MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

Living on the Northern Rio Grande Frontier: Eleven Classic Period Pueblo Sites and an Early Twentieth-Century Spanish Site near Gavilan, New Mexico

Volume 1: Overview and Site Descriptions

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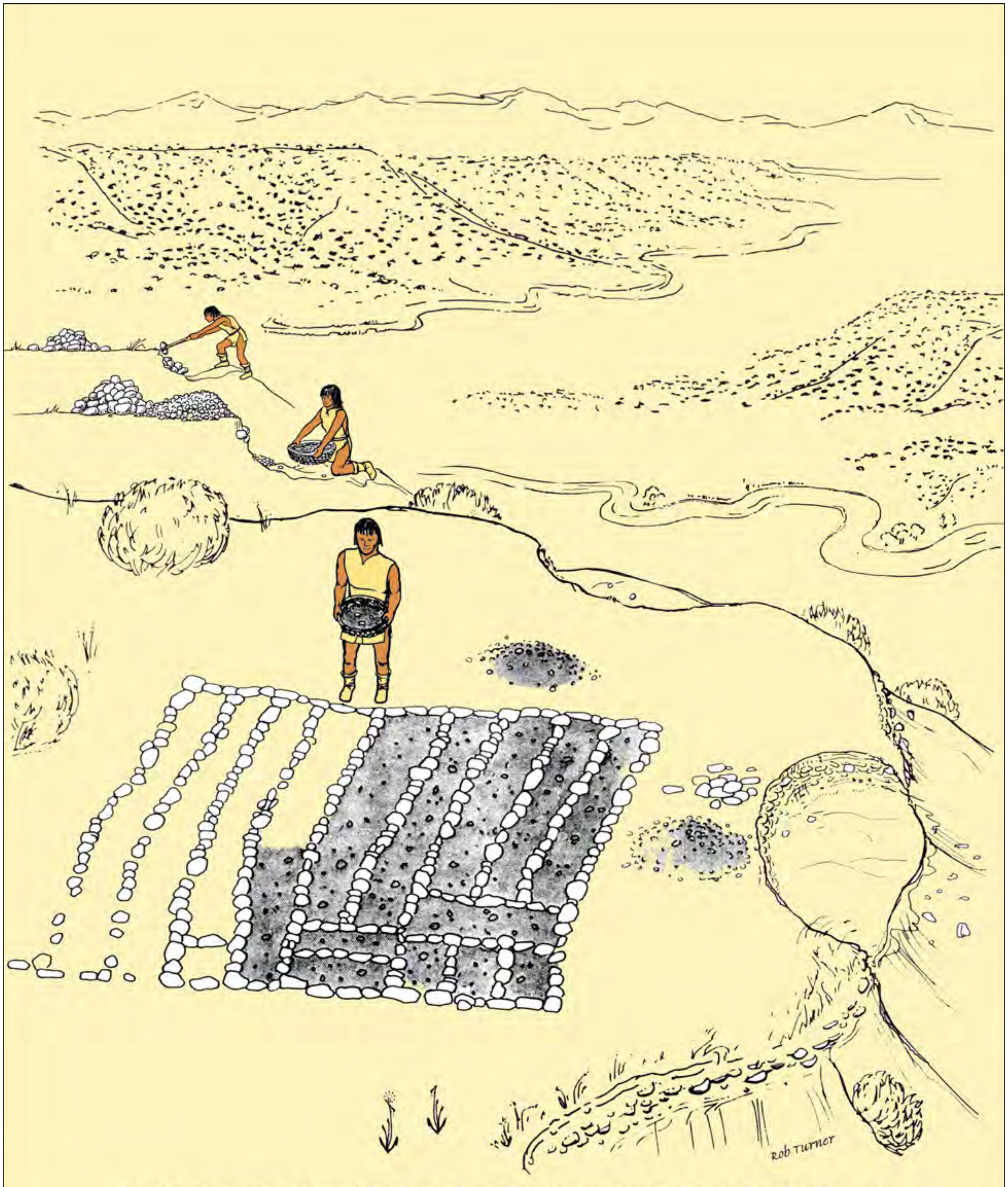

Artist's conception of cobble-and-mulch grid garden preparation, above Rio Ojo Caliente

Administrative Summary

Between July 29 and December 20, 1997, the Office of Archaeological Studies of the Museum of New Mexico conducted archaeological data recovery investigations at twelve sites along U.S. 285 in Rio Arriba and Taos Counties, New Mexico. This project was conducted at the request of the New Mexico Department of Transportation. Excavations were carried out in preparation for the reconstruction of U.S. 285 near the communities of Gavilan, Duranes, Gallegos, and Ojo Caliente.

Data recovery efforts were aimed at recovering information relevant to local prehistory and history. The array of cultural properties examined included nine Classic period farming sites (LA 105703—LA 105709, LA 105713, and LA 118547), segments of a Classic period trail (LA 118549), deposits associated with the Classic period occupation of Hilltop Pueblo (LA 66288), and the remains of an early twentieth-century store and morada (LA 105710). While each of these sites extended into project limits, none was completely within the planned construction zone. Our investigations are considered to have exhausted the potential of the parts of these sites within project limits to yield information relevant to local prehistory and history.

MNM Project No. 41.6131.
NMDOT Project No. NH-285-9(7)346.
BLM Permit No. 21-8152-97-2a, with amendments.
State of New Mexico Permit No. AE-77, with amendments.

Acknowledgments

I and the contributors owe a great deal of gratitude to the many people who helped this project in one way or another. The fieldwork began during the hottest days of summer and lasted into the coldest depths of winter. To all of those who worked through the extremes of weather and suffered through the long daily commute we would like to express our deepest appreciation. We would especially like to thank our volunteers, who did all of that without any pay! We felt ourselves very fortunate to be given this chance to work in the beautiful Ojo Caliente Valley on some very interesting, impressive, and important sites. Thus, we would also like to thank the staff of the Environmental Section of the New Mexico Department of Transportation for their support and for providing us with this opportunity.

Finally, before this report could be completed we suffered the loss of a valued friend. Sam Sweesy started working for the OAS as a volunteer in 1988, served as a laborer for several years, and eventually became an assistant archaeologist—all this as his third career, after he had officially retired from the aerospace industry and run a successful string of camping stores in California. An ornery old cuss (he would have been most offended by the use of the word "old" to describe him), Sam was a pleasure to work with. We'll miss him and would like to dedicate this report to his memory. —JLM

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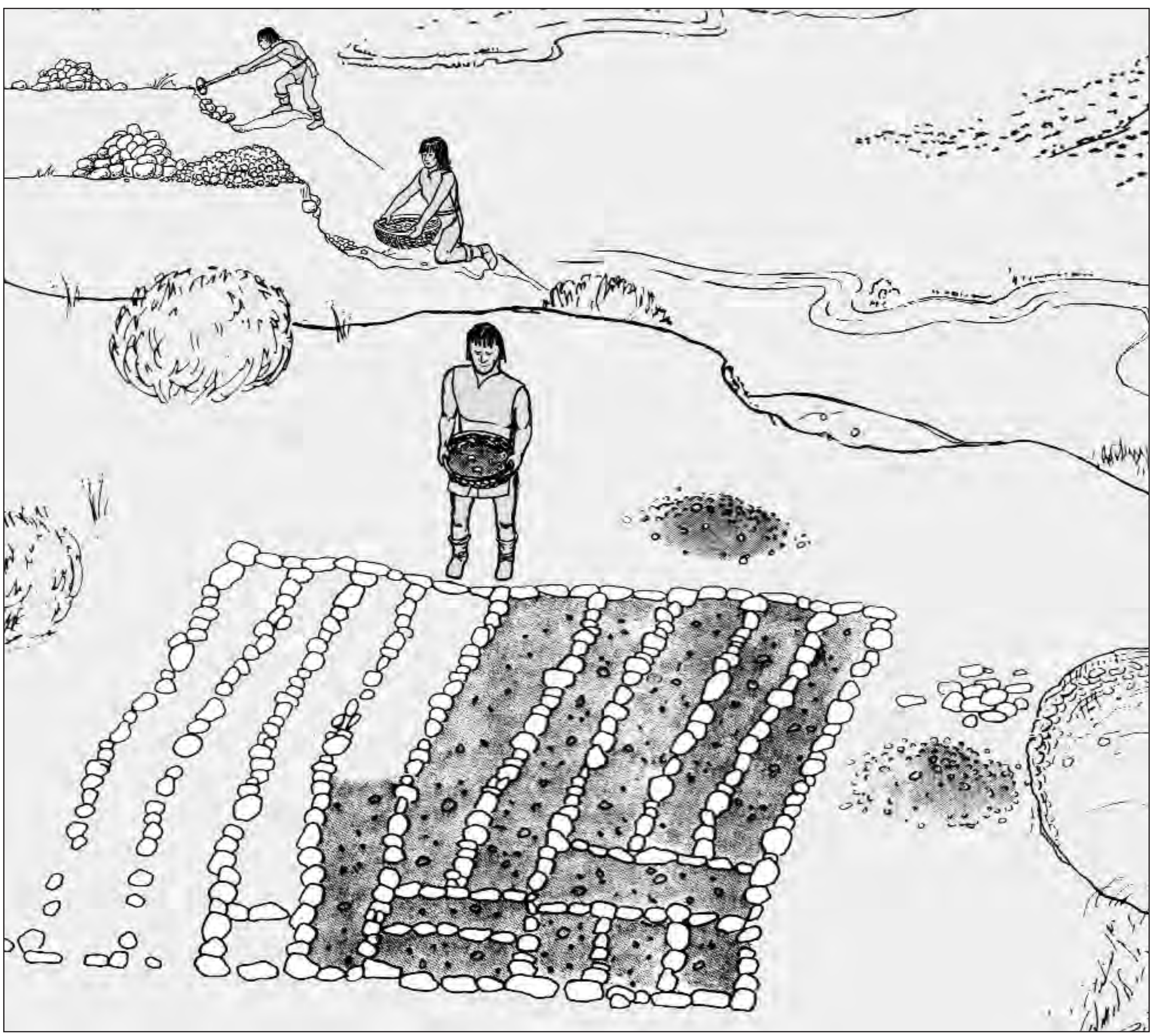
Part 1

Project Background and Overviews



Chapter 1. Introduction

James L. Moore

At the request of the New Mexico Department of Transportation (NMDOT, formerly the New Mexico State Highway and Transportation Department), the Office of Archaeological Studies (OAS), Museum of New Mexico, conducted data recovery investigations at twelve sites along U.S. 285 in Rio Arriba and Taos Counties, New Mexico (Fig. 1.1). The impetus for these investigations was the reconstruction of a section of U.S. 285 near the communities of Gavilan, Duranes, Gallegos, and Ojo Caliente in the Ojo Caliente Valley of northern New Mexico. Highway reconstruction included road widening and slope cutting along a gravel terrace that flanks the east side of most of this section of U.S. 285. Except for two sites in the valley bottom (LA 66288 and LA 105710), the sites were situated on top of and along the west edge of the gravel terrace included in the slope cut. None of the sites investigated were completely within the highway right-of-way; all extended outside project limits, and in several cases only a small part of a given site was within project limits.

The associated right-of-way was originally inventoried by Marshall (1995), and eleven sites were examined in more detail in 1995 to determine whether they warranted further study (Wiseman and Ware 1996). Eight of these sites (LA 105703–LA 105709 and LA 105713) were determined to be loci of prehistoric farming and were recommended for data recovery without subsurface testing (Wiseman and Ware 1996:1). Limited testing was conducted at Hilltop Pueblo (LA 66288) and LA 105710. LA 105712 was determined to be outside project limits and was not tested or recommended for data recovery.

Just as the data recovery phase was beginning, the Environmental Section of the NMDOT discovered that additional width had been added to the east side of the right-of-way at the south end of the project. This area had not been examined by previous phases of archaeological investigation. A supplemental archaeological survey was conducted, which found another farming site that was partly within project limits (LA 118547) and a probable prehistoric trail (LA 118549) running along the east side of the right-of-way that had not been identified by previous studies (Levine 1997). Both of these sites were added to the data recovery plan, increasing the number of sites scheduled for examination to twelve.

Fieldwork during the data recovery phase was conducted between July 29 and December 20, 1997. Timothy D. Maxwell of the OAS was principal investigator, and fieldwork was directed and carried out by OAS staff and volunteers. Investigations at the nine farming sites (LA 105703–LA 105709, LA 105713, and LA 118547) and the trail (LA 118549) were directed by James L. Moore. Field studies at Hilltop Pueblo (LA 66288) and the García store (LA 105710) were directed by Jeffrey L. Boyer. Field assistants were Susan Moga, Guadalupe Martinez, Sonya Urban, David Hayden, Steven Lakatos, and Marcy Snow. Crew members included Philip Alldritt, Sam Sweesy, Theresa Fresquez, Rick Montoya, and Laura Rick. Mechanical excavations were conducted by Eligio Aragon of Alley Cat Excavating. We were joined in the field for parts of the project by Jane Lindskold, Linda Lambert, and Marian Chavie, who graciously volunteered their time and whose efforts are greatly appreciated. This report was edited by Tom Ireland, and the graphics were produced by Ann Noble and Rob Turner.

The sites investigated by this study were on land administered by the USDI Bureau of Land Management (BLM) or the New Mexico State Land Office (SLO). Sites on land administered by the BLM included LA 66288, LA 105703, LA 105704, LA 105709, LA 105710, LA 105713, LA 118547, and parts of LA 118549. Fieldwork was conducted at these sites under BLM Permit No. 21-8152-97-2a, with amendments. Four sites (LA 105705, LA 105706, LA 105707, LA 105708) and parts of a fifth (LA 118549) were on State Trust land administered by the SLO. Fieldwork at these sites was conducted under State of New Mexico Permit No. AE-77, with amendments.

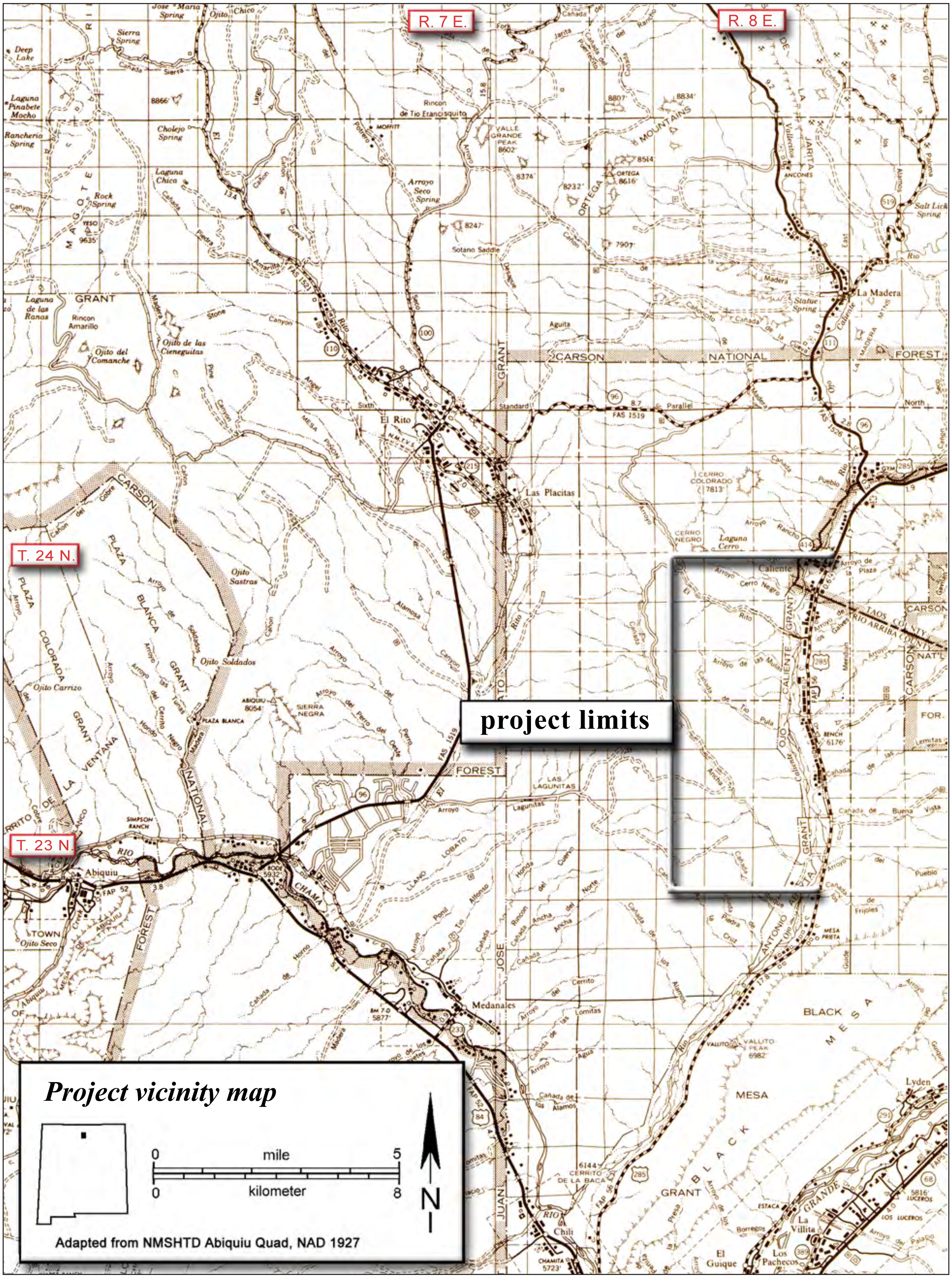


Figure 1.1. Project vicinity map.

Numerous personnel were involved in laboratory analysis of the materials recovered during data recovery. C. Dean Wilson conducted the ceramic artifact analysis, assisted by Carol Price, who graciously volunteered her time. Chipped stone analysis was conducted by James L. Moore, with assistance from Sonya Urban. Historic artifacts were examined by Natasha Wilson, assisted by David Norris. Mollie S. Toll and Pamela McBride conducted botanical field studies on the farming sites, and Pamela McBride examined macrobotanical samples. Susan Moga completed a study of nonhuman bone, supervised by Nancy Akins. Laura Rick analyzed gravel samples for the farming sites under the supervision of James L. Moore. Finally, palynological analysis of sediment samples was conducted by Dr. Richard Holloway of Quaternary Services in Flagstaff, Arizona.

Most of the sites examined were used during the Rio Grande Classic period (A.D. 1325–1600). Temporally diagnostic sherds collected and recorded at the nine farming sites were primarily biscuit wares, which indicate Classic period use. The features identified on the farming sites were dominated by gravel-mulched plots used for growing crops, and borrow pits that were the source of most of the materials used to build those fields. While other types of farming features such as contour terraces and check dams were also identified at a few sites, they were quite rare. Informal occupation areas at four of the nine farming sites consisted of scatters of chipped stone artifacts and occasional ground stone artifacts, sherds, thermal features, and possible fieldhouse locations. These areas appear to represent temporary occupational areas used while nearby fields were being cultivated. Chipped stone artifacts, common along the terrace edge at these sites, probably represent use of that zone for material acquisition.

Hilltop Pueblo (LA 66288) is about 200 m east of Nute (LA 298), a large Classic period village considered ancestral by the Tewas (Harrington 1916). The pottery recovered from Hilltop Pueblo also indicates a Classic period occupation. It is uncertain whether it was an independent entity or a part of Nute that was separated from the main village by a short distance. The trail (LA 118549) extends through most of the project area and was traced as far south as Ponsipa'akeri, another large Classic period village considered ancestral by the Tewas (Harrington 1916). The configuration of the trail and its close association with several farming sites indicate that it was a prehistoric travel corridor dating to the Classic period occupation of the valley.

LA 105710 was a multicomponent site containing prehistoric and historic remains. Most of the prehistoric component consisted of materials washed downslope from Hilltop Pueblo. Two simple hearths associated with the prehistoric occupation of that site were found in the profiles of backhoe trenches and represent the only in situ prehistoric features found at LA 105710 or LA 66288. The historic component was the main focus of excavation at this site. Two historic structures were identified at LA 105710—an abandoned morada at the edge of the right-of-way that was avoided rather than excavated, and the remains of a small store operated by Candido García in the early 1930s. Also included in this site was a concentration of wolfberry bushes thought to represent the former location of corrals used by the Archuleta family.

These twelve sites provide us with a look at two very different periods of use and adaptation in the Ojo Caliente Valley. The excavation of these sites and the analysis of materials recovered during this study were aimed at answering a series of questions posed in the data recovery plan (Wiseman and Ware 1996). Further questions were generated as data recovery and analysis proceeded and were added to those in the data recovery plan. This report is structured in four basic sections. The first section describes the project in general, the research design, field and laboratory methods, and overviews of the natural and cultural environments of the area. The sites are described in the second section, and the results of data recovery at each are detailed. Discussions of the artifact analyses conducted by OAS staff comprise the third section. The fourth section contains research reports and syntheses concerning the sites.

Based on the results of this study, we determined that the potential for yielding important data was exhausted in the sections of sites that extended into the right-of-way for this highway construction project. No further investigations within project limits were indicated. However, it should be noted that all twelve sites included in this study extend outside project limits. Further studies may be necessary at these sites if U.S. 285 is scheduled for further widening or reconstruction that would expand the right-of-way examined for the current project.

Chapter 2. The Physical Environment of the Project Area

James L. Moore

According to Fenneman (1931), the project area falls within the Southern Rocky Mountain Province of the western United States. The main features of this physiographic province in New Mexico are the central Rio Grande Valley, flanked to the east and west by parallel mountain ranges that form the south end of the Rocky Mountains. Both ranges are linear in form and run north-south; the Sangre de Cristos are on the east side of the Rio Grande Valley, and the Jemez and Nacimiento ranges are on the west (Fenneman 1931:104–105). Structurally, the project area is in the northern Española Basin. The Rio Ojo Caliente, which drains the project area, is a tributary of the Chama River, which flows into the Rio Grande just north of Española.

Geomorphology

The northern Española Basin is one of six or seven similar basins that comprise the Rio Grande depression between southern Colorado and southern New Mexico (Kelley 1979:281). In structure, the Española Basin is a broad, gentle, northeast-trending syncline with downwarping along its west margin (May 1979:83). It is bounded on the west by the Jemez Mountains, on the northwest by the Tusas and Brazos ranges, on the north by the Taos Plateau, on the east by the Sangre de Cristos, on the south by the Cerrillos hills and the north edge of the Galisteo River Valley, and on the southwest by the La Bajada fault escarpment and the Cerros del Rio (Kelley 1979:281). The Rio Grande enters the basin in the north through the Taos Gorge and exits in the south through the Whiterock Gorge (Kelley 1979:281).

The Española Basin is 64 to 80 km long by 47 to 64 km wide (Woodward 1974:126) and developed after a long period of geologic stability that prevailed during the late Eocene and most of the Oligocene. The basin began forming when the margin of the Colorado Plateau began foundering along the roots of early Laramide uplifts, producing the downwarping and extensional faulting that became the Rio Grande rift (Kelley 1979:281). Several features that form the modern boundary of the Española Basin were already in place when it began to subside, including the Nacimiento, Jemez, Brazos, and Sangre de Cristo uplifts (Kelley 1979:281). These ranges were the main sources of the materials deposited in the basin and formed the Santa Fe group. These sediments were augmented by volcanic materials during the Miocene and early Pliocene as eruptions occurred in the Jemez, Brazos, and Sangre de Cristo areas (Kelley 1979:281). Most of the Santa Fe formation had been deposited when uplifting along the east edge of the basin caused major subsidence during the late Pliocene. This was followed by a long period of geologic stability, erosion, and the development of pediments (Kelley 1979:281).

According to Kelley (1979), the Ortiz surface is the most widespread and well-preserved pediment in the basin, but it has mostly been removed by erosion. Black Mesa represents a local remnant of the Ortiz surface. There are also several lower pediments in the basin, but none occur in the Ojo Caliente Valley. Extensive erosion during the Quaternary formed the inner valleys of the Rio Grande depression, and this dissection was greatest in the Española Basin (Kelley 1979:285). This process formed valleys and gorges with as much as 300 m of relief (Kelley 1979:285).

Kelley (1979:284) feels that the Rio Ojo Caliente was initially a tributary of the Rio Grande, flowing into that river near present-day Embudo. However, the basalt flow that formed Black Mesa deflected the Rio Ojo Caliente, turning it into a tributary of the Chama River. As the Rio Ojo Caliente cut downward through the Santa Fe formation it created a series of gravel terraces, mostly along the east side of the valley between Ojo Caliente and Black Mesa (Kelley 1979:287). At least three terrace levels are represented on the east side of the river between 30 and 75 m above the river (Kelley 1979:287). The few terraces that occur along the west side of the river differ somewhat in elevation from those on the east side (Kelley 1979:287), so their relationship is questionable. Gravels in the terraces are predominantly Precambrian quartzites originating northwest of La Madera (Kelley 1979:287).

Geology and Stratigraphy

The stratigraphy of the Ojo Caliente area is summarized by May (1979:84), from which the following discussion is taken, except where noted. Other than an exposure of Precambrian rocks near Ojo Caliente, the Abiquiu Tuff of Oligocene to Miocene age is the lowest exposed stratigraphic unit and is 0 to 60 m thick. This formation unconformably overlies igneous and metamorphic rocks of Precambrian age and consists of a tuffaceous sandstone with a layer of volcanic-pebble conglomerate near the top. The Abiquiu Tuff is mostly composed of volcanic sediments derived from the San Juan Mountains and is overlain by formations of the Santa Fe Group (Galusha 1974:285).

The Abiquiu Tuff formation grades into the Los Piños formation in the north part of the Ojo Caliente area, and the Chama–El Rito member of the Tesuque formation in the south. The Los Piños formation is a 410 m thick series of volcanic- and metamorphic-pebble conglomerates and tuffaceous sandstone beds. It is similar to and intertongued with a thin layer of the Chama–El Rito member in the Ojo Caliente area. Evidence suggests that the Los Piños formation represents a broad, south-sloping alluvial fan built of materials eroded from a volcanic source to the north—possibly the southern San Juan Mountains—during the Oligocene and Miocene periods.

The Chama-El Rito member is 30 to 550 m thick and consists of slightly tuffaceous sandstone and siltstone containing lenses of volcanic-pebble conglomerate. The upper member of the Tesuque formation, the Ojo Caliente sandstone, is of Miocene age and is 160 m thick. It is primarily an eolian sandstone with a few beds of tuff and tuffaceous sandstone near the bottom. Along the sides of Black Mesa this formation is overlain by the Chamita formation, which consists of a series of fluvial sandstones of upper Miocene age. Tuffs and tuffaceous sandstones are also common in that formation.

Soils

Soils of the study area are described by Hacker and Carleton (1982:48, 50, 81–82, 85, 94–95, 98), and this discussion is summarized from their work. Soils on the gravel terraces south of Ojo Caliente are of the Sedillo-Orthents association. Sedillo soils comprise about 45 percent of the association and are deep, well-drained gravelly loams that have formed in alluvium on terraces with slopes of 3 to 15 percent. The upper part of this soil tends to be a layer of brown gravelly loam about 7.6 cm thick. This is underlain by about 20 cm of reddish brown and brown very gravelly clay loam. The substrate is a pink and brown very gravelly sandy loam, which occurs to a depth of 1.5 m. Below 20 cm this soil is slightly to strongly calcareous. Sedillo soils are moderately slowly permeable, with moderate runoff and slight wind erosion hazards.

Orthents occur on slopes of 30 to 45 percent and comprise about 35 percent of the association. These soils are deep, gravelly, and well drained. The surface layer is typically a very gravelly loam, which is underlain by a very gravelly clay loam. Permeability is moderate to moderately rapid, and this soil has high water-erosion and slight wind-erosion hazards.

Several other soils are minor components of this association. Silva, Manzano, Fernando, and Hernandez soils each comprise about 5 percent of the association. The Silva series consists of deep, well-drained soils forming in mixed alluvium and eolian sediments on upland fans and valley sides with slopes of 0 to 10 percent. The surface layer is a brown to dark brown loam 5 cm thick, underlain by various clay loams to a depth of 1.5 m. The Manzano series consists of deep, well-drained soils forming in mixed alluvium on valley bottoms and alluvial fans with slopes of 0 to 5 percent. This series contains several brown to dark brown clay loams to a depth of 1.5 m. The Fernando series is also comprised of deep, well-drained soils forming in mixed alluvium, in this case on alluvial fans with slopes of 0 to 7 percent. This series has A and B horizons of light brown to brown silt loam, underlain by clay loams to a depth of 1.07 m, which in turn are underlain by loam for another 45 cm. Finally, the Hernandez series consists of deep, well-drained soils forming in mixed alluvium and eolian sediments on alluvial fans and valley bottoms with slopes of 0 to 5 percent. This series grades from a brown loam on the surface through several horizons of clay loam to a depth of 1.5 m.

Soils at the base of the gravel terraces in the vicinity of LA 66288 and LA 105710 are categorized as Royosa loamy sand. This soil occurs on 1- to 8-percent slopes and is deep and somewhat excessively drained. Occurring on undulating to gently rolling landforms, Royosa loamy sand formed in eolian materials in old dunes. The surface layer is typically a brown sand about 20 cm thick, underlain by brown loamy sand to a depth of 1.5 m. Royosa is highly permeable, and it has slight water erosion and high wind erosion hazards. Also included with this soil in mapping were small areas of Vibo, Petaca, and Manzano soils; the latter has already been described. The Vibo series consists of deep, well-drained soils forming in mixed alluvium on alluvial fans with slopes of 3 to 10 percent. This series grades from a brown sandy loam on the surface through sandy clay loams, sandy loam, and loamy sand to a depth of 1.5 m. Petaca soils do not occur in the study area.

Biotic Environment

The condition of the local plant and animal populations is far from pristine due to human exploitation of the study area for a variety of purposes through time. Prehistorically, there were at least five large Classic period (A.D. 1325–1600) villages in the Ojo Caliente Valley, with some evidence of a sedentary Pueblo population extending back into the Coalition period (A.D. 1150–1325). Before those times, Archaic remains in the valley indicate the occasional presence of groups of transient hunter-gatherers. Drastic changes to the biotic structure of the project area probably did not occur until it was occupied by farmers, though even the hunter-gatherers could have affected the ecology of the region to some extent.

Human use of the Ojo Caliente area since the Coalition period has undoubtedly caused changes in the biotic environment. Pueblo gravel-mulched fields built along the edges and tops of gravel terraces flanking both sides of the Rio Ojo Caliente have changed the character of those areas in ways that can still be seen today. The use of wood for building, cooking, and heating probably left zones around villages virtually denuded by the end of the Pueblo occupation. Similarly, Spanish use of the region for farming and grazing affected the distribution and types of plants used for forage by cattle and sheep. Heavy use of wood for building and fires probably again left the area nearly denuded around settlements. While the woodlands have begun recovering since more efficient means of heating and cooking became widely available, grazing in the uplands flanking the valley and farming in the river bottom have continued to change the character of the biotic environment. Thus, descriptions of local flora and fauna based on modern data are not directly comparable to the conditions experienced by prehistoric populations.

Local Vegetation

The distribution of plants is conditioned by a number of factors, including the availability of water, exposure, and soil type. Thus, the types of plants growing adjacent to the Rio Ojo Caliente differ from those occupying the valley margin and upland areas. The uplands bordering the Ojo Caliente Valley generally contain two bands of piñon-juniper woodland in the study area. The lower band is fairly narrow and occupies the west-facing slope of the gravel terrace that borders the east side of the valley, extending up drainages cut into the terrace by east-west-flowing intermittent streams. This band of woodland often extends up to the terrace top and in places spills over onto the gravel-mulched fields that usually line the west edge of the terrace. Rather than invading a new area, the woodland is probably just beginning to reoccupy parts of the terrace top that were cleared of trees, perhaps as early as the Classic period, when the gravel-mulched fields were built.

A higher band of woodland begins at the base of the next gravel terrace to the east, extending upslope and often onto the top of that terrace, which also contains some gravel-mulched fields but was not as heavily used as the lower terrace. The dominant soils on the terrace are of the Sedillo-Orthents association. Hacker and

Carleton (1982:50) indicate that careful grazing of this soil will create an understory dominated by western wheatgrass, blue grama, galleta, and Indian ricegrass. Overgrazing results in dominance of ring muhly, broom snakeweed, and big sagebrush. To that list can be added cholla, which is fairly common in the study area. Thus, this soil association has been overgrazed, and the modern vegetative cover does not reflect its prehistoric condition.

A third band of woodland exists in the valley bottom adjacent to the river but differs somewhat from the upland bands. Right along the river is a band of riparian vegetation dominated by cottonwoods. Tamarisk, introduced from Europe, and willow also occur. Flanking the riparian zone and occupying most of the Royosa loamy sand is a woodland zone dominated by juniper and piñon, with an understory containing blue grama and Indian ricegrass (Hacker and Carleton 1982:48).

Piñon-juniper woodlands are one of the largest ecosystems in the Middle Rio Grande Basin and the Southwest in general (Gottfried et al. 1995:95). The distribution of woodlands and the density and size of trees are controlled by available soil moisture and season of precipitation. Moist areas support relatively dense stands of tall trees, while dry areas contain scattered trees of low stature (Gottfried et al. 1995:98). This variety is visible in the study area, where trees are denser and taller in the valley bottom adjacent to the Rio Ojo Caliente, and smaller and more scattered on the flanking terrace slopes and tops. A diverse variety of understory plants can occur in piñon-juniper woodlands that have not been heavily affected by grazing. Surveys in Bandelier National Monument have recorded about 450 species of vascular plants in this zone (Gottfried et al. 1995:103). At least 100 forbs and 36 grasses have been recorded at Mesita de los Ladrones near Pecos, and at least 6 tree taxa, 12 shrubs, 31 forbs, and 15 grasses were found in Comanche Canyon, just north of our study area (Gottfried et al. 1995:103). Thus, undamaged piñon-juniper woodlands tend to have a very diverse understory containing many more species than were noted at the sites examined during this study.

Local Wildlife

In general, piñon-juniper woodlands support at least 70 species of birds and 48 species of mammals. Species distribution is determined by geographic location and type of piñon-juniper habitat (Gottfried et al. 1995:104). Birds that commonly live in piñon-juniper woodlands include the piñon jay, scrub jay, screech owl, gray flycatcher, mockingbird, lark sparrow, and plain titmouse; turkeys also occur where ponderosa pine is available for roosting (Gottfried et al. 1995:104). Several types of raptors also occur in this zone, including golden eagle, Swainson's hawk, Cooper's hawk, red-tailed hawk, kestrel, and great-horned owl (Gottfried et al. 1995:105). Many species of bats have been netted at night in piñon-juniper woodlands, but whether they simply forage there or roost in the trees is currently unknown (Gottfried et al. 1995:105).

Artiodactyls commonly found in piñon-juniper woodlands include mule deer and elk. Pronghorns live in the more open zones. Predators include mountain lions, coyotes, gray foxes, long-tailed weasels, western spotted skunks, and hog-nosed skunks (Gottfried et al. 1995:105). Common small mammals are cliff chipmunk, rock squirrels, brush mice, piñon mice, rock mice, white-throated woodrats, and Mexican woodrats (Gottfried et al. 1995:105). Jackrabbits, cottontails, prairie dogs, pocket gophers, and kangaroo rats also live in this type of environment (Anschuetz 1998:253).

The Modern Climate

In general, the climate of New Mexico is moderate in terms of temperature and arid to semiarid in terms of precipitation; there is plenty of sunshine, skies are clear, relative humidity is low, and the amount of evaporation over open water is high (Tuan et al. 1973:185). Temperature ranges are rather high between day and night and winter and summer because the dry, clear air allows rapid heating and cooling (Tuan et al. 1973:185). Three general climatic zones are recognized in New Mexico: arid, semiarid, and subhumid/humid. Differences in climate are a function of latitude, location in relation to moisture-bearing winds, and variation in elevation (Tuan et al. 1973:186, 188). Ojo Caliente is near the boundary between semiarid and subhumid/humid zones, but since humid conditions only occur in the highest parts of mountains, the study area is actually at a boundary between semiarid and subhumid zones (Tuan et al. 1973:187).

