								
Indeterminate gray rim	-	-	-	-	1	100.0	1	100
Plain gray	-	-	7	100.0	-	-	7	100
Corrugated gray	-	-	2	100.0	-	-	2	100
Whiteware								
Pueblo I/II Black-on-white	2	100.0	-	-	-	-	2	100
Indeterminate black-on-white	1	100.0	-	-	-	-	1	100
Total	3	23.1	9	69.2	1	7.7	13	100

Site NM-Q-23-59

A total of 11 sherds weighing 69.2 g were recovered during testing at site NM-Q-23-59. Of these, one sherd is identified as too small for analysis and is not included in the discussion below. The remaining 10 sherds are assigned rough-sort types corrugated gray, Red Mesa, Escavada, and Pueblo I/II black-on-white (Table 25.19). The distribution of vessel forms indicates that most of the whiteware sherds are from bowls and the single corrugated gray sherd is from a jar (Table 25.20). From these, only two sherds could be assigned traditional ceramic types. Based on the rough-sort types, site NM-Q-23-59 dates to the mid- to late-Pueblo II (AD 1000 to 1150). The two typeable sherds are Red Mesa and Escavada Black-on-white of the Cibola tradition. Based on the traditional ceramic types, which included corrugated gray, Red Mesa and Escavada black-on-white, and the absence of Gallup Black-on-white, this assemblage probably dates between AD 975 and 1025.

Table 25.19. Summary of Rough-sort Types from Site NM-Q-23-59.

Rough-sort Type	Count		Weight	
	n	%	g	%
Grayware				
Corrugated gray	1	9.1	3.5	5.1
Whiteware				
Red Mesa Black-on-white	1	9.1	4.5	6.5
Escavada Black-on-white	1	9.1	20.1	29.0
Pueblo I/II Black-on-white	7	63.6	35.7	51.6
Not examined				
Too small	1	9.1	5.4	7.8
Total	11	100.0	69.2	100.0

Table 25.20. Vessel Form and Portion for Rough-sort Types from Site NM-Q-23-59.

Rough-sort Type	Bowl				Jar (Unspecified)				Total	
	Body		Rim		Body		Rim			
	n	%	n	%	n	%	n	%	n	%
Grayware										
Corrugated gray	-	-	-	-	1	100.0	-	-	1	100
Whiteware										
Red Mesa Black-on-white	-	-	-	-	1	100.0	-	-	1	100
Escavada Black-on-white	1	100.0	-	-	-	-	-	-	1	100
Pueblo I/II Black-on-white	3	42.9	2	28.6	1	14.3	1	14.3	7	100
Total	4	40.0	2	20.0	3	30.0	1	10.0	10	100

Site NM-Q-23-60

During testing of site NM-Q-23-60, 49 ceramic artifacts weighing 203.5 g were recovered. Of these, four (2.2 g) sherds are considered too small or have one or more exfoliated surfaces. These four sherds are not included in the following discussion. The remaining 45 sherds include a variety of rough-sort and traditional ceramic types ranging from Pueblo II period to Protohistoric period wares (Table 25.21). All of the sherds large enough for analysis are assigned rough-sort types, vessel form, and vessel portion. An 18% sample (n=8) of sherds are assigned traditional ceramic types.

The majority of the assemblage from site NM-Q-23-60 dates to the Protohistoric period and includes Navajo Gray Ware, Puebloan utility, and Puebloan decorated types. The utility ware portion of the assemblage includes 2 sherds of Navajo Gray Ware and 14 Puebloan utility sherds.

Table 25.21. Summary of Rough-sort Types From Site NM-Q-23-60.

	Count		Weight	
Rough-sort Type	n	%	g	%
Grayware				
Plain gray	1	2.0	1.4	0.7
Corrugated gray	3	6.1	3.3	1.6
Navajo Gray Ware	2	4.1	4.9	2.4
Puebloan utility	14	28.6	88.6	43.5
Whiteware				
Red Mesa Black-on-white	1	2.0	6.2	3.0
Indeterminate Black-on-white	1	2.0	25.3	12.4
Slipped white	2	4.1	6.3	3.1
Glaze Ware				
Zuni Glaze Ware	18	36.7	52.8	25.9
Yellow Ware				
Hopi Yellow Ware	3	6.1	12.5	6.1
Not examined				
Too small or exfoliated	4	8.2	2.2	1.1
Total	49	100.0	203.5	100.0

The decorated sherds include 3 Hopi Yellow Ware and 18 Zuni Glaze Ware sherds. Sherds identified as Pueblo II types comprise only 18% (n=8) of the analyzed assemblage, including one plain gray, three corrugated gray, one Red Mesa, and one indeterminate black-on-white, and two slipped whiteware sherds.

Vessel form and portion data for the Protohistoric ceramics indicate that most of the Puebloan vessels were bowls and the single Navajo Gray Ware vessel (represented by two sherds) was a jar (Table 25.22). This particular configuration of vessel forms on Protohistoric Navajo sites is common, and it is suggested that Puebloan ceramics were used for serving vessels and the locally made Navajo Gray Ware jars were used for cooking and storage (Carlson 1965; Reed 1995; Reed and Reed 1992). The large number of Puebloan sherds, however, compared to the Navajo Gray Ware is unusual. In contrast, the Pueblo II period ceramics consist predominate of grayware jar sherds. The single Red Mesa Black-on-white sherd is the only example of a bowl form and the indeterminate black-on-white sherd is a ladle handle fragment.

Table 25.22. Vessel Form and Portion for Rough-sort Types from Site NM-Q-23-60.

	Bowl						Olla				Jar (Unspecified)		Ladle		Total	
	Base		Body		Rim		Body		Neck		Body		Appendage			
Rough-sort Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grayware																
Corrugated gray	-	-	-	-	-	-	-	-	-	-	3	100.0	-	-	3	100
Navajo gray ware	-	-	-	-	-	-	-	-	-	-	2	100.0	-	-	2	100
Plain gray	-	-	-	-	-	-	-	-	-	-	1	100.0	-	-	1	100
Puebloan utility	1	7.1	10	71.4	-	-	2	14.3	1	7.1	-	-	-	-	14	100
Whiteware																
Indeterminate black-on-white	-	-	-	-	-	-	-	-	-	-	-	-	1	I00.0	1	100
Red Mesa Black-on-white	-	-	1	100.0	-	-	-	-	-	-	-	-	-	-	1	100
Slipped white	-	-	-	-	-	-	-	-	-	-	2	100.0	-	-	2	100
Glaze Ware																
Zuni Glaze Ware	-	-	12	66.7	3	16.7	-	-	-	-	3	16.7	-	-	18	100
Yellowware																
Hopi Yellow Ware	-	-	3	100.0	-	-	-	-	-	-	-	-	-	-	3	100
Total	1	2.2	26	57.8	3	6.7	2	4.4	1	2.2	11	24.4	1	2.2	45	100

A sample of eight sherds was selected for traditional ceramic type analysis. Because this assemblage is small and most of the Protohistoric sherds are decorated, identification of sherds from a single vessel was relatively simple. Thus, for the Protohistoric assemblage from site NM-Q-23-60, seven distinct vessels were identified (Table 25.23) and one sherd from each vessel was examined in more detail to assign a traditional ceramic type. Sherds assigned vessel numbers represent no more than 10% of any one vessel. Both of the Hawikuh Polychrome vessels (1 and 6) have crushed sherd temper, buff paste color, white slipped surfaces, and red matte designs outlined in black glaze paint. The two Jeddito Black-on-yellow vessels (3 and 5) have no added temper, yellow paste color, and black mineral-painted designs on polished yellow surfaces. The two Puebloan utility vessels (2 and 7) have polished surfaces and distinctive crushed igneous rock temper, similar to that seen in some Rio Grande Glaze Ware. Finally, the single Dinetah Gray jar (vessel 4) is represented by two sherds having coarse sand temper and highly striated, plain surfaces. The presence of Dinetah Gray and Hawikuh Polychrome in the assemblage allows inference of a pre-AD 1750 date for the Protohistoric sherds. Generally, Dinetah Gray is present in Navajo assemblages dating between AD 1500 and 1750 (Brown and Hancock 1992; Brugge 1981; Reed 1995; Wilson and Blinman 1993). Hawikuh Polychrome has a more narrow temporal range of AD 1630 to 1680 (Dittert and Plog 1980). Thus, the Protohistoric assemblage probably dates between AD 1630 and 1700.

Table 25.23. Vessels Identified in the Protohistoric Ceramic Assemblage from Site NM-Q-23-60.

Vessel Number	Ceramic Type	Vessel Form	Catalog Numbers	Sherd Count
1	Hawikuh Polychrome	Bowl	FS 42 Lot 2, FS 48 Lot 1-2, FS 49 Lot 1, FS 69 Lot 1	15
2	Indeterminate Puebloan utility	Bowl	FS 30 Lot 2, FS 42 Lot 1, FS 49 Lot 2, FS 62 Lot 2, FS 107 Lot 1	11
3	Jeddito Black-on-yellow	Bowl	FS 42 Lot 3	2
4	Dinetah Gray	Jar (unspecified)	FS 65 Lot 1	2
5	Jeddito Black-on-yellow	Bowl	FS 64 Lot 1	1
6	Hawikuh Polychrome	Jar (unspecified)	FS 27 Lot 1, FS 55 Lot 2	3
7	Indeterminate Puebloan utility	Olla	FS 50 Lot 1, FS 55 Lot 3	3

The Pueblo II sherds include corrugated gray, plain gray, Red Mesa and indeterminate black-on-white, and slipped white. The only typeable sherd in the Pueblo II assemblage is identified as Red Mesa Black-on-white based on design style, paint type, and temper. Considering the presence of corrugated sherds and Red Mesa Black-on-white, the Pueblo II assemblage probably dates to the middle Pueblo II period (AD 975 to 1100). In most areas of the San Juan Basin, corrugated vessels are not present in assemblages until AD 975 at the earliest and neck corrugation appears to be a short-lived transition between neckbanding and full corrugation (Goetze and Mills 1993; Hays-Gilpin et al. 1998; Pierce 1996; Reed and Hensler 1996b).

In summary, the assemblage from site NM-Q-23-60 includes both Protohistoric Navajo and Puebloan sherds and Pueblo II period sherds. The Navajo assemblage probably dates between AD 1630 and 1700, based on the presence of Hawikuh Polychrome. The handful of Pueblo II sherds probably date between AD 975 and 1100.

Site NM-Q-23-62

During testing at site NM-Q-23-62, 3239 ceramic artifacts weighing 8778.8 g were recovered (Table 25.24). Of this assemblage, 65% (n=2116) of the sherds are too small for analysis or have at least one surface missing. These sherds are not assigned rough-sort types and are only counted and weighed. By weight, this large number of nonanalyzed sherds comprises only 26% of the assemblage, clearly illustrating the small size of the sherds. The remaining 1123 sherds are assigned rough-sort types. Based on the rough-sort analysis, this assemblage dates to the Basketmaker III period and probably no later than AD 600. This conclusion is predicated on the small number of decorated sherds, the presence of early pre-La Plata-style designs, and the large number of gray/brownware sherds.

Table 25.24. Summary of Rough-sort Types from Site NM-Q-23-62.

	Count		Weight	
Rough-sort Type	n	%	g	%
Grayware				
Plain gray rim (Lino style)	20	0.6	84.2	1.0
Indeterminate gray rim	22	0.7	35.6	0.4
Plain gray	436	13.5	1896.5	21.6
Polished gray	50	1.5	212.3	2.4
Gray/brownware				
Plain gray/brown	149	4.6	784.2	8.9
Polished gray/brown	358	11.1	3030.8	34.5
Whiteware				
Pre-La Plata Black-on-white	1	-	5.9	0.1
La Plata Black-on-white	4	0.1	15.1	0.2
Basketmaker III/Pueblo I Black-on-white	4	0.1	69.3	0.8
Indeterminate black-on-white	2	0.1	16.5	0.2
Redware				
Basketmaker III slipped red	30	0.9	139.7	1.6
Unfired Ware				
Indeterminate unfired	47	1.4	182.8	2.1
Not examined				
Too small or exfoliated	2116	65.3	2305.9	26.3
Total	3239	100	8778.8	100

Recent research at early Basketmaker III sites and reevaluation of previously collected assemblages across the northern Southwest suggests that grayware technology typical of later Anasazi assemblages emerged from a pan-Southwestern brownware technology (Dittert et al. 1963; Heidke and Stark 1996; Reed et al. 1997; Skibo and Blinman 1996; Wilson and Blinman 1994). The period between approximately AD 500 and 600 is identified by Reed et al. (1997) as a time of technological transition in the northern Southwest during which many potters experimented extensively with local resources. Prior to this time, ceramic vessels across the Southwest were essentially brownware with little or no added temper, silty paste, and friable texture (Heidke and Stark 1996; Reed et al. 1997; Skibo and Blinman 1996; Wilson and Blinman 1994). On the Colorado Plateau, the clay resources (predominate alluvial clays) used to produced brownware vessels became inadequate once vessel function dictated the need for larger, sturdier forms. Experimentation with a variety of clay and temper resources characterize many assemblages dating to the AD 500s. These assemblages generally include sherds with a wide range of paste colors, a range of paste textures (soft to hard), and a variety of tempering materials (Hays-Gilpin et al. 1998; Reed and Hensler 1996a).

The assemblage from site NM-Q-23-62 fits this general profile characterizing the AD 500s. The utility ware assemblage is almost evenly represented by grayware and gray/brownware sherds. Following Reed et al. (1997), sherds with brownish paste colors, soft fracture, and a silty paste are identified as gray/brownware, representing the transition in resource utilization toward true grayware. Sherds with a hard fracture, grayish paste color, and clean (nonsilty) paste were identified as grayware. Not only is there evidence of a gray/brownware-to-grayware transition at site NM-Q-23-62, but there is also evidence that red slipped and painted vessels were in transition as well. Although red slipped sherds were combined into a broad category of Basketmaker III redware during the rough sort, it is evident that the paste of many redware sherds has a silty texture and soft fracture characteristic of gray/brownware. One painted sherd was identified as pre-La Plata Black-on-white with broad-lined designs, silty gray/brown paste, and a red pigment similar to that used as a slip on the redware sherds. This distinctive pigment is easily scraped away, a characteristic representing the early development of decorated pottery. Four sherds are identified as La Plata Black-on-white with classic Basketmaker III designs, hard fracture, and black mineral paint that adheres well to the vessel surface. Similar to many Basketmaker III assemblages, fugitive red pigment was identified on approximately 2% (n=21) of the analyzed sherds.

As expected, most of the gray sherds are from jars, represented by rims from an olla, seed jars, and wide-mouthed jars (Table 25.25). Polished gray sherds are common in the assemblage and include predominate bowl body sherds. Plain gray/brown sherds are primarily from jars, including evidence of seed jars, wide-mouthed jars, and pinch pots. Polished gray/brown, on the other hand, includes 14% from bowls. Sherds classified as Basketmaker III slipped red are represented by both jars and bowls. The only pre-La Plata Black-on-white sherd identified in the assemblage is from a jar, contrasting with bowl sherds for La Plata Black-on-white.

A sample of 69 sherds (6% of the analyzed assemblage) was selected for more detailed analysis to assign traditional ceramic types. Sherds from each ware category were selected. As shown in Table 25.26, all of the sherds sampled are identified as Cibola series and probably represent local pottery production. Lino Gray and Obelisk Utility are the most common utility ware types in the assemblage. One of the polished grayware sherds is identified as Lino Polished, following Spurr

Table 25.25. Vessel Form and Portion for Rough-sort Types from Site NM-Q-23-62.

	Bowl				Olla				Pinch Pot		Seed Jar		Wide-mouthed Jar		Jar (Unspecified)								Other		Indeterminate					
	Body		Rim		Neck		Rim		Rim		Rim		Rim		Base		Body		Neck		Rim		Other		Appendage		Body		Total	
Rough-sort Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grayware																														
Plain gray rim (Lino style)	-	-	2	10.0	-	-	1	5.0	-	-	5	25.0	10	50.0	-	-	-	-	-	-	2	10.0	-	-	-	-	-	-	20	100
Indeterminate gray rim	-	-	-	-	-	-	-	-	-	-	1	4.5	-	-	-	-	-	-	-	-	21	95.5	-	-	-	-	-	-	22	100
Plain gray	-	-	-	-	2	0.5	-	-	-	-	-	-	-	-	6	1.4	425	97.5	2	0.5	-	-	-	-	1	0.2	-	-	436	100
Polished gray	30	60.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	38.0	-	-	1	2.0	-	-	-	-	-	-	50	100
Gray/brownware																														
Plain gray/brown	-	-	-	-	-	-	-	-	2	1.0	2	1.0	2	1.0	3	1.5	138	70.8	-	-	1	0.5	-	-	-	-	1	0.5	149	100
Polished gray/brown	51	14.2	1	0.3	-	-	-	-	-	-	-	-	1	0.3	1	0.3	299	83.5	1	0.3	2	0.6	-	-	-	-	2	0.6	358	100
Whiteware																														
Pre-La Plata Black-on-white	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100.0	-	-	-	-	-	-	-	-	-	-	1	100
La Plata Black-on-white	4	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	100
Basketmaker III/Pueblo I Black-on-white	2	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	25.0	1	25.0	-	-	-	-	-	-	-	-	4	100
Indeterminate black-on-white	1	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	50.0	-	-	-	-	-	-	-	-	-	-	2	100
Redware																														
Basketmaker III slipped red	9	30.0	4	13.3	-	-	-	-	-	-	-	-	1	3.3	-	-	16	53.3	-	-	-	-	-	-	-	-	-	-	30	100
Unfired Ware																														
Indeterminate unfired	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	100.0	-	-	-	-	47	100
Total	97	8.6	7	0.6	2	0.2	1	0.1	2	0.2	8	0.7	14	1.2	10	0.9	900	80.2	4	0.4	27	2.4	46	4.1	1	0.1	3	0.3	1123	100

Table 25.26. Summary of Ceramic Series and Type for a Sample of Sherds from Site NM-Q-23-62.

Ceramic Type	n	%
Cibola Gray Ware		
Lino Gray	20	29.0
Lino Polished	1	1.4
Cibola Gray/Brown Ware		
Obelisk Utility*	7	10.1
Plain gray/brown	6	8.7
Cibola Red Ware		
Tallahogan Red	28	40.6
Tohatchi Red	2	2.9
Cibola White Ware		
La Plata Black-on-white	4	5.9
Tohatchi Red-on-brown**	1	1.4
Total	69	100.0

*Count includes a representative sherd from Vessels 1, 2, and 4.
**Count includes a representative sherd from Vessels 3.

and Hays-Gilpin's (1996) reinstitution of the type. Slipped redware sherds were identified predominate as Tallahogan Red, representing local San Juan Basin production of the type similar to that identified by Daifuku (1961) for the Kayenta region. Although the type originally was defined within the Tusayan series in the Kayenta region, the type name is used for general classification of Basketmaker III slipped redware in both the Tusayan and Cibola traditions (Goetze 1993; Hays-Gilpin et al. 1998; Reed et al. 1997). With further analysis and a local resource reconnaissance during the data recovery phase, identification of local and nonlocal varieties of Tallahogan Red, similar to that undertaken by Hays-Gilpin et al. (1998), may be possible for the N11 assemblage. Two slipped redware sherds, however, were identified as Tohatchi Red, following Goff and Reed's (1996b) definition of red-slipped gray/brownware from the southern Chuska Valley. Tohatchi Red is interpreted by Goff and Reed (1996b) and Reed et al. (1997) as the red-slipped gray/brownware predecessor of Tallahogan Red. On a similar technological track, evidence of a decorated gray/brownware predecessor to La Plata Black-on-white is further supported by the site NM-Q-23-62 assemblage. Reed and Hensler (1996a) identify Tohatchi Red-on-brown in assemblages from the southern Chuska Valley and indicate a transition in decorated pottery beginning with painted gray/brownware in the middle to late AD 500s. This early painted technology evolved into the traditional Basketmaker III La Plata Black-on-white by AD 600. One sherd from site NM-Q-23-62 is identified as Tohatchi Red-on-brown, having a soft silty paste, friable fracture, brownish paste color, and a broad-lined design painted with a red pigment that adheres poorly to the surface. Four sherds are identified as La Plata Black-on-white, having classic Basketmaker III designs executed in dark mineral paint and pastes that are hard and more similar to grayware pastes.

From FS 17 and FS 108, 47 pieces of unfired, tempered clay were identified. These pieces have vegetal impressions on one side and are relatively smooth on the other surface. Most of the pieces appear to have been shaped in a manner resembling a rounded, disk-shaped object and all 44 of these fragments are from a single item. Considering the addition of sand temper to the raw clay and the relatively shaped appearance of some of the sherds, it is suggested that these fragments are from a cist cover or seal. If the object was used as a cist cover or seal, the vegetal impressions are possibly from a woven mat used to cover the cist prior to placement of the clay seal. Additional analysis of these pieces in conjunction with the next data recovery phase may reveal the type of vegetal material impressed into the surface and confirm the function of the object as a cist cover or seal. Also, because these pieces are unfired, geochemical analysis of a small fragment in conjunction with a clay resource reconnaissance will yield data relevant to local resource utilization.

Although not a specific focus of this analysis, several distinct vessels were identified in the assemblage. Most of these include sherds from a single FS that were easily identified as belonging to a single vessel. Vessel numbers were assigned under the comments field in the data base. Vessel 1 was identified as an Obelisk Utility seed jar from FS 14 represented by 41 sherds. Vessel 2 is an Obelisk Utility jar (unspecified shape) from FS 17 represented by 154 sherds. Vessel 3 is a Tohatchi Red-on-brown jar from FS 17 and possibly FS 108 represented by 15 sherds. Finally, Vessel 4 is an Obelisk Utility jar (unspecified shape) from FS 113 represented by 91 sherds.

Based on the rough-sort analysis and the small sample of sherds selected for traditional type classification, the assemblage from site NM-Q-23-62 is comprised solely of Basketmaker III period ceramics. Considering the large percentage of gray/brownware and evidence of Tohatchi Red and Tohatchi Red-on-brown ceramics, it is suggested that the assemblage dates specifically to the late AD 500s. Also, this assemblage appears to represent a technology in flux, similar to that seen in the southern Chuska Valley (Reed and Hensler 1996a) and the Prayer Rock District (Hays-Gilpin et al. 1998; Morris 1980). The ceramic artifacts collected during testing of site NM-Q-23-62, along with those from the impending data recovery phase, will be examined in more detail. Typological, technological, and stylistic attributes will be recorded and a clay/temper reconnaissance will be focused on the area around site NM-Q-23-62. This site has the potential to yield a wealth of information concerning the early development of grayware technology in the San Juan Basin. This site appears similar, ceramically, to sites in the southern Chuska Valley and Prayer Rock District that have provided supporting evidence for an early, local brownware technology that evolved into grayware characteristic of late Basketmaker III assemblages.

Site NM-Q-23-63

A total of 980 sherds (3678.3 g) was collected during testing at site NM-Q-23-63. The assemblage is comprised primarily of Basketmaker III ceramic types, but 4% (n=41) includes sherds characteristic of late Pueblo I to middle Pueblo II assemblages (Table 25.27). Most of the intrusive types are from surface contexts; however, seven are from subsurface contexts, allowing the possibility of a small, later component. Two sherds are identified as Navajo Gray Ware and originate from subsurface contexts. Approximately 49% (n=480) of the assemblage was not examined because the sherds were too small or were missing at least one surface. When these 480 sherds are considered with regard to weight, they comprise only 15% of the assemblage. Of the remaining 500 sherds, 457

Table 25.27. Summary of Rough-sort Types from Site NM-Q-23-63.

Rough-sort Type	Count		Weight	
	n	%	g	%
Grayware				
Plain gray rim (Lino style)	13	1.3	132.0	3.6
Wide neckbanded rim (Kana-a style)*	11	1.1	57.0	1.5
Indeterminate gray rim	10	1.0	22.5	0.6
Plain gray	399	40.7	2502.5	68.0
Polished gray	2	0.2	9.6	0.3
Banded gray*	4	0.4	19.7	0.5
Corrugated gray*	3	0.3	10.4	0.3
Navajo Gray Ware**	2	0.2	4.9	0.1
Gray/brownware				
Plain gray/brown	9	0.9	57.0	1.5
Polished gray/brown	2	0.2	12.5	0.3
Brownware				
Mogollon Brown Ware	1	0.1	2.1	0.1
Whiteware				
La Plata Black-on-white	6	0.6	58.2	1.6
White Mound Black-on-white	3	0.3	43.1	1.2
Red Mesa Black-on-white*	6	0.6	53.6	1.5
Escavada Black-on-white*	1	0.1	20.0	0.5
Gallup Black-on-white*	7	0.7	40.1	1.1
Basketmaker III/Pueblo I Black-on-white	5	0.5	13.5	0.4
Pueblo I/II Black-on-white*	8	0.8	23.8	0.6
Indeterminate black-on-white	7	0.7	30.3	0.8
Redware				
Pueblo I painted orange*	1	0.1	8.1	0.2
Not examined				
Too small or exfoliated	480	49.0	557.4	15.2
Total	980	100.0	3678.3	100.0

*Sherds considered intrusive late Pueblo I or Pueblo II types.
**Sherds considered intrusive Protohistoric types.

are identified as Basketmaker III types, representing a significantly different assemblage from that collected from site NM-Q-23-62. Based on the small number of gray/brownware sherds and the absence of pre-La Plata Black-on-white, this site probably dates later in the Basketmaker III period (AD 600 to 700). Because approximately 91% of the analyzed assemblage is attributable to a Basketmaker III occupation, intrusive Pueblo I to Pueblo II sherds are excluded from the remaining discussion.

In contrast to the assemblage from site NM-Q-23-62, utility ware from site NM-Q-23-63 consists primarily of grayware. Only 11 sherds were identified as gray/brownware, and it is suggested that the transition to a grayware technology was essentially complete by the time of occupation at site NM-Q-23-63. Grayware sherds in this assemblage have the typical coarse-grained temper of classic Basketmaker III grayware and a hard, nonfriable fracture, consistent with the use of geologic rather than alluvial clays. The only diagnostic grayware sherds in this assemblage are 13 plain gray (Lino style) rims. As mentioned above, only 11 gray/brownware sherds were identified in the Basketmaker III assemblage. Nine of these have plain surfaces and two have at least one polished surface. A single Mogollon Brown Ware sherd with a highly polished exterior surface, dark brown paste, and fine sand temper also was identified. Whiteware includes six La Plata, three White Mound style, five Basketmaker III/Pueblo I, and seven indeterminate black-on-white sherds. In comparison to site NM-Q-23-62 and NM-Q-23-64, Basketmaker III slipped redware is noticeably absent at site NM-Q-23-63.

As expected, vessel form and portion data indicate that jar body sherds dominate the assemblage (Table 25.28). Of the total Basketmaker III assemblage, approximately 90% of the sherds are from the body portion of jars. Based on the small number of plain gray rims, grayware vessels include bowls, ollas, seed jars, and wide-mouthed jars. One of the plain gray sherds has a handle suggestive of a ladle. Polished gray sherds include only fragments of bowls and may have originated from the unpainted portions of black-on-white bowls. The gray/brownware sherds indicate a variety of vessel forms, including miniatures, a seed jar, a bowl, jars (unspecified shape), and one indeterminate form with the remains of a strap handle. The single Mogollon Brown Ware sherd is from a jar. Approximately 62% (n=13) of the 21 whiteware sherds are from bowls. The remaining eight whiteware sherds are from the body portion of jars. The large number of whiteware bowl sherds is not unexpected, considering that whiteware probably was used most frequently as serving vessels.

A sample of 58 sherds (12%) from the combined Basketmaker III and Pueblo I/II assemblage were selected for a more detailed analysis (Table 25.29). This group includes sherds considered typeable based on the rough-sort analysis. The Pueblo I/II sherds include Kana-a Neckbanded, Abajo Red-on-orange, Red Mesa, Escavada and Gallup black-on-white. With the exception of the single Abajo Red-on-orange sherd of the San Juan Red Ware series, the remaining Pueblo I/II sherds are Cibola series. The Basketmaker III sherds selected for traditional type identification include Lino Gray, polished gray, Obelisk Utility, plain gray/brown, La Plata and White Mound black-on-white of the Cibola tradition. The only obviously nonlocal vessel in the assemblage is represented by a single Woodruff Brown sherd, indicating trade connections with the northern Mogollon region. Two typeable sherds are Protohistoric Navajo Dinetah Gray sherds.

In summary, the ceramic assemblage from site NM-Q-23-63 consists of predominate Basketmaker III sherds along with a small group of potentially intrusive late Pueblo I to Pueblo II sherds and two Protohistoric Navajo sherds. Based on the small number of gray/brown sherds and the presence of La Plata and White Mound black-on-white sherds, the Basketmaker III assemblage probably dates to the late AD 600s. This site has excellent research potential for studying late Basketmaker III technology, vessel function, and design style. The site NM-Q-23-63 assemblage is

Table 25.28. Vessel Form and Portion for Rough-sort Types from Site NM-Q-23-63.

	Bowl				Miniature		Olla				Seed Jar		Wide-mouthed Jar		Jar (Unspecified)						Indeterminate			
	Body		Rim		Rim		Neck		Rim		Rim		Rim		Body		Neck		Rim		Appendage		Total	
Rough-sort Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grayware																								
Plain gray rim (Lino style)	-	-	2	15.4	-	-	-	-	3	23.1	2	15.4	3	23.1	-	-	-	-	3	23.1	-	-	13	100
Indeterminate gray rim	-	-	-	-	-	-	-	-	-	-	-	-	2	20.0	-	-	-	-	8	80.0	-	-	10	100
Plain gray	-	-	-	-	-	-	1	0.3	-	-	-	-	-	-	395	99.0	2	0.5	-	-	1	0.3	399	100
Polished gray	1	50.0	1	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	100
Gray/brownware																								
Plain gray/brown	-	-	-	-	2	22.2	-	-	-	-	1	11.1	-	-	5	55.6	-	-	-	-	1	11.1	9	100
Polished gray/brown	1	50.0	-	-	-	-	-	-	-	-	-	-	-	-	1	50.0	-	-	-	-	-	-	2	100
Brownware																								
Mogollon Brown Ware	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100.0	-	-	-	-	-	-	1	100
Whiteware																								
La Plata Black-on-white	2	33.3	2	33.3	-	-	-	-	-	-	-	-	-	-	2	33.3	-	-	-	-	-	-	6	100
White Mound Black-on-white	1	33.3	2	66.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	100
Basketmaker III/Pueblo I Black-on-white	3	60.0	1	20.0	-	-	-	-	-	-	-	-	-	-	1	20.0	-	-	-	-	-	-	5	100
Indeterminate b/w	2	28.6	-	-	-	-	-	-	-	-	-	-	-	-	5	71.4	-	-	-	-	-	-	7	100
Total	10	2.2	8	1.8	2	0.4	1	0.2	3	0.7	3	0.7	5	1.1	410	89.7	2	0.4	11	2.4	2	0.4	457	100

Note: This table excludes the intrusive Pueblo I/II and Protohistoric sherds.

Table 25.29. Summary of Ceramic Series and Type for a Sample of Sherds from Site NM-Q-23-63.

Ceramic Type	n	%
Cibola Gray Ware		
Kana-a Neckbanded*	12	20.7
Lino Gray	13	22.4
Polished gray	1	1.7
Cibola Gray/Brown Ware		
Obelisk Utility	1	1.7
Plain gray/brown	4	6.9
Mogollon Brown Ware		
Woodruff Brown	1	1.7
San Juan Red Ware		
Abajo Red-on-orange*	1	1.7
Cibola White Ware		
La Plata Black-on-white	6	10.3
White Mound Black-on-white	3	5.2
Red Mesa Black-on-white*	6	10.3
Escavada Black-on-white*	1	1.7
Gallup Black-on-white*	7	12.1
Protohistoric Navajo Gray Ware		
Dinetah Gray**	2	3.4
Total	58	100.0

*Sherds considered intrusive late Pueblo I or Pueblo II types.
**Sherds considered intrusive Protohistoric types.

most similar to that from site NM-Q-23-64, providing an opportunity to examine differences in resource use between the two sites. Given that site NM-Q-23-62 probably dates earlier than either sites NM-Q-23-63 or NM-Q-23-64, the technological transition from gray/brown to grayware pottery will be a focus of research during the next data recovery phase.

Site NM-Q-23-64

A total of 1948 ceramic artifacts weighing 6613.4 g were recovered during testing at site NM-Q-23-64. Of these, 929 are too small or have one or more exfoliated surfaces. Although these sherds comprise 48% of the assemblage by count, they make up only 13% of the assemblage when sherd weight is considered. Thus, the sherd count percentage is deceiving when compared with weight, indicating that the percentage of unanalyzed sherds is actually quite small. These sherds are not included in the discussion of the assemblage. The remaining 1019 ceramics are assigned rough-sort types. Based on the rough-sort analysis, 29 sherds are identified as intrusive Pueblo II sherds and are primarily from surface contexts. Considering the proximity of site NM-Q-23-64 to the Muddy

Water Great House, the occurrence of Pueblo II sherds in the assemblage is not unusual. Therefore, the 990 sherds discussed below are considered part of the Basketmaker III occupation at site NM-Q-23-64 and are the focus of this study. After completion of the rough-sort phase, 65 sherds were considered typeable and were selected for traditional ceramic type analysis. Basketmaker III ceramic types identified in the traditional type sample include Lino Gray, Woodruff Smudged, Tallahogan Red, La Plata and White Mound black-on-white. From these data, site NM-Q-23-64 dates to the late Basketmaker III period (AD 600 to 700).

The majority of Basketmaker III grayware sherds from site NM-Q-23-64 were identified as plain gray (Table 25.30). The only diagnostic grayware in the assemblage includes 29 plain gray rims (Lino style). Only one sherd is identified as plain gray/brown. The relative absence of gray/brownware from the assemblage indicates a post-AD 600 occupation. A single Mogollon Brown Ware sherd is the only obvious evidence of imported vessels in the assemblage. The Basketmaker III decorated assemblage consists of La Plata, White Mound, Basketmaker III/Pueblo I and indeterminate black-on-white ceramics. Although it is probable that a few of the indeterminate black-on-white sherds are from intrusive vessels, the percentage is probably small. Thus, these sherds are included in the Basketmaker III discussion. The two redware sherds are identified as Basketmaker III slipped red. Not included in Table 25.30 is a raw clay sample weighing 1.8 g. The small size of the sample, however, may limit further analysis during the next data recovery phase.

Based on the vessel form and portion data, roughly 90% of the sherds are from the body portion of jars (Table 25.31). Grayware includes primarily jars and the only bowl sherd in the grayware assemblage is a polished gray sherd. The 29 plain gray (Lino-style) rims indicate that most of the grayware vessels are seed jar shapes, having no neck and a restricted orifice smaller in diameter than the maximum vessel diameter. Seed jars are a common vessel shape found in most Basketmaker III assemblages. The only gray/brownware sherd in the assemblage is a rim from an unspecified jar. The single Mogollon Brown Ware sherd is from a bowl. Whiteware sherds include examples of both jars and bowls; all of the La Plata Black-on-white sherds are from bowls and two of the seven White Mound Black-on-white sherds are from jars. Finally, the two Basketmaker III slipped red sherds are from jars.

Thirty of the plain gray body sherds show evidence of fugitive red pigment on the exterior surface. Although the actual function and significance of fugitive red pigment is unknown, it is probable that some sherds having fugitive red are from Tallahogan Red sherds in which the slip has eroded away. Three plain gray sherds have soot on the exterior surfaces, thus they may originate from cooking vessels.

Based on the rough-sort analysis, 53 sherds from the Basketmaker III assemblage and 12 intrusive Pueblo II sherds are assigned traditional ceramic types (Table 25.32). The Pueblo II sherds include Escavada, Gallup, Red Mesa, and Reserve black-on-white. All but one of the Basketmaker III sherds are identified as Cibola series. The only Mogollon Brown Ware from the assemblage is identified as Woodruff Smudged, originating from a bowl with a highly polished interior surface. All of the plain rims in the assemblage are identified as Lino Gray. The Basketmaker III whiteware includes 13 La Plata Black-on-white and 7 White Mound Black-on-white sherds. The ceramic types

Table 25.30. Summary of Rough-sort Types from Site NM-Q-23-64.

	Count		Weight	
Rough Sort Type	n	%	g	%
Grayware				
Plain gray rim (Lino style)	29	1.5	271.6	4.1
Indeterminate gray rim	10	0.5	25.1	0.4
Plain gray	890	45.7	4941.5	74.7
Polished gray	1	0.1	3.1	-
Banded gray*	3	0.2	8.7	0.1
Corrugated gray*	3	0.2	29.6	0.4
Gray/brownware				
Plain gray/brown	1	0.1	2.8	-
Brown Ware				
Mogollon Brown Ware	1	0.1	3.3	-
White Ware				
La Plata Black-on-white	13	0.7	57.5	0.9
White Mound Black-on-white	7	0.4	36.9	0.6
Basketmaker III/Pueblo I Black-on-white	12	0.6	33.6	0.5
Red Mesa Black-on-white*	3	0.2	24.5	0.4
Escavada Black-on-white*	1	0.1	43.5	0.7
Escavada/Gallup Black-on-white*	1	0.1	4.7	0.1
Gallup Black-on-white*	7	0.4	77.9	1.2
Pueblo I/II Black-on-white*	8	0.4	43.0	0.7
Indeterminate black-on-white	24	1.2	106.0	1.6
Slipped white*	3	0.2	16.0	0.2
Redware				
Basketmaker III slipped red	2	0.1	5.8	0.1
Not examined				
Too small or exfoliated	929	47.7	878.3	13.3
Total	1948	100.0	6613.4	100.0

*Sherds considered intrusive Pueblo II types.

Table 25.31. Vessel Form and Portion for Rough-sort Types from Site NM-Q-23-64.

	Bowl				Olla		Seed Jar		Wide-mouthed Jar		Jar (Unspecified)													
	Body		Rim		Neck		Rim		Rim		Appendage		Base		Body		Neck		Rim		Indeterminate		Total	
Rough-sort Type	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grayware																								
Plain gray rim (Lino style)	-	-	-	-	-	-	12	41.4	2	6.9	-	-	-	-	-	-	-	-	15	51.7	-	-	29	100
Indeterminate gray rim	-	-	-	-	-	-	3	30.0	-	-	-	-	-	-	-	-	-	-	7	70.0	-	-	10	100
Plain gray	-	-	-	-	-	-	-	-	-	-	1	0.1	1	0.1	875	98.3	12	1.3	-	-	1	0.1	890	100
Polished gray	1	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100
Gray/brown Ware																								
Plain gray/brown	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100.0	-	-	1	100
Brown Ware																								
Mogollon Brown Ware	1	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100
White Ware																								
La Plata Black-on-white	9	69.2	4	30.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	100
White Mound Black-on-white	4	57.1	1	14.3	-	-	-	-	-	-	-	-	-	-	1	14.3	-	-	1	14.3	-	-	7	100
Basketmaker III/Pueblo I Black-on-white	9	75.0	-	-	-	-	-	-	-	-	-	-	-	-	3	25.0	-	-	-	-	-	-	12	100
Indeterminate black-on-white	6	25.0	2	8.3	1	4.2	-	-	-	-	-	-	-	-	13	54.2	-	-	2	8.3	-	-	24	100
Redware																								
Basketmaker III slipped red	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	100.0	-	-	-	-	-	-	2	100
Total	30	3.0	7	0.7	1	0.1	15	1.5	2	0.2	1	0.1	1	0.1	894	90.3	12	1.2	26	2.6	1	0.1	990	100

Note: This table excludes the intrusive Pueblo II sherds.

Table 25.32. Summary of Ceramic Series and Type for a Sample of Sherds from Site NM-Q-23-64.

Ceramic Type	n	%
Mogollon Brown Ware		
Woodruff Smudged	1	1.5
Cibola Gray Ware		
Lino Gray	29	44.6
Cibola Gray/Brown Ware		
Plain gray/brown	1	1.5
Cibola Red Ware		
Tallahogan Red	2	3.1
Cibola White Ware		
Escavada Black-on-white*	1	1.5
Gallup Black-on-white*	7	10.8
La Plata Black-on-white	13	20.0
Red Mesa Black-on-white*	3	4.6
Reserve Black-on-white*	1	1.5
White Mound Black-on-white	7	10.8
Total	65	100.0

*Sherds considered intrusive Pueblo II types.

from site NM-Q-23-64 are believed to result from a late Basketmaker III occupation dating between AD 600 and 700. Given the occurrence of White Mound Black-on-white, the assemblage may date closer to AD 700.

In summary, the ceramic assemblage from site NM-Q-23-64 includes primarily Basketmaker III sherds dating between AD 600 and 700. A small number of intrusive Pueblo II types also were identified. Considering the close proximity of Muddy Water Great House, however, the occurrence of Pueblo II intrusives is not unexpected. Most of these sherds are from surface contexts and are not indicative of another occupational component. The Basketmaker III ceramics are identified primarily as Cibola series. Only one Woodruff Brown sherd of the Mogollon tradition was identified in the assemblage. The majority of the ceramics are from jars, of which most represent grayware utility vessels. The decorated ceramics include both bowl and jar sherds. This site, along with the other two Basketmaker III sites, has excellent potential for exploring research issues regarding ceramic function, technology, production, and exchange. The next phase of data recovery at sites NM-Q-23-64, NM-Q-23-62, and NM-Q-23-63 should yield an excellent comparative data set with which to address questions concerning resource use, design style, exchange networks, and the gray/brownware to grayware transition.

SUMMARY

The sites tested for the proposed N11(1&2) road include diverse ceramic assemblages with excellent potential to address research questions relating to ceramic production, resource use, exchange, style, and chronometry. Three sites (NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64) have Basketmaker III assemblages. Site NM-Q-23-62, in particular, has a ceramic assemblage characteristic of pre-AD 600 technology and will afford an excellent opportunity to study the transition in resource use evident during this period. The other Basketmaker III sites, NM-Q-23-63 and NM-Q-23-64, provide a definite contrast to the site NM-Q-23-62 assemblage. Ceramic data obtained during the pending data recovery phase will provide a good comparative data set with which to study changes in ceramic technology, resource use, and painted design style during the Basketmaker III period. In a similar fashion, the Pueblo II assemblages include types dating to the early part (AD 900 to 1000) and the later part (AD 1000 to 1150) of the period. An initial observation based on the testing phase analysis is the obvious lack of gray- and whiteware of the Chuska tradition. Chuska corrugated types, in particular, are abundant in most San Juan Basin assemblages dating between AD 1000 and 1200. The absence of Chuska Gray Ware from N11 assemblages is an interesting occurrence that will be explored in more depth during the next data recovery phase. Given this absence, identifying other sources of imported ceramic vessels will be another area of research focus. Finally, the single Protohistoric Navajo site in the project area (site NM-Q-23-60) has excellent potential to address research questions concerning early Navajo ceramic technology, trade with Protohistoric Puebloan villages, and comparison with contemporary sites in the Dinetah region.

Chapter 26

FLAKED, GROUND, AND MISCELLANEOUS STONE ARTIFACTS

Jonathan Damp and Kenny Bowekaty

INTRODUCTION

Analysis of the flaked, ground, and miscellaneous stone material was carried out in order to obtain information regarding procurement, modification, and use of stone at the N11 sites. This information is intended to assist in determining site function and chronological placement. Ultimately, it can be used to suggest future directions for research with regards to proposed data recovery excavations at the N11 sites. The following information was recorded for all of the chipped stone artifacts: raw material type, size, presence or absence of cortex, type of cortex present (primary or secondary), presence of retouch, type of artifact (debitage, core, formal tool), and evidence of thermal alteration. For ground stone artifacts, the recorded information includes raw material type, size, artifact type (mano, metate, ground slab, etc.), completeness, evidence of modification other than grinding (shaping, burning, etc.), and presence and direction of striations.

METHODOLOGY

Technological and functional attributes were recorded for each of the artifacts recovered during the project. Flaked stone attributes include Raw Material Type, Weight, Length, Width, Thickness, Presence or Absence of Cortex, Type of Cortex, Artifact Type, Presence or Absence of Retouch, and Presence or Absence of Thermal Alteration. Ground stone attributes include Artifact Type, Raw Material Type, Striations, Grinding, Shaped, Burned, Completeness, Length, Width, and Thickness.

Identification of raw material for this project was performed macroscopically, by comparing the characteristics of artifact materials with known primary and secondary sources both within and outside of the project area.

Raw Material Categories

The identifying characteristics of each raw material are as follows:

Chalcedony—cryptocrystalline quartz consisting mostly of silica.

Chert—opaque cryptocrystalline quartz. Chert occurs in a variety of colors and textures from secondary sources within and around the project area including San Juan River terrace gravels (Shelley 1983). A number of cherts are derived from primary sources outcropping in isolated locations. For example, Chinle (leopard spotted) Zuni Mountain chert is identifiable by a yellow to orange color with black inclusions. Another chert variety is found in the vicinity of Washington Pass in the Chuska Mountains, west of the N11 project area.

Hematite—iron oxide mineral with a red streak.

Obsidian—volcanic, igneous glass.

Sandstone—sedimentary rock made up of sand and compacted with clay or cemented by silica, carbonates, clay, or iron oxides.

Petrified (silicified) wood—any cryptocrystalline material which exhibits evidence of a woody, fibrous texture or structure, resulting from the replacement of the organic material with silica. Silicified wood is extremely common across the entire Colorado Plateau, primarily within the Chinle Sandstone Formation (Ash 1987; Sigleo 1978, 1979).

Quartzite—any sandstone that has been partially vitrified (metamorphosed) due to heat and/or pressure after the rock was originally formed in a sedimentary context. Quartzites have a granular, sugary texture and, like cherts, are found in a variety of colors in gravel deposits (Irwin 1994).

Siltstone—any stone predominately composed of silt. Siltstone tends to lack the finely laminated structure of many sedimentary rocks and is identified primarily by grain size.

Artifact Type Categories

The identifying characteristics of each artifact type are as follows:

Biscuit mano—small circular to almost oval grinding stone often exhibiting evidence of circular striations.

Mano (one-hand)—small grinding stone. Often exhibits evidence of circular striations associated with basin metates and the processing of wild foods (Martin 1972; Nelson 1991).

Mano (two-hand)—large handstone used in association with trough metates for the processing of maize. Striations are parallel.

Metate—a large ground stone, generally characterized as either trough (open-ended), basin or a simple slab. Metate morphology is frequently associated with specialized plant processing (trough for domesticates and basin for wild foods; Adams 1988; Cordell 1984; Lancaster 1986).

Ground Slab—a rock slab that is not identifiable as a shaped trough or basin metate but which shows some evidence of grinding.

Mortar—a container with a cavity in which substances are ground or crushed.

Unidentified Ground Fragment—an artifact that exhibits some evidence of grinding but which is not complete enough to be placed into any of the above categories.

Polishing Stone—an artifact that exhibits some evidence of grinding; usually a thin, circular-shaped stone.

Fetish—an object considered to embody a spirit or have magical powers, usually related to animals.

Pendant—an ornament that is suspended when worn.

Biface—an artifact with flake scars on both faces.

Blade—a flake with parallel or subparallel lateral edges and a length at least twice that of the width.

Chopper—a core tool probably used for chopping.

Cobble—a stone larger than a pebble and smaller than a boulder.

Core—a nucleus or mass of material worked to remove flakes; a core will show evidence of negative flake scars.

Core-flake—a core that has been worked to the point that the remaining portion can be or was used as a flake.

Debitage—residual lithic material often in the form of angular shatter left over from tool manufacture.

Flake—a piece of stone removed from a larger piece (core).

Hammerstone—usually a cobble-sized stone used for percussion.

Microflake—a very small flake removed from a core or biface through thinning and retouching.

Projectile point—a spear, dart, or arrow point.

Scraper—a stone tool used for scraping.

Uniface—an artifact worked only on one face.

The presence of primary or secondary cortex was recorded for each flaked stone artifact, in order to establish the nature of the utilized resource. Raw material with primary (unweathered) cortex is more likely to have been procured from embedded sources. The presence of secondary (weathered) cortex is more likely to indicate transportation from a more distant resource.

RESULTS OF ANALYSIS

Flaked, ground, and miscellaneous stone pieces were analyzed from all sites investigated as part of the N11 testing phase project. The following section details the results of the descriptive analysis of these pieces. By site, flaked stone artifacts are listed first, followed by ground stone artifacts, and then by miscellaneous pieces of stone. Raw material is also discussed within this context. This descriptive portion is, in turn, followed by a summation of patterns present within the artifact assemblages and an additional discussion of what scientific questions can be posed given this lithic data base. The final part is intended not only to pose questions but to generate new questions that may guide future data recovery operations at selected N11 project area sites.

Site NM-Q-27-13

Seventeen pieces of flaked stone were collected and analyzed from site NM-Q-27-13. Artifact types include 13 flakes, 3 cores, and 1 cobble. Chert, Washington Pass chert, Chinle chert, petrified wood, and quartzite were identified in the sample (Tables 26.1 and 26.2). Seven artifacts, made of chert, Chinle chert, and petrified wood, possess cortex, three primary and four secondary. Two artifacts were identified with retouched edges, one with thermal alteration, and one other with bipolar reduction. No flaked stone tools were identified on this site. Two unidentified ground fragments made from granite and quartzite and one ground slab fragment were also identified (Tables 26.3 and 26.4). In addition, one fossil, a piece of a shark tooth, was retrieved.

Site NM-Q-22-48

Five flaked stone artifacts were analyzed for site NM-Q-22-48. Artifact types include four flakes and one core. Raw materials include Chinle chert, chert, petrified wood, and quartzite (Tables 26.1 and 26.2). Two artifacts with cortex were identified, one primary (petrified wood) and one secondary (quartzite). No formal tools were identified nor was retouching found to be present.

Ground stone specimens include five ground slab fragments, four unidentified ground fragments, and one polishing stone. These artifacts, made from sandstone and quartzite (Tables 26.3 and 26.4), show evidence of shaping, grinding, and burning.

Site NM-Q-22-52

Nineteen flaked stone artifacts from site NM-Q-22-52 include 16 flakes, 2 cores, and 1 blade (Figure 26.1). These artifacts were manufactured from chert, petrified wood, Washington Pass chert, and hematite (Tables 26.1 and 26.2). Four artifacts have cortex present, one primary (petrified wood) and three secondary (two chert and one petrified wood). Two artifacts show evidence of bipolar percussion.

Six ground stone artifacts were retrieved and include three unidentified fragments, two slab fragments, and one mano made from sandstone (Table 26.3 and 26.4). Evidence of shaping, bifacial grinding, and burning was noted.

Table 26.1. N11(1&2) Testing, Flaked Stone Artifact Types By Site.

	Site NM-Q-													
Artifact Type	27-13	22-48	22-52	22-53	22-54	23-56	23-57	23-58	23-59	23-60	23-62	23-63	23-64	Total
Biface	-	-	-	-	-	-	-	1	-	11	3	-	-	15
Blade	-	-	1	-	-	-	-	5	-	6	-	-	-	12
Chopper	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Cobble	1	-	-	3	4	-	-	-	-	-	-	-	-	8
Core	3	1	2	1	21	5	-	2	-	9	9	2	4	59
Core-flake	-	-	-	-	-	-	-	5	-	19	5	4	-	33
Debitage	-	-	-	-	-	-	-	1	-	24	11	4	3	43
Flake	13	4	16	10	13	8	3	35	4	344	220	45	67	782
Hammerstone	-	-	-	-	2	3	-	1	-	-	3	2	1	12
Microflake	-	-	-	-	2	-	-	1	1	92	9	-	-	105
Projectile point	-	-	-	1	-	-	-	1	-	2	3	-	2	9
Scraper	-	-	-	-	-	-	-	-	-	2	1	1	-	4
Uniface	-	-	-	-	-	-	-	-	-	-	-	-	2	2
Total	17	5	19	15	42	16	3	52	5	510	264	58	79	1085

Table 26.2. N11(1&2) Testing, Flaked Stone Raw Materials By Site.

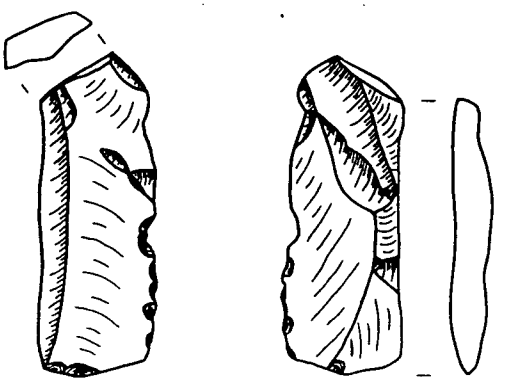
	Site NM-Q-													
Raw Material Type	27-13	22-48	22-52	22-53	22-54	23-56	23-57	23-58	23-59	23-60	23-62	23-63	23-64	Total
Chalcedony	-	-	-	-	-	-	-	-	-	6	1	1	-	8
Chert	8	1	9	2	19	3	-	27	3	277	133	5	25	512
Chert- Chinle	1	2	-	2	-	5	-	1	-	9	30	32	31	113
Chert - Washington Pass	6	-	1	-	-	-	-	2	-	2	3	1	1	16
Hematite	-	-	1	5	-	-	-	5	-	22	13	-	-	46
Obsidian	-	-	-	1	1	-	-	-	-	17	31	5	4	59
Petrified Wood	1	1	8	3	7	2	-	13	1	131	38	9	9	223
Quartzite	1	1	-	2	15	6	3	4	1	43	12	4	6	98
Sandstone	-	-	-	-	-	-	-	-	-	-	1	1	-	2
Siltstone	-	-	-	-	-	-	-	-	-	3	2	-	3	8
Total	17	5	19	15	42	16	3	52	5	510	264	58	79	1085

Table 26.3. N11(1&2) Testing, Ground Stone Artifact Types By Site.

	Site NM-Q-												
Artifact Type	27-13	22-48	22-52	22-53	22-54	23-56	23-57	23-58	23-60	23-62	23-63	23-64	Total
Fetish	-	-	-	-	-	-	-	-	-	-	-	1	1
Mano	-	-	1	-	-	-	1	-	3	-	-	-	5
Mano - biscuit	-	-	-	-	-	-	-	-	4	-	-	-	4
Mano - one-hand	-	-	-	-	-	1	-	-	-	1	1	2	5
Mano - two-hand	-	-	-	-	-	-	-	-	1	1	1	-	3
Metate	-	-	-	-	-	-	-	-	3	-	-	-	3
Metate - basin	-	-	-	-	-	-	-	-	1	1	-	-	2
Metate - slab	-	-	-	-	-	-	-	-	6	-	-	-	6
Metate - trough	-	-	-	-	-	-	-	-	-	1	-	-	1
Mortar	-	-	-	-	-	-	-	-	-	-	1	-	1
Pendant	-	-	-	-	-	-	-	-	1	-	-	-	1
Polishing stone	-	1	-	-	-	-	-	-	3	2	-	1	7
Slab	-	-	-	-	-	1	1	1	-	-	-	-	3
Slab fragment	1	5	2	1	1	-	-	2	-	-	3	4	19
Unidentified fragment	2	4	3	2	2	4	-	-	14	8	1	12	52
Total	3	10	6	3	3	6	2	3	36	14	7	20	113

Table 26.4. N11(1&2) Testing, Ground Stone Raw Materials By Site.

	Site NM-Q-												
Raw Material Type	27-13	22-48	22-52	22-53	22-54	23-56	23-57	23-58	23-60	23-62	23-63	23-64	Total
Jedeite	-	-	-	-	-	-	-	-	-	-	-	1	1
Granite	1	-	-	-	-	-	-	-	-	-	-	-	1
Quartzite	2	2	-	1	-	-	-	-	4	3	-	1	13
Sandstone	-	8	6	2	3	6	2	3	31	11	7	18	97
Petrified Wood	-	-	-	-	-	-	-	-	1	-	-	-	1
Total	3	10	6	3	3	6	2	3	36	14	7	20	113



Actual Size

Figure 26.1. Blade From Site NM-Q-22-52.

Site NM-Q-22-53

Site NM-Q-22-53 yielded 15 pieces of flaked stone including 10 flakes, 3 cobbles, 1 core, and 1 obsidian projectile point (Figure 26.2). These artifacts were manufactured from hematite, petrified wood, chert, Chinle chert, quartzite, and obsidian (Table 26.1 and 26.2). Three artifacts possess secondary cortex and only the obsidian projectile point exhibits signs of retouching. A thermally altered artifact and reconstructible core are also contained within the lithic assemblage.

Two unidentified fragments of ground stone and one slab fragment were also retrieved (Tables 26.3 and 26.4). These pieces were manufactured from sandstone and quartzite. The ground stone pieces show evidence of shaping, bifacial grinding, and thermal alteration. A fossil, possibly a tooth, is also represented in the artifact assemblage.

Site NM-Q-22-54

Test excavations and surface collection from site NM-Q-22-54 resulted in the collection of 42 flaked stone artifacts, including 21 cores, 13 flakes, 4 cobbles, 2 hammerstones, and 2 microflakes manufactured from chert, quartzite, petrified wood, and obsidian (Tables 26.1 and 26.2). Thirty-eight pieces exhibit evidence of cortex, 3 with primary cortex and 35 with secondary cortex. Retouch was not noticed on any artifact. Bipolar reduction was observed on one piece.

Two unidentified fragments and one slab fragment were identified within the ground stone assemblage (Tables 26.3 and 26.4). These items, produced from sandstone, show evidence of shaping, bifacial grinding, and slight thermal alteration. Four pieces of coal were also retrieved from this site.

Site NM-Q-23-56

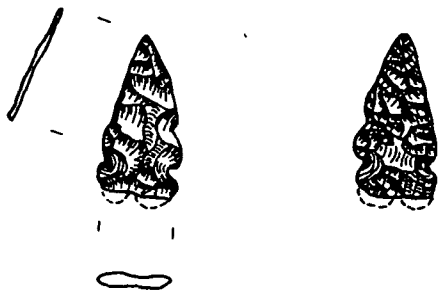
The retrieved lithic assemblage from site NM-Q-23-56 contains 16 pieces of flaked stone, including 8 flakes, 5 cores, and 3 hammerstones made from quartzite, Chinle chert, chert, and petrified wood (Tables 26.1 and 26.2). Three of these pieces have primary cortex present and five have secondary cortex present. No evidence of retouch was observed but thermal alteration was identified and one artifact shows signs of bipolar reduction.

Six ground stone artifacts from this site include four unidentified fragments, one one-hand mano, and one slab, all made of sandstone (Tables 26.3 and 26.4). Bifacial and unifacial grinding, shaping, and burning are evident on the pieces.

Site NM-Q-23-57

Three flaked stone artifacts were analyzed for site NM-Q-23-57 (Tables 26.1 and 26.2). The artifacts are all flakes made from quartzite. One of the flakes shows evidence of secondary cortex.

Two pieces of ground stone were retrieved from the site (Tables 26.3 and 26.4). Both pieces, a slab and a mano, are made of sandstone and show signs of unifacial grinding.



Actual Size

Figure 26.2. Obsidian Projectile Point From Site NM-Q-22-53.

Site NM-Q-23-58

Site NM-Q-23-58 yielded 52 pieces of flaked stone including 35 flakes, 5 core-flakes, 2 cores, 5 blades, 1 hammerstone, 1 projectile point, 1 biface, 1 piece of debitage, and 1 microflake made from chert, petrified wood, hematite, quartzite, Washington Pass chert, and Chinle chert (Table 26.1 and 26.2; Figure 26.3). Thirteen pieces show evidence of cortex, 4 with primary cortex and 9 with secondary cortext. Eight artifacts show evidence of retouch and there is one example of thermal alteration.

One sandstone slab and two sandstone slab fragments were retrieved (Table 26.3 and 26.4). Unifacial grinding and burning were noted on the artifacts. Two pieces of red ochre were also found at this site.

Site NM-Q-23-59

Field investigations at this site yielded five pieces of flaked stone including four flakes and one micro-flake made from chert, quartzite, and petrified wood (Tables 26.1 and 26.2). Two of the artifacts possess secondary cortex.

Site NM-Q-23-60

Site NM-Q-23-60 yielded 510 chipped stone artifacts for analysis including 344 flakes, 92 microflakes, 24 pieces of debitage, 19 core-flakes, 11 bifaces, 9 cores, 6 blades, 2 scrapers, 1 chopper, 1 projectile point, and 1 projectile point fragment (Table 26.1; Figure 26.4). One of the bifaces exhibits what appears to be a channel flute. This artifact may have been part of a Paleoindian fluted point although the flaking pattern is indicative of a biface that did not make it to the projectile point stage but was discarded as a preform, with some subsequent use modification. Raw material consists of chert, petrified wood, quartzite, hematite, obsidian, Chinle chert, chalcedony, siltstone, and Washington Pass chert (Table 26.2). Ninety artifacts show evidence of primary cortex and eight have secondary cortex present. Also present is evidence of retouch and thermal alteration.

Thirty-six ground stone artifacts were collected at this site including 14 unidentified fragments, 3 metates, 6 slab metates, 1 basin metate, 3 manos, 4 biscuit manos, 1 two-hand mano, 3 polishing stones, and 1 pendant (Table 26.3; Figure 26.4). Raw material represented includes sandstone, quartzite, and petrified wood (Table 26.4). One of the biscuit manos, made of quartzite, also shows evidence of use as a hammerstone. In addition to the flaked and ground stone assemblage, six pieces of miscellaneous materials were also retrieved. This material includes two pieces of yellow ochre and four pieces of unmodified petrified wood.

Site NM-Q-23-62

Two hundred sixty-four flaked stone artifacts were analyzed from site NM-Q-23-62. Artifact types include 220 flakes, 11 pieces of debitage, 9 microflakes, 9 cores, 5 core-flakes, 3 hammerstones, 3 projectile points, 3 bifaces, and 1 scraper (Table 26.1; Figure 26.5). Raw materials include chert, petrified wood, obsidian, Chinle chert, hematite, quartzite, Washington Pass chert,

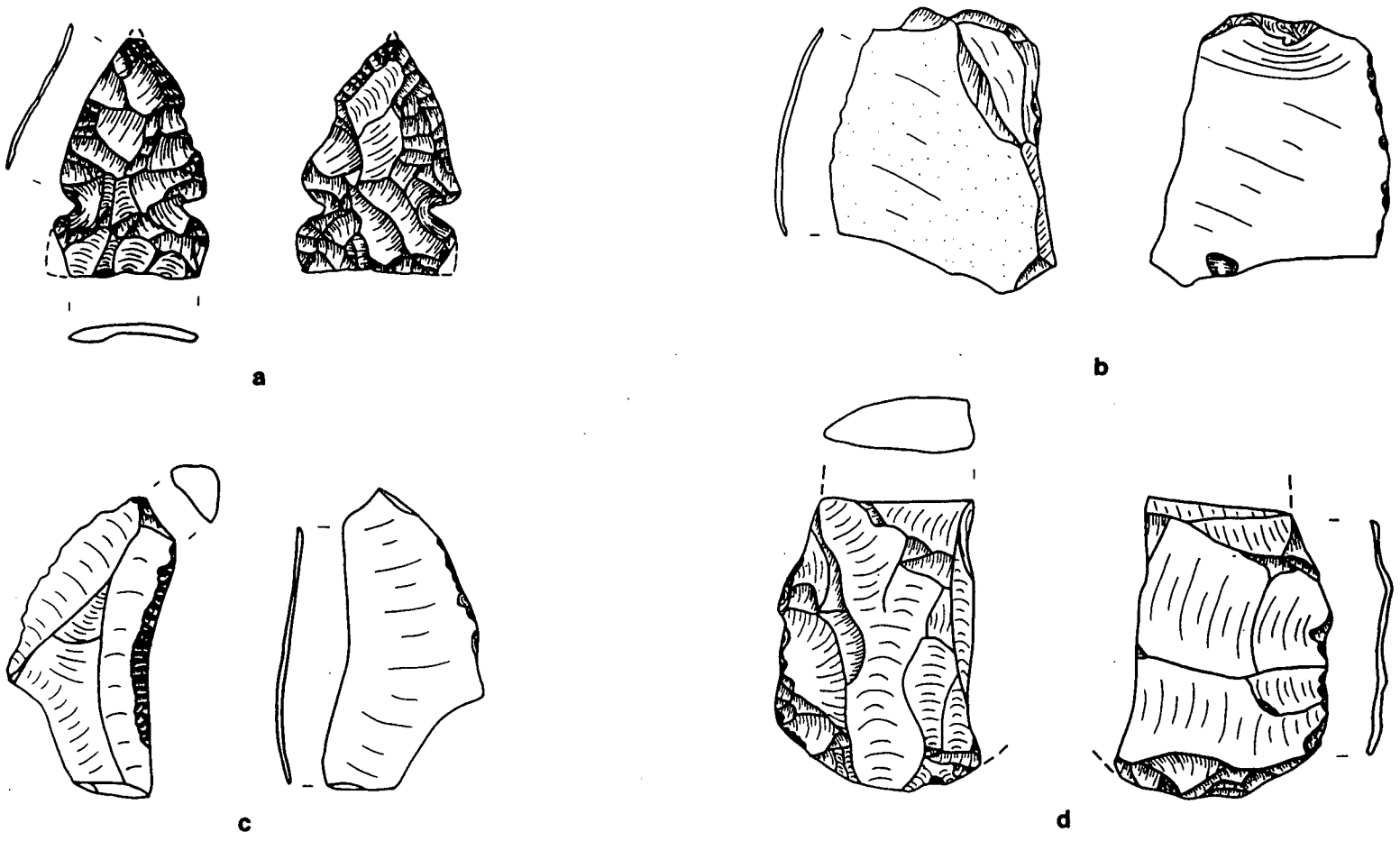


Figure 26.3. Tools From Site NM-Q-23-58, a) Projectile Point, b-d) Blades.