Gabin and Lesperance (1977:272) present annual and monthly means for precipitation from 1923 to 1970, temperature from 1929 to 1970, and potential evapotranspiration from a weather station at Gavilan (Table 2.1). According to these figures, the Gavilan area receives an average of 428 mm of precipitation each year. Mean precipitation levels peak between July and September, while mean temperature peaks between June and August. Not surprisingly, the latter are also the months when moisture loss through evapotranspiration is greatest. Potential evapotranspiration measures moisture loss in irrigated crops (Gabin and Lesperance 1977), so these losses are probably higher than they would be in crops bred for dry farming. Still, these would be the months when moisture loss was highest, so below-average precipitation would severely affect dry-farmed crops. High evapotranspiration may somewhat offset the benefits of these wet months.

Gabin and Lesperance's (1977:272) precipitation figures are much higher than those supplied by Maxwell (2000:99) for the general area, which were obtained from the National Climatic Data Center of the National Oceanic and Atmospheric Administration. Maxwell (2000:99) provides a regional mean precipitation level of 279 mm, which is only 65 percent of Gabin and Lesperance's (1977:272) mean. Three stations at Abiquiu Dam, El Rito, and Ojo Caliente were used in Maxwell's study, and statistical differences in precipitation levels are noted between the stations (Maxwell 2000:11). Extremes in annual precipitation for the period measured ranged from a low of 104 mm in 1956 to a high of 556 mm in 1941 (Maxwell 2000:99). Since the precipitation mean provided by Gabin and Lesperance is about 77 percent of Maxwell's maximum extreme, it could be too high. However, Maxwell's (2000:144) reconstruction of prehistoric precipitation patterns yielded a mean of 402.5 mm between A.D. 1200 and 1500, which is fairly close to the modern mean provided by Gabin and Lesperance (1977). Variation in precipitation levels during the years monitored is probably responsible for the large difference in the means provided by these studies. Fortunately, the distribution of precipitation by month is similar in both data bases. Maxwell (2000:99) indicates that the region receives about 51 percent of its annual precipitation between May and September, and Gabin and Lesperance's (1977:272) figures are comparable at 52.4 percent.

Other climatic factors are also important for farmers. Critical among them is the number of

Table 2.1. Precipitation and evapotranspiration at Gavilan

Month	Mean Precipitation (mm)	Mean Temperature (degrees F)	Potential Evapotranspiration (mm)	Moisture Surplus (mm)	Moisture Deficit (mm)
January	27.6	18.9	6.3	21.3	-
February	30.7	23	8.6	22.1	-
March	31.5	30.7	16.8	14.7	-
April	27.2	40.7	35.3	-	8.1
May	26.2	48.6	69.4	-	43.2
June	22.6	57.3	110.2	-	87.6
July	57.4	64.5	145.8	-	88.4
August	72.9	62.9	122.9	-	50
September	45.2	55.1	74.2	-	29
October	29.7	44.4	36.3	-	6.6
November	24.4	31.5	13	11.4	-
December	31.7	22.8	7.6	24.1	-

Source: Gabin and Lesperance (1977:272).

frost-free days available for plant growth. If the frost-free period is too short, crops will not mature, yields may be lower, crops could be damaged, and viable seed might not be produced. On the average, the last killing frost in the project area occurs between May 20 and 30, while the first killing frost is usually between September 20 and 30 (Tuan et al. 1973:88–89). This provides the area with 120 to 140 frost-free days (Tuan et al. 1973:87), which is sufficient for corn farming.

However, Tuan et al. (1973:79) note that there are some problems with modern meteorological measurements. A standard instrument shelter is normally positioned 1.83 m above the ground surface. Closer to the ground, which is where most crops grow, frosts can occur later in the spring and earlier in the fall (Tuan et al. 1973:79). This is not taken into account in measures of frost-free days, so the frost-free season may be shorter at ground level than these figures suggest. Differences in topography also affect the occurrence of killing frosts, because cold, dry, dense air tends to collect in hollows (Tuan et al. 1993:79). This means that valley bottoms are often colder than adjacent highlands (Anschuetz and Maxwell 1987). Studies at Hopi and Mesa Verde have demonstrated that cold-air drainage can significantly shorten the length of the growing season in valleys (Adams 1979; Cordell 1975). Thus, terraces flanking valley bottoms may actually have longer frost-free periods.

Reconstructions of the Past Climate

A detailed climatic reconstruction does not exist for our specific study area. Maxwell (2000:142–145) reconstructed prehistoric precipitation patterns for the lower Chama River Valley, which should be more applicable to our study that reconstructions by Rose et al. (1981) for the Santa Fe area to the south, and by Orcutt (1999a) for the general Northern Rio Grande region. The period of interest in this discussion spans the Coalition and Classic periods between A.D. 1150 and 1600, which is when the Ojo Caliente Valley was occupied by Pueblo farmers. At this time there is no evidence of earlier farmers in the area, and there were few or no Pueblos living in the valley when the Spaniards founded their first colony at San Gabriel, thus officially ushering in the historic period.

The Lower Chama River

For the lower Chama River, Maxwell (2000:144) calculated an annual mean precipitation level of 402.5 mm between A.D. 1200 and 1500, with a standard deviation of 62.2 mm. He also charted ten-year running means for precipitation, which smoothed variation and suggested a slow, periodic pattern of prehistoric rainfall variation (Maxwell 2000:144, Fig. 8). At no time between A.D. 1200 and 1500 did precipitation for this area seem to exceed or fall short of the mean by as much as one standard deviation. However, there did seem to be a pattern of several generally good years followed by several generally bad years, and the sequences were often of similar duration.

According to Maxwell's (2000:144) data, the period opened with about nine years of above-average precipitation, followed by around 23 years of below-average precipitation lasting until ca. 1230. Precipitation was above the mean between ca. 1230 and 1248, dropping back below the mean from ca. 1249 to 1264, except for one year (1263) of above-average precipitation. This was followed by above-average precipitation between ca. 1265 and 1278, and a period of below-average precipitation between ca. 1279 and 1288, except for one year (1281) with above-average precipitation. Above-average precipitation levels again prevailed between ca. 1289 and 1316, followed by a 35-year period of high-frequency variation around the mean that ended around 1349. Precipitation levels were again above average between ca. 1350 and 1367, followed by a very short period of below-average precipitation that ended around 1372. At that point, the region entered a period of above-average precipitation that lasted until ca. 1390, followed by below-average precipitation until ca. 1410. Between ca. 1411 and 1420 there was a short period of above-average precipitation, which was followed by a short period of below-average precipitation that lasted until ca. 1428. Precipitation was generally above average between ca. 1429 and 1451, though with two short episodes of below-average precipitation (1438–1440 and 1445–1448). Below-average precipitation dominated between ca. 1452 and 1486, returning to above average until ca. 1497. A quick dip below the regional average lasted until nearly 1500, and the sequence ended with above-average precipitation.

The Santa Fe Area

Rose et al. (1981:104–105) reconstructed precipitation patterns for Arroyo Hondo Pueblo, near Santa Fe, between A.D. 985 and 1970, though our period of interest is A.D. 1150 to 1600. Rose et al. (1981) calculated departures from the mean by decades, overlapping each decade by five years and plotting them at the midpoint, effectively graphing the variation in five-year increments. The Santa Fe area was experiencing a period of mostly below-average precipitation between ca. 1150 and 1173, except for a short period in the center of that span. Precipitation was above average between ca. 1174 and 1183, dropping back to below average until ca. 1193. Precipitation levels were above average between ca. 1194 and 1213, dropping back below the mean from ca. 1214 to 1228. Precipitation levels were generally above the mean between ca. 1229 and 1245. Except for a brief period from ca. 1268 to 1273, precipitation levels were mostly below or near average from ca. 1246 to 1293. The next 25 years or so (1294–1318) saw higher than average levels.

There was a short interval of below-average precipitation ca. 1319–1323, followed by a longer interval ca. 1324–1335, when precipitation was above the mean. Below-average precipitation prevailed between ca. 1336 and 1343, followed by higher than average levels ca. 1344–1358. The next 40 years saw short intervals of above-average precipitation ca. 1369–1378 and 1384–1388, and below-average precipitation ca. 1358–1368, 1378–1383, and 1389–1398. The fifteenth century began with a 15-year period of above-average precipitation between about 1399 and 1413. This was followed by below-average precipitation between ca. 1414 and 1425 before heading into about 23 years of above-average precipitation ca. 1426–1448. Precipitation was below average from ca. 1449 to 1463, above average between ca. 1464 and 1473, below average between ca. 1474 and 1485, above average between ca. 1486 and 1495, and below average between 1496 and 1508 to close out the fifteenth century.

The period of below-average precipitation that began the 1500s gave way to a short period of above-average precipitation between ca. 1509 and 1515, followed by below-average levels between ca. 1516 and 1523. Precipitation levels were again above average between ca. 1524 and 1543, followed by short periods of below-average precipitation ca. 1544–1553 and above-average precipitation between ca. 1554 and 1558, and a long period of below-average precipitation between ca. 1559 and 1585. The 1500s closed out with a period of above-average precipitation between 1586 and 1600.

The Northern Rio Grande

Orcutt's (1999a:234–239) reconstruction of the general Northern Rio Grande area was specifically applied to the southern Pajarito Plateau. This reconstruction was done differently from those provided by Maxwell (2000) and Rose et al. (1981), but there is enough comparability that it can be used in this discussion. Orcutt (1999a:231) used the Palmer Drought Severity Index (PDSI) to evaluate climatic trends in the Bandelier area. PDSI "provides an estimate of moisture availability by using both temperature and precipitation to approximate evapotranspiration rates" (Orcutt 1999a:231). As such, it is considered a better measure of climate than precipitation rates or temperature alone. Each year during the period of interest was evaluated and classified as dry, slightly dry, normal, slightly wet, or wet. The former two categories refer to below-average conditions, while the latter two refer to above-average conditions.

Except for one year when slightly wet conditions prevailed (1156), the period between 1150 and 1161 was drier than normal. Conditions were normal to slightly wet between 1162 and 1168, switching to dominantly dryer than normal between 1169 and 1181 except for normal years at 1172–1173 and 1176–1177. Conditions were mostly normal between 1182 and 1188, except for one above-normal year (1186). Conditions were below normal between 1189 and 1194 except for 1192, when they were normal. A long period of above-normal to normal conditions prevailed between 1195 and 1215, followed by dominantly below-average conditions between 1216 and 1227. Conditions returned to normal or above normal between 1228 and 1249, and were below average from 1250 to 1258. Average to above-average conditions were back between 1259 and 1276 before entering a fairly long period of mostly below-average conditions between 1277 and 1296. The latter period essentially corresponds to the period of the Great Drought, which contributed to abandonment of most of the Colorado Plateau by 1300.

A long period of above-normal to normal conditions from 1297 to 1338 ended the thirteenth century and began the fourteenth century, except for one below-average year in 1319. Conditions were below average from 1339 to 1353, and at or above average between 1354 and 1363. Below-average conditions prevailed between 1364 and 1367, with a period of mostly normal conditions between 1368 and 1377, except for two above-average years in 1373 and 1375. Climatic conditions were below average between 1378 and 1380, and above average to normal between 1381 and 1389. Dryer than normal conditions occurred from 1390 to 1394, with normal or above-average conditions between 1395 and 1398.

The 1400s began with a period of below-average conditions between 1399 and 1404, followed by normal to better than average conditions between 1405 and 1414. Below-average conditions again prevailed between 1415 and 1426. Except for 1427, which was a normal year, conditions were wetter than average between 1427 and 1437. This was followed by a brief interval of below-average conditions from 1438 to 1440, and mostly normal conditions between 1441 and 1445 (except for 1443, which was above normal). The region then entered a fairly long period of below-average conditions that lasted from 1446 to 1466, except for a single year with normal conditions at 1442. This was followed by a short stretch of normal to above-normal years between 1467 and 1471 before again entering a period of below-average conditions that lasted from 1472 to 1483.

Mostly above-normal conditions prevailed from 1484 to 1495. The transition between the fifteenth and sixteenth centuries was a period of below-normal to normal conditions; the latter occurred at 1499–1504 and 1506, and the former at 1505 and 1507–1510. Conditions were mostly above normal between 1511 and 1516. Except for three normal years between 1521 and 1523, below-normal conditions prevailed from 1517 to 1528. Normal conditions occurred between 1529 and 1534, except for 1530, when conditions were above normal. Two years of below-normal conditions in 1535 and 1536 were followed by another span of mostly normal years between 1537 and 1544, interrupted by two years of above-average conditions in 1540 and 1541. This was followed by five years of below-average conditions from 1545 to 1549, and eleven years of normal to above-normal conditions between 1550 and 1560.

Conditions during the remainder of the 1560s were mostly below average (1561–1566) or normal. The latter prevailed between 1567 and 1573, except for 1572, when conditions were better than normal. A long period of below-average conditions began in 1573 and lasted until 1594, and the sixteenth century ended with normal (1595–1596) to above-normal (1597–1599) conditions.

Climatic Reconstructions

The three climatic reconstructions discussed above were built differently, so they may have limited comparability. The reconstructions presented by Maxwell (2000) and Rose et al. (1981) used retrodicted precipitation data to build curves that show long-term variation in precipitation levels. Both curves were smoothed to eliminate high levels of annual variation and show longer-term periodicity, but different methods were used to smooth them. Since the data used in this discussion were taken from graphic representations of those curves, dates given in the above discussions should be taken as approximate. Orcutt's (1999a) reconstruction differs from these precipitation curves by also taking reconstructed temperatures into account to determine growing conditions in terms of moisture availability.

With these potential problems in mind, Figure 2.1 compares the reconstructions in a rather simplistic manner. Orcutt's (1999a:234–230) data are condensed into three categories—better than normal, normal, and below normal—and plotted by year. Normal years are left blank. Data from Maxwell (2000:144) and Rose et al. (1981:104–105) are interpreted from their smoothed curves, so the beginnings and ends of periods of above- and below-average precipitation are relative rather than absolute. While Rose et al. (1981) also present the raw data used to construct their precipita-

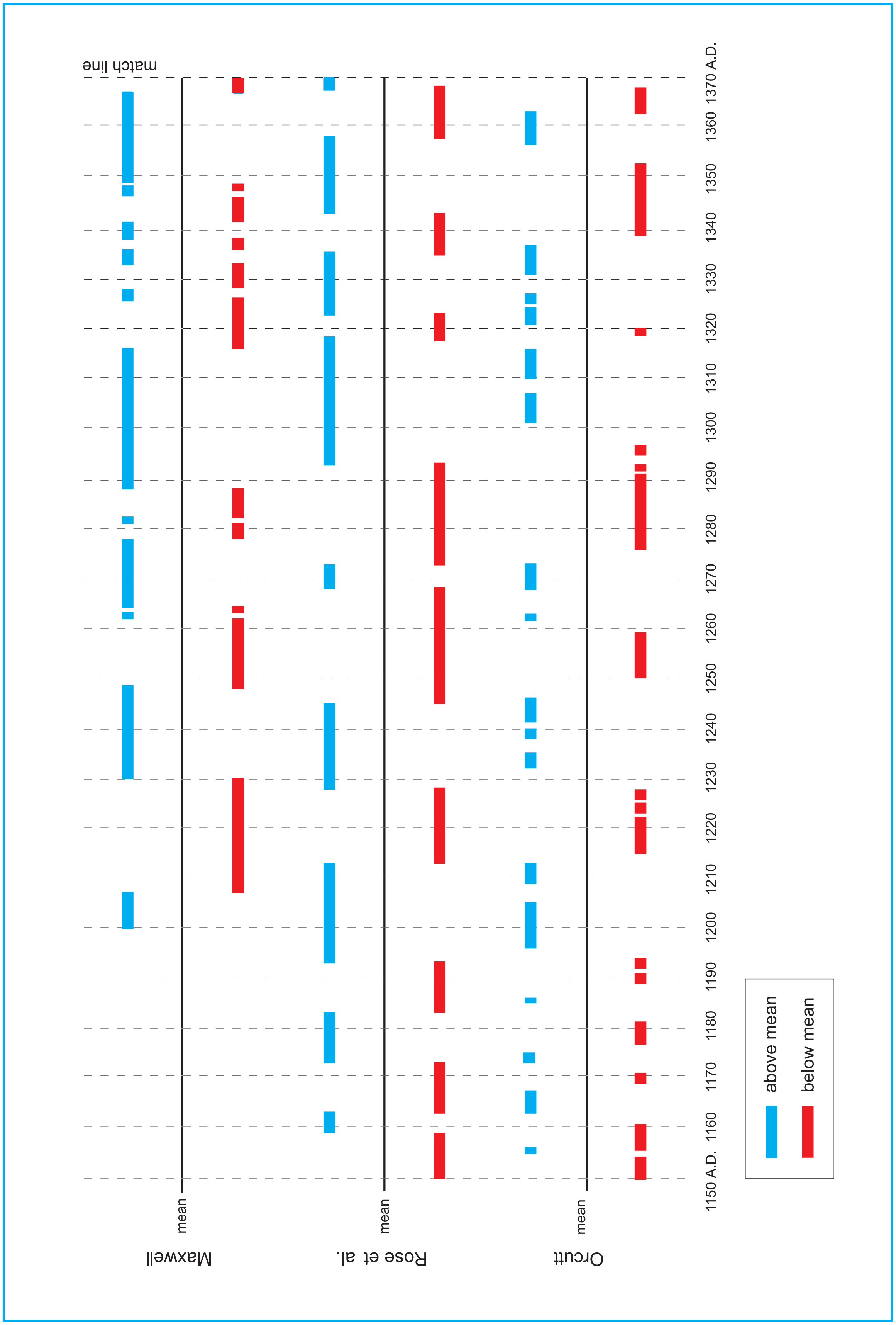


Figure 2.1. Climatic reconstructions for the Northern Rio Grande area compared. Normal (average) years in reconstruction by Orcutt (1999a) and Rose et al. (1981) are left blank.

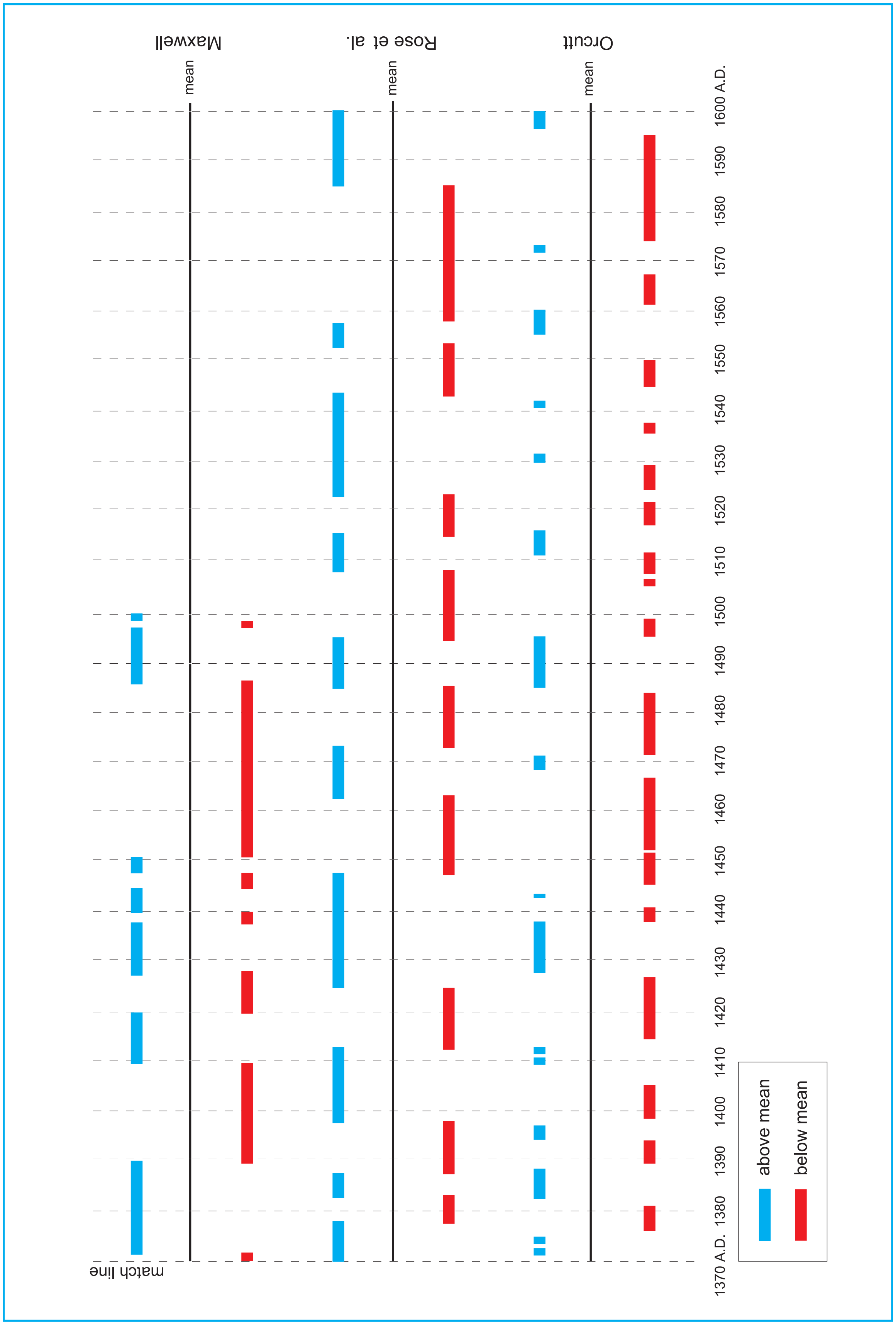


Figure 2.1 (continued)

tion curve, plotting those data against the information taken from the other reconstructions resulted in too much noise for interpretation in this venue, so we returned to the smoothed curve to ease interpretation.

The reconstructions plotted in Figure 2.1 were compared to see how closely they corresponded to one another, and the results of this comparison are presented in Table 2.2. Overall, the three reconstructions were comparable for less than two-thirds of the years between 1200 and 1500. The highest level of comparability was between the reconstructions of Maxwell and Orcutt, and the lowest between those of Maxwell and Rose et al. The greatest amount of correspondence, in general, was for the years between 1200 and 1300, while the least amount of comparability was usually for the years between 1300 and 1400. While this may just be coincidence, it could also indicate that there was less climatic variability in the Northern Rio Grande between 1200 and 1300 than there was between 1300 and 1400.

All three reconstructions tend to agree on certain trends. The 1200s opened with a period of above-average conditions that lasted 7 to 13 years. This was followed by a period of below-average conditions between 1215 and 1228+. Conditions returned to above average between 1230 and 1246+ and dipped back down below average between 1248 and 1260+. There was little further agreement until 1268, when conditions returned to above normal until 1273. The next period of agreement was between 1282 and 1288+, when conditions were again below average.

The 1300s seem to have opened with a period of above-average conditions between 1300 and 1316. Other periods of agreement in the fourteenth century were 1372–1377 and 1383–1388, when conditions were above average, and 1390–1394, when conditions were below average. Otherwise, there were only a few other very short periods of correspondence between the three reconstructions in this century. Disagreement between the reconstructions continued into the early 1400s. They agreed on periods of above-average conditions from 1410 to 1413, 1428 to 1438, 1441 to 1445, and 1486 to 1495. Periods of below-average to average conditions reflected in all three reconstructions included 1420–1425, 1451–1463, and 1473–1485.

So what does this mean? Obviously, all three of these reconstructions cannot be valid for the study area. Maxwell's (2000) reconstruction was built from data obtained nearest the study area, and so it is probably the most valid. However, Orcutt's (1999a) reconstruction takes more data into account, is considered applicable to the general Northern Rio Grande region, and essentially assesses the probability of drought, while Maxwell's reconstruction is a smoothed annual precipitation curve. Fortunately, there is a fairly high degree of correspondence between these reconstructions (Table 2.2).

Overall, what all three reconstructions indicate is that precipitation levels, and therefore crop-growing conditions, were quite variable through time, fluctuating between periods of high and low variability around the mean (or average conditions). There was no disagreement about this aspect of the natural environment. Maxwell (2000:147) calculated that there was only a 61-percent chance of receiving sufficient rainfall for a corn crop during the growing season in the Rio Chama area. According to Orcutt's (1999a) model, agricultural conditions were nor-

Table 2.2. Levels of correspondence between the climatic reconstructions (Maxwell 2000; Orcutt 1999; Rose et al. 1981)

Time Period (A.D.)	Maxwell vs. Orcutt	Maxwell vs. Rose et al.	Rose et al. vs. Orcutt	All Three Reconstructions
1150-1200	-	-	53.3%	-
1200-1300	84.8%	73.0%	93.8%	77.4%
1300-1400	65.7%	60.0%	64.7%	47.6%
1400-1500	82.1%	58.0%	77.8%	63.0%
1500-1600	-	-	62.5%	-
Overall	77.5%	63.7%	72.6%	62.6%

mal or above normal only 57.6 percent of the time between 1150 and 1600 in the Northern Rio Grande. Between 1200 and 1500—the period examined by Maxwell (2000)—the percentage of years with normal to above-normal conditions increased slightly to 59.3 percent. This percentage is so close to the figure derived by Maxwell that the difference is probably negligible.

Sufficient moisture for growing corn was only available about 60 percent of the time in the Northern Rio Grande during the period of interest to this study. There were two basic ways in which this shortfall could be corrected—surplus crops could be stored, or supplemental moisture could be delivered to crops. Had drought years been predictable, production and storage of surplus might have been able to get the population through bad years. However, as Figure 2.1 shows more than anything else, periods of below-average precipitation (or growing conditions) were anything but predictable. Thus, storage of surplus alone would not work; natural precipitation levels had to be supplemented. This could be done in two ways—extra water could be delivered to crops, or soil moisture levels could be enhanced and conserved. Gravel-mulched fields were built to enhance and conserve ground moisture, and their widespread occurrence in the Northern Rio Grande suggests that they were an efficient means of delivering extra moisture to crops, enabling the population to survive most periods of adverse climatic conditions.

Chapter 3. Overview of the Prehistoric Period

James L. Moore, Steven A. Lakatos, and Jeffrey L. Boyer

Through most of its prehistory the Ojo Caliente Valley was linked to a much larger cultural area referred to as the Northern Rio Grande, which stretches from the south edge of La Bajada Mesa to the north end of the Taos Valley and encompasses the Santa Fe area, Galisteo Basin, Pajarito Plateau, Tewa Basin, the Pecos region, and the Taos district. The prehistory of this large region becomes especially closely linked after agriculture appears and spreads, and farming populations began moving in response to climatic change or the need for more land. Since some parts of this region are better known than others, this discussion will not always focus specifically on the study area. Histories of archaeological investigations of the Rio Chama and Rio Ojo Caliente drainages are presented by Anschuetz (1998) and Maxwell (2000) and are not repeated here.

Paleoindian Period (9200–5500 B.C.)

The earliest occupation of the Southwest was during the Paleoindian period, which contains three broad temporal divisions. Holliday (1997:225) provides dates for these divisions from the southern Plains: Clovis, 9200 to 8900 B.C.; Folsom, 8900 to 8000 B.C.; and Late Paleoindian, 8000 to 7000 B.C. Dates for these divisions probably have similar ranges in northern New Mexico, though the end of the Late Paleoindian tradition is usually given as 5500 B.C. in that area. The Late Paleoindian division groups together several different artifact complexes distinguished by variations in projectile points and tool kits that may reflect differences in lifestyle. Fiedel (1999) has reevaluated early Paleoindian radiocarbon dates in light of information provided by other dating methods. He concludes that radiocarbon dates between 12,500 and 10,000 B.P. are problematic because of large-scale fluctuations in carbon-14 ratios, yielding dates that may be off by as much as 2,000 years. Thus, he suggests that the Clovis occupation should be redated at 13,400 to 13,000 B.P. (11,400–11,000 B.C.), and Folsom should be similarly dated about 2,000 years earlier than it currently is.

At one time all Paleoindians were classified as big-game hunters. Some researchers now feel that the Clovis people were unspecialized hunter-gatherers, while Folsom and many later groups turned increasingly toward the specialized hunting of migratory game, especially bison (Stuart and Gauthier 1981). While some Paleoindians drifted out of New Mexico with the migratory big game, those that remained undoubtedly subsisted by a broadly based hunting-gathering economy. The early Archaic inhabitants of the region probably evolved out of this population. Evidence of Paleoindian occupation is rare in the Northern Rio Grande and typically consists of diagnostic projectile points and butchering tools found on the modern ground surface or in deflated settings (Acklen et al. 1990).

Recently, two Clovis period components have been reported in the Jemez Mountains (Evaskovich et al. 1997; Turnbow 1997). Data recovery at one component identified two medial Clovis point fragments associated with a single thermal feature and tool manufacturing debris (Evaskovich et al. 1997). Identification of Paleoindian occupations in a montane setting may suggest a changing subsistence adaptation. An increased focus on the hunting of smaller game and collection of wild plant foods toward the end of the Paleoindian period may reflect changes in climate (Haynes 1980; Wilmsen 1974).

In 1961, Alexander (1964) found a "late Paleo-Indian point" on a pueblo site near the mouth of Taos Canyon. This site was revisited by Wood and McCrary (1981), but the point could not be relocated. Bases of Belen-Plainview points have been found on sites with later components at Guadalupe Mountain (Seaman 1983) and south of Carson (Boyer 1985). Boyer (1988) found a reworked obsidian Folsom point north of Red Hill on the northwest side of the Taos Valley. The point was submitted for obsidian hydration dating, but the material source could not be determined, so no date was obtained (Condie and Smith 1989).

Two isolated late Paleoindian Cody complex artifacts have been reported from the Galisteo Basin (Honea 1971; Lang 1977), and Boyer (1987) reports an isolated Cody knife from the mountains south of Taos. The little evidence of Paleoindian occupation that has been found on the Pajarito Plateau is mostly restricted to isolated projectile points (Powers and Van Zandt 1999). Isolated Clovis, Folsom, Agate Basin, Milnesand, and Scottsbluff points have been found on the Pajarito Plateau and in the nearby Cochiti Reservoir district (Chapman and Biella 1979; Root and Harro 1993; Steen 1982; Traylor et al. 1990). Though no Paleoindian sites have been identified in the study area, the presence of a handful of diagnostic artifacts indicates that Paleoindians were present in the Chama–Ojo Caliente Valleys. Anschuetz et al. (1985) note that isolated Clovis and Folsom points have been found in this region, and a secondarily deposited horizon of possible Paleoindian date was identified in the Abiquiu Reservoir area.

The paucity of Paleoindian remains through much of this area may be attributed to low visibility rather than lack of occupation. Paleoindian remains may be masked by later Archaic and Pueblo deposits. Poor visibility may also be attributed to geomorphology: surfaces or strata containing Paleoindian remains may be deeply buried and only visible in settings where these deposits are exposed. Cordell (1978) contends that the locations of known Paleoindian sites correspond to the areas of New Mexico where erosion has exposed ancient soil surfaces. If so, it may not be surprising that Paleoindian sites have not been found in the Tewa Basin and the study area, which are areas of regional soil accumulation and only local erosion.

Archaic Period (5500 B.C.–A.D. 600)

At an early date, archaeologists realized that the Archaic occupation of northern New Mexico was in many ways distinct from that of its southern neighbor, the Cochise. Bryan and Toulouse (1943) were the first to separate the northern Archaic from the Cochise, basing their definition of the San José complex on materials found in dunes near Grants, New Mexico. Irwin-Williams (1973, 1979) defined the northern Archaic as the Oshara tradition, and investigations along the Arroyo Cuervo in north-central New Mexico allowed her to tentatively formalize its developmental sequence. However, in applying that chronology outside the area in which it was developed, one must realize that specific trends might not occur throughout the Oshara region. Thus, at least some variation from one region to another should be expected.

The Oshara tradition is divided into five phases: Jay (5500 to 4800 B.C.), Bajada (4800 to 3200 B.C.), San José (3200 to 1800 B.C.), Armijo (1800 to 800 B.C.), and En Medio (800 B.C. to A.D. 400 or 600). Jay and Bajada sites are usually small camps occupied by microbands for short periods of time (Moore 1980; Vierra 1980). The population was probably grouped into small, highly mobile nuclear or extended families during these phases. San José sites are larger and more common than those of earlier phases, which may suggest population growth. Ground stone tools are common at San José sites, suggesting a significant dietary reliance on grass seeds. Irwin-Williams (1973) feels that corn horticulture was introduced by the beginning of the Armijo phase ca. 1800 B.C. Others (Berry 1982; Wills 1988) feel that corn did not appear in the Southwest until somewhat later, perhaps no earlier than 1,000 B.C. Base camps occupied by macrobands appeared by the late Armijo phase, providing the first evidence of a seasonal pattern of population aggregation and dispersal.

The En Medio phase corresponds to Basketmaker II elsewhere and represents the transition from a nomadic hunter-gatherer pattern to a seasonally sedentary lifestyle combining hunting and gathering with some reliance on corn horticulture. During this phase the population again seems to have increased. Seasonally occupied canyon-head home base camps became more numerous and began occurring in previously unoccupied locations (Irwin-Williams and Tompkins 1968). A strongly seasonal pattern of population aggregation and dispersal seems likely, with a period of maximum social interaction at home base camps followed by a breakup into microbands occupying smaller camps in other locations. While some corn was grown during this period, there does not seem to have been a high degree of dependence upon horticulture, and the population mostly subsisted on foods obtained by hunting and gathering.

Variation from this pattern occurred in southeast Utah, where Basketmaker II people appear to have been nearly sedentary and highly dependent on corn (Matson 1991). Similarly, during the late San Pedro phase in southeast Arizona (which corresponds to Basketmaker II in many ways), nearly sedentary villages dependent on corn agriculture appear to have existed (Roth 1996). Thus, in many areas of the Southwest the Archaic was coming to an end during this period. Northern New Mexico varied from this pattern, and no sedentary preceramic villages have been identified in that region. While the Archaic ended around A.D. 400 in northwest New Mexico when pottery and the bow were introduced and a shift was made to a more sedentary agricultural subsistence system, this process seems to have occurred later in the Northern Rio Grande. There, the Archaic is thought to have ended around A.D. 600 in some areas and even later in others.

The Northern Rio Grande Archaic may or may not be related to Irwin-Williams's Oshara Tradition. Projectile points illustrated by Renaud (1942, 1946) resemble the Jay, Bajada, and San José types commonly attributed to the Oshara. Cordell (1979) compared Archaic remains from the Northern Rio Grande to those in the Arroyo Cuervo district and saw many similarities. However, similar Archaic point styles occur over a vast region stretching from California to Texas and northern Mexico to the southern Great Plains, so stylistic resemblance cannot always be taken as evidence of similar cultural affinity. Subsequent cultural developments along the Northern Rio Grande suggest that the people in this area differed from those occupying the traditional Pueblo heartland in the Four Corner's region. Those differences quite likely had their basis in the makeup of the Archaic populations that originally settled these regions. Thus, a similarity in projectile point styles does not necessarily mean that the Northern Rio Grande and Four Corner's areas were occupied by groups of common cultural or even linguistic origin. Indeed, it is quite likely that they were not.

Most Archaic sites found in the Santa Fe area and Tewa Basin date between the Bajada and En Medio phases, though Early and Middle Archaic sites tend to be rather rare. These occupations are generally represented by widely dispersed sites and isolated occurrences (Anschuetz and Viklund 1996; Doleman 1996; Lang 1992; Post 1996, 1999). Early and Middle Archaic assemblages represent brief occupations with an emphasis on hunting. Materials associated with these occupations are typically mixed with deposits of later temporal components. Early and Middle Archaic sites have been recorded along the Santa Fe River and its primary tributaries (Post 2004). Until recently, temporal information from this period was derived from obsidian hydration dating (Lang 1992). However, recent excavations in the Santa Fe area have identified thermal features that yielded radiocarbon dates between 6000 and 5000 B.C. (Anschuetz 1998; Larson and Dello-Russo 1997; Post 1999). The limited number of associated artifacts recovered by these excavations indicates brief occupations geared toward hunting by small, highly mobile groups.

Although several Middle Archaic sites have been identified in the Jemez Mountains (Larson and Dello-Russo 1997), archaeological evidence of Middle Archaic occupations in the Santa Fe area are rare. A single hafted San José scraper was identified at a site southeast of Santa Fe (Lang 1992). This tool was mixed with Late Archaic and Pueblo period materials, making it difficult to associate an obsidian hydration date with a discrete component of the chipped stone assemblage. The Las Campanas project identified a late San José phase site that yielded one temporally diagnostic projectile point, tool production debris, and ground stone artifacts (Post 1996). These artifacts were associated with one thermal feature, but no datable charcoal was obtained.

Recently, excavations along the Santa Fe Relief Route identified four Middle Archaic sites. Radiocarbon dates obtained from thermal features ranged between 3200 and 1800 B.C. Two sites contained shallow structures with associated chipped and ground stone artifacts (pers. comm., Stephen Post, 2000). Although associated materials were not abundant, they may indicate a longer and more formal site occupation than is visible at earlier sites (Post 1999).

Early and Middle Archaic sites seem to be rare in the Cochiti Reservoir area, just south of La Bajada Mesa. Chapman (1979:64) indicates that the only diagnostic artifacts reflecting use of that area during the Early or Middle Archaic were two bases of either Bajada or San José points. Otherwise, the types of projectile points and point fragments described during that survey suggest that the main Archaic use of that area occurred during the Armijo and En Medio phases (Chapman 1979:64). No domesticates were identified in flotation samples obtained from associated thermal features, but it should also be noted that only two seeds from samples taken on different sites were identified by this analysis (Chapman 1979:72), so preservation was quite bad.

Middle and Late Archaic sites are common in the lower Rio Chama basin, but most of the Archaic sites investigated in the Chama–Ojo Caliente area are in and around Abiquiu Reservoir. Schaafsma (1976, 1978) completed the first systematic research on the Archaic occupation of that area. Fifty-six Archaic sites were identified in his study, of which 13 were excavated. Most were simple scatters of chipped stone artifacts or isolated projectile points, but five were large base camps situated at the mouths of major drainages on the Rio Chama terrace. More recent work in this area has been completed by Bertram et al. (1989). Eighteen sites were investigated in this study, of which eight contained Archaic components. A Late Archaic occupation was suggested for four sites, all of which seem to have been reused at later times (Bertram 1989; Schutt et al. 1989). Middle to Late Archaic occupations were noted at five sites, and in some instances multiple occupations were suggested by the presence of diagnostic projectile points or obsidian hydration dates from various time periods (Bertram 1989; Schutt et al. 1989).

Anschuetz et al. (1985) note interesting regional variations in the distribution of Archaic sites in the lower Chama Valley. Tools associated with intensive food processing are rare or absent at sites near Abiquiu but are common at sites near the confluence of the Rio Chama and Rio Grande. They feel this demonstrates a differential pattern of seasonal use and exploitation from one end of the valley to the other. In addition to hunting and gathering activities, the Chama Valley also served as a source of Pedernal chert between the Paleoindian and Protohistoric periods. Though this material is abundant in Rio Chama and Rio Grande gravels, Pedernal chert was also quarried around Cerro Pedernal and Abiquiu Reservoir, and quarries in the former location were originally termed the Los Encinos Culture (Bryan 1939).

Late Archaic sites are fairly common in the Santa Fe area, and this is consistent with regional data (Acklen et al. 1997). An increase in sites during the Late Archaic may be due to changes in settlement and subsistence patterns occurring during the Armijo phase. Changes in settlement patterns include evidence of seasonal aggregation, longer periods of occupation, and use of a broader range of environmental settings. Subsistence changes include the adoption of horticulture, which has been identified at sites south of La Bajada Mesa. Armijo phase sites have been identified in the piedmont area around the Santa Fe River (Post 1996, 1999; Schmader 1994). These sites range from small foraging camps to larger base camps with shallow structures. Radiocarbon dates obtained from thermal features suggest they were occupied between 1750 and 900 B.C. (Post 1996, 2004; Schmader 1994).

An Archaic site at the edge of the Tewa Basin and Pajarito Plateau was occupied during the late Armijo or early En Medio phase (Moore 2001a). Excavations at LA 65006 indicated that it was reoccupied on several occasions and that during its main occupation the site served as a workshop for the manufacture of large general-purpose obsidian bifaces (Moore 2001a). Though a few corn pollen grains were recovered from this site, their context was unclear, since no macrobotanical evidence of corn was recovered. Indeed, a few kilometers south of LA 65006, Lent (1991) excavated a Late Archaic pit structure with an associated roofed activity area that dated between ca. 610 B.C. and A.D. 180, recovering absolutely no evidence for the use of domesticates.

En Medio phase sites are the most common evidence of Archaic occupation in the Santa Fe area. These sites are widely distributed across riverine, piedmont, foothill, and montane settings (Acklen et al. 1997; Kennedy 1998; Lang 1993; Miller and Wendorf 1955; Post 1996, 1997, 1999; Scheick 1991; Schmader 1994; Viklund 1988). This phase is represented by finds ranging from isolated occurrences to limited-activity sites to base camps with structures and formal features. Increased diversity in settlement pattern and site types suggest population increase, longer site occupations or reduced time between occupations, and truncated foraging range.

A wide range of En Medio phase habitation and special-activity sites have been identified north of La Bajada Mesa in the Santa Fe area and Tewa Basin. Although many of these sites contain structures, formal features, and grinding implements, evidence of horticulture is virtually absent. Excavation of Late Archaic sites at Las Campanas near Santa Fe (Post 1996) yielded projectile points diagnostic of the period between A.D. 500 and 850. This in addition to a lack of evidence for the use of horticulture during this period suggests that Archaic subsistence strategies may have continued to be used into the early or middle A.D. 900s north of La Bajada Mesa (Dickson 1979; McNutt 1969; Post 1996).

Pueblo Period (A.D. 600–1600)

The Pueblo period chronology follows the framework presented by Wendorf and Reed (1955), which subdivides the Pueblo period into the Developmental (A.D. 600–1200), Coalition (A.D. 1200–1325), and Classic (A.D. 1325–1600) periods. They further subdivide the Developmental and Coalition periods according to changes in pottery types and architectural characteristics. The Developmental period is divided into Early Developmental (A.D. 600–900) and Late Developmental (A.D. 900–1200), and the Coalition period into Pindi and Galisteo "stages." Although Wendorf and Reed (1955) coined names for these stages, they did not assign absolute dates, merely inferring them.

Modifications to the terminology and temporal divisions developed by Wendorf and Reed (1955) have been proposed by Wetherington (1968), McNutt (1969), and Dickson (1979). Wetherington assigned phase names to the periods in the Santa Fe and Taos districts and slightly modified the dates. McNutt renamed one period, preferring Colonization to Developmental, divided that period into "components," and changed the dates for the Coalition period. Dickson subdivided each period into three phases. Terminology aside, each of these researchers found a need to subdivide each period of the Pueblo occupation into early and late components, and one researcher introduced a middle component. Again, subdivisions were based on perceived changes in pottery types and architecture. For each researcher, these subdivisions may have been appropriate and useful for addressing the goals of their studies. For the purpose of this discussion, however, only the Developmental and Classic periods are divided into early and late subperiods.

Early Developmental Period (A.D. 600–900)

Early Developmental period sites dating before A.D. 800 are rare in the Northern Rio Grande. Although sites dating between A.D. 800 and 900 are more numerous, they are typically represented by limited-activity areas and small settlements (Wendorf and Reed 1955). Most reported Early Developmental sites are south of La Bajada Mesa, primarily in the Albuquerque area, and a few are reported at higher elevations along the Tesuque, Nambe, and Santa Fe drainages (Lang 1995; McNutt 1969; Peckham 1984; Skinner et al. 1980; Wendorf and Reed 1955). Early Developmental sites tend to be situated along low terraces overlooking primary and secondary tributaries of the Rio Grande. These locations may have been chosen for their access to water and farmland (Cordell 1978). Terrace locations may also have provided access to ecozones with a wide range of foraging resources (Anschuetz et al. 1997).

Early Developmental habitation sites typically contain one to three shallow, circular pit structures with little or no evidence of associated surface structures (Allen and McNutt 1955; Peckham 1954, 1957; Stuart and Gauthier 1981). One exception is a settlement north of Santa Fe that was identified by Lang (1995) and apparently contains between 5 and 20 structures. Unfortunately, the contemporaneity of the structures in this small settlement has not been established.

Excavation data indicate that a suite of construction methods were employed to build these early structures. Typically, structures were excavated up to 1 m below ground surface and were commonly 3 to 5 m in diameter. Walls were sometimes reinforced with vertical poles and adobe (Allen and McNutt 1955; Condie 1987, 1996; Hammack et al. 1983; Peckham 1954; Skinner et al. 1980). Walls, floors, and internal features commonly lacked plaster. Ventilators were placed on the east to southeast sides of these structures, but Peckham (1954) reported one on the north side of a structure. Common floor features include central hearths, ash-filled pits, upright "deflector" stones, ventilator complexes, ladder sockets, and four postholes. Other, less common floor features include small pits identified as sipapus, warming pits, pot rests, and subfloor pits of various sizes and depths (Allen and McNutt 1955; Condie 1987, 1996; Hammack et al. 1983; Peckham 1957).

Ceramics associated with Early Developmental sites include plain gray and brown wares, red-slipped brown wares, and San Marcial Black-on-white (Allen and McNutt 1955). These types persist through the Early Developmental period with the addition through time of neck-banded types similar to Alma Neckbanded and Kana'a Gray, as well as Kiatuthlanna Black-on-white, La Plata Black-on-red, and Abajo Red-on-orange (Wendorf and Reed 1955). The accumulation of pottery types and surface textures, as opposed to sequential types and textures, appears to be characteristic of the Developmental period, as well as of the Highland Mogollon area (Wilson et al. 1999).

The types of decorated pottery found at Developmental period sites might be indicative of cultural affiliation with peoples living to the west and northwest of the Northern Rio Grande region. However, Early Developmental inhabitants also obtained red and brown wares through trade with Mogollon peoples to the south and southwest (Cordell 1978). Although cultural affiliation may seem more secure in assemblages that are clearly dominated by specific ware groups, cultural affiliation is difficult to determine at Early Developmental sites that contain various percentages of gray, brown, and white wares.

No Early Developmental period sites have been found in the Chama–Ojo Caliente Valleys, and there is no evidence of a resident Pueblo population in that region during this period. Though some sites in the region are considered evidence of periodic temporary use of these valleys during the Early Developmental period, those assertions are generally based on projectile point styles rather than more temporally sensitive artifacts, like pottery (Moore 1992; Schaafsma 1976). In general, these are small corner-notched arrow points that are considered to have fallen out of use by about A.D. 900. However, this scenario is based on data from the Four Corners area, and the situation seems to have been quite different in the Northern Rio Grande. Indeed, Moore (2003) demonstrates that this type of point was manufactured into the seventeenth century in the Pecos area, and later in this report it is shown that they occur at several of our Late Classic period sites. This is similar to the accumulative pattern noted in the Highland Mogollon (Moore 1999a), where new point styles are added without replacing earlier types, resulting in a suite of projectile point styles at Late Pueblo sites. Thus, small corner-notched arrow points are probably not temporally sensitive in the Northern Rio Grande, and their presence cannot be taken as evidence of an Early Developmental period component.

Late Developmental Period

Late Developmental period sites have been identified from the Taos Valley south to the Albuquerque area. This period is marked by an increase in the number and size of residential sites, occupation of a wider range of environmental settings, and appearance of Kwahe'e Black-on-white (Cordell 1978; Mera 1935; Peckham 1984; Wendorf and Reed 1955; Wetherington 1968). Late Developmental residential sites expanded into higher elevations along the Rio Grande, Tesuque, Nambe, and Santa Fe drainages (Allen 1972; Ellis 1975; McNutt 1969; Peckham 1984; Skinner et al. 1980; Wendorf and Reed 1955). These sites are commonly located along low terraces overlooking the primary and secondary tributaries of these rivers, which provided access to water, farmland, and a variety of foraging resources (Anschuetz et al. 1997; Cordell 1978). Although Late Developmental sites are more common at higher elevations than are Early Developmental sites, there is little evidence of Late Developmental occupation on the Pajarito Plateau (Kohler 1990; Orcutt 1991; Steen 1977). Toward the middle of this period, the first Pueblo residential sites were established in the Taos district (Boyer 1997).

Late Developmental sites typically consist of a house group containing one or two pit structures, a shallow midden, and sometimes an associated surface structure containing 5 to 20 rooms

(Ellis 1975; Lange 1968; Peckham 1984; Stubbs 1954; Stuart and Gauthier 1981; Wendorf and Reed 1955). These house groups occur singly or in clusters that are sometimes considered to comprise a community (Anschuetz et al. 1997; Wendorf and Reed 1955). The Pojoaque Grant Site (LA 835) is often used as an example of one of these early communities. This site includes 20–22 house groups containing 10–20 rooms each, their associated pit structures, and a large kiva. However, all of these groups may not have been occupied contemporaneously. House groups are located along low ridges that trend southwest from a prominent sandstone mesita. Those built near the base of the mesita and near the great kiva appear to have been occupied by A.D. 900. Other groups seem to have been built at different times during the Late Developmental period.

An array of construction techniques has been identified in Late Developmental period residential sites (Ahlstrom 1985; Allen 1972; Boyer and Lakatos 1997; Ellis 1975; Lange 1968; McNutt 1969; Stubbs and Stallings 1953; Skinner et al. 1980). Surface structures are commonly constructed of adobe, and little evidence of actual masonry has been reported and is generally limited to stones incorporated into adobe walls or upright slabs used as foundations or footers for adobe walls (Lange 1968; McNutt 1969; Stubbs 1954). Contiguous rectangular rooms are most common, though subrectangular and D-shaped rooms are also reported. Floors are often unplastered, with a few reported examples of adobe, cobble, and slab floors (Ahlstrom 1985; Boyer and Lakatos 1997; Ellis 1975; McNutt 1969; Stubbs 1954; Skinner et al. 1980). Floor features are not common in surface rooms, and when present they typically include hearths and postholes.

Variety in size, shape, depth, and building techniques is typical of Late Developmental pit structures. Circular pit structures are most common, followed by subrectangular. Structure depths range from 0.3 to 2 m below ground surface, and they tend to be between 3 and 5 m in diameter. Surface structure wall treatments vary from the unplastered surface of the original pit excavation to multiple courses of adobe with or without rock, wattle and daub, upright slabs used as foundations, adobe reinforced with vertical poles, or combinations of these techniques (Allen and McNutt 1955; Boyer and Lakatos 1997; Lange 1968; Stubbs 1954; Stubbs and Stallings 1953). Floors range from compact use surfaces to well-prepared surfaces. Common floor features include central hearths, upright "deflector" stones, ash-filled pits, ventilator complexes, ladder sockets, and four postholes toward the interior of the structure. Other, less common floor features include sipapus, subfloor channels, pot rests, and subfloor pits of various sizes and depths. Ventilators were constructed by connecting the exterior vent shaft to the interior of the structure with a tunnel or narrow trench. Trenches were subsequently roofed using latillas, effectively creating a tunnel. Exteriors of shallow structures were connected to the interior through an opening in the wall. Ventilators were commonly oriented to the east and southeast (Allen and McNutt 1955; Boyer and Lakatos 1997; Lange 1968; Stubbs 1954; Stubbs and Stallings 1953).

Utility ware ceramics found at Late Developmental sites include types with corrugated and incised exteriors in addition to the plain gray, brown, and neck-banded types associated with the Early Developmental period. The array of decorated white wares includes types that were both imported and manufactured locally. Common types are Red Mesa Black-on-white, Gallup Black-on-white, Escavada Black-on-white, and Kwahe'e Black-on-white. Less common types include Socorro Black-on-white, Chupadero Black-on-white, Chaco Black-on-white, and Chuska Black-on-white (Allen 1972; Franklin 1992; Lange 1968; pers. comm., Peter McKenna, 2000). Although decorated red wares are present in Late Developmental assemblages, they occur in low frequencies and include types from the Upper San Juan, Tusayan, and Cibola regions.

The quantity of imported decorated pottery and appearance of Kwahe'e Black-on-white, a locally made type similar to white wares produced in the San Juan Basin region, is believed to illustrate a continued affiliation between the Northern Rio Grande and San Juan regions (Gladwin 1945; Mera 1935; Warren 1980; Wiseman and Olinger 1991). Although most of the imported decorated pottery types suggest a continued relationship with people to the west and northwest, Late Developmental peoples also obtained decorated pottery and brown utility wares from the Mogollon region to the south and southwest (Cordell 1978).

There is no direct evidence of use of the Chama–Ojo Caliente region during the Late Developmental period. The only artifact indicative of such use is a single Kwahe'e Black-on-white sherd recovered from Ku, a large village on the Rio del Oso that was occupied from the Coalition into the Classic period (Peckham 1981). This sherd is considered to represent an heirloom piece owned by an occupant of that village (Peckham 1981:131).

Coalition Period

The Coalition period is marked by three major changes: an increase in the number and size of residential sites, the use of surface rooms as domiciles rather than for storage as was common during the Late Developmental period, and a shift from mineral to vegetal-based paint for decorating pottery (Cordell 1978; Peckham 1984; Stuart and Gauthier 1981; Wendorf and Reed 1955). The apparent increase in number and size of residential sites during this period suggests population increase and an extension of the village-level community organization identified during the Late Developmental period. Areas like the Pajarito Plateau, which saw very limited use during the Late Developmental period, became a focus of occupation during the Coalition period, while areas like the Tewa Basin, which saw heavy use during the Developmental period, lost much of their population by A.D. 1200. The apparent increase in number of sites seems to be a function of the areas that have been investigated by archaeologists and points to the amount of work that has been done on the Pajarito Plateau as opposed to elsewhere in the Northern Rio Grande.

Coalition period sites are commonly at higher elevations along terraces or mesas overlooking the Rio Grande, Tesuque, Nambe, Santa Fe, and Chama drainages (Cordell 1978; Dickson 1979). These locations provided access to water, farmland, and a variety of foraging resources (Cordell 1978). Although residence at higher elevations provided reliable water and arable land, innovative methods were needed to produce crops in these cooler settings (Anschuetz et al. 1997), including intensification of water management and farming practices. The use of check dams, reservoirs, and gridded fields, especially during the later parts of this period and the succeeding Classic period, are examples of this intensification (Anschuetz 1998; Anschuetz et al. 1997; Maxwell and Anschuetz 1992; Moore 1981).

Coalition period residential units typically contain 10 to 20 surface rooms, one or two associated pit structures, and a shallow midden (Peckham 1984; Stuart and Gauthier 1981; Wendorf and Reed 1955). Surface structures often consist of small linear or L-shaped roomblocks oriented approximately north-south. These roomblocks are one to two rooms deep, with a pit structure or kiva incorporated into the roomblock or located to its east (Kohler 1990; Steen 1977, 1982; Worman 1967). Sites that exhibit this layout are generally considered to date to the early part of the Coalition period. Although most Coalition period sites are relatively small, some contain up to 200 ground-floor rooms (Stuart and Gauthier 1981) and are commonly U-shaped and oriented to the east, enclosing a plaza or plazas. Generally, large Coalition period sites with enclosed plazas are considered to date to the late part of the period (Steen 1977; Stuart and Gauthier 1981).

A variety of construction techniques was used to build Coalition period surface and subsurface structures. Walls of surface and subsurface structures were built from adobe with or without rock, masonry, or combinations of these techniques. Adobe construction incorporated unshaped tuff into adobe walls on the Pajarito Plateau (Kohler 1990; Steen 1977, 1982; Steen and Worman 1978; Worman 1967). Masonry walls usually consist of unshaped or cut tuff blocks mortared with adobe and sometimes chinked with small tuff fragments (Kohler 1990). The most common room shape is rectangular, though a few examples of subrectangular and D-shaped rooms have been reported (Kohler 1990; Steen 1977, 1982; Steen and Worman 1978; Worman 1967).

Variety in the size, shape, and depth of pit structures is common during the Coalition period. Circular pit structures are the most common type, followed by subrectangular. Pit structures range in depth from 0.3 to 2 m below ground surface, and they are commonly 3 to 5 m in diameter. Walls of pit structures were built with the same techniques that have been described for surface rooms. Common floor features include central hearths, upright "deflector" stones, ash-filled pits, ventilator complexes, and four postholes toward the interior of structures. Other, less common floor features include sipapus, entryways, pot rests, and subfloor pits of various sizes and depths. Ventilators were built by connecting exterior vent shafts to the interior of the structure with a tunnel, though shallow structures were vented by an opening in the wall. Ventilators were most commonly oriented to the east and southeast (Kohler 1990; Steen 1977, 1982; Steen and Worman 1978; Stuart and Gauthier 1981; Stubbs and Stallings 1953; Wendorf and Reed 1955; Worman 1967).

Utility wares most commonly have corrugated, smeared corrugated, or plain exteriors, and more rarely have striated, incised, or tooled exteriors. Decorated white wares include Santa Fe Black-on-white, Galisteo Black-on-white, Wiyo Black-on-white, and very low percentages of Kwahe'e Black-on-white. Few trade wares are reported from Coalition period sites; those that are found tend to be White Mountain Redware (Kohler 1990; Steen 1977, 1982; Steen and Worman 1978; Worman 1967).

In the Santa Fe area, large villages like the Agua Fria School House Ruin (LA 2), LA 109, LA 117, LA 118, and LA 119 were established early in the Coalition period. Other large sites, such as Pindi (LA 1) and Tsogue (LA 742), seem to have been established during the Late Developmental period and grew rapidly during the Coalition period (Franklin 1992; Stubbs and Stallings 1953). The Coalition period also saw the first establishment of farming villages on the Pajarito Plateau (Crown et al. 1996; Orcutt 1991) and in the Galisteo Basin (Lang 1977). At the same time, the first permanent Pueblo population was becoming established in the Chama–Ojo Caliente region.

Though the Coalition period occupation of the study area has often been characterized as small-scale with residence in small villages, plenty of evidence suggests that this was not necessarily the case. Two medium-sized Coalition period villages have been excavated in the north part of the Chama Valley near Abiquiu Dam: Riana Ruin (Hibben 1937) and Palisade Ruin (Peckham 1981). These sites may be models for the initial Pueblo settlement of the Chama–Ojo Caliente frontier. The occupation of Palisade Ruin may have begun with the construction of one or more pit structures, one of which was later remodeled into a mealing room (Peckham 1981:139). Between 45 and 50 surface rooms were eventually built in a U shape around an east-oriented plaza that was closed by a palisade on its east side (Peckham 1981). Cutting dates of A.D. 1312 and 1314 indicate that construction of above-ground rooms began in the early fourteenth century, and occupation of this village was thought to have been fairly short (Peckham 1981). The ceramic assemblage from this site was dominated by varieties of Wiyo Black-on-white, and a small amount of Santa Fe Black-on-white also occurred.

Riana Ruin contained at least 23 surface rooms and one pit structure (Hibben 1937). Rooms were built in an L-shaped configuration oriented toward the southeast, where a small plaza was partly enclosed by the roomblock and partly by a low wall constructed of basalt boulders (Hibben 1937). Cutting dates from building timbers suggest that Riana was built around 1335 (Stallings 1937a), and it appears to have been short-lived, lasting perhaps no more than a dozen years (Hibben 1937). The ceramic assemblage from this site was dominated by Wiyo Black-on-white, though some pottery similar to Santa Fe Black-on-white was also identified.

Two larger Coalition period villages have also been identified in the Chama Valley. Leafwater Pueblo was partly excavated in the 1950s and is reported by Luebben (1953). This village probably contained more than 100 rooms, in places rising to at least two stories, and forms a trapezoid around an enclosed southeast-oriented plaza. Most of the pottery associated with the occupation of this village was Wiyo Black-on-white, though a small amount of a transitional form of Santa Fe Black-on-white was also identified (Luebben 1953:29). The presence of at least two pit structures, one occurring under rooms in the north part of the village, suggests that the initial occupation may have been by a small group that lived in temporary pit structures before and while the first surface rooms were under construction (Luebben 1953; Peckham 1981). The second of the larger Coalition period villages is Tsiping Ruin, just south of Palisade Ruin (Peckham 1981). This village was established around A.D. 1315 and was occupied into the mid-fourteenth century (Beal 1987; Peckham 1981).

More recently, surveys in the Chama Valley have recorded at least four medium to large Coalition period villages (discussed and summarized in Anschuetz 1998:219–220), as well as numerous other sites. Maestas Pueblo (LA 90844) and AR-03-10-06-1230 have ceramic assemblages dominated by Santa Fe Black-on-white and were most likely built in the thirteenth century during the early part of the Coalition period. These early villages contain between 100 and 200 rooms. Maestas Pueblo is a multistoried quadrangular village with two small plazas and two possible pit structure depressions in the Rio del Oso Valley. AR-03-10-06-1230 is a linear pueblo with multiple pit structures just west of the Classic period village of Poshu'ouinge. The other two recently located villages have ceramic assemblages that contain both Wiyo Black-on-white and Santa Fe Black-on-white. LA 98319 is made up of two linear roomblocks and contains more than 100 rooms. AR-03-10-06-1231 is a compact village of about 40 rooms arranged in a quadrangular pattern, with associated cobble-bordered farming plots.

The survey that identified Maestas Pueblo also documented a sizable Coalition period occupation, which may have begun in the thirteenth century (Anschuetz 1998:273–274). Santa Fe Black-on-white was recorded at over half (n=125; 51.7 percent) of the prehistoric Pueblo sites identified by this survey, including nearly 60 percent (n=31) of the architectural sites. Santa Fe Black-on-white was found at all seven of the largest habitation sites, including Pesedeuinge, Leafwater, Maestas Pueblo, and Te'ewi. Some evidence of the use of intensive agricultural methods during the Coalition period was also identified.

In addition to these "pure" Coalition period villages, evidence of earlier components containing mixtures of Santa Fe Black-on-white and Wiyo Black-on-white has been found beneath several of the large Classic period villages in this region. During the excavation of Te'ewi at the confluence of the Rio del Oso and the Rio Chama, Wendorf (1953a) found a concentration of Santa Fe Black-on-white and Wiyo Black-on-white in two roomblocks adjacent to the southwest corner of the north plaza and felt that this represented the earliest section of the village. Bugé (1978) uncovered evidence of a Coalition period structure under Ponsipa'akeri in the Ojo Caliente Valley. A similar date is suggested for housemounds at the west end of Tsama near the confluence of El Rito Creek and the Rio Chama (Archaeological Conservancy 1996:3, cited in Anschuetz 1998:220). Beal (1987) notes that Coalition period occupations also underlie the villages of Hupobi and Sapawe, the former in the Ojo Caliente Valley, and the latter along El Rito Creek in the Rio Chama drainage.

Thus, there is now a substantial body of evidence of a Coalition period occupation in the Chama and Ojo Caliente Valleys. Villages like Maestas Pueblo and AR-03-10-06-1230 represent fairly substantial early Coalition occupations that seem to have begun and ended during the thirteenth century. Villages like Palisade and Riana represent comparatively small, short-lived late Coalition residential sites that failed and were abandoned in a generation or less. Leafwater, LA 98319, and AR-03-10-06-1231 are late Coalition villages that held much larger populations and were probably occupied for substantially longer periods. Tsiping is similar to these sites, but unlike them was occupied into the Early Classic period. For some reason all of these villages failed and were abandoned before the period of highest population density in the valley. However, not all Coalition period settlements were abandoned before this time. Coalition period ceramics have been found at six of the large Classic period villages in the Chama and Ojo Caliente Valleys and probably indicate the initial founding dates for those villages. It is also likely that excavations at many of the other large Classic period villages in this region would identify similar deposits, indicating initial construction during the Coalition period and survival into the Classic period.

Classic Period

Wendorf and Reed (1955:53) characterize the Classic period as "a time of general cultural fluorescence." Occupation shifted away from the uplands and began to concentrate along the Rio Grande, Rio Chama, Rio Ojo Caliente, and Rio Santa Cruz, as well as in the Galisteo Basin. Large villages containing multiple plazas and roomblocks were built, and regional populations peaked. The construction of large, multiplaza communities superseded the village-level community organization of the Late Developmental and Coalition periods. In the Santa Fe area, large villages like the Agua Fria School House Ruin (LA 2), Arroyo Hondo (LA 12), Cieneguilla (LA 16), LA 118, LA 119, and Building Period 3 at Pindi (LA 1) flourished during the early part of this period. Although these large villages grew rapidly during the Early Classic period, only Cieneguilla remained occupied after A.D. 1425.

Regional ceramic trends shifted to the use of carbon-painted biscuit wares in the northern part of this region, including the Tewa Basin, northern Pajarito Plateau, and the Chama–Ojo Caliente area. Polychrome glaze wares were dominant in the southern part of the region, including the Galisteo Basin and southern Pajarito Plateau. The Santa Fe area essentially marked this division in pottery styles. Biscuit wares were produced to the north and glaze wares to the south. Although reasons for the appearance and proliferation of glaze-painted pottery are ambiguous, many researchers believe it developed from White Mountain Redware. Similarities between types in the two regions are viewed as evidence of large-scale immigration into the Northern Rio Grande from the Zuni region and the San Juan Basin (Hewett 1953; Mera 1935, 1940; Reed 1949; Stubbs and Stallings 1953; Wendorf and Reed 1955). Other researchers attribute the changes seen during this period to expanding indigenous populations (Steen 1977) or the arrival of populations from the Jornada branch of the Mogollon in the south (Schaafsma and Schaafsma 1974).

For whatever reason, this was a time of village reorganization. Older sections of sites like Pindi and Arroyo Hondo were reoccupied (Lang and Scheick 1989; Stubbs and Stallings 1953). Intercommunity changes are also suggested by decreasing kiva-to-room ratios (Stuart and Gauthier 1981) and the revival of circular subterranean pit structures with an assemblage of floor features reminiscent of the Late Developmental period (Peckham 1984). Clearly defined plaza space and "big kivas" (Peckham 1984:280) suggest social organization that required centrally located communal space, which may have been used to integrate aggregated populations through ritual (Adams 1991).

The need for defined communal space may also be related to the introduction of the Kachina Cult into the Northern Rio Grande during this period (Adams 1991; Schaafsma and Schaafsma 1974). A shift from geometric designs to masked figures and horned serpents in kiva murals and the occurrence of shield-bearing anthropomorphic rock art figures suggest the acceptance of new ideological concepts (Adams 1991; Dutton 1963; Hayes et al. 1981; Schaafsma 1992). Changes in community structure and settlement patterns during the Classic period may reflect adaptation of the indigenous inhabitants of the region to new populations, ideological elements, and organizational systems.

The process of aggregation into large villages and movement to areas bordering major streams continued through the Classic period in the Northern Rio Grande. Population decline began in the Early Classic period on the Pajarito Plateau and continued through the middle of the period (Orcutt 1991). Most of the large villages in that area were abandoned by 1550, though some continued to be occupied into the Late Classic period between 1550 and 1600 (Orcutt 1991). This population seems to have moved into the Rio Grande Valley. Keres villages like Santo Domingo and Cochiti claim affinity with Classic period villages in the southern Pajarito Plateau, and Tewa villages like San Ildefonso and Santa Clara claim affinity with Classic period villages in the northern Pajarito Plateau.

At least 16 large villages were occupied in the Chama–Ojo Caliente region during the Classic period, and 15 have Tewa names and are considered ancestral to existing villages. Of these villages, Leafwater (Kap) was abandoned in the Coalition period, and Tsiping was abandoned early in the Classic period. Most of the rest were occupied until nearly A.D. 1540, though Mera (1934) suggests that the absence of Sankawi Black-on-cream and late glaze wares at many of them indicates that they were abandoned by A.D. 1500. Only five villages—Sapawe, Psere, Te'ewi, Ku, and Tsama—may have been occupied as late as 1598 to 1620 (Schroeder 1979; Schroeder and Matson 1965). Euroamerican materials, including sheep and cattle bones and metal recovered from Sapawe and Tsama, represent direct evidence of occupation into the historic period (Ellis 1975).

The Chama Valley was abandoned by

Pueblos as a residential area by A.D. 1620 at the latest. That population moved into the Rio Grande Valley, either joining with or forming some of the existing Tewa villages. Residents of San Juan Pueblo consider Homayo, Howiri, and Posi'ouinge to be ancestral (Bandelier 1892:50; Ortiz 1979). Sapawe is also claimed as ancestral by some Tewas (Bandelier 1892:53). Jeançon (1923:76) reports traditions at San Juan and Santa Clara Pueblos that mention migration from the Chama Valley to their villages.

Chapter 4. Overview of the Historic Period

James L. Moore

By tradition, the Ojo Caliente Valley was part of the region occupied by the northern Tewas, and is often considered part of the Rio Chama drainage system. Harrington (1916) recorded Tewa names for most of the large abandoned pueblos in these valleys, which they consider ancestral. Indeed, the hot spring near Posi'ouinge in the Ojo Caliente Valley is thought to be the home of the grandmother of Poseyemu, the Tewa culture hero (Harrington 1916; Parsons 1926). Few of these villages appear to have been occupied when the Spaniards first entered New Mexico, and the northern Tewa population seems to have been mostly concentrated in the Tewa Basin by that time.

Castañeda's chronicle of the Coronado expedition of 1540 to 1542 mentions that the people of the province of Yuqueyunque (or northern Tewa) had "four very strong villages in a rough country, where it was impossible for horses to go" (Winship 1896:137). These villages were not visited by Coronado, and Schroeder (1979:250) believes they were in the Chama Valley and may have included the ancestral Tewa pueblos of Sapawi, Psere, Te'ewi, Ku, or Tsama. The rough country mentioned by Castañeda could have been a reference to the northern Pajarito Plateau, which was also occupied by ancestral Tewas, but since recent research suggests that the large Tewa villages on the Pajarito Plateau were abandoned by the end of the Middle Classic period, ca. A.D. 1400 to 1500 (Preucel 1987), this is unlikely. If Schroeder is correct in placing all of these villages in the Chama Valley, then the Ojo Caliente Valley was abandoned by the Tewas by the early 1500s. However, since no one from Coronado's expedition visited these villages and their names were not recorded, there is no real evidence that only the Chama Valley was occupied at that time. Thus, it is possible that the northern Tewas occupied both valleys until nearly 1600.

Schroeder and Matson (1965:129–134) suggest that most of the Tewa villages in the Chama–Ojo Caliente drainages were abandoned by the time Castaño de Sosa visited nearly all of the existing northern Tewa villages in 1590–1591. They suggest that the village of Te'ewi in the Chama Valley may have been visited by de Sosa's expedition, otherwise the northern Tewas seem to have been concentrated in the Tewa Basin by this time. Spanish explorers encountered at least eight villages in the Tewa Basin including San Gabriel (Yunque), San Ildefonso (Powhoge), Santa Clara (Kapo), San Juan (Ohke), Jacona, Tesuque, Nambe, and Cuyamunge.