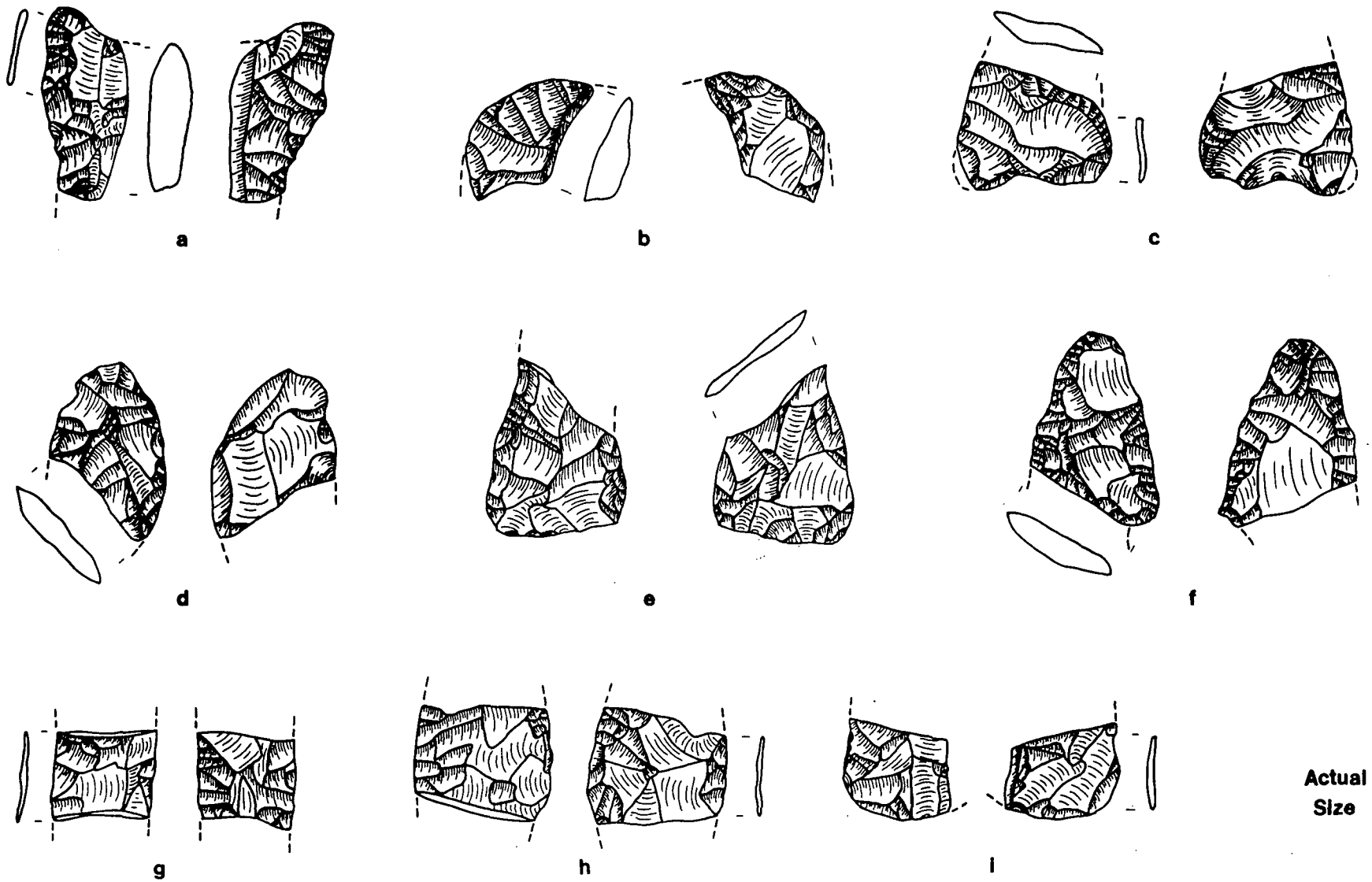


Figure 26.4a. Tools and Ground Stone From Site NM-Q-23-60, a-i) Biface.

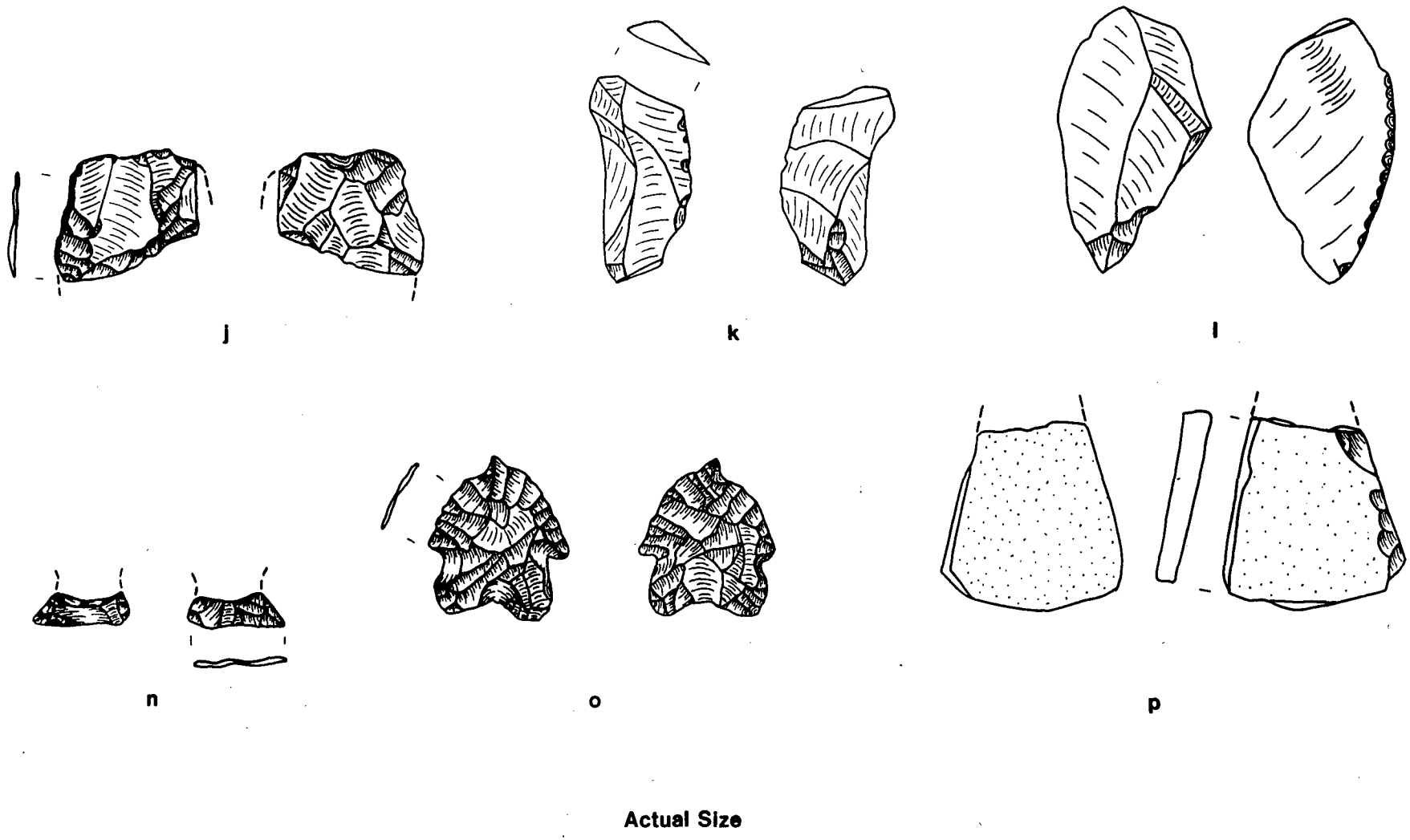


Figure 26.4b. Tools and Ground Stone From Site NM-Q-23-60, j) Possible Fluted Biface k-l) Blades, n-o) Projectile Points, and p) Pendant Fragment.

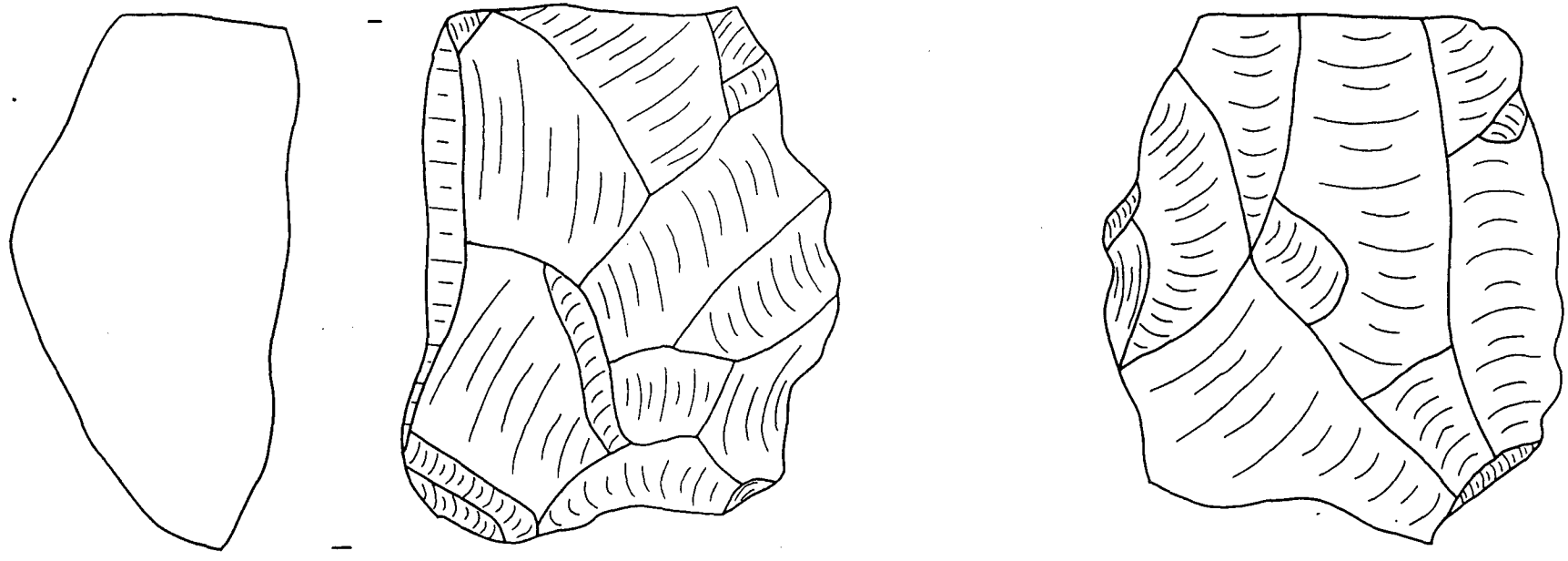


Figure 26.4c. Tools and Ground Stone From Site NM-Q-23-60, m) Chopper.

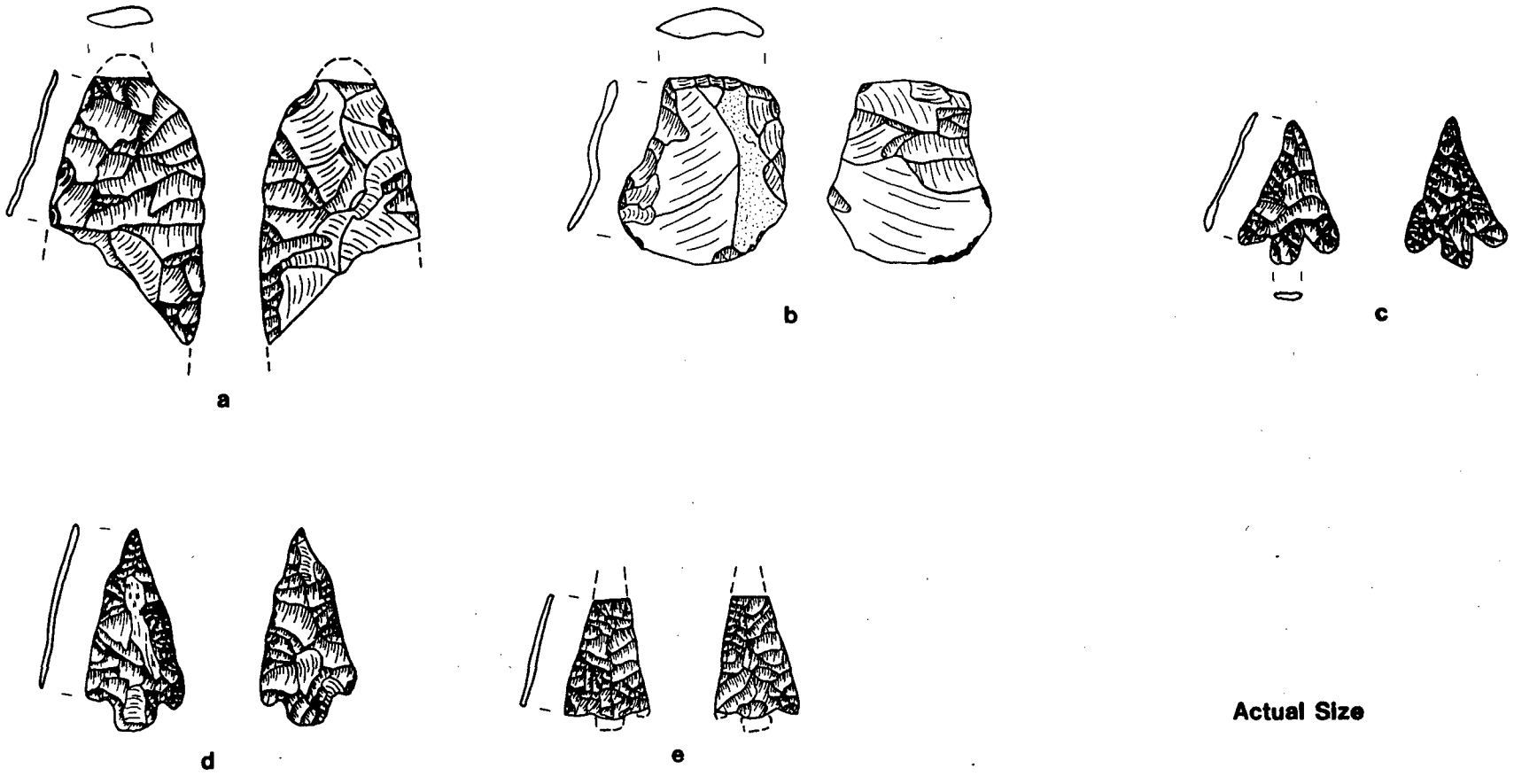


Figure 26.5. Tools From Site NM-Q-23-62, a) Biface, b) Scraper, and c-e) Projectile Points.

siltstone, sandstone, and chalcedony (Table 26.2). Eighty pieces within this assemblage have cortex; 13 show evidence of primary cortex and 67 exhibit evidence of secondary cortex. Evidence of retouching was also identified in the assemblage.

Fourteen ground stone artifacts, manufactured from sandstone and quartzite and including eight unidentified fragments, two polishing stones, a basin metate, a trough metate, a one-hand mano, and a two-hand mano, were retrieved from the site (Tables 26.3 and 26.4). Unfacial and bifacial treatments were both noted on the ground stone assemblage. Five pieces of hematite, 26 or more pieces (decomposing) of mica, two pieces of ochre, and four pieces of turquoise (two conjoinable) were also retrieved from the site.

Site NM-Q-23-63

Site NM-Q-23-63 yielded 58 pieces of flaked stone, including 45 flakes, 2 cores, 4 core-flakes, 4 pieces of debitage, 2 hammerstones, and 1 scraper (Table 26.1; Figure 26.6). Raw material represented among these artifacts include Chinle chert, petrified wood, chert, obsidian, quartzite, chalcedony, Washington Pass chert, and sandstone (Table 26.2). Twenty-one artifacts were identified with evidence of cortex: 12 with primary cortex and 9 with secondary cortex. Evidence of retouching and thermal alteration were also noted in the flaked stone assemblage.

Ground stone artifacts include three slab fragments, one unidentified ground stone, one one-hand mano, one two-hand mano, and one mortar (Table 26.3). All pieces were manufactured from sandstone (Table 26.4). Bifacial and unifacial grinding were noted as was sharpening and burning. One piece of yellow ochre was also collected and analyzed from this site.

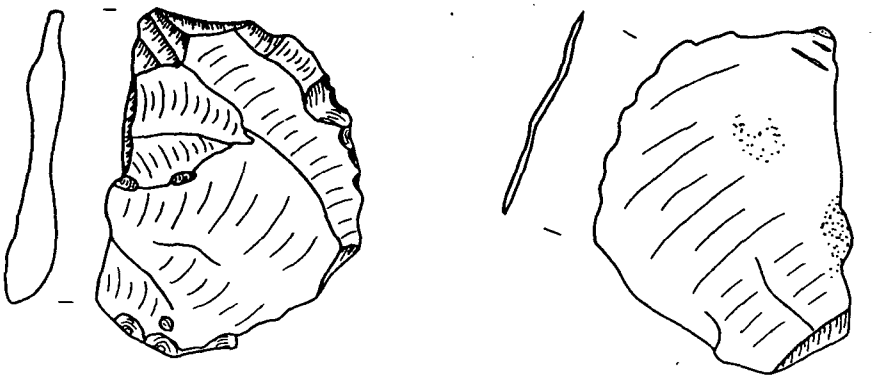
Site NM-Q-23-64

Seventy-nine flaked stone artifacts were collected and analyzed from site NM-Q-23-64. These artifacts include 67 flakes, 4 cores, 3 pieces of debitage, 2 unifaces, 1 projectile point, 1 projectile point base, and 1 hammerstone fragment (Table 26.1; Figure 26.7). The artifacts were manufactured from Chinle chert, chert, petrified wood, quartzite, obsidian, siltstone, and Washington Pass chert (Table 26.2). Twelve of these artifacts show signs of primary cortex and ten exhibit secondary cortex. Retouch and thermal alteration were identified in just a few artifacts.

Twenty ground stone artifacts were analyzed for this site, including 12 unidentified fragments, 4 slab fragments, 2 one-hand manos, 1 polishing stone, and 1 fetish (Figure 26.7). The ground stone artifacts were produced from sandstone, quartzite, and jadeite (the fetish). The fetish is in the shape of a coyote or a similar four-legged animal. Unifacial and bifacial grinding, as well as sharpening and burning, were identified among the remaining ground stone items. One piece of hematite and two pieces of ochre (one red and one yellow) were also retrieved from the site.

SUMMARY

The flaked, ground, and miscellaneous stone materials retrieved from test excavations and surface collection at the N11 sites are, for the most part, typical of assemblages that one would expect to find on the southern edge of the San Juan Basin from the Late Archaic through the Pueblo



Actual Size

Figure 26.6. Scraper From Site NM-Q-23-63.

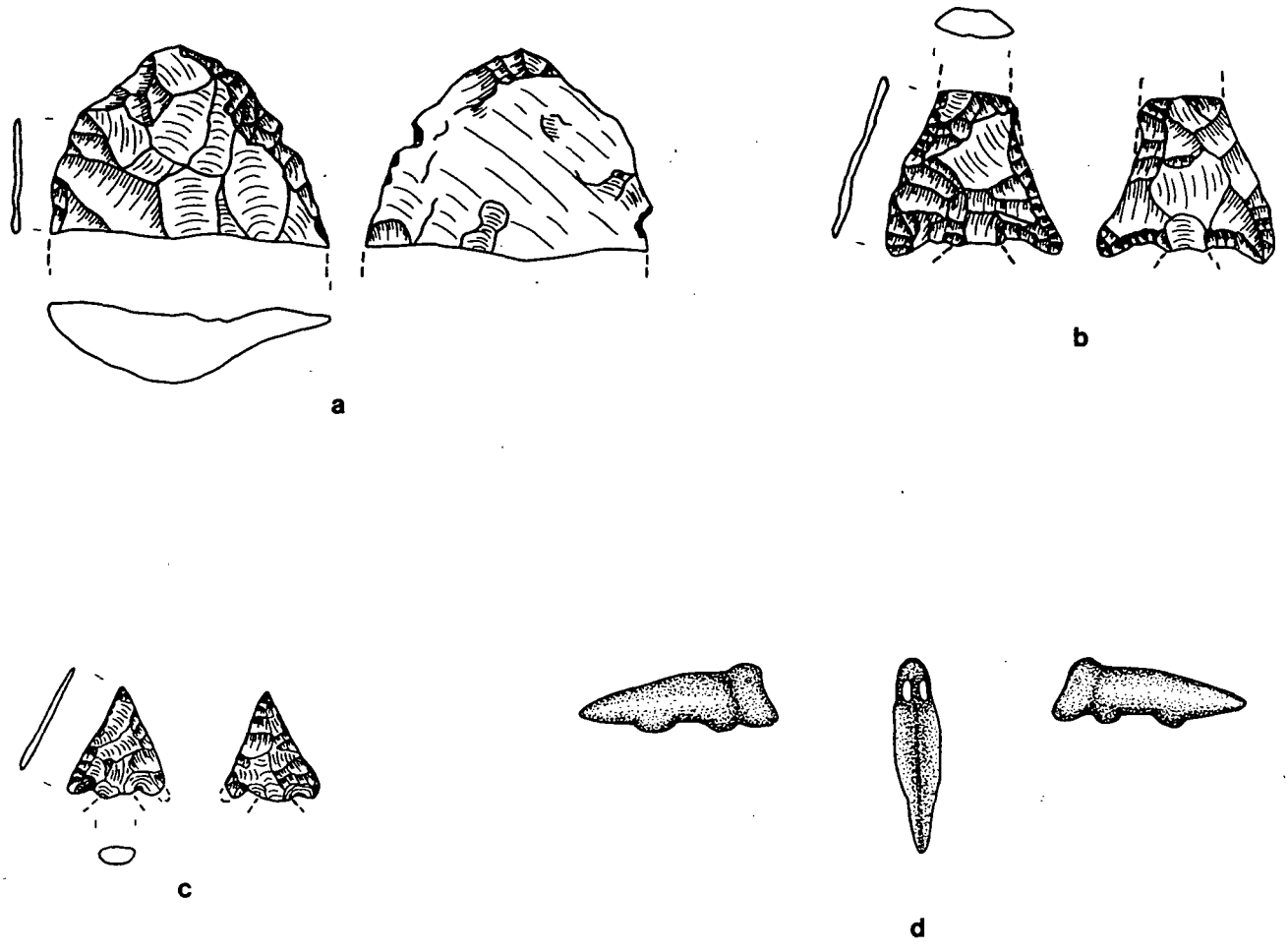


Figure 26.7. Tools and Fetish From Site NM-Q-23-64, a) Uniface, b) Projectile Point, and d) Fetish.

II periods. Material retrieved and studied during the course of the project includes 1085 pieces of flaked stone, 113 pieces of ground stone, and 55 pieces of miscellaneous stone (Tables 26.1, 26.2, 26.3, and 26.4).

Of the flaked stone, 72% of the pieces are flakes, 10% are microflakes, 5% are cores, 4% are pieces of debitage, and 3% are core-flakes. The flaked stone assemblage is dominated by pieces typical of the early stages of lithic artifact reduction. Formal artifact types such as bifaces, blades, choppers, hammerstones, projectile points (possible Paleoindian, Late Archaic, and Puebloan point types), and scrapers make up only 5% of the entire flaked stone assemblage. This situation can be expected in many circumstances but the variations in the relationships of formal tool types to waste products (including cores, flakes, and debitage) may be indicative of functional and adaptational strategies at individual sites in general and within the N11 project area. Most of the flaked stone artifacts were manufactured from cherts (generic, Chinle, and Washington Pass varieties). Generic varieties of chert compose 47% of the entire assemblage and Chinle (10%) and Washington Pass (1%) cherts make up another 11% of the assemblage. The larger amount of Chinle chert may reflect a closer connection to the south, in the area of the Zuni Mountains, than to the west and the area of the Chuska Mountains (a relationship also noted in the ceramic assemblage). Most of the Chinle chert artifacts were obtained at the three Basketmaker sites at the north end of the project area (sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64). Petrified wood and quartzite material make up another 26% of the flaked stone materials in the project area. Obsidian, which would have been brought in from probable sources in the Gila region to the southwest, Mount Taylor to the southeast, or the Jemez region to the northeast, constitutes 5% of the flaked stone assemblage.

The entire ground stone assemblage from the N11 project area sites includes 113 pieces. Of these pieces, the largest categories of ground stone include unidentified ground fragments (46%) and ground slab fragments (17%). Four varieties of manos were identified: generic manos (n=5), biscuit manos (n=4), one-hand manos (n=5), and two-hand manos (n=3). Manos constitute 15% of the ground stone assemblage. Metates, plain (n=3), basin (n=2), slab (n=6), and trough (n=1), make up 11% of the ground stone. Other artifacts include a fetish, a mortar, a pendant, seven polishing stones, and three slabs — 11% of the ground stone. The fetish is a small (2.46 cm long by 0.75 cm wide and 0.51 cm thick) greenish stone (possibly jadeite) in the shape of a four-legged animal that appears to be a coyote (Figure 26.7; see also Cushing 1994:plate V). This fetish was retrieved from a Basketmaker III site (NM-Q-23-64). Most of the other ground stone material was fashioned from sandstone (86%) or quartzite (12%); silicified wood and granite also occur in solitary examples.

Miscellaneous stone artifacts include 55 pieces of sundry materials. Twenty-six pieces or more (the material is quite fragile) of mica were recovered from one site. Nine pieces of ochre were obtained from five sites including the three Basketmaker sites at the north end of the N11 project area, the multicomponent site NM-Q-23-60, and site NM-Q-23-58 where a Pueblo II presence overlies a buried Late Archaic component. Also recovered were six pieces of hematite from the Basketmaker site NM-Q-23-62, four pieces of coal, four pieces of petrified wood, four pieces of turquoise (also from site NM-Q-23-62), and two fossils, both probably teeth, one from a shark.

Several additional patterns are observable in the data. These patterns provide information on site function, chronology, lithic raw material procurement, and stone tool use.

Flaked Stone Tool Diversity

The lithic assemblages are most robust at five sites at the north end of the N11 project area. These five sites include three Basketmaker sites (sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64) and two multicomponent sites (NM-Q-23-58 and NM-Q-23-60). In terms of artifact type diversity, these five sites have a more complete range of represented artifact types than the remaining sites within the N11 project area (Figure 26.8). For example, at one end of the spectrum, site NM-Q-23-60 yielded specimens from the following artifact types: biface, blade, chopper, core, core-flake, debitage, flake, microflake, projectile point, and scraper (Table 26.1). At the other end of the spectrum, site NM-Q-23-57 produced only three flakes, all from one material type. Notwithstanding the possible differences of opinion on terminology vis-a-vis lithic technology as employed by archaeologists, the differences manifest in the inventory provide strong indications that site function varied as represented at the sites discussed in this report. There exists a hierarchy in artifact type distribution within the analyzed sites. The five sites mentioned above contain a more diverse selection of artifact types. One possible reason for this differentiation is that the assemblages with a larger number of artifact types are representative of sites with more complex logistical scheduling tasks. Sites with limited functions produced artifact assemblages with similarly limited artifact types. Of course, all of the above is predicated upon a sampling strategy that deals with an entire site. In the N11 project area, sampling bias is inherent in testing only the portion of the site that lies within the proposed construction right-of-way.

The multicomponent site NM-Q-23-60 includes a possible Paleoindian presence, a Late Archaic campsite, and historic Navajo features. Most of the lithic material probably derived from the Late Archaic component at this site. The overall robustness probably denotes that a greater number and diversity of tools were utilized at these sites and it is inferred that a variety of tasks were performed at this site. Similar conclusions can be reached for the three Basketmaker sites located at the north end of the N11 project area (sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64) and site NM-Q-23-58. The other sites within the N11 project area yielded more limited ranges within the category of represented artifact types. It can be inferred that more limited activities were carried out at these sites. In other words, the five sites with the most diverse assemblages possibly contained a wider range of activities associated with habitation and the rest of the sites were utilized for limited activities such as resource procurement and specialized production. Again, one must condition all statements with the caveat that site sampling biases caused by excavating only within the N11 right-of-way will have an interpretive effect. At site NM-Q-22-54, for example, the part of the site that was sampled during this phase of study lies outside of the main occupational component. Rather than testing a Pueblo II rubble mound showing signs of habitation, the testing effort examined only a portion of the site which was removed from the site center.

Our inspection of the flaked stone assemblages from the N11 sites indicates that at least five sites were habitation sites with settlement that was seasonal, if not year-round. Other sites within the N11 project area may have seen more specialized use or the portions of the sites within the N11 right-of-way are not representative of overall site function. The most complex sites in terms of lithic assemblages are those located at the northern end of the N11 project area. The primary focus at these five sites centers on chronology. The three northernmost sites, Basketmaker II and III with possible earlier components, yielded lithic assemblages that indicate a diverse number of activities

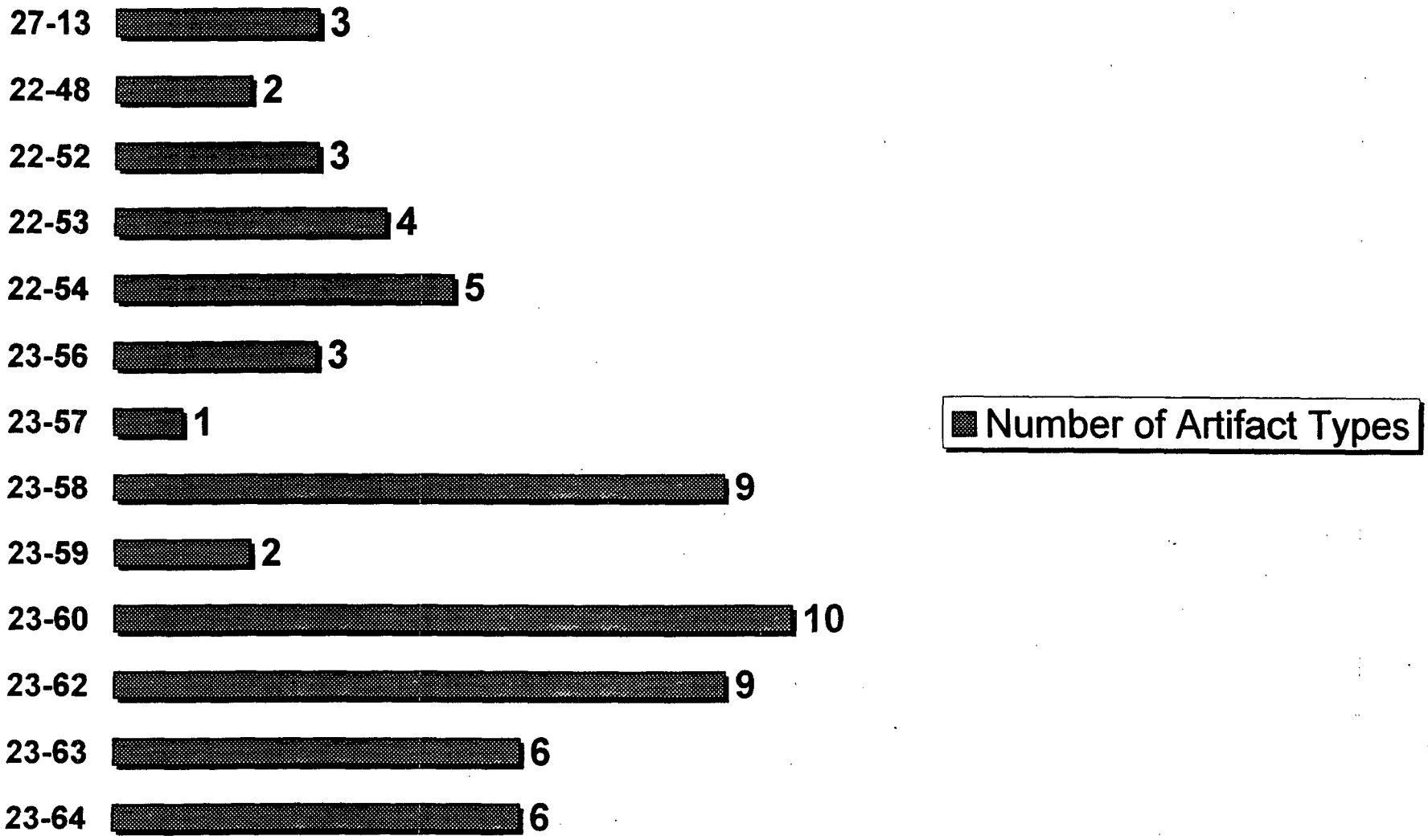


Figure 26.8. Bar Graph Showing the Diversity of Artifact Types for Sites Within the N11 Project Area.

were carried out. Two other sites, both with Late Archaic components, reflect similar diversity in stone tool use and correlated functional activities. The combination of these five sites provides important possibilities for tracing long-term settlement and function within the project area.

Projectile point morphology exhibits similar patterning. When graphed (Figure 26.9), the projectile points from the Late Archaic sites group apart from the Basketmaker projectile points. The single Pueblo II period projectile point is, as expected, the smallest and can also be separated from the Basketmaker and Late Archaic projectile point assemblages. A fragment from a possible fluted Paleoindian point is not included in this analysis because it is not complete. The fragment does provide evidence that an even earlier human presence can be documented along the N11 corridor.

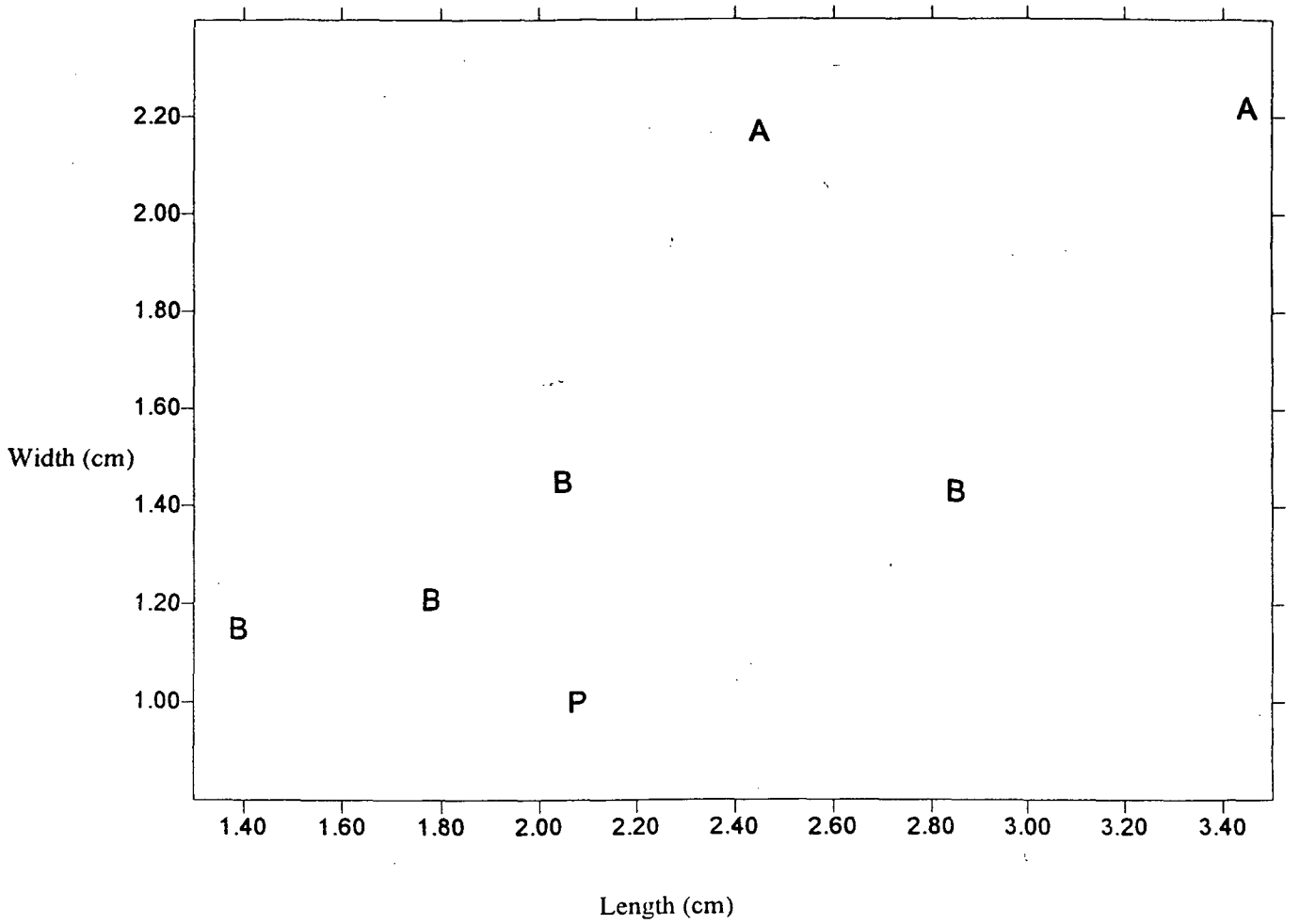
The fact that the major archaeological manifestation close to the project area is the Muddy Water Great House and that the N11 project area sites show a developmental sequence from the Late Archaic to the Pueblo II/III period is important. We have an excellent opportunity to chart not only the diversity of lithic assemblages within an area (as they relate to site function) but also to study how settlement, as reflected in the lithic assemblage, might relate to the evolution of the Chacoan landscape in this edge of the San Juan Basin.

Ground Stone Tool Types, Sizes, and Functions

Conclusions similar to those reached for the flaked stone assemblage can also be expressed for the ground stone assemblage. Site NM-Q-23-60 provided the greatest diversity of ground stone types. The three Basketmaker sites at the north end of the project yielded a somewhat more limited ground stone assemblage.

The ground stone assemblage is dominated by manos and metates. Diversity within the two categories is significant. For example, if we look at the manos, the smallest manos, or biscuit manos (presumably utilized for grinding wild plants), occur at the Late Archaic site NM-Q-23-60 and larger one-hand and two-hand manos are associated with the following Basketmaker period (Figure 26.10). The Late Archaic manos are shown in Figure 26.10 in the lower left. The larger Basketmaker manos are represented in the upper right portion of the figure. Smaller manos were utilized for the processing of wild plant foods and larger manos (especially two-hand manos) processed domesticated crops such as corn. An analysis of the ground stone assemblage at N11 implies that vegetal processing at site NM-Q-23-60 was enacted for wild sources. The ground stone assemblages at the Basketmaker sites NM-Q-23-62, -63, and -64 are different from that at site NM-Q-23-60 (Late Archaic). The larger size of the manos is probably related to changes in food processing. Instead of or in addition to wild plants processed during the Late Archaic, the processing of corn is inferred from the Basketmaker ground stone assemblages.

The coyote fetish from site NM-Q-23-64 provides information on the antiquity of this art form and also, when correlated with information on site structure and function, will be a source of information on ideological systems in a pre-Chacoan world. Similar fetishes have been recovered from other Basketmaker sites in or on the edge of the San Juan Basin.

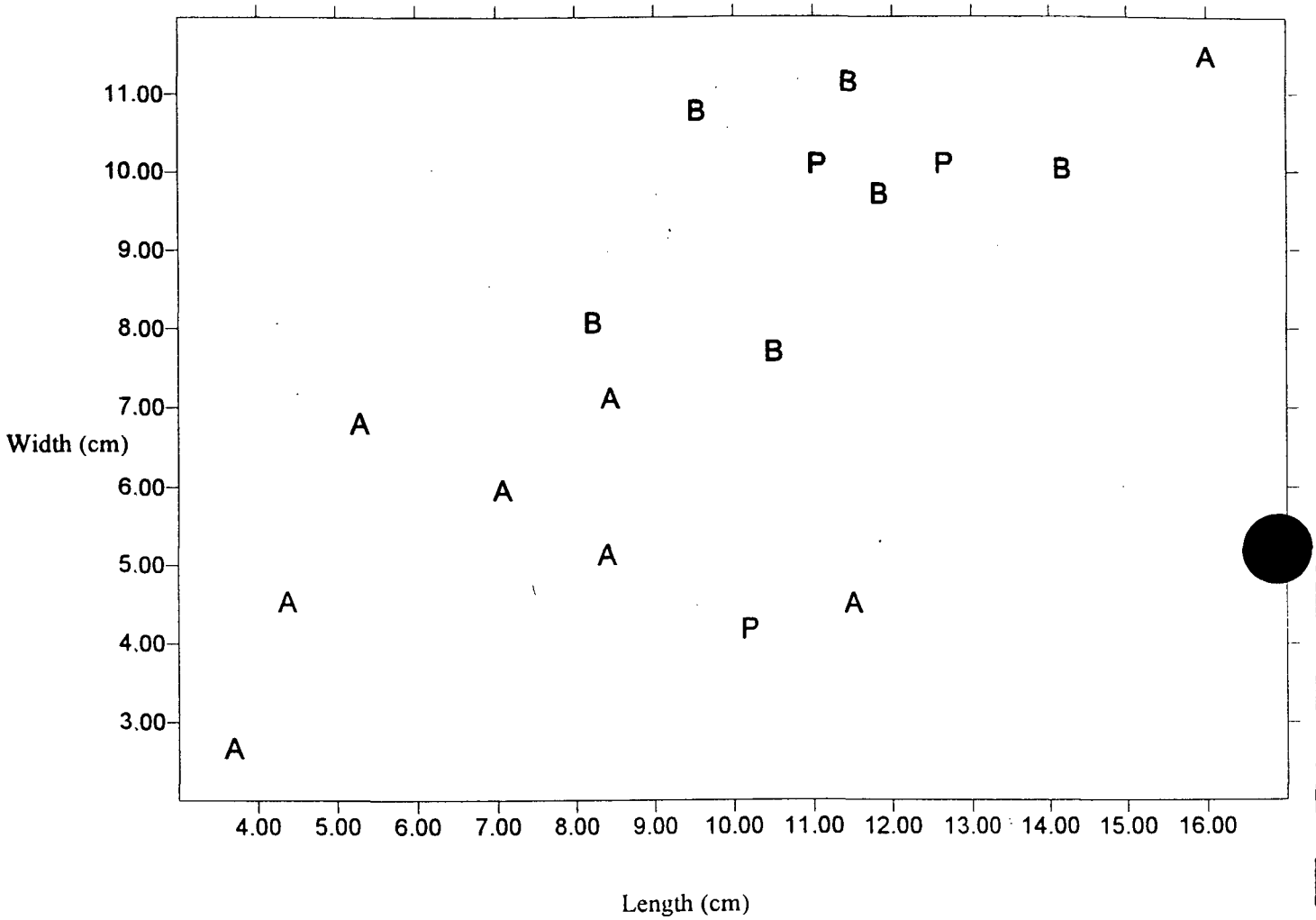


A - Late Archaic (Sites NM-Q-23-58 and NM-Q-23-60)

B - Basketmaker (Sites NM-Q-23-62 and NM-Q-23-64)

P - Pueblo II (Site NM-Q-22-53)

Figure 26.9. Complete Projectile Point Dimensions for N11 Sites.



A - Late Archaic (Site NM-Q-23-60)

B - Basketmaker (Sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64)

P - Pueblo II (Sites NM-Q-22-52, NM-Q-23-56, and NM-Q-23-57)

Figure 26.10. Mano Size for N11 Sites.

CONCLUSIONS

The lithic artifacts analyzed for the N11 project were manufactured from a number of different raw materials. The artifacts are typical of assemblages from Late Archaic to Puebloan contexts. The lithic assemblage including flaked, ground, and miscellaneous stone was described from each site. A discussion of the nature of the lithic assemblages followed and several patterns were discerned. These patterns pertain to the diversity of the lithic assemblage at each site with regard to flaked stone artifacts, ground stone pieces, and the selection of varied raw materials. It is suggested that greater diversity may imply differential use of the site — sites with greater diversity probably represent habitation sites and sites with less diversity may have been used for specialized activities. The sites with the greatest diversity in all categories (flaked artifacts, ground stone tools, and raw materials) all lie at the northern end of the project area and date to the Late Archaic and the Basketmaker periods. Two Pueblo II period sites (NM-Q-22-53 and NM-Q-22-54) have less diversity but the parts of the site tested lay outside the main site area.

Functional differences in the artifact assemblages are also evident at different sites. These functional differences appear to relate to changes in food preparation and hunting strategies. The mano size differs considerably depending upon the component analyzed. The earliest manos, termed biscuit manos, appear within a Late Archaic component. The succeeding Basketmaker manos, one-hand manos, are somewhat larger and were probably used for different grinding activities. The Puebloan period manos, not well represented in the N11 sample, generally contain larger two-hand manos that were used to grind corn. Projectile point morphology also changes from the Late Archaic to the Pueblo II period with points becoming smaller. This observation has been, of course, well documented elsewhere in the Southwest. Changes in point morphology probably result from changes in hunting strategies with less emphasis on hunting in the Puebloan period.

The lithic assemblage represented at the sites within the N11 project provides information on site function and subsistence strategies. These factors appear to be related to evolving socioeconomic structures and the shift from Late Archaic to Basketmaker to Pueblo period adaptations.

Chapter 27

FAUNAL REMAINS

Jerome Zunie

INTRODUCTION

Faunal remains discussed in this report were recovered from test excavation on sites located within the right-of-way of N11 between Mariano Lake and Crownpoint, New Mexico. A total of 545 faunal specimens were analyzed. Faunal remains were recovered from sites NM-Q-27-13 (LA 110304), NM-Q-22-52 (LA 110315), NM-Q-22-53 (LA 110316), NM-Q-22-54 (LA 110317), NM-Q-23-56 (LA 110319), NM-Q-23-57 (LA 110320), NM-Q-23-58 (LA 110322), NM-Q-23-60 (LA 38698), NM-Q-23-62 (LA 110325), NM-Q-23-63 (LA 110326), and NM-Q-23-64 (LA 110327).

The primary purpose of the faunal analysis is to provide descriptive information regarding the kinds of animals represented, as well as their relative abundance in the site deposits. The results of the descriptive analysis are then used to create an economic summary of the taxa identified by site and provenience.

METHODS

All identifications were made to the most precise taxonomic level possible using comparative collections housed at the Museum of Southwest Biology at the University of New Mexico, Albuquerque. Where it was not possible to make identifications to the family or generic levels, the categories of small, medium, and large mammal were employed to provide some level of identification for fragmented specimens. Small mammal refers to mammals smaller than cottontails (genus *Sylvilagus)* and medium mammals are those ranging between cottontails and dogs (genus *Canis)* in size. Large mammals are those larger than dogs. A single fragmented specimen was identified as small bird, which means birds that are sparrow to magpie in size.

The counting unit employed is the number of identifiable specimens (NISP). The minimum number of individuals (MNI) was not used as this measure is a function of both NISP and MNI (Grayson 1984). Therefore, NISP was the preferred measurement for counting taxonomic abundance.

Tables 27.1 through 27.5 present NISP values for taxon by site and provenience for all 11 sites, and Table 27.6 presents a summary of identified mammal and bird bones by taxon and element.

RESULTS OF THE FAUNAL ANALYSIS

Site NM-Q-27-13

A total of four specimens were analyzed from site NM-Q-27-13. Contexts sampled from this site consisted of surface collections and a hand-excavated unit. Three specimens were analyzed from

Table 27.1. Sites NM-Q-27-13, NM-Q-22-52, NM-Q-22-53, NM-Q-22-54, and NM-Q-23-56, Identified Faunal Specimens Per Collected Unit.

	Sites													
	NM-Q-27-13		NM-Q-22-52				NM-Q-22-53	NM-Q-22-54					NM-Q-23-56	
SU No.	10	40	13	14	14	14	16	11	11	11	11	14	34	
Feature No.	-	-	-	1	1	-	-	-	-	-	-	-	-	
Taxon FS No.	10	53	69	76	82	86	47	14	15	18	20	75	39	NISP Total
Sylvilagus sp.	-	-	-	-	-	-	1	-	-	7	-	-	-	8
Cynomys gunnisoni	-	-	1	-	-	1	-	-	-	1	-	-	-	3
Cricetidae	-	-	-	-	-	-	-	1	1	-	-	-	-	2
Artiodactyla	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Small mammal	-	-	-	4	-	-	-	-	2	20	6	-	1	33
Large mammal	3	1	-	-	1	-	-	-	-	-	-	-	-	5
NISP Total	3	1	1	4	1	1	1	1	3	28	6	1	1	52

Key: FS = Field Specimen
NISP = Number of Identifiable Specimens
SU = Study Unit

Table 27.2. Sites NM-Q-23-57 and NM-Q-23-58, Identified Faunal Specimens Per Collected Unit.

	Sites																
	NM-Q-23-57						NM-Q-23-58										
SU No.	6	5	5	10	10	10	-	-	-	-	1	-		-	4	4	
Feature No.	3	1	11	9	9	9	-	-	-	-		-	5	-	-	-	NISP
Taxon FS No.	4	8	11	24	30	50	19	24	50	56	65	69	72	80	86	87	Total
Ovis aries	-	2	4	-	-	5	-	-	-	-	-	-	1	1	-	-	13
Capra hirca	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2
Artiodactyla	-	1	12	1	-	-	-	-	-	-	-	1	-	-	-	-	15
Small mammal	-	-	-	-	-	-	1	1	5	1	1	-	-	-	-	-	9
Large mammal	1	14	71	5	-	4	-	-	-	-	-	-	-	-	2	3	100
NISP Total	1	17	87	6	2	9	1	1	5	1	1	1	1	1	2	3	139

Key: FS = Field Specimen
NISP = Number of Identifiable Specimens
SU = Study Unit

Table 27.3. Site NM-Q-23-60, Identified Faunal Specimens Per Collected Unit.

		Site NM-Q-23-60											
	SU No.	36	47	53	54	58	60	74	77	77	80	82	
	Feature No.	-	-	-	-	-	-	-	-	-	2	-	NISP
Taxon	FS No.	42	53	59	60	64	66	91	104	105	143	161	Total
Leporidae		-	1	-	-	-	-	-	-	-	-	1	2
Sylvilagus sp.		-	-	-	-	-	-	-	-	-	-	-	-
Lepus sp.		-	-	-	-	-	-	-	-	-	49	4	53
Cynomys gunnisoni		-	-	-	-	-	-	-	-	-	-	1	1
Small mammal		2	-	1	28	10	14	3	-	-	77	30	165
Large mammal		-	-	-	-	-	-	-	19	1	-	-	20
NISP Total		2	1	1	28	10	14	3	19	1	126	36	241

Key: FS = Field Specimen
NISP = Number of Identifiable Specimens
SU = Study Unit

Table 27.4. Sites NM-Q-23-62 and NM-Q-23-63, Identified Faunal Specimens Per Collected Unit.

		Sites																					
		NM-Q-23-62													NM-Q-23-63								
	SU No.	-	-	-	-	-	-	-	-	-	-	4	7	16	-	1	2	7	7	7	7	8	
	Feature No.	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	1	1	-	NISP
Taxon	FS No.	13	16	17	19	22	32	52	56	71	76	101	114	151	26	50	51	63	70	71	73	118	Total
Lepus sp.		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	2
Dipodomys ordii		-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cricetidae		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Neotoma sp.		-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	4
Taxidea taxus		-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	2
Odocoileus hemionus		-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
Small mammal		1	1	-	1	-	-	-	-	3	-	1	-	-	-	1	-	6	-	-	-	-	14
Large mammal		-	-	1	-	2	-	1	1	-	-	-	-	2	11	-	1	3	1	1	2	-	26
Amiantis callosa																							
Shell		-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	2
Meleagris gallopavo		-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1
NISP Total		1	1	1	1	2	1	1	1	3	4	1	1	6	11	1	2	11	1	1	2	1	54

Key: FS = Field Specimen
NISP = Number of Identifiable Specimens
SU = Study Unit

Table 27.5. Site NM-Q-23-64, Identified Faunal Specimens Per Collected Unit.

		Site NM-Q-23-64																					
	SU No.					2	2	2	2	1	1	3	3	3	3	3	3	3	3	3	5	5	
Specimen	FS No.	15	40	42	77	124	129	132	133	136	139	143	145	146	147	150	152	154	156	158	173	179	Total
Leporidae		-	-	1	-	-	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	4
Sylvilagus sp.		-	-	-	-	-	1	1	1	-	-	-	-	-	1	2	-	1	-	2	-	-	9
Cynomys gunnisoni		-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
Dipodomys ordii		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Cricetidae		-	-	-	-	1	1	2	-	-	1	2	-	-	-	-	-	-	-	-	-	-	7
Neotoma sp.		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Small mammal		-	-	-	-	1	3	1	8	1	-	-	1	-	2	-	1	-	5	2	1	1	27
Large mammal		2	1	-	2	-	-	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	8
Small Bird		-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
NISP Total		2	1	1	2	2	5	4	10	1	2	2	4	1	4	2	1	1	8	4	1	1	59

Key: FS = Field Specimen
NISP = Number of Identifiable Specimens
SU = Study Units

Table 27.6. Summary of Faunal Specimens Identified to Element.

	Element																			
Taxon	Skull	Mandible	Tooth	Vertebra	Rib	Scapula	Humerus	Ulna	Radius	Coxal	Femur	Tibia	Metatarsal	Tarsus	Carpal bone	Metacarpus	Calcaneus	Phalanx	Carpometacarpus	Unidentified
Leporidae	-	-	-	2	-	-	-	1	1	-	2	-	-	-	-	-	-	-	-	-
Sylvilagus sp.	1	2	-	-	-	-	7	-	1	2	1	3	-	-	-	-	-	-	-	-
Lepus sp.	-	-	-	13	18	-	-	3	3	1	2	1	2	1	-	-	-	11	-	-
Cynomys gunnisoni	1	2	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Dipodomys ordii	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
Cricetidae	-	2	-	-	-	2	1	1	1	1	-	-	-	-	-	-	-	-	-	-
Neotoma sp.	1	2	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Taxidea taxus	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Odocoileus hemionus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Ovis aries	-	2	-	-	-	2	1	-	2	-	-	1	-	-	-	-	-	7	-	-
Capra hirca	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-
Artiodactyla	-	-	1	-	-	-	-	-	-	-	-	-	9	-	-	-	-	6	-	-
Small mammal	19	-	-	1	1	-	3	1	-	1	-	-	2	-	-	-	2	1	-	209
Large mammal	-	-	-	-	2	1	3	-	-	1	1	-	-	-	2	1	-	4	-	155
Meleagris gallopavo	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Small Bird	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
NISP Total	23	11	1	16	21	6	15	8	8	8	7	6	13	1	2	1	3	30	1	364

Key: NISP = Number of Identifiable Specimens

the surface collections and all three specimens were identified to the category large mammal. One specimen was analyzed from the hand-excavated unit (recovered from the 1/4-in screen). The specimen was identified to the category large mammal.

Site NM-Q-22-52

A total of seven specimens were analyzed from site NM-Q-22-52. Contexts sampled from this site consisted of hand-excavated units and a feature. Two specimens were recovered from the 1/4-in screen and five specimens were recovered from a feature (Feature 1).

The two specimens analyzed from the hand-excavated units were identified to prairie dog (*Cynomys gunnisoni*). Of the five specimens analyzed from Feature 1, four specimens were identified to the category small mammal and one specimen to large mammal.

Site NM-Q-22-53

One specimen was analyzed from site NM-Q-22-53. This specimen was recovered from the 1/4-in screen in a hand-excavated unit. It was identified to cottontail rabbit (*Sylvilagus* sp.).

Site NM-Q-22-54

A total of 39 specimens were analyzed from hand-excavated units at site NM-Q-22-54. All 39 specimens were recovered from the 1/4-in screen. Twenty-eight specimens were identified to the category small mammal. One specimen was identified to the order Artiodactyla (deer or sheep). Seven specimens were identified to cottontail rabbit, one specimen was identified to a prairie dog and two specimens were identified to family level of Cricetidae (mice).

Site NM-Q-23-56

Faunal material analyzed from site NM-Q-23-56 included only one item that was identified to the category of small mammal. It was recovered during 1/4-in screening of the sediments from a hand-excavated unit.

Site NM-Q-23-57

A total of 122 specimens were analyzed from site NM-Q-23-52. Contexts sampled at this site consisted of four features (Features 1, 3, 9, and 11).

Seventeen mammal specimens were analyzed from the hogan (Feature 1). Two specimens were identified as domesticated sheep (*Ovis aries*). One specimen was identified to the order Artiodactyla. Fourteen specimens were identified to the category large mammal.

One specimen was analyzed from the ash dump (Feature 3) and was identified to the category large mammal.

Seventeen specimens were analyzed from the trash scatter (Feature 9). Five specimens were identified as domesticated sheep and two specimens were identified as goat (*Capra hirca*). One specimen was identified to the order Artiodactyla and nine specimens were identified to the category large mammal.

A total of 87 mammal specimens were analyzed from the hearth (Feature 11). Four specimens were identified as domesticated sheep. Twelve specimens were identified to the order Artiodactyla. Seventy-one specimens were identified to the category large mammal.

Site NM-Q-23-58

A total of 17 mammal specimens were analyzed from site NM-Q-23-58. Contexts sampled at this site consisted of surface collections, hand-excavated units, and an on-site backhoe trench.

Ten mammal specimens were analyzed from six different surface proveniences. One specimen was identified as domesticated sheep. One specimen was identified to the order Artiodactyla. Eight specimens were identified to the category small mammal.

Six specimens were analyzed from hand-excavated units (recovered from the 1/4-in screen). One specimen was identified to the category small mammal. Five specimens were identified to the category large mammal.

One specimen was analyzed from backhoe trench SU 5 and was identified as domesticated sheep.

Site NM-Q-23-60

The bulk of the faunal material (241 specimens) was recovered from test excavations at site NM-Q-23-60. Contexts sampled from this site consisted of surface collections, hand-excavated units, and a thermal feature (Feature 2).

A total of 56 specimens were analyzed from the surface collections. One specimen was identified to the family level Leporidae, and 55 specimens were identified to the category small mammal.

A total of 59 specimens were analyzed from the hand-excavated units (recovered from the 1/4-in screen). One specimen was identified to the family leporidae. One specimen was identified to prairie dog. Four specimens were identified to jackrabbit (*Lepus* sp.). Thirty-three specimens were identified to the category small mammal, and 20 specimens to the category large mammal.

A total of 126 specimens were analyzed from the thermal feature (Feature 2). Forty-nine were identified as jackrabbit and 77 specimens were identified to the category small mammal.

Site NM-Q-23-62

A total of 24 specimens were analyzed from site NM-Q-23-62. Contexts sampled at this site consisted of surface collections, hand-excavated units, and a roasting pit (Feature 6).

A total of 16 mammal specimens were analyzed from the surface collections. One specimen was identified as Ord's kangaroo rat (*Dipodomys ordii*). Four specimens were identified as woodrat (*Neotoma* sp.). Six specimens were identified to the category small mammal. Five specimens were identified to the category large mammals.

Two specimens were analyzed from 1/4-in screening in hand-excavated units. One specimen was identified to the category small mammal and one specimen was identified as a Venus clam shell (*Amiantis callosa*).

Six specimens were analyzed from the roasting pit (Feature 6). Two specimens were identified as badger (*Taxidea taxus*). One specimen was identified as mule deer (*Odocoileus hemionus*). Two specimens were identified to the category large mammal. One specimen was identified as wild turkey (*Meleagris gallopavo*).

Site NM-Q-23-63

Faunal material analyzed from site NM-Q-23-63 consisted of 29 mammal specimens that were recovered from surface collections, hand-excavated units, and a storage bin (Feature 1).

The eleven specimens analyzed from the surface collections were identified to the category large mammal.

Fifteen specimens were analyzed from 1/4-in screening in the hand-excavated units. Two specimens were identified as jackrabbit. One specimen was identified as mouse family Cricetidae. Seven specimens were identified to the category small mammal. Five specimens were identified to the category large mammal. In addition, one marine shell was identified as Pacific white venus clam (*Amiantis callosa*).

Three specimens were analyzed from the storage bin (Feature 1). These specimen were identified to the category large mammal.

Site NM-Q-23-64

A total of 59 faunal specimens were analyzed from site NM-Q-23-64. Contexts sampled at this site consisted of surface collections and hand-excavated units.

Six mammal specimens were analyzed from the surface collections. One specimen was identified to the family level Leporidae. Five specimens were identified to the category large mammal.

Fifty-three faunal specimens were analyzed from the hand-excavated units, recovered by 1/4-in screening Three specimens were identified to the family level of Leporidae. Nine specimens were identified as cottontail rabbit. One specimen was identified as prairie dog. One specimen was identified as Ord's kangaroo rat. Seven specimens were identified to the family level of Cricetidae. One specimen was identified as woodrat. Twenty-seven specimens were identified to the category small mammal. Three specimens were identified to the category large mammal. One avian specimen was identified to the category small bird.

CONCLUSIONS

The analysis of the faunal assemblage from the N11 sites provides important information on the kinds of taxa present in the archaeological context and taxa exploited by the prehistoric and historic residents. These taxa were probably available in the local environment and procured by the prehistoric and historic residents of Mariano Lake and Crownpoint. Further interpretation about the N11 faunal assemblage would be speculative due to the paucity of identified taxa. However, this information provides a rudimentary listing of taxa found in archaeological contexts and of those potentially utilized by the prehistoric and historic inhabitants.

Taxa identified are consistent with those expected in a woodland environment. Most of the specimens are too fragmented to identify to species level. Hares and rabbits (Leporidae) are represented by both cottontail and jackrabbit which occupy a wide range of diverse habitats. Rodents are represented by four genera: prairie dog, kangaroo rat, mice, and woodrat. Badger was the only carnivore identified in this collection; its presence may be related to burrowing rodents in grasslands and woodlands. Artiodactyla, in particular cervids, prefer such habitats as high, open mountain pastures in summer and lower, wooded slopes in winter. Artiodactyla in this assemblage are most likely mule deer. However, it is also possible that the artiodactyla represented in the historic sites are domesticated sheep and goat. Avian species are represented by wild turkey. Turkeys were abundant in forested areas of New Mexico during prehistoric and present times (Aldrich and Duvall 1955). The important economic species from the faunal collections appear to be cottontail rabbits, jackrabbits, mule deer, sheep, goat, and wild turkey. One important trade item from the collections is a worked clam shell; it is most likely that the prehistoric residents in this region had established trade routes to the Pacific Coast.

Chapter 28

ARCHAEOBOTANICAL REMAINS

Pamela McBride

INTRODUCTION

Thirty flotation samples and three vegetal samples were examined from the nature and extent testing phase excavations at eight sites along Navajo Route 11 from Mariano Lake to Crownpoint in McKinley County, New Mexico. The samples were taken from site NM-Q-27-13 (LA 110304), NM-Q-22-52 (LA 110315), NM-Q-23-57 (LA 110320), NM-Q-23-58 (LA 110322), NM-Q-23-60 (LA 38698), NM-Q-23-62 (LA 110325), NM-Q-23-63 (LA 110326), and NM-Q-23-64 (LA 110327). The methods followed and results obtained from archaeobotanical analysis of flotation and vegetal samples from the eight sites are presented in this chapter. The goals of this report are 1) to describe plant taxa exploited by prehistoric populations and 2) to address research questions such as site function and season of occupation.

The project area lies within the Plains and Great Basin Grassland biotic community (Brown 1994). Grasses such as slender wheatgrass (*Agropyron trachycaulum*), grama grasses (*Bouteloua curtipendula, B. gracilis, B. eriopoda*), and Indian ricegrass (*Oryzopsis hymenoides*) were observed in the project area (Harding Polk, personal communication 1997). Shrubs that occur in the area include fourwing saltbush (*Atriplex canescens*), the European pest Russian thistle (*Salsola kali*), winterfat (*Ceratoides lanata*), soapweed (*Yucca glauca*), big sagebrush (*Artemisia tridentata*), wolfberry (*Lycium pallidum*), Apache plume (*Fallugia paradoxa*), and snakeweed (*Gutierrezia* sp.). Prickly pear (*Opuntia* sp.), cholla (*Opuntia imbricata, O. arbuscula*), and hedgehog cactus (*Echinocereus* sp.) are the dominant cacti in this grassland community. One-seed juniper (*Juniperus monosperma*) grows in grassland communities, particularly on rocky, thin soil environments and occurs on or near the project sites. Pinyon pine (*Pinus edulis*) occurs on or near many of the sites as well.

METHODS

Archaeobotanical analysis of material from the project involved vegetal sample analysis, flotation processing, scan and full-sort analysis, and quantification, as described below. The distinction between charred and uncharred plant remains was also considered.

Vegetal Sample Analysis

Macrobotanical field samples are fortuitous plant specimens collected as they are encountered in the field either during excavation or the screening of fill and are often not associated with an exact provenience. In spite of this, vegetal specimens can offer further insight into the diet and subsistence of site occupants.

Vegetal specimens were identified, counted and weighed, and placed in protective containers such as film canisters or polypropylene vials, depending on specimen size. The taxon, plant part, confidence of the identification, condition, count, and weight of the specimen were recorded along with any observations that may be important in the interpretation of the material.

Flotation Samples

Flotation Processing

The Zuni Cultural Resource Enterprise uses a standard decant flotation system as described by Hammett and McBride (1993a). Flotation samples ranged in size from 2 to 24.5 liters. Each flotation sample was poured into a bucket of water, agitated gently until the botanical material floated to the surface, and then decanted onto a clean piece of chiffon material to dry (light fraction). The residue at the bottom of the bucket (called the heavy fraction) was rinsed to eliminate soil matrix, dried, and examined in order to recover stone, bone, and other materials.

Scan

All 30 flotation samples were scanned to identify charred plant remains. Flotation scan is a reliable method used to recognize samples that contain charred economic taxa and that may warrant further analysis. This method is especially useful during the testing phase of a project to define features especially rich in plant remains to target during the next phase of data recovery.

The floated material was passed through a series of graduated screens (U.S. Standard Sieves with 4-mm, 2-mm, 1-mm, and .5-mm mesh sizes). The material from each screen size was then examined using a binocular microscope at a magnification of 0.7x to 4.5x. Charred plant remains were identified but not quantified. An example of each taxon observed during scanning was removed and placed in a polypropylene capsule or plastic bag.

Full-sort Analysis

Three samples were selected for full-sort analysis. These samples were chosen for further analysis to determine density of plant remains. A comparison of a large volume sample (FS 76 from site NM-Q-22-52) with two smaller samples (FS 112 from site NM-Q-23-62 and FS 158 from site NM-Q-23-64) can offer insights into the effects of sample size on diversity and density of taxa.

During full-sort analysis, the same initial process was carried out: using graduated screens to separate the sample by particle size and subsequently examining material with a binocular microscope. Charred reproductive plant parts like seeds and fruits were identified and counted. Charred nonreproductive plant parts (bark, needles, etc.) and uncharred plant parts were also identified and quantified as an abundance per liter.

If more than 20 pieces of wood charcoal were present in a sample, then 20 pieces, selected randomly from the 4-mm and 2-mm screens, were identified. Then the remainder of each fraction was scanned to identify any taxa that might have been missed and to determine wood taxon

dominance in the sample. Otherwise, all identifiable wood charcoal from a sample was analyzed. All wood and reproductive plant parts that were counted and identified from each sample were placed in polypropylene capsules or plastic bags and labeled for future reference. An example of each uncharred or nonreproductive charred plant part encountered during analysis was also separated and placed in a polypropylene capsule or plastic bag.

Identification was aided by the use of a modern comparative collection. Scientific nomenclature and common names followed those presented in Martin and Hutchins (1980). Identifications were made to different taxonomic levels: family (e.g., Gymnospermae), genus (e.g., *Corispermum*), species (e.g., *Pinus edulis*) and non-Linnaean categories (e.g., cheno-am). The cheno-am category refers to seeds that could be either in the genus *Chenopodium* or *Amaranthus*. This category was used when the condition of a seed prohibited a more specific identification.

Table 28.1 lists the Latin and common names, plant part, and plant category (annuals, perennials, etc.) of all charred plants recovered from the project. For ease of reporting, taxa in all other tables are recorded using the common name only. Any plant remains designated as unknown indicate remains that might be identified later using a more extensive comparative collection. Indeterminate plant remains are unidentifiable due to erosion or fragmentation.

Table 28.2 reports sample volumes (before flotation), sample weights (after flotation), provenience information, and nonvegetal materials (rodent feces and bone). Noncultural remains such as roots and insect parts observed during flotation analysis were also recorded. Roots and insects were recovered from all samples analyzed.

In addition to taxon, plant part, and count, the confidence of the identification (positive, fairly certain, resembles taxon) and condition of the plant part (charred, partially charred, or uncharred) were recorded (Table 28.3).

Quantification

Three forms of quantification were used during the N11 flotation analysis: abundance, ubiquity, and absolute counts. Each of these is described below.

Abundance — To determine the abundance of each taxon present in a sample, an estimate of the number of charred seeds or other plant parts per liter of soil is recorded during scan analysis. This can help the analyst to decide which samples to choose for more detailed full-sort analysis. Abundance was also recorded for uncharred plant parts during full-sort analysis.