Documents related to Juan de Oñate's colonizing expedition in 1598 provide a confused list of villages in the Tewa area (Hammond and Rey 1953:346). The list seems both incomplete and includes names that are not mentioned for this area by any other expedition. Five of the eight historically known northern Tewa villages are listed, including Tesuque (possibly), San Ildefonso, Santa Clara, San Juan, and San Gabriel, as are possible versions of names for Tsirege and Tsama, which are considered ancestral by the Tewas but were abandoned by at least the early 1600s (Schroeder 1979:250). Five other villages are listed in the Tewa district, but their names are suspiciously similar to those of several southern Tiwa pueblos (Schroeder 1979:250). This may represent a clerical error, since these names are not associated with the Tewas in other documents.

Eight villages were occupied by the Tewas in the 1620s, as noted by Fray Alonso de Benavides in his Memorial of 1630 (Ayer 1916). People from other northern Tewa pueblos probably joined these villages, either voluntarily as part of a continuing process of population movement out of the Chama–Ojo Caliente drainages and off the Pajarito Plateau, or because of forced resettlement as part of the Spanish policy of combining villages to make governing them easier. Two Tewa villages—Jacona and Cuyamunge—were abandoned after the Pueblo Rebellion of 1696 and were never resettled. The six remaining villages were inhabited through the Spanish period and continue to exist to the present day, interacting with the European populations that moved into the region. No formal Tewa occupation of the Ojo Caliente Valley can be documented after about 1598, when the first European colony was established in New Mexico.

The historic period in New Mexico began with the entrance of the first Spanish exploring expedition into the region in 1540. Several methods have been used to divide the European occupation into shorter periods. One of the most common methods is to divide the history of the region into politically based periods, including Protohistoric (1540 to 1598), Spanish Colonial (1598 to 1821), Mexican Territorial (1821 to 1846), American Territorial (1846 to 1912), and Statehood (1912 to present). This overview takes a somewhat different approach and partitions the historic period by changes in economy and transportation methods. Thus, we divide the historic occupation of New Mexico into the Exploration period (1540 to 1598), early Spanish Colonial period (1598 to 1680), Pueblo Revolt period (1680 to 1693), late Spanish Colonial period (1693 to 1821), Santa Fe Trail period (1821 to 1880), and Railroad period (1880 to present).

Exploration Period (1539 to 1598)

Based on information gathered by Alvar Nuñez Cabeza de Vaca and his companions following the disastrous Narváez expedition to Florida (Covey 1990), the Spanish Empire became interested in lands north of New Spain in the 1530s. Fray Marcos de Niza was dispatched on a scouting mission into the Southwest in 1539, and a major expedition under Francisco Vázquez de Coronado explored the region between 1540 and 1542. No other formal contact between New Spain and New Mexico occurred until 1581, when Father Agustín Rodríguez and Captain Francisco Sánchez Chamuscado led an expedition up the Rio Grande to the Pueblo country (Hammond and Rey 1966). Ostensibly to rescue two priests left by the Rodríguez-Chamuscado expedition, Antonio de Espejo led a party into New Mexico in 1582. Gaspar Castaño de Sosa attempted to illegally found a colony in 1590–91 but was arrested and returned to Mexico (Simmons 1979). A second illegal attempt at colonization was made by Francisco de Legua Bonilla and Antonio Gutiérrez de Humaña in 1593, but their party was decimated as a result of conflict with Indians (Hammond and Rey 1953).

Early Spanish Colonial Period (1598 to 1680)

Oñate established the first legal and successful European colony in New Mexico at San Juan Pueblo in 1598. By 1600 the Spaniards had moved into San Gabriel del Yunque, sister village to San Juan, which was abandoned for their use by its residents (Ellis 1987). The lack of visible wealth in the new province caused unrest among the Spaniards (Espinosa 1988:7), many of whom seem to have accepted the challenge of establishing the new colony because they thought they would soon get rich. This unrest in addition to Oñate's neglect of the colony while on frequent journeys of exploration eventually contributed to his loss of the governorship. Oñate was replaced as governor in 1607 by Pedro de Peralta, who arrived in New Mexico in 1609 and moved the capital to Santa Fe, which he founded around 1610 (Simmons 1979).

Oñate's colony was a disappointment because of its failure to find the wealth that was expected to exist in New Mexico. Many settlers wanted to abandon the colony, and the government was seriously considering doing just that (Espinosa 1988:8–9). However, the baptism of 7,000 Pueblo Indians in 1608 and reports that many others were ready for conversion provided a viable alternative to an economically autonomous colony (Espinosa 1988:9). New Mexico was therefore allowed to continue, and its maintenance was almost entirely underwritten by the royal treasury (Simmons 1979:181). The colony was maintained as a mission area in the seventeenth century, its primary function being conversion of the Pueblos to Christianity. Because of this, the church was extraordinarily powerful and influential, causing considerable conflict with the secular government (Ellis 1971:30–31). Beginning in the 1640s this struggle weakened the Spaniards hold on the province (Simmons 1979:184).

Rather than furnishing a permanent military garrison for New Mexico, the Spanish government created a class of citizen-soldiers responsible for defense. As a reward for their services, these citizen-soldiers were given the right to collect an annual tribute from the pueblos—the *encomienda* system. The number of *encomenderos* was set at 35 (Espinosa 1988). In times of trouble, of course, all able-bodied citizens were liable for military service (Espinosa 1988:10). Pueblo Indians were also conscripted to serve as laborers on Spanish farms and haciendas under *repartimiento*, a system of forced labor that was designed to provide workers for Spanish holdings (Simmons 1979:182). While laborers were supposed to be paid for their work, abuses of the system were common, and the Spaniards often failed to compensate them (Simmons 1979:182–183).

Since New Mexico was primarily viewed as a mission effort, the secular population received little official support. The church in New Mexico was supplied by a caravan system, which was notoriously inefficient (Moorhead 1958). While caravans were theoretically scheduled for every three years, as many as five or six years often passed between deliveries (Moorhead 1958; Scholes 1930). However, Ivey (1993:41) indicates that even with irregularities there was an average of only three years between caravan arrivals through most of the seventeenth century. Still, irregular supply at fairly long intervals led to serious shortages of important supplies such as metal and kept the cost of manufactured goods high.

Supplies carried by the caravans were meant for support of the missions, though at times goods were also carried north for profit (Hackett 1937; Moorhead 1958). This was especially true of the years between 1664 and 1671, when the caravan passed out of the church's control and was contracted to Don Juan Manso. Apparently, Manso used up to half of the wagons to carry goods for sale in New Mexico (Scholes 1930). According to Ivey's (1993:44) calculations, the supply caravans each carried more than 80 tons of goods—quite a bit of material—that included durable goods as well as foods and cloth. Products shipped out of New Mexico by the missions provided income that enabled them to purchase luxury items that would not otherwise have been available (Ivey 1993:46).

In addition to shipments controlled by the missions and governors, private trade over the Camino Real also occurred. A fairly wide variety of goods moved in both directions: "Imports represent practical, utilitarian tools, equipment, household items, and a range of luxury goods, primarily clothing and textiles. The latter consisted of materials made in New Spain as well as yard goods imported from Europe and China. In return, New Mexicans sold coarse, locally made textiles and clothing (mostly stockings), hides, and aside from animals on the hoof, occasional subsistence foods locally produced" (Snow 1993:141). Most pottery used for domestic purposes was purchased from the Pueblos and Apaches. Majolica imported from Mexico was considered somewhat of a luxury, at least into the nineteenth century (Snow 1993:143). This was partly due to the cost of long-distance freighting. However, it was still cheaper than Chinese porcelain and, initially, English ironstone (Snow 1993:143). While the markup on majolica was not as great as might be expected (Snow 1993:143), manipulation of the New Mexican monetary system by Chihuahuan merchants probably assured them of considerable profit and kept the price of imported pottery high when compared to locally produced Pueblo wares.

On the civilian side, the seventeenth-century upper class was mainly comprised of the families of the governor and the 35 encomenderos (Scholes 1935; Snow 1983). Though governors were banned from engaging in trade, they often broke this regulation by sending goods south with the caravans or shipping them independently (Scholes 1935). The encomenderos were given the right to collect tribute from pueblos in lieu of salaries. An example of how this worked is Francisco Anaya Almazán, who at one time held half of the villages of Quarai and Picuris and all of La Cienega in encomienda (Snow 1983:355). The prestige of the encomenderos coupled with the requirement that they maintain a residence in Santa Fe raised them to a dominant position in the local government and economy (Anderson 1985:362). But not all encomenderos were equal, and a few dominant families formed the core of the upper class: "Their wealth was greater than that of families of lesser social standing; the best lands were theirs; they had greater opportunities to engage in trade; and they probably received the best encomiendas" (Scholes 1935:98). The Lucero de Godoy, Gómez, Domínguez de Mendoza, Romero, Baca, and Duran y Chávez families were among the most prominent in seventeenth-century New Mexico (Scholes 1935). This class was critical to the early Spanish Colonial economy. Not only did the encomenderos receive goods like cotton blankets and buffalo hides from Pueblos as tribute, they may also have acted as the upper level of a redistribution network based on kin ties or population clusters (Snow 1983:351).

Even with the tribute system and the ability to occasionally send goods south for sale in Mexico, the early Spanish Colonial economy was based on a stable barter system rather than hard cash (Snow 1983:348). Goods like corn, wheat, piñon nuts, hides, and cotton blankets were used in lieu of coinage, and the accumulation and shipment to Mexico of these products by governors and mission personnel seem to have done little to stimulate the local economy (Snow 1983:348).

Trade with the Plains Apaches was also an important source of income during this period and mostly occurred at Pueblos along the edge of Spanish New Mexico including Pecos, Taos, and the Salinas villages. Much of this trade was between the Pueblos and Apaches, but the Spaniards also exploited the relationship for goods that could be sold in Mexico. Slaves, an important trade commodity, were bought from the Apaches for resale to the mines of northern Mexico. The Spaniards often supplemented this source of slaves by raiding Apache villages during the seventeenth century. These raids antagonized both the Apaches and their Pueblo trading partners, and caused the former to unleash a series of devastating raids against the Spaniards and certain Pueblos in the 1660s and 1670s (Forbes 1960). Apache raiding, in turn, exacerbated the Pueblos' resentment of the Spaniards, sparking several rebellions that finally culminated in the general revolt of 1680.

Pueblo Revolt Period (1680 to 1693)

A combination of religious intolerance, forced labor, the extortion of tribute, and Apache raids led the Pueblo Indians to revolt in 1680, driving the Spanish colonists from New Mexico. The Pueblos resented Spanish attempts to supplant their traditional religion with Christianity, and numerous abuses of the encomienda and repartimiento systems fueled their unrest (Forbes 1960; Simmons 1979). These problems were further exacerbated by nomadic Indian attacks, either in retaliation for Spanish slave raids or because of drought-induced famine (Ellis 1971:52; Sando 1979:195). The colonists who survived the revolt retreated to El Paso del Norte, accompanied by the few Pueblo Indians who remained loyal to them.

Attempts at reconquest were made by Antonio de Otermín in 1681 and Domingo Jironza Petriz de Cruzate in 1689, but both failed (Ellis 1971). In 1692 Don Diego de Vargas negotiated the Spanish return, exploiting factionalism, which had again developed among the Pueblos (Ellis 1971:64; Simmons 1979:186). De Vargas returned to Santa Fe in 1693 and reestablished the colony. Hostilities continued until around 1700, but by the early years of the eighteenth century the Spaniards were again firmly in control.

Late Spanish Colonial Period (1693 to 1821)

Though failing in its attempt to throw off the Spanish yoke, the Pueblo Revolt caused many changes. The hated systems of tribute and forced labor were never formally reestablished, and the mission system was scaled down (Simmons 1979). The royal government continued to subsidize the province, but it now served as a buffer against the enemies of New Spain, not as a mission field (Bannon 1963). New Mexico was a distant province on the frontier of New Spain and continually suffered from a shortage of supplies while shielding the inner provinces from Plains Indian raids and the ambitions of the French in Louisiana. These aspects of frontier life are critical to an understanding of late Spanish Colonial New Mexico.

Relations between Spaniards and Pueblos became more cordial during this period. This was at least partly due to changes in the structure of both groups, as the Spanish population rapidly grew and finally surpassed that of the Pueblos by the late 1780s (Frank 1992). The increased number of Spaniards created demand for land in the Rio Grande core area, and a drop in the Pueblo population caused a shortage of cheap labor.

These trends resulted in a shift from large landholdings to smaller grants (Simmons 1969). A large labor force was no longer needed to work Spanish holdings, which was just as well because the demise of the repartimiento system meant that the Pueblos could no longer be forced to provide labor. Also contributing to this trend was an increased danger of attack by Plains Indians beginning in the early eighteenth century.

Spanish New Mexico was a frontier on the edge of New Spain during the Early Spanish Colonial period. This situation changed after 1700 as a core area developed around the social and economic center at Santa Fe. Other parts of New Mexico remained a frontier, though now they were centered on the core around Santa Fe rather than the merchant centers of Mexico. The development of New Mexico into a core and frontier was undoubtedly related to its physical separation from the primary core in Mexico, and because for so much of its history it essentially had to stand alone. While the local economy remained linked to the primary core in Mexico through a few wealthy families and merchants, New Mexico also developed an internal economy dominated by trade between the Spaniards and both Pueblo and Plains Indians. This is probably what led to the formation of what Frank (1992:17) has called "the dynamic folk culture and innovative elaboration of Spanish tradition" that prevailed in New Mexico. Separated from the mainstream economy and society, the territory generated its own versions of them.

While New Mexico developed into a secondary core and frontier during this period, it remained on the frontier of New Spain and continued to be dependent on the primary core. For much of the late Spanish Colonial period the secondary core seems to have included little more than the capital and its immediate environs, perhaps expanding a bit during periods of peace and contracting when hostilities resumed. It was not until late in the period that the core seems to have begun a steady expansion.

With the reconquest of New Mexico, much of the earlier economic system was abandoned. The dominance of the church and formal mission supply caravans eventually ended. The military role of the encomenderos was filled by regular presidial garrisons at Santa Fe and El Paso, and they were replaced as an economic force by families who prospered as merchants and/or by dealing sheep. However, most of the people who reoccupied New Mexico were poor farmers and herders.

By the middle of the eighteenth century a considerable trade had developed between New Mexico and Chihuahua (Athearn 1974), mostly to the benefit of the Chihuahuan merchants. This was documented by Father Juan Agustín de Morfí in 1778 (Simmons 1977). Not only did the Chihuahuan merchants inflate prices, they also invented an complex monetary system that was manipulated to increase profits (Simmons 1977:16). Though Frank (2000) suggests that the complexity of the monetary system described by Morfí was more closely related to a need to convert the value of bartered goods into pesos, the conversion rates still benefited the Chihuahuan merchants and kept most New Mexican merchants in debt. Thus, New Mexico was poorly supplied with goods sold at inflated prices. This problem was partly rectified by trading with local Indians for pottery, hides, and agricultural produce, and some goods were apparently manufactured by cottage industries. Unfortunately, many products had no local substitutes.

Metal, especially iron, was in short supply in New Mexico (Simmons and Turley 1980). Nearly all iron was imported from Spain, and colonial iron production was forbidden by royal policy to protect the monopoly enjoyed by Vizcaya (Simmons and Turley 1980:18). While imported iron was relatively cheap in Mexico, by the time it arrived on the New Mexico frontier it was quite costly. The supply of tools and weapons was limited by the lack of metal, and those that were produced were expensive. The lack of metal and the unreliable supply system hurt New Mexico in its role as a defensive buffer. Many accounts mention scarcities of firearms and other weapons (Kinnaird 1958; Miller 1975; Reeve 1960; Thomas 1940). In addition, only a few soldiers were stationed at the New Mexican presidios, forcing local authorities to use militias and other auxiliary troops. Continued conflict with nomadic Indians caused many settlements to adopt a defensive posture, and even individual ranches were built like fortresses.

By the 1730s, attempts were being made to reestablish the New Mexico sheep industry, and at least one shipment of wool was sent south by

1734 (Baxter 1987:26). In the following year, the governor embargoed all exports of wool, livestock, and grain, considering them harmful to the colony (Baxter 1987:26). A number of citizens petitioned the governor to lift the embargo, arguing that "trade in the forbidden commodities offered the only means available to purchase manufactured goods for themselves, their wives, and children" (Baxter 1987:27). Even so, the embargo remained in place, and the acquisition of manufactured goods continued to be difficult.

One of the most important developments in this period was the *partido* system, in which the owners of large numbers of sheep apportioned parts of their flocks out to shepherds, receiving the original animals and a percentage of the increase at the end of the contract period.

> Increased use of partido brought an increase in livestock numbers, but also added another dimension to the local economy. As multiplying flocks made management more difficult for their owners, partido provided a means of spreading responsibility and served as a substitute for wage payments in a region virtually without cash. . . . Partido offered advantages to merchants who accepted sheep in exchange for goods, and to widows or children who inherited flocks but were unable to manage them or sell them because of export regulations and the local cash shortage. (Baxter 1987:29)

By the mid-1750s the embargo on livestock trading seems to have been relaxed. A few traders managed to manipulate the system, which was dominated by merchants in Chihuahua, and had accumulated fortunes by this time. As Baxter (1987:44) notes, "Frequently allied by marriage ties, this little group of "haves" not only maintained a tight grip on New Mexico's economy, but increasingly dominated political and religious affairs as well. Usually, extensive livestock interests, cared for by dependent partiderios, provided the foundation for their growing wealth and set them apart from less affluent competitors." The development of wealthy *partiderios* and relaxation of the trade embargo should have set the stage for accelerated economic growth. Unfortunately, other factors intervened, slowing growth for several decades.

Between 1750 and 1785 New Mexico was hit by a defensive crisis caused by intense Plains Indian and Apache raids (Frank 1992, 2000). While New Mexico suffered from varying degrees of hostile Indian activity virtually from its founding (Forbes 1960), certain periods were worse than others. Attacks by Utes and Comanches began as early as 1716 with raids against Taos, the Tewa Pueblos, and Spanish settlements (Noyes 1993:11). In particular, the Comanches were bent upon driving the Apaches from the Plains and cutting their ties to the French colonies in Louisiana, from whom they were indirectly receiving firearms (Noyes 1993). In conjunction with this they raided Taos, Pecos, and Galisteo Pueblos—the villages that were most closely tied to the Apaches by trade. However, most of the Comanches' fury was directed against the Apaches during this period.

By 1740 the Apaches had been driven off the Plains or south of the Canadian River, and the Comanches were at peace with the Spaniards (Noyes 1993:24–25). This peace was short-lived, because by the mid-1740s the Comanches were mounting intensive raids against Pecos and Galisteo Pueblos, culminating in a series of devastating attacks against Spanish settlements east of the Rio Grande. These raids caused the temporary abandonment of many villages on the east edge of the colony from Albuquerque northward in the late 1740s (Carrillo 2004; Noyes 1993:25). While Governor Tomás Vélez Cachupín established short-lived periods of peace during his two terms of office (1749–54 and 1762–66), most of the years between 1750 and 1780 were marked by war with the Comanches (Noyes 1993).

Raiding by Athabaskans aggravated this situation. Apaches raided New Mexican settlements sporadically in the 1750s and 1760s. The latter period of hostility was apparently sparked by a severe drought in 1758 and 1759 (Frank 1992:39). A second drought in the 1770s caused a deterioration of the defensive abilities of the territory and led to a resumption of raids by the Navajos (Frank 1992:39–40). By the late 1770s, southern New Mexico was under attack by the Sierra Blanca, Mimbres, Gila, Natage, and Lipan Apaches (Thomas 1932:1). In alliance with the Navajos, the latter three groups even raided Zuni, Albuquerque, and nearby settlements (Thomas 1932:1).

During the early 1770s the government of King Carlos III began to rebuild its power in New Spain (Frank 1992, 2000). Solving the problem of Indian raids against the northern provinces was part of this process. The defenses of northern New Spain were reorganized beginning in 1772. Vigorous campaigning had driven the Apaches back by 1776, and a line of presidios was established (Frank 1992; Thomas 1932). Despite these successes, Indian raids continued to be a major problem. With the reorganization of northern New Spain into the Provincias Internas in 1776 came the development of a plan that eventually proved successful: "Established in 1776, Don Teodoro de Croix received the command of the Interior Provinces and arrived in Mexico City early in 1777 to take over his duties. In the few brief years, 1777–1783, that Croix served his king on this immense frontier, he found a solution for this Indian problem and held for all time the border line of Mexico against northern aggression" (Thomas 1932:14). According to Croix's plan, continual campaigns were to be undertaken against the Apaches from Nueva Vizcaya, Sonora, Coahuila, and New Mexico, and an alliance was to be sought with the Comanches against the Apaches (Thomas 1932:18–19). Governor Juan Bautista de Anza of New Mexico concluded a peace treaty with the Comanches in February 1786, which also allied the two nations against their common enemy, the Apaches (Noyes 1993:80; Thomas 1932:75). The Comanches and Utes reconciled their differences soon afterward and concluded a peace treaty (Thomas 1932:75). Later in the same year, Anza successfully broke up an alliance between the Gila Apaches and Navajos who had been plaguing settlements in southern Arizona, and concluded a peace with the Navajos (Thomas 1932:52). As Frank (1992:95) notes, these events

> brought New Mexico into an era of relative peace for the first time since mid-century. Although the province experienced continued occasional raids, nothing close to the frequency and magnitude of the Comanche and Apache raids of the 1770s occurred during the next quarter century. . . . Until the last years of Spanish rule, the alliance system erected to protect the northern provinces from Plains Indians hostility gave the inhabitants of New Mexico respite from the burden of their own defense and freed energies needed to improve the quality of other aspects [of] their lives on the frontier of New Spain.

Unfortunately, just as hostilities on the New Mexican frontier were ending, a second disaster hit. A major smallpox epidemic struck New Mexico in 1780–81, killing a large portion of the population (Frank 1992:64). While rising birth rates soon countered the immediate effects of the epidemic on the population, it had a much longer lasting effect on demography—the Hispanic population surpassed that of the Pueblos for the first time and held that position until the Anglo influx beginning in the second half of the nineteenth century (Frank 1992:64–65). The reduction of population may have concentrated capital at the same time that communications with Mexico over the Camino Real were freed up, and settlers gained the ability to open new lands without fear of Indian attack (Frank 1992:71). Thus, while in the short run the epidemic seriously disrupted New Mexico, in the long run it may have enhanced the province's ability to take advantage of the economic opportunities provided by the newly established peace.

Frank (1992:166) suggests that the juxtaposition of these trends created an economic boom between 1785 and 1815. Beginning in 1732, a 10-percent tithe was levied on New Mexico by the Bishop of Durango, and the right to collect it was auctioned for a flat annual fee (Frank 1992:168–169). Frank (1992:191) traces the economic boom through the value and competition for the tithe rental in New Mexico: "The increase in the real value of the tithe contracts represents a measurable and significant increase in the per capita production of the Vecino population of late colonial New Mexico. The rising value of the tithe rental signifies an active and expanding provincial economy during the last decades of colonial New Mexico."

At the same time the Hispanic population was expanding outward from the established settlement zone (Frank 1992:199). New Mexicans were founding a series of new frontiers as they moved into areas that had previously been closed because of the danger of Indian attack. The improving economic situation undoubtedly fueled this drive, since new lands were required to graze the continually increasing flocks of sheep that were the basis of wealth in the province.

Despite the improving economic situation, New Mexico still depended on shipments from the south to provide manufactured goods, particularly metal and cloth, that could not be produced locally. Caravans continued to supply New Mexico via the Camino Real. While they still followed an irregular schedule, by the middle of the eighteenth century they operated almost annually (Connor and Skaggs 1977:21). Since the ox-drawn wagons of the seventeenth century were eventually replaced by mule trains, it is likely that fewer goods were carried by the caravans (Connor and Skaggs 1977:21). There were apparently only a few New Mexican merchants, and they were exploited by their suppliers in Chihuahua, who managed to keep them in almost perpetual debt. Isolation and dependence on Chihuahua caused goods sold in Santa Fe to cost several times their original value (Connor and Skaggs 1977:21–22; Frank 1992:237–239).

While circulating cash is considered to have been nearly nonexistent in colonial New Mexico, Baxter (1987) notes several occasions on which relatively large sums of cash were used to pay taxes or purchase goods for shipment north. This indicates that hard cash did exist in New Mexico during this period but was concentrated in the hands of a few at the top of the economic ladder and rarely entered into local transactions. Barter continued to be used for the exchange of goods in New Mexico, and hard currency was reserved for purchasing goods for transport north (Frank 2000). Thus, economic conditions for most New Mexicans through the seventeenth and eighteenth centuries seem to have been rather dismal. The economy was controlled by small groups of wealthy families both before and after the Pueblo Revolt, who retained most of the profits realized through trade with Mexico. Some of this wealth trickled down from the upper class to the bulk of the Spanish population. During the seventeenth century this may have taken the form of a redistribution system in which goods collected as tribute from the pueblos found their way into the hands of the Spanish lower class. During the eighteenth century this was replaced by the partido system, which theoretically provided a means for poor Spanish settlers to better themselves.

No Spanish settlements are known to have existed in the Chama and Ojo Caliente drainages until the first half of the eighteenth century. This was primarily due to hostilities with Plains and Apache Indians, which effectively kept the Spanish-controlled section of New Mexico from expanding until that time. The upper Chama drainage and presumably the Ojo Caliente Valley were under Navajo control in the early 1700s. The Spaniards vigorously campaigned against the Navajos between 1705 and 1714 (Hendricks and Wilson 1996). Spanish settlers were finally beginning to enter the Chama and Ojo Caliente Valleys by the 1730s, but the region was devastated by Comanche and Ute raids in 1747, forcing the evacuation of villages and farms and a general retreat to Santa Cruz de la Cañada and San Juan Pueblo (Carrillo 2004). Nomadic Indian raids continued to be a problem, even after the area was resettled in 1750.

Santa Fe Trail Period (1821 to 1880)

Under the Treaty of Cordova, Mexico gained independence from Spain on August 24, 1821, and New Mexico became part of the Mexican nation. Mexican independence brought two major changes to New Mexico—a more lenient land grant policy and expansion of the trade network (Levine et al. 1985). Mexican colonial law and custom concerning settlers' rights was applied to New Mexico, resulting in conflict over ownership of lands held by the Pueblos. Trade between Missouri and Santa Fe began soon after independence and dominated the New Mexican economy for the next quarter century (Connor and Skaggs 1977). Trade with the United States brought ample and comparatively inexpensive goods to New Mexico and broke the Chihuahuan monopoly. This is reflected in the material culture of sites from this period, at which more manufactured goods occur than ever before.

Numerous expeditions into the recently acquired Louisiana Purchase brought American explorers and traders west from the Missouri River, eventually establishing the Santa Fe Trail. The first trading expedition to use this general route was that of William Becknell in 1821. The initial goal of Becknell's expedition was to trade with the Comanches, but they encountered some Mexican rangers and were persuaded to change their plans and trade in Santa Fe instead (Gregg 1844:13). Because of their favorable report, others soon followed. While the trail was officially opened in 1821, the amount of commerce moving over it to New Mexico was limited for the first several years of its existence, and there were only eight to ten expeditions between 1821 and 1824 (Connor and Skaggs 1977:34). Trade began in earnest after 1825, which is when the United States completed a survey of the trail to mark its route and secure safe passage through Indian Territory (Connor and Skaggs 1977).

The eastern terminus of the Santa Fe Trail was at Franklin, Missouri, until 1828. From that year on the trail began at the new town of Independence, Missouri (Connor and Skaggs 1977). Expeditions tended to leave in small groups and form up later at Council Grove, where they would elect leaders and agree on the rules to be followed (Connor and Skaggs 1977; Gregg 1844). Two main routes were used: the Mountain branch, which followed the Arkansas River to Bent's Fort before turning south, and the Cimarron branch, which crossed the Arkansas River between the south bend and present-day Dodge City and then headed southwest along the Cimarron River. The Cimarron branch (1,392 km from Franklin to Santa Fe) was shorter than the Mountain branch (1,463 km) (NPS 1990:14). After the move to Independence, the Cimarron branch was 1,212 km long, while the Mountain branch was 1,282 km long (NPS 1990:14). The Mountain branch was the more popular route during the early years of the trail but became less popular during the later years, even though it was an easier journey because of better water availability (Connor and Skaggs 1977).

Trade over the Santa Fe Trail expanded geographically to Chihuahua and in the volume of consumer goods transported until 1828, when factors like Indian raids, military escorts, and Mexican trade regulations caused notable fluctuations in the flow of commerce (Pratt and Snow 1988:296). The economic impact of such an extensive trade network may be hard to detect, but it is likely that local inhabitants were introduced to a wide variety of material goods that were previously impossible or too expensive to acquire (Pratt and Snow 1988:302).

The first ruts caused by traffic over the trail were seen after Becknell's second expedition to Santa Fe in 1822, in which goods were transported in three ox-drawn wagons (Connor and Skaggs 1977:33). Otherwise, most early expeditions carried goods on the backs of horses and mules (Connor and Skaggs 1977:35). Most of the later expeditions transported goods in wagons drawn by mules or oxen, which could carry much heavier loads, often traveling four wagons abreast to avoid being strung out for miles in hostile territory (Duffus 1930:137; Gregg 1844:24).

The Santa Fe trade was disrupted in the three years preceding the Mexican War (1846 to 1847) because of a Mexican embargo against American goods (Connor and Skaggs 1977:203). As a result of that conflict, New Mexico was seized by the United States in 1846. The years immediately following the acquisition of New Mexico by the United States were characterized by a growing interest in commerce and a market economy that demanded more dependable means of transportation (Pratt and Snow 1988). Long-distance stagecoach routes were established by 1850 to transport travelers and mail.

Trade again declined during the Civil War. A resurgence of trade over the Santa Fe Trail following the end of that war eventually sealed its doom (Connor and Skaggs 1977:204). Railroad promoters saw the possibilities of overland routes to the West and began developing their finances. The railroad reached Santa Fe by 1880, effectively bringing trade over the trail to an end, since it was much more cost-effective to ship goods by rail.

This period saw profound changes in the economic and ethnic structure of New Mexico. The movement of materials over the Santa Fe Trail meant that many goods that had been difficult or impossible to obtain during most of the Spanish periods could now be acquired. Initially, there seems to have been a lack of sufficient currency in both New Mexico and Chihuahua to support the Santa Fe trade (Connor and Skaggs 1977). However, records indicate that large amounts of raw materials were bartered in New Mexico and Chihuahua for the American goods, and without the barter system it is doubtful that the Santa Fe trade would have long survived (Connor and Skaggs 1977:200).

In addition to material goods, the Santa Fe trade also brought citizens from the United States to New Mexico. Most remained only a short while, but some settled down for good, entering into economic relationships with local merchants. This trickle became a flood when New Mexico was annexed by the United States in 1846. Eastern settlers came to New Mexico in increasing numbers seeking economic opportunity, and sometimes finding it.

The New Mexican economy underwent major changes during this period. The influx of eastern goods most likely disrupted the Spanish economic system. An indication of this may be the growth of pottery production by Spaniards from a rarity to a minor cottage industry. Spanish pottery production is questionable prior to 1821, except on rare occasions by a few individuals. After 1821 pottery appears to have been produced in numerous Hispanic villages, as suggested by Carrillo (1997). This may be a reflection of changes in the economic relationship between the Hispanic and Pueblo populations.

Before the Santa Fe trade began, Pueblos were dependent on Spanish traders for manufactured goods and metal. After the Santa Fe trade began, such goods became cheaper and more easily obtained, and Spanish traders no longer held a monopoly, especially after 1846. Pueblo pottery was an important, albeit inexpensive, commodity to the Spaniards. It was used for storing and cooking food, and in poorer households it was also used for serving food. The availability of abundant and comparatively cheap Euroamerican pottery from the East may have cut into Spanish demand for Pueblo pottery. At the same time, less pottery may have been available because of the altered supply of manufactured goods. Pueblo pottery may have become more difficult or expensive to acquire, providing a niche for disadvantaged Hispanics to enter.

Railroad Period (1880 to Present)

The arrival of the railroad significantly altered supply patterns in New Mexico. Rail lines reached New Mexico in 1878, when construction began in Raton Pass (Glover and McCall 1988:112). By 1879 the Atchison, Topeka & Santa Fe line was in Las Vegas, and by early 1880 it was completed to Lamy (Glover and McCall 1988). With this link to the eastern United States, New Mexico entered a period of economic growth and development, primarily in the larger urban areas (Pratt and Snow 1988:441). This linkage also ended New Mexico's long-term position as a frontier territory. It was now firmly linked to the economy of the United States as a whole. In addition to increasing the ease of supply to the region, it made New Mexico more accessible to tourism from the East, which soon became an important facet of the local economy.

With the availability of rapid and inexpensive transport, several industries boomed in New Mexico. While sheep and wool production expanded, the cattle industry was also stimulated and soon became the dominant ranching industry. Mining expanded into the early 1900s, and coal became an important export. The transformation of the New Mexican economy into its modern form was well under way by the time it became the forty-seventh state in 1912.

The arrival of the railroad created another major economic impact, one that rivaled the opening of the Santa Fe Trail in importance. Goods manufactured in the East could now be easily and cheaply transported to New Mexico, resulting in great changes in consumption patterns. While traditional Hispanic consumption patterns seem to have survived the changes in availability of manufactured goods that occurred when the Santa Fe Trail opened, they did not long survive the flood of goods carried by the railroad.

An example of this process is the use of Pueblo pottery for cooking and storage. This practice continued into at least the early Railroad period, as shown by the results of excavation at the Trujillo House and La Puente in the Chama Valley (Moore et al. 2004). Pueblo pottery, apparently supplemented by Hispanic-made wares, was used at these sites until at least the end of the nineteenth century. However, they were associated with large amounts of Euroamerican wares that seem to have mostly replaced the traditional Pueblo and Mexican wares used for serving and consuming food. As the Pueblos began producing increasing amounts of pottery for the tourist trade, their wares became more expensive. At the same time, alternative methods for cooking and storing food were becoming available. Eventually, the use of earthenwares for these purposes virtually disappeared.

Trade over the Santa Fe Trail represents the first erosion of the traditional New Mexican economy, which was mostly based on the barter of agrarian products and goods produced by individuals. Before that time there is little evidence of the circulation of money in New Mexico, and indeed the early Santa Fe traders complained that there was little hard cash in the territory, and what little was available was controlled by just a few families (Connor and Skaggs 1977). Even though much of the commerce conducted over the Santa Fe Trail continued to be based on barter, New Mexico in general was finally introduced to a cash economy. As the territory became integrated into the United States after 1846 and especially after the railroad arrived in 1880, New Mexico finally became fully integrated into the cash economy that dominated the rest of the North American continent.

Ojo Caliente

The Ojo Caliente area was officially settled by Spaniards in 1735 (Ebright 1994:26), part of a process of expansion that brought Spanish settlers into the Chama Valley as well. Fray Agustín de Morfí reported that there were 46 families at Ojo Caliente by 1744, and that the settlement had a chapel (Thomas 1932:94). Along with the Chama Valley, Ojo Caliente was hard hit when the Comanches and Utes began a series of major attacks against settlements along the eastern Spanish frontier in 1747, and in 1748 the settlers petitioned Governor Joaquín Codallos y Rabal for permission to move to a safer location (Adams and Chávez 1956:78; Quintana and Snow 1980:44; Swadesh 1974:35). This was intended to be a temporary measure, and by 1750 orders were issued to the refugees to reoccupy the region on pain of surrendering their grants (Swadesh 1974). However, few settlers returned to the area, and even fewer stayed (Quintana and Snow 1980:44). Juan Muñíz was one of the exceptions, and he reoccupied his grant in 1752 to avoid losing it and opening himself to prosecution for desertion (Swadesh 1974:42). Baxter (1987:45) also notes that an estate inventory from around 1762 mentioned "substantial numbers of partido cattle and sheep at Ojo Caliente in the Rio Arriba," indicating that others were also living in the region.

By 1766 most of the area still was not resettled, and Governor Cachupín reverted grants in the Ojo Caliente area to the Crown, and reopened them to other settlers (Simmons 1968:79). The area was not officially reoccupied until 1768–69, when 53 families returned with grants issued by Governor Cachupín (Adams and Chávez 1956:78; Frank 2000:43). Among the grants made at this time were at least two to Genízaros—in 1768, 13 Genízaros received a grant for a settlement on the land of Juana de Herrera, and in 1769, 22 Genízaros were granted land for a settlement above the hot spring.

By 1770 the new settlers had been attacked by Comanches at least three times, including one occasion where 500 warriors were led against them by Cuerno Verde, one of the Comanche's greatest chieftains of the time (Noyes 1993). Rather than having built a defensible village, the settlers were apparently living in houses scattered through the valley. Governor Pedro Fermín de Mendinueta ordered the inhabitants of Ojo Caliente to build a more defensible community, but the settlers preferred to abandon the region and began to do so in 1770 (Frank 2000:49, 244, n. 55). Ojo Caliente remained abandoned in the Domínguez report of 1776, where it is noted that some of the furnishings from the chapel had been temporarily transferred to Santa Cruz de la Cañada (Adams and Chávez 1956:78–79). Annotations on the Miera y Pacheco maps of 1779 note that the settlements in the Ojo Caliente Valley were "ruined by the enemy Comanche" (Frank 2000:43). An army led by Governor Anza camped at the deserted settlement of Ojo Caliente in August 1779 en route to a decisive victory over the Comanches in which Cuerno Verde was slain (Noyes 1993). Even with this victory, the period of conflict did not end until 1786, when Governor Anza concluded a lasting peace through an alliance with the Comanches against the Apaches and Navajos (Frank 2000; Thomas 1932).

The Ojo Caliente Valley was a dangerous location for settlement during most of the Spanish Colonial period because it was one of the primary routes followed by raiding Comanches and Kiowas into Spanish New Mexico (Frank 2000:43; Swadesh 1974:40). As Frank (2000:43) notes, "The elimination of Ojo Caliente afforded raiding parties traveling from the north easier access to carry out raids on Abiquiu, Chama, and the jurisdiction of Santa Cruz de la Cañada." Thus, until peace was concluded with the Comanches in 1786, it was nearly impossible to establish a stable community in the valley, especially considering the Spanish settlers' reluctance to construct a defendable village rather than live in scattered ranchos. Swadesh (1974:40) notes that Genízaros were repeatedly granted lands in the Ojo Caliente Valley, only to be driven out.

Safe, stable settlements were impossible to establish in the Ojo Caliente Valley until after Anza concluded his peace with the Comanches in 1786. Reduced conflict with Plains Indians after that event allowed the valley to be safely resettled and the resident population to expand. By the end of the Spanish Colonial period in 1821, settlement had spread north into the aptly named Cañada de los Comanches, where numerous families lived in at least two villages in that area (Swadesh 1974:55). Freedom from Spain resulted in many legal changes in the status of Indians and Genízaros. When the latter were given formal citizen status, their grants were broken up and lands were distributed in severalty to the Genízaro families. As Swadesh (1974:54) notes, this process was accomplished with few complications at Ojo Caliente because the lands had been regranted so often that the Genízaro grants had lost the special status usually accorded them. Other than a few scattered artifacts, no remains from this early period of history in the Ojo Caliente Valley were encountered during this study. A more detailed account of the later history of the area is presented in Chapter 25.

Chapter 5. Problem Domains and Field Methods

James L. Moore

Problem domains for most of the sites examined during this study were developed by Wiseman and Ware (1996). These questions were not modified when two more sites—LA 118547 and LA 118549—were added to the scope of this study. LA 118547 can be easily placed under the umbrella of the existing problem domains, since it is a farming site very similar in age and structure to eight of the sites already scheduled for data recovery. Unfortunately, LA 118549 did not fit into the existing project structure as easily. LA 118549 is a trail that runs through most of the project area and continues south beyond project limits. Trail segments paralleled most of the farming sites examined during this project, so it was possible to partly integrate our study of the trail into the investigation of those adjacent sites. However, a very different approach was needed to provide adequate descriptions of the trail and enough data to place it in the proper perspective.

The first section of this chapter presents the problem domains the project was structured to address and is mostly taken from the research design developed by Wiseman and Ware (1996). We develop an additional problem domain on the function and meaning of the trail and how it fit into the prehistoric landscape. We also present a few new research issues for other site classes. Descriptions of the field methods used to extract the data required to address the research issues comprise the second section. The last section presents a series of definitions and descriptions of terms used to describe the farming features encountered during this study.

Problem Domains: What We Were Looking For

The research issues developed for this study fall into four problem domains: the section of Hilltop Pueblo (LA 66288) within project limits, historic use of LA 105710, the nine farming sites, and the trail (LA 118549). Each problem domain is discussed separately.

Problem Domain 1: Hilltop Pueblo

As Wiseman and Ware (1996:50–57) note, Hilltop Pueblo (LA 66288) is a large single-plaza adobe village dating to the Classic period. It includes a structural mound and adjacent, related scatter of cultural refuse. Hilltop Pueblo itself is situated on top of a high terrace and is outside project boundaries, but some of the associated cultural refuse scatter extends into the U.S. 285 right-of-way. These materials occur in a large dune at the base of a higher terrace that the village sits upon. The dune was examined during testing by a series of auger transects to determine whether structural remains might be present. While numerous cultural materials were encountered within the dune, no structural remains were found.

This problem domain was mainly developed to address the potential relationship between the cultural remains encountered within the dune and Hilltop Pueblo. The preliminary study suggested that both areas were used contemporaneously and were related (Wiseman and Ware 1996:50). Several possible functions for the dune were suggested, including a fieldhouse location overlooking adjacent fields, exterior activity areas associated with the village, and a garden or agricultural area (Wiseman and Ware 1996:50). Specific research questions were designed to evaluate these possible functions and help determine the capacity in which this area functioned.

Research Issue 1: Genesis and structure of the dune. Wiseman and Ware (1996:55) believed that an investigation into the genesis and structure of the dune at LA 66288 was critical to understanding the role it played in the occupation of Hilltop Pueblo. By learning how the dune formed and detailing its internal structure and relationships, it was expected that we would be able to correlate the deposits and cultural materials found within this physiographic feature. The relationship between strata defined in the dune was expected to be critical to our attempts to date the cultural manifestations found within it.

Determining the origin of sediments in the dune was considered an important aspect of the overall research design. A source of materials must exist for eolian deposits. Denudation of nearby land is often the source of materials transported by wind and deposited in dunes. As Wiseman and Ware (1996:55) suggest, "If that denudation takes place in agricultural field areas, then it is likely that the growing potential of those fields is lessened or precluded, thereby creating the need for the development of other fields and perhaps alternative kinds of fields and farming strategies. The use of the dune for cropping and the construction of grid gardens on the high terrace are two potential answers to this problem."

By determining the origin of dune sediments, whether or not that area was used for farming, Wiseman and Ware (1996:55) felt that one or more of the following questions could be explored: (1) Did grid gardens derive from a need for additional fields to feed an increasing human population? (2) Were grid gardens built to replace fields lost to erosion? (3) Was there a general denudation of the landscape caused by natural or cultural processes?

Thus, explaining the derivation of sediments in the dune at the base of the terrace occupied by Hilltop Pueblo could be an important step in determining why the intricate gridded fields that this region is known for were built.

Research Issue 2: Pedestrian pathway. Wiseman and Ware (1996:55–56) felt that the dune that constitutes the south end of LA 66288 and the north end of LA 105710 served as a major pedestrian corridor between Hilltop Pueblo, the nearest source of water in the Rio Ojo Caliente, and associated fields in the valley bottom. Thus, they felt that evidence of a path providing access between the village and the valley bottom might be found in this part of the site. However, the potential of locating such a corridor was not considered to be very high. If found, such a pathway was expected to resemble a similar feature discovered at Sapawe in the nearby El Rito Valley. In that case, the suspected pathway was found in a mechanically excavated trench and occurred as a shallow depression in the trench profile (Wiseman and Ware 1996:55). Any such pathway at LA 66288 should be similar in form and was expected to occur as a 10–20 cm deep depression ranging between 0.5 and 1.0 m wide.

There are two potential problems with this research issue that were not considered in the data recovery plan. First, there is the trail (LA 118549) discovered at the beginning of the data recovery phase. As is discussed in a later chapter, the trail disappeared at the south end of LA 105710 as it descended into the valley bottom from its more common route about midway up the slope of the gravel terrace that forms the east edge of the Ojo Caliente Valley. We were uncertain whether disappearance of the trail was the result of historic disturbance of that area from the construction and use of the García store and the morada at LA 105710, or whether it was a consequence of the trail's entering a general occupation zone associated with Hilltop Pueblo in which no formal pedestrian corridors occurred. This problem is exacerbated by the potential relationship between Hilltop Pueblo and the village of Nute in the valley bottom. If these sites represent separate buildings that were integral parts of a single village, then continual traffic between them and activities occurring in the intervening space could have resulted in the formation of numerous activity areas without any specific traffic corridors. Conversely, if these sites were not associated and the intervening space was not the locus of overlapping activity areas, then one or more pedestrian corridors similar to those seen at Ponsipa'akeri (discussed in a later chapter) and Sapawe might occur.

The more likely of these scenarios is that the trail (LA 118549) descended to the valley floor to enter a general occupational zone associated with the occupation of Hilltop Pueblo and possibly Nute because the descent of the trail to the valley bottom at this point is not typical of its routing. Typically, the trail remains between one-third and two-thirds of the way up the terrace slope until a major drainage that deeply dissects the west edge of the terrace is encountered. At that point, the trail curves around the corner of the terrace, disappearing into the intervening valley bottom and reappearing on the opposite edge of the valley. As the trail approaches Hilltop Pueblo and Nute from the south, it leaves the terrace slope and descends into the valley bottom rather than continuing along the terrace slope below Hilltop Pueblo. Thus, if Nute, Hilltop, and the trail were contemporaneous, the trail would enter a heavily used area between the two sections of village rather than directly approaching either. If this is the case, the likelihood of finding identifiable pedestrian corridors in this area would be low.

Research Issue 3: Outdoor activity areas. Wiseman and Ware (1996:56) feel that the quantities of cultural materials found on and within the dune during testing are too great to have derived from an unintentional, random scattering of trash from Hilltop Pueblo. Rather, they feel that the consistent distribution of cultural materials between the surface of the dune and the depths reached by augering represent the accumulation of eolian materials and artifacts over decades to as much as a century or more.

This accumulation may have been the result of the continual use of the dune for a variety of activities. Wiseman and Ware (1996:56) suggest that if the dune was used as a general-activity zone by the occupants of Hilltop Pueblo, evidence of the activities performed there should be present, including hearths, postholes representing the remains of ramadas, pits, and compacted use-surfaces.

Research Issue 4: Fieldhouses. Prehistoric use of the dune that forms the south end of LA 66288 and the north end of LA 105710 may have been more substantial than the possibilities suggested in Research Issue 3. Indeed, the suite of potential activities performed in this area may have necessitated construction of more substantial structures than ramadas or shades. Wiseman and Ware (1996:56) suggest that this area could also have been the location of one or more fieldhouses associated with farming in nearby areas. If this assumption is correct, they felt that data recovery efforts should be able to locate the remains of such a structure(s). The potential structural remains were expected to take the form of wall remnants and associated formal or informal floors and use-areas.

Research Issue 5: Gardens. Wiseman and Ware (1996:56) also consider the possibility that the dune was used as a garden area; however, they caution that finding verifiable evidence of this type of use would be very difficult. Perhaps the only strong evidence of this type of use that could be recovered would be high concentrations of domesticate pollen indicative of the cultivation of such crops as corn, beans, or squash. However, this type of evidence is often difficult to find even in active fields because of the way in which pollen from these cultigens is produced and transported. Thus, the possibility that this type of evidence would be available from LA 66288 was very low. The interpretation of these types of data can also be complicated by the use of the dune as an outdoor activity area or fieldhouse location. All in all, this possibility would be equally difficult to prove or disprove.

Research Issue 6: Dating the prehistoric occupation. Providing dates for whatever strata or features are encountered in the dune was considered crucial for understanding the processes that led to its formation and placing the site in a regional framework. This was to be accomplished by analyzing whatever reliable temporally diagnostic materials were recovered and establishing an internal chronology based on the stratigraphy encountered in the dune (Wiseman and Ware 1996:56–57).

Problem Domain 2: The Historic Occupation at LA 105710

Among the historic features identified at LA 105710 by Wiseman and Ware (1996) were an abandoned morada, the remains of a store, a road used for hauling wood from the terrace top, and a corral. Both of the historic structures are thought to date to the early twentieth century. The García store was at the south end of LA 105710 within project boundaries. This small one-room structure was used for about four years before the proprietor went out of business. The importance of this structure is that it was owned and operated by a local Hispanic man, which is considered to be very unusual for this period in northern New Mexico (Kutsche and Van Ness 1981).

The morada is represented by a low mound and standing corner buttresses at the northeast edge of LA 105710. An abandoned road used to gather wood from the terrace top crossed LA 105710 from east to west, just north of the morada. A corral used to hold livestock and marked by a concentration of wolfberry bushes was identified during testing (Wiseman and Ware 1996:61). These features were outside construction limits, so further studies were limited to ethnohistorical inquiries. Though the following research issues are only concerned with the morada and the García store, any information on the corral and wood hauling road available during ethnohistoric interviews would also be collected to amplify our understanding of these features.

Research Issue 7: Dating the morada. Testing provided only a vague idea of when the morada was constructed and used (Wiseman and Ware 1996:61–62). Marshall (1995) suggests a construction date ca. 1870, which Wiseman and Ware (1996:62) feel may indicate that this was not the first morada constructed by the community, considering that the Ojo Caliente Grant was established in the eighteenth century. Analysis of construction details in the morada would hopefully provide a more accurate date for this structure.

Research Issue 8: Internal organization of the morada. Because the morada was completely dismantled, documentation of the remains in the absence of excavation has little chance of revealing the internal organization of the structure. Wiseman and Ware (1996:62) felt that the only way to ascertain that organization was through ethnohistoric interviews.

Research Issue 9: Location and construction details of the Calvario. Wiseman and Ware (1996:62) indicate that the Calvario of the Ojo Caliente morada was not found during survey or testing. The Calvario, a large cross set at the far end of the Via Crucis, is a focal point of rituals performed during Holy Week. As they note, Calvarios are generally placed on high points near moradas (Wiseman and Ware 1996:62), which in this case may or may not have been outside project limits. Since no physical evidence of this feature was found, ethnohistoric interviews with local residents were considered to be the only way to establish its location. Such interviews could be especially important should the Calvario prove to be within project boundaries.

Research Issue 10: Location and organization of the Via Crucis. The procession route and Stations of the Cross are another major feature of the morada complex (Wiseman and Ware 1996:62). Since these were not permanent features but were set out each Holy Week, Wiseman and Ware (1996:62) indicate that it is unlikely that they could be located by archaeological means. Again, ethnohistoric interviews with local residents represent the only avenue open to identifying the locations of these features.

Research Issue 11: Oratorios. Information available to Wiseman and Ware (1996:62) indicated that two buildings, both of which were physically separate from the morada, were used as chapels in functions of the Penitente Brotherhood. Information on the location, construction details, ownership, and dates of these structures is needed. Since neither structure is still standing, these data will probably only be available through ethnohistoric interviews with local residents.

Research Issue 12: Construction details and interior organization of the García store. Testing suggested that the building housing the García store was completely dismantled at some time in the past, and only the foundations remained for archaeological investigation (Wiseman and Ware 1996:63). Few data concerning construction details and the interior organization of the store are expected to be available archaeologically. Thus, ethnohistoric interviews might be the only way to ascertain the number of rooms, the placement of doors and windows, and the location of counters and shelves.

In addition to the points raised by Wiseman and Ware (1996:63) on this research issue, ethnohistoric interviews can also be used to augment and help interpret information obtained through excavation. Though the store was dismantled down to its foundations, some information about its internal structure could still be obtained through archaeological studies. These data can be examined in light of information provided by ethnohistoric interviews to aid in their interpretation and perhaps verify any archaeological conclusions, thus enhancing both methods of inquiry.

Research Issue 13: Specific types of goods sold and their points of origin. Wiseman and Ware (1996:63) note the importance of determining the types of goods sold by the García store. Such information would reflect the greatest needs of the community, the types of affordable luxury items, the comparative wealth (or lack of wealth) of the inhabitants of the Ojo Caliente area, and changes in community wealth structure through time. Archaeological recovery of examples of the goods sold at the store would be the best way in which to address this research issue, but testing suggested that few artifacts would be recovered from the store during data recovery (Wiseman and Ware 1996:63). Ethnohistoric interviews may be the only way to determine what was sold in the store and could supplement and amplify any archaeological data that were obtained.

Research Issue 14: Social dynamics of the García store. Interest in the social aspects of the García store derives from two factors: the proprietor of the store was a local Hispanic man, and entrepreneurial enterprises tended to cause social disruption in northern New Mexico (Wiseman and Ware 1996:63). As Kutsche and Van Ness (1981) indicate, there is a general belief in northern New Mexico that store owners take advantage of their customers in various ways, including charging high prices for the goods they are selling and paying low prices for locally produced goods (Wiseman and Ware 1996:63). These types of actions can cause social rifts, which can be especially disadvantageous in small communities, where cooperation is necessary for survival.

Information on the proprietor of the García store, his position in the local community, and his role in the economy of the area could provide important information concerning community dynamics and economic success. Ethnohistoric interviews with local residents and archival studies may provide information useful in evaluating this research issue.

Problem Domain 3: Prehistoric Gravel-Mulched Fields at Nine Classic Period Sites

Most of the sites investigated by this study consist of groups of farming plots that are dominated by gravel-mulched fields. As Wiseman and Ware (1996:64–67) point out, gravel-mulched fields have long been known in the Chama and Ojo Caliente drainages, but detailed studies of them are a relatively recent phenomenon. Eight prehistoric farming sites (LA 105703–LA 105709 and LA 105713) were originally scheduled for examination during this study, and LA 118547 was added as data recovery efforts were beginning.

Except for LA 105704, the farming sites are all extensive and only partly within project limits. Their use is generally presumed to coincide with the major Pueblo occupation of this area during the Classic period. In addition to the research issues generated in the research design, a few other issues were added after observations of certain aspects of site structure were made during field investigations.

Research Issue 15: Dating. As Wiseman and Ware (1996:67–68) note, providing absolute dates for prehistoric fields is a very difficult proposition. Because fields reflect a nonresidential use, they tend to lack materials that could provide absolute dates for the period of use. Some materials that might be available tend to provide dates with long probability ranges or that are less than reliable. Hearths tend to be rare at farming sites, and if wood from trees—susceptible to the "old wood" phenomenon—was used for fuel, it is often difficult to derive useful temporal data. Similarly, hydrated rinds can be measured on obsidian to provide information on when that artifact was manufactured. Unfortunately, the rate of hydration in obsidian is affected by both temperature and moisture content and can vary significantly from one side of a valley to another, depending on local microclimates (Ridings 1991). To reduce the effects of climatic variability, the best candidates for this type of dating generally come from at least 1 m below the surface. Even when deeply buried samples occur, however, data on annual moisture and temperature variation are needed for accurate dating.

Since neither charcoal nor adequate obsidian samples were expected to be available, chronometric control would necessarily be provided by analysis of pottery. By collecting all visible ceramic artifacts within project limits and transecting the remainder of each site to record the types of pottery present, it was hoped that suitable chronometric data would be collected.

Research Issue 16: Crop mix. Determining the mix of crops grown in these fields was considered of critical importance (Wiseman and Ware 1996:68–69). Previous studies have recovered corn and cotton pollen from gravel-mulched fields, but were these the only crops whose use could be substantiated? Some investigators (Bugé 1981; Lang 1979, 1980; Lightfoot 1990) have suggested that in addition to the fields themselves, the ubiquitous borrow pits that occur in association with gravel-mulched fields may have also been used for agriculture. These questions will be addressed by collecting and analyzing pollen samples from the fields and a sample of borrow pits.

Research Issue 17: Characterization of field structure and dynamics. Wiseman and Ware (1996:69) note that questions pertaining to field dynamics—how gravel-mulched fields were built, how they functioned, their potential productivity, their life expectancy, and other characteristics—represent important issues that have not been adequately addressed. When drawing conclusions about these issues, most researchers have used data from modern experiments in the use of gravel mulching, extrapolating from them to explain past field dynamics. There is a lack of replicative experiments concerning prehistoric gravel-mulched fields in northern New Mexico, so published accounts can only be used as a general guide.

However, detailed construction data are needed to adequately conduct experiments on prehistoric gravel-mulched fields. Information on field-construction sequences and methods, gravel size, raw-material sources, and surface treatment variation are also needed. Field methods were tailored to collect these data from the sites studied, both by observation and excavation.

Research Issue 18: Embedded lithic extraction and processing activities. Earlier studies of gravel-mulched fields found that chipped stone artifacts indicative of raw-material quarrying were common on field surfaces. Ware (1995) concluded that lithic raw-material extraction and initial core processing were important aspects of field construction and use in the area. Does this pattern extend to the current project area?

Research Issue 19: Methods of field tending. During data recovery, we noted several instances where scatters of artifacts, sometimes with associated features, may represent temporary occupational zones. What does the presence of such zones tell us about how fields were tended, and do they provide any information that may be linked to land tenure systems?

Research Issue 20: Shrines and fields. Several definite and potential shrines were noted on and adjacent to fields during data recovery. Do these features match descriptions of the modern shrines used by the Tewas? Are shrines integrated into field complexes, or are they separate entities? How do these shrines compare to prehistoric shrines identified in other parts of the Southwest?

Problem Domain 4: The Prehistoric Trail

The existence of a trail that links nearly all of the prehistoric sites investigated during this project was noted as data recovery efforts began. LA 118549 runs up the east side of the Ojo Caliente Valley, extending from as far south as Ponsipa'akeri to as far north as LA 105713. As detailed in the site descriptions in this report, the structure of the trail, how it was routed, and other types of data suggest that it was a prehistoric pedestrian corridor. While numerous trails have been documented on the Pajarito Plateau, and Harrington (1916) discusses several that were still known to the Tewas in the early twentieth century, none were previously known or recorded in the Ojo Caliente Valley north of Ponsipa'akeri. The juxtaposition of the trail and farming sites leads us to ponder whether there is a direct relationship between them, or whether this apparent co-occurrence is merely fortuitous?

Research Issue 21: The function of trails in Pueblo society. Were trails mere pedestrian corridors, or were they related to more esoteric aspects of Pueblo religion and ritual? Indeed, did the Pueblos use more than one type of trail, or did trails serve a dual function as pedestrian corridors and as part of the ritual system?

Research Issue 22: Was the trail built to link farming sites to villages? This issue is closely linked to Research Issue 22 and continues our examination of how trails might have functioned in prehistoric Pueblo society. By examining the structure of LA 118549 is it possible to determine whether it functioned primarily as a corridor for pedestrian travel to and from fields, or whether it had another purpose? Could it also have had the secondary function of channeling traffic to and from fields on the east side of the Rio Ojo Caliente?

Field Methods: How We Looked For It

The same general field methods were used at all of the sites investigated by this study, though they varied in specific applications. In particular, the methods used to study the prehistoric fields and trail differed from those used to examine the portion of Hilltop Pueblo within project limits, as well as those used to look at the historic remains at LA 105710. This variation in methods did not create problems in the interpretation of data collected from the sites, because different questions were asked of the various classes of sites, as detailed in the previous section of this chapter.

General Methods

The first step in data recovery was establishing a main site datum, the point from which all vertical and horizontal measurements originated. Since the main datum was rarely the highest point on a site, it was assigned an arbitrary elevation of 10 m below datum to prevent the occurrence of both positive and negative elevations. Sites were mapped by laser transit and/or optical transit, and the locations of all visible cultural features within study limits, excavation units, grid lines, surface artifacts, and relevant topographic features were plotted.

Hand excavation was conducted in 1 by 1 m grids, which were provenienced differently according to the type of site being investigated. Excavation proceeded in arbitrary 10 cm levels unless natural stratigraphic units were identified, in which case the natural strata became the vertical units of excavation. Unless otherwise noted, soil removed from excavation units was screened through 1/4-inch mesh hardware cloth, and all artifacts noted were collected. The same field specimen number was assigned to all artifacts from an excavational unit, but different artifact classes were bagged separately. Standard forms were used to record data from all excavation units.

The methods used to investigate small nonfarming features and structures differed from those used to explore areas outside structures or excavate large features. Small nonfarming features were divided in half, usually along the longest axis. The first half was dug in arbitrary 10 cm levels, if possible. After the exposed deposits were profiled, the second half was excavated by natural strata. A flotation sample was obtained from each cultural stratum defined within small nonfarming features, and samples of datable materials were collected, when available. Upon completion of excavation a second cross section was drawn at a perpendicular to the profile, a plan of the feature was prepared, and the feature was photographed.

When a structure was identified, an exploratory grid was excavated into its interior in arbitrary 10 cm levels to define the natural stratigraphy. The structure was divided into quadrants and excavated, profiling exposed walls to provide perpendicular cross sections showing the strata encountered in relation to walls and floors. Samples of building materials were taken, and portions of the floor were removed to search for subfloor features. Photographs of the completed excavation were taken, detailing walls, floor, and any internal features that were exposed.

Larger features were sampled, but no attempt was made at complete excavation. In this case, excavation proceeded in 1 by 1 m grids. After the internal stratigraphy of the feature was identified in an exploratory grid excavated in arbitrary 10 cm levels, subsequent grids were dug by natural strata. Profiles of stratigraphic exposures were drawn, and photographs were taken when they could be used to better illustrate an aspect of the exposed deposits.

Mechanical equipment was used to open up larger exposures for examination in some instances. These trenches permitted far more extensive stratigraphic exposures and allowed us to examine features in a less time-consuming way than did hand-excavated trenches. Materials removed from mechanically excavated trenches were not screened, though artifacts noted during excavation were recovered for analysis. While this did not provide a statistically valid sample, it did augment the collections from hand-excavated units. The locations of mechanically excavated trenches were plotted on site plans. At least one wall was profiled, showing exposed strata and elevations at the surface and bottom of the trench. Soil samples were obtained from these trenches in certain instances, as detailed in individual site reports.

Excavation Details: Farming Sites

Except initially at LA 105704 and LA 105709, grid lines were not defined at farming sites. Main site datums were placed where the largest exposure of site was immediately visible to help limit the number of mapping stations needed for completing the site plan. Though the data recovery plan called for the complete mapping of cultural features at these sites, this procedure was modified during examination of LA 105707 because it was too time consuming. At subsequent farming sites examined, detailed plans were prepared only for the area within construction limits and an adjacent 25–30 m wide zone. Only site limits and the perimeter of associated occupational areas were plotted outside detailed mapping zones. Features that were completely within or that partly extended into the detailed mapping zone were described, noting characteristics of construction and the matrix used to fill gravel-mulched grids. The size of features that extended outside the detailed mapping zone was estimated by pacing, otherwise feature size was calculated from site plans.

Features were numbered and their limits defined during site mapping. In most cases, boundaries between features were easily defined by visual inspection. Arbitrary boundaries were occasionally imposed when transitions between features were unclear due to erosion or subsequent cultural activities. Because it is very difficult to photograph farming features, representative photographs were taken, usually showing construction details.

Gravel-mulched grids within construction limits were examined using 2 by 2 m excavation units (EU). Each EU was given an alphabetic designation, and individual grids were numbered, beginning with the northeast grid and running clockwise. Thus, the northeast grid of EU-A was designated Grid A-1, the southeast as Grid A-2, and so on. Since excavation was aimed at deriving information concerning construction characteristics, not all materials removed during excavation were screened. Only two of the four grids were screened to recover associated artifacts, though cultural materials noted in the unscreened grids were also collected for analysis. Two soil samples were taken from each EU: a small sample of sediments for pollen analysis, and a larger sample to examine gravel sizing. Photographs were taken of each EU before and after excavation, and preexcavation and postexcavation plans were drawn.

EUs were placed in locations judged capable of providing necessary feature construction data. In addition to placement across alignments that formed the exterior perimeter of features, EUs were also situated where they could be used to examine alignments that formed interior subdivisions in fields, where large cobbles or small boulders were set in a patterned configuration, or where surface indications suggested that atypical construction details could be examined.

Only a few borrow pits were examined in detail, because excavation of this type of feature was felt to have little potential for returning useful information. In the few instances that borrow pits were examined in detail, mechanically excavated trenches were used to provide exposures of the natural strata that these features were dug into, as well as the sediments deposited after they were used. Soil samples were obtained from mechanical trenches in borrow pits to provide information on the types and concentrations of domesticate pollen that might be present and to examine gravel sizing. Other borrow pits within detailed mapping zones were simply described and mapped.

All visible artifacts within the right-of-way were collected for analysis. Artifacts were generally collected by feature or portion of site and not by exact provenience. However, cultural materials were collected by exact provenience at a few sites to provide more precise information on artifact patterning. Visible surface artifacts outside the right-of-way were recorded by pedestrian transects spaced 2 to 4 m apart and provenienced by feature when possible. These data can be used to augment information available from the detailed analysis of collected materials but are not directly comparable, since only a few attributes were recorded for the noncollected sample.

Excavation Details: Other Sites

Excavation at nonfarming sites tended to follow the general methods discussed earlier in this section, except for the trail (LA 118549). Because LA 66288 and LA 105710 were adjacent to one another and a sand dune that contains cultural deposits was contiguous between them, the boundary between them was arbitrarily drawn, and they were placed in the same coordinate system. The main datum for these sites, designated as the intersection of the 500N and 500E grid lines, was at the north end of LA 105710. The elevations and coordinates of mapping points used to construct plans for both sites were calculated from this datum. Because of the long, linear nature of LA 118549, no main datum was defined for it. Instead, segments adjacent to farming sites were mapped in relation to the features defined at those sites. Other segments were not mapped but are shown on aerial photographs in a later chapter.

LA 66288 and LA 105710 were completely mapped, and the locations of all cultural and pertinent topographic features were noted. Differences in vegetative densities allowed us to trace many of the walls at Hilltop Pueblo, permitting definition of roomblocks and a plaza. Other than the obvious structures at LA 105710, vegetational differences representing the former locations of corrals were also plotted. In addition, the positions of abandoned roads and modern erosional channels were mapped.

Three 1 by 1 m grids were used to explore dune deposits at LA 66288 to determine whether cultural strata were present. When no cultural features or deposits were exposed in these exploratory grids, three long trenches were mechanically excavated to provide more extensive exposures of dune deposits. Artifacts noted during mechanical trenching were collected but could not be provenienced to specific strata. Since essentially the same strata were exposed in all three trenches, only one was profiled; a series of pollen samples was also obtained from this trench to provide environmental data, and bulk soil samples were taken from two strata that contained higher concentrations of organic materials.

Both prehistoric and historic components were defined at LA 105710. Fortunately, there was spatial separation between the components. The prehistoric remains occurred mostly at the north end of the site in the same dune that was examined at LA 66288. The historic component included the remains of a morada at the north end of the site, two corrals in the central part of the site, and the foundations of a small store at the south end. Only the store foundations were within the right-of-way, and they were the only historic remains that were examined in any detail.

Three 1 by 1 m units were excavated at the north end of LA 105710 to explore the south end of the dune examined at LA 66288, but no cultural deposits or features were located. As at LA 66288, two long trenches were then mechanically excavated to permit examination of more extensive exposures of dune deposits. Artifacts noted during mechanical trenching were collected but could not be provenienced to specific strata. Since essentially the same strata were exposed in both trenches, only one was profiled; a series of pollen samples was obtained from this trench to provide environmental data, and bulk soil samples were taken from two strata that contained higher concentrations of organic materials. Two simple hearths were also defined in this stratigraphic profile and excavated as small features.

Since the morada and corrals at LA 105710 were outside the right-of-way, no detailed studies of them were possible. The morada was mapped and photographed, and architectural characteristics were noted and described. The extent of a concentration of vegetation that represented the location of the corrals was mapped, but no further studies of those features were possible.

Examination of the García store at LA 105710 began with the excavation of two 1 by 1 m units, one on each side of a north-south foundation wall. Excavation of the interior grid suggested that the foundations and floor of the structure were relatively intact, and excavation continued using the methods detailed earlier. A series of 1 by 1 m units were then excavated around the perimeter of the structure in 10 cm thick arbitrary levels, ending at what was judged to be the ground surface at the time the structure was in use.

Because LA 118549 was a long, linear feature of the landscape representing a prehistoric pedestrian corridor, it was approached much differently than the other sites. As noted earlier, only segments adjacent to farming sites were mapped. Those segments were also described, and representative measurements of the trail's width and depth were taken. All surface artifacts noted along described segments were collected for analysis and compared to materials recovered from the nearby farming sites. Two trenches were mechanically excavated across the segment of trail that was mapped adjacent to LA 105709. These exposures were examined to determine whether they contained evidence of formal construction of the trail, and profiles of each trench were drawn.

Terms Used to Describe Farming Features

Many of the terms used to describe features at the farming sites are not in general use but were developed during our field investigations to accurately describe the features being examined. Terms in general use for Pueblo farming features are also defined for those who are not familiar with them.

Borrow pits. Wide, shallow pits, the source of materials used to build and mulch adjacent fields.

Boundary alignment. A low wall, usually only a single course high and wide, built around the perimeter of a field (Fig. 5.1).

Check dam. An alignment of cobbles or boulders placed across erosional channels to halt downcutting and/or permit buildup of soil that could be used as a farming plot. Check dams often occur in clusters, and subsequent construction occurs in an upstream direction as earlier features became filled with soil.

Contour terrace. An alignment of cobbles or boulders built perpendicular to a slope. The most common type of contour terraces slowed runoff from slopes and caught eroded soil. Besides providing small farming plots, these features sometimes also helped protect fields at the base of slopes from erosion.

Cobble-bordered field. A field that is bordered and often subdivided by cobble alignments, with no obvious alteration of the surface within the borders.

Gravel-mulched field. A field that is usually bordered and often subdivided by cobble alignments, with a layer of mulch applied to the surface of the field that consists of unsorted gravels ranging in size from pea gravels to small cobbles.

Interior subdividing alignment. A low wall, usually only a single course high and wide, used to subdivide a field into smaller plots. These alignments are similar to those built around field perimeters and occur in conjunction with boundary alignments (Fig. 5.2).

Pattern of noncontiguous, evenly spaced large elements. Large cobbles or small boulders placed in a patterned arrangement in fields. While these elements often occur in alignments, they were not placed next to one another, but were usually evenly spaced up to a few meters apart (Fig. 5.3).

Rock pile. Concentration of cobbles to small boulders that were probably originally stacked, but currently may be scattered by erosion or traffic over the surface of a site. These are problematic features that could variably have served as spoils piles, stockpiles of building materials, or small field shrines.

Spoils pile. A pile of cobbles and small boulders that usually occurs within or next to a borrow pit and represents materials rejected for use as gravel mulch (Fig. 5.4).

Terrace-edge borrow pit. A borrow pit that was excavated at the edge of a terrace, usually right at the break between the terrace top and the terrace slope (Fig. 5.5).

Terrace-interior borrow pit. A borrow pit that was excavated some distance away from the edge of a terrace on the terrace top (Fig. 5.6).

Figure 5.1. Boundary alignment around a gravel-mulched field at LA 105707.