Ubiquity — Many factors can affect the number and types of taxa recovered from flotation samples including differential preservation of plant remains, plant processing techniques, and archaeological sampling strategies. Seeds and nuts with hard testa will preserve, while tubers and leafy greens rarely, if ever, preserve. Plants that were parched during processing are more likely to preserve due to "kitchen accidents" than those that do not require this step during food preparation. A 5-liter flotation sample has a greater probability of yielding a diverse number of plant taxa than a 1-liter sample.

Table 28.1. N11 Testing Project, Charred Plant Taxa Recovered from Vegetal and Flotation Samples.

Latin Name	Common Name	Plant Part
	Annuals	
Amaranthus sp.	Pigweed	Seed
cf. Capparidaceae	cf. Caper family	Embryo
Chenopodium sp.	Goosefoot	Seed
Chenopodium berlandieri	Pitseed goosefoot	Seed
Chenopodium sp./*Amaranthus* sp.	Cheno-am	Seed
Corispermum sp.	Bugseed	Seed
cf. *Cycloloma* sp.	cf. Winged pigweed	Seed
Nicotiana sp.	Tobacco	Seed
Portulaca sp.	Purslane	Seed
	Domesticates	
Zea mays	Maize	Cob, cupule, cupule segment, embryo, kernel
	Grasses	
cf. *Sporobolus* sp.	cf. Dropseed Grass	Caryopsis
	Perennials	
cf. *Atriplex* sp.	cf. Saltbush/shadscale	Leaf
Atriplex sp./*Sarcobatus* sp.	Saltbush/greasewood	Wood
Atriplex canescens	Fourwing saltbush	Fruit
Cactaceae	Cactus family	Seed
Echinocereus sp.	Hedgehog cactus	Seed
Juniperus sp.	Juniper	Female cone, leaflet, seed, twig, wood
Lycium sp.	Wolfberry	Seed
Pinus sp.	Pine	Barkscale, needle, umbo
Pinus edulis	Pinyon pine	Needle, nutshell, wood
Pinus ponderosa	Ponderosa pine	Needle
Quercus sp.	Oak	Wood
Sphaeralcea sp.	Globemallow	Seed
Yucca baccata	Banana yucca	Seed
	Other	
Cucurbita sp.	Squash/coyote gourd	Rind
Gymnospermae	Unknown conifer	Wood
Monocotyledoneae	Monocot	Stem
Physalis sp.	Groundcherry	Seed
cf. Polygonaceae	cf. Buckwheat family	Achene
Rosaceae	Rose family	Wood
cf. Solanaceae	cf. Nightshade family	Seed
Unknown ring porous	Unknown ring porous	Wood

Key: cf. = compares favorably.

Table 28.2. N11 Testing Project, Flotation Sample Summary and Provenience Data.

FS No.	Provenience	Sample Volume (liters)	Sample Weight (grams)	Other
NM-Q-27-13				
56	Slab-lined thermal pit (Feature 1)	14.00	86.2	Rodent feces
58	Earthen basin-shaped thermal pit (Feature 2)	8.95	219.0	-
NM-Q-22-52				
76	Slab-lined roasting pit (Feature 1)	24.50	139.3	7 uncharred bones
117	Possible slab-lined thermal pit (Feature 12)	2.80	6.8	-
119	Probable pitstructure (Feature 11)	3.50	8.5	-
125	Ash-filled pit (Feature 17)	12.00	29.0	-
132	Probable pitstructure (Feature 20)	6.80	28.9	-
NM-Q-23-57				
11	Central hearth (Feature 11)	6.50	188.9	-
18	Exterior slab-lined hearth (Feature 8)	3.25	29.2	Rodent feces, 1uncharred bone
NM-Q-23-58				
66	Earthen basin-shaped pit (Feature 1)	7.25	30.9	1 uncharred bone
86	Dark brown sandy loam with cultural debris, level 2, SU 4	2.75	29.6	-
90	Sandy loam with ash, charcoal, and burned sandstone, Levels 3 and 4, SU 4	2.00	10.0	-
NM-Q-23-60				
122	Organically stained layer from first occupation of site, SU 97	3.00	3.0	-
130	Earthen trough-shaped pit (Feature 5)	2.50	2.1	-
131	Earthen irregular-shaped pit (Feature 6)	2.25	4.2	-
132	Earthen bell-shaped pit (Feature 7)	2.60	5.8	-
NM-Q-23-62				
99	Earthen hearth (Feature 2)	2.00	4.9	-
112	Posthole (Feature 3)	4.00	36.6	-
113	Ceramic storage cist (Feature 4)	9.75	12.1	-
125	Slab-lined storage cist (Feature 1)	3.00	12.1	1 uncharred bone
150	Hearth (Feature 12)	2.00	6.4	-
151	Possible storage bin/roasting pit (Feature 6)	3.75	6.1	-
NM-Q-23-63				
75	Bell-shaped storage pit (Feature 1)	4.75	2.6	-
129	Charcoal stain in SU 10	3.75	31.2	3 uncharred bones
130	Shallow, basin-shaped hearth (Feature 3)	2.80	11.4	-
136	Hearth (Feature 4)	3.25	14.2	-
NM-Q-23-64				
158	10 cm above pitstructure (Feature 12) floor	6.00	36.6	Rodent feces, 2 uncharred bones
182	Pitstructure (Feature 12) floor	2.00	9.5	-
209	10 cm above pitstructure (Feature 4) floor	2.50	2.3	-
210	10 cm above pitstructure (Feature 11) floor	3.00	1.4	-

Table 28.3. N11 Testing Project, Flotation Sample Nonwood Scan and Fullsort Analysis Results.

FS No.	Taxon	Plant Part	Confidence	Condition	Abundance*	Count	Count/liter**
NM-Q-27-13							
56	Cheno-am	Seed	Positive	Charred	1	-	-
58	No data	No data	No data	No data	-	-	-
NM-Q-22-52							
76	Banana yucca	Seed	Positive	Charred	-	2	0.08
76	Buckwheat family	Achene	Fairly Certain	Charred	-	1	0.04
76	Caper family	Embryo	Fairly Certain	Charred	-	2	0.08
76	Cheno-am	Seed	Positive	Charred	-	20	0.80
76	Goosefoot	Seed	Positive	Charred	-	51	2.00
76	Goosefoot	Seed	Positive	Uncharred	1	-	-
76	Groundcherry	Seed	Positive	Charred	-	1	0.04
76	Indeterminate	Seed	Positive	Charred	-	1	0.04
76	Maize	Cupule	Positive	Charred	-	46	1.90
76	Maize	Embryo	Positive	Charred	-	3	0.10
76	Maize	Kernel	Positive	Charred	-	2	0.08
76	Hedgehog cactus	Seed	Positive	Charred	-	3	0.10
76	Hedgehog cactus	Seed	Positive	Uncharred	1	-	-
76	Juniper	Leaflet	Positive	Charred	1	-	-
76	Juniper	Seed	Positive	Charred	-	2	0.08
76	Pine	Bark scale	Positive	Charred	1	-	-
76	Pine	Needle	Positive	Charred	1	-	-
76	Pitseed goosefoot	Seed	Positive	Uncharred	1	-	-
76	Purslane	Seed	Positive	Uncharred	1	-	-
76	Squash/coyote gourd	Rind	Positive	Charred	1	-	-
117	Goosefoot	Seed	Positive	Charred	1	-	-
117	Indeterminate	Plant part	Positive	Charred	1	-	-
119	Cheno-am	Seed	Positive	Charred	1	-	-
119	Pitseed goosefoot	Seed	Positive	Charred	1	-	-
125	Banana yucca	Seed	Positive	Charred	1	-	-
125	Cheno-am	Seed	Positive	Charred	1	-	-
125	Maize	Cupule	Positive	Charred	1	-	-
125	Purslane	Seed	Positive	Charred	1	-	-
132	Cheno-am	Seed	Positive	Charred	1	-	-
132	Goosefoot	Seed	Positive	Charred	1	-	-
132	Indeterminate	Plant part	Positive	Charred	1	-	-
132	Juniper	Twig	Positive	Charred	1	-	-
132	Maize	Cupule	Positive	Charred	1	-	-
132	Maize	Kernel	Fairly certain	Charred	1	-	-
132	Pine	Umbo	Positive	Charred	1	-	-
132	Pinyon pine	Nutshell	Fairly certain	Charred	1	-	-
132	Pitseed goosefoot	Seed	Positive	Charred	1	-	-
NM-Q-23-57							
11	Juniper	Female cone	Fairly certain	Charred	1	-	-
11	Juniper	Leaflet	Positive	Charred	1	-	-
18	No data	No data	No data	No data	-	-	-

(continued)

Table 28.3. Continued.

FS No.	Taxon	Plant Part	Confidence	Condition	Abundance*	Count	Count/liter**
NM-Q-23-58							
66	Cheno-am	Seed	Positive	Charred	1	-	-
66	Goosefoot	Seed	Positive	Charred	1	-	-
66	Juniper	Leaflet	Positive	Charred	1	-	-
66	Nightshade family	Seed	Resembles taxon	Charred	1	-	-
66	Pigweed	Seed	Positive	Charred	1	-	-
66	Tobacco	Seed	Positive	Charred	1	-	-
66	Winged pigweed	Seed	Resembles taxon	Charred	1	-	-
86	Indeterminate	Plant part	Positive	Charred	1	-	-
86	Juniper	Twig	Positive	Charred	1	-	-
86	Pinyon pine	Needle	Positive	Charred	1	-	-
90	Indeterminate	Seed	Fairly certain	Charred	1	-	-
90	Juniper	Twig	Positive	Charred	1	-	-
90	Pinyon pine	Needle	Fairly certain	Charred	1	-	-
NM-Q-23-60							
122	Cheno-am	Seed	Positive	Charred	1	-	-
122	Goosefoot	Seed	Positive	Charred	1	-	-
130	Pitseed goosefoot	Seed	Positive	Charred	1	-	-
131	Pitseed goosefoot	Seed	Positive	Charred	1	-	-
132	Cheno-am	Seed	Positive	Charred	1	-	-
132	Goosefoot	Seed	Positive	Charred	1	-	-
132	Pitseed goosefoot	Seed	Positive	Charred	1	-	-
NM-Q-23-62							
99	No data	No data	No data	No data	-	-	-
112	Cheno-am	Seed	Positive	Charred	-	77	19.00
112	Bugseed	Seed	Positive	Charred	-	62	16.00
112	Goosefoot	Seed	Positive	Charred	-	48	12.00
112	Goosefoot	Seed	Positive	Uncharred	1	-	-
112	Maize	Cupule	Positive	Charred	-	2	0.50
112	Pinyon pine	Needle	Fairly certain	Charred	1	-	-
112	Pinyon pine	Nutshell	Positive	Charred	1	-	-
112	Purslane	Seed	Positive	Charred	-	1	0.25
112	Purslane	Seed	Positive	Uncharred	1	-	-
112	Ricegrass	Caryopsis	Positive	Uncharred	1	-	-
113	Goosefoot	Seed	Positive	Charred	1	-	-
113	Maize	Cupule	Positive	Charred	1	-	-
113	Pitseed goosefoot	Seed	Positive	Charred	1	-	-
125	Bugseed	Seed	Fairly certain	Charred	1	-	-
125	Cheno-am	Seed	Positive	Charred	1	-	-
125	Cheno-am	Seed	Positive	Partially charred	1	-	-
125	Goosefoot	Seed	Positive	Charred	1	-	-
125	Fourwing saltbush	Fruit	Positive	Charred	1	-	-
125	Globemallow	Seed	Positive	Charred	1	-	-
125	Hedgehog cactus	Seed	Positive	Charred	1	-	-
125	Maize	Cupule	Positive	Charred	1	-	-

(continued)

Table 28.3. Continued.

FS No.	Taxon	Plant Part	Confidence	Condition	Abundance*	Count	Count/liter**
125	Maize	Kernel	Fairly certain	Charred	1	-	-
125	Wolfberry	Seed	Positive	Charred	1	-	-
150	Cheno-am	Seed	Positive	Charred	1	-	-
150	Goosefoot	Seed	Positive	Charred	1	-	-
151	Bugseed	Seed	Positive	Charred	1	-	-
151	Cheno-am	Seed	Positive	Charred	1	-	-
151	Goosefoot	Seed	Positive	Charred	1	-	-
NM-Q-23-63							
75	Juniper	Leaflet	Positive	Charred	1	-	-
75	Maize	Cupule	Positive	Charred	1	-	-
75	Squash/coyote gourd	Rind	Positive	Charred	1	-	-
129	Cactus family	Seed	Positive	Charred	1	-	-
129	Cheno-am	Seed	Positive	Charred	1	-	-
129	Goosefoot	Seed	Positive	Charred	1	-	-
129	Indeterminate	Seed	Positive	Charred	1	-	-
129	Maize	Cupule	Positive	Charred	1	-	-
129	Monocot	Stem	Positive	Charred	1	-	-
129	Pitseed goosefoot	Seed	Fairly certain	Charred	1	-	-
129	Purslane	Seed	Positive	Charred	1	-	-
130	No data	No data	No data	No data	-	-	-
136	Goosefoot	Seed	Positive	Charred	1	-	-
NM-Q-23-64							
158	Banana yucca	Seed	Positive	Charred	-	1	2.00
158	Cheno-am	Seed	Positive	Charred	-	7	1.20
158	Cheno-am	Seed	Positive	Uncharred	1	-	-
158	Dropseed grass	Caryopsis	Fairly certain	Charred	-	1	0.20
158	Goosefoot	Seed	Positive	Charred	-	4	0.70
158	Goosefoot	Seed	Positive	Uncharred	1	-	-
158	Hedgehog cactus	Seed	Positive	Charred	-	1	0.20
158	Hedgehog cactus	Seed	Positive	Uncharred	1	-	-
158	Indeterminate	Seed	Positive	Charred	-	2	0.30
158	Juniper	Leaflet	Positive	Charred	1	-	-
158	Maize	Cupule	Positive	Charred	-	39	7.00
158	Maize	Cupule segment	Positive	Charred	-	4	0.70
158	Maize	Kernel	Resembles taxon	Charred	-	1	0.20
158	Nightshade	Seed	Positive	Uncharred	1	-	-
158	Pine	Bark scale	Positive	Charred	1	-	-
158	Pinyon pine	Needle	Fairly certain	Charred	1	-	-
158	Prickly pear cactus	Embryo	Positive	Uncharred	1	-	-
158	Purslane	Seed	Positive	Charred	-	3	0.50
158	Purslane	Seed	Positive	Uncharred	1	-	-
158	Saltbush/shadscale	Leaf	Fairly certain	Charred	1	-	-
158	Tobacco	Seed	Positive	Uncharred	1	-	-
158	Winged pigweed	Seed	Positive	Uncharred	1	-	-
182	Cheno-am	Seed	Positive	Charred	1	-	-

(Continued)

Table 28.3. Continued.

FS No.	Taxon	Plant Part	Confidence	Condition	Abundance*	Count	Count/liter**
182	Maize	Cupule	Positive	Charred	1	-	-
182	Pine	Umbo	Positive	Charred	1	-	-
182	Pinyon pine	Nutshell	Positive	Charred	1	-	-
209	Maize	Cupule	Positive	Charred	1	-	-
209	Pinyon pine	Needle	Fairly certain	Charred	1	-	-
209	Ponderosa pine	Needle	Positive	Charred	1	-	-
209	Tobacco	Seed	Positive	Uncharred	1	-	-
210	Maize	Cupule	Positive	Charred	1	-	-
210	Purslane	Seed	Positive	Charred	1	-	-
210	Tobacco	Seed	Positive	Uncharred	1	-	-

*Indicates abundance of 1:10 per liter observed during scan analysis.

**Count/liter = count divided by number of liters per sample (Table 28.2).

When the first two factors are considered, it can be difficult or impossible to determine the exact composition of the prehistoric diet or the degree of dependence on one plant as compared to another. The latter problem of differential sample size can be resolved by standardizing flotation sample volumes or by applying statistical analyses to determine the effects of sample size on archaeobotanical analysis results. Ubiquity is a quantification method used by archaeobotanists to identify possible trends or patterns that can lead to the identification of plant processing or storage loci or changes in plant exploitation through time.

To determine which plant remains were most common in samples, ubiquity tables were created for nonwood plant taxa recovered from the project. Ubiquity tallies the presence or absence of a taxon in each sample, then compares the frequency of a taxon's occurrence within a group of samples. The number of remains of a particular taxon found in a sample is not reported in this method of quantification. Presence is recorded for one specimen of a taxon or 200. Therefore, ubiquity measures the frequency of occurrence of taxa as opposed to absolute counts that measure abundance. The flotation analysis results are reported in ubiquity tables as a count (the number of samples in which the taxon is present) and percent presence (the number of samples in which the taxon is present expressed as a percentage of the total number of samples) as Popper (1988) describes. For example, if bugseed occurs in two samples out of ten, the count would be two and the percent presence would be 20%.

Absolute Counts — Absolute counts measure the abundance of taxa in a sample and become especially useful in situations where the abundance of taxa changes over time, but the frequency of those taxa does not. During full-sort analysis, absolute counts and count per liter were recorded for charred seeds and other reproductive plant parts. A value of 1 was given to a seed or fruit if more than one-half of that reproductive unit was present. The count per liter was calculated by dividing the count by the total number of liters for each sample.

Charred and Uncharred Plant Remains

Archaeobotanists have struggled with the interpretation of uncharred seeds recovered from subsurface samples. The uncertainty as to whether uncharred seeds were deposited because of cultural activity, from rodent and insect activity, or from seed rain precludes their clear interpretation. Minnis (1981) discusses problems inherent in interpreting uncharred seeds recovered from open-air sites. He tested a modern facsimile of an archaeological site to compare the presence of taxa known to have been used to the number of contaminants. Three economic taxa were recovered, as well as 16 taxa that had been deposited by natural processes such as seed rain or rodent movement. Because of these kinds of questions about the origins of uncharred seeds found in open-air sites, this report will focus on charred plant remains. Therefore, when present, uncharred remains were recorded during full-sort analyses, but were considered more a representation of the local vegetation than a reflection of cultural activities.

RESULTS OF FLOTATION ANALYSIS

The following sections describe the results of analysis of charred and uncharred plant remains, as well as wood, from flotation samples. Table 28.3 presents the results of scan and full-sort analysis by site and Field Specimen (FS) number for non-wood taxa.

Uncharred Plant Remains

Ten species of uncharred seeds were recovered from the three samples that were selected for full-sort analysis (Table 28.4). The majority of these were recovered in the sample from site NM-Q-23-64, FS 158 from 10 cm above the floor of Feature 12, a pitstructure. There is no evidence in field notes to indicate that the context of FS 158 was any more disturbed than the other two full-sorts. In fact, FS 112 from site NM-Q-23-62 would presumably show greater evidence of uncharred contaminants because it was taken from a posthole (Feature 3) that was described as disturbed by road maintenance and rodents, but this was not the case.

Table 28.4. Sites NM-Q-22-52, NM-Q-23-62, and NM-Q-23-64, Ubiquity of Uncharred Plant Remains Recovered From Full-sort Flotation Samples.

Taxon/ Plant Part	Count*	%**
Cheno-am seed	1	33
Goosefoot seed	3	100
Hedgehog cactus seed	2	67
Nightshade seed	1	33
Pitseed goosefoot seed	1	33
Prickly pear cactus embryo	1	33
Purslane seed	3	100
Ricegrass caryopsis	1	33
Tobacco seed	1	33
Winged pigweed seed	1	33

*Count = Number of samples with taxon present
**% = Number of samples with taxon divided by total number of full-sort samples (3) x 100

Charred Plant Remains

Site NM-Q-27-13

Site NM-Q-27-13 is a multicomponent site, lacking any architecture. Flotation samples were collected from two thermal features (interpreted as roasting pits in the field) that probably date to the Pueblo II occupation of the site. Historic features were not excavated during the testing phase. The site is on a southeast-facing slope on a ridge between two broad valleys.

Feature 1 (FS 56) produced charred cheno-am seeds, the only possible cultural plant remains recovered from the site. Plant remains from the sample examined from Feature 2 (FS 58) were restricted to uncharred materials and wood charcoal that was not identified during the scan analysis.

Although cheno-am seeds could have been used by site occupants for food, they occurred in low densities and it is unclear whether they were deposited as a result of cultural activity or blown into the roasting pit and accidentally charred. The analysis of more samples from site NM-Q-27-13 could help shed some light on subsistence practices at the site.

Site NM-Q-22-52

Twenty-three features, primarily associated with a Pueblo II occupation of the site, were tentatively identified during testing. Two deep hearths may date to Basketmaker or Archaic periods. Five features, probably related to the Pueblo II occupation, were sampled for plant remains including two pitstructures (Features 11 and 20), a possible slab-lined thermal pit (Feature 12), a slab-lined roasting pit (Feature 1), and an ash-filled pit (Feature 17). The site is in a broad north to south trending valley about halfway between sheer sandstone cliffs and the valley bottom. The site is near the headwaters of a drainage that flows into the Puerco River approximately 2.5 mi to the southwest.

The sample examined from the slab-lined roasting pit (Feature 1) produced the richest assemblage of plant remains from the site. Ten charred taxa were identified including banana yucca, buckwheat family, caper family, goosefoot, groundcherry, hedgehog cactus, and juniper seeds as well as pine needles and bark, *Cucurbita* sp. rind, and maize cupules, kernels, and embryos.

Goosefoot seeds and indeterminate plant parts were recovered from the possible slab-lined thermal pit (FS 117, Feature 12) and pitstructure (FS 119, Feature 11) samples. Banana yucca seeds showed up again in the sample from the ash-filled pit (Feature 117) along with purslane and goosefoot seeds and maize cupules. Cheno-am and goosefoot seeds, pine umbos (part of a pine cone scale), maize cupules and kernels, possible pinyon pine nutshell, and juniper twigs comprise the identified plant remains from the other pitstructure (FS 132, Feature 20).

It cannot be determined if the *Cucurbita* sp. rind is from coyote gourd (*Cucurbita foetidissima*) or from a domesticated squash such as *Cucurbita pepo*. The rind thickness for coyote gourd is cited by King (1985:91) to have an average thickness of 0.7 mm and a maximum thickness of 2.0 mm. King also states that the rind thickness of coyote gourd and squash does overlap. All

Cucurbita rind fragments recovered from the project fall within the range of coyote gourd rind thickness. Therefore, all *Cucurbita* sp. rind remains were recorded in the squash/gourd common name category.

Castetter (1935:26) says that the fruits of *Echinocereus triglochidiatus* (hedgehog cactus) were sliced and baked like squash and Harrington (1967:334) discusses how banana yucca fruits were sometimes roasted before splitting the fruits.

Several members of the buckwheat family (*Polygonaceae viviparum, P. bistortoides, P. cuspidatum*, etc.) have edible fleshy rootstocks that could be baked (Harrington 1967:196-198). The buckwheat family seed could have been accidentally charred if the whole plant was brought back to the site for processing.

The juniper seeds, pine needles, and bark could represent residue from using these conifers for fuel wood. Groundcherries were eaten raw or cooked as a sauce. *Cleome* sp., a member of the caper family, was used to such a degree that Castetter (1935:24) notes that the Tewa of Hano and the Hopi listed the plant in their songs along with the staple cultigens maize, pumpkins, and cotton. The young plants were boiled and eaten as a potherb and the seeds ground into a meal for gruel or bread (Harrington 1967:72). The plant was also boiled a long time until reduced to a thick, black substance that was used as dye or spread out to dry in sheets, stored, and used later as food.

The banana yucca, buckwheat family, maize, possible squash, and hedgehog cactus remains could represent residue from baking these plants in the roasting pit. However, all ten taxa recovered from the roasting pit could be part of the trashy fill of the feature and may not have anything to do with the actual function of the feature.

The archaeobotanical assemblage from site NM-Q-22-52 indicates a mixed diet of cultivated crops and wild annual and perennial plant resources.

Site NM-Q-23-57

Two samples were examined from this historic Navajo site that includes three stone hogans with interior hearths, middens, and various exterior features. Site NM-Q-23-57 is on the west side of a steep-walled box canyon.

The central hearth of a hogan (Feature 11) that displayed the best preservation of the three structures produced charred juniper cones and leaflets. The sample examined from an isolated slab-lined hearth (Feature 8) yielded uncharred material and wood charcoal that was not identified during the scan analysis.

The juniper plant parts probably represent debris from using the wood for fuel. Cones can persist on branches collected for fuel and burn along with the wood. Leaflets (or twigscales) are the equivalent of needles in the pines, so if twigs were burned, juniper leaflets would be an integral part of firewood residue. The only conclusion that can be made from the analysis of these two samples is the occupants were probably using wood that was locally available for fuel.

Site NM-Q-23-58

This multicomponent site consists of Archaic, Pueblo II and historic Navajo occupations. The site is below a prominent ridge spur with small intermittent drainages that cut through the site and have caused significant deflation.

A small basin-shaped pit (Feature 1) produced the only charred tobacco seed recovered from the project along with charred juniper leaflets and goosefoot, cheno-am, and pigweed seeds. The dried leaves of wild tobacco were smoked ceremonially by many Native American groups and this practice is still common today, despite the overwhelming impact of commercial tobacco. The Zuni would also use tobacco medicinally by blowing the smoke on an afflicted area to alleviate the pain that accompanies snakebite (Stevenson 1993:20). If the whole plant was collected, it is possible that the seeds could have been accidentally charred or, if incorporated with the leaves, charred during smoking, and discarded as part of the residue.

The plant remains that could be identified from Levels 2, 3, and 4 of Study Unit 4 probably represent fuel wood residue (juniper twigs and pinyon pine needles).

The archaeobotanical assemblage reflects that weedy annuals could have been used for food and tobacco for ceremonial purposes, and fuel woods were probably collected in the immediate vicinity of the site.

Site NM-Q-23-60

Four samples were analyzed from this multicomponent site associated with Archaic, Pueblo, and historic Navajo occupations. The site is along and above the rim of a small north-to-south trending canyon. Samples were collected from three pit features (Features 5, 6, and 7) and an organically stained layer in backhoe trench Study Unit 97.

Seeds of weedy annuals (goosefoot, pitseed goosefoot, and cheno-ams) comprise the cultural remains recovered from site NM-Q-23-60. Weedy annuals like pigweed and goosefoot have an adaptive advantage of proliferating in the disturbed ground around habitation sites, agricultural fields, and middens. This makes them a readily available resource and their seeds have been recovered from a wide array of prehistoric assemblages. Documented economic uses of goosefoot and pigweed seeds abound in the ethnographic literature. Castetter (1935) describes the use of these as a ground meal, either eaten as gruel or combined with other food such as cornmeal and made into cakes. Harrington (1967) cites the same uses and says the seeds can be parched and eaten partly raw, although he finds the seeds too small to chew easily.

The recovery of weedy annual taxa could indicate the use of these plants by site occupants, but charred seeds occurred in low densities and could just as easily represent seeds that were blown into features and were subsequently charred. It is difficult to make any conclusive statements based on the limited number of samples that were analyzed.

Site NM-Q-23-62

Site NM-Q-23-62 sits on shallow dunes in a wide valley bottom. Six features were sampled for archaeobotanical remains from this large lithic and ceramic artifact scatter with features. Ceramics are compatible with a Basketmaker III occupation of the site.

Fill examined from the slab-lined storage cist (Feature 1) was the most productive, yielding seven taxa including maize cupules and possible kernels, fourwing saltbush fruit, and bugseed, goosefoot, globemallow, hedgehog cactus, and wolfberry seeds.

Saltbush seeds were gathered and ground into meal (Harrington 1967:62) and wolfberry fruits were eaten raw, dried for winter use, or cooked and made into a sauce (Harrington 1967:244). Although bugseed has no documented ethnobotanical uses, it was probably used in much the same way as goosefoot. Charred bugseed has been recovered from southeast Utah (Reed 1983), the Chaco area (Donaldson and Toll 1982), Tsaya Wash (Minnis 1978) and the San Juan Basin (Hammett and McBride 1993c). These data along with bugseed that was found in coprolites at Cowboy Cave (Hogan 1980) provide convincing evidence that bugseed was a source of food for prehistoric populations. Globemallow has documented medicinal uses (Elmore 1944) and among the Havasupai, its juice was one of the ingredients in a paste mixed with clay before making a pot (Weber and Seaman 1985).

The maize, saltbush, and hedgehog cactus remains could represent residue from processing these plants for food or firewood use (maize cobs and saltbush). However, all seven taxa are probably just part of the trashy fill of the feature and may not reflect the actual function of the feature.

Only uncharred material and small fragments of wood charcoal were recovered from the earthen hearth sample (FS 99, Feature 2). Maize occurred in samples from two other proveniences (the posthole, Feature 3, and a buried ceramic storage vessel, Feature 4). Pinyon pine nutshell and needles were recovered from the posthole as well. The remainder of the floral assemblage from the site consists of weedy annual seeds.

The plant remains from site NM-Q-23-62 result from a mixed economy of cultivated crops and the use of wild annual and perennial species.

Site NM-Q-23-63

This Basketmaker III site is on a small rise (aeolian in origin) in a wide valley bottom. Three features were identified during testing and a flotation sample was collected and analyzed from each one. An additional flotation sample was collected from a 1-by-1-m test unit (SU 10).

The most productive sample was the one from the charcoal stain in Study Unit 10 that may be a posthole. Six taxa were recovered including maize cupules, monocot stems, and goosefoot, purslane, cactus family, and pitseed goosefoot seeds. Although plant materials recovered from postholes cannot be tied to a specific event in time, postholes trap concentrations of floor debris and

may contain taxa that are not present in other contexts. The remaining samples from the site are a case in point. Juniper leaflets, maize cupules, and *Cucurbita* sp. rind were recovered from the bell-shaped storage pit (Feature 1). Uncharred material and wood charcoal were the only remains recovered from the shallow basin-shaped hearth (FS 130, Feature 3) and plant remains from the other possible hearth (FS 136, Feature 4) were restricted to goosefoot seeds.

A mixed economy can be inferred from the archaeobotanical assemblage that included cultivation of maize and possibly squash and the exploitation of annual and perennial wild plant species.

Site NM-Q-23-64

Site NM-Q-23-64 is in the same kind of location as site NM-Q-23-63, that is, in a wide valley bottom on top of a small rise formed by aeolian deposition. From ceramic and lithic artifacts and identifiable features, the site is a pitstructure village believed to date to the Basketmaker III period.

The sample taken from 10 cm above the floor of a pitstructure (FS 158, Feature 12) produced the richest array of plant remains. Nine taxa were identified including maize cupules, kernels, and cupule segments, pinyon pine needles, saltbush/shadscale leaves, juniper leaflets, and goosefoot, dropseed grass, hedgehog cactus, banana yucca, and purslane seeds.

Charred plant remains from the other three contexts consisted of pine umbos, pinyon pine nutshell, maize cupules, pinyon pine and ponderosa needles, as well as cheno-am and purslane seeds. Uncharred tobacco seeds that were recovered were considered noncultural in origin.

Woody plant parts such as needles and leaves probably represent residue from fuel wood use. The nonwood plant remains indicate site occupants used a variety of wild plants in conjunction with cultigens.

Charred Wood

Table 28.5 presents charred wood taxa recovered from the three full-sort samples analyzed from sites NM-Q-22-52, NM-Q-23-62, and NM-Q-23-64. The sample (FS 158) collected from near the floor of one pitstructure (Feature 12) at site NM-Q-23-64 yielded the most diverse array of taxa including juniper, pinyon pine, oak, saltbush/greasewood, and rose family wood. This sample was taken above the floor from what amounts to a general fill context, while the samples from sites NM-Q-22-52 and NM-Q-23-62 were taken from more restricted contexts (Feature 1, a roasting pit, and Feature 3, a posthole, respectively). The expectation of finding a greater number of wood taxa from the general fill of a structure than from a specific feature is not unreasonable, although postholes can be a trap for smaller plant debris. General fill would contain charcoal remains that represent wood that was used for fuel as well as construction material.

Juniper and pinyon pine were the most common wood taxa, present in all three samples, followed by saltbush/greasewood present in two of three samples. Wood charcoal designated as Gymnospermae or unknown conifer was too fragmentary to allow more specific identification.

Table 28.5. Sites NM-Q-22-52, NM-Q-23-62, and NM-Q-23-64, Charred Wood Taxa Recovered From Full-sort Flotation Samples.

FS	Common Name	Confidence	Count	Weight
NM-Q-22-52				
76	Unknown conifer	Positive	4	0.1
76	Juniper	Positive	6	0.1
76	Pinyon pine	Positive	9	0.2
76	Unknown Ring porous	Positive	1	<0.1
NM-Q-23-62				
112	Saltbush/greasewood	Positive	1	<0.1
112	Juniper	Positive	17	0.4
112	Pinyon pine	Positive	2	<0.1
NM-Q-23-64				
158	Saltbush/greasewood	Positive	6	0.1
158	Unknown conifer	Positive	4	<0.1
158	Juniper	Positive	4	<0.1
158	Pinyon pine	Positive	4	<0.1
158	Oak	Positive	1	<0.1
158	Rose family	Positive	1	<0.1

Fragments of wood that were designated as pine were generally not large enough to allow identification to species, but have a high probability of being pinyon pine. Shinnery oak (*Quercus havardii*) and wild rose (*Rosa*) may be found in Plains Grassland environments, according to Brown (1994:116-117). The presence of small quantities of oak and rose family wood in FS 158 (Feature 12) at site NM-Q-23-64 indicates that these shrubs occurred in the environment prehistorically.

VEGETAL SAMPLE ANALYSIS RESULTS

Site NM-Q-22-52

Table 28.6 presents the results of vegetal sample analyses. Two small pieces of uncharred wood were identified as pinyon pine from FS 87 (SU 14).

Table 28.6. Sites NM-Q-22-52 and NM-Q-23-64, Vegetal Sample Analysis Results.

FS No.	Taxon	Plant Part	Confidence	Condition	Count	Weight	Comments
NM-Q-22-52							
87	Pinyon pine	Wood	Positive	Uncharred	2	3.9	-
NM-Q-23-64							
133	Maize	Cupule segment	Positive	Charred	1	0.1	-
156	Maize	Cob fragment	Positive	Charred	1	0.1	8-rowed

Site NM-Q-23-64

A cupule segment was identified from FS 133 (SU 2) and a cob fragment from FS 156 (SU 3). Maize cob fragments are distinguished from cupule segments during analysis. A maize cob

fragment is defined as a fragment of cob with an entire diameter, thus making row number and measurements possible to record. A cupule segment is a fragment of a cob without a complete diameter (e.g., two fused cupules), precluding detailed analysis. The cob fragment is 8-rowed and measures 16.1 mm long with a rachis segment length of 3 mm.

A larger data base would allow comparison to other areas of New Mexico and within the same region. For example, during the time that site NM-Q-23-64 may have been occupied (AD 500 to 900), the presence of cobs with lower row numbers increased in the Mogollon Highlands. In his substantial stratigraphic sample of cobs from Tularosa Cave, Cutler (1952) notes this trend that began in the early eighth century which he attributed to the introduction of tripsacoid varieties from Mexico. These varieties, later referred to as "Maiz de Ocho" by researchers, can survive in a wider range of growing conditions, and are higher yielding (Sanchez G. and Goodman 1992:42). However, Brandt's (1994a) study of maize cobs recovered from Basketmaker III sites in the foothills of the Chuska Mountains indicates a very different pattern. Most of the cobs in the study were 12-rowed (52%). The same dominance of 12-rowed cobs was evident in data from a Basketmaker III site near Navajo, Arizona (Brandt 1994b). Additional maize cob information from the next data recovery phase of the N11 project would add to the growing data base for Basketmaker sites and our understanding of maize varieties that were present in the San Juan Basin and surrounding areas.

SUMMARY AND CONCLUSIONS

Thirty flotation samples and three vegetal samples were examined from eight sites with occupations ranging from the Archaic to historic Navajo. This broad range in time periods offers the potential for examining changes in subsistence patterns through time in the region. However, the limited number of samples examined during the testing phase of the project precludes making any definitive conclusions.

Fifteen taxa were recovered from the Basketmaker III sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64. This may be a function of sample size rather than a reflection of real differences in diet. Fourteen samples were examined from the Basketmaker III sites as opposed to seven from the Pueblo II sites NM-Q-22-52 and NM-Q-27-13, for example. Eleven taxa were recovered from Pueblo II sites, despite the small number of samples that were analyzed.

Maize was the only domesticate positively identified from the project. The occupants of the region could have cultivated squash as well as maize, but it cannot be determined if the *Cucurbita* rinds that were recovered from sites NM-Q-22-52 and NM-Q-23-63 are wild gourd or domestic squash rind. The seeds of weedy annuals dominated the archaeobotanical assemblage from the project (Table 28.7) including bugseed, caper family, goosefoot, cheno-am, pigweed, pitseed goosefoot, purslane, and winged pigweed. These plants all prefer disturbed ground such as that encountered around human habitation sites. Bye (1981) has documented the encouragement and harvest of goosefoot, pigweed, mustard, and purslane in the modern cultivated fields of the Tarahumara of northern Mexico. A similar practice of encouraging weedy annuals could have been part of the subsistence repertoire of the occupants of the N11 project area.

Table 28.7. N11 Testing Project, Ubiquity of Charred Nonwood Plant Remains from Flotation Samples.

Common Name/Plant Part	Count*	%**
Annuals		
Bugseed seed	3	10
Caper family embryo	1	3
Cheno-am seed	15	50
Goosefoot seed	14	47
Pigweed seed	1	3
Pitseed goosefoot seed	7	23
Purslane seed	5	17
Tobacco seed	1	3
Winged pigweed	1	3
Domesticates		
Maize cupule	12	40
Maize cupule segment	1	3
Maize embryo	1	3
Maize kernel	4	13
Grasses		
Dropseed grass caryopsis	1	3
Perennials		
Banana yucca seed	3	10
Cactus family seed	1	3
Fourwing saltbush fruit	1	3
Globemallow seed	1	3
Hedgehog cactus seed	3	10
Juniper female cone	1	3
Juniper leaflet	5	17
Juniper seed	1	3
Juniper twig	3	10
Pine barkscale	2	7
Pine needle	1	3
Pine umbo	2	7
Pinyon pine needle	5	17
Pinyon pine nutshell	3	10
Ponderosa pine needle	1	3
Saltbush/shadscale leaf	1	3
Wolfberry seed	1	3
Other		
Buckwheat family achene	1	3
Groundcherry seed	1	3
Monocot stem	1	3
Nightshade family	1	3
Squash/coyote gourd rind	2	7

*Count = Number of samples with taxon present.
**% = Number of samples with taxon divided by total number of samples (30) x 100.

Charred tobacco was recovered from a site that is probably associated with the Basketmaker III/Pueblo I period, possibly documenting the ceremonial or medicinal use of tobacco during these periods. Uncharred tobacco seeds were identified in samples associated with a Basketmaker III occupation, although these were considered noncultural in origin. Tobacco data from the Transwestern Pipeline project (Hammett 1993:512) indicate that the majority of tobacco from San Juan Basin sites was recovered from sites dating to the Basketmaker III and early Pueblo I periods. A similar pattern could be reflected in the data from the current project.

The majority of the perennial plant remains such as juniper leaflets and twigs and pinyon pine needles probably represent residue from fuel wood use. The presence of banana yucca, hedgehog cactus, and wolfberry seeds indicates that these plants were used for food. Groundcherry, buckwheat family, and nightshade family are other taxa present in samples that could have been used for food.

The three flotation samples that were selected for full-sort analysis offer insights into the effects of sample size on the diversity and density of plant remains. Table 28.8 presents a summary of these data. The average density per liter of soil floated is actually highest in the sample with the smallest volume (FS 112 from site NM-Q-23-62). FS 112 was collected from a probable posthole. Plant debris can be trapped in postholes (as already discussed) and diversity and density of taxa can be greater in these contexts. However, in this case, the average diversity per liter of soil floated was greatest in the sample collected from the general fill above a pitstructure floor (FS 158 at site NM-Q-23-64). The big surprise here is that the sample with the largest volume (FS 76 from site NM-Q-22-52) had the lowest diversity and lowest density of plant remains. It would be interesting to analyze a 2-liter sample from a roasting feature and then analyze a 20-liter sample from the same context and record any differences in density and diversity of plant remains. The type of feature that is sampled as well as preservation could both be factors affecting results.

Table 28.8. Sites NM-Q-22-52, NM-Q-23-62, and NM-Q-23-64, Comparison of Full-sort Volumes and Plant Density and Diversity.

FS No.	Total Liters	Total No. of Plant Remains	Taxa	Average Density*	Average Diversity**
NM-Q-22-52					
76	24.5	134	11	5.5	0.4
NM-Q-23-62					
112	4.0	190	6	47.5	1.5
NM-Q-23-64					
158	6.0	63	10	10.5	1.7

*Average Density = Total No. of plant remains divided by total liters

**Average Diversity = No. of taxa divided by total liters

Seasonality is an important concern of archaeologists when trying to determine site settlement patterns. It is important to realize that inferences concerning seasonality should be made using a combination of data from faunal, pollen, archaeobotanical, and archaeological analysis results. As Brandt (1992:11) states, Inferring seasonality of site occupation based solely on the presence of plant remains is difficult for several reasons. First, certain plants do not follow calendric cycles. Second, climate may affect the production of seed and fruit by influencing abundance; flowering and fruiting can be delayed or stimulated. Finally, seeds and nuts may be stored through several seasons.

The wild plant assemblage from the N11 project consists of plants with seeds, leaves, or fruits that could have been gathered during the spring and fall. Goosefoot leaves can be collected as early as April, pigweed leaves in May, and beeweed (a member of the caper family) in June. Dropseed grass is abundant in July and August. The succulent leaves of purslane appear in early to midsummer and the seeds of purslane, goosefoot, and pigweed mature in late summer and early fall. Wolfberry fruits mature in July and yucca fruits can be harvested in August. Cactus fruits can be collected as late as September or October. A continuum of plant utilization from early spring through the fall can be inferred from the archaeobotanical assemblage. It is reasonable to assume that sites in the N11 project area with diverse plant assemblages were occupied at least from spring, before the sowing of maize through the fall, during or after harvest time.

The ethnobotanical evidence from sites NM-Q-27-13, NM-Q-23-57, NM-Q-23-58, and NM-Q-23-60, may be interpreted as indicative of more limited-use areas, occupied for short time spans. Plant remains were restricted to weedy annuals and coniferous fuel wood debris; no cultigens were recovered. The historic Navajo site, NM-Q-23-57, was the only site of these four with significant architectural features that were identified during nature and extent testing. The lack of architecture on the other three sites lends support to the argument that these sites functioned as limited- or special-use locations. The fewest number of samples were examined from these sites, however, so sample size may be a factor.

Charred wood recovered from flotation samples represent taxa that were probably collected locally and used for fuel and construction. All wild plant remains that were identified from this study are available in the vicinity of the project area today. Archaeobotanical analysis results do not indicate any major environmental differences between prehistoric conditions and those of today.

Chapter 29

POLLEN ANALYSIS FOR SITES NM-Q-22-52 (LA 110315), NM-Q-23-62 (LA 110325), NM-Q-23-63 (LA 110326), AND NM-Q-23-64 (LA 110327)

Linda Scott Cummings and Thomas E. Moutoux

INTRODUCTION

Four sites on Dutton Plateau and the extreme southern portion of the San Juan Basin were sampled for pollen during nature and extent testing for the N11(1&2) road. Site NM-Q-22-52 is a Pueblo II site situated in a broad valley on the Dutton Plateau. Sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64 represent Basketmaker occupations, and are situated in the southernmost portion of the San Juan Basin near tributaries of Indian Creek. Seven pollen samples were examined from storage pits and pitstructures in an effort to identify native and cultivated plants used by the occupants of these sites. One of the N11(1&2) testing project's research domains addresses the environment and economy, seeking to find relationships between humans and their environment. Pollen analysis will contribute to an understanding of issues within this research domain.

METHODS

A chemical extraction technique based on flotation is the standard preparation technique used in this laboratory for the removal of the pollen from the large volume of sand, silt, and clay with which they are mixed. This particular process was developed for extraction of pollen from soils where preservation has been less than ideal and pollen density is low.

Hydrochloric acid (10%) was used to remove calcium carbonates present in the soil, after which the samples were screened through 150 micron mesh. The samples were rinsed until neutral by adding water, letting the samples stand for two hours, then pouring off the supernatant. A small quantity of sodium hexametaphosphate was added to each sample once it reached neutrality, then the beaker was again filled with water and allowed to stand for two hours. The samples were again rinsed until neutral, filling the beakers only with water. This step was added to remove clay prior to heavy liquid separation. At this time the samples were dried, then pulverized. Zinc bromide (density 2.1) was used for the flotation process. The samples were mixed with zinc bromide and centrifuged at 1500 rpm for 10 minutes to separate organic from inorganic remains. The supernatant containing pollen and organic remains was decanted and diluted. Zinc bromide was again added to the inorganic fraction to repeat the separation process. After rinsing the pollen-rich organic fraction obtained by this separation, all samples received a short (20-minute) treatment in hot hydrofluoric acid to remove any remaining inorganic particles. The samples were then acetolated for three minutes to remove any extraneous organic matter.

A light microscope was used to count the pollen to a total of 201 pollen grains at a magnification of 400 to 600x. Pollen preservation in these samples varied from good to poor. Comparative reference material collected at the Intermountain Herbarium at Utah State University and the University of Colorado Herbarium was used to identify the pollen to the family, genus, and species level, where possible.

Pollen aggregates were recorded during identification of the pollen. Aggregates are clumps of a single type of pollen, and may be interpreted to represent pollen dispersal over short distances, or the introduction of portions of the represented plant into an archaeological setting. Aggregates were included in the pollen counts as single grains, as is customary. The presence of aggregates is noted by an "A" next to the pollen frequency on the pollen diagram. A plus (+) on the pollen diagram indicates that the pollen type was observed outside the regular count while scanning the remainder of the microscope slide.

Indeterminate pollen includes pollen grains that are folded, mutilated, and otherwise distorted beyond recognition. These grains are included in the total pollen count, as they are part of the pollen record.

ETHNOBOTANICAL REVIEW

It is a commonly accepted practice in archaeological studies to cite ethnological (historic) plant uses as indicators of possible or even probable plant uses in prehistoric times. It gives evidence of exploitation in historic times of numerous plants, both by broad categories (such as greens, seeds, roots, tubers, etc.) and by specific example (i.e., seeds parched and ground into meal which was formed into cakes and fried in grease). Repetitive evidence of resource exploitation indicates a widespread utilization and strengthens the possibility that the same or similar resources were used in prehistoric times. Ethnographic sources outside the study area have been consulted to permit a more exhaustive review of potential uses for each plant. Ethnographic sources do document that the historic use of some plants was developed and carried from the past. A plant with medicinal qualities very likely was discovered in prehistoric times and the usage persisted into historic times. However, there is likely to have been a loss of knowledge concerning plant resource utilization as cultures moved from foraging to agricultural economies and/or were introduced to European foods during the historic period. The ethnobotanic literature serves only as a guide indicating that the potential for utilization existed in prehistoric times—not as conclusive evidence that the resources were used. Pollen and macrofloral remains, when compared with material culture (artifacts and features) recovered by the archaeologists, become indicators of use. Plants represented by pollen and charred macrofloral remains will be discussed in the following paragraphs providing an ethnobotanic background for discussing the remains.

Picea (Spruce)

Picea is used by Native Americans ceremonially, nutritionally, medicinally, and architecturally. To the Hopi, it is used to represent one of the sacred directions (northwest) and it is associated with the kachina-cottonwood phratry (Whiting 1939:45). The branches are used in almost all Puebloan dances as symbols for their emergence from the prior world and as a symbol for rain (Robbins et al. 1916; Sweet 1976; Whiting 1939:42). In emergencies, Native Americans have been known to use the inner bark and new shoots as food. In general, *Picea* is used to cure dietary ills such as kidney infections and scurvy, as an antiseptic, and as a cold medicine (Moerman 1986:338). Specifically, its needles are brewed as a tea and used as a ceremonial emetic (Vestal 1952:12, as cited in Moerman 1986:338) and for ritual smoking (Whiting 1939:40). Moreover, some have used the ashes from burned twigs as a grease ointment or salve (Steedman 1928:475, as cited in Moerman 1986:338). Interestingly, while it is used in building as roof supports, it is not used, at least by the Hopi, as firewood in the kiva (Whiting 1939:38).

Liguliflorae (Chicory Tribe)

Liguliflorae includes such genera of the Asteraceae (composite) family as *Taraxacum* (dandelion) and *Cichorium* (chicory). Dandelion greens may be eaten raw or cooked like spinach. The roots, which are reputed to have medicinal properties, may be eaten raw. Chicory leaves also may be eaten raw in salads or cooked like spinach. The roots may be roasted to provide a coffee-like drink (Kearney and Peebles 1960:958, 964). The greens and roots may be harvested at any time during the growing season, although the greens would be more tender in the spring and early summer.

Pseudotsuga (Douglas-fir)

Pseudotsuga (Douglas-fir) trees range throughout forested mountains in the Southwest, and are most plentiful in the mixed conifer zone between ponderosa pine (*Pinus ponderosa*) and spruce (*Picea*). Fresh *Pseudotsuga* needles can be steeped in water to make a tea high in vitamin C. Douglas-fir was important in many Hopi and Tewa ceremonies and dances. The Hopi used to travel long distances to collect Douglas-fir boughs for the kachina dances. *Pseudotsuga* may be found from British Columbia south to west Texas, Arizona, California, and northern Mexico (Kearney and Peebles 1960:55-56; Kirk 1975:19; Lamb 1989:113-114; Robbins et al. 1916:42-43; Whiting 1939:42,63).

Brassicaceae (Mustard Family)

Several members of the Brassicaceae (mustard) family are noted to have been exploited for their greens, which were used as potherbs, and for their seeds. Brassicaceae seeds ripen in early summer. All species of *Descurainia* (tansy mustard) are edible. Indians often baked fresh young leaves in firepits lined with stones. Alternating layers of leaves and hot rocks were used to create a type of steamer. The plants were steamed for about 30 minutes then used right away or dried for later use (Harrington 1967:308). The parched and ground seeds were used to thicken soup and to make pinole. A poultice of the plants was applied to toothaches and used as a lotion for frostbite and sore throats. In Mexico, the seeds are poulticed and applied to wounds. *Descurainia* is a weedy annual or biennial found on hillsides, in plains, valleys, fields, waste places, and along roadsides (Harrington 1967:307-308; Kearney and Peebles 1960:349; Kirk 1975:38; Moerman 1986:151; Muenscher 1987:242). *Lepidium* (peppergrass) is a weedy annual or biennial plant. The leaves contain vitamins A and C, iron, and protein, and may be eaten fresh or cooked as potherbs. Seeds have a peppery taste and may be used to flavor salads and stews. Indians used bruised plants or a leaf tea to treat poison ivy and scurvy. Leaves were poulticed on the chest for croup. Navajo-Kayenta peoples used the plant for "effects of swallowing an ant," and the plant was "rubbed on baby's face to put infant to sleep" (Moerman 1986:257-258). *Lepidium* also was used as a disinfectant, for heart palpitations, dizziness, or poulticed to "draw blister quickly" (Moerman 1986:258). *Lepidium* may be found in dry or moist soil in fields, cultivated ground, and waste places (Foster and Duke 1990:34; Kirk 1975:37; Muenscher 1987:250; Peterson 1977:26).

Cactaceae (Cactus Family)

Opuntia and Cylindropuntia (Prickly Pear Cactus, Cholla Cactus)

Many members of the cactus (Cactaceae) family were important food resources. Cactus fruits, buds, and stems provided some essential nutrients not available in most native foods (Gasser 1981:224). The *Opuntia* group consists of both flat-jointed species (prickly pear cactus) and cylindric-jointed species (cholla). *Cylindropuntia* is an antiquated term for cholla cactus which has been applied in palynology to distinguish cholla cactus from prickly pear cactus. Cholla flower buds were an important wild food staple and are comparable to other flower bud vegetables such as broccoli. The buds were collected during the spring and roasted, and cooked buds may be dried for future use. These buds are an excellent source of calcium. Also, the fruits and younger stems (joints) were eaten after the spines had been removed. The spine-removing process usually involved rubbing the fruit with a branch, then rolling it in the sand. The young cholla stems were often placed on a fire to burn off spines and partially cook the stems. The stems could then be baked in a pit. The core of the *Opuntia bigelovii* (teddybear cholla) root was boiled into a diuretic tea. *Opuntia fulgida* (jumping cholla) produces a gum that hardens into black, dry nodules, which were then eaten. Cholla is found in the western United States in Kansas, Oklahoma, Texas, New Mexico, Arizona, Colorado, Utah, Nevada, and California (Greenhouse et al. 1981; Kearney and Peebles 1960:581-586; Manning 1962:15).

All prickly pear cactus species produce edible fruits, which were eaten raw, stewed, or dried for winter use. Dried fruits could be ground into a meal, young stems or pads were peeled and eaten raw, or roasted, and peeled stems could be used as a dressing on wounds. The seeds were eaten in soups, or dried, parched, and ground into a meal to be used in gruel or cakes. The process of removing spines from cacti usually involved roasting or baking in a pit, and rubbing the spines off (Beaglehole 1937:70; Greenhouse et al. 1981; Harrington 1964:382-384; Kearney and Peebles 1960:581-586; Nequatewa 1943:18-9; Robbins et al. 1916:62; Stevenson 1915:69; Whiting 1939:85-6). Prickly pear plants are found throughout the western United States on arid, rocky, or sandy soils (Kirk 1975:50-52; Muenscher 1987:317).

Mammillaria-type (Hedgehog-type Cactus)

Many members of the cactus (Cactaceae) family were important food resources. Cactus fruits, buds, and stems provided some essential nutrients not available in most native foods (Gasser 1981:224). *Echinocereus* (hedgehog cactus, strawberry cactus) are small, cylindrical plants with juicy, edible fruits. The fruits have large spine clusters that readily detach when mature. Fruits were eaten raw after the spines were rubbed off, and are reported to taste very much like strawberries. *Echinocereus* fruits were important food resources for the Hohokam and later Pima (O'odham) peoples. *E. enneacanthus* (pitahaya) flowers were used to treat intestinal worms and to poison fish. *Echinocereus* may be found in Utah, Colorado, New Mexico, Arizona, California, and northern Mexico. *Echinocereus* plants flower from February to May, depending on the species and elevation (Kearney and Peebles 1960:570-571; Krochmal and Krochmal 1978:92; McDougall 1973:320; Shields 1984:92).

Cheno-ams (Goosefoot and Pigweed)

Cheno-ams refer to a group representing the Chenopodiaceae (goosefoot) family and the genus *Amaranthus* (amaranth, pigweed). These plants are weedy annuals or perennials, often growing in disturbed areas such as cultivated fields and archaeological site vicinities. Cheno-ams, including a variety of plants such as *Chenopodium*, *Amaranthus*, *Suaeda*, and *Atriplex*, are noted to have been used as food and for processing other foods. These plants were exploited for both their greens (cooked as potherbs) and seeds. The seeds were eaten raw or ground and sometimes mixed with cornmeal to make a variety of mushes and cakes. The seeds are usually noted to have been parched prior to grinding. The greens are most tender when young, in the spring, but may be used at any time. The greens may be harvested and cooked either alone or with other foods. Various parts of the Cheno-am plants are noted to have been gathered from early spring through the fall (Castetter and Bell 1942:61; Curtin 1984:47-71; Kearney and Peebles 1960:251, 255, 263, and 265). *Chenopodium* (goosefoot) leaves are rich in vitamin C and were eaten to treat stomachaches and to prevent scurvy. Leaf poultices were applied to burns, and a tea made from the whole plant was used to treat diarrhea. *Amaranthus* leaves were an important source of iron. *Amaranthus* poultices were used to reduce swellings and to soothe aching teeth. A leaf tea was used to stop bleeding, and to treat dysentery, ulcers, diarrhea, mouth sores, sore throats, and hoarseness (Angier 1986:33-35; Foster and Duke 1990:216; Harris 1982:58; Krochmal and Krochmal 1978:34-35, 66-67; Moore 1990:12). *Atriplex* (saltbush) leaves and young shoots have a salty taste and may be used as a seasoning, often boiled with meat. The Hopi used ashes of *A. canescens* as a substitute for baking powder (Kearney and Peebles 1960:255). The dried tops of *A. canescens* (fourwing saltbush) were used to make a tea for treating nausea and vomiting from the flu. A hot tea was taken for breaking fevers, while a cold tea was used to treat stomachs (Moore 1990:29). *Atriplex* leaves, twigs, and blossoms yielded a bright yellow dye (Bryan and Young 1978:32). *Suaeda* (seepweed) greens are noted to have been collected in April with cholla buds, dried, and stored for later use with the buds. Greens were packed around cholla buds when they were roasted. The seeds also were ground into meal and frequently mixed with cornmeal. The Hopi applied the dried leaves to sores (Greenhouse et al. 1981:238; Kearney and Peebles 1960:263).

Cleome (Beeweed)

Cleome (beeweed) is a weedy plant that grows in disturbed areas. This plant is noted to have been allowed to grow in gardens with cultivated plants. *Cleome* was used both as a food and a pottery paint. The young plants usually were gathered and boiled as potherbs from spring until mid-summer. Large quantities of leaves were gathered and hung indoors to dry for winter use by the Zuni. The leaves were cooked with boiled corn and highly seasoned with chile. The seeds also may be gathered and ground into meal, although utilization as a potherb appears to have been more common. The seeds ripen in the late summer and fall. Both the young and older plants may be gathered and the entire plant boiled until the water is thick and black. This fluid is then dried and made into cakes, which keep for an indefinite period. The cakes may be reconstituted by soaking them in water for use as pottery paint, or fried in grease to be eaten. *Cleome* is noted to yield a yellow-green dye (Bryan and Young 1978:23; Clary 1983:55; Harrington 1967:72; Robbins et al. 1916:58-9; Stevenson 1915:69,82; Whiting 1939:77-8).

Liliaceae (Lily Family)

Several native members of the Liliaceae (lily) family were important resources for prehistoric peoples in the Southwest. Wild onions (*Allium*) were consumed raw, used as flavoring, or preserved for future use (Beaglehole 1937:69; Cushing 1920:227; Nequatewa 1943:20; Robbins et al. 1916:53,110; Whiting 1939:70). *Brodiaea capitata* (*Dichelostemma pulchellum*) is a close relative of the onion. All species of *Brodiaea* produce edible, bulb-like underground stems. The small bulbs may be eaten raw or cooked, and are noted to taste best when roasted in hot ashes. In Arizona, these plants are found on mesas and open slopes, and bulbs are reported to have been eaten by the Pima and Papago (O'odham). *Brodiaea* are perennial herbs in fields, meadows, dry ground, open ground, and/or moist soils (Castetter and Underhill 1935:18 in Gallagher 1977:69; Kearney and Peebles 1960:182; Kirk 1975:173; Medsger 1966:197). *Calochortus* (sego lily) roots frequently were eaten raw, and the seeds and flowers ground to make "yellow pollen" (Colton 1974:297; Whiting 1939:70). Southwest Indians are reported to have used the caudex (thickened base) and young shoots of *Nolina microcarpa* (beargrass, sacahuista) in the same way that the corresponding parts of yucca and agave were used (Kearney and Peebles 1960:189; Kirk 1975:281). *Yucca* (yucca, soapweed) buds, flowers, and flower stalks were eaten raw or boiled, and the flower stalks were roasted like agave. *Y. baccata* (banana yucca) produces a fleshy fruit that was eaten raw or roasted, and fruits also were dried and ground into a meal or stored for future use. A fermented beverage also was made from the fruits. Young *Y. glauca* seed pods are slightly sweet and were boiled and eaten. Yucca seeds also were used as food. Yucca roots contain saponin, and peeled roots were pounded with cold water to produce suds that were used for washing. Stevenson (1915:83) notes that yucca suds were used by all Indians of the Southwest for washing hair and cleaning wool garments and blankets. Fiber from yucca leaves was used to make cloth, sandals, baskets, mats, and rope. Leaves also were used to make brushes for painting pottery and decorating a variety of objects (Bryan and Young 1978:13; Kearney and Peebles 1960:185; Stevenson 1915:72-73, 78-79, 82-83).

Poaceae (Grass Family)

Members of the Poaceae (grass) family, such as *Oryzopsis* (Indian ricegrass) and *Sporobolus* (dropseed) have been used widely as a food resource (Colton 1974:338, 365; Cushing 1920:219, 253-254; Whiting 1939:65). *Oryzopsis* produces an abundant quantity of seeds, that could be eaten raw, but usually were parched and ground into a flour that could be combined with other flours and ground meal to make breads and mushes. Ground seeds also were used to thicken meat gravy. *Oryzopsis* is a cool season grass available in the spring, and is found in dry, open woods, prairies, deserts, and dry hillsides throughout the western United States (Gasser 1982:225-226; Kirk 1975:182; Medsger 1966:128; Niethammer 1974:37). *Sporobolus* may be an annual or perennial grass. The seeds of certain species may be eaten raw or parched and ground into a flour. *Sporobolus* is found in a variety of habitats, including dry prairies, sandy or muddy shores and marshes, saline flats, along roadsides, waste places, and in dry, sandy, sterile, or rocky soils (Fernald 1950; Kirk 1975:181-182). Other members of the Poaceae family also were utilized. Like *Oryzopsis* and *Sporobolus*, the seeds could be eaten raw, but usually were parched and ground into a flour that could be combined with other flours and ground meal to make breads and mushes. Young shoots and leaves may have been cooked as greens (Rogers 1980:32-40). Grass also is reported to have been used as a floor covering (Chamberlin 1964:372). Various grasses were used in the manufacture or decoration of pahos (prayer sticks) (Whiting 1939:65-66). Grass seeds ripen from spring to fall, depending on the species, providing a long-term available resource.

Portulaca (Purslane)

Portulaca (purslane) is a salt-tolerant, weedy annual or perennial with fleshy leaves and small black seeds. The whole plant may be cooked and seasoned like spinach or added raw to salads, but the young leaves and stems are best. The leaves and stems are rich in iron, and contain vitamins A and C, calcium, and phosphorous. The leaves also have a high water content and can be eaten raw to quench thirst. Young stems may be used to thicken soup. The starchy seeds were parched and ground into a meal or flour that was used in a variety of breads, mushes, and cakes. Harrington (1967:87-89) notes that Southwestern people dried large quantities of purslane by spreading young stems out in the sun on rooftops. Dried stems could be boiled and reconstituted as a potherb. This plant typically grows on dry soil in full sunlight and flowers between July and October (Clary 1983:56; Kearney and Peebles 1960:290; Kirk 1975:46; Niethammer 1974:121; Peterson 1977:72). The seeds are expected to be available for harvest by early August, and may be available until November.

Sphaeralcea (Globemallow)

Sphaeralcea (globemallow) was widely used for medicinal purposes. Hopi people used it to treat diarrhea, bowel trouble in babies, broken bones, and as an emetic. *S. coccinea* was used in a variety of ways. Crushed leaves were made into a poultice for skin inflammations and for sore, blistered feet. Fresh leaves and flowers were chewed or dried and made into a tea to treat sore throats, hoarseness, and minor stomachaches. Navajo-Kayenta peoples used an infusion of the plant to stop bleeding, as a lotion for skin diseases, as a tonic to increase appetite, and as a ceremonial fumigant ingredient. Navajo peoples also used *S. angustifolia* as a ceremonial medicine and to treat coughs, colds, and influenza. The Pima used a leaf decoction as a remedy for diarrhea, while the Tewa applied a pulverized root poultice to snakebites and sores. Pima peoples also used *Sphaeralcea* as a cure for sore eyes. The stems may be chewed like chewing gum. *Sphaeralcea* tea has been used as a hair rinse, and a strong tea will curl hair if it is not washed out. Several of the species flower in spring and again after summer rains, and they may be found growing along roadsides and in fields (Curtin 1984:80; Moerman 1986:465-466; Moore 1982:167-168; Shields 1984:53).

Typha (Cattail)

Typha (cattails) are perennial marsh or aquatic plants with creeping rhizomes. This plant is a rich source of nutrients. Indian groups are noted to have used various parts of the cattail plant throughout the year. In the spring, young shoots were peeled and the inner portion eaten raw or cooked as potherbs. During the summer, young flower stalks were taken out of their sheaths and cooked. Flowers were eaten alone or added as a flavoring or thickening for other foods. Pollen-producing flowers and the pollen itself were collected and used as flour, either alone or mixed with other meal. In the fall, the rootstalks were collected, the outer peel removed, and the white inner cores of almost pure starch were eaten raw, boiled, baked, or dried and ground into flour. Cattail roots are richer in starch during the fall. Cattail starch flour is noted to be similar in quantities of fats, proteins, and carbohydrates to flour from rice and corn. The seed-like fruits also were collected and eaten in the fall. Indian groups are noted to process these "seeds" by burning off the bristles. The seeds then were parched and could be more easily rubbed off the spike. Hopi peoples mixed

cattail fruits with tallow to make a type of chewing gum. Cattail down was used as dressing for wounds and padding in cradleboards. Leaves were used for weaving mats. Cattails are found in marshy habitats in or near swamps, ponds, sloughs, and edges of streams (Harrington 1964:29-30, 1967:220-224; Kearney and Peebles 1960:63-64; Kirk 1975:171; Sweet 1976:5).

Cucurbita (Squash, Pumpkin, Gourd)

Cucurbita (squash/pumpkin/gourd) is noted as one of the most important New World crops, and, along with corn and beans, belongs to what Ford (1981) has called the Upper Sonoran Agricultural Complex (Cordell 1984:171). These crops were the first to be cultivated everywhere in the Southwest. Fresh squash was cut into pieces, boiled, baked, or roasted whole in ashes. Squash and pumpkins also were cut in coils that were dried for future use. Blossoms were fried in grease and used as a delicacy in combination with other foods. Seeds also were roasted and eaten, or used to oil *piki* stones. The Zuni are noted to have used a paste made from grinding *Xanthium* (cocklebur) seeds, squash seeds, and maize kernels to extract cactus splinters and to heal wounds (Stevenson 1915:62). Gourds were dried and made into cups, ladles, dippers, ceremonial rattles, and used for other purposes (Cordell 1984:178; Cushing 1920:561; Stevenson 1915:62, 67, 88; Whiting 1939:93).

Zea mays (Maize)

Zea mays (maize, corn) has been an important New World cultigen, originating from a wild grass called teosinte. Maize has long been a staple of the Southwest inhabitants, and charred maize is found in almost every cliffhouse in the Southwest (Stevenson 1915:73). Maize is by far the most common remain in Anasazi coprolitic material from Basketmaker III to Pueblo times (Clary 1983; Cummings and Puseman 1992; Minnis n.d.; Moore 1978; Scott 1979; Stiger 1977; Williams-Dean 1986; Williams-Dean and Bryant 1975). Innumerable ways of preparing maize exist. Green corn was widely used, and ears were collected from the regular fields. Mature ears were eaten roasted or wrapped in corn husks and boiled. The kernels may be parched, soaked in water with juniper ash, and boiled to make hominy. Dried kernels may be ground into meal, which is used as a staple. Cornmeal may be colored with *Atriplex* ashes. Black corn is used as a dye for basketry and textiles and as a body paint. Maize may be husked immediately upon harvesting. Clean husks are saved for smoking and other uses, such as wrapping food. The Pima (Akimel O'odham) and Papago (Tohono O'odham) harvested corn by pulling up the entire stalk after it was dry and piling them at the edges of the fields. Women and children removed unhusked ears from the stalks and then threw them into piles, which ultimately were carried to the dwelling in burden baskets. Unhusked ears frequently were roasted by piling up maize and mesquite brush and setting this pile on fire. The fire burned much of the husk away and the ears were pulled from the fire and dried on top of the house. The roasted, unhusked maize then was stored for later use. Maize also sometimes was shelled prior to storage. Ears also may be allowed to dry on the roof, and ristras of maize may be hung inside from the roof (Castetter and Bell 1942:180-189; Cushing 1920:264-267; Robbins et al. 1916:83-93; Stevenson 1915;73-76; Whiting 1939:67-70). "Corn appears in virtually every Hopi ceremony either as corn meal, as an actual ear of corn or as a symbolic painting" (Whiting 1939:67).

RESULTS

Four sites from the southern portion of the San Juan Basin and Dutton Plateau were examined for pollen. Samples collected from storage pits and pitstructures provide pollen evidence of local and regional vegetation, as well as plants probably used by the occupants of these sites. Three sites from the extreme southern portion of the San Juan Basin represent Basketmaker III occupations, while the fourth site from the Dutton Plateau represents a Pueblo II occupation. Samples were collected from 10 cm above the floor in pitstructures. Presumably these deposits represent floor fill and thus pollen associated with the occupation of the structures. Provenience data for the pollen samples is provided in Table 29.1. Table 29.2 lists all the pollen types observed. Figures 29.1 and 29.2 provide the pollen diagram and pollen aggregates, respectively, for the samples.

Table 29.1. N11 Testing, Provenience Data for Samples.

Site No.	FS No.	Feature No.	Provenience/Description	Pollen Counted
NM-Q-22-52	87	-	N110, E94.90; SU 14, Level 7*	201
NM-Q-23-62	125	1	N969.10, E1028.60; SU 11, Level 1*	201
NM-Q-23-63	75	1	N1001, E988; SU 7, Level 11*	201
NM-Q-23-64	209	4	N1058.55, E1018.53; SU 18, 10 cm above floor**	201
	158	6	N1050, E1012.50; SU 3, Level 16*	201
	210	11	N1023.82, E1002.92; SU 21, 10 cm above floor**	201
	182	12	N1020, E995; SU 5, Level 12*	201

*Grid coordinates denotes southwest corner of hand-excavated unit in which feature was located.
**Grid coordinates denote southwest corner of backhoe trench in which feature was located.,

Site NM-Q-22-52

This compact Pueblo II site included three possible pit structures, one slab-lined roasting pit, one storage pit, nine ash/charcoal pits, and six ash lenses. The pollen sample, Field Specimen (FS) 87, was collected from the charcoal-flecked matrix surrounding Feature 1, a slab-lined roasting pit that contained ashy/charcoal sandy loam fill approximately 35 cm deep. Sherds and lithic artifacts were recovered from the fill of the feature as well as the surrounding matrix. The sherds indicate a Pueblo II occupation.

Sample 87 was dominated by *Pinus* pollen and contained a small quantity of *Juniperus* pollen, reflecting the local pinyon and juniper community. The small quantity of *Quercus* pollen reflects local Gambel oak that probably was a part of the pinyon and juniper community. The trace of *Picea* pollen noted during the scan of this sample was transported by the wind from a mountain forested community. Local understory vegetation included *Artemisia* (sagebrush), Low-spine and High-spine Asteraceae (sunflower family), *Ephedra nevadensis*-type (Mormon tea), *Eriogonum* (wild buckwheat), Onagraceae (primrose family), and Poaceae (grass family) pollen. The moderately

Table 29.2. N11 Testing, Pollen Types Observed.

Scientific Name	Common Name
ARBOREAL POLLEN:	
Betula-type	Birch
Juniperus	Juniper
Pinaceae:	Pine family
Abies	Fir
Picea	Spruce
Pinus	Pine
Pseudotsuga	Douglas-fir
Quercus	Oak
Salix	Willow
NON-ARBOREAL POLLEN:	
Asteraceae:	Sunflower family
Artemisia	Sagebrush
Low-spine	Includes ragweed, cocklebur, etc.
High-spine	Includes aster, rabbitbrush, snakeweed, sunflower, etc.
Liguliflorae	Includes dandelion and chicory
Brassicaceae	Mustard family
Cactaceae:	Cactus family
Cylindropuntia	Cholla
Mammillaria-type	Hedgehog-type
Opuntia	Prickly pear cactus
Cheno-am	Includes amaranth and pigweed family
Sarcobatus	Greasewood
Cleome	Beeweed
Ephedra nevadensis-type	Mormon tea
Eriogonum	Wild buckwheat
Euphorbia	Spurge
Liliaceae	Lily family
Nyctaginaceae:	Four o'clock family
Abronia	Sand verbena
Mirabilis	Four o'clock
Onagraceae	Evening primrose family
Poaceae	Grass family
Portulaca	Purslane
Sphaeralcea	Globemallow
Typha angustifolia	Cattail
Cucurbita	Squash, pumpkin, gourd
Zea mays	Maize, corn
Indeterminate	Too badly eroded to identify
SPORES:	
Selaginella densa	Little clubmoss
Trilete	Fern

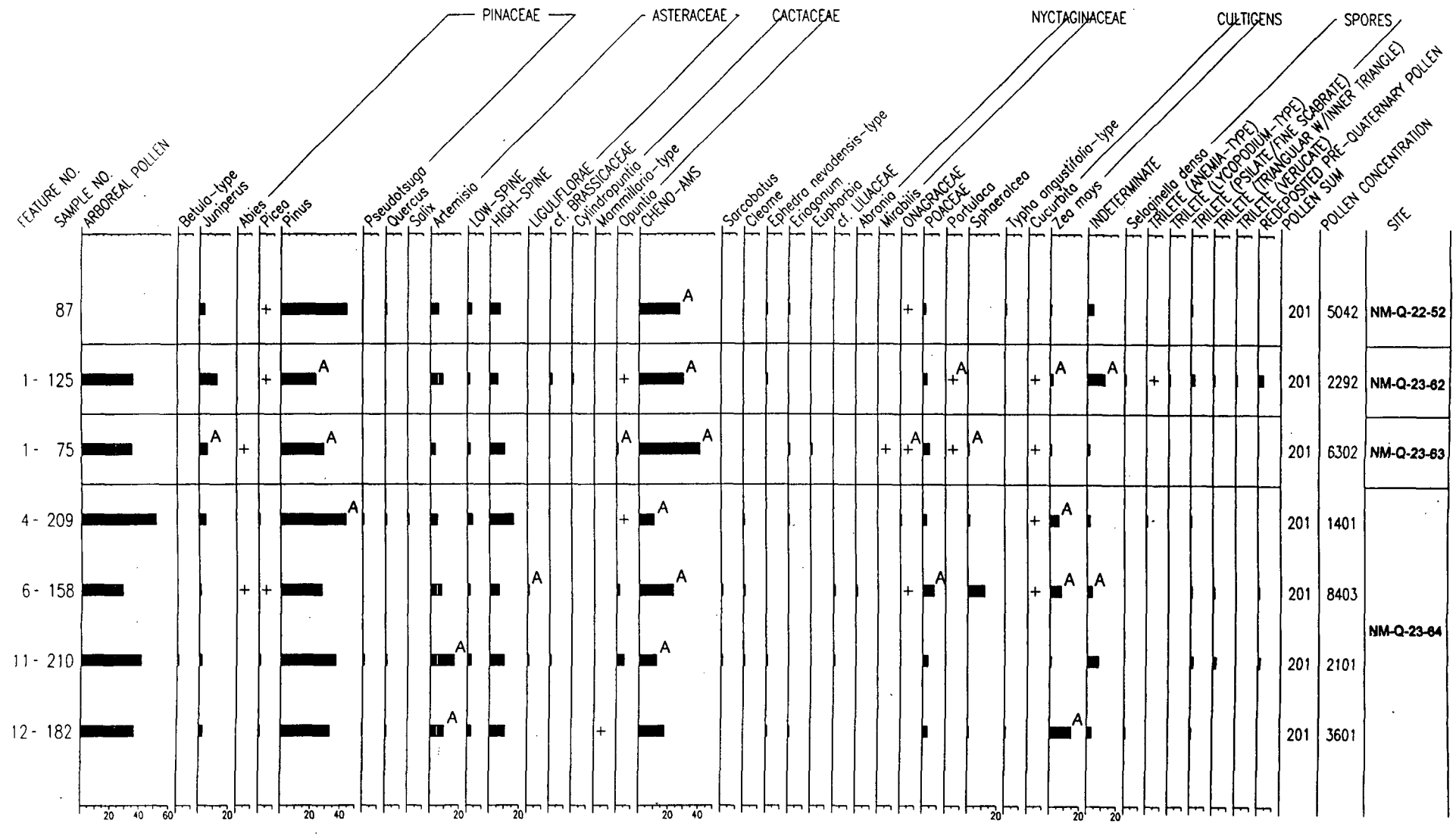


Figure 29.1. Pollen Diagram, Sites NM-Q-22-52, NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64.

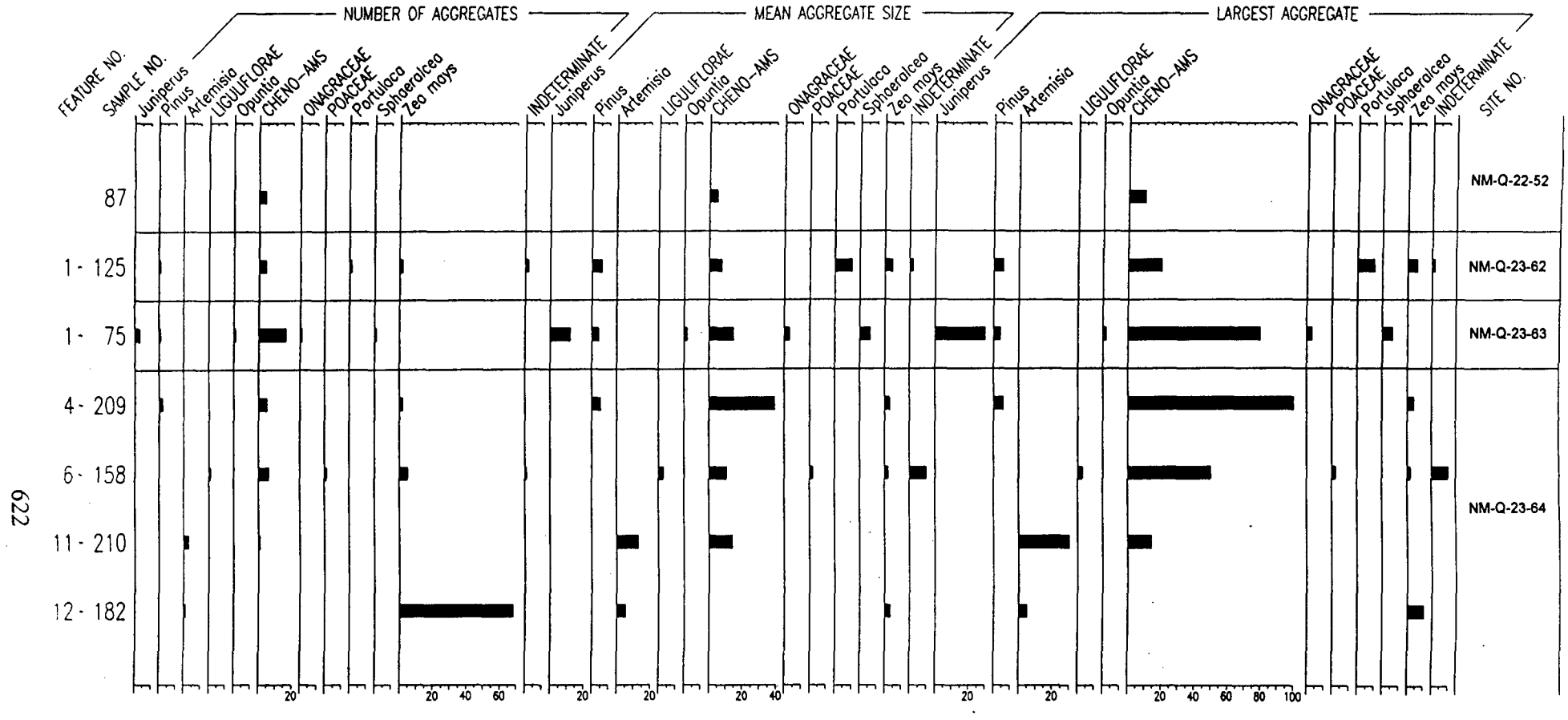


Figure 29.2. Pollen Aggregates, Sites NM-Q-22-52, NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64.

large quantity of Cheno-am pollen probably represents a mixture of pollen from local plants such as saltbush (*Atriplex*) and edible plants such as *Chenopodium* and *Amaranthus*. These latter two plants produce edible greens and seeds. Recovery of a small quantity of small aggregates reflects the possibility that Cheno-ams were processed in this hearth. A small quantity of *Typha angustifolia*-type pollen indicates that cattails were available for exploitation. This pollen may have been introduced into the feature as a result of wind transport from a riparian vegetation community within approximately 1.6 km (1 mi) of the site or might have been introduced through processing or cooking cattails. The small quantity of *Zea mays* pollen noted in this sample indicates that maize was processed.

Site NM-Q-23-62

This large lithic and ceramic artifact scatter is located on shallow dunes in a wide valley bottom. Ceramics recovered included Lino Gray and Tallahogan Red, indicating a Basketmaker III (AD 500 to 700) occupation. Local vegetation is typical of the Plains and Great Basin Grassland Biotic Community and includes broom snakeweed (*Gutierrezia sarothrae*—a High-spine Asteraceae), Indian ricegrass (*Oryzopsis hymenoides*), ring muhly (*Muhlenbergia torreyi*—a Poaceae), Russian thistle (*Salsola kali tenuifolia*), cactus (*Opuntia*), and dropseed grasses (Poaceae).

Feature 1 was a slab-lined storage bin. Pollen sample FS 125 was collected from Level 1 of this bin. This sample yielded a smaller quantity of *Pinus* and larger quantity of *Juniperus* pollen than did sample 87 from the later site NM-Q-22-52. This pollen indicates presence of a scattered pinyon and juniper woodland in the region. Recovery of a small quantity of *Picea* pollen during the scan of this sample indicates wind transport of spruce pollen from a mountain community. Small quantities of *Artemisia*, Low-spine and High-spine Asteraceae, *Ephedra nevadensis*-type, and Poaceae pollen indicate local plants. The elevated Cheno-am frequency was accompanied by a small quantity of small- to moderate-sized aggregates, and it is suggested that Cheno-ams were stored in this bin. Recovery of a small quantity of Brassicaceae (mustard family) pollen is interpreted to indicate that a member of this family also was stored in this bin. Alternatively, mustards may have been present as weeds in an agricultural field and the pollen might be present as a result of "hitchhiking" on a plant that was harvested. However, because mustards tend to flower early in the growing season, this scenario is less likely. From the presence of small quantities of *Cylindropuntia* and *Opuntia* pollen, it is suggested that cholla and prickly pear cactus were also stored. Recovery of a small quantity of *Portulaca* pollen in the scan was accompanied by aggregates, which indicate that purslane probably was among the plants stored. Recovery of small quantities of *Cucurbita* and *Zea mays* pollen, the latter accompanied by a single, small aggregate, indicates that these cultigens were among the contents of this storage bin. This slab-lined storage bin appears to have contained a wide variety of economically important plants including a member of the mustard family, cholla, prickly pear cactus, Cheno-ams, purslane, squash/pumpkin, and maize.

Site NM-Q-23-63

This very large ceramic and lithic artifact scatter was located on a small rise in a wide valley bottom. Local vegetation is similar to that at site NM-Q-23-62. Ceramics included Lino Gray, plain grayware, and some black-on-white, placing occupation during the Basketmaker III period (AD 500 to 700). Feature 1, a storage bin, was sampled for pollen in Level 11.

Sample FS 75 exhibited both *Pinus* and *Juniperus* pollen, representing a local, probably scattered, pinyon and juniper community. The presence of a moderately large *Juniperus* pollen aggregate is interpreted as evidence that juniper was used near this feature or perhaps grew near this feature. Recovery of a small quantity of *Abies* (fir) pollen during the scan of this sample indicates wind transport from a mountain forest. *Artemisia*, Low-spine and High-spine Asteraceae, *Eriogonum*, *Euphorbia*, *Mirabilis*, Onagraceae, and Poaceae pollen probably represent local vegetation. Pollen that may represent plants stored in this bin include small quantities of *Opuntia* (accompanied by a single, small aggregate), *Portulaca*, *Sphaeralcea*, and the cultigens *Cucurbita* and *Zea mays*. In addition, this sample contained the largest quantity of Cheno-am pollen, accompanied by a moderate number of aggregates ranging in size from small to an anther fragment, which supports an interpretation that Cheno-ams were stored in this bin. It is likely that this storage bin held a variety of plants that were either edible or had medicinal uses including prickly pear cactus, Cheno-ams, purslane, globemallow, squash/pumpkin, and maize.

Site NM-Q-23-64

This very large ceramic and lithic artifact scatter was located on a small rise in a wide valley bottom. Vegetation was very similar to that of sites NM-Q-23-62 and NM-Q-23-63, with the exception that occasional juniper (*Juniperus monosperma*) were present. The artifact assemblage and features indicate that this site was a Basketmaker III pitstructure village (AD 500 to 700). Four features were sampled for pollen at this site. All pollen samples were collected approximately 10 cm above the floors of pitstructures in trench walls or hand-excavated units. Presumably these deposits represent floor fill associated with occupation of the structures.

Pollen sample FS 209 from Feature 4 was dominated by *Pinus* pollen, accompanied by a few small aggregates, indicating that pinyon pine probably grew in this portion of the San Juan Basin and/or on Dutton Plateau during occupation. Small quantities of *Juniperus* and *Quercus* pollen indicate that juniper and Gambel oak also were part of the local pinyon and juniper woodland. Recovery of a small quantity of *Salix* pollen indicates that willow was part of a riparian community in the vicinity of this site. Small quantities of *Picea* and *Pseudotsuga* pollen may be present as a result of transporting spruce and Douglas-fir to the site for use. Garlands of both spruce and Douglas-fir are noted to have been used historically. If spruce and/or Douglas-fir branches were cut and transported to the site either while they were pollinating in the late spring or within a few weeks after pollinating, they would be expected to transport their own pollen into the structure. Collection at the time of pollination is less likely since no aggregates of *Picea* or *Pseudotsuga* pollen were observed. Alternatively, these pollen may have been transported by the wind. Their presence only in pitstructure samples makes this alternative a weak one. *Artemisia*, Low-spine and High-spine Asteraceae, *Eriogonum*, Onagraceae, and Poaceae pollen probably represent local vegetation. Small quantities of *Opuntia*, *Cleome*, *Sphaeralcea*, *Cucurbita*, and *Zea mays* pollen probably represent use or processing of prickly pear cactus, beeweed, globemallow, and the cultigens squash/pumpkin and maize.

Feature 6 is represented by sample FS 158, which yielded the smallest quantities of arboreal pollen at this site. *Pinus* and *Juniperus* pollen indicate the presence of pinyon and juniper. Small quantities of *Abies* and *Picea* pollen noted during scan probably represent wind transport from forests at higher mountain communities. Local vegetation appears to be represented by *Artemisia*,

Low-spine and High-spine Asteraceae, *Sarcobatus*, *Abronia*, and Onagraceae pollen. Pollen that may represent economic activity in this structure includes small quantities of Liguliflorae, *Opuntia*, *Cleome*, cf. Liliaceae (lily family), *Cucurbita*, and elevated quantities of Cheno-am, Poaceae, *Sphaeralcea*, and *Zea mays* pollen. The elevated Cheno-am frequency is accompanied by a small number of aggregates ranging in size from small to large, strengthening the interpretation that Cheno-ams were used and/or processed. Poaceae and *Sphaeralcea* pollen are noted in their largest frequencies in this sample, and it is suggested that both were processed and/or used. Numerous native plants such as prickly pear cactus, beeweed, a member of the lily family, Cheno-ams, and globemallow appear to have been processed or utilized. The cultigens squash/pumpkin and maize also were used and/or processed.

Feature 11 is represented by pollen sample 210. This sample yielded a moderate *Pinus* pollen frequency and a small *Juniperus* pollen frequency, reflecting a pinyon and juniper woodland. *Quercus* pollen indicates that Gambel oak also was present. A small quantity of *Betula*-type pollen represents birch that probably grew in a riparian zone, perhaps along one of the local drainages. Small quantities of *Picea* and *Pseudotsuga* pollen in the count of this sample may represent use of spruce and Douglas-fir in this structure. The elevated *Artemisia* pollen frequency is accompanied by a few aggregates ranging in size from small to large, interpreted as a possibility that sagebrush was used in the structure or that it grew close to the structure. Small quantities of Low-spine and High-spine Asteraceae, *Sarcobatus*, *Ephedra nevadensis*-type, and Poaceae pollen probably represent local vegetation. Pollen that may represent native plants utilized by the occupants of this structure include small quantities of Liguliflorae, cf. Brassicaceae, *Cleome*, cf. Liliaceae, and *Zea mays*. The small quantity of Cheno-am pollen was accompanied by a few aggregates ranging in size from small to an anther fragment. Recovery of this anther fragment strengthens the interpretation that Cheno-ams were used, since anther fragments are not readily wind transported. A moderately large quantity of *Opuntia* pollen underscores the use of prickly pear cactus in this pitstructure.

Feature 12, represented by pollen sample FS 182, yielded quantities of *Pinus*, *Juniperus*, and *Quercus* pollen typical for this site. This sample contained only *Picea* pollen in the count; *Pseudotsuga* (Douglas-fir) pollen was absent. Recovery of *Picea* pollen in the count may represent the use of spruce. If Douglas-fir were collected when the tree was not pollinating or had not pollinated for many months, it would not be expected to introduce pollen into the structure. Local vegetation appears to be represented by small quantities of *Artemisia*, Low-spine and High-spine Asteraceae, *Ephedra nevadensis*-type, *Eriogonum*, and Poaceae pollen. In contrast, small quantities of *Mammillaria*-type, *Sphaeralcea*, *Typha*, and Cheno-am pollen may represent economic activity in the structure. Only a single moderate-sized Cheno-am aggregate was observed in this sample. This sample yielded the largest quantity of *Zea mays* pollen recorded at this site (nearly 20%), as well as numerous small aggregates. The elevated *Zea mays* pollen frequency and large number of aggregates indicate that maize pollen may have been used ritually in this area.

SUMMARY AND CONCLUSIONS

Pollen analysis of seven samples from four sites in the southern San Juan Basin and on Dutton Plateau provided excellent pollen counts. Pollen concentrations ranged from 1401 to 8403, indicating adequate preservation and the probability of minimal, if any, contamination. Viewed collectively, these samples indicate that a pinyon and juniper woodland probably was scattered or

patchy on the landscape. Gambel oak apparently was a part of this woodland. Birch and willow grew along drainages or in riparian zones associated with springs. Wind transport probably was responsible for the introduction of fir and spruce pollen recorded only during scans of these samples. Recovery of spruce and Douglas-fir pollen in the counts of pitstructure samples is more likely the result of the use of spruce and Douglas-fir in the structures.

Local understory plants included sagebrush, various members of the sunflower (Asteraceae) family, a member of the mustard family, members of the Cheno-am group such as saltbush, occasional greasewood, beeweed, various cacti, Mormon tea, wild buckwheat, spurge, sand verbena, four o'clock, members of the primrose family, grasses, purslane, and globemallow. Cattails grew in riparian zones. Of these plants many probably were utilized by the Basketmaker III and Pueblo II occupants of these sites. The Pueblo II occupants of site NM-Q-22-52 appear to have used Cheno-ams and cattails. The Basketmaker III occupants of sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64 probably used a member of the chicory tribe of the sunflower family, mustards, cholla, prickly pear cactus, hedgehog cactus, beeweed, a member of the lily family, grasses, purslane, globemallow, and cattail. The difference in Cheno-am pollen frequencies between storage bins and pitstructure samples is striking. Storage bins contain higher frequencies of Cheno-am pollen uniformly across the Basketmaker III and Pueblo II occupations than were observed in the Basketmaker III pitstructure samples. This pattern strengthens the interpretation that Cheno-ams were stored. Both squash/pumpkin and maize appear to have been grown by all the Basketmaker III occupants, while only maize appears to have been grown and used by the Pueblo II occupants of site NM-Q-22-52. The relatively small amount of pollen evidence for native and cultivated plant use by the Pueblo II occupants of site NM-Q-22-52 might be an artifact of the single feature sampled from that site. It is likely that analysis of a greater number of samples from Pueblo II sites would have yielded a more accurate interpretation of the subsistence base. Feature 12, a Basketmaker III pitstructure at site NM-Q-23-64, yielded a large quantity of maize pollen aggregates, which might represent use of maize pollen in a ritual or ceremonial activity.

Chapter 30

HISTORIC ARTIFACTS

Harding Polk II

INTRODUCTION

Test excavations at sites along Navajo Route 11 resulted in the recovery of 321 historic artifacts from six sites (NM-Q-27-13 [LA 110304], NM-Q-22-48 [LA 110311], NM-Q-23-57 [LA 110320], NM-Q-23-58 [LA 110322], NM-Q-23-59 [LA 110323], and NM-Q-23-60 [LA 38698]). Artifacts dated temporally from the nineteenth century to the second half of the twentieth century. The artifacts consisted of glass, ceramics, metal, plastic, and rubber, as well as some composite items. Site NM-Q-23-57 comprised the bulk of the historic artifact assemblage (64%) since it was the only predominate historic site investigated during this project. The other sites contained much smaller quantities of historic artifacts to as little as one artifact in the case of site NM-Q-23-60. Such small quantities may result from only a transient presence at a site. At some of the sites, such as NM-Q-23-59 or NM-Q-23-60, historic occupation components are present; however, they lay outside the right-of-way and so their representation in the nature and extent testing artifact assemblage is limited.

METHODS

The primary objective of this analysis was to identify and describe the material culture of the historic occupations of sites along N11(1&2). A secondary objective of the analysis was an attempt to provide useful dates with which to identify the historic occupations at the sites where these artifacts occurred. To accomplish these goals two systems of artifact classification were used. The initial categorization was by material: glass, ceramic, metal, or other. The second categorization was by function. For some fragmentary artifacts the form was extrapolated from the fragment to infer function. For most of these sites the assemblage was so small that this was generally done in the course of the description and there was no need to tabulate the data. Measurements of some artifacts, particularly tin cans, were recorded to further aid in analysis. The historic artifacts were recorded in English measurements (inches and tenths [converted from fractions]), because until relatively recently most American manufactured products (as well as those manufactured in many other countries) used English measurements in the design, manufacture, and sales of their products. The author believes it would be more consistent to stay with the standard of the design and manufacture. Using the type, decoration, form, and/or distinguishing marks, inferences regarding occupation dates of the historic components of the sites can be made.

RESULTS OF ANALYSIS

Site NM-Q-27-13

Fifteen ceramic sherds and 81 fragments of glass were recovered from site NM-Q-27-13. The ceramic sherds were recovered from nine different locations. All the ceramic sherds represent

whiteware type ceramics. Whitewares typically have a white or nearly white body with a clear glaze, and have a relatively hard body. However, "whiteware" is a rather generic term and ceramics falling into this category can span a broad spectrum of types depending on the mix of clay, hardness, decoration, and firing technique. Decoration often defines the subcategories of whitewares and can range from plain white to molded, hand decorated, or transfer printed. Beginning in the 1820s whitewares became the dominant ceramic type during the nineteenth century and continue to be made and used into the present. At site NM-Q-27-13 various surface decorations were noted, including flow blue, blue, molded edge, and plain white.

Flow blue whitewares are characterized by painted or transfer-printed blue designs that appear very fuzzy. As a result of adding various chemicals or minerals to the kiln during firing, the design bleeds or "flows" into the surrounding undecorated areas. Flow blue was introduced as early as the 1820s but generally did not become popular until the 1840s or 1850s and continued to be made until approximately 1910 (Cote 1987:167-168). Seven flow blue sherds were recovered, consisting of three rims (two of which are illustrated in Figure 30.1) and four body sherds. Two of the rims and two of the body sherds mend. The decoration exhibits a floral pattern with annular bands on the interior and exterior of the rims. The shape of the sherds is compatible with bowl forms and this inference is further bolstered by the decoration on both interior and exterior. Measurement of the rims indicate 12-cm-diameter (4.75-in) vessels.

The two blue decorated sherds include one rim and one body sherd. Very little of the design is present to determine the decoration. The rim sherd indicates that this is a bowl form; the body sherd may also be a bowl form. A measurement of the rim sherd indicates an approximate diameter of 12 cm (4.7 in). Blue decorated whitewares span almost the entire period that whitewares have been made, therefore little more can be said about the date of these particular sherds.

One rim sherd of relief-molded whiteware was recovered from the site. Generally relief-molded whitewares were made from around the 1860s into the 1900s but the peak of their popularity ranged from after the Civil War to 1900. Unfortunately this sherd is too small to determine the vessel form.

Five undecorated whiteware sherds were recovered, consisting of one rim and four body sherds. Unfortunately the sherds are too small, fragmentary, or exfoliated to do any constructive analysis. One may represent a bowl fragment. Eighty-one fragments of glass were recovered from 22 locations at site NM-Q-27-13. They consist of 73 amethyst, 4 clear, 2 brown, and 2 white fragments (Table 30.1). Glass color can be an important temporal marker at archaeological sites. Glass was and is primarily used for product containers. To keep the product at a competitive price there was a keen desire to reduce the cost of the manufacturing the container. Totally machine-made bottle manufacturing replaced handblown-assisted manufacture around the beginning of the twentieth century allowing for cheap cost and high production rates. A clear container was often desired to allow the customer to view the contents. Different minerals were added to make glass clear. Glass, however, has a tendency to change color with time and exposure to sunlight. Beginning in the 1880s manganese was added to make glass clear. Exposure to sunlight over time causes glass with manganese to become amethyst colored. Kovel and Kovel (1981:93-94) indicate that experiments have been conducted to test how long it takes for glass to change color. They note

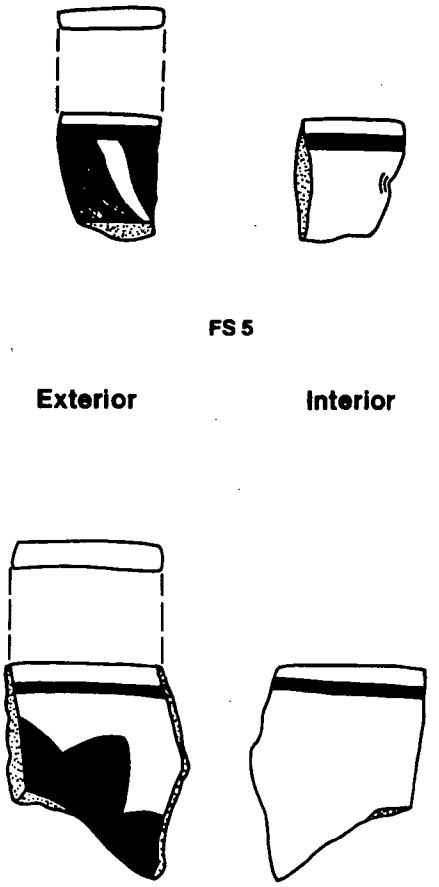


Figure 30.1. Flow Blue Whiteware Rim Sherds from Site NM-Q-27-13.

Table 30.1. Tabulation of Glass Artifacts from Site NM-Q-27-13.

FS#	Color	Quantity	Vessel Form	Vessel Part	Dimensions (cm)	Comments
1	Amethyst	11	Bottles	Body	-	All curved, 3 fire-crazed
	Amethyst	4	Bottles?	Body	-	All flat
	Amethyst	1	Bottle	Shoulder	-	-
	Amethyst	1	Bottle	Base	6.5 OD	Reversed "2" in center of base
3	Amethyst	1	Pitcher	Rim	8 OD	May represent a constricted-rim vessel
4	Amethyst	2	Bottles?	Body	6.5 OD	2 curved
	Amethyst	1	Small pitcher	Body and lip	5.5 OD	Faceted body with portion of spout
	Amethyst	2	Drinking glass	Rim	5.5 OD	-
	Brown	1	Bottle	Body	ca. 7	-
5	Amethyst	4	Bottles?	Body	5.5, 7 and ?	4 curved
	Amethyst	1	Small pitcher	Body and lip	5.5	Faceted body, may mend with FS 4 above
	Brown	1	Unid.	Body	-	
	Clear	2	Unid.	Body	-	Has portion of seam
	Clear	1	Oval bottle	Base	ca. 5 X 10	1 has tiny bubbles "717" inside diamond maker's mark, 1-pt capacity
6	Amethyst	2	Bottles?	Body	-	2 curved
	Amethyst	1	Drinking glass	Body	6.5	Near rim, rouletted
	White	1	Button	Whole	1.15	4 hole,18 lines (7/16"), shirt (?) button
7	Amethyst	2	Bottles?	Body	-	1 flat, 1 curved
8	Amethyst	2	Bottles	Body	5.5 OD and ?	1 flat, 1 curved
	Amethyst	1	Bottle	Foot and side	-	Oval shaped
9	Amethyst	1	Bottle	Body	ca. 6.5 OD	Curved
10	Amethyst	2	Bottle	Body	-	2 curved
	Amethyst	1	Bottle	Neck and lip	ca. 2.5 ID	From shoulder to lip is 2.5 cm, threaded lip
11	Amethyst	4	Bottle	Body	1-5.5 OD	4 curved
	Amethyst	4	Drinking glass	Rim	6.5 OD	Rouletted below rim
	Amethyst	2	Bottle	Neck and lip	2.5 ID	From shoulder to lip is 2.5 cm, threaded lip
17	Amethyst	1	Bottle	Shoulder?	-	At turn from shoulder to neck
21	Amethyst	1	Unid.	Body	5.5 ID	Hexagonal ext., round int., pressed glass ext. with bird motif, carnival type glass
22	Amethyst	1	Bottle	Body	7.5 OD	Curved, mold seam
	White	1	Jar	Foot and side	4.5 OD	"...TU..." on base (MENTHOLATUM 1903)
23	Amethyst	5	Bottles	Body	1-6 OD	1 has mold seam; 1 flat, 4 curved
	Amethyst	2	Bottles	Base	-	1 is oval with "I" inside diamond
	Amethyst	1	Pitcher?	Body w/ handle	-	maker's mark ca. 1916-1929, 1-pt capacity? Carnival type glass, floral design
24	Amethyst	1	Bottle	Body	7.5 OD	Curved

(continued)

Table 30.1. Continued.

FS#	Color	Quantity	Vessel Form	Vessel Part	Dimensions (cm)	Comments
26	Amethyst	1	Bottle?	Base	5.5 OD	
	Amethyst	1	Unid.	Body	?	Flat
27	Amethyst	1	Bottle	Shoulder	?	At shoulder/neck juncture, partial mold seam
28	Amethyst	5	Drinking glass	Rim	6.5	Rouletted below rim, 2 mends
30	Clear	1	Bottle	Body	?	Embossed lettering "WINE", curved
32	Amethyst	1	Bottle	Body	?	Curved
34	Amethyst	1	Bottle	Neck and lip	2 ID	Wine or brandy finish with automatic bottle machine molding (1903→)
53	Amethyst	1	Bottle	Neck?	4 OD	Curved

Key: OD = outside diameter
ID = inside diameter
Unid. = unidentifiable
int. = interior
ext. = exterior

an experiment conducted in 1881 indicating that 10 years of exposure to the sun would color any glass; this probably seemed acceptable to the manufacturers. With the advent of World War I, supplies of manganese were cut off from Germany or diverted to arms manufacture. As a result, selenium was substituted and glass manufactured from between 1915 and 1930 on archaeological sites tends to have a light amber color (Kovel and Kovel 1981:94).

Amethyst glass is typically dated from 1880 to ca. 1915, although the end date is variable depending on the reference. G. Kendrick (1967:57) indicates an end date of 1914, Rock (1981:16) indicates an end date of 1916, Ward et al. (1977:240) indicate 1917 as an end date, and Newman (1970:74) indicates a date of 1925. In general it is agreed that the end date was a result of an interruption of manganese from Germany during World War I and the subsequent search for other ingredients to manufacture clear glass.

Truly clear (flint) glass dates from approximately 1929 to the present. Brown glass came into use approximately 1873. Brown or amber glass was used in beer bottles to help keep light from spoiling the contents. It is still widely used today. The 1870s and 1880s was a period when pasteurization was perfected permitting the bottling of beer. Manufacture of white glass began after 1900 (Kovel and Kovel 1981:94).

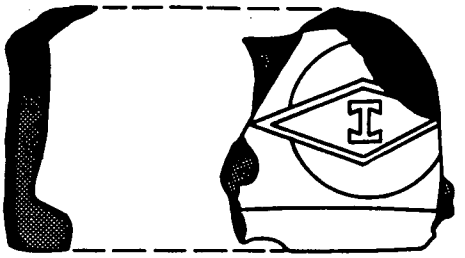
Seventy-three amethyst glass fragments were recovered. Identified vessel forms include bottles, drinking glasses, and small pitcher(s). The bottle fragments make up the majority of fragments in the assemblage (n=54). Most of the assemblage consisted of nondiagnostic body parts; however, a small quantity of bases (n=4), necks (n=3), rims (n=12), and lips (n=4) were identified. It was assumed that most of the body fragments represented bottle fragments, based on apparent shape (a straight-sided cylinder with a reduction at the shoulder to form the neck) and the presence

of molding seams. Also included in the bottle category were flat pieces of glass of varying thickness. Panel or other sided, shaped bottles were common at the turn of the century. In the two instances where shape could not be determined, the vessel form was left as unidentifiable.

Bases and necks provide the most diagnostic information about when a glass vessel may have been manufactured. Bases often include a maker's mark or provide information on the manufacturing method. Within the amethyst glass assemblage, one maker's mark was present (Figure 30.2). The mark consisted of an "I" inside a diamond, which Toulouse (1971:264) identifies as a mark used by the Illinois Glass Company from 1916 to 1929. There is a slight difference though. Toulouse's "I" does not have the horizontal appendages at top and bottom (making it a capital I) as is seen on the example in the assemblage. This may be a variant of the same mark. The four other base fragments do not have maker's marks, but do exhibit mold seams consistent with automatic machine-made bottles, which date to post-1903 (Miller and Sullivan 1984:85). Four necks were present in the assemblage. Three exhibited identical profiles of short-necked, wide-mouthed jugs with a continuous thread finish (i.e., screw-on cap, one is illustrated in Figure 30.3). Lief (1965:27) indicates the standardization of continuous thread caps occurred in the early 1920s. Although they were not conjoining, they likely came from the same vessel. The fourth neck and finish (Figure 30.4) was what Fike (1987:8) describes as a standard wine or brandy finish which McKearin and Wilson (1978:206-207) shows dating as early as the 1850s. This particular neck, however, has a mold seam all the way to the lip indicating that it was manufactured with an automatic bottle-making machine, indicating a post-1903 date for this item. A 1909 price list for Robert J. Alther (1970:58) of San Francisco depicts the same style noting its use for wine or whiskey.

Twelve amethyst-colored glass fragments represent drinking glasses. These were identified either by their smooth rims or a smooth rim and a rouletted design just below the rim (Figure 30.5). At least two glasses were represented, one 6.5 cm (2.6 in) in diameter and the other 5.5 cm (2.2 in) in diameter. The latter was decorated with the rouletted rim. Two of these drinking glass fragments mend and are from the same provenience. As with the other amethyst-colored glass a manufacture date between the 1880s and 1915 is suggested. Unlike bottles, however, which would have been disposed of after use, these tableware items would have been "curated" for a much longer time and, as such, may have been carried from place to place and eventually disposed of at a date later than 1915.

Two amethyst-colored glass fragments are at least 5 mm (0.2 in) thick and have mold-made faceted sides imitating cut glass. The vessel is approximately 5.5 cm (2.2 in) in diameter with a flaring rim. It has an asymmetrical shape resembling a spout. The interior of the larger fragment curves inward indicating either a very shallow concavity or a constricted neck as might be seen on an ewer-type vessel. A third piece is from a thinner, 2-mm-thick (0.1-in-thick), smooth-edged vessel approximately 8 cm (3.1 in) in diameter. This fragment also has an asymmetrical shape resembling a spout. From the size of this vessel, it may have contained one quart or more. As with all the other amethyst-colored glass a manufacture date between the 1880s and 1915 is suggested. As noted above, these tableware items would have been "curated" for a much longer time and thus the manufacture date probably does not reflect their date of disposal.

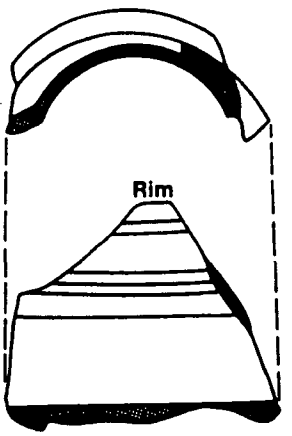


FS 23

Exterior

Actual Size

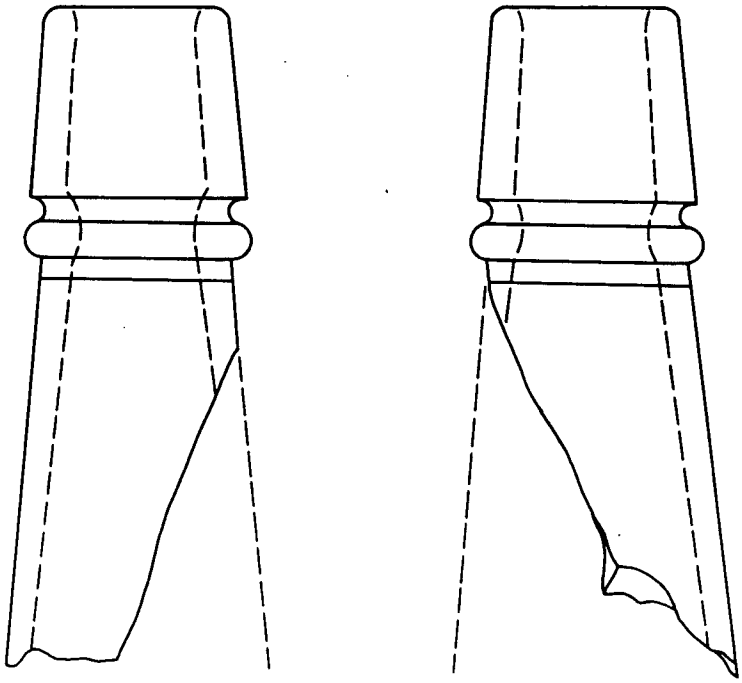
Figure 30.2. Amethyst-colored Bottle Base with Marker's Mark from Site NM-Q-27-13.



FS 11

Actual Size

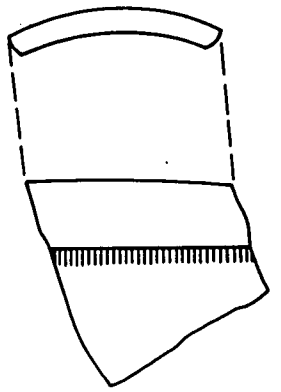
Figure 30.3. Amethyst-colored Bottle Lip with Screw-on Beaded Seal from Site NM-Q-27-13.



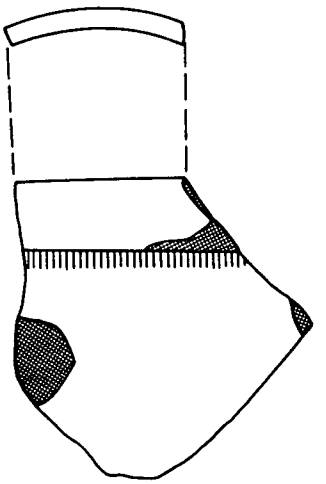
FS 34

Actual Size

Figure 30.4. Amethyst-colored Bottle Neck with Wine or Brandy Type Finish from Site NM-Q-27-13.



FS 11



FS 23

Exterior

Actual size

Figure 30.5. Amethyst-colored Drinking Glass Rims with Rouletted Decoration from Site NM-Q-27-13.

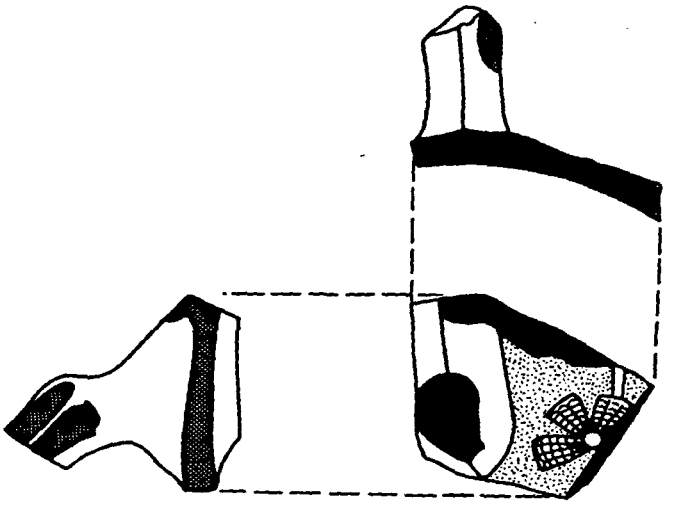
Two pieces of amethyst-colored glass exhibit molded decoration and an orangish iridescence. The iridescence is representative of what is known as "carnival glass." One fragment is a six sided or paneled vessel with the molded relief of a bird on one face (Figure 30.6). The second fragment has a floral motif and a portion of a handle, possibly for a pitcher (Figure 30.7). These two pieces have the same iridescence and thickness but it could not be determined if they are from the same vessel. Kovel and Kovel (1981:59) state that carnival glass "was a cheap pressed glass made by the carload to be given away at carnivals or sold in the five-and-ten-cent stores." They further indicate that it was made from approximately 1905 to 1930 at several locations in Ohio and West Virginia. As with the drinking glasses and other tablewares, the carnival glass items would have been more prized by the owners and kept in their possession for a longer time. These "special" items would not have been discarded until they broke, again allowing the inference that disposal occurred after the period of manufacture.

As was noted above, two white, two brown, and four clear glass fragments were recovered. The two white glass fragments are a four-hole button (Figure 30.8) and a foot fragment of a small jar. Fontana and Greenleaf (1962:98) note that four-hole glass buttons date from about the 1860s. The jar contains enough lettering on the base to identify it as a jar containing Mentholatum. This fragment, although small, appears to be the 1-oz size. Ward et al. (1977:240) indicate that the 1-oz jar (0.8 by 0.6 cm or 2 by 1.6 in) was manufactured around 1900 and continued to 1959.

The two brown glass fragments are quite small. One has a mold seam along one edge. Although they do not contain any particularly diagnostic characteristics, it is likely that they both represent fragments of beer bottles. From the weathering on the glass, they may date to the first half of the twentieth century.

The four clear fragments of glass consist of the base of an oval bottle with a maker's mark, (Figure 30.9) one body fragment with "WINE" in raised letters, (Figure 30.10) and two body fragments with no markings. The oval base maker's mark consists of a diamond with "717" inside. The maker's mark is contained within a round "slug", which obliterates the seam across the long axis of the base. Toulouse (1971:551) notes that the diamond shape has been used as a part of several trademark designs including the Diamond Glass Company, Dominion Glass Company, and the Illinois Glass Company among others. All have a long period of manufacture from the turn of the century to the present. The fact that all four of these pieces are clear and not amethyst-colored indicates that they date after 1929. On the side of the oval base is enough lettering to indicate that the bottle was a 1-pt container. The size and shape is typical of a liquor bottle and appears to postdate the majority of historic material at the site. The fragment with "WINE" is self-evident as to the contents and the lack of weathering is compatible with a relatively recent age, again postdating the primary historic occupation of the site.

Taken as a whole the historic artifact assemblage from site NM-Q-27-13 indicates an occupation during the first quarter of the twentieth century, and more specifically around the World War I period or immediately after. Unfortunately the ceramics do not aid in narrowing the occupational date range. The prevalence of amethyst glass identifies the period 1880 to circa 1915 to 1925. Bottle mold seams indicate manufacture after 1903 with the advent of the automatic bottle-manufacturing machinery. The presence of the Mentholatum jar fragment further supports a post-

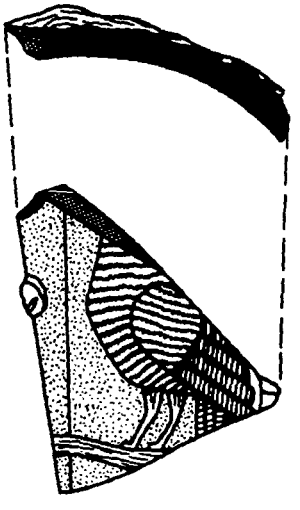


FS 23

Exterior

Actual Size

Figure 30.6. Carnival Glass Molded Bird Handle of Lid to Covered Dish from Site NM-Q-27-13.



FS 21

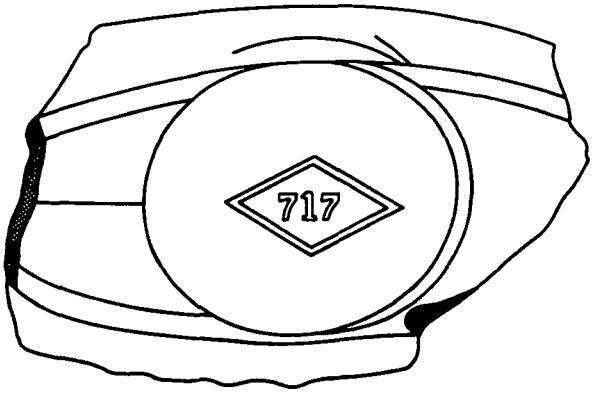
Actual Size

Figure 30.7. Carnival Glass Molded Floral Design from Site NM-Q-27-13.

FS 6

Actual Size

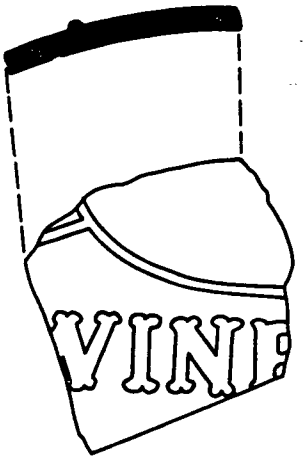
Figure 30.8. White Glass Four-hole Button from Site NM-Q-27-13.



FS 5

Actual Size

Figure 30.9. Clear Glass Bottle Base with Maker's Mark from Site NM-Q-27-13.



FS 30

Actual Size

Figure 30.10. Clear Glass Fragment with "WINE" Embossing from Site NM-Q-27-13.

1900 date. One bottle manufacturer's mark indicates a date between 1916 and 1929 and the carnival glass dates between 1905 and 1930. From the relatively small quantity of artifacts, a relatively short occupation is inferred, probably less than one year.

Site NM-Q-22-48

Two small pieces of clear glass were recovered from site NM-Q-22-48. One piece shows a lot of wear and the other looks relatively new. The second piece exhibits some molded stippled relief resembling that found on modern soda bottles. Because of the small size of the two fragments the vessel forms can only tentatively be identified as bottles based on a minimal amount of curve seen in the fragment. No manufacturer's marks or other distinguishing marks were seen on the fragments. Based on the lack of diagnostic attributes it can only be stated that these artifacts date after 1930 when the manufacture of clear glass was perfected. As noted above, the second fragment exhibited molded relief; from that attribute coupled with the lack of weathering it is suggested that the fragment is from a modern soda bottle and less than 20 years old. The presence of this artifact on an otherwise prehistoric site resulted from casual disposal, possibly by a person conducting sheepherding activities.

Site NM-Q-23-57

Over 208 historic Euro-American manufactured artifacts were recovered from site NM-Q-23-57. The historic artifacts included metal, glass, ceramics, plastic, rubber, and composite

items. A number of pieces of bone were recovered, which in general can be attributed to the historic assemblage. A small quantity of non-Euro-American manufactured artifacts, including ceramics, ground stone, and flaked stone were also recovered but are dealt with in Chapters 25 and 26. The analysis determined that some of these artifacts that would be typically classed as prehistoric were in fact used historically.

The uncertainty of the total quantity of artifacts stems from the fact that a group of artifacts was accidentally discarded. Fortunately descriptions and quantities of most of the artifacts were recorded since they came from a number of features. Generalizations about the functions and dates of those features will be based on that information. Discussion of the artifacts is included in the appropriate sections; however, none of these artifacts are included on the tables.

In processing and analysis, the artifacts were first sorted by material type and then by functional category. This analysis and description follows the same format. By material type the majority of the historic artifact assemblage was metal (81.7%) with small quantities of glass (15.9%), plastic (1.4%), rubber (0.5%), and composite (0.5%). Within the metal category (n=170), the majority of artifacts were cans. Within the glass category (n=33) virtually all the artifacts were bottle fragments.

Metal Artifacts

A total of 170 metal artifacts were recovered from site NM-Q-23-57. Analysis of the metal artifacts was divided into two groups: cans and other metal. Tin cans (n=125) constitute the primary category of metal artifacts. Within the can group, the vast majority consist of food containers. The other metal category (n=45) is dominated by fragments of wire with lesser quantities of bullet cartridges, cookware, fasteners, and other single items.

Cans. A total of 125 cans or can fragments were recovered from site NM-Q-23-57. Tin cans (actually tin-plated steel) can be very useful in analyzing historic sites by helping to provide nutritional, functional, and temporal data. Can manufacturing methods often provide date ranges to help date a site. Additionally, measurements of certain types of cans can also provide useful date ranges. Since labels rarely survive, can dimensions, form, and opening method provide reliable methods for determining can contents. Unfortunately, most of the cans from this site have been smashed flat or bent out of their original shape. Useable data, however, could still be extracted from these cans as is shown in Table 30.2.

The cans recovered from site NM-Q-23-57 were divided into several categories; solid foodstuffs, food preparation comestibles, beverage, tobacco, automotive, paint, and unknown as on Table 30.3 The solid foodstuffs category consists of solid or semisolid foods, such as fruits and vegetables. These comprise 44.3% of the identifiable cans. Tables 30.2 and 30.3 reflect the number of pieces of cans recovered, while percentage figures in the text reflect the portions of reconstructable cans in the assemblage. In general these cans are identifiable by their size, width-to-height proportion, and opening method. They are generally cylindrical and taller than they are wide. Their method of opening is the primary means to identify them. Because of the contents' reconstructable cans in the assemblage. In general these cans are identifiable by their size,

Table 30.2. Descriptions of Metal Cans from Site NM-Q-23-57.

FS	#	Can Type	Part	Edge Seam Type	Top/Bottom Seam Type	Opening Method	Diameter or L X W (in.)	Height (in.)	Contents	Embossed End Marks	Comments
7	1	Sanitary	Whole	Interior roll	-	Slip-on lid	2 ⅜	4¼	Baking powder	None	-
19	1	Sanitary	Mostly whole	Interior roll	Crimped	Bayonet	3¼	4 ½	Solid food	"2993 PSB"	-
	1	Sanitary	Mostly whole	Interior roll	Crimped	Bayonet	2 ⅞	4 3.4	Solid food	-	-
	1	Sanitary	Mostly whole	Interior roll	Crimped	Bayonet	2 ¾	4 ⅜	Solid food	"27"	-
	1	Sanitary	Body frag.	Interior roll	Crimped	Bayonet	?	4 ¾	Solid food	-	-
	1	Vent hole	Top and body	Interior roll	Machine solder	-	2 ⅞	4 ½	Solid food	-	-
	1	Snap seam	Whole	Interior roll	Machine solder	Single friction	3 ⅜	ca. 3 ¾	Solid food	-	-
20	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	3 1/4	4 ½	Solid food	"26" over "R"	Knife stabbed through body after flattening
	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	2 11/16	3	Chilies?	"16"	
	1	Sanitary	Upper ½	Interior roll	Crimped	Bayonet	ca. 2.¾	3¼+	Solid food	-	-
	1	Sanitary	Bottom ¼	Interior roll	Crimped	?	ca. 3	?	Solid food	Oval	-
	1	Sanitary	End rim	?	Crimped	?	2 ⅞	?	Unid.	-	-
	1	Sanitary	Upper ⅛	Interior roll	Crimped	Top cut off	2 ½	-	Solid food?	"27" "ESTAB 288.."	-
	1	Unid.	Lid	?	?	Bayonet	2 ¾	?	Solid food	"815"	-
	2	Snap seam	Bottom and body	Interior roll	Machine solder	Side strip?	2 X 2 ¾	2 ½+	Potted meat	"R ARGENTIN, INSPECTINADO, ESTAB 1912"	-
	1	Vent hole	Whole	Unid.	Machine solder	None apparent	2⅞	3¾	Solid food	-	-
	1	Vent hole	Top and body	Interior roll	Machine solder	?	?	4	Solid food?	-	-
	1	Vent hole?	Whole	Interior roll	Machine solder	Single friction	3	4	Solid food	-	-
21	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	3	4 ½	Solid food	-	-
	1	Vent hole	Whole	Interior roll	Machine solder	Puncture slit	2 15/16	3 15/16	Evap. milk	-	Simonis® type 19 (1930 to 1975)
	1	Vent hole	Top and body	Interior roll	Machine solder	Knife slit	2 7/16	?	Evap. milk?	-	poss. Simonis type 15 or 16 (1920 to 1948)
	1	Snap seam	Whole	Interior roll	Machine solder	Single friction	3	4	Solid food?	-	-
	1	Snap seam	Lid	?	Machine solder	?	2 ½		Evap. milk	-	-
23	1	Sanitary	½	Interior roll	Crimped	?	?	6 ⅞	Juice	-	Ribbed body
25	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	3.0	4 ½	Solid food	-	-
	2	Sanitary	Top, bottom	Interior roll	Crimped	Bayonet	3.0	ca. 4 ½	Solid food	-	Prob. 2 parts of same can
	1	Sanitary	Top	?	Crimped	Top cut off	2 9/16	?	Solid food	-	Top & seam removed
	I	Unid.	Lid	?	?	Bayonet	ca. 3.0	?	Unid.	Oval	-
	3	Sanitary	Bottom, sides	Interior roll	Crimped	?	2 ⅜X1 3/16	3.25	Spice?	-	-
26	1	Snap seam	Lid	?	Machine solder	?	3 ½	?	Solid food?	"CANCO" inside oval	
27	2	Sanitary	Whole	Interior roll	Crimped	Bayonet	3	4½	Solid food	"CANCO" inside oval	Ca. 1922-
	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	2¾	4	Solid food	"(8) 15"	-
	1	Sanitary	Whole	Interior roll	Crimped	Side strip	5⅛	2⅞	Coffee?	-	Key stub on base
	1	Sanitary	Lid	?	Crimped	?	ca. 2½	?	Solid food?	-	-
	1	Unid	Lid	?	?	Bayonet	3⅜+	?	Solid food?	" 4 27R" over" m1M9"	-
	1	Unid	Lid	?	?	Bayonet	3⅛+	?	Solid food?	"CANCO" in oval	Ca. 1922-
	3	Sanitary	Rim fragments	Interior roll	Crimped	?	?	?	Unid.	-	-
	3	Pail	Rim and body frag. bottom and body	Folded lap	N/A	Slip-on	?	4+	Lard?	-	Clinched ear for bail handle, top end cut off
	1	Unid		Interior roll	Machine solder	Knife stab	2 15/16	1⅞	Evap. milk?	-	1885 to 1985
28	3	Sanitary	Whole	Interior roll	Crimped	Bayonet	ca. 3⅜+	2¼	Tuna?	-	-

(continued)

Table 30.2. Continued.

FS	#	Can Type	Part	Edge Seam Type	Top/Bottom Seam Type	Opening Method	Diameter or L X W (in.)	Height (in.)	Contents	Embossed End Marks	Comments
29	1	Sanitary	Whole	Soldered flat lap	Crimped	Side strip	5⅛	6	Coffee	-	SCHILLING COFFEE faintly visible on can
30	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	2 7/16	2 7/16	Chiles?	-	Side strip opening not used
	2	Sanitary	Whole	Interior roll	Crimped	Side strip	2 7/16	2 7/16	Chiles?	"ESTAB" over "2-A"	-
	1	Snap seam	Whole	Interior roll	Machine solder	?	ca. 2⅛	4	Solid food?	-	-
	1	Slip-on	Lid	?	?	Slip-on lid	2¼	?	Baking powder	"TRUE HEIGHT CAN GUARANTEED, KC BAKING POWDER"	Ca. 1925 to 1950, knurled rim, two nail holes, one up, one down
31	2	Sanitary	Whole	Interior roll	Crimped	Bayonet	ca. 3¼	1 13/16	Tuna?	-	-
	1	Sanitary	Top ¾	Interior roll	Crimped	Bayonet	2⅛	4¼+	Solid food?	-	-
	1	Sanitary	Part rim and body	Interior roll	Crimped	Bayonet	?	3¼+	Unid.	-	-
	1	Vent hole	ca . ¾	Interior roll	Machine solder	Knife stab	2 15/16	3 ⅞	Evap. milk	-	Simonis type 19 (1930 to 1975)
	2	Vent hole	Lid and body	?	Machine solder	?	2 15/16	?	Evap. milk?	-	1885 to 1985
	2	Sanitary	Rim	?	Crimped	?	?	?	Unid.	-	-
	2	Unid.	Lid	?	?	Bayonet	2¼-2¾	?	Unid.	-	-
	1	Unid.	Lid frag.	?	Machine solder	?	?	?	Unid.	-	-
	1	Unid.	Body frag.	Interior roll	?	?	?	?	Unid.	-	-
32	1	Vent hole	Nearly whole	Interior roll	Machine solder	Stab	2 15/16	3⅞	Evap. milk?	-	Simonis type 19 (1930 to 1975)
33	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	2⅛	4½	Solid food	-	-
	1	Sanitary	¾ whole	Interior roll	Crimped	Bayonet	ca. 2½	4	Solid food	-	-
	1	Sanitary	⅛ body and rims	Interior roll	Crimped	Bayonet	ca. 2½	2 15/16	Chiles	-	-
	1	Unid.	Lid	?	?	Bayonet	2½+	?	Unid.	"380"	-
	1	Unid.	Lid	?	?	Friction	2¼	?	Cocoa?	-	-
38	1	Sanitary	Top and side seam	Interior roll	Crimped	Slip-on?	?	4¼	Lard?	-	-
42	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	2 15/16	4⅜	Solid food	Oval	-
	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	2 11/16	1 15/16	Chiles	-	-
	1	Sanitary	Nearly whole	Interior roll	Crimped	Bayonet	2½	3 15/16	Solid food	-	-
	1	Vent hole	Whole	Interior roll	Machine solder	Stab	2 15/16	3 15/16	Evap. milk	-	Simonis type 19 (1930 to 1975)
	1	Unid.	Lid	?	?	Bayonet	2⅝+	?	Solid food	-	-
	1	Unid.	Lid	?	?	Friction	ca. 2¼	?	Cocoa?	-	-
	1	Unid.	Lid	?	?	Slip-on	2 7/16	?	Baking powder	"TRUE HEIGHT GUARANTEED, KC BAKING POWDER"	Ca. 1925 to 1950, knurled edge, nail hole in middle
	1	Unid.	Body frag.	Interior roll	?	Poss. side strip	?	4+	Unid.	-	-
48	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	2 11/16	3	Solid food	-	-
	1	Sanitary	Top half?	Lap	Crimped	Bayonet	ca. 2¾	3+	Solid food	-	-
	1	Sanitary	Rim	?	Crimped	?	ca. 2⅛	?	Unid.	-	-
	1	Vent hole	Nearly whole	Interior roll	Machine solder	Stab	ca. 2 15/16	3 15/16	Evap. milk	-	Simonis type 19 (1930 to 1975)
	1	Unid.	Lid	?	?	Friction	4¾	?	Paint?	-	-
50	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	ca 2½	4	Solid food	-	-
50	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	ca 2½	4	Powder cleanser?	-	Lid for cardboard body, upper part flanged to take cardboard label
51	1	Unid.	Lid	?	?	Slip-on	2⅜	?	Baking powder	-	-

(continued)

Table 30.2. Continued.

FS	#	Can Type	Part	Edge Seam Type	Top/Bottom Seam Type	Opening Method	Diameter or L X W (in.)	Height (in.)	Contents	Embossed End Marks	Comments
52	2	Tall slip-on	All but lid	Folded lap	Crimped	Slip-on	2 7/16	4½	Baking powder?	-	Prob. mates with lid in FS 51
53	4	Sanitary	Whole	Interior roll	Crimped	Bayonet	2 11/16	4	Solid food	1-"815" one end and oval oppoosite end; 2-	-
	1	Sanitary	Whole	Interior roll	Crimped	Bayonet	3 3/16	4 ⅜	Solid food	"405""252A";1-"...15"	-
	1	Sanitary	Whole	Folded lap	Crimped	Sidestrip key ind	4¼	3⅜	Coffee?	"EST 108, 0155, PSV" "KEY ON BOTTOM", "LIFT UP KEY, DO NOT TWIST" "G41F"	-
	1	Sanitary	Top ⅛	Interior roll	Crimped	Poss. side strip	4¼	?	Unid.	-	-
	1	Unid.	Lid	?	?	Pressure seal	2 1/6	?	Cocoa?	-	-
	1	Unid.	⅛ lid	?	?	Pressure seal	ca. 2¾	?	Unid.	-	Purposely cut with knife or tinsnips
54	2	Sanitary	Lid and body	Interior roll	Crimped	Bayonet	2 11/16	4	Solid food	"518", oval on opposite end	The 2 pieces form a whole can
55	2	Sanitary	Whole	Interior roll	Crimped	Geared crank	4	4 ⅝	Solid food	"TYR5"	-
	1	Sanitary	Whole	Interior roll	Crimped	Puncture-and-pry and bayonet	4	5¼	Motor oil	"SAE 30" - -	Can was first opened by knife (puncture-and-pry) with secondary vent hole, then bayonet method and lid pulled back
56	1	Large slip-on	Lid	?	?	Slip-on	4⅛	?	Axle grease	"THE TEXAS COMPANY, PORT ARTHUR TEXAS U.S.A. TEXACO VEGA AXLE GREASE"	Texaco started in 1902
57	1	Slip on	Body and base	Folded lap	Crimped (bottom)	Slip-on	ca. 4¼	5	Lard	-	Clinched ear bail button
58	1	Vent hole	Whole	Interior roll	Machine solder	Knife puncture	2 15/16	3 15/16	Evap. milk	-	Simonis type (1930 to 1975)
61	1	Unid.	Body frag.	Interior roll	?	?	?	?	Unid.	-	-
	1	Unid.	Lid	?	?	Bayonet	2½+	?	Solid food	Oval	-
63	1	Tall oval hinged lid	Whole	Interior roll	Crimped (bottom)	Hinged lid	3 X ⅞	4½	Tobacco	-	2 hinge lid (ca. 1913 to 1960)
67	1	Side strip?	Lid and upper ⅛	Interior roll	Crimped and soldered?	Side strip key wind	3¼ X 2 7/16	?	Potted meat?	-	Can has a raised hole in cap-type seal in lid
74	5	Beer can	Whole	Straight soldered	Crimped	Church key	2 ⅝	4 13/16	Beer	-	One has "Budweiser" lithographed 1935-late 1950s seam type
	4	Unid.	Lid and body fragments	?	Crimped	Bayonet?	2⅝+	?	Solid food?	-	Four have secondary punctures in the body possibly from target shooting

Note: If a dimension has a + it represents the measureable extent. If ca. is used the can was probably flattened and the diameter was derived from the circumference.
*Simonis 1997

Key: Frag. = Fragment
Poss. = Possibly
N/A = not applicable
Evap. = Evaporated
L = length
Prob. = Probably
W = width

Table 30.3. Distribution of Cans or Can Fragments at Site NM-Q-23-57.