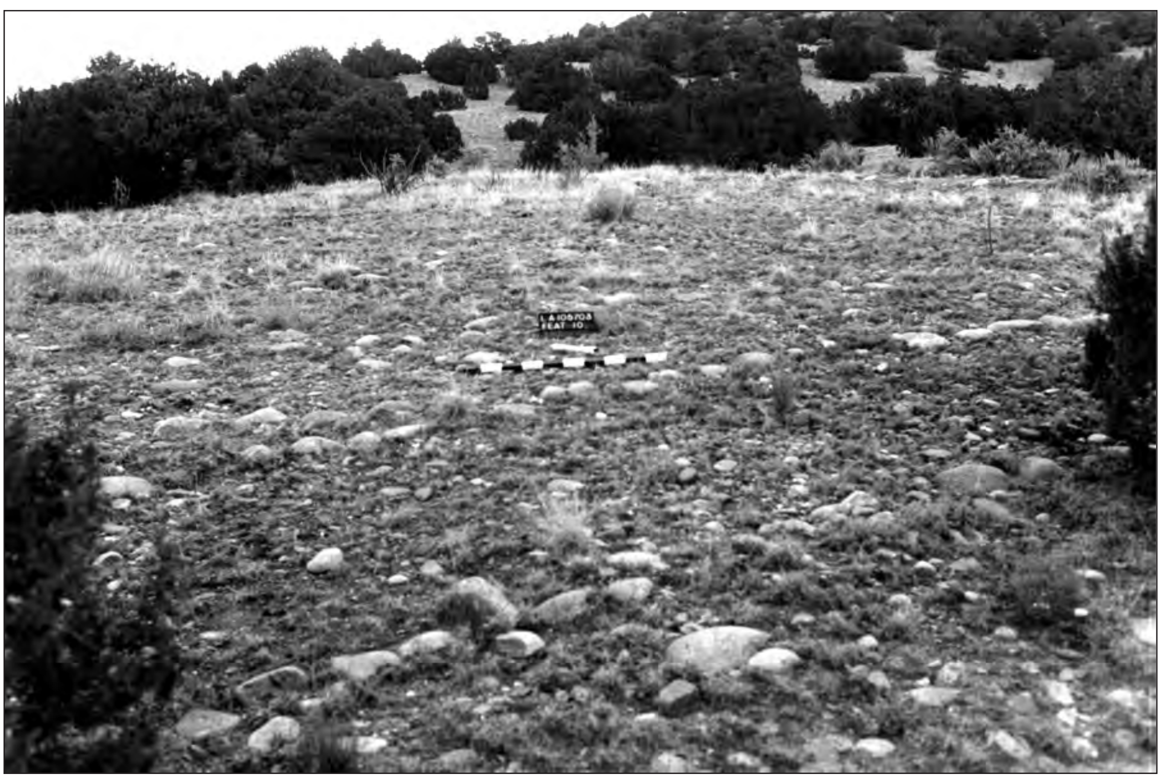


Figure 5.2. Interior subdividing alignments in Feature 10, LA 105703.

Figure 5.3. Pattern of noncontiguous, evenly spaced elements in EU-F, LA 118547.

Figure 5.4. Spoils pile adjacent to Feature 11 at LA 105703, a terrace-edge borrow pit.

Figure 5.5. Feature 6, a terrace-edge borrow pit at LA 105703.

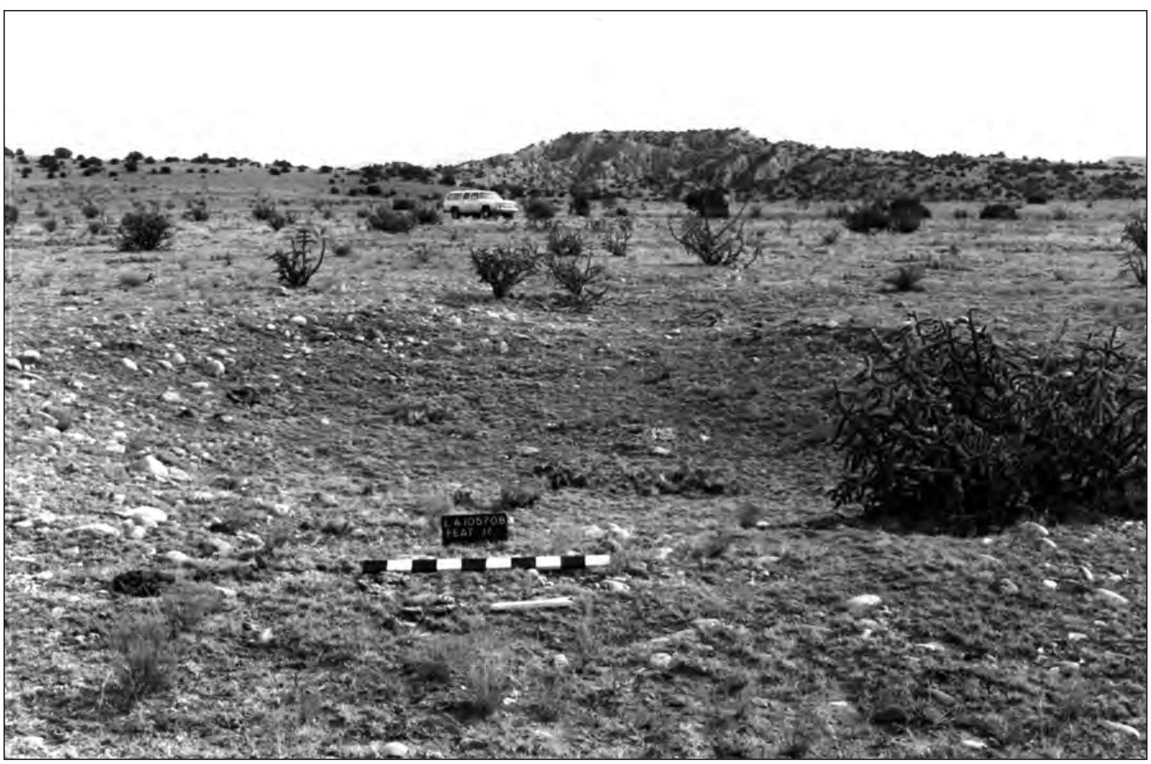
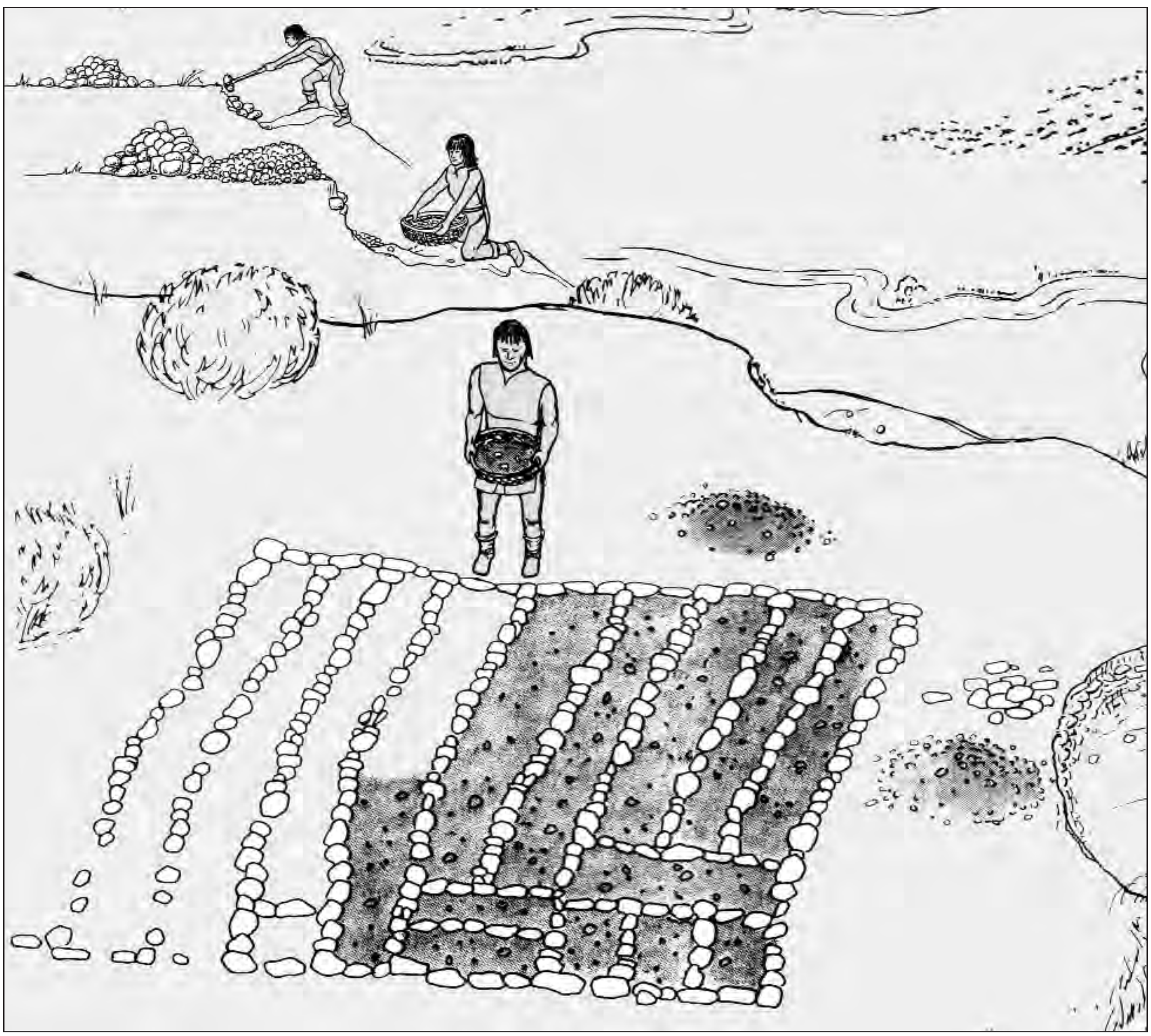


Figure 5.6. Feature 17, a terrace-interior borrow pit at LA 105708.

Part 2

Site Descriptions



Chapter 6. Hilltop Pueblo: Investigations at LA 66288 and the Prehistoric Component at LA 105710

Jeffrey L. Boyer

LA 66288 and the adjacent northern portion of LA 105710 make up a large site composed of a small, Classic period pueblo (Hilltop Pueblo) and an associated artifact scatter. The sites are on the east side of U.S. 285 in the community of Gavilan, on land administered by the Bureau of Land Management (see Fig. 1.1). Because the prehistoric components of both sites are related to the occupation of Hilltop Pueblo, the boundary separating the two sites has been arbitrarily defined as a small arroyo immediately south of the pueblo. Because most of LA 105710 consists of historic structures and features associated with the Hispanic community of Gavilan, the prehistoric components of LA 105710 are also described in this chapter. Chapter 14 is devoted to investigations of the historic component of LA 105710.

The portions of the Hilltop Pueblo site investigated during this project were at the base of the gravel terrace on which Hilltop Pueblo itself is located. Deposits at the terrace base, thought initially to be the location of activities and features associated with Hilltop Pueblo, were determined during our investigations to be a series of colluvial and alluvial sediments and soil horizons dating after the occupation of the small pueblo. Artifacts recovered from the terrace base deposits during testing and data recovery had been redeposited from trash left by pueblo residents in middens on the edge and sides of the terrace. Although the redeposited materials provide only a tenuous basis for dating Hilltop Pueblo, radiocarbon dates obtained from charcoal in a stratum possibly associated with the pueblo and from an isolated hearth feature indicate that it was occupied early in the Classic period, probably in the first quarter of the fifteenth century.

Because the prehistoric artifacts recovered from the Hilltop Pueblo site came only from contexts involving redeposited materials and sediments and do not provide information relevant to addressing the research issues proposed for this site (with the exception of dating), this chapter does not include discussions of artifacts recovered from the site. The reader is referred to the relevant chapters for descriptions of these materials.

Testing Investigations at LA 66288

As recorded by Williams (1988) and Marshall (1995), LA 66288 covers an area of about 300 by 300 m. This area includes Hilltop Pueblo itself and an artifact scatter extending from about 25 m east of the pueblo to about 60 m west of the existing U.S. 285 right-of-way (Marshall 1995:35). Marshall recorded a possible roomblock or midden area within the right-of-way at the southern end of the site and scattered artifacts within the west side of the right-of-way. Based on this information, Wiseman and Ware (1996) conducted test investigations at LA 66288 that were limited to surface artifact inventory within the right-of-way and four series of auger tests, one on the west side of the right-of-way and three on the east side. The auger tests on the west side of the right-of-way indicated that the artifact-bearing deposits in that area had been disturbed by or were the result of previous highway construction, since prehistoric sherds were found with late historic glass and modern plastic items (Wiseman and Ware 1996:29–31). No additional investigations were recommended for that area, and none were conducted during the data recovery phase. On the east side of the right-of-way, Wiseman and Ware excavated three series of auger tests in the area identified by Marshall as a possible roomblock or midden area. This area is at the foot of the terrace slope below (southwest of) Hilltop Pueblo. The auger tests revealed prehistoric sherds and chipped stone artifacts at depths up to 1.5 m below modern ground surface (Wiseman and Ware 1996:25–29). Based on these results, Wiseman and Ware recommended data recovery excavations to determine the origin of these artifacts and search for subsurface structures, features, or living surfaces.

Testing Investigations at LA 105710

When Wiseman and Ware returned to LA 105710 to conduct testing investigations, they focused their activities on the area within the right-of-way immediately south of LA 66288 and west of the morada, limiting their efforts to surface artifact inventory and three series of auger tests. Wiseman and Ware were concerned that this part of LA 105710 was part of the same "dune" feature (the terrace base deposit) that they tested at LA 66288 and that their inventory recorded mostly prehistoric artifacts in this area. The auger tests revealed prehistoric sherds and chipped stone artifacts from depths of up to 1.5 m below modern ground surface (Wiseman and Ware 1996:32–37). Based on these results, Wiseman and Ware recommended data recovery excavations in this area to determine the origins of these artifacts and to search for subsurface structures, features, or living surfaces.

Identifying Hilltop Pueblo

Marshall (1995:34) notes that Hilltop Pueblo is about 200 m east of Nute (LA 298), a large pueblo considered an ancestral Tewa site (Harrington 1916). Harrington's (1916:168) informants identified Nute'onwekeji, "ashes estufa pueblo ruin," as the northern edge of an area known as Tfugæ'iwe, "place of *Falco nisus*." *Falco nisus* is the Latin name for the chicken hawk, and the Tewa name is obviously related to the Spanish name for the local community, Gavilan (hawk) (see also Harrington n.d.). Harrington was not able to determine whether the Tewa name is a translation of the Spanish name of the community or vice versa. However, his informants did identify the area of the Gavilan community, bounded on the north by Nute Pueblo and Arroyo Gavilan and on the south by Arroyo de los Lemitas, as the location of a battle between the Tewa culture hero Poseyemu and the Euroamerican god Josí (José? Jesús?) (Harrington 1916:169). Apparently, Harrington's informants either did not know of the ruin that has become known as Hilltop Pueblo or did not differentiate between it and Nute.

Morley (1910a:19–20) recorded Nute Pueblo in his summary of the School of American Research's 1910 Rio Grande Expedition:

> On the way home 2 miles above the last house (or 2 miles from camp) we encountered the Gavilan ruin so-called. This is on the west side of the wagon road about 150 yds. and just south of a big wash or arroyo head. It is east of the Rio Ojo Caliente, however. It is rather unusually located for a Pajaritan site, being so near the bed of the stream. In this position it has been subjected to considerably more washing than any other Pajaritan sites in this canyon, and it will be a difficult task to secure even an approximate ground plan.

Elsewhere, Morley (1910b:6) describes Nute Pueblo as follows:

> The ruin of Nute'eowi or [?] as it is sometimes called stands on the eastern bank of the Rio Ojo Caliente two miles below the Mexican town of that name. In this position the ruin has been subjected for centuries to the not infrequent overflowals of the stream and the repeated washings of its high water. These in the course of time have so reduced the several mounds and worked over the site that it is now impossible to trace the true ground-plan. For this reason no attempt was made to map the site. Low mounds of irregular shape and size scattered here and there appear to conform roughly to the sides of two and possibly three courts. All remains of the estufas seem to have disappeared either having washed away or covered up by sediment deposited in great quantities by the stream at flood season.

Morley (1910b) produced a small sketch map of Nute Pueblo showing a C-shaped roomblock open to the south and, to the immediate east, an L-shaped roomblock open to the northeast. No mention is made in Morley's journals of the structure now known as Hilltop Pueblo; it appears that the expedition's San Juan Pueblo workers/informants did not identify the pueblo for the expedition's archaeologists. Morley (1910b) wrote that Nute Pueblo had another name, but he did not mention the second name in his manuscript. It is tempting to think that it might have been Tfugæ'iwe, referring to the community of Gavilan.

Beal (1987) was not able to relocate Nute Pueblo and, like Harrington and Morley, does not mention Hilltop Pueblo. We could infer from this situation that either Harrington's and Morley's informants did not know of Hilltop Pueblo or that the two pueblos were not differentiated because they were considered to be part of the same community. Although Hilltop Pueblo is not as large as the other known Classic period pueblos along the Rio Ojo Caliente, it is an obvious feature and is well known to modern residents of Gavilan.

People living west of U.S. 285 across from Hilltop Pueblo are also aware of Nute Pueblo, which is visible from the highway, and showed us that surface artifacts, particularly sherds, are common in the fields, yards, and driveways between Nute and Hilltop Pueblos. This situation is reflected in the site descriptions by Marshall and Wiseman, in which LA 66288, including the pueblo and its artifact scatter, extends up to 60 m west of the highway. However, it seems clear that, based on surface artifacts, it is not really possible to define a line separating LA 298 (Nute) and LA 66288 (Hilltop) except in an arbitrary fashion. Consequently, because LA 298 is the larger pueblo and should have a larger surrounding artifact scatter, we suggest that Hilltop Pueblo and its artifact scatter, including LA 66288 and the prehistoric component of LA 105710, are limited to the east side of U.S. 285. In this scenario, which we follow in this report, LA 66288 consists of the pueblo mound and surrounding artifact scatter and is bounded on the north by Arroyo Gavilan, on the south by a dredged arroyo separating LA 66288 and LA 105710, on the west by U.S. 285, and on the east by the limit of the artifact scatter (Fig. 6.1). The prehistoric component of LA 105710 is on the terrace slope at the northern end of the site just south of the dredged arroyo.

Data Recovery Procedures

LA 66288 and LA 105710 were mapped using optical and laser transits. Figure 6.1 shows the site features and areas excavated at LA 66288 and the northern end of LA 105710, which includes the prehistoric component excavation area. During the testing phase, a primary datum was established at the north end of LA 105710. Because of the close proximity of the sites, the arbitrary nature of the line dividing them, and the actual continuity of the terrace slope and base feature investigated at both sites, this datum was also used to define auger test locations at LA 66288. The datum, which was originally designated 0/0, was redesignated 500N/500E during data recovery and used to establish a grid across LA 66288 and LA 105710, oriented to true north. Using the results of auger testing to select excavation locations, six 1 by 1 m grid units were excavated in arbitrary 10 cm levels at LA 66288 and LA 105710. At LA 66288, units were excavated to 1.3 m (one unit) and 1.5 m (two units) below modern ground surface. At LA 105710, units were excavated to 1.4 m (two units) and 1.5 m (one unit) below modern ground surface. Elevations were maintained relative to the arbitrary elevation of the primary datum. All fill was screened, and all recovered artifacts were collected.

The testing failed to reveal any evidence of cultural features or deposits but suggested that this area was comprised of a series of natural slope-wash (and eolian?) strata. Consequently, five backhoe trenches were excavated to obtain a more extensive view of the subsurface stratigraphy of this portion of the site (Table 6.1). Locations of the trenches are shown in Figure 6.1. At LA 66288, Trench 1 was placed at the base of the terrace slope, Trench 2 was placed across an arroyo channel previously identified as an abandoned road, and Trench 3 was placed across a gravel bar between the arroyo on the south side of the site and another arroyo channel that had been identified as an abandoned road. At LA 105710, Trench 1 was placed immediately west of the morada, while Trench 2 was placed 15 m southwest of the morada. Artifacts observed in the backdirt of these trenches were collected, although their exact stratigraphic proveniences could not be defined. Profiles of the south walls of Trench 1 at each site were drawn. Pollen samples were collected from 10 strata defined in the LA 66288 Trench 1 profile and 12 strata in the LA 105710 Trench 1 profile. Bulk soil samples were collected from two strata having darker organic

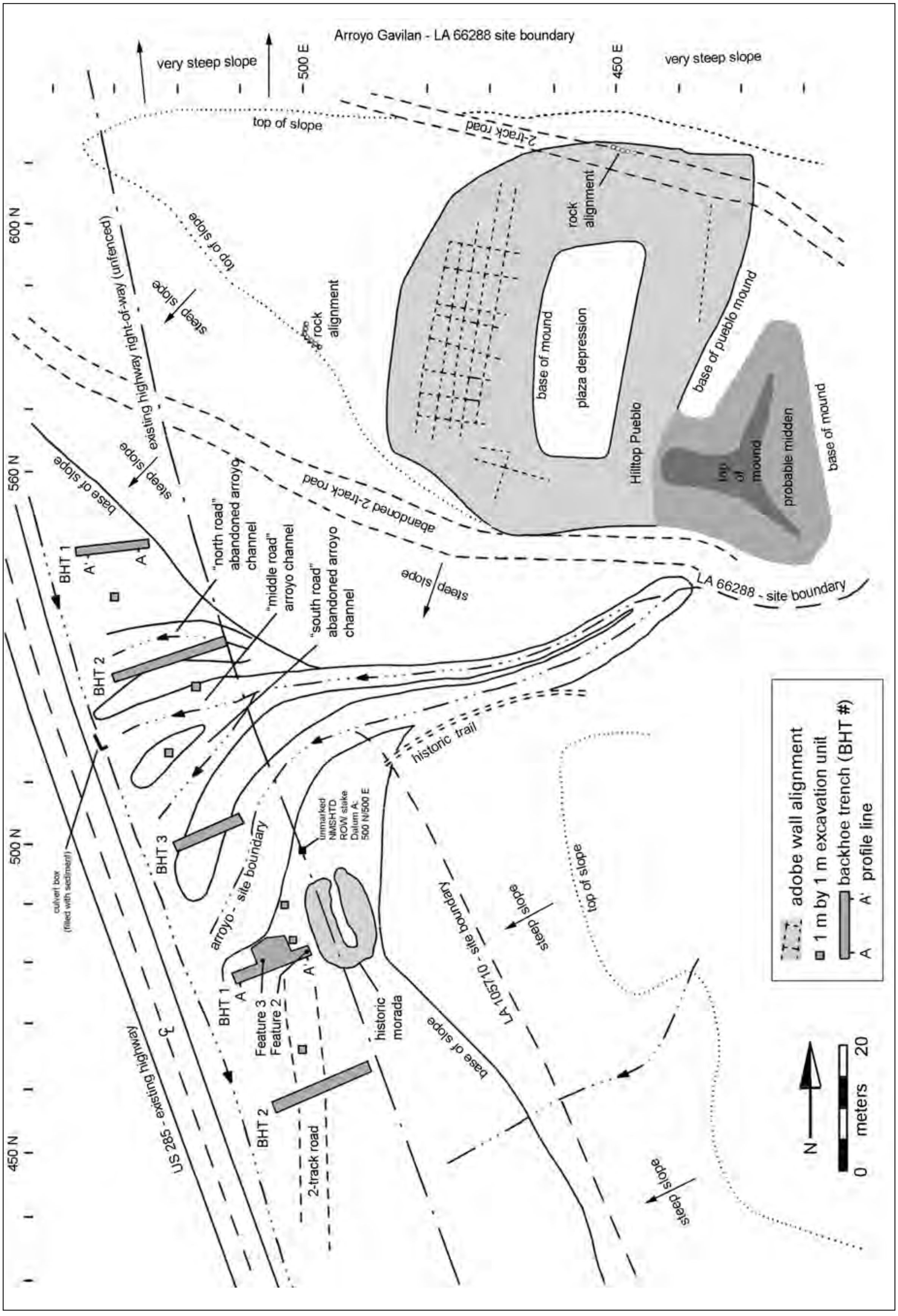


Figure 6.1. Plan of prehistoric component at Hilltop Pueblo, LA 66288 and LA 105710.

Table 6.1. Backhoe trench data for Hilltop Pueblo

Site No.	Trench No.	Length (m)	Width (m)	Maximum Depth (m)	Profile
LA 66288	1	12	16	1.77	yes
	2	19	1.6	1.9	no
	3	12	1.6	1.2	no
LA 105710	1	13	1.6	1.92	yes
	2	18	1.6	1.6	no

material than surrounding strata.

Two small, informal basin hearths were exposed in Trench 1 at LA 105710, one at the east end of the trench and the other in the north wall of the trench. Trench 1 was subsequently widened to the north (Fig. 6.1) to facilitate excavation of the hearth in the north trench wall and to examine a gravel lens first thought to be a surface but eventually defined as an alluvial lens. The hearths were defined, photographed before and after excavation, excavated, profiled, mapped, and described on feature forms. The fill of both hearths was collected for flotation analyses. No other features were observed, and the two hearths could not be associated with surfaces, other features, or buried soil horizons. They apparently represented very short-term use of the dune area during the years of soil deposition.

Investigations at the Hilltop Pueblo Site

Figure 6.1 shows the Hilltop Pueblo site as defined during this project, including LA 66288 and the northern portion of LA 105710. The site measures about 150 m east-west by 90 m north-south, is roughly triangular in shape, and covers approximately 6.7 ha. Hilltop Pueblo is roughly rectangular, with roomblock mounds surrounding a probable plaza depression. The pueblo mound is 65 m north-south by 50 m east-west. Room wall alignments are visible as vegetation differences on two roomblock mounds—at least 42 rooms are apparent in the western roomblock, while a long alignment is evident in the eastern roomblock. Based on visible wall alignments and the size of the mound, we estimate that the structure had at least 200 ground-floor rooms. The height of the roomblock mounds (1 to 1.5 m above modern ground surface) suggests that some portions of the pueblo were multistoried. At the pueblo's southeast corner is a large, roughly triangular mound that may be a midden, based on its generally dark, ashy color. The pueblo is on a narrow northwest-trending ridge that is part of the edge of the gravel terrace overlooking the Rio Ojo Caliente floodplain. Artifacts are scattered at least 25 m east of the pueblo on top of the ridge northwest of the pueblo and on the slopes and base of the terrace west and south of the pueblo. The latter area was examined during data recovery.

Soil and Sediment Strata in the Terrace Base Deposit

Data recovery investigations at the Hilltop Pueblo site showed that information about the portion of the site within the existing right-of-way could be useful in addressing the research issues developed in the data recovery plan (Wiseman 1996:56–58). Those issues begin with defining the origin and structure of the sandy "dune" feature at the base of the terrace slope.

Figure 6.2 shows the profile of the south wall of Backhoe Trench 1 at LA 66288, which was excavated 1.5 to 1.8 m below modern ground surface. Twenty-three strata were identified in the profile. Figure 6.3 shows the profile of the south wall of Backhoe Trench 1 at LA 105710, which was excavated 1.6 to 2.3 m below modern ground surface. Of the 23 strata defined in the backhoe trench profile at LA 66288, 15 were not found in Backhoe Trench 1 at LA 105710. Of these, 12 were strata specific to small, alluvial channels (Fig. 6.2). Sixteen strata (Strata 24–39) were identified at LA 105710 that were not found at LA 66288. As Figure 6.3 shows, most of these strata were also specific to small alluvial channels that cut across the eastern half of the profile. In other words, the major strata in each profile were substantially identical. The following descriptions of strata are presented in descending order from top to bottom of the profiles.

Stratum 1. Stratum 1 was the A-horizon topsoil at the surface of the historic/modern stabilized deposits at the base of the terrace. It was light yellowish brown, contained considerable amounts of organic material including roots and

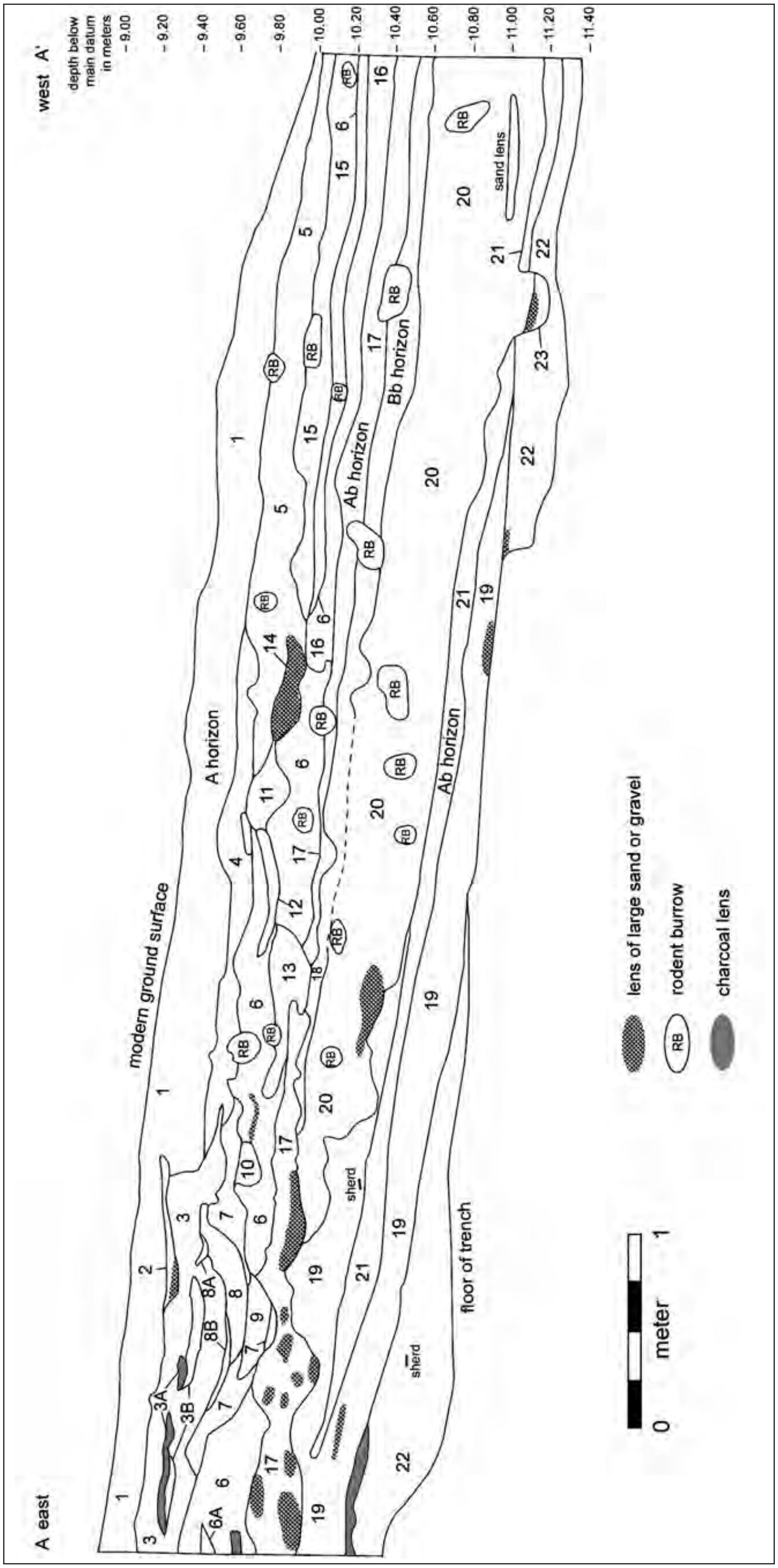


Figure 6.2. Profile of south wall of Backhoe Trench 1 at Hilltop Pueblo, LA 66288.

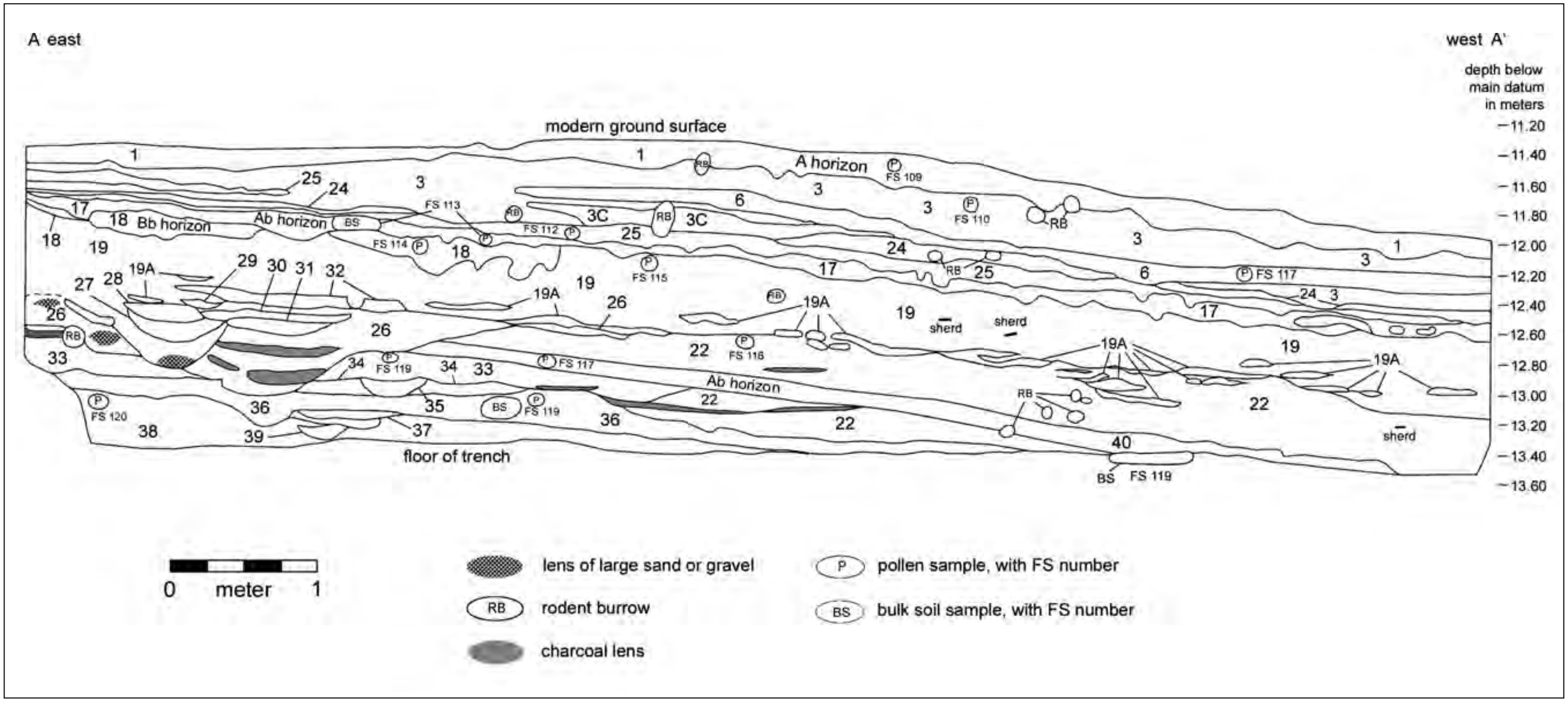


Figure 6.3. Profile of south wall of Backhoe Trench 1 at Hilltop Pueblo, LA 105710.

decayed plant parts, and formed as organic material with sand from the underlying strata and probably with eolian sand and colluvial, slopewash sands from the terrace. Prehistoric artifacts were present in low frequencies, as were modern road-trash artifacts. Charcoal flecks were present but may not have been cultural in origin.