	Quantity by Location						
	SU 5**	SU 8***	SU 9		SU 10		
Contents	Feature 1	Feature 1	Feature 7	-	Feature 9	-	Total
Solid or semi-solid food*	-	-	4	9	38	-	51
Chiles	-	-	-	-	6	-	6
Potted meat	-	-	-	-	2	1	3
Evaporated milk	-	-	-	1	9	-	10
Juice	-	-	-	-	1	-	1
Spice	-	-	-	-	3	-	3
Coffee	-	-	-	1	2	-	3
Lard	-	1	-	1	3	-	5
Tuna	-	-	-	-	5	-	5
Baking powder	-	-	-	3	3	-	6
Cocoa	-	-	-	1	2	-	3
Beer	-	-	5	-	-	-	5
Tobacco	-	-	-	-	1	-	1
Paint	-	-	-	-	1	-	1
Motor oil	-	-	-	1	-	-	1
Axle grease	-	-	-	1	-	-	1
Unidentified	1	-	-	2	17	-	20
Totals	1	1	9	20	93	1	125

* Solid or semisolid foods are generally fruits or vegetables
** Recovered from 1-by-2-m unit in hogan (Feature 1)
*** Recovered from general hogan area (Feature 1)
Key: SU = Study Unit

width-to-height proportion, and opening method. They are generally cylindrical and taller than they are wide. Their method of opening is the primary means to identify them. Because of the contents' consistency, a large opening is required. Consequently bayonet, geared crank, or multiple knife puncture-and-pry-type openings are seen. Almost all of the fruit or vegetable cans from this assemblage were opened with a bayonet-type opener. A single example of a geared crank opening was seen in this group. Within this assemblage, few of the solid food cans were distinctive. Although a number of them had embossed manufacturer's marks, they likely refer to the size of the can, contents, or have some other obscure meaning. However, several had "CANCO" inside an oval (Figure 30.11), indicating they had been manufactured by the American Can Company. Rock (1987:105) indicates that the American Can Company adopted CANCO as its logo in 1912, but the word was not used on its products until circa 1922. Several others just had the oval, and the same manufacturer is suggested.

Also in the same solid food category are chiles (5.2%), potted meat (1.7%), and tuna (4.3%). These three types of cans are particularly distinctive by their shape. Chile cans are generally small and squat, and not more than 7.6 cm (3 in). wide or 5.1 cm (2 in) tall. Although a Vienna sausage can is a similar size it is generally a little taller. Some of the chile cans had embossed numbers or lettering, but their meaning could not be determined. One had "ESTAB" over "2-A". The former part resembles a lead-in to giving the year of establishment, but the latter dispels that. Potted meat is generally in rectangular cans with the standard size roughly 5.1 by 7.6 by 7.6 cm high (2 by 3 by

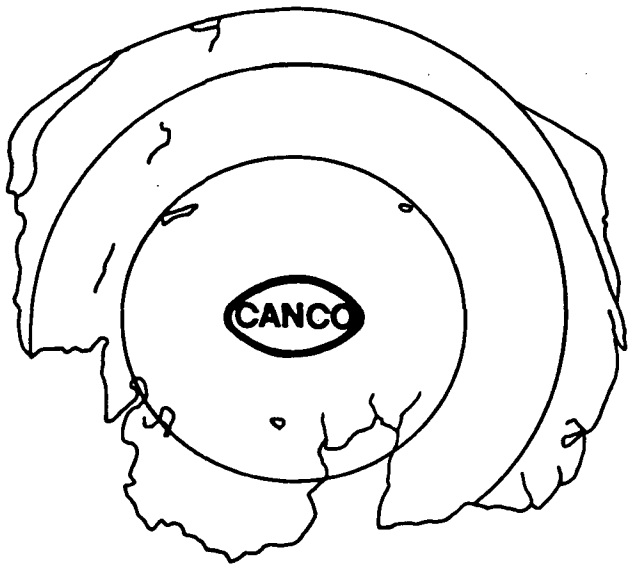


Figure 30.11. American Can Company Maker's Mark on Can Base from Feature 9 at Site NM-Q-23-57.

3 in). Only two canned meat cans were recovered. One had an embossed round seal noting "R.ARGENTIN, INSPECTINADO, M de A, ESTAB 1912" indicating that the meat had come from and been inspected in Argentina (Figure 30.12). Although the last part of the notation might mean that the company was established in 1912, the notation "ESTAB" on the chiles and other food cans, without an accompanying date, might indicate otherwise. Since these cans are rectangular the standard bayonet or geared crank opener will not work, therefore, these cans have a built-in scored side strip which pulls or winds off. Tuna cans are short and wide and opened with a bayonet or geared crank. One of the meat cans had an older type hole-in-cap seal in the lid with a side strip opening. This type of seal was used up into the 1930s.

Food preparation comestibles included baking powder (5.2%), lard (4.3%), and spice (2.6%) cans. Baking powder cans are often quite datable depending on the brand. Baking powder typically came in relatively tall narrow cans with a resealable slip-on lid. The lids are often embossed with the brand name and other information. A total of six baking powder cans or lids were recovered from this site. Two lids identifying "KC BAKING POWDER, TRUE HEIGHT CAN, GUARANTEED" are in the assemblage (Figure 30.13). This particular style dates between ca. 1925 and 1950 (Rock 1987:27). Both of these lids had round hole punctures. It could not be determined if this represents a casual puncture or secondary usage. Lard typically comes in a small bucket type can with a resealable slip-on lid and bail handle. Five fragments of lard buckets were recovered, including a bail handle and its attachment point. No lard bucket lids were recovered from this site. Spices typically come in small rectangular cans no more than 2.5 by 5.1 by 7.6 cm high (1 by 2 by

Actual Size

Figure 30.12. Meat Can with Argentine Stamp from Feature 9 at Site NM-Q-23-57

Actual Size

Figure 30.13. KC Baking Powder Slip-on Can Lid from Feature 9 at Site NM-Q-23-57

3 in). Their opening methods depend on the type of spice and whether it is to be shaken, spooned, poured out, or a combination thereof. Only one spice can in three pieces was recovered from this site. It could not be determined what the particular spice was in this container.

The beverage category includes evaporated milk (8.7%), coffee (2.6%), cocoa (2.6%), juice (0.9%), and beer (4.3%). Ten evaporated milk cans (one in two pieces) were recovered from this site. The chronology of evaporated milk cans has been well established by Simonis (1997) who uses their dimensions to 1/16 in, sealing method, and embossing to determine their date range. Six of the cans could be identified as Simonis' type 19 which dates from 1930 to 1975. Two of the cans crossed too many of the types and covered nearly the whole span that these cans have been in existence (1875 to present). One was identified as a type 15 or 16 can, dating between 1920 and 1948.

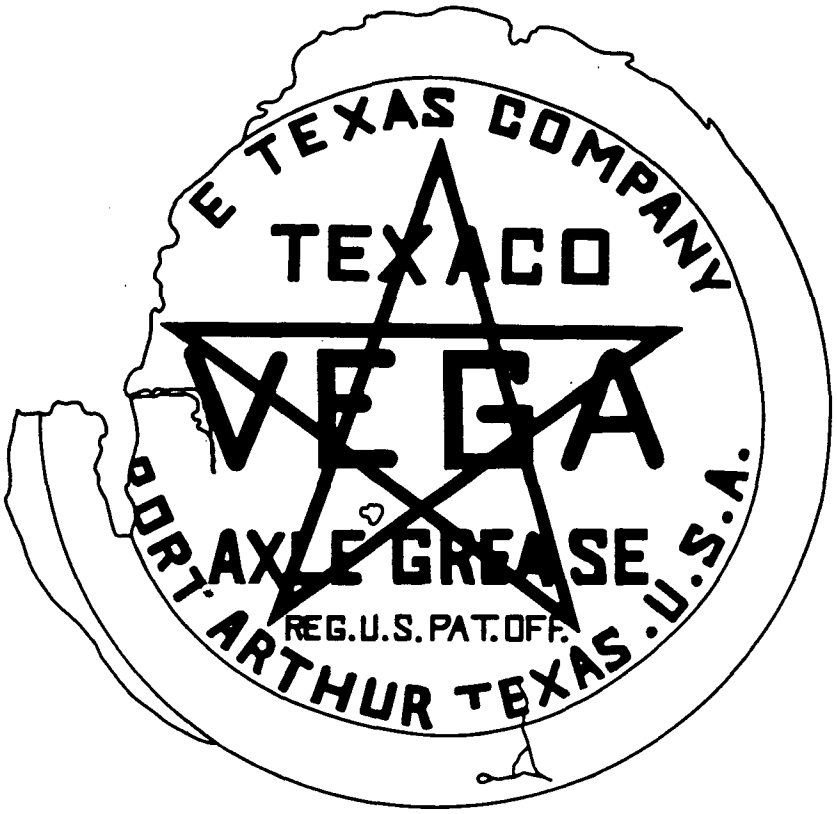
Three coffee cans without lids were recovered from this site. Coffee cans are typically large and often have two or more beads around the body. The method of opening is usually with a key-wound strip, with the key attached to the bottom of the can. When the key is detached for opening, a small stub of the end remains, helping to identify this opening method. All three of these cans exhibit this method of opening. One can still had faint traces of the lithographed label identifying it as Schilling brand coffee. Considering the condition of all the other cans at this site, the good condition of this can may result from a more recent disposal.

Three lids from probable cocoa tins were identified at this site. These lids are of the single friction type that is used for cocoa tins. One, small, single-serving juice can was recovered from the site.

Five beer cans were collected from a single provenience at this site. The cans were all identical in size, seal, and opening method. One retained faint traces of its lithographed label identifying it as Budweiser beer. All five of the cans exhibited a "church key"-type opening. The cans have a straight seam type which Martells (1976:44) dates from 1935 to the late 1950s. Four of the cans have round puncture holes with some exhibiting entry and exit holes on opposing sides. These cans are believed to have been secondarily utilized for target practice with a small caliber weapon, possibly .22 cal.

Only a single tobacco tin was recovered comprising 0.9% of the identifiable assemblage. Loose tobacco often was packaged in a flat oval tin with a hinged resealable top. The hinge style can provide a broad diagnostic marker. Using this diagnostic marker this tobacco tin dates from ca. 1913 to 1960 (Rock 1987:61).

The automotive category is represented by a 1-qt motor oil can and the lid to a can of axle grease. The oil can was identified by the oil weight marking embossed on the top, "SAE 30". Rock (1987:57) indicates that oil cans come into use ca. 1932-1936. The axle grease lid identifies it with "THE TEXAS COMPANY, PORT ARTHUR TEXAS, U.S.A." around the rim and in the center an open star overlying "TEXACO, VEGA, AXLE GREASE" (Figure 30.14). The Texas Company (Texaco) was founded in 1902 at Port Arthur, Texas. The star logo was in use no later than the mid-1910s. The company had provided its products with names taken from stars in the sky, hence the



Actual Size

Figure 30.14. Texaco Vega Axle Grease Can Lid from Study Unit 9 at Site NM-Q-23-57.

name Vega, a star in the constellation Lyra. This practice was apparently taken up even earlier than the star logo (James 1953:56). Unfortunately it could not be determined when Vega axle grease was first sold.

The final identifiable category is represented by a single resealable double friction lid. This is the standard closure for paint cans. From the size of the lid, it probably covered a 1-qt container. Rock (1987:70) indicates that this type of closure dates after 1906.

Other Metal. Of the 170 metal artifacts recovered 45 were other miscellaneous items (Table 30.4). These consisted of wire, bullet cartridges, cookware parts, fasteners, and other assorted items. Twenty-four fragments of wire were recovered. They range in length from 6.4 to 63.5 cm (2.5 to 25 in). Wire is measured in gauges with a smaller gauge being larger in diameter. Within this assemblage 19 fragments were 16 ga, 4 were 14 ga, and 1 was a 6 ga wire bail handle. Many of the pieces had their ends twisted together to join them in addition to being folded and twisted. From the manner in which their ends are twisted together, these are probably fragments of hay or straw baling wire. Although one piece was formed into a rough rectangle, it could not be determined if it had a secondary usage. The one piece of 6-ga wire has a shaped end indicating that it was a wire bail handle for a bucket as seen on modern 5-gal buckets.

Table 30.4. Descriptions of the Miscellaneous Metal Artifacts Collected from Site NM-Q-23-57.

Fea.	SU	FS#	Metal Type	Item	Quantity	Description	Comments
3	7	6	Iron	Unidentified	9	Small fragments of rusted metal	-
1	5	7	Iron	Wire	4	16 ga, various pieces twisted together, unknown length	Possible baling wire
9	10	19	Iron	Wire	1	16 ga, ca. 22"	-
			Iron	Nail	1	Corrugated type fastener	-
9	10	20	Iron	Wire	5	16 ga, 1-25", 2-9", 2-4" ends twisted together	-
9	10	22	Brass	Bullet cartridges	2	22 cal long, "Peters HV" and "◇" head stamps	"Peters HV" = Peters poss. ca. pre-1934 "◇" =Western ca. 1950s
9	10	26	Iron, brass, porcelain	Spark plug	1	Model C7A "MADE IN USA"	ca. 1932 to 1941
9	10	31	Iron	Coffee pot	1	White enameled metal coffee pot, handle broken off, top missing, approximately 1 quart	-
9	10	32	Iron	Wire	1	16 ga, ca. 11"	-
-	8	37	Iron	Wire	4	16 ga, 1-15", 1-18", 2-5" looped & twisted ends connected	Possible baling wire
1	8	38	Iron	Wire	1	16 ga, ca. 11"	-
9	10	42	Iron	Wire	1	16 ga, 15" , ends twisted together forming rough rectangle	-
9	10	62	Iron	Wheel	1	Small with central hole, 11/16" diam., 7/16" L, 4/16" ID	Possible caster or roller
			Brass	Bullet cartridge	1	.22 cal long, "C" head stamp	"C" =Cascade Cartridge Industries, ca. early 1960s
9	10	64	Iron	Wire	2	16 ga, 2-2½", one is looped and twisted, and the other twisted into first loop	-
			Steel?	Bottle cap	1	Crown cap	Post-1892
-	10	68	Steel?	Harmonica reed	1	3⅜" L X 1" W, 10 reeds	ca. post-1880
-	10	70	Iron	Handle	1	Cooking pot handle, 5" L	-
-	10	71	Brass	Bullet cartridges	2	.22 cal long, "HP" head stamp	"HP"=Federal Cartridge Co. ca. 1950s
-	10	72	Iron	Nail	1	Wire type, 3½" (16d)	-
-	10	73	Iron	Wire	4	14 ga, 2-24" ends twisted together and the whole twisted, 1-13" and 1-22" with ends twisted together	Possible baling wire
7	9	74	Iron	Wire handle	1	Wire bail handle, ca. 6ga, 14+"L, hooked on one end for attachment	-

Key: SU = Study Unit
Fea. = Feature
Quan. = Quantity
FS = Field Specimen
L = Long
W = Wide
ID = Inside diameter

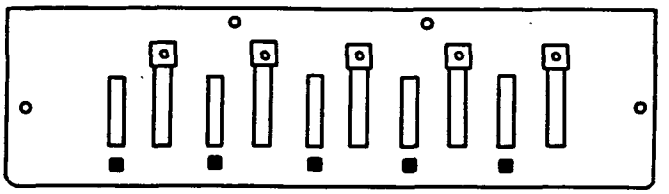
Five .22 cal bullet cartridges were recovered at site NM-Q-23-57. The size of the cartridge case indicates that these were all .22 cal Long or Long Rifle. Barnes (1997:380) notes that as early as 1871 the .22 Long was used as a pistol load but it was not until 1887 that the .22 Long Rifle was developed by the Stevens Arms and Tool Company (Herskovitz 1978:46). Unfortunately these two cartridges are virtually indistinguishable. Nevertheless, the cartridge maker's headstamp on the base of the casing is often quite temporally diagnostic. Four different headstamps were present on the cartridges from this site, they included "Peters HV", "◊", "C", and "HP". The "Peters HV" headstamp is a currently used headstamp of the Peters Cartridge Company indicating a modern cartridge. Barnes (1997:380) notes that Remington first introduced the high velocity .22 cartridge in 1930. The "◊" headstamp was used by the Western Cartridge Company. Morris and Kimball(1994:B-211) indicate that this headstamp was used from the 1950s. The "C" headstamp indicates Cascade Cartridge Industries and was probably used during the 1960s. "HP" is the headstamp of Federal Cartridge Company and was used from the 1950s to 1960s (Thomas Messerli personal communication 1997).

Two pieces of metal cookware were recovered. One was a white enamelware coffee pot of approximately 1-qt capacity and smashed flat. The handle was missing. The second was a handle to a cooking pot or frying pan. It did not have any enameling, however, it was very corroded and all the enamel may have spalled off. Enameled metal cookware dates to at least the 1870s (Franklin 1984) and continues to be made today.

Two fasteners were recovered from the site. These consist of one 16d wire nail and one corrugated nail. Manufacture of wire nails did not begin in the United States until 1875 and it was not until the late 1880s that their distribution became widespread. There is little corrosion, thus this nail may be much more recent, possibly post-1950. The corrugated nail is a specialized nail often used to hold the slats of a wooden packing crate together. Although still available, their use has decreased with the decrease in the use of wooden packing crates.

Twelve other assorted metal artifacts were recovered. These consist of nine small fragments of rusted metal, a small wheel or caster, a crown bottle cap, and a harmonica reed. The small wheel may be a part of a caster or roller. The crown cap was invented in 1889 and was patented in 1892 (Lief 1965:14) as a new type of closure for bottles, in particular those containing beer and soda. They continue to be used to the present and are relatively unchanged. One stylistic change came in 1955 with the replacement of cork liners with plastic. Unfortunately the type of liner could not be determined. The harmonica reed (Figure 30.15) did not have any diagnostic marks on it to help identify it. However, Hohner has been the dominant harmonica maker since Matthias Hohner invented them in 1857 (Chelminski 1995:124). By 1880 he was producing exclusively for the American market (Chelminski 1995:125). It is unlikely that this reed represents a harmonica that old and more likely dates to some time during the twentieth century.

One composite artifact is included in this category since it is mostly metal. The composite artifact is a Champion spark plug, model C-7A (Figure 30.16). This model dates from ca. 1932 to 1941, according to William H. Bond of Spark Plug Collections of America, Ann Arbor, Michigan (Bond, personal communication 1997). The beginning date is likely a response to the addition of lead to gasoline allowing a hotter burn and thus more power. Bond indicated that this was a widespread model that probably fit several dozen different vehicles.



Actual Size

Figure 30.15. Unidentified Harmonica Reed from Study Unit 10 at Site NM-Q-23-57

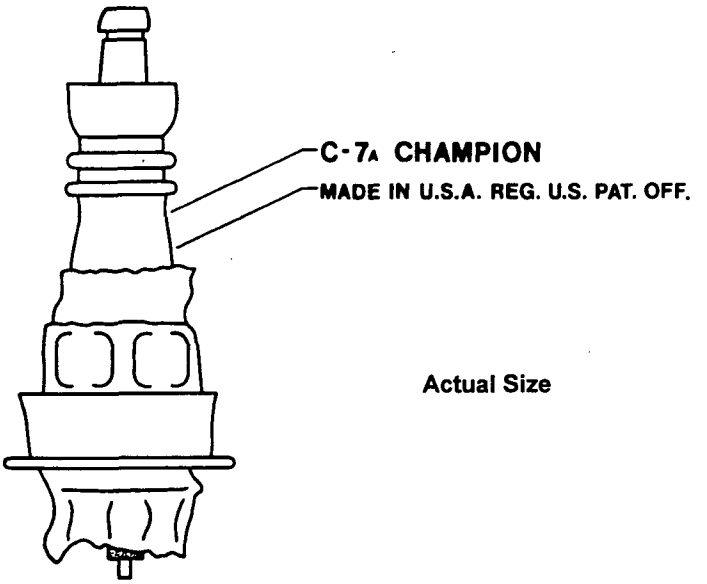


Figure 30.16. Champion Spark Plug from Feature 9 at Site NM-Q-23-57.

Glass Artifacts

A total of 35 glass artifacts were recovered from site NM-Q-23-57 from five proveniences (Table 30.5). Except for one tiny piece of amethyst-colored glass, all the other glass was clear. Twenty-four pieces represent fragments of a single small medicine bottle (Figure 30.17). These 24 pieces were all recovered from the hearth within Feature 1, a hogan. The bottle is marked with pharmaceutical symbol indicating that it is a 2-oz bottle. The base of the bottle has a maker's mark reading "ATLAS". The Atlas Glass Company was founded in 1896 and merged with the Hazel Glass Co. in 1901 to become the Hazel-Atlas Glass Company. The Atlas Glass Company closed in 1964 (Toulouse 1971:55-56). Toulouse indicates that the Atlas trademark was used for entire 68-year period.

Table 30.5. Descriptions of the Non-Metal Artifacts from Site NM-Q-23-57.

FS#	SU #	Feat.#	Material	Color	Quantity	Description	Comments
6	7	3	Glass	Clear	2	Bottle body fragments	-
			Glass	Amethyst	1	Bottle body fragment	Ca. 1880 to 1915
8	5	11	Glass	Clear	22	All fragments of one 2 oz medicine bottle. "ATLAS" makers mark on base	1896 to 1900
22	10	9	Plastic	Gray tinted	1	Sunglasses lens fragment	-
26	10	9	Plastic	Black	1	Screw-on bottle cap, with coat of arms on top with motto "THE SEAL OF PERFECTION"	Probably liquor bottle cap
42	10	9	Glass	Clear	2	Bottle body fragments	Post-1930
50	10	9	Glass	Clear	5	Fragments of oval-shaped bottle with vertical ribbing up edges, variable thickness	Probably liquor bottle
55	9	-	Plastic	Green	1	Small oval wheel with acrobat figure in center, 1¼" X 1⅛"	Possible Cracker Jack prize
69	10	-	Glass	Clear	1	Bottle base fragment	Post-1930
74	9	7	Rubber	Reddish	9	Possible shoe or boot fragments	-

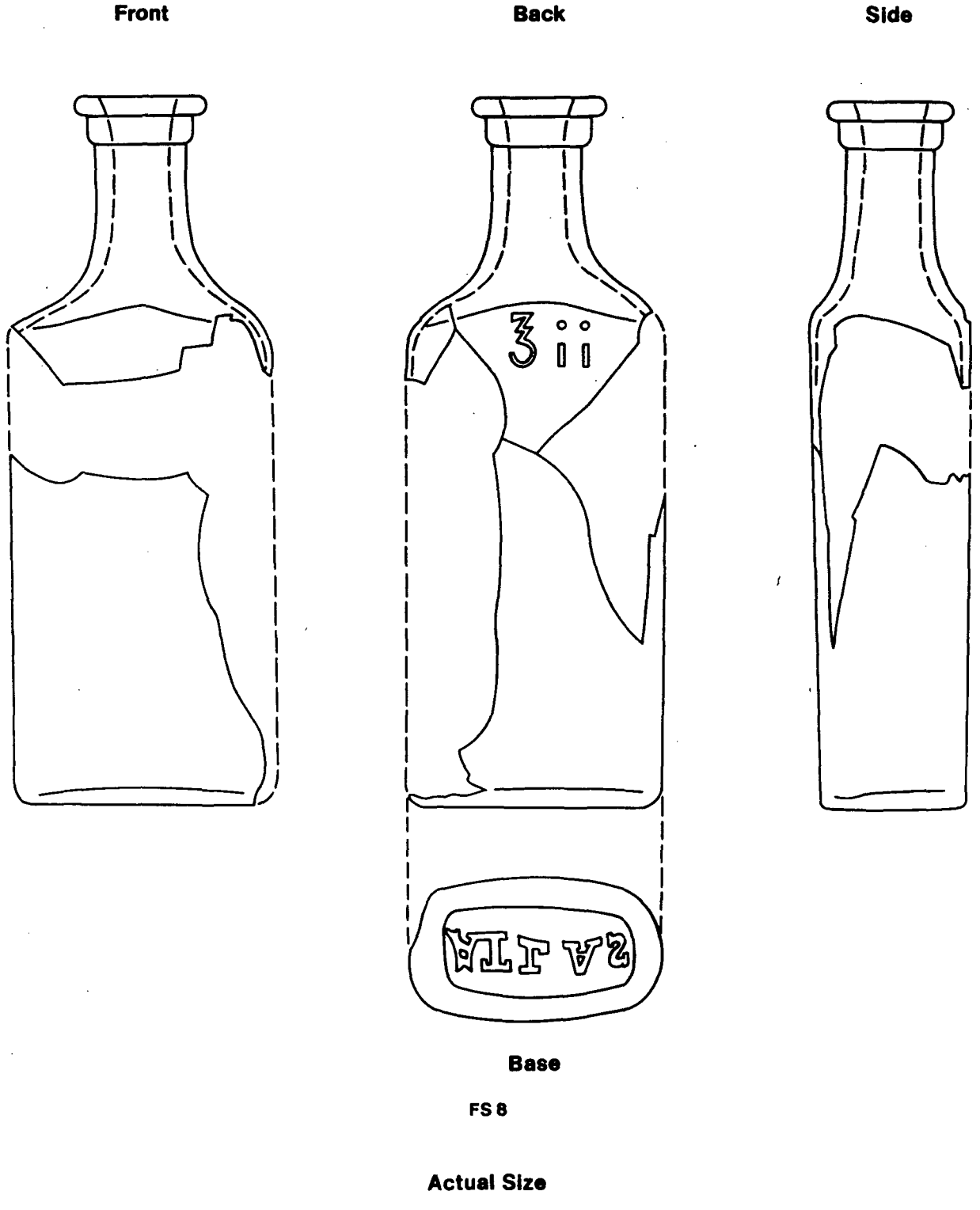


Figure 30.17. Clear Glass 2-oz Medicine Bottle from Hearth (Feature 11) at Site NM-Q-23-57.

However, from the swirls in the glass and the variable thickness, this medicine bottle probably dates to the first quarter of the twentieth century. Since this bottle was buried, it was not subjected to the purpling effects of solar exposure. Similarly two of the three pieces of glass from Feature 3, the ash dump associated with the hogan, exhibit swirling and variable thickness, thus they may be similar in age to the medicine bottle. The one amethyst-colored glass fragment from Feature 3 was likely exposed to sunlight and thus more realistically reflects the 1880 to 1915 date range.

The remaining eight fragments of glass were recovered from Study Unit (SU) 10, the southernmost portion of the site. Five fragments appear to come from the same vessel, an oval bottle with vertical ribbing up the sides. Three of the pieces mend. The bottle is probably a liquor bottle and may have held 1 qt or one fifth of liquid. The remaining three fragments do not have diagnostic features to precisely determine age or vessel shape although they probably were from bottles. All eight of these fragments date after 1930 when the process for producing clear glass was developed for mass production.

Plastic Artifacts

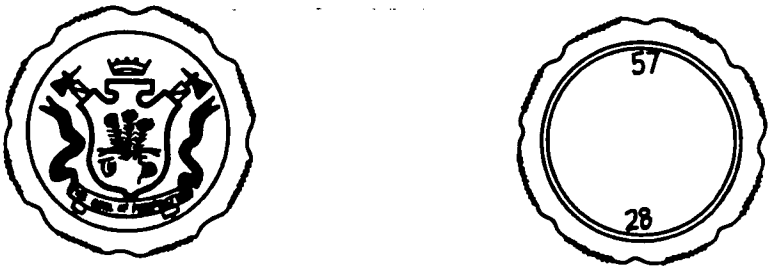
Although the development of plastic occurred before World War II, its use in mass-production consumer products did not occur until after the war. Three plastic items were recovered from site NM-Q-23-57 consisting of a screw-on bottle cap, a small toy, and a fragment of tinted eyeglasses lens (Table 30.5). The bottle cap has a coat of arms on top consisting of three feathers over the letters TD (in Old English script) in front of two *fasces* and surmounted with a crown (Figure 30.18). The motto "THE SEAL OF PERFECTION" is underneath. It is likely from a liquor bottle, but it could not be determined what brand or type of liquor. The toy is composed of Kelly green plastic and consists of a oval ring with an acrobat inside (Figure 30.19). The size and simplicity of the toy suggests it may have been one of the prizes inside a box of Cracker Jacks. The age of the eyeglass lens could not be determined but from its amber tinted color, it is relatively recent. As suggested above these plastic items likely date after World War II and may in fact be much more recent.

Rubber

At least nine fragments of brownish red rubber were recovered from Feature 7, a rock enclosure (Table 30.5). Although the pieces were fragmentary, their shape resembles parts of some footwear. From the thinness and color, the fragments may have been from the inner part of a shoe.

Ceramic Artifacts

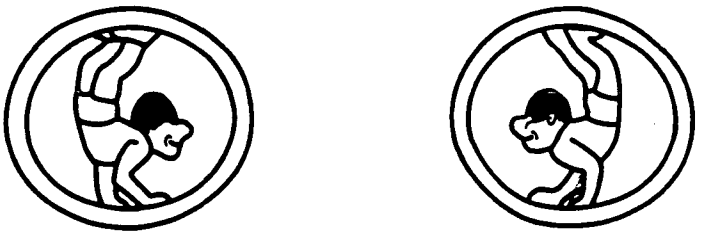
A small quantity of Euro-American ceramic artifacts were recovered or noted at site NM-Q-23-57. The ceramics were either recovered and subsequently lost or located outside the right-of-way. All the fragments represent tablewares. Approximately 12 sherds of one large whiteware soup bowl were noted near the bottom of the slope east of Feature 1. Another cluster of annular ring-decorated whiteware bowl sherds were recovered from Feature 4, immediately behind Feature 1. A third small assemblage of ironstone and whiteware was recovered from Feature 6, a small trash disposal area immediately east of Feature 5. These sherds appear to also represent bowl forms. Although at least two manufacturer's marks were noted they could not be identified.



FS 26

Actual Size

Figure 30.18. Black Plastic Screw-on Bottle Cap from Feature 9 at Site NM-Q-23-57.



FS 55

Actual Size

Figure 30.19. Green Plastic Toy from Study Unit 9 at Site NM-Q-23-57.

Summary

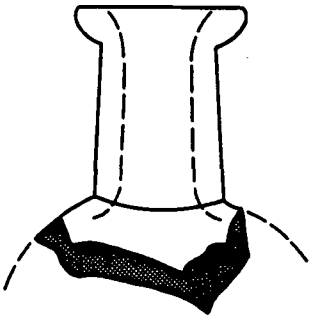
As noted above over 208 Euro-American artifacts were recovered from site NM-Q-23-57. Most of the 23 features at the site contained some quantity of artifacts. Different components of the site were represented by clusters of features, generally clustered around one of three hogans (Features 1, 2, and 5). The discussion of the artifacts will follow this format since it appears that the clusters represent different temporal occupations. The discussion will start with the apparently oldest feature and work forward in time. This also works from north to south across the site.

Artifacts from the Feature 2 cluster at the northern end of the site appear to represent the oldest occupation at site NM-Q-23-57. Although this cluster of features lies outside the right-of-way, the artifacts noted near or in association with it were recorded. In the hogan proper were two tin cans and

two pieces of probable baling wire. The associated ash dump (Feature 25) contained numerous fragments of burned bone and several pieces of flaked stone including one petrified wood uniface scraper. A silver electroplated iron teaspoon lay nearby. Several other artifacts were noted within 10 m of the hogan that may be associated. These include a fossilized shark tooth, a .22 cal shell with an "F" headstamp, a slip-on lid (baking powder), and a Cibola Gray Ware sherd. Determination of the relationship of the cans and baling wire to the hogan was limited by the level of investigation. Excavations in the hogan might be able to determine if other similar material is directly associated with the occupation of the hogan. From the relative paucity of Euro-American artifacts at this component, a tentative occupation date of the late nineteenth century is suggested.

Artifacts from the Feature 1 cluster appear to represent the next youngest component of site NM-Q-23-57. The cluster of eight features straddles the eastern right-of-way boundary. Within the hogan (Feature 1) two tin cans and several pieces of probable baling wire were noted on the surface. Two pieces of ground stone were recovered outside the hogan. The hearth inside the hogan (Feature 11) yielded 22 fragments of a small clear medicine bottle. The ash dump to the northeast (Feature 3) yielded burned bone and amethyst-colored glass. Two .22-cal shells with "U" and "◊" headstamps lay nearby. The former which lay outside the right-of-way refers to Union Metallic Cartridge, which was acquired by Remington Arms Company in 1911 (Barnes 1997:416). The latter is a headstamp for Western Cartridge Company, used since the 1950s (Morris and Kimball 1994:B-211). Feature 4, a small-low density artifact scatter, contained approximately a dozen fragments of an annularly decorated single-serving bowl, a metal clothing button, and several fragments of milled wood with 6d wire box end nails. All of these artifacts were lost from the assemblage. Historic whiteware ceramics have an extremely long period of use from the first half of the nineteenth century to the present. Without a maker's mark, narrowing this date range is extremely difficult. The metal button may have been for a pair of jeans. The button did not have any diagnostic lettering on it. These clothing fasteners also have a long period of use from the mid-nineteenth century to the present. The milled wood was 6.7 cm wide and 1.1 cm thick (2.6 by 0.4 in). Several 6d box head wire nails were driven into the edge, and it is believed that this lumber was the remains of a wooden crate. Wire nails date from the 1880s to the present. Feature 16, a second ash dump outside the right-of-way, contained burned bone, an enamelware pan handle, an amethyst colored bottle neck (Figure 30.20), and a chert flake. Downslope from this feature and also outside the right-of-way were approximately a dozen fragments of a large fluted whiteware soup bowl and a small handmade sifter, possibly for pinyon nut gathering. Located around the cluster of features was an enamelware pan, several tin cans, and more burned bone. These artifacts, primarily the amethyst glass, are compatible with a turn of the twentieth century occupation, with the early twentieth century more likely. The enamelware cooking pan had an approximate 2-qt capacity. Although it lies approximately 15 m away it is probably associated with the occupation of the hogan. Enameled metal cookware dates from the post-Civil War period to the present.

Artifacts from the Feature 5 cluster appear to represent the next occupation. The only artifact recovered from the hogan (Feature 5) was both halves of a twist key-levered-opening shoe polish container. Corrosion has eliminated the lithographed label. Shoe polish has been packaged in low cylindrical cans with slip-on lids since at least 1865. A number of them were recovered from the Steamboat *Bertrand* which sank in the Missouri River at Portage LaForce, Nebraska Territory, on April 1, 1865 (Rock 1987:76). Although the brand could not be established, Kiwi brand shoe polish is one of the largest shoe polish manufacturers in the world and uses a twist key-levered opening like the one



Actual Size

Figure 30.20. Amethyst-colored Bottle Neck from Feature 16 at Site NM-Q-23-57.

found at this site. Bram (1966:n.p.) indicates that by 1924 Kiwi was being distributed in 50 countries; although he does not specify the United States, it is likely to be one of them.

The ash dump to the east (Feature 6) contained clear glass, sanitary seal tin cans, plain whiteware and ironstone ceramics, and burned bone. Most of the glass appears to be bottle forms. The ceramics do not have any maker's marks. The cans are all solid or semisolid food cans. Nearby Features 14 and 15 did not contain any artifacts. A variety of sanitary seal food cans were noted north of the hogan. At a greater distance to the east of the hogan other cans including food, evaporated milk, coffee, lard, baking powder, cocoa, oil, and an axle grease lid were noted. Unfortunately because of the widely scattered nature of the cans, it could not be determined if they were associated with the hogan or represented random disposal. The artifacts indicate a post-World War I deposition and more likely a post-1930 occupation of the hogan.

Study Unit (SU) 10 is the area south of a seasonal drainage that includes Feature 9, a widespread artifact scatter that had no distinct architecture or subsurface deposits, and a number of other smaller features. SU 10 likely represents the most recent occupation of NM-Q-23-57. Artifacts from SU 10 constituted the bulk of artifacts from the site. The majority of those artifacts consisted of tin cans. Cans from the SU 10 area constitute 75% of all the cans recovered from the site and as such contain the greatest variety of types. These include solid or semisolid foods, chiles, potted meat, evaporated milk, juice, spices, coffee, lard, tuna, baking powder, cocoa, tobacco, and paint. Several other miscellaneous metal items are present in the assemblage including five .22 caliber shells, a spark plug, a coffee pot, a harmonica reed, a bottle cap, and various pieces of probable baling wire. Three pieces of plastic were noted including a fragment of sunglass lens, a screw-on bottle cap, and a possible Cracker Jack prize. A small quantity of clear glass was recovered from this area and likely represents bottle forms. A molded glass bead and a small scrap of sheet brass were located beyond the southeast extreme of Feature 9. At least three, and possibly as many as seven, hearths are associated with the artifact scatter. The SU 10 artifact scatter may represent repeated visits to the site from pre-World War II to the 1960s or even later, but generally centers on the 1950s.

Site NM-Q-23-58

Eleven pieces of glass and one ceramic sherd were recovered from site NM-Q-23-58. The glass consists of one clear, two amethyst and eight light green pieces. The clear glass is an intact small bottle (Figure 30.21). The bottle style is that for liquid medicine. The bottle has redundant measurement markings including 1 oz, 8 drams and 20 cc. In two different locations a script "Duraglas" mark identifies the maker. Toulouse (1971:170) indicates this manufacturer's mark has been in use from 1940 to the present. The two amethyst-colored glass fragments represent two conjoining rim fragments of a drinking glass. No maker's marks or other diagnostic attributes are present to identify a date or place of manufacture. However, the amethyst color indicates that it was manufactured between 1880 and circa 1915 when manganese was used to produce clear glass. The eight fragments of light green glass are from an electrical insulator of which several pieces are conjoinable (Figure 30.22). It is likely that all eight pieces are from the same insulator. Two fragments contain lettering indicating a patent date of 1893. A small quantity of bubbles were noted in the glass body. Abbink (1987:143) cites Kendrick (1967:63) concerning the presence of bubbles in glass, noting that they generally do not occur after 1920.

The one ceramic sherd is an undecorated whiteware fragment. A measurement of the curve of the sherd indicates a 4-cm (1.6-in) diameter. From the shape of the sherd and its small diameter, an upright container form is suggested. Whitewares were typically used for dinnerwares; this sherd seems too small for a cup, therefore it may have been used for serving condiments. Unfortunately historic whitewares have an extensive period of use from the 1830s to the present, so without any other diagnostic attributes such as decoration or maker's marks a more precise dating of this piece is impossible.

The assemblage of historic artifacts from site NM-Q-22-58 is functionally broad for its small size since it includes medicinal, dinnerware, and electrical uses. The small medicine bottle clearly postdates all the other artifacts. While the other items may be contemporaneous, the obvious disparity in their functions precludes their being associated. No old utility pole (or stump) was noted in the site vicinity which would provide a possible source of the insulator. However, the absence of a pole is not surprising as they are often reutilized after their primary function. Furthermore, the fragments of the insulator did not show any evidence of flaking for secondary use as a blade or scraper. The drinking glass and ceramic vessel may be related archaeologically. Unfortunately, the periods of their overlap is so broad that unless found in direct contextual association this can only be conjecture. The amethyst-colored drinking glass provides the narrowest date range of between 1880 to 1915. Unfortunately, for the archaeologist, the use-life of such items as drinking glasses can often be quite long, extending well beyond when the item was last manufactured. Nevertheless we can be sure that the deposition of the drinking glass fragments did not occur prior to the 1880s. Likewise the insulator has a *terminus post quem* of 1893, having been used no earlier than the patent date on it.

Site NM-Q-23-59

Three amethyst glass fragments were recovered from site NM-Q-23-59. The fragments are all conjoinable representing a portion of the body of a round container, probably a bottle. The diameter of the bottle is 6 cm (2.3 in). There were no distinguishing or maker's marks to indicate date or place

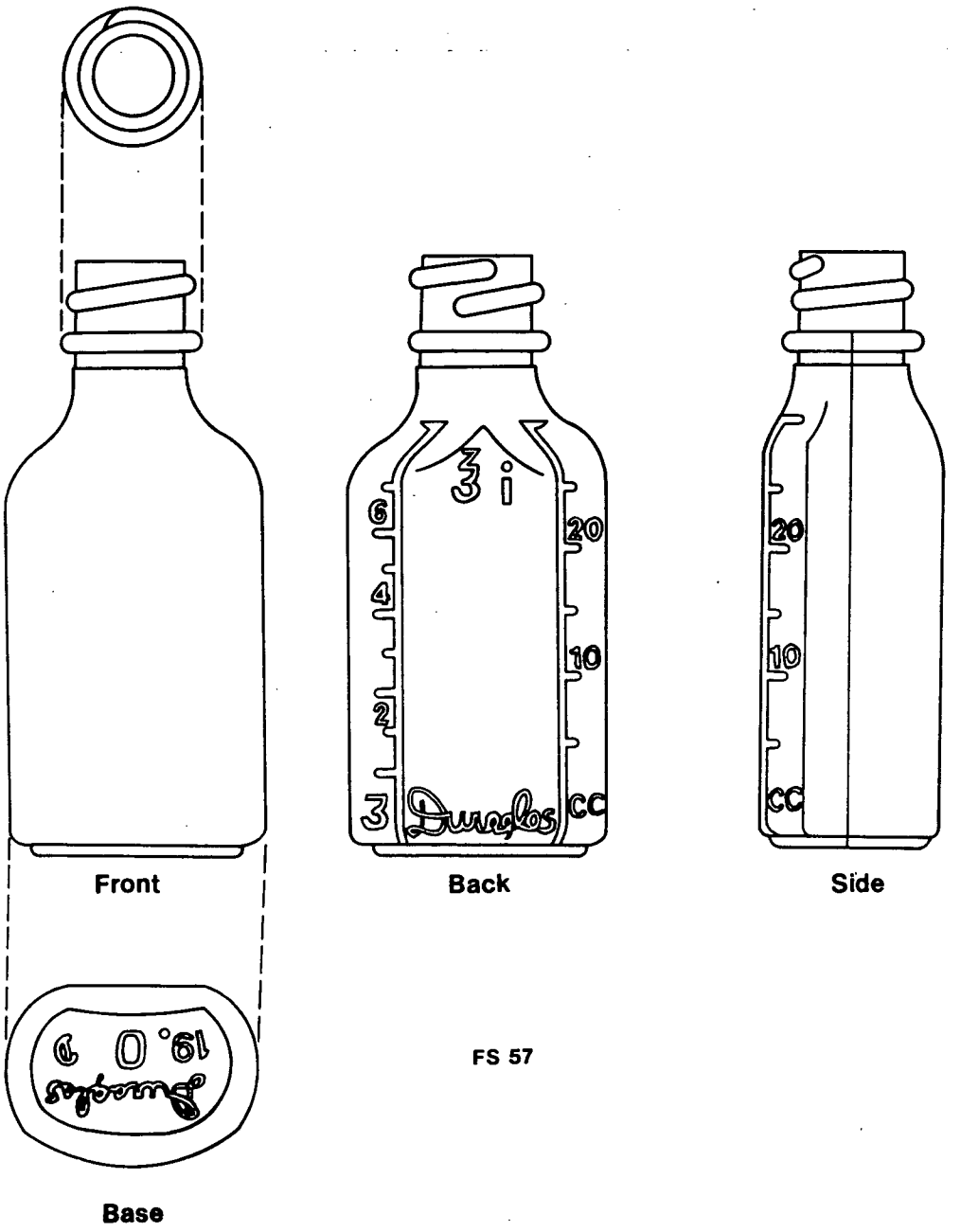
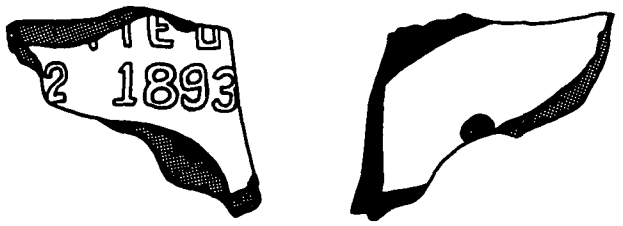


Figure 30.21. Intact Clear Glass 1-oz Medicine Bottle from Site NM-Q-23-58.



FS 35

Actual Size

Figure 30.22. Green Glass Insulator Fragment with Patent Date from Site NM-Q-23-58.

of manufacture or contents. The amethyst color does provide a date range of 1880 to ca. 1915. The presence of this artifact on an otherwise prehistoric site may result from casual disposal possibly by some person conducting sheepherding activities.

Site NM-Q-23-60

A soda green bottle neck and neck finish was recovered from site NM-Q-23-60 (Figure 30.23). The fragment is 44 mm (1.8 in) long with an exterior diameter of 21 mm (0.8 in) and an interior diameter of 12 mm (0.5 in). The neck finish is a flat or patent type finish (Filk 1987:8). This type of neck was primarily used for patent medicines. Herskovitz depicts an entire bottle with this type of neck and describes it as a ball neck panel bottle (Herskovitz 1978:4). He later depicts neck types and describes this type as patent/extract (Herskovitz 1978:5). This type of neck was in popular use from the late nineteenth century to the early twentieth century. The 1909 Robert J. Alther glassware price list depicts and describes ball neck bottles as used for patent medicines, sewing machine oil, tooth wash, and cream (Alther 1970: 29, 47-48). The presence of this artifact on an otherwise prehistoric site probably results from casual disposal possibly by some person conducting sheepherding activities.

SUMMARY

Test excavations at sites along N11(1&2) resulted in the recovery of 321 historic artifacts from six sites (NM-Q-27-13, NM-Q-22-48, NM-Q-23-57, NM-Q-23-58, NM-Q-23-59, and NM-Q-23-60). As was noted above, the assemblage from site NM-Q-23-57 composed 64% of the historic artifact assemblage. Although two other sites (NM-Q-23-60 and NM-Q-23-58) contained

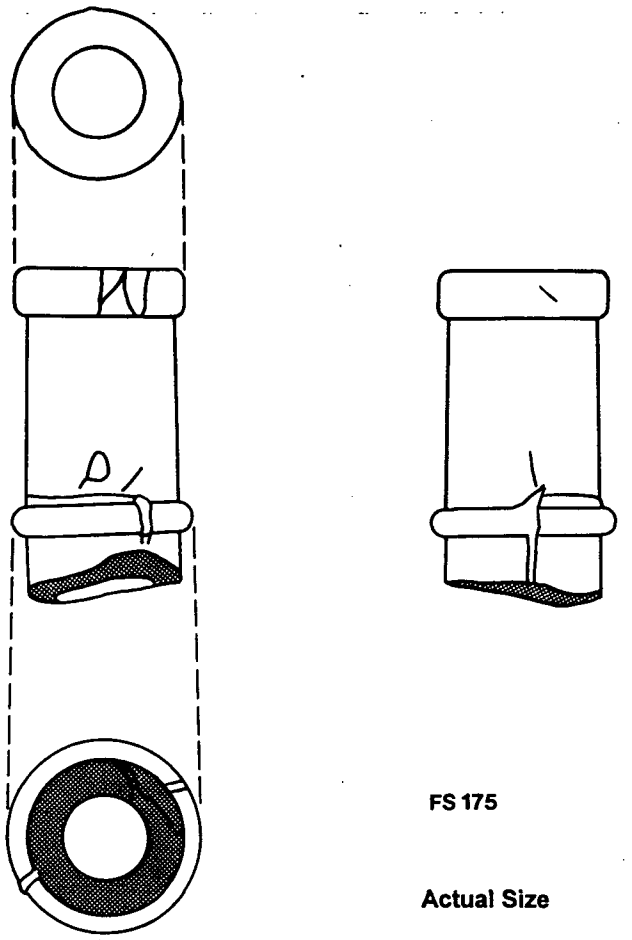


Figure 30.23. Soda Green Patent Medicine Bottle Neck and Neck Finish from Site NM-Q-23-60.

historic components, they were located outside the right-of-way and thus were not subject to investigation and collection. Some of the sites contained only a few historic artifacts and represent a limited presence on the site (such as at sites NM-Q-22-48 and NM-Q-23-59).

Manufacturing dates for the artifacts ranged from the early nineteenth century to the second half of the twentieth century; however, they generally concentrated between the late nineteenth century through the first half of the twentieth century. Material types included glass (mostly bottles), ceramics (mostly tablewares), metal (mostly cans), plastic, and rubber, as well as some composite items. A range of artifact classes were identified. Subsistence items (food and beverage cans and bottles) dominate the assemblage, with lesser amounts of food preparation and storage (ceramic and glass kitchen- and tablewares), medicinal (medicine bottles), arms (bullet cartridges), automotive (a spark plug, axle grease can and oil can), indulgences (a tobacco tin, beer cans), and miscellaneous. It can be confidently stated that subsistence items represent the most frequent purchases made by Navajos in the area.

A variety of food and beverage containers were recovered including unidentified canned fruits and vegetables, chiles, potted meat, evaporated milk, juice, spice, coffee, lard, tuna, baking powder, and cocoa. Obviously the advantage of canned foods is the ability to store the food without refrigeration until needed. A drawback in a low cash flow economy is that canned foods require cash or bartering materials to be able to acquire them. This represents a fundamental change in the subsistence strategy, as well as nutrition and dietary habits. It also opens up a whole new world of available foodstuffs.

Food preparation and storage items represent the second most common artifact class. It was surprising that there was a relatively higher percentage of tablewares (plates and bowls) than kitchenwares (pans or coffeepots). Furthermore, some of these tablewares were very nicely decorated (flow blue and other blue decorated ceramic whitewares and the carnival glass wares) showing a certain level of expendable income to purchase more decorative items than plain and heavy utilitarian goods. This is likely reflective of a transition from a subsistence to a wage-based economy and/or off-reservation employment.

Several medicinal items showed a certain reliance on nontraditional methods of health care, likely learned from increased interaction with Anglos, either from the Navajos going off reservation to work or from the influence of trading posts in this area. It could only be determined that the medicines were liquid; they may have represented cough formulations as coughs were known to afflict many Navajos who lived in smoke-filled hogans with poor ventilation.

The .22-cal shells show a use of that size weapon. It could not be determined if they represented a rifle or pistol. In one instance target shooting was evident (as seen from the beer cans with bullet holes at site NM-Q-23-57). Undoubtably the use of this size cartridge also represented hunting of small game (mostly rabbit) and guarding domestic livestock from coyotes and other predators.

The spark plug, oil can, and axle grease lid indicate the use of automobiles or trucks. Unfortunately it could not be determined what vehicle model or even what size engine was used, as the spark plug was a very widely used model for that time period. A 30-weight oil is common for most internal combustion engines. Axle grease can have a variety of uses beyond automotive use. For instance, axle grease is equally necessary on horse-drawn wagon axles and other swivel joints or hinges as it is for self-propelled vehicles.

Indulgences were relatively lightly represented. A wine bottle fragment and five beer cans were the only confidently identified alcohol containers. It is likely that other unidentified glass bottle fragments also contained alcohol. Only a single tobacco tin was collected.

Despite the quantity and variety of artifacts, few intersite comparisons can be made since the vast majority came from only one site. Nevertheless, these sites seem to reflect the increased reliance on manufactured goods as outside influences made inroads on the reservation.

SECTION IV

SUMMARY AND CONCLUSIONS

Chapter 31

SUMMARY

The task order for Phased Data Recovery on Navajo Route 11(A)1, Mariano Lake to N9, McKinley County, New Mexico; Modification No. Two (2), Archaeological Inventory and Testing, of Contract No. C30657-NR11(A), called for investigations of 17 sites along the proposed alignment. These 17 sites were designated NM-Q-27-13 (LA 110304), NM-Q-27-15 (LA 110307), NM-Q-22-45 (LA 110308), NM-Q-22-48 (LA 110311), NM-Q-22-51 (LA 110314), NM-Q-22-52 (LA 110315), NM-Q-22-53 (LA 110316), NM-Q-22-54 (LA 110317), NM-Q-23-55 (LA 110318), NM-Q-23-56 (LA 110319), NM-Q-23-57 (LA 110320), NM-Q-23-58 (LA 110322), NM-Q-23-59 (LA 110323), NM-Q-23-60 (LA 38698), NM-Q-23-62 (LA 110325), NM-Q-23-63 (LA 110326), and NM-Q-23-64 (LA 110327). Nature and extent testing followed the site-specific work plan outlined in Zimmerman and Abbott (1996). The original level of effort proposed for Phase I data recovery, however, was structured around the possibility that extensive subsurface cultural deposits were present on each of these sites. The draft report of the investigations was to be delivered within 160 working days of the completion of fieldwork. This report fulfills these requirements.

ARCHAEOLOGICAL INVESTIGATIONS

The 17 sites listed above were included in the proposed Phase I Data Recovery program of testing for nature and extent. Fieldwork was conducted on these sites between 21 April 1997 and 20 August 1997 under Navajo Nation Cultural Resources Investigation Permit C9706 and United States Department of Interior Permit ARPA-NAO-97-002. As mentioned in the Methods chapter (Chapter 6), procedures for the collection of archaeological data were uniform for all 17 sites. This chapter will present a summary of the level of effort for each site and general results of those investigations.

Three primary types of investigations were conducted within the proposed right-of-way on each site: (1) identification and mapping of all artifacts and features or probable features located on the surface; (2) excavation of areas with the potential for buried cultural deposits by hand to ensure stratigraphic control; and (3) excavation of on- and off-site locations using heavy machinery to expedite identification of buried cultural deposits.

All sites were treated equally in surface collections; however, there was variability due to the range of site types that were investigated. Chapter 6 presents a detailed account of surface collection procedures for each site. Surface artifacts were collected after their locations were plotted on sites with a low density of cultural material. For sites in which a higher density of cultural material was present (typically more than 50 artifacts), surface artifacts were collected in either 4-m-by-4-m, 5-m-by-5-m, or 10-m-by-10-m collection units. Again, this flexibility was necessary due to the range of sites that were investigated.

Hand-excavated test units in all sites were located with respect to artifact distribution, probable feature boundaries, and areas observed to correlate with the occurrence of artifacts or

cultural material elsewhere. Most hand-excavated test units were continued to a minimum of two sterile levels below the last level containing in situ cultural material. In some instances, hand-excavated units were excavated only to reveal or identify feature boundaries.

Backhoe trenches were all studied for the presence of cultural materials or features. Facing the trenches to maximize visibility of the deposits was conducted with either shovels or trowels. All of the trenches were profiled. A minimum of one and a maximum of three profiles were drawn for each of the backhoe trenches. When several features were observed in a single trench, a profile of the entire wall of the trench was drawn.

Level of Effort

The original level of effort for the investigations along N11(1&2) was presented in Zimmerman and Abbott (1996), and is presented here in Table 31.1. The level of effort that was conducted between 21 April 1997 and 20 August 1997 is presented in Table 31.2. Differences in the number of off-site backhoe trenches are a result of site boundaries being expanded from the boundaries identified by the survey crew.

Table 31.1. N11(1&2) Testing, Proposed Level of Effort.

	Hand-excavated	Backhoe Trenches	
Site No.	Units (1 by 1 m)	On-site (m)	Off-site (m)
NM-Q-27-13	4	-	-
NM-Q-27-15	4	-	30
NM-Q-22-45	3*	-	-
NM-Q-22-48	6	25	30
NM-Q-22-51	5	20	60
NM-Q-22-52	6	60	80
NM-Q-22-53	6	70	80
NM-Q-22-54	3	75	90
NM-Q-23-55	1	-	-
NM-Q-23-56	4	15**	-
NM-Q-23-57	5	-	-
NM-Q-23-58	3	20	40
NM-Q-23-59	2	20	30
NM-Q-23-60	6	85	75
NM-Q-23-62	12	195	200
NM-Q-23-63	12	135	130
NM-Q-23-64	12	140	100
Total	94	860	945

Source: modified from Zimmerman and Abbott 1996: Table 10.1.

* 1-by-3-m hand-excavated units

** 15 m of arroyo profiling

Table 31.2. N11(1&2) Project, Summary of Archaeological Nature and Extent Testing.

	Hand-Excavated Units		Backhoe Trenches	
Site No.	Number	Volume (cu m)	Number	Length (m)
NM-Q-27-13	6	2.07	3	49.50
NM-Q-27-15	-	0.00	2	18.20
NM-Q-22-45	1	1.20	-	-
NM-Q-22-48	8	4.19	7	61.30
NM-Q-22-51	-	-	1	10.70
NM-Q-22-52	17	8.25	8	144.75
NM-Q-22-53	10	6.32	5	104.45
NM-Q-22-54	7	10.60	10	264.90
NM-Q-23-55	-	0.30	-	-
NM-Q-23-56	4	3.37	-	-
NM-Q-23-57	7	3.42	-	-
NM-Q-23-58	4	2.20	4	60.00
NM-Q-23-59	3	1.02	5	62.00
NM-Q-23-60	12	9.15	19	216.40
NM-Q-23-62	12	5.54	27	392.04
NM-Q-23-63	12	9.25	13	172.20
NM-Q-23-64	10	9.94	19	245.50
Total	114	76.82	123	1801.94

Zimmerman and Abbott (1996) proposed the excavation of 94 hand -excavated units, mostly 1 by 1 m, and a total of 1790 m of backhoe trenches for the 17 sites to be investigated. As shown in Tables 31.2 and 31.3, a total of 114 hand-excavated units were excavated. These ranged in size from 1 by 1 m to 2 by 2 m and covered 161.525 sq m. Importantly, the volume of those units excavated was 76.82 cu m. This is slightly higher than that originally proposed (65.8 cu m assuming each 1-by-1-m unit was excavated to a depth of 0.7 m). A difference of approximately 40 m separates the proposed and the actual level of effort regarding the length of backhoe trenching at the 17 sites. The total length of all the backhoe trenches was 1801.94 m (Table 31.4).

Tables 31.3 and 31.4 provide a summary, respectively, of hand-excavated units and backhoe trenches (which are all referred to as study units), and associated features. The section for each site in Table 31.3 presents dimensions (both horizontal and vertical) of the hand-excavated units, and whether features were observed. Hand-excavated units that were less than 20 cm deep were excavated to better define features, and not necessarily excavated to sterile sediments. Information regarding backhoe trenches is structured similarly, presenting dimensions (in terms of length and depth) and any associated features. The width of all backhoe trenches was uniformly 70 cm, although occasionally the backhoe bucket created slightly wider areas for short distances in some trenches. Table 31.4 also provides information regarding off-site trenches.

Table 31.3. N11(1&2) Testing, Summary of Hand-excavated Units by Site.

Site No. / Study Unit No.	Dimensions (m) Horizontal	Vertical	Associated Features (Feature No.)
NM-Q-27-13			
35	1 by 1	0.60	2
36	1 by 1	0.12	1
37	1 by 1	0.15	1
38	1 by 1	0.28	2
39	1 by 2	0.36	1
40	1 by 2	0.10	2
Subtotal	8.0 (sq m)	2.07 (cu m)	
NM-Q-22-45			
1	1 by 3	0.40	None
Subtotal	3.0 (sq m)	1.2 (cu m)	
NM-Q-22-48			
7	1 by 1	0.20	None
8	1 by 1	0.49	None
9	1 by 1	0.20	None
10	1 by 1	0.50	None
11	1 by 1	0.70	None
12	1 by 1	0.40	None
13	2.0 by 0.5	0.57	None
14	1 by 1	1.13	None
Subtotal	8.0 (sq m)	4.19 (cu m)	
NM-Q-22-52			
10	5.00 by 0.50	0.34	4, 5, 6
11	4.75 by 0.50	0.23	1, 10
12	4.00 by 0.50	0.36	7, 8
13	1 by 1	0.07	2
"	1 by 1	0.05	2, 3
"	1 by 1	0.05	3
"	1 by 1	0.78	2
"	1 by 1	0.16	2, 3
"	1 by 1	0.07	3, 9
"	1 by 1	0.07	None
"	1 by 1	0.17	9
14	1 by 1	0.38	1
"	1 by 1	0.83	1
15	1 by 1	1.16	None
16	1 by 1	0.80	21
17	1 by 1	0.74	None
18	1 by 1	0.80	None
Subtotal	20.875 (sq m)	8.25 (cu m)	
NM-Q-22-53			
2	2 by 2	0.33	None
	reduced to 1 by 2	0.10	
9	2 by 2	0.15	None
	reduced to 1 by 1	0.10	
10	2 by 2	0.29	None
11	0.81 sq m*	0.13	1
11	0.27 sq m*	0.27	1
12	1 by 1	0.44	None
13	1 by 1	0.76	None
14	1 by 1	0.72	None
15	1 by 1	0.47	None
16	1 by 1	0.48	None
Subtotal	18.08 (sq m)	6.32 (cu m)	

(continued)

Table 31.3. Continued.

Site No. / Study Unit No.	Dimensions (m) Horizontal	Vertical	Associated Features (Feature No.)
NM-Q-22-54			
11	2 by 2	0.15	None
	reduced to1 by 1	1.10	
12	2 by 2	0.42	None
	reduced to 1 by 1	0.62	
13	4.00 by 0.50	0.48	None
14	4 by 1	0.47	None
	reduced to 1 by 1	0.30	
15	2 by 2	0.35	None
16	2 by 2	0.29	None
17	1 by 2	0.45	None
Subtotal	24.0 (sq m)	10.60 (cu m)	
NM-Q-23-55			
1	1 by 1	0.30	None
Subtotal	1.0 (sq m)	0.30 (cu m)	
NM-Q-23-56			
34	1 by 1	0.81	None
35	1 by 1	0.90	None
36	1 by 1	0.75	None
37	1 by 1	0.91	None
Subtotal	4.0 (sq m)	3.37 (cu m)	
NM-Q-23-57			
1	2 by 2	0.16	8
2	1 by 2	0.30	5, 12
3	1 by 1	0.30	10
4	2 by 2	0.20	4
5	1 by 2	0.09	1, 11
	reduced to 1 by 1	0.02	
6	reduced to 1 by 0.50	0.15	3
7	1 by 2	0.20	3
	1 by 2	0.20	
Subtotal	17.0 (sq m)	3.42 (cu m)	
NM-Q-23-58			
1	1 by 1	0.50	1
2	1 by 1	0.60	None
3	1 by 1	0.60	None
4	1 by 1	0.50	None
Subtotal	4.0 (sq m)	2.20 (cu m)	
NM-Q-23-59			
1	1 by 1	0.37	None
2	1 by 1	0.30	None
3	1 by 1	0.35	None
Subtotal	3.0 (sq m)	1.02 (cu m)	

(continued)

Table 31.3. Continued.

Site No. / Study Unit No.	Dimensions (m) Horizontal	Vertical	Associated Features (Feature No.)
NM-Q-23-60			
1	1 by 1	0.38	None
2	1 by 1	0.30	None
73	2 by 2	0.50	None
74	1 by 2	0.40	2 possible postholes (P1, P2)
75	1 by 1	0.40	1 possible posthole (P3)
76	1 by 2	0.80	None
77	1 by 2	0.70	1
79	1 by 1	0.24	3
80	1 by 1	0.35	2
81	1 by 1	0.50	13
82	1 by 1	0.90	None
83	1 by 1	0.28	14
Subtotal	18.0 (sq m)	9.15 (cu m)	
NM-Q-23-62			
1	1 by 1	0.51	None
2	1 by 1	0.20	2
3	1 by 1	0.20	2
4	1 by 1	0.40	None
5	1 by 1	0.30	None
6	1 by 1	0.40	13 & 14
7	1 by 1	0.50	None
8	1 by 1	1.47	None
9	1 by 1	0.60	None
10	1 by 1	0.70	None
11	0.36 sq m*	0.18	1
12	1 by 1	0.20	12
Subtotal	11.36 (sq m)	5.54 (cu m)	
NM-Q-23-63			
1	1 by 1	0.80	1
2	1 by 1	0.70	None
3	1 by 1	0.80	None
4	1 by 1	0.80	None
5	1 by 1	0.90	None
6	1 by 1	0.90	None
7	1 by 1	0.94	1
8	1 by 1	1.00	2
9	1 by 1	0.80	None
10	1 by 1	0.98	None
11	0.21 sq m*	0.16	3
12	1 by 1	0.60	4
Subtotal	11.21 (sq m)	9.25 (cu m)	
NM-Q-23-64			
1	1 by 1	1.10	None
2	1 by 1	1.00	6
3	1 by 1	2.24	6
4	1 by 1	0.80	None
5	1 by 1	1.30	12
6	1 by 1	0.60	None
7	1 by 1	0.40	None
8	1 by 1	0.60	None
9	1 by 1	1.10	None
10	1 by 1	0.80	None
Subtotal	10.0 (sq m)	9.94 (cu m)	
Total	161.525 (sq m)	76.82 (cu m)	

* These units had irregular dimensions; their areas were estimated.

Table 31.4. N11(1&2) Testing, Summary of Backhoe Trenches by Site.

Site No. / Study Unit No.	DIMENSIONS (m) Width by Length (area)	Depth	Associated Features (Feature No.)
NM-Q-27-13			
41	0.70 by 26.50	1.40	None
42	0.70 by 13.00	1.10	None
43	0.70 by 10.00	1.52	None
Subtotal	49.50 m (34.65 sq m)	46.62 (cu m)	
NM-Q-27-15			
1	0.70 by 10.50	1.77	None
2	0.70 by 7.70	1.60	None
Subtotal	18.20 m (12.74 sq m)	21.63 (cu m)	
NM-Q-22-48			
15	0.70 by 8.60	1.50	None
16	0.70 by 12.40	1.40	None
17	0.70 by 8.00	1.10	None
18	0.70 by 4.30	0.90	None
19	0.70 by 14.00	1.80	None
20	0.70 by 8.00	1.60	None
21	0.70 by 6.00	0.60	None
Subtotal	61.30 m (42.91 sq m)	59.17 (cu m)	
NM-Q-22-51			
1	2.50 by 3.00	1.00	1
Subtotal	ca.10.70 m (7.50 sq m)	7.50 (cu m)	
NM-Q-22-52			
2	0.70 by 22.50	1.90	19, 20, 22
3	0.70 by 24.50	1.70	15, 16, 17
4	0.70 by 19.25	1.53	11, 12, 13, 14
5	0.70 by 16.00	1.49	None
6	0.70 by 24.25	1.63	18, 23
7	0.70 by 18.75	1.62	None
8	0.70 by 13.50	1.47	11
9	0.70 by 6.00	1.63	None
Subtotal	144.75 m (101.33 sq m)	166.07 (cu m)	
NM-Q-22-53			
4	0.70 by 20.25	1.09	None
5	0.70 by 30.25	0.96	1
6	0.70 by 22.20	0.79	None
7	0.70 by 16.00	0.79	None
8	0.70 by 15.75	0.71	None
Subtotal	104.45 m (73.12 sq m)	64.74 (cu m)	
NM-Q-22-54			
1	0.70 by 23.00	1.85	None
2	0.70 by 21.30	1.33	None
3	0.70 by 25.90	1.30	None
4	0.70 by 28.20	1.47	None
5	0.70 by 21.80	1.58	None
6	0.70 by 15.30	1.37	None
7	0.70 by 18.70	1.38	None
8	0.70 by 12.70	1.39	None
9	0.70 by 56.70	1.85	None
10	0.70 by 41.30	1.74	None
Subtotal	264.90 m (185.43 sq m)	295.14 (cu m)	

(continued)

Table 31.4. Continued.

Site No. / Study Unit No.	DIMENSIONS (m) Width by Length (area)	Depth	Associated Features (Feature No.)
NM-Q-23-58			
5	0.70 by 22.00	0.70	None
6	0.70 by 21.00	1.00	None
7	0.70 by 9.00	0.74	None
8	0.70 by 8.00	0.70	None
Subtotal	60.00 m (42.00 sq m)	34.06 (cu m)	
NM-Q-23-59			
4	0.70 by 12.00	0.78	None
5	0.70 by 12.00	0.82	None
6	0.70 by 11.00	0.74	None
7	0.70 by 13.00	0.96	None
8	0.70 by 14.00	0.90	None
Subtotal	62.00 m (43.40 sq m)	36.69 (cu m)	
NM-Q-23-60			
84	0.70 by 13.00	1.25	None
85	0.70 by 13.00	1.38	None
86	0.70 by 10.30	1.55	None
87	0.70 by 10.20	1.20	None
88	0.70 by 8.00	0.83	None
89	0.70 by 9.00	1.34	None
90	0.70 by 7.00	1.43	None
91	0.70 by 6.50	1.10	None
92	0.70 by 18.80	1.96	None
93	0.70 by 11.30	1.53	None
94	0.70 by 7.20	1.25	None
95	0.70 by 12.30	1.48	None
96	0.70 by 17.30	1.60	None
97	0.70 by 12.50	1.91	12
98	0.70 by 11.00	1.50	4
99	0.70 by 21.00	1.30	5, 6, 7, 8, 9, 10
100	0.70 by 7.00	1.30	11
101	0.70 by 10.50	1.36	None
102	0.70 by 10.50	1.70	None
Subtotal	216.40 m (151.48 sq m)	221.33 (cu m)	
NM-Q-23-62			
OS 1	0.70 by 24.80	1.04	None
OS 2	0.70 by 20.80	1.32	None
OS 3	0.70 by 28.40	1.17	None
OS 4	0.70 by 11.00	1.52	None
OS 5	0.70 by 19.00	0.94	None
13	0.70 by 20.00	1.10	None
14	0.70 by 11.00	1.04	None
15	0.70 by 10.80	1.67	None
16	0.70 by 13.40	1.70	6
17	0.70 by 10.60	1.27	7, 8
18	0.70 by 10.20	1.25	9, 10
19	0.70 by 10.80	1.46	None
20	0.70 by 10.20	1.63	None
21	0.70 by 23.60	1.20	11
22	0.70 by 11.20	1.15	None
23	0.70 by 22.20	1.68	None
24	0.70 by 12.00	1.64	None
25	0.70 by 17.40	2.10	None
26	0.70 by 10.20	1.61	None
27	0.70 by 14.40	1.38	12
28	0.70 by 14.60	1.58	None
29	0.70 by 8.00	1.34	None
30	0.70 by 11.20	1.48	None
31	0.70 by 11.20	1.50	None
32	0.70 by 11.44	1.38	15
33	0.70 by 9.20	1.37	None
34	0.70 by 14.40	0.73	None
Subtotal	392.04 m (274.43 sq m)	371.70 (cu m)	

(continued)

Table 31.4. Continued.

Site No. / Study Unit No.	DIMENSIONS (m) Width by Length (area)	Depth	Associated Features (Feature No.)
NM-Q-23-63			
OS 1	0.70 by 20.40	1.04	None
13	0.70 by 9.20	1.33	None
14	0.70 by 11.80	1.48	None
15	0.70 by 16.80	1.26	None
16	0.70 by 10.60	1.25	None
17	0.70 by 11.20	1.07	None
18	0.70 by 13.40	1.19	None
19	0.70 by 21.80	1.36	None
20	0.70 by 20.40	0.88	None
21	0.70 by 9.80	0.76	None
22	0.70 by 11.00	0.59	4
23	0.70 by 10.40	1.90	None
24	0.70 by 5.40	1.15	None
Subtotal	172.20 m (120.54 sq m)	140.54 (cu m)	
NM-Q-23-64			
OS 1	0.70 by 9.00	1.59	None
OS 2	0.70 by 14.00	1.59	None
OS 3	0.70 by 11.50	1.58	None
11	0.70 by 10.50	1.71	None
12	0.70 by 20.00	1.52	None
13	0.70 by 3.00	1.48	None
14	0.70 by 21.00	1.85	None
15	0.70 by 12.00	2.02	1
16	0.70 by 12.50	1.97	2, 3
17	0.70 by 11.00	2.12	None
18	0.70 by 12.50	1.78	4, 5
19	0.70 by 14.50	1.86	7, 8, 9, 10
20	0.70 by 10.50	1.57	None
21	0.70 by 23.50	2.10	11
22	0.70 by 9.50	1.80	None
23	0.70 by 10.00	1.80	None
24	0.70 by 9.00	1.58	None
25	0.70 by 18.50	1.35	None
26	0.70 by 13.00	1.53	None
Subtotal	245.50 m (171.85 sq m)	299.47 cu m	
Total	1801.94 m (1261.38 sq m)	1764.66 cu m	

Key: OS = Off-site trench

Results of Investigations

Nature and extent testing at the 17 sites allowed a redefinition of site boundaries and an assessment of the presence of buried cultural materials within sites. All sites were modified in area to reflect the artifacts, or lack thereof, encountered during surface collections. One site, NM-Q-22-45, was determined to be a natural rock alignment, not a cultural feature. No subsurface cultural deposits or features were observed at four sites (NM-Q-27-15, NM-Q-22-45, NM-Q-23-55, NM-Q-23-59). Three other sites (NM-Q-22-48, NM-Q-22-53, NM-Q-22-54) comprised no definitive subsurface cultural deposits, but contained charcoal-stained or ashy deposits that may be cultural. Site NM-Q-23-57 comprised primarily surface historic features; however, these retain integrity of location and structure.

Subsurface Cultural Deposits and Features

Nine sites (NM-Q-27-13, NM-Q-22-51, NM-Q-22-52, NM-Q-23-56, NM-Q-23-58, NM-Q-23-60, NM-Q-23-62, NM-Q-23-63,and NM-Q-23-64) were observed to contain intact, subsurface cultural deposits. These deposits range in age from the Late Archaic to the Historic period.

A total of 101 features were defined within the right-of-way at 11 sites (NM-Q-27-13, NM-Q-22-51, NM-Q-22-52, NM-Q-22-53, NM-Q-23-56, NM-Q-23-57, NM-Q-23-58, NM-Q-23-60, NM-Q-23-62, NM-Q-23-63,and NM-Q-23-64) during the testing efforts. Another 10 are located outside the proposed N11 (1&2) right-of-way. Charcoal-stained or ashy layers were found at three sites, as noted above. Most of the features await further investigation to determine their dimensions, content, and function. Seven (five at NM-Q-23-64 and two at NM-Q-22-52) of these features, however, are definitely structural (pitstructures), all of which have high potential for additional interior features. ZCRE projects that as many as 13 additional pitstructures may exist at the three northernmost Basketmaker III sites. Projected numbers of additional features that may be encountered during the next phase of work are presented in the site-specific work plan (Chapter 34).

Artifacts Recovered

Ceramics. Fourteen sites (Table 31.5) investigated contained ceramic artifacts in their assemblage. These assemblages include commponents dating from the Basketmaker III to late Pueblo II, and Protohistoric periods (Table 25.1). A total of 7564 ceramic artifacts, weighing 25,571.1 g, were analyzed (Chapter 25). The three large Basketmaker III sites (NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64) comprise 82% (n=6167) of the assemblage by count, and 75% (19,070.5 g) by weight. Pueblo II and Protohistoric ceramic artifacts comprise the remainder of the assemblage, along with a trace of Pueblo I period ceramics.

Wares observed in the assemblage include Cibola Gray Ware, Cibola Gray/Brown Ware, Cibola White Ware, Mogollon Brown Ware, Cibola Red Ware, San Juan Red Ware, Protohistoric Navajo Gray Ware, Zuni Glaze Ware, and Hopi Yellow Ware. The assemblage is dominated, however, by Cibola tradition ceramics.

The ceramic artifact assemblage has excellent potential to address such important questions as ceramic production, resource use, exchange, style, and chronometry. Probable kilns were observed at site NM-Q-27-13. These date to the Pueblo II, and will provide meaningful information regarding ceramic production for this area during a period of intensive and extensive interaction with groups in other areas throughout the region. Early ceramic production, transitions in resource use related to ceramic production, and technology during the Basketmaker III are questions that may be addressed specifically with the material from sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64.

The lack of Chuska Gray Ware from any of the sites tested poses an interesting question. Why do the sites, throughout the prehistoric sequence, consistently lack Chuska ceramics? Sites throughout the San Juan Basin typically have high amounts of these ceramics. This apparent pattern should be further investigated.

Table 31.5. N11(1&2) Testing, Summary of Recovered Artifacts by Site and Material or Sample Type.

Site No.	Ceramics	Flaked Stone	Ground Stone	Misc. Stone	Historic Artifacts	Faunal Specimens	Macrobotanical. Samples Analyzed	Pollen Samples Analyzed	Radiocarbon Samples Analyzed	Tree-Ring Samples
NM-Q-27-13	X	X	X	X	X	X	X	-	X	X
NM-Q-27-15	-	-	-	-	-	-	-	-	-	-
NM-Q-22-45	-	-	-	-	-	-	-	-	-	-
NM-Q-22-48	X	X	X	-	X	-	-	-	-	-
NM-Q-22-51	-	-	-	-	-	-	-		-	-
NM-Q-22-52	X	X	X	-	-	X	X	X	X	-
NM-Q-22-53	X	X	X	X	-	X	-	-	-	-
NM-Q-22-54	X	X	X	X	-	X	-	-	-	-
NM-Q-23-55	X	-	-	-	-	-	-	-	-	-
NM-Q-23-56	X	X	X	-	-	X	-	-	-	-
NM-Q-23-57	X	X	X	-	X	X	X	-	-	-
NM-Q-23-58	X	X	X	X	X	X	X	-	X	-
NM-Q-23-59	X	X	-	-	X	-	-	-	-	-
NM-Q-23-60	X	X	X	X	X	X	X	-	X	-
NM-Q-23-62	X	X	X	X	-	X	X	X	X	-
NM-Q-23-63	X	X	X	X	-	X	X	X	X	-
NM-Q-23-64	X	X	X	X	-	X	X	X	X	-

Other potential areas of research specifically related to the ceramic assemblage include early Navajo ceramic technology. Trade and exchange with Pueblo villages, such as Zuni and Hopi, may potentially be investigated. Protohistoric assemblages within the project area could also be compared with contemporaneous assemblages from other sites.

Flaked, Ground, and Miscellaneous Stone Artifacts. A total of 1085 flaked stone artifacts, 113 ground stone artifacts, and 55 pieces of miscellaneous stone were recovered from 13 sites (Table 31.5). No artifacts from these categories were recovered from sites NM-Q-27-15, NM-Q-22-45, NM-Q-22-51, or NM-Q-23-55. Flakes represent 72% of the flaked stone assemblage, while 10% are microflakes, 5% are cores, 4% are pieces of debitage, and 3% are core-flakes. Only 5% of the flaked stone assemblage comprised formal artifact types such as projectile points (including possible Paleoindian, Late Archaic, and Puebloan point types), bifaces, blades, choppers, scrapers and hammerstones. Flaked stone raw material is dominated by cherts (generic, Chinle [yellow-spotted], and Washington Pass comprising 59% of the assemblage), followed by petrified wood (21%), quartzite (9%), obsidian (5%), hematite (4%), chalcedony (1%), siltstone (1%), and sandstone (trace).

Of the 113 pieces of ground stone, unidentified ground fragments comprise 46% of the entire assemblage. Ground slab fragments make up 17% of the assemblage. Four types of manos (generic, biscuit, one-hand, and two-hand) together consist of 15% of all the ground stone recovered. Metates (which include plain, basin, slab, and trough types) make up 11% of the assemblage. Other ground stone items recovered include a mortar, a pendant, a fetish, three slabs, and seven polishing stones (all comprising the remaining 11% of the assemblage). The fetish may be made from jadeite. Other ground stone raw material includes sandstone (86%), quartzite (12%), along with trace amounts of silicified wood and granite.

Mica comprises 47% of the miscellaneous stone artifacts. Nine (16%) pieces of ochre were recovered from five sites. The remainder of the miscellaneous assemblage includes hematite (11%), ochre (16%), coal (7%), petrified wood (7%), turquoise (7%), and fossils (probably fossil shark teeth, 4%).

Historic Artifacts. A total of 321 historic artifacts were recovered from six sites (Table 31.5). These artifacts date from the late nineteenth to the second half of the twentieth century. Artifact categories, in order of frequency, include metal, glass, ceramics, rubber, and plastic. Most of the artifacts (64%) were recovered from site NM-Q-23-57. Dominating the assemblage are subsistence items (food and beverage cans and bottles). Food preparation and storage are represented by ceramics and glass kitchen- and tablewares. Materials represent a time period when persons and families living in the project area were experiencing dramatic changes in the local and national economy.

Faunal Specimens. A total of 545 faunal specimens from 11 sites (Table 31.5) were analyzed. Over three-quarters of the faunal specimens were classified as unidentified small mammal (47.5%) and unidentified large mammal (28.9%). As Zunie (Chapter 27) points out, all taxa are consistent with those expected for a woodland environment. Hares and rabbits (cottontail and jackrabbit), rodents (prairie dog, kangaroo rat, and woodrat), badger, artiodactyla (mule deer,

sheep/goat), and wild turkey were all recovered during testing. Important species for subsistence and other activities would most likely have been cottontail rabbits, jackrabbits, mule deer, sheep and goat in historic times, and wild turkey. A single specimen of worked clam shell was recovered from site NM-Q-23-63. This indicates the ability to acquire shell from the Pacific.

Floral Remains. The floral remains are divided into macrobotanical remains and microbotanical remains, or pollen and spores. Regarding the macrobotanical assemblage, 30 flotation samples and 3 vegetal samples were analyzed from eight sites (Table 31.5). The components examined range from the Late Archaic to the Historic period. Fifteen taxa were recovered from the Basketmaker III sites. Eleven taxa were identified for the Pueblo II samples analyzed. Maize is the only cultigen that could be confidently identified. Dominating the assemblage, however, are seeds of weedy annuals, such as bugseed, caper, goosefoot, pigweed, pitseed goosefoot, purslane, and winged pigweed. Charred tobacco was recovered from site NM-Q-23-58. Juniper leaflets and twigs and pinyon pine needles recovered likely represent fuel wood.

Remains of banana yucca, hedgehog cactus, and wolfberry are also plants that were probably used as food. Other plant resources that were most likely used as food include groundcherry, buckwheat family, and the nightshade family.

All wild taxa that were identified during the macrobotanical analyses can be collected today in the project area, supporting an inference of little environmental change between the Late Archaic and the present.

Seven pollen samples were analyzed from four sites (Table 31.5). Pollen concentrations ranged from 1401 to 8403, which indicates adequate preservation and little, if any, contamination. Taxa identified are consistent with those of a pinyon and juniper woodland, with Gambel oak. Birch and willow were present in the wetter areas. The understory contained primarily sagebrush, members of the sunflower family, mustard family, saltbush, greasewood, beeweed, various cacti, *Ephedra*, and wild buckwheat. Cattails were probably also growing in wetter areas.

From the pollen data it is inferred that during the Basketmaker III period, mustards, a member of the chicory tribe of the sunflower family, cholla, prickly pear cactus, hedgehog cactus, beeweed, a member of the lily family, grasses, purslane, globemallow, and cattail were used. Chenoams were probably stored. Maize was identified, as was squash/pumpkin pollen for the Basketmaker III period. As noted above, no definitive macrobotanical evidence for cultivated squash was identified, further supporting the need for pollen analyses. Only maize, however, was identified in the Pueblo II sample.

High frequencies of maize pollen in Feature 12, a pitstructure at site NM-Q-23-64, may result from the use of maize pollen in a ritual or ceremonial activity. Zunie (Chapter 23) notes that a high frequency of ground stone was observed in this pitstructure. Further supporting the belief that ceremonial activities occurred here is the presence of spruce pollen.

Chronometrics. Charcoal samples retrieved from features or stained layers from seven sites (Table 31.5) were submitted for radiocarbon dating. Two charcoal samples from one site (NM-Q-27-13) were submitted for tree-ring analysis. Radiocarbon dates returned range from the Late Archaic to Late Pueblo II/Early Pueblo III (Table 31.6). Results have not been returned as of the time of writing regarding the tree-ring samples.

Human Remains. Information regarding human remains encountered during Phase I Data Recovery testing is provided in Confidential Appendix D of this report.

FURTHER WORK

Based upon the nature and extent testing conducted by ZCRE personnel between 21 April 1997 and 20 August 1997, 10 of the 17 sites require additional investigations during Phase II Data Recovery. These 10 sites include NM-Q-27-13, NM-Q-22-52, NM-Q-22-54, NM-Q-23-56, NM-Q-23-57, NM-Q-23-58, NM-Q-23-60, NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64. Details of the projected amount of work required on each site are provided in Chapter 35 (the site-specific work plan).

Two sites require monitoring during construction activities: sites NM-Q-22-48 and NM-Q-22-53. The five remaining sites (NM-Q-27-15, NM-Q-22-45, NM-Q-22-51, NM-Q-23-55, and NM-Q-23-59) were determined to have little to no remaining integrity or subsurface features, or testing efforts exhausted the potential for gaining additional information. Site NM-Q-22-51 should be the focus of further historical research to provide contextual information regarding the history of road construction in the area.

Table 31.6. N11(1&2) Testing, Summary of Radiocarbon Dates by Site.

Site No. FS	Beta No.	Age[1]	Calibrated Age[2]	Calibrated Age[3]	Provenience
NM-Q-27-13					
FS 55	110376	940±60	AD 995 to 1235	AD 1020 to 1180	SU39, F1
FS 58	110377	1120±60	AD 785 to 1020	AD 880 to 995	SU35, F2
NM-Q-22-52					
FS 76	110378	1250±60	AD 665 to 905 and AD 920 to 950	AD 690 to 875	SU14, F1
FS 119	110379	910±40	AD 1025 to 1225	AD 1040 to 1195	SU14, F11
NM-Q-23-58					
FS 62	110380	2820±70	BC 1145 to 820	BC 1030 to 890	SU1
FS 66	110381	3050±70	BC 1435 to 1065	BC 1400 to 1200	SU1, F1
NM-Q-23-60					
FS 118	110374	2290±40	BC 400 to 345 and BC 310 to 210	BC 390 to 365	SU97
FS 130	110375	2330±40	BC 415 to 365	BC 400 to 380	SU99, F5
NM-Q-23-62					
FS 125	110382	1650±80	AD 235 to 600	AD 340 to 530	SU11, F1
FS 151	110383	1810±70	AD 70 to 405	AD 130 to 330	SU16, F6
NM-Q-23-63					
FS 75	110384	1140±80	AD 695 to 1030	AD 800 to 995	SU7, F1
FS 130	110385	2270±60	BC 1030 to 810	BC 980 to 830	SU11, F3
NM-Q-23-64					
FS 173	110386	1840±60	AD 65 to 350	AD 110 to 245	SU5
FS 209	110387	1680±80	AD 210 to 560	AD 260 to 440	SU18, F4

Note: 1 - Uncalibrated age (BP)
2 - 2 sigma (95% probability)
3 - 1 sigma (68% probability)
Key: SU - Study Unit
F - Feature

Chapter 32

CONCLUSIONS

James W. Kendrick

The structure guiding the nature and extent testing at the 17 sites along N11(1&2) was presented in Chapter 5. That discussion presented the research design and the fundamental research requirements for this project. Following the research design, this chapter addresses conclusions that can be drawn from the data collected. A discussion of the fundamental research requirements follows these conclusions, representing fulfillment of the contract. As anticipated, the findings of the testing project can only address portions of the general research design. The testing phase did, however, provide interesting and important information regarding the prehistoric and historic use of the southern San Juan Basin and Dutton Plateau.

RESEARCH DESIGN

Any discussion of how the collected data contribute to the research design and the better understanding of the prehistory and history of the project area must be prefaced by the fact that only a minor portion of each archaeological site was investigated. Testing efforts provided the minimum amount of information that could allow a reasoned projection of the total amount of features and cultural material that may be present. These efforts also provided an estimate of the nature of the deposits involved.

Cultural material at seven sites were determined to be entirely surficial or significantly lacking in integrity because of erosion or other circumstances. Site NM-Q-27-15 (LA 110307), a sandstone alignment possibly representing an agricultural feature, was determined not to contain any subsurface cultural material. Two lithic artifacts were observed, however (Chapter 8). Site NM-Q-22-45 (LA 110308), originally believed to potentially represent an agricultural feature, was determined not to be cultural. Site NM-Q-22-48 (LA 110311), originally defined as a Pueblo II artifact scatter and small rubble mound, was determined not to contain any architecture or subsurface features. A charcoal-stained layer was observed over 1 m below the surface, although it is uncertain if this layer is cultural. Site NM-Q-22-53 (LA 110316) comprised primarily surfacial material. Artifacts were recovered from subsurface contexts, but it is believed they represent postoccupational deposition. Similar to site NM-Q-22-48, site NM-Q-22-54 (LA 110317) comprised only surface artifacts within the right-of-way. An ashy layer was observed below the surface, yet it is uncertain whether it is cultural. Site NM-Q-23-55 (LA 110318), a prehistoric ceramic and lithic artifact scatter, was determined to contain no subsurface cultural material. Site NM-Q-23-59 (LA 110323), a Pueblo II ceramic and lithic artifact scatter with a thin scatter of historic material, was determined to contain no subsurface cultural material.

Even though these sites were determined to be surficial, save for site NM-Q-22-45 which is not cultural, the artifacts from them potentially may contain important information. For example, the surface scatter at site NM-Q-23-59 indicates limited activities at the base of the Dutton Plateau

during the Pueblo II period. Sites NM-Q-27-15 and NM-Q-22-48 likely indicate agricultural or limited activities in the Upper Puerco valley and on the Dutton Plateau. Therefore, although these sites have no subsurface integrity, they can provide information relevant to understanding the past in the project area.

The currently known cultural deposits and features and the data obtained from test excavations permit some of the issues of the research design to be addressed. Due to the limited nature of the investigations, no conclusive data have been collected regarding these issues. The sites to be investigated during the next data recovery phase, however, have excellent potential to provide many data relevant to much of the general research design. The following discussion is organized in the order of the overarching research design.

Environment and Economy

Mobility/sedentism and land use are the major issues in the domain of environment and economy. Occupation duration, season(s) of occupation, site spatial structure, reuse, and modes of abandonment are issues relevant to examining mobility/sedentism, while environmental location, site function, and subsistence strategies are important in understanding land use.

Paleoindian

Little can be said regarding this period in the project area; there is, however, potential for informative future research. One fluted projectile point fragment was recovered from the surface at site NM-Q-23-60. Research conducted throughout North America has shown that groups during this period were highly mobile. They likely were in the San Juan Basin and its peripheries as well. Judge and Dawson (1972) identified water, overview, and hunting area as important factors for the establishment of Paleoindian campsites in the Rio Grande Valley. Based upon these factors, Vivian (1990) predicts the Chuska Valley, Chaco Slope, Puerco Platform, and the San Juan River Valley near its confluence with the Chaco Wash as potential areas of greater use during the Paleoindian period.

Site NM-Q-23-60 is located on the Chaco Slope near the highlands of the Dutton Plateau, along the upper reaches of Indian Creek. Therefore, the water and overview conditions for settlement appear to be met although site NM-Q-23-60 has a restricted eastern view. From the top of the Dutton Plateau, however, one can see across the San Juan Basin. Little can be said regarding occupation duration, site spatial structure, season of occupation, site reuse, or mode of abandonment at this time regarding this component. The occupation was likely short-term and potentially seasonal. Interestingly, an additional Paleoindian site (LA 22183) is located 1.1 km (0.7 mi) to the east of site NM-Q-23-60. Further research, it would seem, may prove beneficial to better understanding this period.

Discussion of the other research domains regarding the Paleoindian period would be speculative. Nevertheless, it can be assumed, based on previous research, that population would have been low, and groups would have been organized into small hunting and gathering bands. Regional relationships may have been extensive, but the lack of chronological control for contemporaneity precludes sound attempts at this research domain.

Future research on the Paleoindian period could begin by conducting a fluted projectile point survey (Meltzer 1986) for the counties of northwestern New Mexico to determine if the areas defined above actually contain more recorded Paleoindian sites. Research could then proceed by examining exposed Late Pleistocene sediments in these areas to identify additional sites. Such procedures may potentially be successful in the project area in the vicinity of Mariano Lake, a now-dry natural lake surrounded by highlands.

Late Archaic

Late Archaic components are represented in sites NM-Q-23-60, NM-Q-23-58, and possibly NM-Q-23-63. Sites NM-Q-23-60 and NM-Q-23-58 have intact Archaic deposits, and a radiocarbon sample produced a Late Archaic date for site NM-Q-23-63. It is uncertain what the nature and extent of these deposits may be at site NM-Q-23-63.

Site NM-Q-23-60 comprises at least two buried Archaic components (Chapter 20). Samples from these two components, which are separated by 20 to 40 cm of sediments, returned essentially contemporaneous radiocarbon dates ranging between 400 and 365 BC (calibrated, 1 sigma probability; Beta-110374 and Beta-110375; Appendix B). Thompson (Chapter 24), based upon her geomorphological analysis of site NM-Q-23-60, believes as much as 2000 years may separate these two distinctly separate deposits. One explanation for this contradiction is possible contamination of the lower radiocarbon sample by the upper layer. If we assume the radiocarbon date for the upper layer is not contaminated and reflects an actual age of occupation, then we can use the geomorphology of the site to infer the age of occupation for the lower layer. The upper stained layer (Figure 20.29, and not to be confused with the latest component of the site) returned a date of 2330+/-40 BP (400 BC to 380 BC, 1 sigma, calibrated; Beta-113075; Appendix B). This places this occupation in the En Medio phase of the Late Archaic (Irwin-Williams 1973). Extending these dates back in time 2000 years places the lower stained layer in the San Jose phase of the Late Archaic, which dates between 3000 and 1800 BC (Irwin-Williams 1973). This argument is enhanced by the San Jose style projectile point, a basin ground metate, biscuit manos, and large chopping tools located at site NM-Q-23-60.

San Jose phase (3000 BC to 1800 BC) mobility/sedentism is characterized by larger sites than the preceding Bajada phase, from which is inferred larger groups and repeated use of sites (Irwin Williams 1973). Base camps were identified by Irwin-Williams in the Arroyo Cuervo region (an area between the Rio Puerco of the East and the Jemez River) and tend to be located at canyon heads and canyon rims. Brush structures are known at some sites during this phase (Irwin-Williams 1979:39). At site NM-Q-23-60, possible postholes were observed along with small pit features, and a site function of a base camp is inferred.

Regarding diet and subsistence, as mentioned above, a basin ground metate and biscuit, or cobble, manos were recovered from site NM-Q-23-60. Unfortunately, most were recovered from deflated contexts. They are believed, however, to have been deposited during this phase. This would indicate less reliance on hunting than in previous periods, and a greater use of plant foods. Seasonal use is assumed, but the particular seasons in which groups were occupying site NM-Q-23-60 is unknown at the present time. McBride (Chapter 28) observed seeds from woody

annuals (goosefoot, pitseed goosefoot, and cheno-ams) from macrobotanical samples taken from site NM-Q-23-60, and suggested these may have been utilized for food. No cultigens were recovered from this occupation.

The Armijo phase (1800 BC to 800 BC) follows the San Jose phase, and is represented by occupations at sites NM-Q-23-58 and NM-Q-23-63. Armijo phase mobility/sedentism is not significantly different than that of the preceding period. Fall to fall and winter base camps may be slightly larger; temporary shelters are known, as are large cobble-filled hearths (Vivian 1990:85). In the Arroyo Cuervo region, base camps continue to be at canyon heads. Importantly, based upon her work at the Armijo Shelter, Irwin-Williams believes this is the period when seasonal aggregation began (Irwin-Williams 1973).

Site NM-Q-23-58 comprises two occupations dating to the Armijo phase. Little could be determined regarding the first occupation during testing. Evidence for this occupation is seen is the profile of SU 4 (Figure 18.7). The occupation is further supported by a radiocarbon date of 3050+/-70 BP (1400 BC to 1200 BC, 1 sigma, calibrated; Beta-110381; Appendix B). Due to erosion, material from this occupation may be mixed with the later occupation in the southern portion of the site.

The later Armijo phase occupation of site NM-Q-23-58 comprises at least one intact buried feature and a possible occupation surface. This occupation dates to 2820+/-70 BP (1030 BC to 890 BC, 1 sigma, calibrated; Beta-110380; Appendix B) placing it in the Late Armijo. Very little can be said regarding occupation duration, season of occupation, or mode of abandonment. It does appear, however, that the site was reused throughout much of the Armijo phase.

The environmental location of site NM-Q-23-58 is on an alluvial fan of the Dutton Plateau (Chapter 24). This location would have been optimal for exploiting resources of the plateau and the San Juan Basin. It is difficult to interpret site function from the limited testing data, though site NM-Q-23-58 likely functioned as a seasonal camp during this period. Macrobotanical samples taken from both Armijo occupations produced seeds from weedy annuals which could have been used as foods, as mentioned above for site NM-Q-23-60.

Site NM-Q-23-63 also comprises an Armijo phase occupation. The nature and extent of this occupation was not determined during testing efforts. Feature 3, a hearth that was excavated along the roadcut of the existing N11 road, produced a radiocarbon date of 2770+/-60 BP (980 BC to 830 BC, 1 sigma, calibrated; Beta-110385; Appendix B). Little can be said regarding this occupation, other than it is in a slightly different environmental location than site NM-Q-23-58. Site NM-Q-23-63 is located on the dune fields of the Chaco Slope. The potential exists for additional intact buried Armijo phase deposits.

The En Medio phase (800 to AD 400) follows the Armijo phase, and is represented at site NM-Q-23-60. One radiocarbon date of 2330 +/40 BP (400 BC to 380 BC, 1 sigma, calibrated; Beta-110375; Appendix B) was recovered for this occupation. Irwin-Williams (1973) defined the phase based upon her work in the Arroyo Cuervo region. She extends the phase into what is traditionally known as Basketmaker II under the Pecos Classification in an attempt to demonstrate a continual,

unbroken cultural sequence from the Archaic to ancestral Pueblo periods. This discussion will follow Vivian (1990) and discuss the Basketmaker II as a late En Medio phase. Although an unbroken sequence may exist in the project area, data recovered from this phase of work can not address this issue.

The En Medio phase is generally seen to be a time period of greater sedentism, possibly increased population, and greater group size during seasonal aggregation (Vivian 1990:85). Ground stone tools, flaked stone, and flaked stone tools become more abundant on En Medio sites (Vivian 1990:85). At site NM-Q-23-60, these characteristics are evident. Very dark staining, burned sandstone slabs, multiple pit features, and abundant flaked stone were all recovered from site NM-Q-23-60 indicating at least a seasonal habitation. A review of the flaked stone (Chapter 26) from this site shows that 344 flakes, 92 microflakes, 24 pieces of debitage, 19 core-flakes were recovered. Eleven bifaces and nine cores were also recovered. Many of these artifacts were recovered from surface contexts, and may be mixed with other components represented at the site. It is believed, however, that most of the flaked stone items are associated with the En Medio occupation.

The material recovered and features identified at site NM-Q-23-60 support the idea of increased sedentism, and possibly larger group size than in previous periods. Increased sedentism is inferred from the numerous pit features and microflakes. Specific functions could not be determined for many of these features, but they tend to be larger when compared with the features excavated for earlier Archaic components at other sites in the project area. The very high number of microflakes (n = 92) indicates bifacial thinning and retouching. Increased use of dune ridges during this period is also reflected in the environmental location of the site.

Site spatial structure was difficult to determine for this component of site NM-Q-23-60. Two distinct stained areas may be present. Staining and only one feature were observed in SU 97, while SU 99 revealed staining and multiple features. SU 82 was placed between these study units to determine if they were physically linked. No evidence was observed that they were connected. It is believed that, if the cultural deposits are found to be contemporaneous, distinct activity areas are present. Any further discussion of spatial structure would be speculative.

Occupation duration could not be determined from the limited data that were collected. Season of occupation may have been between spring and fall based upon weedy annual seeds and pollen that were recovered (Chapters 28 and 29). Site reuse during this phase is inferred from the fact that some of the pit features cut into one another. Further work, however, needs to be conducted to fully understand these processes.

Diet and subsistence during the Late Archaic at sites NM-Q-23-58 and NM-Q-23-60 appears to have consisted of small and large mammals and possibly weedy annuals. An articulated jackrabbit (*Lepus* sp.) was recovered from a thermal feature (Feature 2) at site NM-Q-23-60, indicating specific exploitation for this resource.

Basketmaker II/Late En Medio

Basketmaker II dates primarily from 100 BC to AD 400, overlapping with the late En Medio phase. The increased sedentism of the En Medio phase continues, with year-round occupation of some sites (Vivian 1990:91). There is an increased reliance on horticulture, particularly maize and squash. This lead to more storage features at habitations. Vivian (1990: 102) describes late En Medio habitation sites as comprising "large, shallow storage pits, fire-cracked cobble concentrations, and patterned refuse-work areas on dune ridges." This description fits the features and the patterning of material at site NM-Q-23-60. Late En Medio dates were also obtained for sites NM-Q-23-62 and NM-Q-23-64 (Appendix B).

The nature and extent of Basketmaker II/late En Medio deposits were not determined during investigations at site NM-Q-23-64. Features at site NM-Q-23-62, however, include storage pits and hearths, fitting with the description of typical sites of this period. In terms of environmental location, site NM-Q-23-62 is located along the dune ridges of the Chaco Slope, consistent with the increased use of dunes seen across the San Juan Basin at this time (Vivian 1990:102). Since site NM-Q-23-62 dates to the early Basketmaker III period also, more will be discussed below regarding this site.

Basketmaker III

The Basketmaker III period generally is dated between AD 400/500 and 700, and is represented by components at sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64. Extensive Basketmaker III deposits were located at these sites, all of which were habitations. Based upon the ceramic analyses conducted on these sites, occupations range from the AD 500s to 700, encompassing the entire Basketmaker III period.

Occupation duration is believed to have been extensive based upon early (Basketmaker II) radiocarbon dates and the ceramic profiles for sites NM-Q-23-62 and NM-Q-23-64. It is unknown, however, if occupations at these sites were continuous from Basketmaker II to Basketmaker III. Site reuse is evident at site NM-Q-23-64, where pitstructures are superimposed upon earlier pitstructures. This implies a lengthy occupation of the site. Reuse is also evident in a small amount of Pueblo II ceramics recovered from sites NM-Q-23-63 and NM-Q-23-64.

Season of occupation is difficult to determine from the limited data, but may be inferred from several lines of evidence. As mentioned in the research design (Chapter 5), the presence of pitstructures at site NM-Q-23-64 is interpreted as evidence of a winter occupation (Gilman 1987). External hearths at each of these sites may result from a warm season occupation (Dodd 1987).

Site spatial structure varies among the Basketmaker III sites. Site NM-Q-23-62 comprises only storage pits and hearths, as does site NM-Q-23-63; however, site NM-Q-23-63 may comprise pitstructures also based upon the nature of the features (Chapter 22). Five pitstructures were located at site NM-Q-23-64, along with multiple extramural features. Orientation of one of the pitstructures (Features 4 and 5) appears to be to the southeast, but it is not yet possible to assess the orientation of the others.

All of the Basketmaker III sites are located on the dune ridges of the Chaco Slope in the San Juan Basin at the northern end of the project area. Occupants could have easily exploited the nearby upland resources of the Dutton Plateau as well as the lowland basin resources. Evidence for diet and subsistence from these sites constists of large and small mammals, including mule deer, badger, jackrabbit and cottontail rabbit, and prairie dog (Chapter 27). Subsistence from plant species included maize, a member of the chicory tribe of the sunflower family, mustards, cactus (particularly cholla and prickly pear, and hedgehog cactus), beeweed, grasses, purslane, globemallow, cattail, a member of the lily family, and cheno-ams. Squashes were also grown at all of the Basketmaker III sites.

Modes of abandonment at these sites can not be fully determined at this phase of the project. The pitstructures at site NM-Q-23-64 do not appear to be burned; however, we were only able to observe a small fraction of each of them. Any discussion regarding formal or informal abandonment processes would be speculative at this point.

Pueblo I

The Pueblo I period is traditionally dated from AD 700 to 900. Evidence for Pueblo I occupation within the project area is sparse. One radiocarbon date of 1250 +/-60 BP (AD 690 to 875, q sigma, calibrated; Beta-110378;Appendix B) recovered from Feature 1 at site NM-Q-22-52 falls within the Pueblo I time period. At site NM-Q-23-63, one radiocarbon date of 1140 +/-80 BP (AD 800 to 995, 1 sigma, calibrated; Beta-110384; Appendix B) falls within the late Pueblo I to early Pueblo II period, and a minor amount of Pueblo I ceramics were recovered.

Feature 1 at site NM-Q-22-52 was a sandstone slab-lined thermal feature. It is interpreted by Polk (Chapter 12) to have functioned as a roasting pit. The nature and extent of the Pueblo I occupation at site NM-Q-22-52 is unclear, unfortunately, and little can be said regarding its function. The presence of *Typha* (cattail) pollen, however, is evidence that the occupation may have taken place between the spring and fall, but little else can be said regarding season of occupation or occupation duration during this period.

Regarding land use, site NM-Q-22-52 is located atop the Dutton Plateau, where upland resources were exploitable. Within the slab-lined roasting pit, McBride (Chapter 28) observed charred remains of 10 different taxa: banana yucca, buckwheat family, caper family, goosefoot, groundcherry, hedgehog cactus, juniper seeds, pine needles and bark, cucurbit rind, and maize (cupules, kernels, and embryos).

Pueblo II

The Pueblo II period is generally dated from AD 900 to 1100/1150. Several researchers are now ending the period at AD 1150 (Adler 1996). This is the period which witnessed the development of great-house communities throughout the region (Chapter 4). Chaco became a center of regional activity for the San Juan Basin and its peripheries. Roads connected Chaco with nearby great houses, such as Kin Ya'a.

Within the project area, the Pueblo II period is represented by components at 11 sites: NM-Q-27-13, NM-Q-22-48, NM-Q-22-52, NM-Q-22-53, NM-Q-22-54, NM-Q-23-56, NM-Q-23-57, NM-Q-23-59, NM-Q-23-60, NM-Q-23-63, and NM-Q-23-64. Site functions range from limited activity to habitations.

Occupation duration at these sites ranges from short-term to possibly long-term. For the limited-activity sites NM-Q-22-48, NM-Q-22-53, NM-Q-23-57, NM-Q-23-59, NM-Q-23-60, NM-Q-23-63, and NM-Q-23-64, occupation duration is assumed to be short-term. Season of use can not be determined at this time for these sites. The limited-activity sites occur both on the Dutton Plateau and below on the Chaco Slope. Site NM-Q-22-48 may have functioned as a fieldhouse, although construction of the existing N11 roadbed most likely destroyed any architecture associated with this site. Material found at site NM-Q-22-53 may be associated with a habitation upslope and outside the right-of-way for the proposed N11(1&2) road. Occupation at sites NM-Q-23-63 and NM-Q-23-64 are associated with the Muddy Water community. Further investigations are needed, however, to determine the nature and extent of these occupations.

Polk (Chapter 12) identified three possible pitstructures at site NM-Q-22-52, a multicomponent site on the Dutton Plateau. Numerous features were also identified; however, the pitstructures (as far as can be seen during test excavations) contain no masonry. It is inferred that use of this site was on a seasonal basis. Eighty-seven percent of the sherds recovered were from jars, further supporting seasonal habitation and possibly representing fieldhouses.

A rubble mound and external features are present at site NM-Q-22-54, which is located atop the highest portion of the Dutton Plateau within the project area. The mound and features were not investigated to any great detail because they are outside the right-of-way of the current project. Numerous study units within the right-of-way on the western portion of the site revealed only an ash stain. No other features were observed. Occupation duration and seasonal occupation are difficult to address with such limited data. Nevertheless, ceramic data (Chapter 25) are used to infer a single occupation dating between AD 1000 and 1150, or Late Pueblo II.

Based upon the density of material observed at site NM-Q-23-56 (primarily outside the right-of-way), this site was most likely a habitation. No architecture was observed, and it is believed a structure was destroyed during the construction of the existing N11 roadbed. The site's location at the base of the Dutton Plateau would have facilitated exploitation of both upland and lowland resources.

Evidence for ceramic production during the Pueblo II was observed at site NM-Q-27-13. This site is located along a southeast-facing slope atop at ridge overlooking Mariano Lake. A pitstructure was observed outside the right-of-way indicating this site likely also functioned as a habitation. Reed and Goff (Chapter 25) have identified the thermal features (Features 1 and 2) as probable kilns. Based upon the ceramic types, Reed and Goff date the occupation of the site between AD 975 and 1025, or early Pueblo II. The potential at this site for better understanding ceramic production during this period is excellent.

Pueblo III

One radiocarbon date falling within the Pueblo III period (AD 1150 to 1300) was recovered from site NM-Q-22-52. This date, 910 BP +/40 (AD 1040 to 1195, 1 sigma, calibrated; Beta-110379; Appendix B) potentially represents a Pueblo III occupation. It is more likely, however, based uandpon the ceramic profile (Chapter 25) that the site dates primarily to the Pueblo II period. Reed and Goff found no ceramics dating to the Pueblo III period (post AD 1150) from the 14 sites in the project area which they investigated, though Protohistoric sherds were identified.

Protohistoric

The Protohistoric Period varies in time depending on what area of the American Southwest one is discussing. It is a period when records are being written in an area or region, yet a period when those records are not comprehensive enough to chronicle all of the events, groups, or individuals of that period. The Protohistoric, for the general project area, will be dated from AD 1539 to 1700, following Brown (1996). Zimmerman and Abbott (1996) extend the period to AD 1860.

One component at site NM-Q-23-60 dates to the Protohistoric period, based upon Navajo Gray Ware, Jeddito Yellow Ware, and Zuni Glaze Ware sherds. This ceramic assemblage gives evidence for an occupation range between AD 1630 and 1700 (Chapter 25). This component, then, most likely represents an early Navajo occupation. Two Dinetah Gray sherds were also recovered from site NM-Q-23-63. These are the first indication of Navajo settlement within the project area. As mentioned in the Culture History section of this report (Chapter 3), Schaafsma (1979) believes the Navajo did not populate the San Juan drainage in appreciable numbers until the Pueblo Revolt in AD 1680. Based upon the data recovered from our investigations, it is difficult to determine if the occupation at site NM-Q-23-60 dates to the early or late 1600s.

Most of the Protohistoric component at site NM-Q-23-60 is believed to be located outside the project boundaries. Organic staining of sediments was observed in the vicinity of the Zuni Glaze Ware sherds, but predominately outside the proposed right-of-way. Therefore, no discussion can be made regarding the research issues of mobility/sedentism. Regarding land use, we know the site is located on the dune ridges of the Chaco Slope, along a major tributary to Indian Creek, and very close to the Dutton Plateau. The site is not in a defensive location, as known for many early Navajo sites (Marshall and Hogan 1991). Without investigating portions of the site outside the proposed right-of-way, however, we can not determine site function or diet and subsistence practices.

Historic

The Historic Period is dated here from AD 1700 to the present. This period witnessed changes from a subsistence-based to a wage labor economy. Six sites in the project area included components dating to this period: sites NM-Q-27-13, NM-Q-22-48, NM-Q-23-57, NM-Q-23-58, NM-Q-23-59, and NM-Q-23-60.

Duration of occupation at these sites ranged from short- to long-term. The two sites located on top of the Dutton Plateau, sites NM-Q-27-13 and NM-Q-22-48, were characterized by short-term to single event occupations. Material from site NM-Q-27-13 may be from a nearby habitation (Chapter 30) dating in the late nineteenth to early twentieth centuries. Site NM-Q-22-48, comprising two glass fragments for this component, represents a single disposal event, likely within the past 20 years.

Sites on the Chaco Slope, below the Dutton Plateau, are larger and have more extensive occupations (similar to those of the prehistoric periods). Site NM-Q-23-57 is a large, multicomponent habitation located at the base of the plateau and including three disinct historic occupations between the late nineteenth and early twentieth centuries. Site NM-Q-23-58 comprises a short-term occupation dating between the late nineteenth and early twentieth centuries. This site contains a small hogan or sheepherder's structure outside the project right-of-way. Site NM-Q-23-59 comprises a light scatter of historic material and likely represents limited activity in the area. Site NM-Q-23-60 has multiple historic components. A short-term occupation between the late nineteenth and early twentieth centuries is indicated by a bottle top fragment. A more recent occupation, dating to the 1960s, also occurred at site NM-Q-23-60. No artifacts from this latest occupation were collected.

Site spatial structure can be discussed for sites NM-Q-23-57, NM-Q-23-58, and NM-Q-23-60. Site NM-Q-23-57 includes three stone hogans arranged in a linear fashion from north to south. The hogans are believed by Polk (Chapter 17) to have been occupied consecutively between the late nineteenth and early twentieth centuries. Extramural hearths, ash dumps, and artifact concentrations generally occur to the northeast, east, and southeast of these structures. A possible sweatlodge is located to the west of the central stone hogan.

The spatial structure at site NM-Q-23-58 could also be determined. This site includes a small circular depression (Chapter 18) that likely functioned as a short-term habitation. This structure is located adjacent to, but outside, the proposed right-of-way. Therefore, it was not investigated. A low-density artifact scatter comprised of medicine bottles, glass, and historic whitewares was recorded to the west of the structure (Chapter 30). Cut juniper was scattered throughout the site.

The most recent occupation of site NM-Q-23-60 is manifested extensively across the site (Chapter 20). Historic material is concentrated within and beyond the proposed right-of-way. A depression, possibly representing a habitation structure, was observed outside the right-of-way. A concentration of material, along with the remains of a wooden corral, were observed in the northernmost portion of the site. Stone corrals and stone hogans were observed, but not investigated, outside the right-of-way below the canyon rim to the southeast of the main portion of the site. Investigation of this area would prove beneficial to understanding the Historic period at site NM-Q-23-60. Most recently, within the past 10 years, a horse has been buried within the site boundaries, indicating continued use of this location.

Data pertaining to diet and subsistence for this time period were obtained primarily from site NM-Q-23-57 and historic records. Traditionally, Navajo subsistence is based upon sheep (along with goats and cattle) supplemented by horticulture and hunting and gathering. Polk (Chapter 30)

states that subsistence items comprise the most frequent material remains on the historic sites in the project area. Containers from canned fruits and vegetables, chiles, potted meat, evaporated milk, juice, spices, coffee, lard, tuna, baking powder, and cocoa were recovered. These are all foods that can be stored for long periods of time without refrigeration.

Population and Demography

Local and regional population growth and abandonment is the central issue in this research domain. Studies of population dynamics, such as size, growth, and decline, and the mechanisms of demographic variability are germane to this issue. Processes of abandonment are relevant also. The nature of the investigations at this phase of the project do not allow thorough examination of this research domain.

Increases and decreases in the numbers of sites in an area over time have may be interpreted as a general indicator of population growth or decline, immigration, emigration, and abandonment (Chapter 5). Ranges of activities varied through time, however, and produced differing types, as well as numbers, of sites. No analysis of human remains is available or will be forthcoming from the project area, as directed by Navajo Nation guidelines. Nevertheless, a brief examination of the number of sites for each major component within and adjacent to the project area provides a hint of past population dynamics.

A review of Tables 4.1 and 4.2 provides the number of components at sites within 1.6 km (1 mi) of the project boundary. No information is given regarding site size or number of rooms or kivas. Sites are also described as dating to broad time periods, such as AD 900 to 1100 (traditionally Pueblo II). Yet, many researchers now extend the Pueblo II to AD 1150, further complicating the matter. Archaic components at sites are often difficult to recognize, and they are most certainly underrepresented in these counts. It is also difficult to determine function without further investigation of these sites. For sites dating to the Pueblo II, Pueblo III, and Historic periods, it was often easy to distinguish habitation sites, but not always. For sites dating prior to the Pueblo II period, no attempt was made to distinguish habitations from other types of sites. Given these caveats, a tentative discussion of population dynamics is provided below.

Population was certainly low during the Paleoindian and Archaic periods. As mentioned above, two sites within and adjacent to the project area are known to include Paleoindian components. They are located near one another, on the Chaco Slope of the San Juan Basin. One site (LA 20893) listed in Table 4.1 is described as multicomponent Archaic. This site is located approximately 1.4 km (0.9 mi) northwest of site NM-Q-23-60, which contains multiple, intensive Late Archaic occupations. Population is believed to have increased during the Late Archaic, but without further investigations any discussion of Late Archaic population would be speculative.

Based on number of components, it appears that population more than doubled from Basketmaker III (n = 12) to Pueblo I (n = 33). Within the project area itself, very little evidence for the Pueblo I exists. Reed and Goff (Chapter 25) found virtually no good ceramic evidence for occupation of the project area during the Pueblo I period. The three large Basketmaker III sites near the northern end of the project (sites NM-Q-23-62 through NM-Q-23-64) indicate occupation of the area during this time was intensive, and most likely extensive.

Population seems to have risen dramatically during the Pueblo II. Excluding the Hurley Site (LA 10959), a Pueblo II great house, a total of 102 components were identified within 1.6 km (1 mi) of the project boundaries. Habitations comprise 68 (67%) of these components, while other sites such as fieldhouses and limited activity sites constitute the remainder of sites. The majority of Pueblo II sites are associated with the Muddy Water community, and are predominately outside (but adjacent to) the project boundary. Within the project area itself, including those sites not tested, four habitations are present, along with eight short-term habitations or limited activity sites.

Assessment of Pueblo III population dynamics is difficult due to the lack of specific information regarding many of the sites. Thirty-three components are listed in Tables 4.1 and 4.2 that date to the period between AD 1100 to 1300. Habitations comprise 22 (67%) of these components, while fieldhouses or other types of sites make up the remainder of sites. Within the project area itself, no site can be confidently placed within the Pueblo III. Site NM-Q-22-52 may conceivably have a very early Pueblo III component based upon one radiocarbon date (Beta 110379; Appendix B). Reed and Goff (Chapter 25) believe the ceramics from this site are clearly Pueblo II, however. It would seem that a significant decrease in population, followed by abandonment of the area, occurred during the Pueblo III. Abandonment of the area was likely the result of several factors, some of which were environmental degradation (Chapter 2) and the collapse of the Chaco System (Judge 1989).

Occupation of the area does not manifest itself again until the Protohistoric Period. As described above, site NM-Q-23-60 includes a Protohistoric occupation, most of which is outside the project boundaries. Population density was low during this period, but increased steadily through the Historic Period.

The Historic Period has witnessed significant increases in population in the project area. A total of 71 components dating to the Historic period are listed in Tables 4.1 and 4.2. Habitations make up 36 (51%) of these components, while other sites such as corrals, concentrations of refuse, and ceremonial sites comprise the remainder of sites. Designation of a site as a habitation was based on whether hogans were present. Within the project area itself, three Historic sites were identified by Zimmerman and Abbott (1996) as habitations, along with four nonhabitation sites (primarily sweatlodges or other types of ceremonial sites). Along with a general increase in the population of the Navajo Nation, improvements of the infrastructure of the entire region has contributed to increased growth and development within the project area. The growth of nearby Crownpoint and Mariano Lake, New Mexico, indicates this trend continues.

Social Organization

Local group formation, community development, and horizontal and vertical organization at these local levels are key issues in this research domain. The fundamental key to these research issues is an understanding of the contemporaneity between sites, and among features within those sites. At this stage in the project, there is no fine-grained control of contemporaneity on these levels. In spite of this, a brief discussion of these issues is possible in general terms.

Local Group Formation and Community Development

Late Archaic. Manifestations of local group formation are evident beginning in the Late Archaic in the project area. Artifact distribution, patterning of features, and staining are believed to be evidence that task-specific groups or other small groups are potentially identifiable for the Late Archaic at sites NM-Q-23-60 and NM-Q-23-58. Discussion of group development above the task-group or household level during the Late Archaic requires further investigation.

Basketmaker III to Pueblo II. Both local group and community development are evident between the Basketmaker III to Pueblo II periods. By the Pueblo II period, a distinct community was present in the northern portion of the project area. Numerous habitations clustered near public architecture, such as great houses and great kivas, mark the development of the Muddy Water community. Most of these sites are outside the project area, save for limited Pueblo II occupation at sites NM-Q-23-63 and NM-Q-23-64. The development of the Muddy Water community, however, arguably began prior to the Pueblo II. The three Basketmaker III sites at the northern end of the project provide information regarding the early development of the Muddy Water community.

Importantly, information gained from testing at the Basketmaker III sites identified features at the task and household levels (Chapters 21, 22, and 23). When combined, these sites provide information regarding the development of the Muddy Water community from early to late Basketmaker III. Further research will provide data on the early development of great-house communities. This should allow initial testing of Kantner's (1996) political competition model for the region.

Protohistoric and Historic Periods. Discussion of local group formation and community development, along with horizontal and vertical organization, during the Protohistoric and Historic Periods is beyond the scope of this project at this phase of work. Groups were identified at the household level only at site NM-Q-23-57, however, it is not believed that the households recorded were occupied contemporaneously.

Horizontal and Vertical Organization

As discussed in Chapter 5, horizontal organization refers to the nature of internal segmentation and integration within groups. Vertical organization refers to social inequality in groups, and may manifest itself through differential access to goods, resources, and space. Gaining control of contemporaneity between features and sites, again, is essential. During this phase of work, only contemporaneity within broad periods of time is possible. The length of the phases during the late Archaic, and subseqent difficulty establishing contemporaneity, precludes any in-depth discussion of horizontal organization at this phase of the project. No obvious manifestations of vertical organization are evident during this period. During the Basketmaker III, however, we begin to see possible indicators of vertical organization.

Basketmaker III. Incipient development of vertical organization may be evident in the Basketmaker III sites at the northern end of the project. As mentioned above, these sites, when taken collectively, span the entire Basketmaker III period. Few obvious indications of social stratification

are evident at site NM-Q-23-62, which dates primarily to the late AD 500s. It is during the AD 600s, and quite possibly the late AD 600s, that we begin to see significant variation in features to infer social differentiation. These data come mainly from site NM-Q-23-64, where variation in architecture and location of large storage features are believed to reflect emerging social stratification.

Five pitstructures were identified at site NM-Q-23-64, ranging in diameter from 2.7 m (Feature 8) to 8 m (Feature 6). The diameter of Feature 8 may not reflect a true diameter, based upon the location of the backhoe trench within the pitstructure. Although the sample size is small, Feature 6 clearly stands out as much larger than the other pitstructures at the site. Interestingly, the largest storage pits found at either site NM-Q-23-63 or NM-Q-23-64 are located adjacent to the largest pitstructure. These are large bell-shaped storage pits that are 2 m or greater in diameter at their base. These pits are twice as large as the bell-shaped storage pit observed at site NM-Q-23-63, an apparently contemporaneous site.

Feature 12, a pitstructure, at site NM-Q-23-64 also warrants discussion related these research issues. It is not altogether clear whether the data obtained from this pitstructure relate best to horizontal or vertical organization within the emerging Muddy Water community. Feature 12 has a diameter of 6 m, and comprised a very interesting assemblage of artifactual and other data. Zunie (Chapter 23) suggests wooden structural members, fired clay hearth collars, and ground stone may be present within the pitstructure. Cummings and Moutoux (Chapter 29) identified elevated levels of *Zea mays* and the only *Picea* (spruce) identified in their pollen counts. Based upon these data, Feature 12 appears to have had, at least in part, a specialized function. This function may have been religious in nature. Further supporting this interpretation is a fetish, possibly a coyote (see Figure 26.7) that was recovered from this pitstructure.

Pueblo II. Vertical organization is evident during the Pueblo II within the Muddy Water community. This is based primarily upon the significant differences between the great house and great kiva complex and the contemporaneous small habitations within the Muddy Water community. It is still unclear, however, how great houses and great kivas functioned within communities. Even less clear is whether individuals, groups, or the entire community sponsored the construction and maintenance of great houses and great kivas.

Within the project area itself, vertical organization is inferred at site NM-Q-22-50 (LA 110313). This site was rerecorded by ZCRE personnel during the inventory phase of this project. It comprises a rubble mound measuring 20 by 15 m (Zimmerman and Abbott 1996:70) and multiple extramural features. It is the most prominent Pueblo II site along the existing N11 road, and likely played an important role when occupied. It is located atop the Dutton Plateau, well away from the Muddy Water community. This site was not tested by ZCRE personnel, and will be avoided by any construction activities.

Regional Relationships

Cultural affilliation and boundaries, and processes within and on the peripheries of regional systems are the research issues under this domain. They are concerned with intergroup relationships

at a scale beyond the local area. These issues involve the study of style, exchange, material analyses, and distribution. They are addressable to a limited extent based upon the data recovered from the testing efforts beginning with the Late Archaic.

Late Archaic

A brief discussion of regional relationships is possible for the Late Archaic. Specific identification of cultural affiliation and boundaries or regional systems is difficult during this period. An examination of lithic material that is clearly not from local contexts, such as obsidian, Washington Pass chert, and yellow spotted chert (sometimes referred to as Chinle chert), provides some interesting patterns (Chapter 26). The two sites with the most obsidian (in terms of number) have significant Late Archaic/Basketmaker II components (sites NM-Q-23-60 and NM-Q-23-62). Interestingly, no obsidian was recovered from site NM-Q-23-58 which also contains intact Late Archaic deposits. Washington Pass chert was found at each site containing a Late Archaic or Basketmaker II component, but only in minor amounts. Yellow spotted chert was located at both sites NM-Q-23-60 and NM-Q-23-62, but appears to become predominant during the Basketmaker III period.

The obsidian recovered during the testing efforts was not sourced. All that can be said at this point is that the obsidian was obtained from well outside the general region of the Chaco Slope of the San Juan Basin. Washington Pass chert, of course, is obtained from the pass with the same name in the Chuska Mountains. Yellow spotted chert, or Chinle chert, outcrops around Lookout Mountain in the Zuni Mountains (Vierra 1993:163). Vierra, however, cautions that there are many varieties of this type of chert, and identification may be difficult. At any rate, it appears that resources in various directions and distances were exploited during the Late Archaic.

One interesting observation regarding cultural affiliation was made regarding a projectile point (Figure 26.3) recovered from site NM-Q-23-58. This projectile point is clearly a type known as Los Pinos (Morris and Burgh 1954:Figure 27; Vivian 1990:Figure 4.11). Los Pinos phase (AD 1 to 400) sites are most commonly found in southwestern Colorado and the Navajo Reservoir District of northwestern New Mexico (Eddy 1961, 1966). The Los Pinos projectile point from site NM-Q-23-58 may indicate relationships with groups in these regions. It also may indicate a slightly longer occupation (into En Medio) than the radiocarbon dates document.

Basketmaker III

This examination of regional relationships is based primarily upon data obtained from the ceramic assemblages from the three Basketmaker III sites at the northern end of the project (sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64). During the very early Basketmaker III period, all ceramics identified to series and type were made locally (Chapter 25). This is based on the data from site NM-Q-23-62, where Cibola wares comprise the entire assemblage. Tallahogan Red is present, making one believe Kayenta ceramics make up a portion of the assemblage. Reed and Goff (Chapter 25) believe that it was produced locally within the San Juan Basin.

By the AD 600s, data indicate that more formal interaction with groups throughout the San Juan Basin and other portions of the Colorado Plateau was beginning to occur. Ceramic series present at site NM-Q-23-63 include Cibola Gray Ware, Cibola Gray/Brown Ware, and Cibola White Wares, along with a trace of both Mogollon Brown Ware and San Juan Red Ware. At site NM-Q-23-64 no San Juan Red Ware sherds were recovered, yet Mogollon Brown Ware is present in trace amounts. All but one sherd were typed as within the Cibola series from site NM-Q-23-64.

A notable absence within the assemblage is the presence of Chuska tradition ceramics. Many San Juan Basin sites have varying amounts of Chuska ceramics (Chapter 25), however, no Chuska ceramics were recovered from any of the 17 sites tested along the project area. Interestingly, Marshall et al. (1979) also observed very few to no Chuska ceramics on Pueblo II sites around the Muddy Water great houses. This apparent pattern would be important to investigate further during the next phase of the project.

Pueblo II

Regional relationships in the project area become formalized during the Pueblo II. The Muddy Water great house complex, and the other great houses in the immediate area, such as Kin Ya'a, Section 8, and Dalton Pass, along with the seemingly extensive road system, indicate a formal system of interaction with other groups throughout the San Juan Basin, and particularly Chaco Canyon. None of the Pueblo II habitations of the Muddy Water community are within the project area. Marshall et al. (1979:219), however, demonstrate that Cibola series sherds at Pueblo II sites in the Muddy Water community are predominately Cibola Gray and White Wares. Chuska Gray Ware sherds are noticeably absent, as seen in the Basketmaker III assemblages. Traces of Mesa Verde White Wares are present beginning in the Late Pueblo II, further indicating interaction with the northern San Juan Basin.

Within the project area itself, the Pueblo II sites are dominated by Cibola Gray Wares and White Wares. Interestingly, no San Juan tradition ceramics are found in the assemblages of the sites on the Dutton Plateau. Although the sample size is far too small to draw any conclusions, it is an interesting pattern that could be investigated further.

Recently, Kantner (1997) has shown that clusters of Pueblo II habitation on top of the Dutton Plateau, also known as Lobo Mesa, occur in locations where multiple cost-paths (GIS-generated, mimimal energy paths between two locations) cross one another. This may help explain why a significant Pueblo II presence is found atop the plateau, where agriculture would have been more difficult than at lower elevations.

Protohistoric

From the limited data obtained during testing efforts, a brief discussion of regional relationships during the Protohistoric period can be made. Navajo Gray Ware, Jeddito Yellow ware, and Zuni Glaze Ware sherds were recovered from site NM-Q-23-60. Although the sample is small, it demonstrates interaction among groups in the project area with the Zuni and Hopi Pueblos during the AD 1600s. The sample size limits, however, any meaningful examination of this interaction.

Historic

The sample size again precludes a lengthy discussion of regional relationships during the Historic period. This research issue during this time period is truly beyond the scope of this project. Historic material recovered from the project, however, does encompass a time when groups within the project area were, to a great extent, self-sufficient to a time when they became involved in a nationwide wage labor economy.

FUNDAMENTAL RESEARCH REQUIREMENTS

There are four fundamental research requirements: archaeological description and material analysis, chronology, paleoenvironmental conditions, and formation processes of the archaeological record. These were outlined in Chapter 5 following the research design. All requirements were fulfilled to the extent that nature and extent testing investigations allow. A summary of the results relevant to each is presented below.

Archaeological Description and Material Analysis

Chapters 7 through 23, Section II of this report, present the descriptions of the sites, the portions of the sites investigated, the procedures used to test for nature and extent of cultural deposits, and the results of those investigations. Because of the nature of the methods of discovery, the descriptions of the individual deposits encountered are necessarily brief. Information limited to several vertical crosssections of an archaeological feature allows little in the way of definitive description. Only limited samples of the feature fill and context have been observed or analyzed.

Chapters 24 through 30, Section III of this report, present the analytic data derived from the materials collected. Small assemblages do not support particularly in-depth analyses, and a significant portion of the entire assemblage was obtained from surface contexts. The ceramics contribute to an understanding of the chronology for several sites, and all artifact classes provide data regarding subsistence and technology.

Chronology

The discussion of culture history in Chapter 3 provides the structure within which the sites under study can be placed. Chapter 25 presents the majority of chronological data. The primary method with which to place the sites in temporal context was ceramic typology. Identified types can be associated with time periods and median dates of manufacture. The assemblages thus provide an estimate for the period and time of occupation. Supporting data for several features in question is derived from radiocarbon dating (Appendix B). The radiocarbon dates do not definitively place the features in temporal context, but do present an estimate for the period of occupation. Unfortunately, radiocarbon dates obtained for some features do not agree with other data, such as geomorphological context. The geomorphological studies presented in Chapter 24 provide additional temporal contexts for sites expected to be investigated during the final phase of the project.

Environmental Studies

The physiographic, geological, hydrological, pedological, botanical, zoological, and climatological background data required for interpretation are presented in Chapter 2. The modern conditions existing in the project area provide insight into paleoenvironmental conditions when combined with data from studies specifically designed to reveal past environmental variability. Chapters 24, 27, 28, and 29 provide additional insight into the physical environmental context for the sites and their occupants.

Formation Processes

No intensive investigations were conducted regarding the simple and complex properties of artifacts, because of the preliminary and partial nature of the excavations and assemblages recovered in nature and extent testing. The properties of deposits that could reflect formation processes were addressed through the careful archaeological description of the sediments observed in hand-excavated units and backhoe trenches, and the involvement of a geomorphologist in the study of exposed subsurface stratigraphy. Further investigations in this area will be conducted during the next data recovery phase of the project.

CONCLUDING REMARKS

The 17 sites investigated during nature and extent testing along the proposed N11(1&2) project area comprise Paleoindian, Archaic, Basketmaker, ancestral Pueblo, and Protohistoric and Historic Navajo components. Data from investigation of these components are seen as evidence for intensive use of the project area beginning in the Late Archaic. Significant occupation (i.e., occupation that left intact cultural deposits) is inferred for the project area throughout the Late Archaic. The San Jose, Armijo, En Medio, and late En Medio phases are represented at these sites. The potential is high for these sites to contribute meaningful information regarding Late Archaic settlement and subsistence strategies, technology, land use, and the transition to the Basketmaker III period.

Information gathered from Basketmaker III components within the project area hint at various segments of community life during these times. The beginnings of ceramic production in the project area are seen at site NM-Q-23-62, during the early Basketmaker III. Variation in architecture and storage features is evident by the late Basketmaker III at sites NM-Q-23-63 and NM-Q-23-64. Political competition models such as that proposed by Kantner (1996) may be applicable not only to the Pueblo II, but also the Basketmaker III period. Processes along these lines that seem to have formalized during the Pueblo II may have begun during earlier periods.

Within the immediate area of the project distinct communities with public architecture and a formal system of interaction with other communities throughout the region is evident during the Pueblo II. Sites within the project area dating to this period varied in function. The limited-activity sites likely reflect use of the area by inhabitants of the great-house communities. Short-term habitations were also tested, and are believed to reflect seasonal use of the uplands. Ceramic

production was taking place in the southernmost portion of the project, near Mariano Lake. Although data from all of these sites are limited, they may be interpreted as providing the support structure for great-house communities.

The Protohistoric period, represented by two components in the project area, was also characterized by a geographically extensive system of interaction. Although this interaction may not have been as formal as the Chaco regional system, it provided occupants of the project area with material from as far away as Zuni and Hopi. Future research may also provide information pertaining to the production, and locations of production, of Dinetah Gray Ware.

The project area witnessed an increase in population beginning in the late nineteenth and early twentieth centuries. This period was characterized by a changing economy throughout northwestern New Mexico, as reflected by the variation in the historic artifact assemblage. The area continues to grow in population, as seen in the development of Crownpoint and Mariano Lake, New Mexico. The development of a modern infrastructure, availability of higher education, and proximity to rail lines and the interstate highway system have provided a foundation for future growth in the general project area.

SECTION V

DATA RECOVERY PLAN FOR FURTHER INVESTIGATIONS

Chapter 33

FOCUSED RESEARCH DESIGN AND RESEARCH POTENTIAL

The general research design that ZCRE uses for investigations throughout the northern Southwest is presented in Chapter 5, with modifications that address the archaeological record of the N11(1&2) project area. For final data recovery, it is now necessary to focus on specific research issues relevant to the types of sites, components, features, and deposits observed during the nature and extent testing.