In the LA 66288 profile (Fig. 6.2), Stratum 1 was 20 to 40 cm thick, while in the LA 105710 profile (Fig. 6.3), it was 10 to 20 cm thick. In both profiles, Stratum 1 overlay Stratum 3. However, in the LA 66288 profile, Stratum 3 had been cut, probably by water erosion. Stratum 1, or the material that became Stratum 1, filled that cut, as did Stratum 4. Probably for that reason, Stratum 1 was thinner in the LA 105710 profile, since Stratum 3 was apparently not disturbed in that area. A sample of the uppermost portion of Stratum 1 was collected as a control for pollen studies (Appendix 1 presents the results of pollen analyses). In this discussion, we are particularly concerned with the presence of domestic plant pollen in assessing use of the terrace base for farming during the occupation of Hilltop Pueblo. The only domestic species represented in the samples is corn (*Zea mays*). Although several species of economically significant plants were represented in pollen samples from the LA 105710 profile, we cannot be sure that they were used by local residents of whatever period. Corn pollen, found in the control sample in a fairly high concentration (43 grains/g), was probably deposited from historic/modern cornfields downwind (west) of the site.

A second sample of Stratum 1, taken from lower in the stratum than the control sample, also contained corn pollen (16 grains/g). Although lower in concentration than the control sample, the second Stratum 1 sample contained a higher corn pollen concentration than any other subsurface sample.

Stratum 2. Stratum 2, observed only in the LA 66288 profile (Fig. 6.2), was a small deposit (70 cm long in the profile) of pale brown, small to large alluvial sands. It represented the fill of a small channel that ran northeast-to-southwest across the top of Stratum 3. The larger sands were sorted in the deepest part of the channel deposit.

Stratum 3. Stratum 3 consisted of light yellowish brown, loose, very fine sand. Lensing and laminations were absent, and the sand was mottled in appearance. These characteristics could suggest that the stratum was eolian rather than colluvial or alluvial in origin. However, the presence of artifacts in Stratum 3 argued against this notion. Stratum 3 was 25 to 40 cm thick. In the LA 66288 profile (Fig. 6.2), Stratum 3 filled two small channels, one above Stratum 8 and the other cut into the top of Stratum 7. In turn, Stratum 3 was cut by a large channel that removed most of the stratum and cut into Stratum 5. Part of that channel was filled by Stratum 4 and then by Stratum 1. Much smaller channels were cut during deposition of Stratum 3 and filled with Substrata 3A and 3B, each with charcoal lensing. Another channel was cut into the top of Stratum 3 and filled by Stratum 2. Stratum 3 extended the length of the LA 105710 profile (Fig. 6.3), although it may have been disturbed by alluvial processes, evidenced by Stratum 25. Substratum 3C was the fill of a channel or other alluvial disturbance at the bottom of Stratum 3. The matrix of Substratum 3C appeared identical to that of Stratum 3, except that it was divided into three lenses of very light, fine sand. Each lens had a base of darker small sand, suggesting some sorting during deposition. This indicates that a channel was cut into Stratum 3 that then filled with Stratum 3C. A sample of Stratum 3 sediment contained a very low concentration of corn pollen (3 grains/g).

Stratum 4. Stratum 4 was observed only in the LA 66288 profile (Fig. 6.2). This alluvially deposited layer of pale brown, laminated, small sands was 4 to 22 cm thick and represented the fill of a wide erosion channel that cut Strata 3, 5, 6, 7, and 11. Laminations were weakly present in small lenses rather than in well-defined striations filling the entire channel. A few small gravels were present, as were prehistoric artifacts. The shape of the top of Stratum 4 suggested that it, too, was cut by erosion before the terrace base deposit was stabilized through plant growth and Stratum 1 began to form.

Stratum 5. Stratum 5 was also observed only in the LA 66288 profile (Fig. 6.2). It ranged from 15 to 28 cm thick and consisted of a matrix of light yellowish brown, small sands mixed with medium and large sands and small to medium gravels that contained prehistoric artifacts. The large sands and gravels were well rounded. This stratum represented the fill of a wide, shallow erosional channel that truncated Stratum 11 and cut through Stratum 15, which probably once reached to or near Stratum 11. A subsequent erosional episode cut the eastern side of Stratum 5, creating another shallow channel that was filled by Stratum 4.

Stratum 6. Stratum 6 was a deposit of light yellowish brown, colluvially deposited, small sands extending across both profiles (Figs. 6.2 and 6.3). Laminations were weakly present in small lenses rather than in well-defined striations. The exception to this was Substratum 6A, a small channel deposit at the east end of the LA 66288 profile consisting of small sands in well-defined laminations (Fig. 6.2). Prehistoric artifacts and charcoal flecks were present in Stratum 6, as were small charcoal lenses. In the western half of the LA 66288 profile (Fig. 6.2), Stratum 6 was thinner than in the eastern half. This fact, and the continuity of breaks between Strata 6 and 14, 16 and 5, and 6 and 15 may indicate that Stratum 6 was, at one time, considerably thicker across its length, equivalent to its thickness at the eastern edge of the profile. Stratum 6 was also a long, thin deposit in the LA 105710 profile (Fig. 6.3). Further, the LA 105710 profile shows that Stratum 6 was deposited in that area at the same time as Stratum 3. Certainly, the discontinuities of Stratum 6 in the LA 66288 profile and its irregular relationships with Strata 11, 12, and 13 (Fig. 6.2) show that it was subjected to several erosional events and processes. That it was thinner in the LA 105710 profile may also reflect the fact that this profile was farther from the actual terrace than the LA 66288 profile (Fig. 6.1), and the processes by which Stratum 6 was deposited and modified produced a thinner layer of material at this greater distance. No corn pollen was found in a sample of Stratum 6 sediment.

Stratum 7. Stratum 7 was a thin (5 to 15 cm), alluvially deposited layer of light yellowish brown, weakly laminated, small sands observed only in the LA 66288 profile (Fig. 6.2). Laminations occurred as small lenses rather than as well-defined striations. Large sands were occasionally present, as were charcoal flecks; artifacts were not obviously present. Stratum 7 represented the fill of an erosional channel that cut into the top of Stratum 6, and was subsequently cut and filled by Strata 9, 8, and 3.

Stratum 8. Stratum 8 was a thin (3 to 13 cm), alluvially deposited layer of pale brown, well-sorted, well-laminated small sands observed only in the LA 66288 profile (Fig. 6.2). Charcoal flecks were present, but artifacts were not obviously associated with this stratum. Stratum 8 represented the fill of a small erosional channel cut into Stratum 7, which was subsequently cut and then filled by Stratum 3. Included with Stratum 8 were Substrata 8A and 8B. Substratum 8A consisted of the weakly laminated fill of a very small channel that cut the upper west side of Stratum 8. Substratum 8B was a deposit of laminated small sands and small gravels that represented the fill of a very small channel or depression in the top of Stratum 8.

Stratum 9. Also observed only in the LA 66288 profile (Fig. 6.2), Stratum 9 consisted of well-sorted, well-laminated, very pale brown, small sands representing the fill of a small erosional channel. Neither charcoal nor artifacts were present. The channel cut through and was then partially covered by Stratum 7. It was also covered by Stratum 8.

This series of channel deposits—Strata 7, 9, and 8—represent an erosional episode that cut through Stratum 6 and into Stratum 17. It was initially filled at least partially by Stratum 7, which was then cut and partially filled, first by Stratum 9 and then by Stratum 8 and Substratum 8A. A depression remained, which was filled by Stratum 3 and Substratum 3B.

Stratum 10. Stratum 10, observed only in the LA 66288 profile (Fig. 6.2), was a small deposit of alluvially deposited, yellow, weakly laminated, small sands representing the fill of a very small erosional channel cut into the top of Stratum 6. Large sands were present, but charcoal and artifacts were apparently not.

Stratum 11. Like Stratum 10, Stratum 11 was the fill of a small erosional channel cut into the top of Stratum 6, observed only in the LA 66288 profile (Fig. 6.2). It consisted of yellowish brown, moderately laminated, small sands. The shape of the stratum suggested that the channel was originally deeper, that subsequent erosion on the west side removed part of Stratum 11, and that Stratum 11 was subsequently covered at least in part by Stratum 5. Subsequent erosional processes also seem to have moved sediment from Stratum 6 across part of Stratum 11.

Stratum 12. Stratum 12, observed only in the

LA 66288 profile (Fig. 6.2), represented the fill of a small erosional channel cut into Stratum 6. It consisted of a thin (4 to 8 cm) deposit of small to medium, pale brown, alluvial sands. Weak laminations were present but the sands were not sorted. No cultural materials were observed. The shape of Stratum 12 suggested that the channel also cut into the east side of the Stratum 11 channel. Subsequent colluvial processes apparently moved material from Stratum 6 back over Stratum 12.

Stratum 13. Stratum 13 represented the fill of a small erosional channel observed only in the LA 66288 profile (Fig. 6.2). The channel cut through Strata 6 and 17 and was filled with small to medium, pale brown, laminated, sorted sands containing charcoal flecks. The shape of Stratum 13 suggested that it was originally thicker. Erosion appeared to have removed part of Stratum 13 and covered it with materials from Stratum 6.

Stratum 14. Stratum 14, observed only in the LA 66288 profile (Fig. 6.2), consisted of a deposit of light yellowish brown, alluvially deposited, well-sorted, strongly laminated, small to large sands and small gravels. The medium to large sands and small gravels were largely restricted to the bottom half of the deposit and to a lens at the top of the west side of the deposit. Small sands were found in the top half of the east side and beneath the large sand and gravel lens on the west side. Stratum 14 represented the fill of a small erosional channel that probably formed soon after Stratum 5 began to be deposited, since this channel cut into the bottom of Stratum 5 and the top of Stratum 6. Stratum 14 was subsequently covered by Stratum 5. The erosional event that created the wide channel filled by Stratum 5 left a depression or channel between Strata 6 and 11 on the east and Stratum 15 on the west. Stratum 14 was the fill of a small channel within that depression.

Stratum 15. Observed only in the LA 66288 profile (Fig. 6.2), Stratum 15 consisted of a thin (8 to 15 cm) layer of pale brown, weakly laminated, small sands. Laminations were found in small lenses, sometimes with sands lighter in color than the surrounding matrix. Medium and large sands were occasionally present but were not sorted. Charcoal flecks were present, as were prehistoric artifacts, but they appeared to be more common near rodent burrows.

Stratum 15 was not a channel deposit but appears to represent colluvial slope wash from the terrace. It was laid down over Stratum 6 and probably started in the vicinity of Stratum 14, where Stratum 6 was thicker than in the western third of the profile. Stratum 15 was cut by erosion near its eastern side, and the cuts were filled by Strata 5 and 14.

Stratum 16. Stratum 16, observed only in the LA 66288 profile (Fig. 6.2), consisted of a deposit of pale brown, loose, dry, small sands. Small lenses were only occasionally present, and the deposit had a mixed appearance. These characteristics suggested that Stratum 16 may have been eolian rather than alluvial or colluvial in origin. Small pockets of lensed, laminated sands may be locations of erosion affecting the eolian sand. Stratum 6 was apparently cut by erosion, and Stratum 16, if it was eolian in origin, blew up against that cut. Subsequent erosion seems to have removed part of Stratum 16, the remainder of which was covered by colluvial material from Stratum 6.

Stratum 24. Observed only in the LA 105710 profile (Fig. 6.3), Stratum 24 was a thin (4 to 10 cm), colluvial, slope-wash deposit consisting of pale brown, laminated, small sands. A few charcoal flecks were present, but since no artifacts were observed, the charcoal may not be cultural in origin. The shape of the deposit showed that, on the east, it was cut by an erosional episode that resulted in a shallow channel or depression filled by Substratum 3C. On the west side, erosional channels divided Stratum 24 into thin, separated deposits; gaps between them were filled with Stratum 6. Stratum 24 was on top of the remarkably flat upper surface of Stratum 25. The erosional episodes that disturbed the eastern and western sides of Stratum 24 apparently did not disturb Stratum 25.

Stratum 25. Stratum 25 was a deposit of laminated, light yellowish brown, small sands running across most of the LA 105710 profile (Fig. 6.3). Laminations were strongly present, suggesting that a number of colluvial slope-wash episodes created this stratum on top of Stratum 17. The top of Stratum 25 was remarkably flat, with very few undulations, indicating considerable stability following deposition. The exception to this statement was an area near the east end of the profile, where an erosional event left a small depression or channel that was filled by Stratum 24 as it flowed over Stratum 25. Corn pollen was found in a low to trace concentration (3 grains/g) in a sample of Stratum 25 sediment.

Stratum 17. Stratum 17 was a buried A (Ab) soil horizon observed in both profiles (Figs. 6.2 and 6.3). It consisted of brown to dark brown, loose, small sand mixed with organic material from plants. Although the stratum was 60 to 70 cm below modern ground surface and the strata above it contained no roots, Stratum 17 contained a large number of rootlets, and many small root lines were visible.

Stratum 17 ran the entire length of the LA 66288 profile (Fig. 6.2). However, in the east half it was severely impacted by erosion. In the eastern 2 m of the profile, the dark, organic-rich soil was jumbled with colluvial or alluvial deposits of medium to large sands and gravels. In that area, Stratum 17 had a very mottled appearance, with dark soil pockets mixed with small pockets of lensed small sands and pockets of large sands and gravels. Stratum 17 was also cut by the same event that resulted in the channel that filled with Stratum 13. However, to the west of Stratum 13, Stratum 17 was relatively undisturbed.

In the east half of the LA 105710 profile (Fig. 6.3), the upper surface of Stratum 17 was remarkably flat, suggesting considerable stability in that ground surface. The west half of the upper surface of Stratum 17 was more undulating, suggesting less stability and more erosional activity. At the western end of the profile, Stratum 17 was apparently disturbed by an erosional episode that resulted in the inclusion of some lensed and laminated sands in the stratum, with a mixed, mottled appearance similar to that of the eastern portion of the stratum in the LA 66288 profile (Fig. 6.2). No domestic plant pollen was found in a sample of Stratum 17 soil.

Stratum 18. Stratum 18 consisted of brown to dark brown, loose, small sand mixed with organic material. It was not as dark as Stratum 17, suggesting that it did not contain as much organic material as Stratum 17. Artifacts and charcoal were present. Stratum 18 may have been an incipient B (Bb) soil horizon that was forming beneath Stratum 17 before the stable surface was covered, plant growth stopped, and the formation of soil horizons halted. In both profiles (Figs. 6.2 and 6.3), Stratum 18 occurred under the relatively undisturbed portions of Stratum 17, but it was not present beneath the disturbed portions. This may indicate that the same processes that disturbed Stratum 17 impacted Stratum 18, or that disturbance prohibited the stability needed for formation of a B horizon. Alternately, Stratum 18 may be a lower portion of Stratum 17, with decreasing amounts of organic material—and, hence, lighter soil—with increased depth below the former ground surface. No domestic plant pollen was found in a sample of Stratum 18 soil.

Stratum 19. Stratum 19 was a thick layer of colluvial, slope-wash sediment. In the LA 66288 profile (Fig. 6.2), Stratum 19 consisted of a matrix of loose, yellowish brown, small sands, with medium to large sands and small gravels. The sands were not sorted, and very weak lamination was present in the form of occasional thin lenses of small sand. Charcoal flecks were present throughout but did not appear to cluster or concentrate except near the western side of the profile, where they occurred as sand lenses. Sherds and chipped stone artifacts were present. Stratum 21 formed on the upper surface of Stratum 19. Subsequent erosion removed part of Stratum 21, and Stratum 19 material from upslope was redeposited over the remaining Stratum 21. Much of the redeposited layer of Stratum 19 was then apparently removed by erosion that re-exposed the top of Stratum 21. Stratum 20 replaced the portion of Stratum 19 removed during this process.

In the LA 105710 profile (Fig. 6.3), Stratum 19 was a thick deposit of loose, small sands that, unlike the LA 66288 profile, included almost no large sands or small gravels. This was probably because the LA 105710 profile was farther from the terrace slope and larger materials were not transported that far, except under more extreme alluvial conditions. Lamination of the small sands was very weak and consisted of small sand lenses. No domestic plant pollen was found in a sample of Stratum 19 sediment.

Stratum 20. Stratum 20 was observed only in the LA 66288 profile (Fig. 6.2). Like Stratum 19, Stratum 20 was a thick, colluvial slope-wash layer consisting of a loose, small sand matrix with medium to large sands and small gravels. Some cobbles were also present, as were artifacts. Charcoal was present throughout, most commonly as small lenses and concentrations of flecks. Lamination of sands was weak, but lensing was more common than in Stratum 19. Lensing and lamination were more common near the bottom of Stratum 20, directly above Stratum 21, suggesting some sorting of materials. Conversely, sands and gravels were more mixed in the upper two-thirds of Stratum 20. Larger gravels and cobbles appeared more frequently in the upper two-thirds of the stratum, indicating differing intensities of colluvial action during deposition. Stratum 20 filled the missing slope created by an erosional process or event that cut Stratum 19 and exposed Stratum 21. The relatively flat upper surface of Stratum 20 suggested subsequent stability, which allowed for deposition of materials that formed the soil horizons identified as Strata 17 and 18.

Stratum 22. Stratum 22 was a colluvial slopewash deposit that consisted of a matrix of pale brown, fine sand containing some large sands and small gravels. Lensing was present, primarily in pockets, but lamination was weak. Charcoal flecks were present throughout, and pockets of flecks were present but not common. Artifacts were also present. Stratum 22 was separated from Stratum 19, which was immediately above it, by a thin (0.5 to 1 cm) lens of laminated small sand. That lens probably represented a low-energy alluvial episode that deposited sands on top of the relatively stable upper surface of Stratum 22. The LA 105710 profile (Fig. 6.3) suggested that the episode may have been variable in energy. The break between Strata 22 and 19 was represented by a series of small sorted sand lenses, identified as Substratum 19A. They did not constitute a single layer of material but rather the fill of a series of small, shallow depressions, indicating that the depositional episode disturbed the top of Stratum 22 and, in fact, happened during deposition of Stratum 19, since it also disturbed lower portions of that stratum. No domestic plant pollen was found in a sample of Stratum 22 sediment.

Stratum 22 was at the bottom of the LA 66288 profile (Fig. 6.2). The presence of charcoal and artifacts showed that the stratum, encountered about 1.3 m below modern ground surface, did not predate the occupation of Hilltop Pueblo. A small deposit of Stratum 22 near the bottom center of the LA 105710 profile (Fig. 6.3) probably represented the original deposit. An erosional episode removed much of the stratum. Based on its size in the LA 66288 profile, it was fairly thick. That episode created a depression or channel that was subsequently filled by Stratum 33. Stratum 40 formed over Stratum 33 and the remnant of Stratum 22, after which an erosional event or episode redeposited Stratum 22 material from upslope over Stratum 40. Another significant erosional event cut the eastern side of the profile, leaving a channel that filled with Stratum 26, which contained several charcoal lenses. The eastern side of that channel was cut by another event, leaving a smaller channel that filled, in order, with Strata 19, 27, and 28. A smaller event left a shallow channel that filled with Strata 31 and 30, after which another event left a shallow channel that filled with Stratum 32. Following this, a combination of alluvial and colluvial processes cut through Stratum 32, modified the top of Stratum 22, and redeposited Stratum 19 material from upslope over the tops of Strata 32, 36, and 22, including depositing pockets of Substratum 19A.

Stratum 21. Stratum 21 was a thin (8 to 9 cm), colluvial slope-wash deposit of pale brown, small sands containing some large sands and gravels. It was observed in the LA 66288 profile (Fig. 6.2). The small sands were lensed but only weakly laminated, and lensing was not consistent throughout but occurred in pockets. Still, lensing was more common than in Strata 19 or 20. Charcoal was present throughout as flecks, but it did not occur in pockets or concentrations. Artifacts were present.

Stratum 21 was darker than Strata 19 and 20 and appeared to contain more rootlets. The darker color may indicate that it had a higher charcoal content, but the presence of rootlets suggested that Stratum 21 was an incipient A horizon. Stratum 21 was found within Stratum 19 and beneath Stratum 20. As discussed earlier, Stratum 21 formed on top of Stratum 19 during a period of stability allowing plant growth and the beginning of topsoil formation. Subsequently, erosion removed part of Stratum 21 and redeposited Stratum 19 material from upslope over the top of Stratum 21. Another event or longer episode removed much of the redeposited Stratum 19 material, which was replaced by Stratum 20. Based on the relatively consistent thickness of Stratum 21, that event or episode did not remove much of Stratum 20, although a small channel was cut through Stratum 21 that filled with Strata 23 and 20.

Stratum 40. Seen in the LA 105710 profile (Fig. 6.3), Stratum 40 was a thin, colluvial slope- wash deposit of pale brown, small sands. The sands were lensed in pockets, but only weakly laminated. Charcoal and artifacts were present. Stratum 40 was darker than adjacent strata and appeared to contain more rootlets. It formed after Stratum 22 was deposited and disturbed, and Stratum 33 was deposited. Stratum 40 was relatively consistent in thickness in both profiles, lending support to the notion that it was a relatively stable deposit, and based on its color, that it was an A horizon topsoil layer. These characteristics led to the initial identification of Stratum 40 as Stratum 21 in the LA 105710 profile (Stratum 40 is identified as Stratum 21 in Appendix 1). The two strata were very similar in appearance and in the circumstances of their formation, in that both apparently formed on top of relatively stable colluvial deposits (Stratum 21 over Stratum 19, Stratum 40 over Strata 22 and 33), after which erosion covered the incipient soil horizons with redeposited layers of the sediments beneath them. However, the consistent placement of Strata 21 and 40 within Strata 19 and 22, respectively, showed that Strata 21 and 40 were not the same horizons. They did point to periods of stability following deposition of Strata 19, 22, and 33. It is likely that Stratum 21 also formed on top of Stratum 19 in LA 105710, but was removed by the same or similar erosional processes that disturbed Stratum 19 in LA 66288.

A sample of Stratum 40 was submitted for radiocarbon dating of the rootlets and decayed plant material it contained (FS 64; Beta-163882). Charcoal in the sample was removed during processing. The resulting material yielded a two-sigma measured radiocarbon age of B.P. 670 ± 40, a two-sigma conventional age of B.P. 750 ± 40, and a two-sigma calibrated age of A.D. 1220–1300 (B.P. 730 to 650). Its calibration curve intercept date was A.D. 1270 (B.P. 680). These dates are impossible to reconcile with the dates obtained from artifacts recovered from the Hilltop Pueblo site, since the site does not appear to have a component dating to the Coalition period (see Chapter 19). Further, it is older by over 100 years than a sample of charcoal collected from Stratum 36, which was below Stratum 40 (Fig. 6.3; see discussion of Stratum 36). Potential explanations for this discrepancy can come from two directions. In one, there was a geomorphological situation involving deposition of older sediments, containing natural materials apparently dating to the thirteenth century, over younger sediments containing cultural materials dating to the fourteenth century. There is no evidence to support this situation in that the description of Stratum 40 does not point to different processes of origin than those seen in the other major strata crossing the profiles. The other possible explanation is that the radiocarbon dates were affected by different carbon (C3 and C4) pathways of the plants whose decayed remains comprised the datable organic material in the sediment sample submitted for dating. Since there is no evidence to support the first explanation, the second seems likely (pers. comm., P. McBride and M. Toll, 2002). However, using information available from data recovery, we cannot resolve the obvious problem of the Stratum 40 radiocarbon dates.

It is interesting, in this regard, that corn pollen was found in a low concentration (6 grains/g) in a sample of Stratum 40. Although low in comparison to other species represented in the sample, this is the highest concentration of corn pollen found below Stratum 1. It is unlikely that the corn pollen in Stratum 40 resulted from the colluvial processes that moved artifacts and other materials from the terrace slope to the terrace base area, since corn pollen was not found in a sample of Stratum 33, which was below Stratum 40, or from samples of Strata 22 and 19 taken above Stratum 40. On the other hand, since Stratum 40 was an A horizon, showing that the sediment was stable for long enough to allow growth of a plant community, it is more likely that Stratum 40 was used for prehistoric corn farming. However, that farming activity was probably not associated with Hilltop Pueblo, which was apparently abandoned before deposition of Stratum 40 (see discussion of Stratum 36). It is possible, although not demonstrable, that Stratum 40 was farmed by residents of Nute Pueblo, which is about 200 m west of LA 66288 and LA 105710. Alternatively, the pollen in Stratum 40 may have been blown from farm fields immediately upwind (west) of the sites. In either case, the farming probably postdated occupation of Hilltop Pueblo, but not Nute Pueblo. Incidentally, this may help explain why neither Harrington's or Morley's informants knew of or showed them Hilltop Pueblo. If Hilltop Pueblo was occupied early in the Classic period, as might be indicated by the radiocarbon date from Stratum 36 (see the discussion of Stratum 36), and Nute was occupied later in or throughout the Classic period, the collective memory of Hilltop Pueblo may have been lost or subsumed with that of Nute Pueblo.

Stratum 23. Stratum 23 was observed only in the LA 66288 profile (Fig. 6.2). It consisted of light yellowish brown, small to large sands in a laminated deposit that filled the lower half of a small channel that cut through Stratum 20 and into Stratum 22. The larger sands were sorted and appeared in the upper half of the stratum.

Stratum 33. Observed only in the LA 105710 profile (Fig. 6.3), Stratum 33 was a relatively thick (10 to 19 cm) deposit of light yellowish brown, alluvially deposited, lensed, and well-laminated small sands. Charcoal flecks were present throughout, and some lenses within the matrix had tiny charcoal flecks mixed with the sands, creating the impression that this stratum was somewhat darker than neighboring strata. Artifacts were not observed

Stratum 33 filled a large, shallow erosional channel that cut and removed portions of Stratum 22 at the east end of the profile. The top of Stratum 33 was altered, probably by sheet erosion, to slope down to the west. Stratum 40 formed on this slope, after which Stratum 22 materials from upslope were redeposited over Stratum 40. Stratum 33 was also cut by a large channel that filled with Stratum 26 (see discussion of Stratum 22). No domestic plant pollen was found in a sample of Stratum 33 sediment.

Stratum 26. Stratum 26 filled a large erosional channel observed only at the east end of the LA 105710 profile (Fig. 6.3). The matrix was light yellowish brown, small sands. Some large sands and small gravels were present in small pockets on the east end of the profile. Thin lenses of small sand and thicker lenses of well-laminated sands were present. Charcoal flecks were present throughout. A small lens of charcoal and sorted sand was present at the east end of the profile, and two lenses of charcoal flecks mixed with small sand were present within the channel. Artifacts were present. The erosional channel filled by Stratum 26 cut through Strata 22, 40, 28, and 33, and into Stratum 35. It may have followed a small channel cut into Stratum 37 that was filled with Stratum 35. Stratum 26 was, in turn, cut by two or three erosional channels (see Stratum 22 discussion).

Stratum 27. Stratum 27 filled a small erosional channel observed only in the LA 105710 profile (Fig. 6.3). It consisted of pale brown, loose, small sands. Some lensing occurred on the east side of the channel, and lamination was weakly present. With the sand lenses were lenses of tiny charcoal flecks.

An erosional channel cut into Stratum 26, the fill of a larger channel on the east side of the profile. The channel filled with Stratum 19 material as it was being deposited. Stratum 27 was the lower fill of a small channel that cut into the Stratum 19 channel fill.

Stratum 28. Stratum 28 was the upper fill of the small erosional channel in the LA 105710 profile whose lower fill was Stratum 27 (Fig. 6.3). Stratum 28 consisted of pale brown, fine sand that was very weakly laminated. Some lensing was present but not prevalent. The shape of the top of this stratum suggested that it was the final fill material of the small channel. Stratum 28 was cut by an erosional event that created a shallow channel to the west. That channel was filled by Strata 30 and 31.

Stratum 31. Stratum 31 was the lower fill of a shallow erosional channel in the LA 105710 profile (Fig. 6.3), the upper fill of which was Stratum 30. Stratum 31 consisted of pale brown, small sands containing medium and large sands and small gravels. The medium sands were not sorted, but the large sands and gravels were sorted into small pockets at the bottom of the stratum.

Stratum 30. Stratum 30 was the upper fill of the small erosional channel in the LA 105710 profile (Fig. 6.3) whose lower fill was Stratum 31. It consisted of light yellowish brown, weakly sorted, laminated, small sands. The sorted sands occurred as small lenses within the laminated matrix. The erosional channel cut into Stratum 26 and cut the west side of the small channel filled by Strata 19, 27, and 28. Stratum 30 intersects Strata 27 and 28.

Stratum 32. Stratum 32, observed in the LA 105710 profile (Fig. 6.3), consisted of light yellowish brown, well-laminated, small sands that appeared to represent the fill of a shallow channel or depression. Small lenses of dark sand, perhaps containing ash or tiny charcoal flecks, were present. Early in the deposition of Stratum 19 over Strata 26, 19a, 27, 28, and 22, an erosional event created the shallow channel or depression that filled with Stratum 32. The eastern side of Stratum 32 may have been cut later and replaced by Stratum 19 materials. A U-shaped break in the stratum resembled a rodent burrow but did not have the other characteristics of a burrow (such as very loose, jumbled fill, sometimes with a different color from surround strata). It may actually have been created by alluvial action.

Stratum 34. Stratum 34 was also observed only in the LA 105710 profile (Fig. 6.3). It consisted of light yellowish brown, weakly sorted, weakly laminated, alluvially deposited, small sands. Sorting occurred as small lenses. Neither charcoal nor artifacts were observed. The shape of Stratum 34 suggested that it was the lower fill of a broad, shallow channel whose upper fill was Stratum 33. The east side of Stratum 34 was cut by the large channel that filled with Stratum 26. Stratum 34 was also cut by a small channel that filled with Stratum 35.

Stratum 35. Stratum 35 was the fill of a small channel that cut through Stratum 34 in the LA 105710 profile (Fig. 6.3). The matrix was pale brown, loose, small sand, containing some medium sands. Large sands and small gravels were also present but were sorted into a small pocket at the bottom of the channel. Neither charcoal nor artifacts were observed.

Stratum 36. Stratum 36 was a long stratum of variable thickness (9 to 22 cm) that ran along the eastern two-thirds of the LA 105710 profile (Fig. 6.3). It consisted of pale brown, small sands mixed with medium sands and charcoal flecks. Charcoal was much more common in Stratum 36 than in any other stratum in either profile, and, though scattered throughout the stratum, was also consolidated in lenses of sorted sand. Near the middle of the profile, where Stratum 36 dropped to the floor of the trench, charcoal was more concentrated, particularly along the bottom of the stratum. In fact, for about 2 m west of the point at which Stratum 36 dropped below the trench, there was a charcoal and ash deposit some 2 cm thick on the trench floor, representing the charcoal that occurred along the bottom of the stratum in the profile. Artifacts were only occasionally evident in Stratum 36, but charcoal and ash were plentiful. Although this was not a cultural deposit—witness the lensing and lamination that pointed to its colluvial, slope-wash origins—it was, with Stratum 21 (and 26?), the stratum that yielded the most artifacts during auger testing (Wiseman and Ware 1996) and hand excavations (see discussion of excavation units). Stratum 36 was cut by an erosional episode that created a channel that filled with Stratum 34 (and 33?). It was also cut by erosional activity that was followed by deposition of Stratum 22. Corn pollen was found in a low concentration (5 grains/g) in a sample of Stratum 36 sediment.

A sample of Stratum 36 sediment was submitted for radiocarbon dating of the charcoal and ash it contained (FS 119; Beta-163883). Its two-sigma measured radiocarbon age was B.P. 490 ± 60, its two-sigma conventional age was B.P. 570 ± 60, and its two-sigma calibrated age was A.D. 1290–1440. Its calibration curve intercept date was A.D. 1400 (B.P. 550). The conventional and calibrated ages place the materials early in the Classic period. They represent an "average" age for the burned materials contained in the Stratum 36 sample and reflect the Classic period occupation of Hilltop Pueblo. They should not, however, be taken to demonstrate conclusively that Hilltop Pueblo, itself, dates to the Early Classic period, since the sample may have included burned materials subject to "old wood" dating problems. Because Stratum 36 represents colluvial redeposition of discarded material from the pueblo, and because the goal for dating this sample was only to establish association of Stratum 36 with the pueblo, the various burned materials in the sample were not differentiated prior to processing for radiocarbon dating.

Stratum 37. Stratum 37 was fill in a small erosional channel in the LA 105710 profile (Fig. 6.3). It consisted of light yellowish brown, laminated, small sands with lenses of sorted, medium sands. Neither charcoal nor artifacts were observed. Apparently, a small channel was cut into the top of Stratum 38 and was partially filled by Stratum 36. Stratum 37, the upper fill of that channel, was subsequently covered by more Stratum 36 material.

Stratum 38. Stratum 38, which was at the bottom of the LA 105710 profile (Fig. 6.3), consisted of pale brown, weakly laminated, small sands. Small lenses of weakly sorted sands were also present. Charcoal flecks were infrequent. No artifacts were observed. The top of Stratum 38 was relatively flat, suggesting some stability to the deposit prior to deposition of Stratum 36. A small channel was cut into Stratum 38 and filled by Stratum 39. A second small but broader channel that cut into the top of Stratum 38 was filled by Stratum 36. A portion of that fill was then cut and replaced by Stratum 37. A trace concentration of corn pollen (1 grain/g) was found in a sample of Stratum 38 sediment.

Because Stratum 38 contained only a few charcoal flecks and few if any artifacts, and because Stratum 36, which was immediately above Stratum 38, contained charcoal, ash, and artifacts and yielded Classic period radiocarbon dates, it is likely that Stratum 38 was the natural ground surface during occupation of Hilltop Pueblo. If so, then Stratum 36 represented colluvial redeposition of discarded artifacts and other materials from the terrace edge and slopes during and immediately after occupation of the pueblo.

Stratum 39. Stratum 39 filled a small channel in the LA 105710 profile (Fig. 6.3) that was cut during the deposition of Stratum 38. The matrix consisted of mixed small, medium, and large sands. No sorting or lamination was present. Neither charcoal nor artifacts were observed.

Discussion

The stratigraphic record defined in the LA 66288 and LA 105710 profiles reveals a long sequence of natural sediment and soil strata in the terrace base area. Of the 40 strata described from the two profiles, most (n=31) were the result of localized alluvial events or episodes that created erosional channels crossing the terrace base area. Strata 2, 4, 5, 7–16, 20, and 23 were found only in the LA 66288 profile (Fig. 6.2), while Strata 24 through 40 were found only in the LA 105710 profile (Fig. 6.3). This left seven strata common to both profiles: Strata 1, 3, 6, 17, 18, 19, and 22. However, since the profiled trench at LA 66288 was not as deep as the profiled trench at LA 105710, three strata found only at the latter—Strata 36, 38, and 40—were not recorded at the former but were, based on their natures, probably common to both.

Of these 11 strata, four (Strata 1, 17, 21, and 40) were A soil horizons, three of which (Strata 17, 21, and 40) were buried (Ab) horizons, while Stratum 1 was the modern topsoil. The four A horizons formed on relatively stable strata that resulted from colluvial slope-wash processes moving sediments and associated cultural materials down from the terrace slopes below Hilltop Pueblo. None of the strata recorded in the two profiles were clearly eolian in origin, a conclusion based on the presence of artifacts and charcoal in most strata. Most strata were alluvial in nature, representing the fill of numerous small channels crossing the terrace base. The larger strata reflected periods of time when local (at least) conditions encouraged colluvial processes and the development of slope-wash deposits.

Excavation Units in the Terrace Base Deposit

Six 1 m by 1 m grid units were excavated in the terrace base deposit, three at LA 66288 and three at LA 105710 (Fig. 6.1). The placement of units was based on the results of auger testing at the sites (Wiseman and Ware 1996). Auger test locations that revealed comparatively higher quantities of artifacts and charcoal were selected for examination through excavation. The six units were excavated prior to excavation of the backhoe trenches. Consequently, soil and sediment strata had not been defined, and excavations were conducted in arbitrary 10 cm levels. Elevations were maintained relative to the arbitrary elevation of the main datum.