RESEARCH ORIENTATION

Following the general research design, this discussion will be presented under the four broad areas of research interest, or research domains. Each domain is a general aspect of current research interests throughout the American Southwest. These are discussed in greater detail in Chapter 5, and only a brief summary will be presented in the following discussion. The range of the prehistoric and historic cultural sequence represented in the data recovery sites allows all of the research issues presented in Chapter 5 to be addressed.

Environment and Economy

The research domain of "Environment and Economy" concerns the relationship between people and the environment. Research issues within this domain addressable by the N11(1&2) data recovery effort include mobility/sedentism and land use. Specific aspects of these research issues may be addressed, and are discussed below.

Within the research issue of mobility/sedentism, specific questions regarding occupation duration, site spatial structure, season(s) of occupation, site reuse, and modes of abandonment may all be examined from the data collected during the final data recovery phase. Estimates of residential stability and use duration are important factors regarding these areas of investigation. In considering land use, environmental location, site function, and diet and subsistence practices are important aspects of this research issue.

Mobility/Sedentism and Land Use

Paleoindian Period. One site, NM-Q-23-60, has a probable Paleoindian component. As mentioned earlier, another Paleoindian component is known at a nearby site. Basic data regarding the environmental location for site NM-Q-23-60 have already been gathered. These data will be augmented by further paleoenvironmental studies conducted during the final data recovery phase. Additional intensive analyses of the lithics from this site may yield more data regarding site function during this period.

Late Archaic Period. Two sites (NM-Q-23-58, and NM-Q-23-60) contain buried deposits dating to the Late Archaic period. These components include a possible San Jose Phase occupation at NM-Q-23-60, Armijo Phase occupations at NM-Q-23-58. The possible San Jose Phase occupation is manifest in an extensive organically stained layer, pit features and postholes, indicating the presence of structures. Occupation duration, site spatial structure, season(s) of occupation, site reuse, and modes of abandonment are potential areas of further research within this component. Environmental location, site function, and diet and subsistence practices are also potential areas of research.

These research issues may also be addressed for the Armijo Phase occupations at site NM-Q-23-58; however, most of the cultural deposits at this site are deflated and out of context. Still, intact buried features are present and may contribute to our understanding of mobilty/sedentism and land use during the Armijo Phase on the Chaco Slope.

Late En Medio/Basketmaker II Period. Several pit features (n= 7) that appear to date to the Late En Medio/Basketmaker II period were discovered at site NM-Q-23-60. Information gathered from the excavation of these features will contribute to our understanding of mobility/sedentism and land use. These data will be particularly important because they will allow a broader examination of the changes that take place in the Basketmaker III period. Also, Vivian (1990:101) notes that Late En Medio sites are rare on the Chaco Slope, further indicating the importance of this component at site NM-Q-23-60.

Basketmaker III Period. The Basketmaker III sites (NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64) have high potential to contribute substantially to our understanding of mobility/sedentism and land use for this period. These sites provide a range of occupation from early to late Basketmaker III, allowing an examination of these issues over a long period of time. ZCRE estimates that as many as 13 pitstructures may be present in these 3 sites, and as many as 68 extramural features. Each research issue will be addressable from the data obtained from these features.

Pueblo II Period. Five sites (NM-Q-27-13, NM-Q-22-52, NM-Q-22-54, NM-Q-23-56, and possibly NM-Q-23-60) will contribute to our understanding of Pueblo II mobility/sedentism and land use. Information regarding occupation duration, site spatial structure, season of occupation, and site reuse will be important in determining site function and relationships with the Muddy Water community and other great house communities in the region. Site NM-Q-27-13 will provide important information regarding ceramic production and the setting in which this activity was conducted during the Pueblo II.

Sites NM-Q-22-52 and NM-Q-22-54 will contribute to our understanding of small (possibly seasonal) Pueblo II sites on the Dutton Plateau, while sites NM-Q-23-56 and NM-Q-23-60 will add to our understanding of small Pueblo II sites located at the base of the Dutton Plateau.

Protohistoric Period. Many of the data that can be recorded regarding Protohistoric environment and economy issues have already been recorded. It is believed that most of the features associated with the Protohistoric component at site NM-Q-23-60 are located outside the area of

construction, and are therefore beyond the realm of investigation. More detailed analyses of the ceramic assemblage from this occupation, however, may prove beneficial. Zuni Glaze Wares can be sourced by refiring, and then compared to the work previously conducted by Mills (1995).

Historic Period. Site NM-Q-23-57 will contribute substantially to our understanding of late nineteenth century and early twentieth century mobility/sedentism and land use. This is a period when the economy was in transition to wage labor, and the artifact assemblage has the potential to contribute significantly to our understanding of changes in diet and subsistence. Three hogans enable a close examination of occupation duration, site spatial structure, site reuse and modes of abandonment.

Population and Demography

The research domain of "Population and Demography" examines the characteristics and dynamics of human population. Although the sites recommended for the final data recovery phase span thousands of years, they are unlikely to yield significant information regarding population and demography dynamics for each period in the cultural sequence. Rather, by combining information from other investigations in the area with the data gathered from the final data recovery phase, it may be possible to investigate questions of local population size, growth, and decline for the Basketmaker III to late Pueblo II/early Pueblo III periods. Information gathered by Marshall et al. (1979) will be a primary source of information regarding the number and distribution of sites near the project area.

Studies of demographic variability are not possible, due to policies currently in place prohibiting the direct study of human remains within the project area. Processes of abandonment, however, can be estimated from feature (including pitstructures), trash, and activity area assemblages.

Social Organization

The research domain of "Social Organization" concerns issues related to how groups structure themselves. Research issues focus on local group formation and community development, and horizontal and vertical aspects of social structure.

Local Group Formation

Paleoindian Period. There is limited potential for the Paleoindian component at site NM-Q-23-60 to contribute this research issue.

Late Archaic Period. Features and activity areas dating to the Late Archaic (possible San Jose Phase at site NM-Q-23-60, and Armijo Phase at site NM-Q-23-58) potentially will be able to address issues at the local group or task-group level.

Late En Medio/Basketmaker II Period. The Late En Medio/Basketmaker II period component at site NM-Q-23-60 will also contribute to the research issue of local group formation. This information will be important for a better interpretation of the Basketmaker III, when village/community groups have established themselves upon the landscape.

Basketmaker III Period. Several pitstructures were discovered during the testing phase at the Basketmaker III sites (NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64) and will potentially contribute to our understanding of household economy during this period. The Basketmaker III is the first period which allows examination of local social groups above the household level or task-group level, and may be the period in which political competition began (or at least the period in which it begins to manifest itself) on the Chaco Slope.

Pueblo II Period. Household economy and interaction may be addressable in the final data recovery phase during the Pueblo II, although no architectural features will be excavated. Task-group activities, possibly representing households, will be examined. These activities likely represent a range of endeavors at site NM-Q-22-52, where numerous features were observed. High potential for examining ceramic production during the Pueblo II period exists at NM-Q-27-13, where probable kilns were discovered. The site's location indicates ceramic production was being conducted, at least in part, away from community centers.

Protohistoric Period. Limited potential exists for examining local group formation at the Protohistoric component at site NM-Q-23-60.

Historic Period. Features discovered at site NM-Q-23-57 will potentially provide insight into late nineteenth and early twentieth century Navajo household economy. Information from these features and the artifact assemblage, coupled with historical research for the area, may allow examination of group formation above the household level for this area of the San Juan Basin.

Community Development

Basketmaker III Period. The three sites dating to the Basketmaker III period (NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64) allow an examination of early community development on the Chaco Slope. These sites represent the beginnings of the Pueblo II period Muddy Water great house community. Sites NM-Q-23-63 and NM-Q-23-64 appear to be contemporaneous (though more data are needed to support this probability), allowing investigation of intersite integration, and comparisons of assemblages and architectural variation, which in turn permit the study of political competition. It will also be important to gather information on the distribution of Basketmaker III communities in the general area of the project in an attempt to examine their spatial scale. Identifying the spatial organization of Basketmaker III communities along the Chaco Slope may provide clues to developing land tenure systems and community territories. Spatial analyses between communities will also allow an investigation of the available resources which each community could have potentially exploited. This investigation may provide clues to community variation known to have developed during the Pueblo II period.

Pueblo II Period. Recognizable communities are known for the Pueblo II period within and near the project area. A portion of the Muddy Water great house community is located in the northern portion of the project, which includes multiple great houses, clustered contemporaneous unit pueblos, a great kiva, and prehistoric roads (linear bermed features). A portion of one of the roads extends into the project area. It is unclear from the testing phase data how the Pueblo II components represented at sites NM-Q-27-13, NM-Q-22-52, NM-Q-22-54, NM-Q-23-56, and

NM-Q-23-60 relate to the Muddy Water community or other communities in the area. Sites NM-Q-22-54, NM-Q-22-52, and NM-Q-23-56 may provide information on habitations (possibly seasonal habitations) located away from the core communities. Investigation of seasonal habitations will allow an examination of land use and land tenure systems associated with the Pueblo II communities of the area. Site NM-Q-27-13 will provide information on ceramic production in the area, which may benefit our understanding of intersite and intercommunity interaction. Site NM-Q-23-60 contains a low density scatter of Pueblo II ceramic artifacts, suggesting limited use of this locality. Further investigations may reveal the specific nature of these activities. In general, though, the Pueblo II components at these sites will provide data regarding the support system for the nearby great house communities.

Protohistoric Period. Potential for investigating Protohistoric community development from the few artifacts recovered from site NM-Q-23-60 is limited. These data would have to be combined with historical data regarding the Navajo settlement of the San Juan Basin and their interaction with other groups, such as the Hopi, Acoma, and Zuni.

Historic Period. As in the case of the Protohistoric period, a discussion of community development for the Historic period will need to be coupled with additional information. Site NM-Q-23-57 has high potential for contributing to our understanding of community development in the Crownpoint area. The site's integration into the larger national economy will be a key aspect of our investigations. By focusing our research in this direction, we may be able to observe how other communities facilitated the distribution of goods to isolated households.

Horizontal Organization

Basketmaker III Period. Internal segmentation, interaction and integration will be investigated at sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64. These studies will complement other analyses conducted to examine community dynamics during this period.

Pueblo II Period. Horizontal organization within Pueblo II communities will be difficult to examine from the limited number of sites (n=5; NM-Q-27-13, NM-Q-22-52, NM-Q-22-54, NM-Q-23-56, and NM-Q-23-60) dating to this period. Ceramic and lithic analyses will be used to examine the production and distribution of these resources in order to examine this research issue.

Protohistoric Period. The potential for examining Protohistoric period horizontal organization at site NM-Q-23-60 is low due to the limited nature of investigations (analyses can only be conducted within the proposed construction zone).

Historic Period. Internal settlement dynamics at site NM-Q-23-57 are potentially addressable for the Historic period. Spatial analyses of the features and architecture will be critical for these issues, as will establishing a fine-grained chronology for the site and its architectural features.

Vertical Organization

Basketmaker III Period. Examining the nature of vertical organization within sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64 will be important not only for a better understanding

of community dynamics during the Basketmaker III, but also for a more in-depth analysis of political competition within communities. Several lines of evidence from sites NM-Q-23-63 and NM-Q-23-64 suggest there may have been competition during late Basketmaker III times. Variation in pitstructure size and the proximity of the largest storage features to the largest pitstructures suggests groups (or households) were in the process of establishing greater access to goods and resources.

Pueblo II Period. Social inequality may have become established across much of the San Juan Basin and its peripheries during the Pueblo II period. This is manifest in specialized architecture, such as great houses and great kivas, and artifact assemblages contained therein. Examining the nature of vertical organization during this period in the project area will be difficult due to the types of Pueblo II components (small, seasonal, and specialized) represented in the final data recovery phase sites. Comparison of artifact assemblages from these small and specialized sites, combined with previous and on-going investigations of Pueblo II sites in the area will provide information on this research issue. Kantner is currently conducting research on ceramic artifacts throughout the region in which the project area is located (John Kantner, personal communication). Collaboration with such research projects will provide valuable information regarding the Pueblo II components in the project area.

Protohistoric and Historic Periods. The potential for intensive analyses of vertical organization during the Protohistoric and Historic periods from the components at NM-Q-23-57, and NM-Q-23-60 is low. An evaluation of access to resources during both of these periods, however, is possible. Hopi Yellow Ware and Zuni Glaze Ware are both present at site NM-Q-23-60, indicating interaction with the western Pueblos. This assemblage could be compared with other Protohistoric assemblages in the region to examine variation in the distribution of these products. Analyses of artifacts at site NM-Q-23-57 will provide information on changes in access to goods between the late nineteenth century and early twentieth century at the household level, but additional historical data will be needed to integrate these data into discussions of community vertical organization.

Regional Relationships

Cultural Affilliation and Boundaries

Paleoindian Period. Style and exchange are important aspects of this research issue. The probable Paleoindian component at NM-Q-23-60 could potentially provide insight to both style and exchange during this time period. The raw material can possibly be sourced, which may provide information on exchange. Additional attribute analyses on the fluted base may also provide information on style and reduction strategies.

Late Archaic Period. Relationships between Late Archaic groups on the Chaco Slope and those identified elsewhere in the northern American Southwest are potentially addressable during the final phase of data recovery. The probable San Jose Phase occupation at site NM-Q-23-60 and the Armijo Phase occupation at site NM-Q-23-58 will yield artifact assemblages conducive to

examining manufacture and use of lithic tools. This information can be compared to Late Archaic assemblages elsewhere. Raw material sourcing is also a potential avenue for investigating the range of interaction during these phases.

Late En Medio/Basketmaker II Period. The Late En Medio/Basketmaker II component at site NM-Q-23-60 will contribute to research issues related to distinguishing Late En Medio and Los Pinos assemblages. Vivian (1990:105-109) discusses the similarities and differences between these two adaptations. Los Pinos phase sites tend to cluster in the northern portion of the hydrologic San Juan Basin, while Late En Medio sites tend to cluster in the core San Juan Basin. Chronometric data will produce needed information regarding the contemporaneity of these two Late Archaic manifestations, which currently is not well established. Data recovered regarding diet and subsistence during this phase may provide information to the timing of the transition to horticulture in the Chaco Slope. Although no evidence for cultigens was recovered during the testing phase, Los Pinos horticulturists were establishing settlements in the northern portions of the San Juan Basin (Stuart and Gauthier 1981:36; cited in Vivian 1990:107-108). If no cultigens are found at site NM-Q-23-60 during the Late En Medio/Basketmaker II occupation, this may indicate groups along the Chaco Slope were continuing an Archaic adaptation rather than accepting horticulture. These types of data will provide information regarding cultural affiliation and boundaries during this period.

Basketmaker III Period. Vivian (1990:113) identifies four subregional variants for the Basketmaker III period throughout the Four Corners region. These variants include the La Plata in the northwestern portion of the area described above, Sambrito in the northeastern portion, Trujillo-Sky Village in the southeastern portion, and Lupton, in the very southwestern portion of this region. The three Basketmaker III sites within the project area (NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64) fall within the La Plata variant in this scheme. The range of La Plata sites, however, extends to the Lowry area of southwestern Colorado, located over 175 km to the northwest of the project area. Investigations of the range of cultural similarities and differences within the La Plata variant, based upon architectural, ceramic, and other assemblage data will be conducted. Interaction with the other subregional variant groups, especially Lupton, will also be investigated, primarily through ceramic and lithic artifacts.

Pueblo II Period. The widespread and formal nature of interaction among groups during the Pueblo II makes discussion of cultural affilliation and boundaries complex. Architecture and ceramic data are important for any discussion of these research issues. Vivian (1990:448-492) discusses the distinction between San Juan and Cibola traditions at Chaco and the San Juan Basin. Vivian (1990:449) believes that these "two diverging cultural traditions evolved simultaneously in the central Basin from at least AD 400." The San Juan tradition was based upon a dual social organization (and reflected in great house architecture), and the Cibolan tradition was based upon "social relationships embedded in the lineage" (Vivian 1990:449). Investigations to be conducted during the final phase of data recovery will address this research issue. Analysis of ceramic artifacts will provide most of the information that can be obtained from the sites in the project area. Architectural data will be gathered from recorded Pueblo II sites in the general area (particularly within the Muddy Water great house community). The interpretation of these architectural data will be particularly concerned with the presence or absence of duality. Investigations of the ceramic data will focus on the distribution of San Juan versus Cibolan wares.

Ceramic data from the testing phase hint at the identification of boundaries during the Pueblo II period. The distribution of San Juan Wares (Reed and Goff, Chapter 25) does not extend beyond the San Juan Basin. These wares do not extend onto the Dutton Plateau within the project area. Additionally, no Chuska Gray Wares were recovered during the testing phase within the project area. This implies little interaction with groups along the Chuska Slope. Further analyses on larger samples are needed, however, to suggest boundaries were present between these groups.

Protohistoric Period. The potential for examining cultural affilliation and boundaries during the Protohistoric period is low. Few data were recovered from the Protohistoric component at site NM-Q-23-60, which primarily consisted of information from ceramic artifacts. These few data, however, attest to the complexity of addressing cultural affilliation based on material remains. Boundaries, of course, are different and can be investigated through the examination of the distribution of material. Distribution of Dinetah Gray Ware and Western Pueblo Glaze Wares will be examined to provide further context for the data already recovered from site NM-Q-23-60.

Historic Period. The Historic component at site NM-Q-23-57 is clearly Navajo, precluding the applicability of research issues such as cultural affilliation and boundaries. The expansion of the American frontier, however, likely played an important role in the lives of the occupants of site NM-Q-23-57, and will be an aspect of the research approach for this site. For example, the impact of the railroad and trading posts upon the material culture and diet of households will be areas of research to investigate. This research concerns the expanding boundary of the United States throughout the historic period.

Regional Systems

Pre-Basketmaker III Period. The potential for identifying regional systems from the final data recovery phase sites during the periods prior to the Basketmaker III period is very low. Although it is possible to examine certain types of group interaction within regions, such as raw material distribution and exchange, it is very difficult to establish contemporaneity among sites of this age. Without chronological control it is difficult to identify whether interaction was formalized to the level of a system, which implies a degree of interdependency among its components.

Basketmaker III Period. The beginnings of the Chaco regional system may have begun during the Basketmaker III period. Increased reliance on horticulture (Vivian 1990:455), and increased sedentism may have caused factions to compete for the most productive and predictable agricultural lands. This competition may manifest itself in variation in architecture and storage, as seen in site NM-Q-23-64.

Evidence of Pacific coast shell was recovered from sites NM-Q-23-62 and NM-Q-23-63. This indicates that groups on the Chaco Slope were not restricted to interacting with others in the San Juan Basin, but had more widespread interactions. Distributional analyses of such non-local material will be examined within each Basketmaker III site.

Pueblo II Period. The most likely period in which a true regional system was extant within the project area is the Pueblo II. The Chaco regional system (Crown and Judge 1991; Vivian 1990) manifests itself in the project area and surrounding region in the form of Chaco-style great houses, great kivas, roads and road segments, and ceramic artifacts from throughout the San Juan Basin (Chapter 3). As mentioned throughout this report, within the project area small (possibly seasonal) and limited or specialized activity sites dating to the Pueblo II will be excavated during the final data recovery phase. A prehistoric road associated with the Muddy Water great house community is also located within the project area. These sites, when coupled with previous and current research, will potentially enable an examination of great house models.

There are numerous competing models that attempt to explain the occurrence, function, and distribution of Chaco-style great houses during the Pueblo II. Vivian (1996) has recently outlined five explanatory "scenarios," compilations of similar explanatory models, for the Chaco regional system. These include Chaco and the regional system as a state (Wilcox 1993), a Puebloan enterprise (Vivian 1996:48), a cosmography (Fritz 1978), a redistribution/ceremonial center (Judge et al. 1981; but see Judge 1989 for revisions of this model), and simply as a pan-regional eastern Anasazi adaptation (Lekson 1991).

To focus on how data collected from the final phase of data recovery will enable an examination of the Chaco regional system and evalute current explanatory models, we must direct our investigations to the local, or community, level. Kendrick and Judge (1998) have proposed that a product of local (or outlying) Chaco-style great houses within communities was continued economic autonomy at the household level. This model could potentially be evaluated through the sites with Pueblo II components within the project area by examining the control of resources. Do resources, such as agricultural lands, water, clays, and lithic raw material continue to be controlled by small sites or are they controlled by the larger community? Sites such as NM-Q-27-13, a ceramic production locale, will potentially provide data relevant to these issues. The sites of NM-Q-22-52, NM-Q-22-54, and NM-Q-23-56 will contribute data from small and possibly seasonally occupied sites to these issues.

Protohistoric Period. Regional exchange systems were certainly operating during the Protohistoric period, as seen by the Hopi Yellow Ware and Zuni Glaze Ware recovered from site NM-Q-23-60. The nature and timing of the interaction between various groups throughout northwest New Mexico and northeast Arizona during this period in time is not well understood. Did the interaction take place at the household or community level? Were more than just pots exchanged? What advantages were provided by the exchange system? Questions such as these are not likely to be addressable by the data collected from site NM-Q-23-60, but they emphasize that more focused investigations are needed to better understand the Protohistoric period.

Historic Period. The Historic period component at site NM-Q-23-57 will provide data that will contribute to our understanding of the transition from a local/regional economy to a national economy in the late nineteenth to early twentieth centuries for residents of the project area. Again, historical data from beyond the project area will be necessary to provide context for this period. Analyses of the artifact assemblage from this site will potentially provide data on the changing nature of regional distribution networks, and the role(s) households played in these systems.

SITE-SPECIFIC SUMMARY

Table 33.1 provides a site-specific summary of the research potential of each of the ten sites to be investigated during the final phase of data recovery along N11(1&2). The summaries are based on the research design and research potential discussed above.

FUNDAMENTAL RESEARCH REQUIREMENTS

The four areas of fundamental research requirements are archaeological description, chronology, past environmental conditions, and formation processes. The first requirement encompasses all the standard methodology, recording, and analysis common to southwestern archaeological investigations. No special requirements are called for in this investigation; ZCRE's standard methodology will fulfill this requirement. The second requirement involves an effort to precisely date the features and deposits that are the subject of investigation. Here, relative dating will be provided by stratigraphy and ceramic typology, while absolute techniques will involve dendrochronology, radiocarbon dating, and perhaps archaeomagnetic dating. The third requirement involves further study of geology, geomorphology, hydrology, soils, vegetation, fauna, and climate, as well as paleobotanical analysis of flotation samples and other plant matter recovered, and palynological studies. The fourth requirement involves study of simple and complex properties of artifacts, including size, density, diversity, refitting, and sedimentology.

Table 33.1. Research Potential of Each Site to be Investigated During the Final Phase of Data Recovery Along N11 (1&2).

		Environment and Economy		Social Organization				Regional Relationships	
Sites	Component	Mobility/ Sedentism	Land Use	Local Group Formation	Community Development	Horizontal Organization	Vertical Organization	Cultural Affiliation and Boundaries	Regional Systems
NM-Q-27-13	Pueblo II	-	X	X	X	-	X	X	X
	Historic	-	-	-	-	-	-	-	-
NM-Q-22-52	Pueblo II	X	X	X	X	-	X	X	X
NM-Q-22-54	Pueblo II	X	X	-	X	-	X	X	X
NM-Q-23-56	Pueblo II	X	X	-	X	-	X	X	X
NM-Q-23-57	Historic	X	X	X	X	-	-	X	X
NM-Q-23-58	Armijo	X	X	X	-	-	-	X	-
NM-Q-23-60	Paleoindian	X	X	-	-	-	-	X	-
	San Jose (poss)	X	X	X	-	-	-	X	-
	Late En Medio	X	X	X	-	-	-	X	-
	Pueblo II	X	X	-	X	-	X	X	-
	Protohistoric	-	-	-	-	-	-	X	X
	Recent	-	-	-	-	-	-	-	-
NM-Q-23-62	Early Basketmaker III	X	X	X	X	X	X	X	X
NM-Q-23-63	Basketmaker III	X	X	X	X	X	X	X	X
NM-Q-23-64	Basketmaker III	X	X	X	X	X	X	X	X

Chapter 34

DATA RECOVERY FOR 10 SITES ALONG N11

INTRODUCTION

This chapter outlines in detail the archaeological Data Recovery activities proposed for 10 sites (NM-Q-27-13, NM-Q-22-52, NM-Q-22-54, NM-Q-23-56, NM-Q-23-57, NM-Q-23-58, NM-Q-23-60, NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64) along N11. The proposed archaeological investigation, in the context of the Zuni Cultural Resource Enterprise (ZCRE) Research Design and Fundamental Research Requirements, is in keeping with established guidelines for the treatment of archaeological properties under 36 CFR Part 800 and the Archaeological Resources Protection Act (ARPA).

Basic assumptions regarding the scope of work for Data Recovery are based upon an estimated amount of cultural material present within the project area and the amount of information retrieval deemed necessary in order to satisfy the ZCRE Research Design and Fundamental Research Requirements. The sampling design outlined below will allow for the excavation of some portion of most features.

FIELD METHODS

Procedures for the collection of archaeological data will be generally uniform on all 10 sites. Due to the unique nature of archaeological sites, there will be some deviation from the methods outlined below. It is likely that the presence of unanticipated features or other cultural materials will require modification of the proposed methodology. If no evidence of cultural integrity can be discerned for individual features during final Data Recovery, excavation will be terminated.

Mechanized Operations

Heavy equipment will be used on most sites in order to facilitate identification of site boundaries, to find the depth of cultural deposits, and to expedite feature excavation. Mechanized operations will quickly and efficiently expose the buried cultural material noted during the testing phase. Once the depths of known cultural material are reached, individual features and structures will be identified. ZCRE will excavate the number of pitstructures anticipated within the data recovery plan at each site. If a greater number of pitstructures is uncovered than anticipated in this data recovery plan, the decision will be made to sample the identified pitstructures. This sampling will allow us to remain within budget. The main criteria for selecting the pitstructures to be excavated will be integrity of preservation and potential for non-redundant information retrieval. Heavy equipment will be used in order to facilitate identification of feature and pitstructure boundaries, to find the depth of cultural deposits, and to re-locate previously identified features and locate new features. A belly scraper or backhoe will be employed to carry out most of the overburden and expose the features and structures identified during the testing phase at the sites. Where possible, mechanized scraping will be employed at the completion of excavation of all known

features in order to establish whether or not all features present have been identified. As much of each site area as possible will be scraped. In areas where scraping is not feasible, mechanized- or hand-trenching may be attempted. This decision will be made on a site-by-site basis in the field. Pitstructures and features identified during mechanized operations will be hand excavated in the manner described below.

Hand Excavations

Hand-excavated units will be placed in areas where subsurface features or cultural deposits were identified during the testing phase of the project. In general, hand excavation will proceed in arbitrary 10-cm levels. If appropriate, excavation may be done in natural levels. This decision will be made in the field based on stratigraphy and proveniencing requirements. Most of the material excavated by hand will be screened through 1/4-in mesh. In some cases, only a sample of the material excavated by hand will be screened. All artifactual materials recovered during systematic hand excavation will be collected with provenience information. All artifacts will be subjected to analysis by ZCRE analytic consultants. All hand excavated units will be excavated at least two levels below sterile before excavation is terminated.

Feature Excavations

Pitstructures

Pitstructures will be sampled in the following way. Controlled excavation of a 1-by-1-m (1 cu m) or 1-by-2-by-1-m (2 cu m) will be performed for each pitstructure. Once the elevation of the floor has been established, a backhoe will remove the rest of the fill down to 20 cm above the floor. The rest of the material left in the structure from 20 cm above the floor to the floor will be excavated systematically by hand. Total documentation of the features will include controlled excavation of the 1-by-2 m unit, excavation of all material from 20 cm above the floor, excavation of all internal features, collection of samples from the pitstructure floor, a sub-floor test, and mapping and photographing of the feature. Sampling will include retrieval of soil from features and floors for flotation (paleoethnobotanical analysis) and pollen analysis. These techniques will provide data on diet and subsistence, seasonality, land use, and possibly site (or pitstructure) spatial structure and inter-site spatial organization. On the basis of observations made during test excavations, we estimate 18 pitstructures. If more than 18 pitstructures are discovered during mechanized stripping, a sampling strategy will be imposed so as to investigate only 18 such structures.

Surface and Other Structures

Controlled excavation of a portion of a surface or other structure (1-by-1 m or 0.5-by-2 m hand-excavated units) will be performed by hand. Once depth and stratigraphy have been established, the remaining fill will be removed non-systematically down to within 20 cm above the floor. Given the size of the average hogan at site NM-Q-23-57 this excavation will probably be accomplished by hand, not mechanically. Smaller, possible Archaic structures at site NM-Q-23-60 will be excavated in a similar fashion. It is probable that the outlines of the Archaic structures will

be revealed during mechanized scraping. If this is the case, then the floor will be identified and the fill removed as described above. In this case ZCRE does not anticipate large amounts of fill. Upon completion of these tasks, hand excavation of all material 20 cm above the floor, hand excavation of all internal features, collection of samples from all internal features and the floors, a sub-floor test, mapping and photographing of the feature will take place. Sampling will include the techniques noted above in order to examine economic and social questions. If similar structures are identified in the immediate subsurface, a sampling strategy will be implemented to ensure that redundant information retrieval does not occur.

Extramural Features

We anticipate approximately 163 extramural features once mechanized stripping unearths the buried occupations at the sites. We will sample these features so as to avoid excavation of redundant feature types that repeatedly yield similar information. In general, extramural features will be excavated by bisecting the feature. One-half of the feature will be removed without samples or screening in order to establish depth and stratigraphy. This removed fill will be curated in the laboratory at ZCRE for contingency purposes. The remaining one-half of the fill will be taken entirely, (if the feature is very small, like a posthole), or sampled if the feature is larger. If the feature is small, the fill may be taken entirely as samples (pollen, soil, water/fine screen, paleoethnobotanical, radiocarbon, and dendrochronological). Pollen samples will be taken from the floor of the feature and from ground stone used for food preparation that might be found in association with the features. The entire feature will be cleaned out, maps drawn, and photographs taken. Features larger than 1 cu m will be exposed until a determination of function can be made if possible. The feature will then be sampled by one of several methods, depending on the assumed function of the feature. One possible sampling strategy includes excavating a quarter rather than a half (this will take place if redundancy in feature presence is high and information potential is thus limited). Another possibility is removal of fill to the feature floor and subsequent sampling. In the case of high potential for non-redundant information, the large features will be excavated in their entirety. This decision will be made on a feature-by-feature basis in the field. All features will be mapped. If it is found that an inordinate number of features are exposed during mechanized stripping (more than will be able to be excavated within the scope of work as allowed for in the budget) then a systematic sampling strategy will be imposed on specific sites. This sampling strategy will be based on the excavation of features until the derived information becomes redundant, at which point excavation will cease.

Treatment of Human Remains

In strict accordance with the *Navajo Nation Policy for the Protection of Jishchaa': Gravesites, Human Remains, and Funerary Items*, treatment of human remains will be limited to in-field non-destructive determination of age and sex. The approximate date of internment and culture affiliation will be determined based on burial context and funerary items. ZCRE anticipates eight burials will be identified during data recovery excavations.

ADDITIONAL FIELD INVESTIGATIONS

Because the northern portion of the site lies in the vicinity of the Muddy Water Protection Area, consultation with the Interagency Management Group (IMG) will be required. The IMG is a umbrella group of government agencies charged with the protection of selected Chacoan sites. The consultation process will take the form of presenting the IMG with the results of field work and the proposed treatment. Additional consultation will also be required because of the presence of Chacoan linear features near the three northernmost sites (sites NM-Q-23-62, NM-Q-23-63, and NM-Q-23-64). This effort will be coordinated through the offices of John Stein, Program Manager, Chaco Canyon Protection Sites Program, Navajo Nation Historic Preservation Department. It is anticipated that this collaboration will allow for the exploration of the Chacoan landscape as it relates to the Chacoan presence at the Muddy Water Great House and the Pueblo II sites located during the course of this project. These Pueblo II sites are located south of the Muddy Water area and at a higher elevation. If these sites were integrated into the Chacoan social and economic sphere, then a landscape approach centered at the great house site will provide important links to community integration during that time period. Similarly, we have an excellent opportunity to examine the evolution of a great house community by exploring landscape changes and land use associated with the three Basketmaker sites at the north end of the project area. We will ask whether this Basketmaker presence constituted the antecedents of Chacoan great house community development. If so, we need to integrate elements of the pre-Chacoan landscape into an evolutionary model of community development. These goals will be addressed and put into place through the consultation process outlined above. This process will be at two levels. The first level will be through the normal procedures of report reviewing. The second level will involve in-field examination of the Muddy Water Chacoan landscape by the Navajo Nation Historic Preservation Department's Chaco Canyon Protection Sites Program staff. ZCRE personnel will not conduct any field work within the Protection Area but will work to complement this activity by examining features within the project area and by synthesizing results into a comprehensive study of pre-Chacoan and Chacoan landscapes associated with a great house community.

SITE SPECIFIC WORK PLAN

The site specific work plan outlines the number of projected structures and features present on each site and the total level of effort proposed for total excavation and identification of all features. Estimates for the total of number of structures and features is based upon the number and dimensions of structures and features discovered during testing as well as known feature density and volume for sites of similar time period and size in the general project area.

Site NM-Q-27-13

During the testing phase, evidence of ceramic manufacture and kiln use was revealed at site NM-Q-27-13. ZCRE estimates that a total of 10 extramural features are present on this site. Following the feature excavation design outlined above, excavation of all features will require 5 cu m of controlled hand excavation (Table 34.1). The total volume of mechanical stripping proposed for this site is 4048 sq m (Table 34.2).

Table. 34.1. Projected Number of Features and Total Proposed Hand-excavations.

	Pitstructures		Extramural Features		Burials		Surface Rooms	
Site	No.	Volume (cu m)	No.	Volume (cu m)	No.	Volume (cu m)	No.	Volume (cu m)
NM-Q-27-13	-	-	10	5	-	-	-	-
NM-Q-22-52	3	4	30	15	2	2	-	-
NM-Q-22-54	-	-	1	1	-	-	-	-
NM-Q-23-56	-	-	2	2	-	-	-	-
NM-Q-23-57	-	-	21	11.5	-	-	2	10
NM-Q-23-58	-	-	3	1	-	-	-	-
NM-Q-23-60	5	6	28	14	2	2	-	-
NM-Q-23-62	3	9	30	15	3	3	-	-
NM-Q-23-63	2	6	14	7	1	1	-	-
NM-Q-23-64	8	31	24	12	6	6	-	-
Totals	21	56	163	83.5	14	14	2	10

Table 34.2. Projected Total Mechanical Excavations.

Site	Mechanical Stripping (sq m)
NM-Q-27-13	4048
NM-Q-22-52	2025
NM-Q-22-54	144
NM-Q-23-56	336
NM-Q-23-57	-
NM-Q-23-58	270
NM-Q-23-60	5400
NM-Q-23-62	2470
NM-Q-23-63	1034
NM-Q-23-64	2680
Totals	18407

Site NM-Q-22-52

ZCRE estimates that 3 pitstructures, 30 extramural features, and 2 burials are present at this Pueblo II period site located in the higher reaches of the project area. ZCRE proposes 2025 sq m of mechanical stripping for this site (Table 34.2). Upon the completion of the mechanical stripping, the pitstructures will be excavated in the fashion outlined above and the features will either be excavated in full or sampled. Burials will be treated in the manner outlined above (Table 34.1).

Site NM-Q-22-54

ZCRE has identified one feature within the right-of-way at this site. Most of the features at this Pueblo II period site, including a rubble mound and an artifact scatter lie, outside the right-of-

way. ZCRE proposes to mechanically strip 144 sq m (Table 34.2) in order to expose the feature and then excavate the feature. We anticipate that this task will call for 1 cu m of feature excavation (Table 34.1).

Site NM-Q-23-56

This site is located at the base of a steep slope where, during the testing phase, ZCRE identified a cultural deposit buried by colluvial deposits. ZCRE proposes to strip by mechanical means 336 sq m of these deposits (Table 34.2). ZCRE estimates that up to two buried features will be identified. ZCRE proposes to excavate these features and also excavate an additional two 1-by-1-m hand-excavated units into the cultural deposit. Total fill removal is projected at 2 cu m (Table 34.1).

Site NM-Q-23-57

ZCRE identified three hogans at this Navajo site. We propose that one hogan be avoided by constricting the right-of-way and that the remaining two hogans be excavated. No mechanical stripping will be required at this site (Table 34.2). A number of features were also identified at this site. ZCRE proposes either to excavate in full or to sample 21 such features (Table 34.1).

Site NM-Q-23-58

ZCRE proposes to mechanically strip 270 sq m (Table 34.2) of overburden at this site and excavate three features (1 cu m) in areas of dense artifact concentration (Table 34.1).

Site NM-Q-23-60

Site NM-Q-23-60 is a complex site with a number of components. ZCRE estimates that between three and five Archaic or Basketmaker II structures are present near the surface or are buried. We also estimate that 28 extramural features and 2 burials are present at this site. ZCRE proposes 5400 sq m of mechanical stripping for this site (Table 34.2). Upon the completion of the mechanical stripping, the entirety of the Archaic and Basketmaker II structures will be excavated and the features will be excavated in full or sampled depending on information potential. Burials will be treated in the manner outlined above (Table 34.1).

Site NM-Q-23-62

ZCRE estimates that 3 pitstructures, 30 extramural features, and 3 burials are present at this early Basketmaker III site. ZCRE proposes 2470 sq m of mechanical stripping for this site (Table 34.2). Upon the completion of the mechanical stripping, the pitstructures will be excavated in the fashion outlined above and the features will be excavated in full or sampled. Burials will be treated in the prescribed manner (Table 34.1).

Site NM-Q-23-63

ZCRE estimates that 2 pitstructures, 14 extramural features, and 1 burial are present at this Basketmaker III site. ZCRE proposes 1034 sq m of mechanical stripping for this site (Table 34.2). Upon the completion of the mechanical stripping, the pitstructures will be excavated in the fashion outlined above and the features will be excavated in full or sampled. Burials will be treated as described above (Table 34.1).

Site NM-Q-23-64

This site, the most northern in the project area, contains abundant evidence of Basketmaker III pitstructures and features. ZCRE estimates that 8 pitstructures, 24 extramural features, and 6 burials are present at this site. ZCRE proposes 2680 sq m of mechanical stripping for this site (Table 34.2). Upon the completion of the mechanical stripping, the pitstructures will be excavated in the fashion outlined above and the features will be excavated in full or sampled. Burials will be treated in the manner outlined above (Table 34.1).

In summary, the data recovery plan outlined above is designed to recover the most information possible by focusing on sampling from all features. ZCRE believes that this design will ensure that no cultural resources will be left unexamined along N11.

SECTION VI

APPENDICES

APPENDIX A

Excavation and Laboratory Forms

TRANSIT/MAPPING FORM

Revised 3/95

PAGE: ____ of ____

MAPPING STATION: _____
STATION ELEVATION: _____ (M)
INSTR. HEIGHT: _____ (M)
SCOPE ELEVATION: _____ (M)

PROJECT: _____
SITE: _____
DATE: _____
OPERATOR: _____

		HAIR READINGS						
MAP NO.	COMMENTS/NOTES	TOP	MIDDLE	BOTTOM	HORIZ. ANGLE	VERT. ANGLE	DISTANCE	ELEVATION

Additional Mapping Notes: _____

SUB-DATUM LOG

Revised 3/95

PROJECT: _____ SITE: _____ SA: _____ PAGE: ___ of ___

DATUM LETTER	GRID COORDINATES		ELEVATION (M)	DATE ESTABLISHED	DATE CHECKED	DATE ABANDONED	COMMENTS
	NORTHING	EASTING					

STUDY UNIT SUMMARY LOG

Revised 3/9!

PROJECT:_______________ SITE:_______________ SA:_______________ PAGE: ____ of ___

SU NO.	DATE	DESCRIPTION	LOCATION	EXCAVATOR/ RECORDER	SUBDATUM

Entered by:__________ Date:_________

Date: __/__/__ Site Number: _____ Page: _____ of _____

UNIT LEVEL EXCAVATION FORM UNIT: _____ FEATURE: _ _ _

Provenience: North _ _ _ . _ _ East _ _ _ . _ _ Subdatum: ___ Datum Elevation _ _ . _ _

Level: _ _ _ Stratum: _ _ _ _ FS Number(s): _____

Elevations: Beginning: _ _ . _ _ Ending: _ _ . _ _ Initials: _____

Soil Color(s): _____ Texture: _____

Screen Size: ¼" _____ ⅛_____ Other: _____ Not Screened: _____ N/A _____

Dimensions of excavated unit:_____ _____ . _____ _____ by _____ _____ . _____ _____

SCHEMATIC OF AREA EXCAVATED

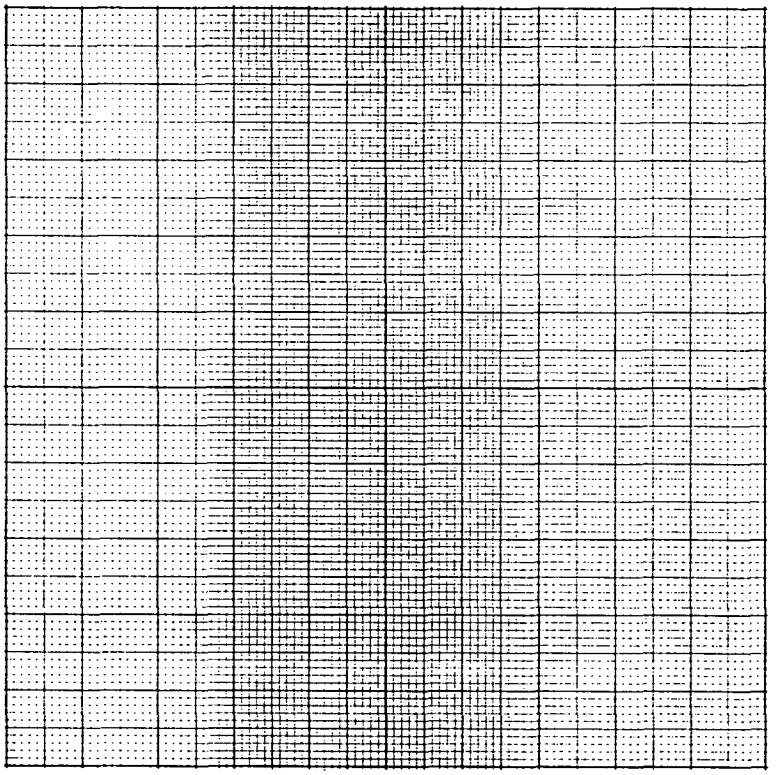
Elevations (m): Tape Reading: **MAGNETIC NORTH** Tape Reading: Elevations (m):

_ _ _ . _ _ _ _ _ . _ _ _ _ _ . _ _ _ _ _ . _ _ b
(beginning)

_ _ _ . _ _ _ _ _ . _ _ _ _ _ . _ _ _ _ _ . _ _ e
(ending)

_ _ _ . _ _ _ d
(difference)

W Corner NE Corner



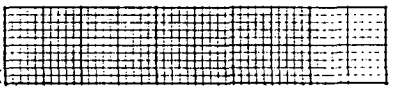
Centerpoint
_ _ _ . _ _ _
(beginning)
_ _ _ . _ _ _
(ending)

SW Corner SE Corner

b_ _ _ . _ _ _ _ _ . _ _ _ _ _ . _ _ _ _ _ . _ _ b

e_ _ _ . _ _ _ _ _ . _ _ _ _ _ . _ _ _ _ _ . _ _ e

d_ _ _ . _ _ _ _ _ . _ _ _ _ _ . _ _ d

Scale: 

Check if present or provide counts as directed

ARTIFACTS:		DEPOSITS/DISTURBANCES		SAMPLES/OTHERS	
Ceramics C	____	Charcoal	____	Flotation B	____
Flaked Stone L	____	FCR	____	Pollen P	____
Ground Stone G	____	Daub	____	Phytolith Y	____
Unmodified Stone U	____	Adobe	____	Waterscreen W	____
Fauna F	____	Masonry	____	Tree-Ring/Dendro D	____
Shell S	____	Rodent Burrows	____	Radiocarbon R	____
Vegetal V	____	Roots	____	Archaeomag A	____
Historic H	____	Mechanical	____	Miscellaneous M	____
Miscellaneous M	____	Dry deposits	____	Fine-screen N	____
Other	____	Wet deposits	____	Other	____

If found, please return to: Zuni Cultural Resource Enterprise, P.O. Box 1149, Zuni, NM 87327

ZUNI CULTURAL RESOURCE ENTERPRISE
PHOTOLOG

PROJECT: _____

FILM TYPE: B/W C/R EXPOSURES: 24 / 36 CAMERA NO. ____ PHOTOGRAPHER: _____ ROLL NO. _____

DATE	SHOT	SITE NUMBER	SU NO.	FEATURE NO.	FACING	DESCRIPTION/COMMENTS	FRAME
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						

DATE	SHOT	SITE NUMBER	SU NO.	FEATURE NO.	FACING	DESCRIPTION/COMMENTS	FRAME
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						
	36						
	37						
	38						
	39						
	40						

LAB USE ONLY	Proofed with Originals by: _____	Date: _____

FEATURE LOG

REVISED 3/95

PROJECT: ______________________ SITE: ______________________ SA: ______________________

PAGE: ____ OF ____

FEA NO.	DATE	DESCRIPTION OF COMMENTS	NORTHING	EASTING	EXCAVATOR/ RECORDER	SUBDATUM

REVISED 3/95

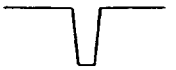
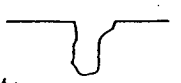
FEATURE SUMMARY FORM

Project: _____

Date: _____ Site: _____

Recorder: _____ SU Type - Number: _____

Supervisory Arch: _____ Feature Number: _____

SHAPE (Circle options)				CONSTRUCTION (Circle all appropriate options)	
Planview		Profile		Walls	Floor/Base
Circular	○	Basin		Earthen	Earthen
Ovoid	⬭	Bell		Slab	Slab
Subrectangular	▭	Cylindrical		Adobe	Adobe
Linear		Trough		Wood	Wood
Square	□	Irregular		Indeterminate	Indeterminate
Irregular		Indeterminate			
Indeterminate					

LOCATION	MEASUREMENT OF TWO DIRECTIONS				DEPTH and/or HEIGHT
	Long Axis	Direction	Short Axis	Direction	
Top:					Max:
Bottom:					Min:

FEATURE FILL SUMMARY (Number strata from top to bottom)

- ☐ Non-cultural Fill
- ☐ Cultural Fill
- ☐ Trashy Fill
- ☐ Ash Lens
- ☐ Charcoal Lens
- ☐ Burned Earth Lens
- ☐ Ash/Charcoal/Burned Earth Lens
- ☐ Wallfall
- ☐ Rooffall
- ☐ In situ Post
- ☐ In situ Vessel
- ☐ Other, describe: _____

Stratigraphy Form must be attached and completed.

FEATURE FUNCTION					
GENERAL	Thermal	Storage	Post	Other	Indeterminate
	1	1	1	1	1
SPECIFIC	Hearth	Bin	Primary	Deflector	Pit
	Roasting Pit	Floor Vault	Secondary	Tunnel	
	Ashpit		Ladder	Ventshaft	
	Lens		Indeterminate	Wingwall	
				Pilaster	
				Mealing Bin/Trough	

CAPPING (Circle Options)				TRUNCATION (List Feature Nos.)	Remodeled (Circle Option)	
None	Slab	Adobe	Stone	By: _____	Yes	No
				Into:		

NARRATIVE

In complete sentences, describe the importance of this feature, which samples are most important, how does this feature relate to other features spatially, temporally, etc.

	Plan View Drawn	Profile Drawn	Cross Section Drawn	Photographed
YES				
NO				

Roll Nos. _____

If response is "YES" put the date in the box. Use an (X) for "NO" responses.

REVISED 3/95

SURFACE ARCHITECTURE FORM

Project: _____

DATE: _____

SITE: _____ **RECORDER:** _____

FEATURE NO.: _____ **SUPERVISOR ARCH:** _____

DIMENSIONS

Attributes	Location of Wall Measurements				Comments
Interior Length of Each Wall					
Maximum Height					
Minimum Height					
Maximum Wall Thickness					
Minimum Wall Thickness					

WALL CONSTRUCTION

TYPE	Stone					
	Vertical Slab					
	Adobe/Wood					
	Earthen					
FOOTING	Stone					
	Vertical Slab					
	Adobe/Wood					
	Earthen					
BASE	Bedrock					
	Sterile					
	Cultural Fill					

WALL ABUTTMENT / BONDING INFORMATION

Wall	Circle appropriate option			Wall
	abuts into	bonds with	indeterminate	
	abuts into	bonds with	indeterminate	
	abuts into	bonds with	indeterminate	
	abuts into	bonds with	indeterminate	

(Circle option)	EARTHEN WALLS / ADOBE/WOOD WALLS					
	Attributes	**Location of Walls**				**Comments**
	Smoothed					
	Digging Stick					
	Smoke Blackening					
	Sterile Submatrix					
(Circle option)	STONE WALLS / VERTICAL SLAB WALLS					
	MAXIMUM # of Courses					
	MINIMUM # of Courses					
MATERIAL	Sandstone					
	Limestone					
	Basalt					
	Igneous, other					
	Ground Stone Inclusion					
SHAPING	Pecked					
	Ground					
	Flaked					
	Unmodified					
SHAPE	Blocky					
	Cobble					
	Tabular					
	Slab					
FACE TYPE	Uncoursed					
	Semi-coursed					
	Fully Coursed					
	Vertical slab					
CROSS SECTION	Single					
	Double					
	Compound					
	Double with Core					
	Compound with Core					

Additional Comments pertinent to this page: _____

MORTAR ATTRIBUTES

Attributes		Location of Wall				Comments
HORIZONTAL Thickness (cm)						
VERTICAL Thickness (cm)						
METHOD	No Mortar (dry laid)					
	Wet Laid					
	Indeterminate					
TYPE	Flush					
	Concave					
	Extruded					
INCLUSIONS	Ash/Charcoal					
	Stone					
	Artifact					
	Not Observed					

PLASTER ATTRIBUTES

Write # of Layers for each wall					

CHINKING ATTRIBUTES

TYPE	None					
	Stone					
	Artifact					
	Not Observed					
FORM	Subangular					
	Spalled					

FLOOR(s)

TYPE	No. 1	No. 2	No. 3	No. 4	
Slab-lined					
Adobe					
Earthen					

SITE: _____ FEATURE NO.: _____

SURFACE ARCHITECTURE FEATURE SUMMARY

A **Feature Summary Form** is required for each feature which records specific details of that feature.

	FEATURE TYPE	FEATURE NUMBER(s)	QUANTITY
FLOOR	Hearth		
	Ashpit		
	Deflector		
	Floor Vault		
	Primary Posts/Postholes		
	Wingwall(s)		
	Bin(s)		
	Floor Pits		
	Floor Depressions (Pot Rests)		
WALL	Entryway(s) - Open		
	Entryway(s) - Sealed		
	Wall Opening(s) - Open		
	Wall Opening(s) - Sealed		
	Niche(s)		

ADDITIONAL NOTES

MASTER PLAN VIEW: Yes / No **CROSS SECTION:** Yes / No

SITE: _____ FEATURE NO.: _____

FEATURE DISCUSSION AND INTERPRETATION

Function: (Circle option) Habitation Storage Ceremonial Indeterminate

Reason/Evidence: _____

Remodeling: (Circle option) Present Absent

Reason/Evidence: _____

Depositional History: (Circle options) Burned vs. Unburned
Intentionally filled vs. Naturally filled

Reason/Evidence: _____

Temporal Placement: Discuss the presence or absence of features in the fill, abundance or lack of construction materials, truncated by or intrusive into other features, etc.

Note: If stone walls exist, draw a representative sketch elevation of masonry style on a separate page.

SUBTERRANEAN ARCHITECTURE FORM

PROJECT: _____ PHASE: _____ DATE: _____

SITE: _____ RECORDER: _____

FEATURE NO.: _____ SUPERVISORY ARCH.: _____

DIMENSIONS

Attributes	Location of Measurement (m)				Comments
Interior Length					
Interior Width					
Floor to Modern Ground Surface					
Floor to Prehistoric Surface (if possible)					
Wall Thickness (if applicable)					

WALL CONSTRUCTION

Attributes		Location of Wall				Comments
TYPE	Masonry					
	Slab-lined					
	Adobe/Jacal					
	Earthen					
FOOTING	Masonry					
	Slab-lined					
	Adobe/Jacal					
	Earthen					
BASE	Bedrock					
	Sterile					
	Cultural Fill					

Additional comments pertinent to this page: _____

(Circle option)	EARTHEN WALLS / ADOBE/JACAL WALLS					
Attributes	Location of Walls				Comments	
Smoothed						
Digging Stick Marks						
Smoke Blackened						
Sterile Submatrix						

(Circle option)	MASONRY WALLS / SLAB-LINED WALLS					
MAXIMUM # of Courses						
MINIMUM # of Courses						
MATERIAL	Sandstone					
	Limestone					
	Basalt					
	Igneous, other					
	Groundstone Inclusion					
SHAPING	Pecked					
	Ground					
	Flaked					
	Unmodified					
SHAPE	Blocky					
	Cobble					
	Tabular					
	Slab					

Additional comments pertinent to this page: _____

SITE: _____ FEATURE NO. _____

MASONRY WALLS / SLAB-LINED WALLS (continued)						
Attributes		Location of Walls				Comments
FACE TYPE	Uncoursed					
	Semicoursed					
	Fully Coursed					
	Coursed Patterned					
	Vertical Slab					
CROSS SECTION	Single Stone					
	Double Stone					
	Compound					
	Double with Core					
	Compound with Core					
MORTAR ATTRIBUTES						
HORIZONTAL Thickness (cm)						
VERTICAL Thickness (cm)						
METHOD	No Mortar					
	Wet Laid					
	Indeterminate					
TYPE	Flush					
	Concave					
	Extruded					
PLASTER ATTRIBUTES Write # of Layers in column						

Additional comments pertinent to this page: _____

SITE: _____ STUDY UNIT NO. _____

MORTAR ATTRIBUTES (continued)

Attributes		Location of Walls				Comments
INCLUSIONS	None					
	Ash/Charcoal					
	Stone					
	Vegetal					
	Artifact					
	Not Observed					

CHINKING ATTRIBUTES

TYPE	None					
	Stone					
	Artifact					
	Not Observed					
FORM	Subangular					
	Spalled					

FLOOR(S)

TYPE	No.1	No.2	No.3	No.4	Comments
Slab-lined					
Adobe					
Earthen					

Additional Comments pertinent to this page: _____

(Circle option)	BENCH / RECESS				
Location:			**Shape:**		
Attributes		**Location of Measurements (m)**			**Comments**
DIMENSIONS	Length				
	Width				
	Wall Height above Floor				
	Wall Height above Surface of Bench/Recess				
*WALL CONSTRUCTION TYPE					

(Circle option)	ANTECHAMBER / VENTILATOR SHAFT				
Location:			**Shape:**		
Attributes		**Location of Measurements (m)**			**Comments**
DIMENSIONS	Length				
	Width				
	Floor/Base to Modern Ground Surface				
	Floor/Base to Prehistoric Ground Surface				
*WALL/LINING CONSTRUCTION TYPE					

(Circle option)	ANTECHAMBER TUNNEL / VENTILATOR TUNNEL		
Axis Orientation:		**Horiz. Shape:**	**Vert. Shape:**
Attributes		**Measurements and Type**	**Comments**
DIMEN	Length of Tunnel		
	Width of Opening		
	Height of Opening		
	Height above Floor		
*WALL/LINING CONSTRUCTION TYPE			

***Construction Type Key:** 1 - Masonry; 2 - Slab-lined; 3 - Adobe/Jacal; 4 - Earthen; 5 - Other

SITE: _____ FEATURE NO. _____

FEATURE SUMMARY

A **Feature Description/Summary Form** is required for each feature which records specific details of that feature.

	FEATURE TYPE	FEATURE NUMBERS	QUANTITY
WALL	Inset Primary Post/Postholes		
	Inset Secondary Post/Postholes		
	Niche(s)		
	Pilasters		
BENCH-RECESS	Primary Post/Postholes		
	Secondary Post/Postholes		
	Indeterminate Post/Posthole		
	Pilasters		
	Niche(s)		
	Bin(s)		
	Pit(s)		
FLOOR	Primary Post/Postholes		
	Secondary Post/Postholes		
	Indeterminate Post/Postholes		
	Hearth		
	Ashpit		
	Deflector		
	Floor Vault		
	Wing Wall(s)		
	Bin(s)		
	Pit(s)		
	Shallow Pit(s)		
ANTECHAMBER	Primary Post/Postholes		
	Secondary Post/Postholes		
	Bin(s)		
	Pit(s)		

STRUCTURE DISCUSSION AND INTERPRETATION

Function: Habitation Storage Ceremonial Indeterminate (Circle option)

Reason/Evidence: _____

_____

_____

_____

Remodeling: Present Absent (Circle option)

Reason/Evidence: _____

_____

_____

_____

_____

Depositional History: Burned vs. Unburned (Circle applicable options)

Intentionally filled vs. Naturally filled

Reason/Evidence: _____

_____

_____

_____

_____

Temporal Placement: Discuss about presence or absence of features in fill, abundance or lack of construction materials, truncation into or by other features, etc.

_____

_____

_____

_____

_____

Note: If masonry walls exist, draw a representative sketch elevation of masonry style on the back of this page.

ZUNI CULTURAL RESOURCE ENTERPRISE SOIL RECORDING FORM

PROJECT:
SITE:
UNIT:

RECORDED BY:
DATE:
COMMENTS:

Layer	Depth (cm)	Color Moist	Color Dry	Texture	Structure	Wet Consistence	Dry Consistence	Gravel %	Roots	Boundaries	Artifacts or Other Cultural Material Present
				st fs sl scl k vfs fsl cl g lcos vfsl sicl vcos ls l sc cos lfs si sic s cosl sil c	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	so po ss sp s p vs vp	lo so sh h vh eh	0 50 <10 75 10 >75 25 30 40	vl mi 1 vf 2 f 3 m co	va s a w c i g b d	

Notes:

Layer	Depth (cm)	Color Moist	Color Dry	Texture	Structure	Wet Consistence	Dry Consistence	Gravel %	Roots	Boundaries	Artifacts or Other Cultural Material Present
				st fs sl scl k vfs fsl cl g lcos vfsl sicl vcos ls l sc cos lfs si sic s cosl sil c	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	so po ss sp s p vs vp	lo so sh h vh eh	0 50 <10 75 10 >75 25 30 40	vl mi 1 vf 2 f 3 m co	va s a w c i g b d	

Notes:

Layer	Depth (cm)	Color Moist	Color Dry	Texture	Structure	Wet Consistence	Dry Consistence	Gravel %	Roots	Boundaries	Artifacts or Other Cultural Material Present
				st fs sl scl k vfs fsl cl g lcos vfsl sicl vcos ls l sc cos lfs si sic s cosl sil c	m vf gr sg f pl 1 m pr 2 c cpr 3 vc abk sbk	so po ss sp s p vs vp	lo so sh h vh eh	0 50 <10 75 10 >75 25 30 40	vl mi 1 vf 2 f 3 m co	va s a w c i g b d	

Notes:

Texture: st=stones and stony; k=cobbles and cobbly; g=gravel and gravelly; vcos=very coarse sand; cos=coarse sand; s=sand; fs=fine sand; vfs=very fine sand; lcos=loamy coarse sand; ls=loamy sand; lfs=loamy fine sand, cosl=coarse sandy loam; sl=sandy loam, fsl=fine sandy loam; vfsl=very fine sandy loam; l=loam; si=silt; sil=silt loam; scl=sandy clay loam; cl=clay loam; sicl=silty clay loam; sc=sandy clay; sic=silty clay; c=clay
Structure: m=massive, sg=single grain; 1=weak; 2=moderate; 3=strong; vf=very fine; f=fine; m=medium; c=coarse; vc=very coarse; gr=granular; pl=platy; pr=prismatic, cpr=columnar; abk=angular blocky; sbk=subangular blocky
Wet Consistence: so=nonsticky; ss=slightly sticky; s=sticky; vs=very sticky; po=nonplastic; sp=slightly plastic; p=plastic; vp=very plastic **Dry Consistence**: lo= loose; so=soft; sh=slightly hard; h=hard; vh=very hard; eh=extremely hard
Roots: vl=very few, 1=few; 2=common; 3=many; mi=micro; vf=veryfine; f=fine; m=medium; co=coarse **Boundaries**: va=very abrupt; a=abrupt; c=clear; g=gradual; d=diffuse; s=smooth; w=wavy; i=irregular; b=broken.

ZUNI CULTURAL RESOURCE ENTERPRISE
FILM LOG (FIELD)

ASSIGNED ROLL NO.	FILM TYPE	CAMERA NO.	SITE NUMBER	CREW CHIEF	DATE OUT	DATE IN

TE #: _____

EXCAVATION UNIT LOG AND FIELD SPECIMEN CATALOG SHEET

PAGE:_____of_____

ew Chief:_____

Date:_____/_____/_____

Tracking Data			Provenience		Dimensions			Elevation		Characteristics			Excavtrs		Dates		Recovery	θ
FS #	SU	Feat.	North	East	Len.	Wid.	Area	Start	End	SC	Strat.	Lev.	# 1	# 2	St	Fn	Artifacts Present	✓

Note: Dotted lines=decimal points. SC=screen size: 14=1/4, 16=1/16, 18=1/8, NS=not screened. Level 0=surface. Use Days for start (St) & finish (Fn). Use artifact codes for "Recovery". Check "θ" if no artifacts were recovered.

APPENDIX B

Chronometric Data

BETA ANALYTIC INC.

DR. M.A. TAMERS and MR. D.G. HOOD

UNIVERSITY BRANCH
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305/667-5167 FAX: 305/663-0964
E-MAIL: beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

FOR: Ms. Janet Hagopian
Pueblo of Zuni

DATE RECEIVED: October 14, 1997
DATE REPORTED: November 20, 1997

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)
Beta-110374	2210 +/- 40 BP	-20.1 o/oo	2290 +/- 40 BP
SAMPLE #: LA 38698 FS 118 ANALYSIS: Standard-AMS MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid			
Beta-110375	2250 +/- 40 BP	-20.3 o/oo	2330 +/- 40 BP
SAMPLE #: LA 38698 FS 130 ANALYSIS: Standard-AMS MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid			
Beta-110376	940 +/- 60 BP	-25.0* o/oo	940 +/- 60* BP
SAMPLE #: LA 110304 FS 55 ANALYSIS: radiometric-standard MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid			
Beta-110377	1120 +/- 60 BP	-25.0* o/oo	1120 +/- 60* BP
SAMPLE #: LA 110304 FS 58 ANALYSIS: radiometric-standard MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid			
Beta-110378	1250 +/- 60 BP	-25.0* o/oo	1250 +/- 60* BP
SAMPLE #: LA 110315 FS 76 ANALYSIS: radiometric-standard MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid			

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

BETA ANALYTIC INC.

DR. M.A. TAMERS and MR. D.G. HOOD

UNIVERSITY BRANCH
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305/667-5167 FAX: 305/663-0964
E-MAIL: beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

FOR: Ms. Janet Hagopian

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)
Beta-110379	850 +/- 40 BP	-21.3 o/oo	910 +/- 40 BP

SAMPLE #: LA 110315 FA 119
ANALYSIS: Standard-AMS
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

Beta-110380	2820 +/- 70 BP	-25.0* o/oo	2820 +/- 70* BP

SAMPLE #: LA 110322 FS 62
ANALYSIS: radiometric-standard
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid
COMMENT: the small sample was given extended counting time

Beta-110381	3050 +/- 70 BP	-25.0* o/oo	3050 +/- 70* BP

SAMPLE #: LA 110322 FS 66
ANALYSIS: radiometric-standard
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

Beta-110382	1650 +/- 80 BP	-25.0* o/oo	1650 +/- 80* BP

SAMPLE #: LA 110325 FS 125
ANALYSIS: radiometric-standard
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid
COMMENT: the small sample was given extended counting time

Beta-110383	1810 +/- 70 BP	-25.0* o/oo	1810 +/- 70* BP

SAMPLE #: LA 110325 FS 151
ANALYSIS: radiometric-standard
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid
COMMENT: the small sample was given extended counting time

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

BETA ANALYTIC INC.

DR. M.A. TAMERS and MR. D.G. HOOD

UNIVERSITY BRANCH
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305/667-5167 FAX: 305/663-0964
E-MAIL: beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

FOR: Ms. Janet Hagopian

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)
Beta-110384	1140 +/- 80 BP	-25.0* o/oo	1140 +/- 80* BP

SAMPLE #: LA 110326 FS 75
ANALYSIS: radiometric-standard
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

Beta-110385	2770 +/- 60 BP	-25.0* o/oo	2770 +/- 60* BP

SAMPLE #: LA 110326 FS 130
ANALYSIS: radiometric-standard
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

Beta-110386	1840 +/- 60 BP	-25.0* o/oo	1840 +/- 60* BP

SAMPLE #: FS 173 LA 110327
ANALYSIS: radiometric-standard
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid
COMMENT: the small sample was given extended counting time

Beta-110387	1680 +/- 80 BP	-25.0* o/oo	1680 +/- 80* BP

SAMPLE #: FS 209 LA 110327
ANALYSIS: radiometric-standard
MATERIAL/PRETREATMENT:(charred material): acid/alkali/acid

NOTE: It is important to read the calendar calibration information and to use the calendar calibrated results (reported separately) when interpreting these results in AD/BC terms.

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950A.D.). By International convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

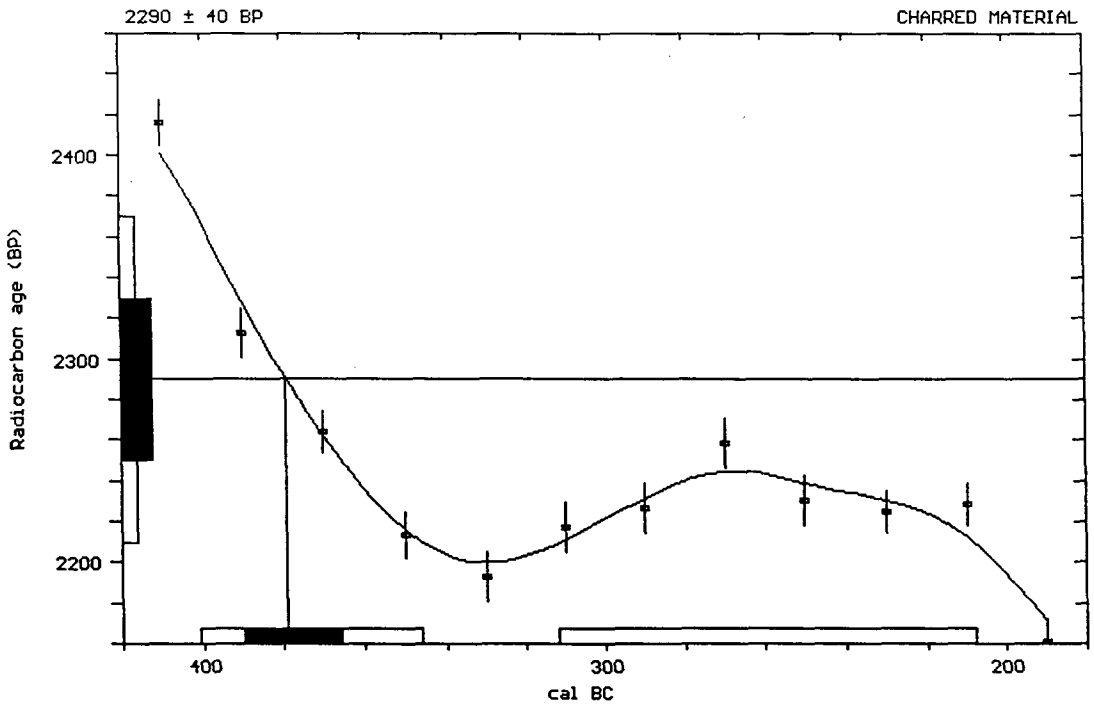
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-20.1:lab. mult=1)

Laboratory Number:	Beta-110374
Conventional radiocarbon age:	**2290 ± 40 BP**
Calibrated results: (2 sigma, 95% probability)	**cal BC 400 to 345 and cal BC 310 to 210**

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal BC 380
1 sigma calibrated results: (68% probability)	cal BC 390 to 365



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-20.3:lab. mult=1)

Laboratory Number: Beta-110375

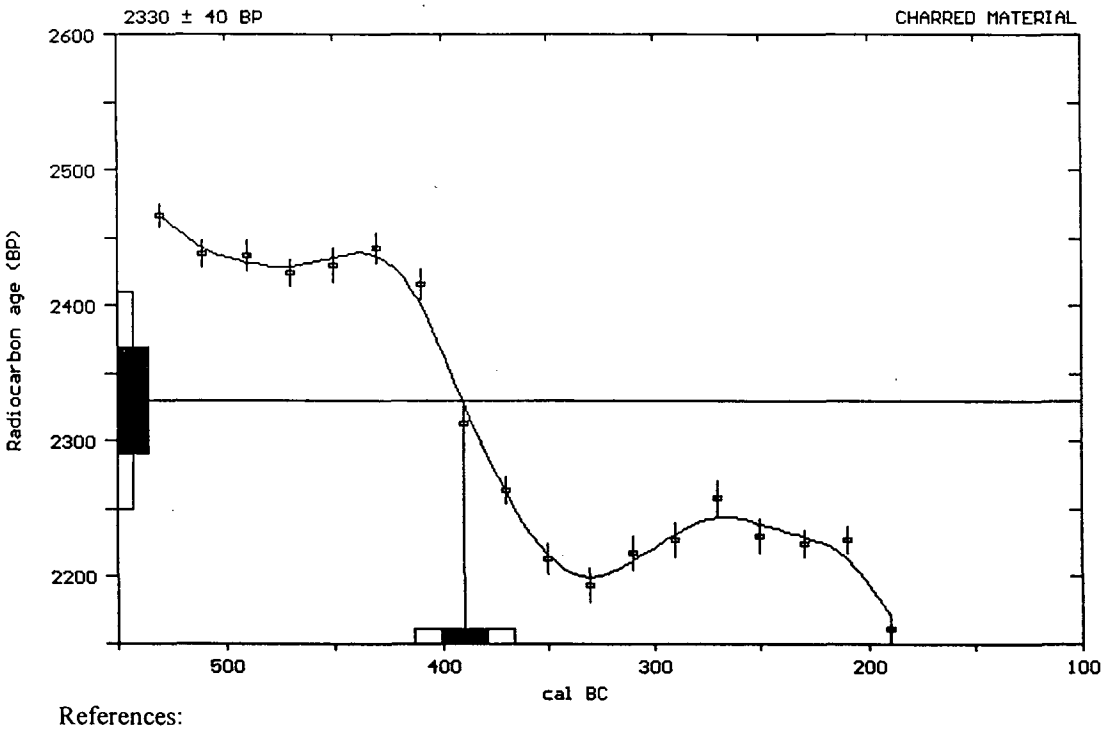
Conventional radiocarbon age: **2330 ± 40 BP**

Calibrated results: (2 sigma, 95% probability) **cal BC 415 to 365**

Intercept data:

Intercept of radiocarbon age with calibration curve: cal BC 390

1 sigma calibrated results: (68% probability) cal BC 400 to 380



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

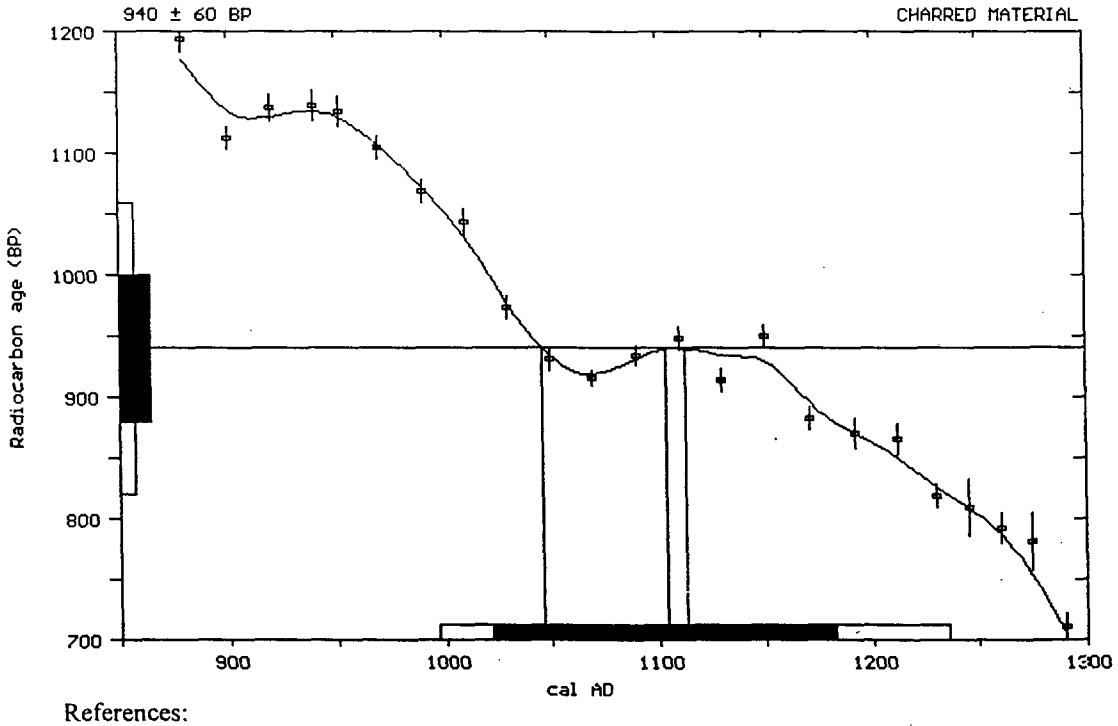
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110376
Conventional radiocarbon age*:	**940 ± 60 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 995 to 1235**

* C13/C12 ratio estimated

Intercept data:

Intercepts of radiocarbon age with calibration curve:	cal AD 1045 and cal AD 1105 and cal AD 1115
1 sigma calibrated results: (68% probability)	cal AD 1020 to 1180



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

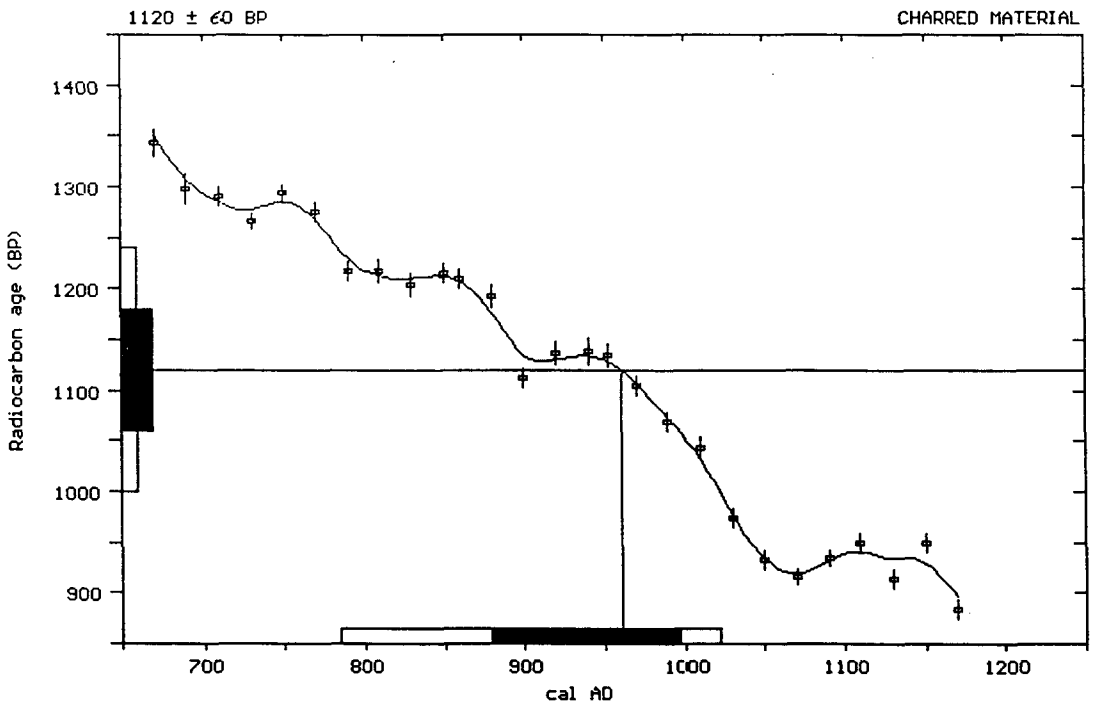
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110377
Conventional radiocarbon age*:	**1120 ± 60 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 785 to 1020**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 960
1 sigma calibrated results: (68% probability)	cal AD 880 to 995



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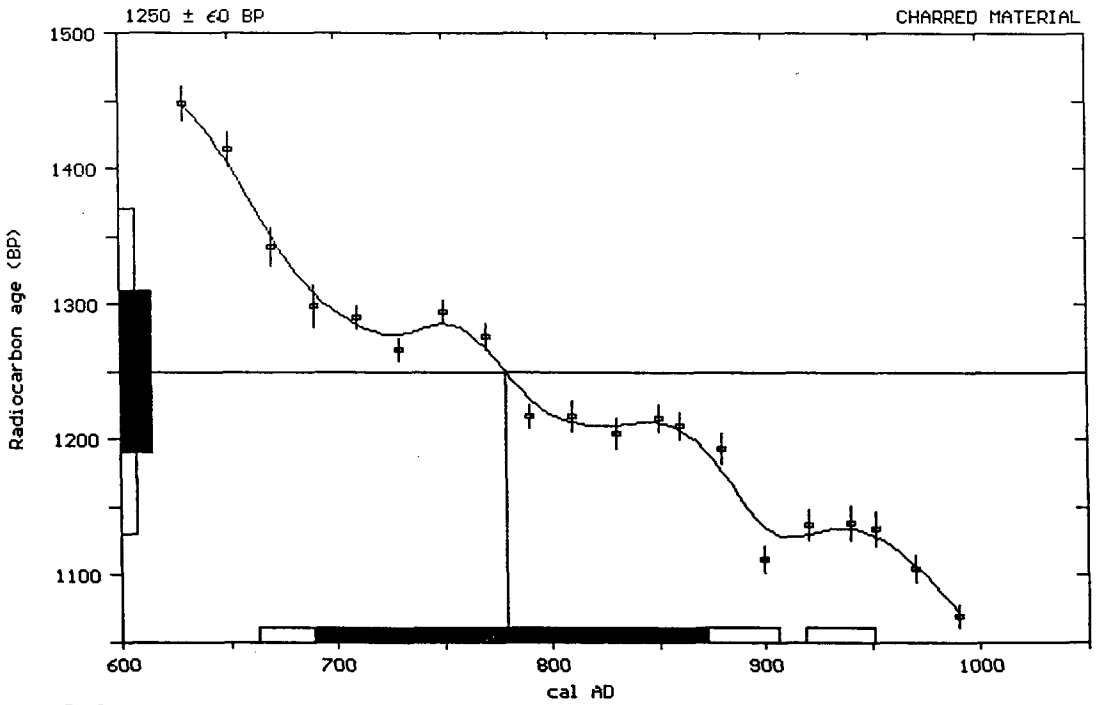
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110378
Conventional radiocarbon age*:	**1250 ± 60 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 665 to 905 and cal AD 920 to 950**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 780
1 sigma calibrated results: (68% probability)	cal AD 690 to 875



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-21.3:lab. mult=1)

Laboratory Number: Beta-110379

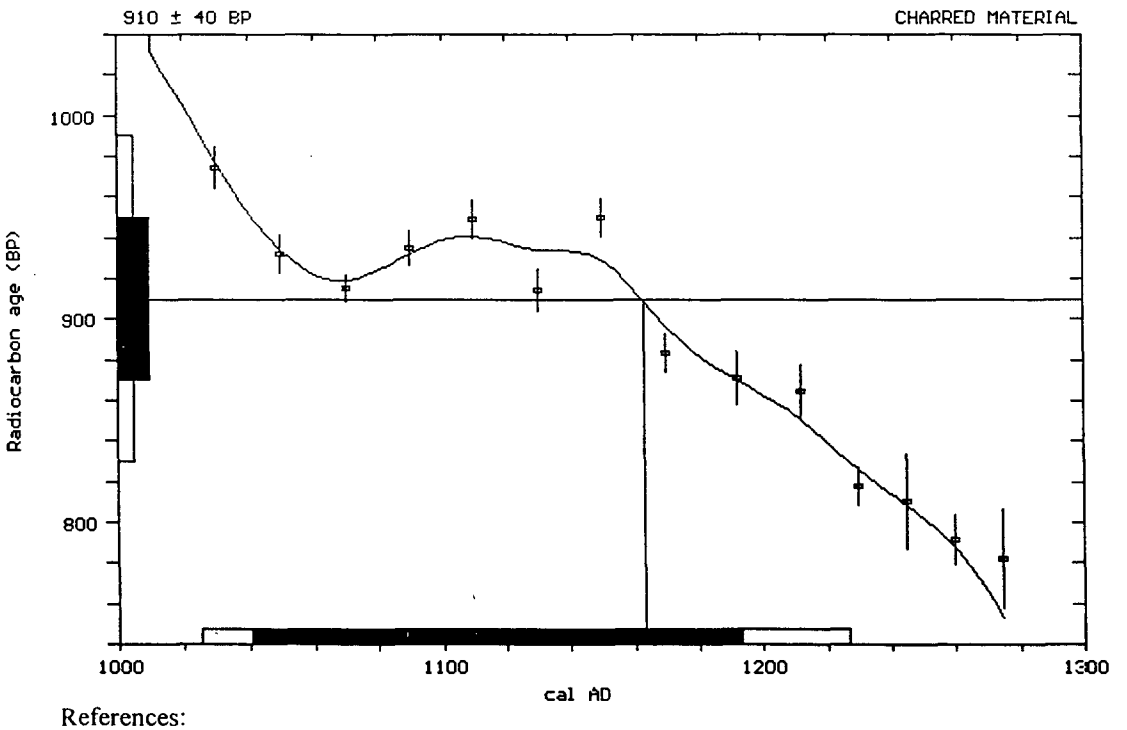
Conventional radiocarbon age: **910 ± 40 BP**

Calibrated results: **cal AD 1025 to 1225**
(2 sigma, 95% probability)

Intercept data:

Intercept of radiocarbon age with calibration curve: cal AD 1165

1 sigma calibrated results: cal AD 1040 to 1195
(68% probability)



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

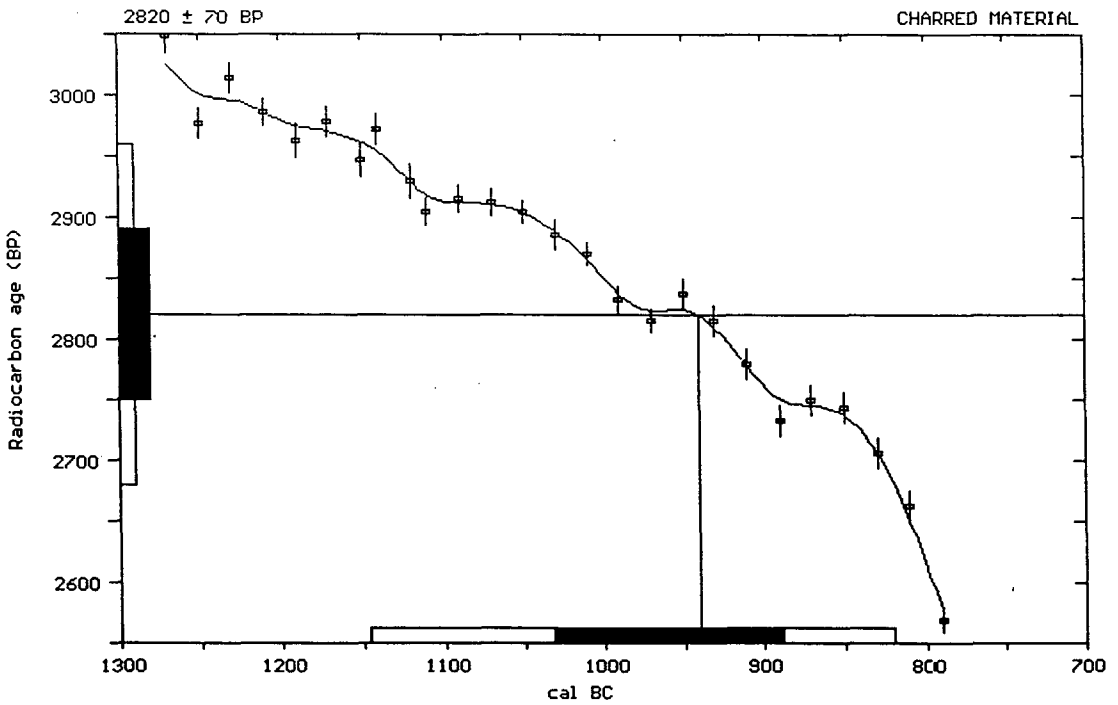
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110380
Conventional radiocarbon age*:	**2820 ± 70 BP**
Calibrated results: (2 sigma, 95% probability)	**cal BC 1145 to 820**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal BC 940
1 sigma calibrated results: (68% probability)	cal BC 1030 to 890



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

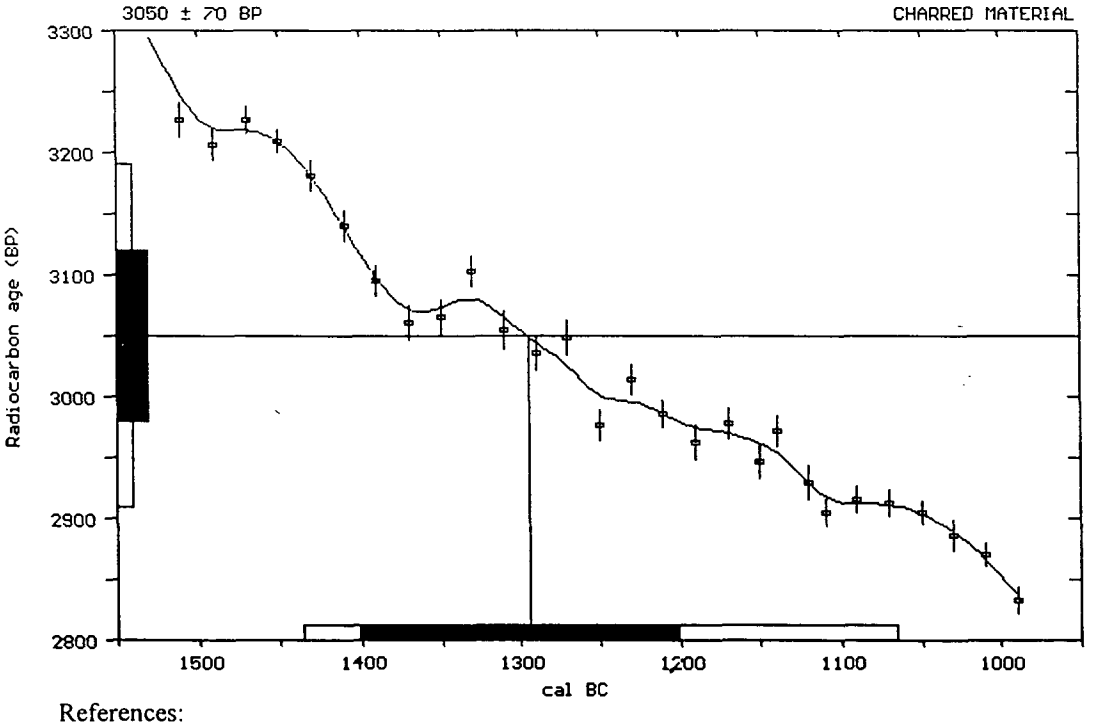
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110381
Conventional radiocarbon age*:	**3050 ± 70 BP**
Calibrated results: (2 sigma, 95% probability)	**cal BC 1435 to 1065**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal BC 1295
1 sigma calibrated results: (68% probability)	cal BC 1400 to 1200



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

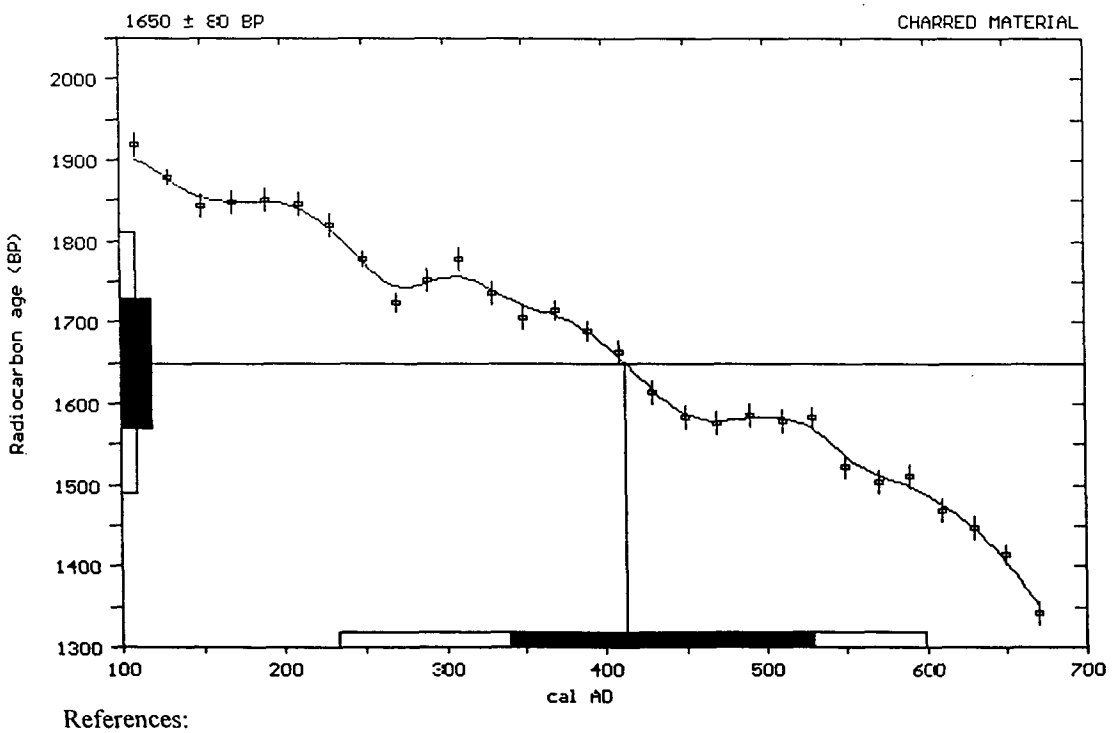
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110382
Conventional radiocarbon age*:	**1650 ± 80 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 235 to 600**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 415
1 sigma calibrated results: (68% probability)	cal AD 340 to 530



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

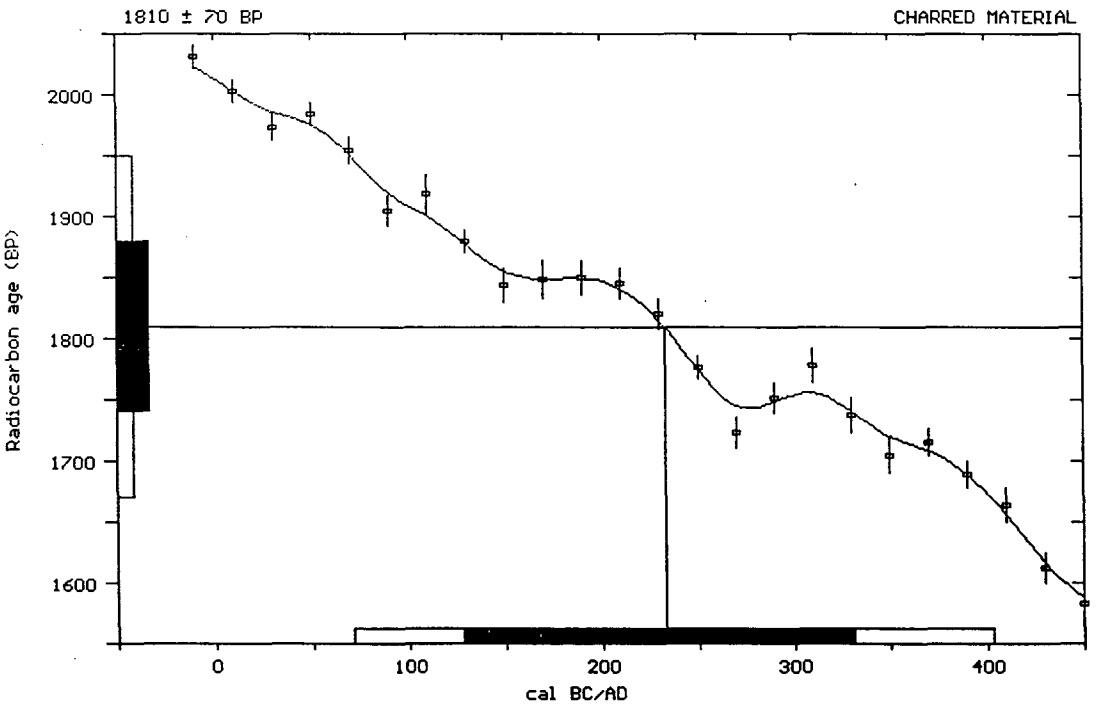
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110383
Conventional radiocarbon age*:	**1810 ± 70 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 70 to 405**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 235
1 sigma calibrated results: (68% probability)	cal AD 130 to 330



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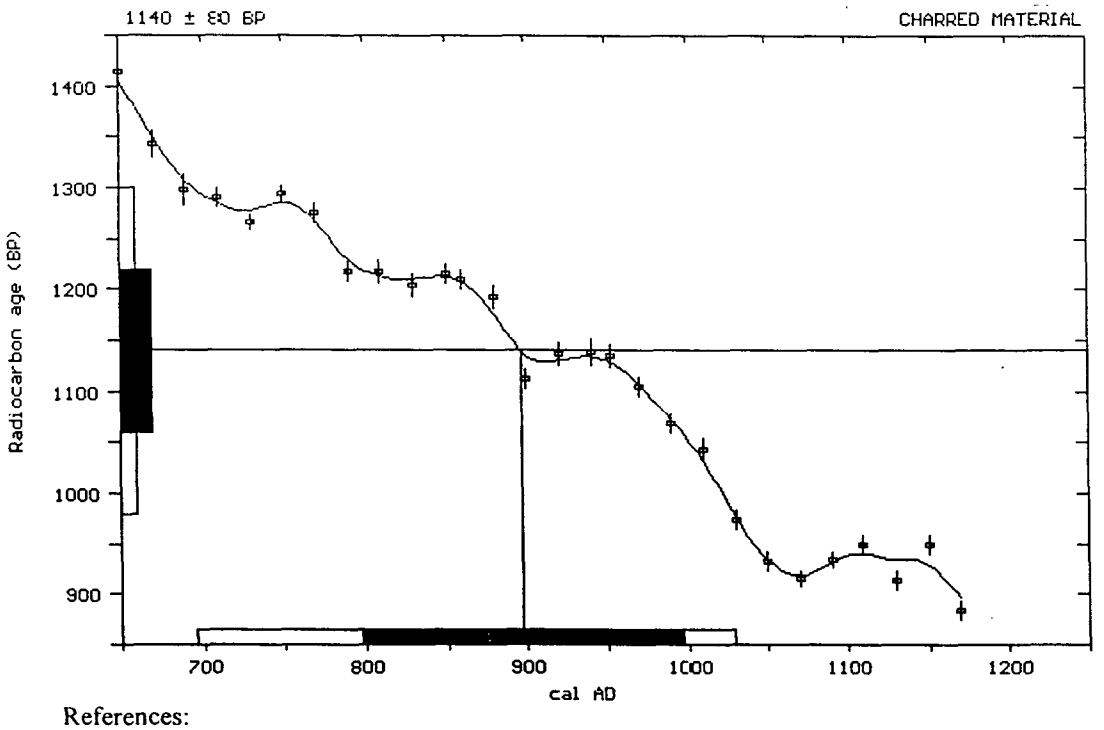
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110384
Conventional radiocarbon age*:	**1140 ± 80 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 695 to 1030**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 895
1 sigma calibrated results: (68% probability)	cal AD 800 to 995



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

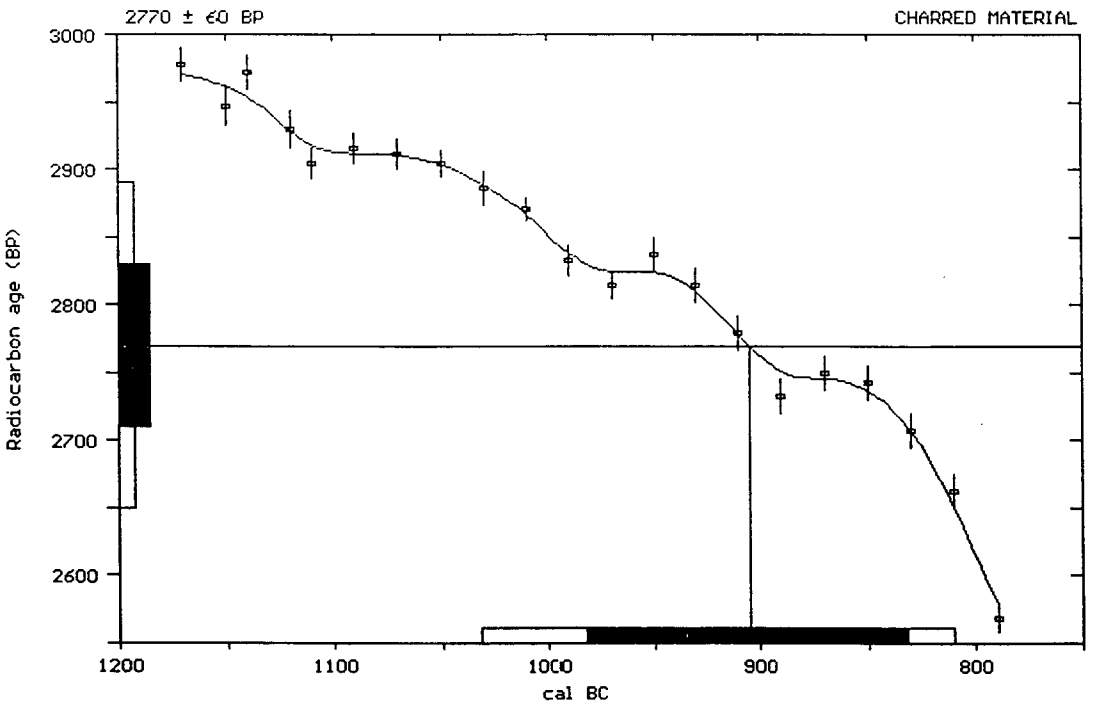
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110385
Conventional radiocarbon age*:	**2770 ± 60 BP**
Calibrated results: (2 sigma, 95% probability)	**cal BC 1030 to 810**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal BC 905
1 sigma calibrated results: (68% probability)	cal BC 980 to 830



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

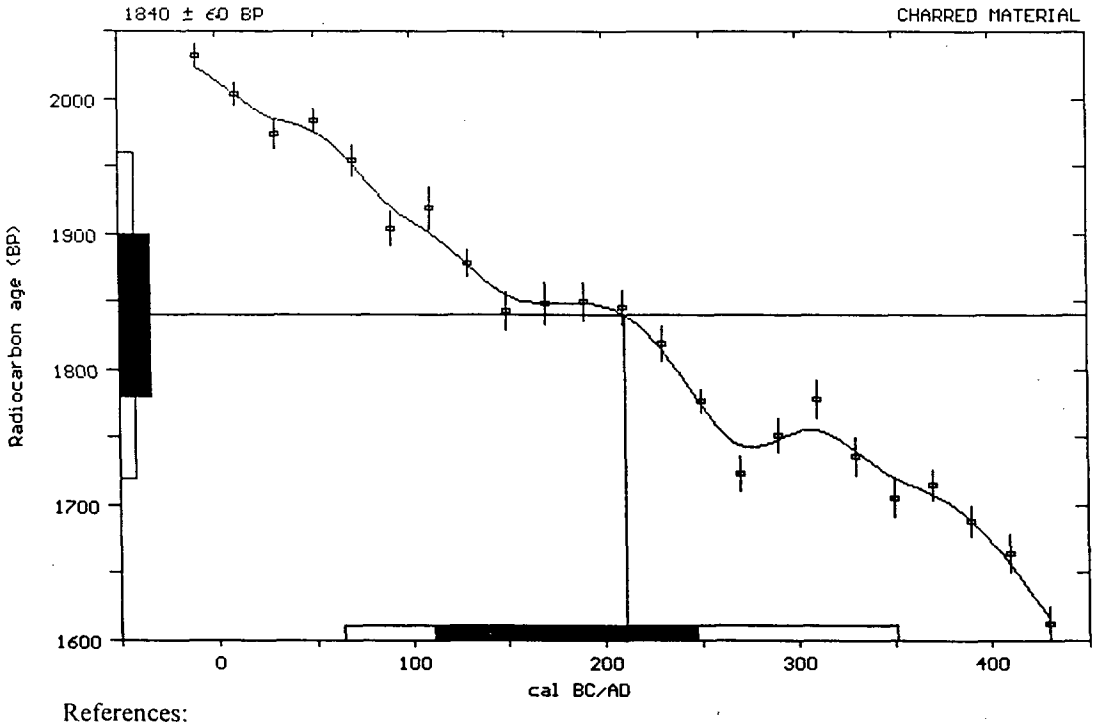
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110386
Conventional radiocarbon age*:	**1840 ± 60 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 65 to 350**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 210
1 sigma calibrated results: (68% probability)	cal AD 110 to 245



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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

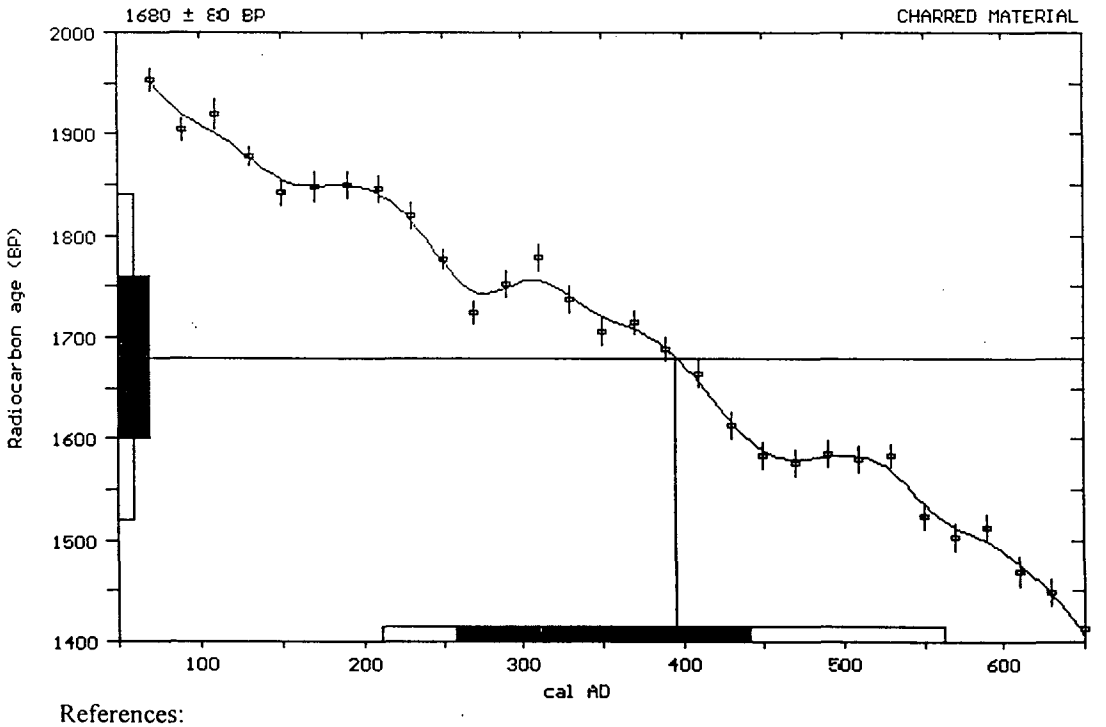
(Variables: est. C13/C12=-25.0:lab. mult=1)

Laboratory Number:	Beta-110387
Conventional radiocarbon age*:	**1680 ± 80 BP**
Calibrated results: (2 sigma, 95% probability)	**cal AD 210 to 560**

* C13/C12 ratio estimated

Intercept data:

Intercept of radiocarbon age with calibration curve:	cal AD 395
1 sigma calibrated results: (68% probability)	cal AD 260 to 440



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APPENDIX C

Ceramic Data

Appendix C. Ceramic Data Base Structure.

The ceramic data base is stored in Paradox 5.0 format and the data structure and codes are presented below in Tables C.1 and C.2. The stored data base includes both codes and associated text for each field.

Table C.1. Ceramic Data Base Structure.

Field ID#	Field Name	Type	Size
1	Site Number	A	10
2	FS Number	S	D
3	Lot Number	S	D
4	Ceramic Ware	S	D
5	Rough-sort Type	S	D
6	Vessel Form	S	D
7	Vessel Portion	S	D
8	Count	N	D
9	Weight	N	D
10	Comments	A	100
11	Ceramic Series	S	D
12	Ceramic Type	S	D

Key: A = Alpha, S= Short Number (whole number), N= Number, D=Default

Table C.2. Ceramic Codes Used for Analysis of N11 Testing Sherds.

CERAMIC WARE CODES

Ware Codes	Ware Descriptions
0	Not Analyzed
1	Gray Ware
2	Gray/Brown Ware
3	White Ware
4	Red Ware
5	Yellow Ware
6	Brown Ware
7	Glaze Ware

ROUGH SORT TYPE CODES

Type Code	Rought-sort Type Description
0	Not Examined (Too small or exfoliated)
1	Indeterminate unfired
2	Unfired clay
100	Indeterminate gray rim
101	Plain gray rim (Lino style)
102	Wide neckbanded rim (Kana-a style)
103	Narrow neckbanded rim (Tohatchi style)
105	Erect corrugated rim (Mancos style)
108	Plain gray
109	Corrugated gray
111	Polished gray
112	Banded gray
150	Plain gray/brown
151	Polished gray/brown
201	LaPlata Black-on-white
202	White Mound Black-on-white
203	Kiatuthlanna Black-on-white
204	Red Mesa Black-on-white
206	Escavada Black-on-white
207	Gallup Black-on-white
209	Escavada/Gallup Black-on-white
212	Pre-La Plata Black-on-white
220	Indeterminate black-on-white
221	Slipped white
222	Basketmaker III/Pueblo I Black-on-white
223	Pueblo I/II Black-on-white
301	Basketmaker III slipped red
303	Pueblo I painted orange
305	Pueblo I/II Black-on-red
400	Mogollon Brown Ware
800	Navajo Gray Ware
803	Jeddito Yellow Ware
805	Zuni Glaze Ware
806	Indeterminate Puebloan utility

VESSEL FORM CODES

Form Code	Form Description
0	Not examined
1	Indeterminate
2	Bowl
3	Wide-mouthed jar
4	Seed jar
5	Olla
6	Jar (unspecified shape)
8	Ladle
9	Miniature
11	Pinch pot
99	Other

VESSEL PORTION CODES

Portion Code	Portion Description
0	Not examined
1	Indeterminate
2	Body
3	Rim
4	Neck
5	Base
6	Appendage
7	Other

Appendix C.2. Continued.

CERAMIC SERIES CODES

Series code	Series Description
0	Not analyzed
2	Northern San Juan
3	Cibola
6	Mogollon
8	Protohistoric Navajo
9	Protohistoric Pueblo

TRADITIONAL CERAMIC TYPE CODES

Type code	Traditional Ceramic Type Description
0	Not examined
2132	Polished gray
2311	Abajo Red-on-orange
2313	Bluff Black-on-red
3110	Lino Gray
3111	Kana-a Neckbanded
3112	Tohatchi Neckbanded
3114	Pueblo II Coolidge All-over Corrugated
3117	Obelisk Utility
3118	Lino Polished
3130	Plain gray
3210	La Plata Black-on-white
3211	White Mound Black-on-white
3212	Kiatuthlanna Black-on-white
3213	Red Mesa Black-on-white
3214	Gallup Black-on-white
3216	Escavada Black-on-white
3219	Reserve Black-on-white
3231	Pueblo I or Pueblo II black-on-white
3331	Indeterminate White Mountain black-on-red
3400	Plain gray/brown
3500	Tallahogan Red
3501	Tohatchi Red-on-Brown
3503	Tohatchi Red
6131	Woodruff Brown
6133	Woodruff Smudged
8110	Dinetah Gray
9000	Indeterminate Puebloan painted
9112	Jeddito Black-on-yellow
9601	Hawikuh Polychrome

APPENDIX D

Site Locations and Human Remains
(CONFIDENTIAL - BOUND SEPARATELY)

SECTION VII

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EXHIBIT 6

SITE LOCATIONS AND HUMAN REMAINS

CONFIDENTIAL APPENDIX D
FOR THE ROUTE 11 REPORT

40-8968

HRI, INC.

(A Subsidiary of Uranium Resources, Inc.)

5656 South Staples
Suite 250, LB 8
Corpus Christi, Texas 78411
Telephone: (512) 993-7731
Fax: (512) 993-5744

12750 Merit Drive
Suite 1020, LB 12
Dallas, Texas 75251
Telephone: (214) 387-7777
Fax: (214) 387-7779

P.O. Box 777
Crownpoint, New Mexico 87313
Telephone: (505) 786-5845
Fax: (505) 786-5555

Mark S. Pelizza
Vice President
Health, Safety and Environmental Affairs

August 15, 1996

Mr. Daniel M. Gillen, Assistant Chief
Uranium Recovery Branch
Division of Waste Management
Office of Nuclear Materials Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20550-0001

RE: Response to Request for Further Clarification and Additional Information of Responses; Safety Analysis Review and Environmental Review for the Hydro Resources, Inc. Uranium Solution Mining License Application, Crownpoint, New Mexico.

Dear Mr. Gillen:

Please find attached three copies of the responses to the subject requested information dated July 15, 1996. We have formatted this response by first restating your request and then responding appropriately. This correspondence will serve as a revision to the overall Crownpoint ISL license application as required within this request.

As a rule, where corrections to previously submitted information is warranted, to correct the record, we have resubmitted revised Q1 text as a Q2 attachment. If new information is submitted, we have either included the new information as an attachment to the Q2 or, in the case of Q2/37, we have indicated that it will be provided in a subsequent submittal.

NL05

In the case of Q2/37, HRI is in the process of compiling an updated Operations Plan consistent with the outline suggested by NRC at the June 19th meeting. This operating plan will contain the new informational requests specified in Q2/37 and elsewhere. We will also be submitting updated UIC technical reports for the Churchrock, Unit 1, and Crownpoint properties, with the updated Operations Plan. These applications were prepared with the intent of providing NRC an update to the previous UIC reports, which are consistent with all of the statements and commitments

Maps located in file Center

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OC/LFMB 1 0
OGC/REGD/SPFC 1 0

within the responses to Q1/2-1 through Q1/2-93. These reports also will provide the basis for all future UIC permit renewals and new applications to other regulatory agencies. When submitted, we believe the Revised Operating Plan, the revised UIC technical reports, and the Q1/2-1 through Q1/2-93 responses will fulfill all of the information requests of the NRC and resolve the concern the NRC voiced of a "disjointed application" due to numerous submittals over approximately eight years.

We also believe the Q1/2 responses address the outside questions voiced, both from public and regulatory agencies, and comments we have heard at hearings throughout the EIS process.

Please feel free to contact me with questions pertaining to this matter.

Sincerely,

Mark S. Pelizza
Vice President
Health, Safety and Environmental Affairs

MSP/dlg
Encl. (4 sets)
Via Federal Express

CLARIFICATION AND ADDITIONAL INFORMATION REQUEST
HYDRO RESOURCES, INC. IN-SITU LEACH URANIUM MINE
CROWNPOINT, NEW MEXICO

Q2/24. Discussion: HRI and its cultural resources consultant have made some progress toward providing the information requested in Question 24. However, the information provided to date is not sufficient for an assessment of potential impacts to traditional cultural properties in the Environmental Impact Statement. In a previous communication to HRI (Gillen 1996), NRC outlined four steps required to identify and evaluate traditional cultural properties (based on general guidance provided in the *National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties*). The four steps are:

1) identify the traditional communities and groups that have ties to the area(s) in question;

2) make contact with the appropriate authorities and other person(s) within these groups;

3) conduct background research; and

4) conduct interviews and field surveys as necessary.

HRI has completed step 1 and has made some progress on steps 2 and 4. However, we are unaware of any activity that may have occurred regarding step 3.

Action Needed: HRI must perform the following actions to complete the response to Question 24.

1) Determine whether any Navajo persons/clans and traditional practitioners (in addition to those identified in Mr. Becenti's report) have ties to the areas in question. Document the findings in a report.

2) An ethnographer or ethnohistorian should perform necessary follow-up to Mr. Becenti's report, including a summary report that shows (on a legible map) the approximate location of the sites relative to the project area and that assesses the significance of any identified sites from which the project area can be seen. (This is necessary because sites located beyond the project boundaries may nevertheless be affected by the project.)

3) An ethnographer or ethnohistorian should follow-up initial contacts made with the Hopi and the Zuni, as both tribes have responded affirmatively to the initial contact by asserting that traditional cultural properties associated with their people may exist in the project area (Anyon 1996; Jenkins 1996). The follow-up must include working with each tribe's cultural resource office to identify the persons/clans and/or traditional practitioners who have ties to the project area; conducting or assisting the tribe's cultural resource office in conducting background research; and conducting interviews and field surveys to ascertain the location and significance of traditional cultural properties. All information should be documented in a traditional cultural properties summary report(s).

REFERENCES

Anyon, Roger 1996. Director, Heritage and Historic Preservation Office, Pueblo of Zuni, Zuni, New Mexico. Letter to Mark S. Pelizza, Environmental Manager, Uranium Resources, Inc. March 28.

Gillen, Daniel M. 1996. U.S. Nuclear Regulatory Commission, Washington, D.C. Letter to Hydro Resources, Inc. (Attn:: Mr. Mark Pelizza). January 31.

Jenkins, Leigh 1996. Director, Hopi Cultural Preservation Office, Kykotsmovi, Arizona. Letter to Mark S. Pelizza, Environmental Manager, Uranium Resources, Inc. April 25.

U.S. Department of the Interior 1990. *National Register Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties.* National Park Service, Washington, D.C.

Action Needed (1)

Determine whether any Navajo persons/clans and traditional practitioners (in addition to those identified in Mr. Becenti's report) have ties to the area in question. Document the findings in a report.

Response:

No living registered traditional practitioners other than Mr. Becenti have been identified for any of the properties. However, two knowledgeable individuals from the Crownpoint area were contacted on August 5, 1996 and a field visit to T17N R13W, Section 12 was made. These men are Mr. Tom Shorty and Mr. Lincoln Perry.

Mr. Tom Shorty is considered to be a medicine man by local residents. Today, he lives in Becenti, a community just north of Crownpoint. He has a sheep camp near the Crownpoint project area. Further, he grew up in the vicinity of Crownpoint and herded sheep across a broad area (including Section 12) just west of town.

Mr. Lincoln Perry is not a medicine man, but also herded sheep throughout the Crownpoint area. He has a home near Unit 1 and is familiar with all of the project properties.

Both men are adept at identifying and using herbs, saying that many plants are found and collected throughout the local landscape. Both Mr. Shorty and Mr. Perry stated that sacred localities are most commonly found in mountainous areas, canyons and along cliffs. Sacred localities are usually high in the landscape such as Mount Taylor or Hosta Butte. Disturbed areas are avoided for ceremonial purposes. With the exception of ceremonial practices performed at personal homes or camp locations, populated areas are avoided for sacred activities. Further, Anasazi archaeological sites area also avoided.

Plants collected for sacred practices are gathered away from human habitation and are collected from mountainous areas. Both mentioned the mountains south of Interstate 40 and Mount Taylor. They pointed out that plants gathered for sacred purposes must be from areas that are clean. They stated that they knew of no sacred plants that are gathered from the project parcels, and said that these localities are unsuitable for them. Previously, on February 13, 1996, Mr. Becenti expressed the same views saying that the project areas are disturbed by habitation and grazing. He pointed out that the Churchrock parcel has been impacted by the nearness of the roads, other activities on the properties, and mining in the immediate area. He said that sacred plants will not remain in disturbed areas or areas where there are many non-Navajo, and that had they grown in the project areas in the past, these sacred plants would have "gotten up and walked away in the night". Mr. Becenti said that he gathers herbs and sacred plants from secret localities in the mountains south of Interstate 40.

Walking over Section 12, both Mr. Shorty and Mr. Lincoln noted the presence of common plants and discussed landscape changes that had occurred during their lifetimes. These changes included the decrease in plant density, as well as diminished surface, near surface and spring waters. Standing on a hilltop on Section 12, they pointed out the location of springs and low areas south and west of Section 12, where water was once more plentiful.

They identified several plants that are used in teas, solutions for soaking, or as crushed leaves to treat minor ailments . One of these was a narrow-leafed yucca whose roots are used to produce a soapy substance for washing; another is orange mallow - the leaves of which can be crushed and applied to certain skin ailments. They commented that both plants are widespread and have no sacred significance.

Mr. Shorty and Mr. Lincoln identified the hogans, rectangular stone houses, corrals and baking areas where the Yahzi family once lived on Section 12, saying that they had visited the Yahzi family when they were young. Approximately 2,000 sheep had been grazed in the area the includes Section 12. They stated that large numbers of sheep were once grazed across all of the Crownpoint Project area, but that the number of sheep is greatly reduced today. Mr. Perry believes that a Mr. Yahzi who died in the 1930's is buried in the floor of the rectangular house.

In summary, Shorty, Lincoln and Becenti indicated that the Crownpoint Project properties are not topographically located in areas likely to be held sacred. Further, had there been sacred character to the properties, grazing, mining development, and proximity to settlement would have damaged their integrity.

On August 13, 1996, Mr. Becenti, Dr. Eric Blinman (Museum of New Mexico, Office of Archaeological Studies) and I made a field visit to T17N R13W Section 12. Mr. Becenti confirmed the observations of Mr. Shorty and Mr. Perry. In reference to the potential for human remains in the rectangular house or an isolated burial nearby, Mr. Becenti commented that while Navajo human remains are considered sacred, the area around them is not imbued with any sacred properties.

Action Needed (2)

An ethnographer or ethnohistorian should perform necessary follow-up to Mr. Becenti's report, including a summary report that shows (on a legible map) the approximate location of the sites relative to the project area, and that assesses the significance of any identified sites from which the project can be seen. (This is necessary because sites located beyond the project boundaries may nevertheless be affected by the project.)

Response:

A summary report discussing the approximate location of the sites was provided on May 3, 1996 in a letter to Joe Holonich from HRI, Inc.

To clarify the response of May 3, a note that the locations of these sacred localities is not known because, if sacred sites are not to be impacted, Mr. Becenti does not want to identify their locations to outsiders. Further, HRI, Inc. does not have access to any of these locations.

To the best of my knowledge, the project area can not be seen from any of the sacred localities identified by Mr. Becenti's informants. I examined topographic maps, and based on the verbal locations of the localities provided by Mr. Becenti's informants, determined that topographic features will block visual impacts to the sites; i.e., these sites are out of the line of sight of the Churchrock properties.

Finally, Mr. Becenti said that the Churchrock property is too close to town, a highway, and the site itself too disturbed by modern activities and the activities of non-Navajos, to retain sacred significance.

The Native American Graves Protection and Repatriation Act (NAGPRA) Public Law 101-601 [HR.R. 5237], 1990 will pertain to all project activities. The procedures to be followed should human remains be encountered will be set forth in a Memorandum of Agreement between concerned and interested parties as part of the National Historic Preservation Act of 1966 (NHPA), Section 106 process.

Action Needed #3:

An ethnographer or ethnohistorian should follow-up initial contacts made with the Hope and Zuni, as both tribes have responded affirmatively to the initial contact by asserting that traditional cultural properties associated with their people may exist in the project area (Anyon 1996; Jenkins 1996). The follow-up must include working with each Tribes' cultural resource office to identify the persons/clans and/or traditional practitioners who have ties to the project area; conducting or assisting the Tribes' cultural resource office in conducting background

research; and conducting interviews and field surveys to ascertain the location and significance of traditional cultural properties. All information should be documented in a traditional cultural properties summary report(s).

On August 13, 1996, Dr. Eric Blinman and I visited the Navajo Nation Historic Preservation Department. We examined the site files for previously recorded Traditional Cultural Properties that might be located on the Crownpoint Project properties. There were none. Further, Peter Noyes (Cultural Resource Compliance Section Program Manager) confirmed to Dr. Blinman that there are no previously recorded Traditional Cultural Properties on the Crownpoint Project properties.

Response:

On July 12, 1996, letters were sent to Acoma, Hopi, Laguna, and Zuni Pueblos and the all Indian Pueblo Council notifying them that T17N, R13W, Section 12 had been added to the project.

Letters were also sent to the Hopi and Zuni asking them to identify ongoing or extant traditional cultural practices that might be performed on any of the Crownpoint Project properties.

On July 24, follow-up telephone calls were made to each group to confirm that the letters had been received.

On July 24, I spoke with Gilbert Petuuche of Acoma Pueblo. He had received the letter and stated that Acoma has no cultural properties in the project areas. He approves of the plan for avoidance of recorded cultural resources, and in keeping with the previous response to our February 22 and 28, 1996 letters, he reiterated that if human remains are encountered, Acoma Pueblo should be notified immediately.

On July 24, I spoke with Terrill Muller of the All Indian Pueblo Council. She stated that she will look into the project and may have comments. We discussed the project and the Native American groups that have been notified. She agreed that the proper contacts had been made.

On July 25, I spoke with Leigh Jenkins of Hopi Pueblo. He had received the cultural resources management plan and the letters of July 12. He said he may respond later.

On July 29, I was informed that the letter to Laguna Pueblo had been correctly routed to Stan Lucero.

I spoke with Joe Dishda of Zuni Pueblo on August 4. He will check with the cultural advisory committee to determine if members of Zuni Pueblo traverse or use any of the Crownpoint project properties.

Follow-up ethnographic and archaeological investigations will be performed by the Museum of New Mexico, Office of Archaeological Studies. The Principal Investigator will be Dr. Eric Blinman. Other key personnel will be Janet Spivey and/or Dr. Linda Goodman. All three individuals are approved by the Navajo Nation Historic Preservation to perform ethnographic investigations. The Office of Archaeological Studies will provide a comprehensive and well integrated ethnographic and archaeological study.

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

- - - - - - - - - - - - - - - - - x

In the Matter of: :

PREHEARING CONFERENCE OF :

HYDRO RESOURCES, INC. : Docket No. 40-8968-ML

- - - - - - - - - - - - - - - - - x

Crownpoint Community School

State Road 371, Building 3001

Crownpoint, New Mexico

Tuesday, September 15, 1998

The above-entitled matter came on for prehearing conference, pursuant to notice, at 1:45 p.m.

BEFORE:

THE HONORABLE PETER B. BLOCH,

Judge

APPEARANCES:

On Behalf of the Nuclear Regulatory Commission:

THOMAS D. MURPHY, Esquire

JANICE S. HESTER, Esquire

U.S. Nuclear Regulatory Commission

Atomic Safety and Licensing Board

Washington, D.C. 20555

Francisco to discus questions that we have regarding sole source aquifer type questions for a management control permitting requirements.

We've also looked at other areas of water quality, groundwater, air questions and emergency response-type questions to handle any type of spills. Basically, we've presented our comments in technical form to our oversight committee which the Resources Committee, and we've also submitted comments to the full Navajo Nation Council last year, July of 1997, and I have that document here with me.

We've also submitted comments to the past president, and we are yet to update our current president. Unfortunately, our director is unable to make it today. However, we will be getting a letter to the NRC with our signature probably Thursday. So that was all I wanted to let you know.

JUDGE BLOCH: Ms. Morrison, you arrived after my introduction. I just want to state that the formal record here is being compiled by the parties, and I am interested -- intensely interested in hearing from the people today. But for material to be considered before me, it has to be submitted by a party to the case.

MS. MORRISON: Okay.

JUDGE BLOCH: Earnest Biscente.

STATEMENT BY MR. EARNEST BISCENTE

MR. BISCENTE: Good afternoon, ladies and gentlemen. My name is Earnest Biscente, Sr., former president, Eastern Navajo Council for the last 20 years, the chapter also for 34 years, chairman of McKinley County, County Commissioner 16 years.

Talking about uranium, to look at it, my grandmother's just walked out of here. Talk about water. Is the water your mother, right? Why talk about your mother? Your mother raised you, feed you, come to the point where you became a man and a woman. That's the way of my thinking.

I'm living right above four miles of Church Rock mine. My grandfather hits 115 years old, four teeth, black hair, steady hair, 100 yards. My grandmother's 114 years old, still has the same thing, no glasses, all of that. My mother, 110, grows the same way.

I never believe in what is all about, you know. We don't want to talk about it. I don't want to talk about my mother. I don't want to talk about my father. My Mother Earth, heavenly father, the sun, the moon, and the mountains. It's our mothers, it's our nature. Why are we talking about it.

My grandfather shaked that out of that well. It's still there. The well's still there. We still use it. We still drink it. I don't think that's a bother to your health. I think that's ability. Your ability, your thinking, your long range planning of the living on this earth, that's where it's from, our Mother Nature, our mother water.

I believe and this is the words that come out. Why are we fighting? Why don't we fight something else like my grandmother says -- disease, drugs and this and that. What are we fighting for? I don't think that's right.

I don't think I'll fight with my mother. I don't think I'll fight with my brothers. I think I have a confidence behind them, and that's why when I was the president of the Church Rock chapter, to telling my people we had a movie for a week.

We had the slides for a week to make them understand how that thing worked. That's why we passed that resolution.

At this time of the day right now, I'm still supporting that resolution. Remember that. Your Mother Earth. As you go back, you go back to your mother down below. Nobody's going up. It's down here. They still take care of you down there like they take care of you right on top. They take care of your life style. They water your livestock. They water you.

So this is how that thing worked out. Let's work it out the same now. And I think in Church Rock area, I don't see anybody die from there just like my grandmother says. I don't see any horse die, mice, roaches, ants, nothing. Nothing happened like these guys talk about. I don't know, maybe their policies are different from other there where they work. But in all that mine and all those years, all those people are healthy as it is today. Thank you very much.

[Applause.]

JUDGE BLOCH: Thank you, Mr. Biscente. Larry King.

STATEMENT BY MR. LARRY KING

MR. KING: My name is Larry King, and I live just across from the proposed Church Rock uranium mine. And speaking on behalf of my relatives that are currently living there, residing there, we are strongly opposed against this uranium mining that is proposed there. And also, I believe that the HRI are not giving us a straight answer on what they're proposing to do.

I understand and I heard that they were going to start the Church Rock uranium mining or the Church Rock site as an exploratory. In other words, I'm going to

HRI, INC.

(A Subsidiary of Uranium Resources, Inc.)

5656 South Staples
Suite 250, LB 8
Corpus Christi, Texas 78411
Telephone: (512) 993-7731
Fax: (512) 993-5744

12750 Merit Drive
Suite 1020, LB 12
Dallas, Texas 75251
Telephone: (214) 387-7777
Fax: (214) 387-7779

P.O. Box 777
Crownpoint, New Mexico 87313
Telephone: (505) 786-8646
Fax: (505) 786-5565

February 20, 1996

40-8968

Mr. Joe Holonich, Chief
High-Level Waste and Uranium Recovery Projects Branch
United States Nuclear Regulatory Commission
Division of Waste Management
Office of Nuclear Materials Safety and Safeguards
Washington, D.C. 20555-0001

Dear Mr. Holonich:

Attached, please find three (3) copies of HRI's responses to NRC Request For Additional Information, #1-48. These requests were transmitted by letter, signed by Daniel M. Gillen, dated January 11, 1996.

The responses are complete except for Response #32, which will be followed by a free-standing engineering report, and Responses #22, #23, and #24, which will be the subject of additional work by our cultural resources contractor. Because of the various levels of inspections concerning cultural resources, our consultants and employees who are expert in these areas will make continuous contacts and reports throughout the lives of the projects. However, the company is committed to meet all the requirements of the NRC.

Please feel free to contact me with additional questions.

Sincerely,

Mark S. Pelizza
Environmental Manager

MSP/dlg
Enclosures (via Federal Express)

NL05
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22DT24

ADDITIONAL INFORMATION REQUEST
HYDRO RESOURCES, INC. IN-SITU LEACH URANIUM MINE
CROWNPOINT, NEW MEXICO

ISSUE: Cultural Resources

22. **Discussion** - None

Action Needed - Describe any discussions and negotiations among the applicant, Navajo officials, New Mexico State Historic Preservation Office representatives, and any other officials concerning the presence of, and potential impacts to, cultural resources at the Crownpoint, UNIT I, and Churchrock sites.

Response -

Rolf J. Nabahe archeologist for the Navajo Nation Historic Preservation Department, Cultural Resource Compliance Section has been contacted (Feb. 9, 1996). He will be our cultural resources contact for both archeological and traditional issues for the Crownpoint Unit I and Churchrock sites. He provided the "Navajo Nation Policy to Protect Traditional Cultural Properties" and outlined the steps that must be taken to identify and record Traditional Cultural Properties (TCP's) pertaining to Navajo and other potentially affected Native American groups. These steps are:

1. To identify and record Navajo TCP's we must contact each chapter official and identify the traditional practitioners and land users. Through this process, individuals with information about TCP's will be identified. Each must be interviewed by an ethnohistorian or other qualified individual permitted by the Navajo Historic Preservation Department Sacred and Traditional Places Documentation Form". A literature search must also be conducted to identify previously reported TCP's.

2. Letters must be sent to the governors of the Acoma, Hopi, Laguna, and Zuni tribes. These letters should briefly describe the project, include a project location map and inquire if traditional cultural properties are known that m might potentially be impacted. A follow-up telephone call should be made after one week and thirty to sixty days allowed for written response from each tribe.

Lynne Sebastian, Acting New Mexico State Historic Preservation Officer has been contacted (Feb. 15, 1996). She stated that if the appropriate tribal contacts are made, her office will be satisfied. She listed the Navajo, Acoma Hopi, Laguna and Zuni. A representative of HRI will meet with her on Monday, February 19, 1996.

The presidents of the Churchrock (Ernest Bicenti) and Crownpoint (Charles Long) Chapters and land users on each of the three locations have been contacted. Ernest Bicenti has

been identified as the traditional practitioner (medicine man) for both the Crownpoint and Churchrock Chapters. A list of potentially knowledgeable individuals is being compiled. An ethnohistorian permitted by the Navajo Nation will be retained to interview each person and to compile "Navajo Nation Historic Preservation Department Sacred and Traditional Places Documentation Forms".

THE
NAVAJO
NATION

P.O. BOX 308 • WINDOW ROCK, ARIZONA 86515 • (602) 871-4941

PETERSON ZAH
PRESIDENT

MARSHALL PLUMMER
VICE PRESIDENT

UNIT 1
NN-HRI

27 January 1992

Mr. Mark S. Pelizza, Environmental Manager
Hydro Resources, Inc.
12377 Merit Drive, Suite 750, LB 14
Dallas, TX 75251

RE: A Cultural Resources-Environmental Assessment and Management Plan for the Proposed Hydro Resources, Inc., Unit No. 1 Lease in the Crownpoint Area of the Eastern Navajo District, New Mexico (HPD 91-633, Cibola Research Cultural Resources Report No. 52).

Dear Mr. Pelizza:

Pursuant to the Public Law 93-638 archaeological services contract with the Bureau of Indian Affairs, the Historic Preservation Department (HPD) has completed its review of the subject document. Your contractor is to be commended for the thoroughness of his work.

Given that ground disturbing activities are in no way a part of the proposed lease negotiations, we have no objection to the execution of such an agreement. Furthermore, in the event that the lease agreement is successfully negotiated and HRI elects to proceed with the uranium exploitation in the Unit 1 area, it is our opinion that the plans and stipulations outlined in the document adequately address the needs of the Navajo Nation pursuant to cultural resources.

If you have any questions about our comments, or if we can be of assistance in any way, please call Eric van Hartesveldt

or me at (602) 871-6437. Please keep us informed as to the progress of your negotiations and your development plans.

Sincerely,

Alan Downer, Director
Historic Preservation Department
P.O. Box 2898
Window Rock, AZ 86515

xc: file
desk

ADDITIONAL INFORMATION REQUEST
HYDRO RESOURCES, INC. IN-SITU LEACH URANIUM MINE
CROWNPOINT, NEW MEXICO

ISSUE: Cultural Resources

23. Discussion - None

Action Needed - Provide a copy of the report or a summary of findings of site surveys focused on traditional cultural properties completed by Ernest Becenti. Indicate whether the report has been (or will be) reviewed by appropriate Navajo and New Mexico cultural resources officials.

Response -

The information that Ernest Bicenti provided will be transcribed to a Navajo Nation Historic Preservation Department Sacred and Traditional Places Documentation Form. The report will be reviewed by appropriate Navajo and New Mexico cultural resources officials.

ADDITIONAL INFORMATION REQUEST
HYDRO RESOURCES, INC. IN-SITU LEACH URANIUM MINE
CROWNPOINT, NEW MEXICO

ISSUE: Cultural Resources

24. **Discussion** - None

Action Needed - Prepare summary reports from each cultural resources director of the Navajo, Hopi, Zuni, Acoma, Laguna, and other potentially affected tribes that describe: 1) any traditional cultural properties identified by each tribe to be present at or near each of the three sites, and 2) the potential impacts of the proposed project to each of those properties. The methods used in preparing each report should follow those set forth in the National Park Service's National Register Bulletin 38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties*.

Response -

Summary reports of the responses from each of the appropriate cultural resources officials from the Navajo, Acoma, Hopi, Laguna and Zuni tribes will be prepared. These reports will identify and describe any TCP's present or near each of the three sites and describe potential impacts of the proposed projects to each property. The methods used will follow the guidelines set forth in the National Park Service's National Register Bulletin 38, "Guidelines for Evaluating and Documenting Traditional Properties" and reflected by the "Navajo Nation Historic Preservation Department Sacred and Traditional Places Documentation Form".