LA 66288 Excavation Units

Unit 526N/483E, on the bank of an arroyo, was excavated to 1.3 m below modern ground surface (13 levels). Comparison of the elevations of levels in this unit with the LA 66288 profile (Fig. 6.2) suggests correlations between excavation levels and strata defined in the profile. Of 968 artifacts recovered from this unit (Table 6.2), 276 (28.5 percent) came from Levels 7, 8, and 9, which probably corresponded to Strata 17 and 18 (upper Ab

Table 6.2. Artifact frequency by excavation unit level for Hilltop Pueblo (count and row percentage)

Site	Excavation Unit	Excavation Levels																Total
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LA 66288	515N/479E	2	46	23	53	32	106	161	45	15	15	51	62	74	29	109	129	952
		0.2%	4.8%	2.4%	5.6%	3.4%	11.1%	16.9%	4.7%	1.6%	1.6%	5.4%	6.5%	7.8%	3.0%	11.4%	13.6%	100.0%
	526N/483E	0	1	12	25	30	75	61	88	141	47	76	152	168	92	-	-	968
		0.0%	0.1%	1.2%	2.6%	3.1%	7.7%	6.3%	9.1%	14.6%	4.9%	7.9%	15.7%	17.4%	9.5%	-	-	100.0%
	540N/470E	3	5	6	4	54	41	25	35	37	45	22	28	64	36	54	49	508
		0.6%	1.0%	1.2%	0.8%	10.6%	8.1%	4.9%	6.9%	7.3%	8.9%	4.3%	5.5%	12.6%	7.1%	10.6%	9.6%	100.0%
LA 105710	468N/501E	0	6	8	6	3	0	4	1	7	5	12	0	13	0	68	-	133
		0.0%	4.5%	6.0%	4.5%	2.3%	0.0%	3.0%	0.8%	5.3%	3.8%	9.0%	0.0%	9.8%	0.0%	51.1%	-	100.0%
	488N/499E	0	6	13	12	1	11	27	6	26	7	-	55	76	87	135	-	462
		0.0%	1.3%	2.8%	2.6%	0.2%	2.4%	5.8%	1.3%	5.6%	1.5%	-	11.9%	16.5%	18.8%	29.2%	-	100.0%
	491N/498E	0	9	10	0	7	3	19	17	13	21	19	0	0	46	103	51	318
		0.0%	2.8%	3.1%	0.0%	2.2%	0.9%	6.0%	5.3%	4.1%	6.6%	6.0%	0.0%	0.0%	14.5%	32.4%	16.0%	100.0%

and Bb horizons); 488 (50.4 percent) came from Levels 10 through 13, which probably corresponded to Stratum 20.

Unit 540N/470E, the northernmost unit excavated at LA 66288, was excavated to 1.5 m below modern ground surface (15 levels). Of 508 artifacts recovered from this unit (Table 6.2), 72 (14.2 percent) came from Levels 7 and 8, which probably corresponded to Strata 17 and 18 (upper Ab and Bb horizons); 195 (38.4 percent) came from Levels 9 through 13, which probably corresponded to Stratum 20; 54 (10.6 percent) came from Level 14, which probably corresponded to Stratum 21 (lower Ab horizon); and 49 (9.6 percent) came from Level 15, which probably corresponded to Stratum 22.

Unit 515N/479E, the southernmost unit excavated at LA 66288, was also excavated to 1.5 m below modern ground surface (15 levels). This unit was about 1 m lower in elevation than the other two units: Unit 515N/479E ranged from 10.55 to 12.00 m below datum, while Unit 526N/483E ranged from 9.43 to 10.70 m below datum, and Unit 515N/479E ranged from 9.75 to 11.30 m below datum. The upper surface of the LA 66288 profile ranged from 9.00 to 10.00 m below datum. Consequently, we cannot directly compare the elevations of Unit 515N/479E with those of the profile. However, we may be able to postulate correlations between levels in this unit and soil and sediment strata, based on patterns observed in the other two units. Specifically, of 952 artifacts recovered from Unit 515N/479E, 327 (34.4 percent) came from Levels 5 through 8, which probably corresponded to Strata 17 and 18 (upper Ab and Bb horizons); 231 (24.3 percent) came from Levels 9 through 13, which probably corresponded to Stratum 20; 109 (11.5 percent) came from Level 14, which may have corresponded to Stratum 21 (lower Ab horizon); and 129 (13.6 percent) came from Level 15, which may have corresponded to Stratum 22.

LA 105710 Excavation Units

Comparison of levels in the three LA 105710 excavation units with strata defined in the LA 105710 profile (Fig. 6.3) suggests possible correlations, although differences between the elevations of the units and the profile preclude more direct comparisons, which are possible with two unit levels and strata at LA 66288.

Unit 468N/501E, the southernmost unit excavated at LA 105710—and thus the most distant from Hilltop Pueblo—was excavated to 1.4 m below modern ground surface (14 levels). Of 133 artifacts recovered from this unit, only 7 (5.3 percent) came from Level 8, which may correspond to Stratum 17 (upper Ab horizon); 30 (22.6 percent) came from Levels 9 through 12, which may correspond to Stratum 19; and 68 (51.1 percent) came from upper portions of Levels 13 and 14, which may correspond to the upper portion of Stratum 22. Because Stratum 40 (lower Ab horizon in the LA 105710 profile) was within Stratum 22 (Fig. 6.3), it is unlikely that any of the artifacts were recovered from Stratum 40, which would probably have been encountered at about Level 16 or 17.

Unit 488N/499E was also excavated to 1.4 m below modern ground surface (14 levels). Of 462 artifacts recovered, only 26 (5.6 percent) came from Level 8, probably corresponding to Stratum 17 (upper Ab horizon); 138 (29.9 percent) came from Levels 9–12, which probably corresponded to Stratum 19; and 222 (48.1 percent) came from Levels 13 and 14, probably corresponding to the upper portion of Stratum 22.

Unit 491N/498E was excavated to 1.5 m below modern ground surface (15 levels). Of 318 artifacts recovered from this unit, only 13 (4.1 percent) came from Level 8, probably corresponding to Stratum 17; 40 (12.6 percent) came from Levels 9–12, probably corresponding to Stratum 19; and 200 (62.9 percent) came from Levels 13 through 15, probably corresponding to Stratum 22.

Discussion

Several observations can be made based on information gathered from the six excavation units. First, far fewer artifacts were recovered from the LA 105710 units (Table 6.2), probably reflecting the relative distance of those units from Hilltop Pueblo. Second, and despite the different numbers of artifacts, there is an overall pattern in which artifact frequencies are generally highest in the lowest levels and decrease with proximity to the modern ground surface. This probably reflects decreased numbers of artifacts on the terrace slope through time: during and just after occupation of Hilltop Pueblo, more artifacts were available to be affected by alluvial and colluvial processes and events revealed in the trench profiles. Consequently, we should expect there to be higher artifact frequencies associated with natural sediment deposition that occurred during and just after occupation of the pueblo than with deposition that occurred later. This overall pattern is more characteristic of the LA 105710 assemblages than of the LA 66288 assemblages. Excavation units at LA 105710 yielded 79.0 to 83.6 percent of their artifacts from Stratum 17 and below. Only 4.1 to 5.6 percent of those artifacts came from Stratum 17, while 12.6 to 29.9 percent came from Stratum 19, and 48.1 to 62.9 percent came from Stratum 22. Again, this probably reflects relative distance from the pueblo trash deposits.

Third, the LA 66288 assemblages also show the overall pattern of more artifacts from lower levels. However, they also show more variation, in the form of some higher artifact counts in the upper and intermediate levels. The LA 66288 units yielded 72.8 to 83.8 percent of their artifacts from Stratum 17 and below, a range of values that is wider but essentially comparable to those from the LA 105710 units. However, in contrast to the LA 105710 units, the LA 66288 units yielded 14.2 to 34.4 percent of their assemblages from Stratum 17. This situation probably reflects the relative proximity of those units to Hilltop Pueblo; more artifacts were discarded on the terrace slope just below the pueblo during its occupation and were available to be redeposited at the terrace base by alluvial and colluvial events and processes. Consequently, we should expect both higher artifact frequencies in the LA 66288 units and less discrepancy in artifact frequencies between upper and lower excavation levels than in the LA 105710 units.

Features in the Terrace Base Deposit

Two features were identified and excavated in the LA 105170 portion of the Hilltop Pueblo site. Both were exposed in Backhoe Trench 1: Feature 2 was at the east end of the trench, and Feature 3 was found along the north wall of the trench (Fig. 6.1).

Feature 2. Feature 2 was a shallow basin hearth, approximately pear-shaped in outline (Fig. 6.4). Because it was exposed in the backhoe trench, only about half of its east-west width was available for excavation. It measured 43 cm north-south by 21 cm east-west; its original east-west width was probably about 40 cm. Although Feature 2 was 8 cm deep in its center, it was only about half full (3 to 4 cm) of a matrix consisting of very loose, ashy sand containing bits of charcoal. This suggests that Feature 2 was used only once, a conclusion supported by the fact that its sides were not significantly baked. No artifacts were directly associated with this feature.

Feature 2 was constructed by digging a shallow basin in the sand of Stratum 19. The basin was not lined with mud or rocks. No surface could be defined within the stratum, showing that Feature 2 was made and used while Stratum 19 was being deposited but that it was not associated with use of a stabilized surface in the terrace base area.

Table 6.3 lists the types of wood charcoal recovered from a flotation sample of Feature 2 fill. Most of the wood burned in Feature 2 could only be identified as coming from the families Rosaceae (Rose family; otherwise unidentifiable) and Salicaceae (probably cottonwood or willow). Because of the very small amounts of charcoal recovered from Feature 2, none was submitted for radiocarbon dating.

Table 6.4 lists the other plant remains recovered from a flotation sample of Feature 2 fill. The assemblage is dominated by burned *Amaranthus* seeds, suggesting that the primary purpose of the fire in Feature 2 was preparation of *Amaranthus*, probably for consumption. A few burned *Portulaca* seeds were also recovered, as were a few Monocotyledonae stem fragments. The latter may be from corn plants, but certain identification could not be made.

Feature 3. Feature 3 was also a shallow basin hearth, approximately oval or circular in outline (Fig. 6.5). Because it was also exposed in the backhoe trench, only about half of its north-south width was present at excavation. It measured 40 cm east-west by 20 cm north-south; its original north-south width was probably about 40 cm. Although it was 10 cm deep at its center, Feature 3 contained a 3 to 4 cm thick deposit of ash mixed with loose, small sand. The thin deposit suggested that Feature 3 was only used once. The fire was hot enough to burn but not bake the sides of the pit. The deposit contained charcoal bits and

Figure 6.4. Feature 2 at LA 105710, a shallow simple hearth.

Table 6.3. Wood charcoal in flotation samples from the LA 105710 component of Hilltop Pueblo

Category	Taxon	Feature 2 (FS 144)	Feature 3 (FS 145)
Conifers	*Juniperus*	1	-
		<0.1 g	-
Nonconifers	*Atriplex/Sarcobatus*	-	130
		-	4.9 g
	Cercocarpus	-	9
		-	0.1 g
	Rosaceae	18	10
		0.1 g	0.2 g
	Salicaceae	18	1
		0.1 g	<0.1 g
	Unknown nonconifer	6	4
		<0.1 g	0.1 g
Total		45	154
		0.2 g	5.3 g

Table 6.4. Plant remains in flotation samples from the LA 105710 component of Hilltop Pueblo*

Category	Taxon	Feature 2 (FS 144)	Feature 3 (FS 145)
Cultural, annual noncultivars	*Amaranthus*	200 121.2	-
	Portulaca	11 6.7	-
Cultural, annual cultivars	*Zea mays*	-	9.5 cob fragments, +++ cupules, 1.0 kernel, 2.9 kernel fragments
Other annuals	Monocotyledonae	+ stem	-
	Unidentifiable	1 0.6	-
	Unknown plant part	1 0.6	-
Perennials	*Sphaeralcea*	-	1 1.0

* Except for *Zea mays* , numbers in each cell are by count and abundance per liter. Plant remains are all carbonized, and seeds unless indicated otherwise. For *Zea mays* , + = less than 10/liter; +++ = 25 to100/liter.

Figure 6.5. Feature 3 at LA 105710, a shallow simple hearth.

corncob fragments. No artifacts were directly associated with the feature.

Feature 3 was constructed by digging a shallow basin into the sand of Stratum 22. The basin was not lined with mud or rocks. During investigation of the feature, a possible surface was identified around the feature. Consequently, an area 8.75 m east-west by 4.5 to 5 m north-south was removed by backhoe to expose the feature and the area around it. However, no ground or use surface was actually present, and no other features were observed. Feature 3 was made and used while Stratum 22 was being deposited. Its elevation placed it near but above Stratum 40 (lower Ab horizon), suggesting that the terrace base area was in use not long after colluvial processes began to cover Stratum 40 with Stratum 22 material.

Table 6.3 lists the types of wood charcoal recovered from a flotation sample of Feature 3 fill. Most of the wood burned in Feature 3 was either *Atriplex* (greasewood) or *Sarcobatus* (saltbush). A few fragments of *Cercocarpus* (mountain mahogany) and Rosaceae charcoal were also recovered. The greasewood/saltbush charcoal was submitted for radiocarbon dating (FS 145; Beta-167116). Its two-sigma measured radiocarbon age was B.P. 410 ± 50, its two-sigma conventional age was B.P. 620 ± 50, and its two-sigma calibrated age was B.P. 670 to 530 (A.D. 1280–1420). Its calibration curve intercept dates were B.P. 640 (A.D. 1310), B.P. 590 (A.D. 1360), and B.P. 560 (A.D. 1390). The conventional and calibrated ages, including the intercept dates, place the materials early in the Classic period, while the measured age is later in the Classic period.

The primary purpose of the fire in Feature 3 was probably processing corn for consumption. Burned cob fragments, cupules, a kernel, and kernel fragments comprise almost all the assemblage. One *Sphaeralcea* (globemallow) seed was also present (Table 6.4).

Addressing the Research Issues

Wiseman and Ware (1996:56–58) present six research issues to be addressed by data recovered from the portions of the Hilltop Pueblo site within project limits. These issues focus on identification of the terrace base deposits and definition of prehistoric use of the terrace base area.

Research Issue 1: Genesis and Structure of the Dune

Testing investigations at the base of the terrace at LA 66288 and LA 105710 revealed the presence of sandy deposits thought to represent a sand dune: "Local topographic conditions, wind patterns, and land-use problems (overgrazing/ farming) have resulted in the accumulation of a major eolian sand deposit (i.e., a single large dune) piled at the base of the high terrace east of U.S. 285" (Wiseman and Ware 1996:21). Those deposits yielded artifacts and charcoal during testing, and indicated to the investigators that the deposits were perhaps contemporaneous with Hilltop Pueblo and were used by pueblo occupants. Wiseman and Ware (1996:56) argue, "One key to understanding prehistoric use of the dune of the south area of LA 66288 and the north end of LA 105710 lies in the origin and structure of the dune. Only by learning how the dune formed and the details of the internal structure and relationships can we correlate the deposits and the cultural materials in them."

Wiseman and Ware (1996:56) are particularly concerned with (1) whether the eolian processes presumed to have formed the "dune" resulted from denudation of agricultural areas upwind of the site; (2) whether the "dune" offered prehistoric farmers an additional or alternative location for farming, and if so, (3) whether the need for an additional or alternative farming location resulted from population increase (whether by growth or expansion is not specified), the need to replace farming locations because of wind erosion, or "general denudation of the landscape" (natural, assisted by human activities, or both).

However, our investigations at the Hilltop Pueblo site show that the terrace base deposits were not eolian in origin—that is, the deposit was not a dune. As discussed earlier, most (n=29) of the 40 strata defined in the two backhoe trench profiles were alluvial in nature and represent the fill of numerous small channels that cut different parts of the terrace base area. Four strata were topsoil (A) horizons: three were buried (Ab), and one was the modern topsoil. The three topsoil horizons formed on the tops of large, thick, colluvial strata that remained stable long enough for plants to grow, die, and decay, adding organic material to the sandy sediments and encouraging soil formation. The oldest Ab horizons (Strata 21 and 40) were not old enough for underlying B horizons to begin forming before they were covered by colluvial sediments (Stratum 19 over Stratum 21 in the LA 66288 profile, Stratum 22 over Stratum 40 in the LA 105710 profile). A Bb horizon (Stratum 18) had begun to form in places beneath the third Ab horizon (Stratum 17), showing a longer period of stability and soil formation on top of Stratum 19. Most erosional episodes that resulted in the many small channels in the eastern halves of the profiles took place after formation of Stratum 17. Beneath Stratum 17, most strata run the lengths of the profiles, and there is less evidence of the kinds of erosional events and channels seen above Stratum 17. Stratum 17 reflects this long period of relative stability as plant growth stabilized and held a ground surface, allowing formation of soil, including a B horizon. The remaining strata resulted from colluvial slope wash that moved artifacts and charcoal from the terrace slope, redepositing them at the base of the terrace.

The colluvial and alluvial origins of the soils and sediments in the terrace base deposit explain three characteristics of the strata. First, the gravels in most of the strata, which would not be expected in eolian deposits, were derived from terrace gravels. Second, artifacts were present in most of the strata. Only a few of the small channel strata appeared not to contain artifacts, and that may have been because they were recorded in profile rather than during excavation. Third, the frequency of artifacts was generally higher in lower excavation levels in the terrace base area, reflecting decreasing numbers of artifacts available for redeposition through time. This was most evident in the LA 105710 excavation units, which were farther from the pueblo than the LA 66288 units. Although the pattern is also seen in assemblages from the LA 66288 units, those units yielded many more artifacts than the LA 105710 units and yielded more artifacts from upper levels, reflecting the presence of more artifacts on the terrace slope nearer the pueblo. The higher number of artifacts in lower levels shows that the terrace slope was not the scene of consistent artifact disposal through time. Rather, the terrace base deposits, with the possible exceptions of Strata 36 and 38, reflect natural processes and events that occurred after occupation of the pueblo.

Research Issue 2: Prehistoric Pathways

Wiseman and Ware (1996:56) contend, "It is a virtual certainty that the dune that constitutes the south area of LA 66288 and the north end of LA 105710 was used as a major pathway between Hilltop Pueblo and the fields and water of the Ojo Caliente Valley." Since we have established that the terrace base deposits investigated during this project postdate the pueblo, it seems unlikely that our investigations would have revealed an actual path. The backhoe trench profiles did reveal several small, shallow, probably linear depressions that could fit Wiseman and Ware's description of a path. But, as discussed earlier, those depressions were erosional channels that cut across the deposits. This does not preclude the presence of paths used by Hilltop Pueblo occupants, but, if present, they were below the levels investigated during this project, associated with a surface contemporaneous with the pueblo, which we did not identify with certainty during our investigations (perhaps the top of Stratum 38?). There is no evidence in the portions of LA 66288 and LA 105710 included in the Hilltop Pueblo site of the trail that follows the eastern slope of the river valley (LA 118549). That trail enters LA 105710 at its southern end but was not discerned within that site or LA 66288.

Research Issue 3: Outdoor Activity Area

Wiseman and Ware (1996:57) state, "The quantities of cultural debris (sherds and lithic debitage) demonstrated by the surface and subsurface evidence are too great for us to believe that it all derives from random, unintentional scattering of trash from the pueblo." They then argue, "If we are correct in assuming that the cultural materials are the product of trash accumulation in the vicinity of activity areas, then we should be able to find other evidence of these activities, such as hearths, structural remains (ramada postholes, pits, compacted use-surfaces, and the like)." As we have seen, however, the strata comprising the terrace base deposit probably postdate occupation of Hilltop Pueblo, and artifacts accumulated in the strata as a result of natural events and processes. Two simple hearths, Features 2 and 3, were found in the LA 105710 portion of the site. However, these features also probably postdate occupation of the pueblo, since they were found in colluvial strata (Strata 19 and 22, respectively) above a buried A horizon (Stratum 40) that formed well after strata that may have been associated with occupation of the pueblo (Strata 38 and 36). No evidence of artifacts, use-surfaces, or structural remains were found near the features, which were each probably used only once. Obviously, someone stopped on the terrace base deposit during the Early Classic period, as Strata 22 and 19 were being deposited, for activities that involved one-time uses of small, simple hearths, probably for food preparation. What other activities were performed there at those times cannot be determined. Strata 22 and 19 did not yield corn pollen, so there is no evidence that the strata were farmed. Nor can we determine how commonly the terrace base area was used, and for what purposes, after Stratum 40 was no longer used for farming. It is possible that activity areas and features actually associated with Hilltop Pueblo are present below the terrace base deposit, but if so, our investigations did not reveal evidence of them.

Research Issue 4: Fieldhouses

In addition to pathways and activity areas, Wiseman and Ware (1996:57) suggest that the terrace base area might have been the location of fieldhouses: "The quantities of cultural debris indicate various uses of the dune. These activities might have involved the construction of more substantial structures than ramadas or shades. If one or more fieldhouses were built and used on the dune, we should be able to find and excavate the remains." By implication, these suspected fieldhouses would have been associated with Hilltop Pueblo, although Wiseman and Ware do not speculate as to why pueblo residents would have built fieldhouses less than 100 m from their homes at the pueblo. Even Nute Pueblo, about 200 m to the east, was probably too close to have contributed fieldhouses at LA 66288 or LA 105710. In any case, since most of the terrace base deposit postdates the occupation of Hilltop Pueblo, evidence of fieldhouses or other structures contemporaneous with the pueblo should not be expected and was not found.

Research Issue 5: Gardens

The potential presence of fieldhouses would suggest the associated presence of garden/farming locations at the Hilltop Pueblo site. Wiseman and Ware (1996:57) argue that the best evidence of gardening at the site would be the presence and changing concentrations of cultigen pollen. They advocate systematic horizontal and vertical soil sampling to examine the distribution of cultigen pollen. However, their approach to this research issue is predicated on the notion that the terrace base area was a dunal deposit and the location of activities associated with the occupation of Hilltop Pueblo.

Again, since data recovery investigations revealed that the terrace base deposit was not dunal in nature, and that it largely postdated occupation of Hilltop Pueblo, there is little possibility that investigations would reveal prehistoric gardens associated with the pueblo. Further, both testing and data recovery showed that the terrace base deposit was deep, and comparison of Figures 6.2 and 6.3 show that, while the major strata were present in both profiles, most of the 40 strata identified resulted from events specific to the two profiles. Consequently, since it would have been difficult or impossible to consistently control which strata were sampled, and many samples would have been collected from noncultural contexts, we did not conduct systematic soil sampling across the sites. Instead, sediment and soil samples for pollen analysis were collected from strata in the LA 66288 and LA 105710 Backhoe Trench 1 profiles. Only samples from the LA 105710 profile were submitted for analysis (Appendix 1; Figs. 6.2 and 6.3).

The only cultigen pollen identified in the samples was from corn (*Zea mays*). Corn pollen was recovered from, in descending order, the control sample and Strata 1, 3, 25, 40, 36, and 38. Pollen from four nondomestic but possibly economic plants—wild buckwheat, unidentified cactus, cholla cactus, and prickly pear cactus—was recovered from, in descending order, the control sample and Strata 1, 6, 25, 17, 22, 40, 36, and 38 (Holloway 1999; Appendix 1). Pollen from economic plants, both domestic and nondomestic, make up only small fractions of the spectra recovered from any of the samples.

Analysis of the pollen spectra suggests to Holloway (Appendix 1) that "a juniper dominated assemblage in association with *Pinus* was likely present during the time period represented by Strata 1–15," that is, the uppermost strata in the profiles (Figs. 6.2 and 6.3). Corn pollen in Strata 1, 3, and 25 likely reflect late historic and modern farming immediately upwind of the sites, since there is no historic evidence of recent farming on the sites (see Chapter 25). This would explain why corn pollen concentrations in the control and Stratum 1 samples were considerably higher than in samples from lower strata. Additionally, pollen spectra below Stratum 1 have suffered from weathering that impacted preservation. Holloway (Appendix 1) states,

> Concentration values decrease to below 1,000 grains/g in the upper strata (through Stratum 25). The concentration values increase in Stratum 17, which is expected given the interpretation of this stratum as a buried A horizon. These again decrease gradually and remain below 1,000 grains/g from Stratum 22 through the bottom. Thus, there are apparently two sections of the profile containing very low pollen concentration values separated by increased values in the area of the buried A horizon.

Although Holloway's interpretation is that the values were uniformly low ("below 1,000 grains/g") in the lower half of the profile, the concentration values were actually below 1,000 grains/gram in the Stratum 22, 33, and 38 samples. In contrast, the concentration values in Strata 40 and 36 are 1,153 and 1,188 grains/gram, respectively. As discussed earlier, Stratum 40 was a buried A horizon, while Stratum 36 was probably formed by colluvial processes during or soon after occupation of Hilltop Pueblo. It is interesting, then, that Strata 40 and 36 were also the lower strata that yielded corn pollen.

Stratum 40 was an A horizon, showing stability and soil formation, that yielded corn pollen in relatively high concentration values. This strongly suggests that the horizon was farmed. However, as discussed in the description of Stratum 40, farming on Stratum 40 was probably not associated with the occupation of Hilltop Pueblo and may have occurred during the later or longer occupation of Nute Pueblo. If Stratum 40 was farmed, then we may presume that gardens of some sort were present. However, none of the backhoe trench profiles, including the two shown in Figures 6.2 and 6.3, revealed any evidence of farming features. This may indicate that prehistoric farming associated with Stratum 40 was relatively more informal than that associated with the many large, complex farming sites described in this report. On the other hand, it may only indicate that our data recovery activities did not encounter farming features. In either case, we were not able to determine whether farming occurred on Stratum 40 until analysis of a soil sample revealed the presence of corn pollen.

Research Issue 6: Dating the Prehistoric Occupations

Wiseman and Ware (1996:57–58) place a high priority on dating the terrace base deposits with both relative and absolute methods. In this chapter, we have described the sequence of deposition and modification of natural sediment and soil strata comprising the terrace base deposit. With that description we are able to examine the timing of events and processes represented in the sequence. As discussed earlier, a radiocarbon date from Stratum 36 points, through deposition of trash on the terrace slope and natural redeposition of trash in the terrace base area, to occupation of Hilltop Pueblo during the Classic period. Based on the Stratum 36 date, it is possible that Hilltop Pueblo was occupied early in the period, but that cannot be confidently determined because the context of the dated charcoal is one of deposition and redeposition following burning; thus, it is an indirect context for dating the pueblo itself. Still, the nature of Stratum 36, in combination with the radiocarbon date, indicate that the stratum was deposited during or shortly after occupation of the pueblo. Assuming this to be the case, the sediment and soil strata above Stratum 36 must date after that time.

A soil sample from Stratum 40 provided a problematic radiocarbon date that is actually older than the date from Stratum 36, which was below Stratum 40. The available data do not allow us to resolve this apparent paradox, although it seems likely that the problem involves the plant remains contained in the Stratum 40 sample.

A radiocarbon date from Feature 3, which was in Stratum 22 above Stratum 40, suggests that little time passed while strata between Strata 36 and 22 were being deposited. This included formation of Stratum 40. There is no indication from pollen spectra that the terrace base deposit was used for farming at the time that either Feature 2 or Feature 3 was used. Consequently, we cannot know why the features were created or what activities may have taken place in their vicinities. Clearly, however, they were created not long after Hilltop Pueblo was abandoned, probably during occupation of nearby Nute Pueblo.

Analysis of ceramic artifacts from the Hilltop Pueblo site (Chapter 19) revealed that Biscuit B sherds significantly outnumber Biscuit A sherds (see Table 19.1). Since Biscuit B is presumed to have been introduced in the fifteenth century after introduction of Biscuit A in the late fourteenth century, assemblages dominated by Biscuit B should date after about A.D. 1400. This may correspond with the Stratum 36 radiocarbon date, which extends to A.D. 1420 (one sigma, calibrated) or A.D. 1440 (two sigma, calibrated), and whose intercept date is A.D. 1400. The Feature 3 radiocarbon date, on the other hand, extends to A.D. 1400 (one sigma, calibrated) or A.D. 1420 (two sigma, extended), with intercept dates at A.D. 1310, 1360, and 1390. Since Feature 3 must be younger than the materials in Stratum 36 (based on stratigraphy, even though the radiocarbon dates are essentially identical), we can assert (if not demonstrate) the following:

1. Stratum 36 should date after about A.D. 1375, based on the presence of Biscuit A sherds in the assemblage.

2. Stratum 36 should date after about A.D. 1400, based on the presence of Biscuit B sherds in the assemblage.

3. Feature 3 should date before about A.D. 1420, based on the two-sigma calibrated radiocarbon date.

4. If Stratum 36 dates after about A.D. 1400 and Feature 3 dates before about A.D. 1420, then (a) Stratum 36 was probably deposited between about A.D. 1400 and 1420, indicating that Hilltop Pueblo was abandoned near the turn of the fifteenth century; and (b) no more than about two decades is represented in the colluvial deposits between Stratum 36 and the placement of Feature 3 in Stratum 22. Included in that time period is the stabilization, formation, and covering of Stratum 40, an A horizon that was farmed by nearby Puebloan residents, probably from Nute Pueblo.

5. The terrace base deposit was no longer farmed after the covering of Stratum 40, between about A.D. 1400 and 1420, until the historic period.

Clearly, the data available from our investigations allow us to raise but not to confirm or deny these assertions.

During the early deposition of Stratum 19 in the LA 105710 profile (Fig. 6.3), there was a significant erosional period that resulted in the cutting and filling of one large and several small channels in the eastern third of the profile. The erosional events that occurred in that period cut the lower portion of Stratum 19, Strata 22, 40, 33, 34, and the upper surface of Stratum 36, and created Strata 26 through 32. The deposition of Stratum 19 continued after this erosional period, covering the large and small channels; that the upper surface of Stratum 19 became stable enough to allow formation of Strata 17 and 18; and that the subsequent strata were largely present across the length of the profile indicate that the erosional period represented by Strata 26–32 was relatively intense and short-lived compared to the colluvial processes that deposited the major strata.

A later erosional period was seen in the eastern half of the LA 66288 profile (Fig. 6.2). This period occurred after formation of Strata 17 and 18 in the upper portion of Strata 19 and 20. The events of this period cut through Strata 5, 15, 6, and 16, and into the upper surface of Stratum 17, and created numerous large and small channels that filled with Strata 7–13. Like the earlier erosional period seen in the LA 105710 profile, the period represented in the LA 66288 profile was apparently relatively intense and short-lived, and it was followed by a renewal of the colluvial processes that deposited Stratum 3 over the erosional channels. Stratum 3 was later cut by erosional events that resulted in deposition of Strata 4 and 2. Finally, the sequence was covered by Stratum 1.

That the two major erosional periods were not seen in both profiles suggests that they were localized within the terrace base area. Similar localized episodes may have cut the terrace base numerous times during the approximately six centuries represented by the profiles (assuming that Stratum 36 was deposited during the fourteenth century, as may be indicated by the radiocarbon date). Whether those erosional periods were related to human activities on or near the terrace base or to natural environmental events and processes cannot be determined from the available evidence. However, the radiocarbon date from Feature 3, which was used after formation of Stratum 40 during deposition of Stratum 22, shows that the earlier erosional event, in the LA 105710 profile, occurred after about A.D. 1420. The later erosional period occurred well after the formation of Stratum 17, which did not yield corn pollen and, therefore, may date after abandonment of Nute Pueblo and before European occupation of the Gavilan area in the 1700s. It was covered by Stratum 3, which did yield corn pollen and was probably late historic in age. Under these circumstances, we can suggest that the later erosional period probably occurred during the historic period, although we cannot determine whether that happened early or late in the period.

Summary

Investigations at LA 66288 and the prehistoric component of LA 105710 were limited to deposits at the base of the gravel terrace on which Hilltop Pueblo is located. Testing in the terrace base area had suggested that the deposits were eolian in origin and, thus, dunal in nature. However, examination of long, deep backhoe trenches excavated across the terrace base revealed that the deposits resulted from colluvial and alluvial events and processes. Those events and processes created a series of sediment strata, some of which remained exposed and stable long enough to allow formation of soil horizons before being covered by subsequent sediment strata.

The data recovery plan specified six research issues to be addressed by investigations at the Hilltop Pueblo site. All were predicated on the supposition that the terrace base deposits were dunal and had been present during the occupation of Hilltop Pueblo. Based on that supposition, the research issues focused on identification of prehistoric activities assumed to have been performed by Hilltop Pueblo residents in the terrace base area, and features or structures that might have been associated with those activities. Specifically, the issues involved the identification of Puebloan pathways, outdoor activity areas, fieldhouses, and gardens, and dating the prehistoric use of the terrace base. However, because the terrace base deposits were not dunal and largely postdated the occupation of Hilltop Pueblo, the search for and identification of activities and features associated with the pueblo could be expected to yield negative results, and such was the case. The evidence of prehistoric farming of Stratum 40, one of the buried A horizons, and the presence of two small, isolated hearths show that the terrace base area was, indeed, the location of prehistoric activities. However, those activities were probably performed by residents of nearby Nute Pueblo, after Hilltop Pueblo was no longer occupied.

Ceramic types recovered from the Hilltop Pueblo site and radiocarbon dates obtained from redeposited trash and from one of the hearth features suggest that Hilltop Pueblo was occupied early in the Classic period and probably abandoned in the first quarter of the A.D. 1400s. Although the study of natural stratigraphy, redeposited ceramic artifacts, and radiocarbon dates from contexts not directly associated with Hilltop Pueblo provides, at best, a tenuous basis for proposing dates for the pueblo, it does allow a hypothesis that could be tested by investigations of the pueblo itself and may help explain why Hilltop Pueblo was not identified as an ancestral Tewa site by early twentieth-century informants.

Chapter 7. LA 105703

James L. Moore

LA 105703 is a large farming site on land administered by the USDI Bureau of Land Management. It occupies an irregular rectangular area bounded by a low terrace edge on the west and arroyos formed by intermittent drainages on the north (except for one feature) and south. The east boundary of the site is formed by the edge of the farming features and the base of a higher terrace. This site is not typical of the other fields examined during this study. Rather than being situated on top of a high terrace overlooking the river valley, it sits on an eroded, low-lying terrace remnant on the east edge of the Ojo Caliente Valley. These boundaries define the extent of a continuous scatter of farming features through this area, but it is unlikely that they replicate any important aspects of the prehistoric land tenure system.

LA 105703 measures 340 m north-south by 228 m east-west and covers 43,760 sq m (4.37 ha). The U.S. 285 right-of-way runs through the site, truncating several features. About 22 percent of the site extends into the right-of-way, mostly on the east side of the highway, though a few features were defined on the west side. In-field pottery analysis indicated that LA 105703 was used during the Classic period.

Vegetation is moderate on the site, and the plant cover of on- and off-feature areas is generally similar. However, distinct differences noted in a few places are discussed in individual feature descriptions. Grasses, the most common plants, include grama, three-awn, and muhly. Other common plants include rabbitbrush, sagebrush, snakeweed, narrowleaf yucca, prickly pear, barrel cactus, and cholla. Small juniper and piñon trees are growing all through the site area and have spread onto most of the farming features.

Field Procedures

Detailed mapping was restricted to the section of site that extends into the U.S. 285 right-of-way and an adjacent 25+ m wide zone except where the right-of-way widens in the north part of the site. This comprises a sample of about 36 percent of LA 105703, and all cultural features within this zone were mapped and recorded in detail. Several features were partly or wholly within project limits, including six gravel-mulched fields (Features 2, 8, 18, 20, 21, and 22) and eight borrow pits (Features 4 ,5, 6, 7, 12, 16, 17, and 19). The archaeologists concentrated on describing surface features in the mapped area and sample excavation of fields within project limits. The latter focused on Features 2, 8, 18, 21, and 22, each of which was sampled by as few as one or as many as eight excavation units. Since excavation of borrow pits would have provided little information that was not available from surface examination, no subsurface studies were conducted in those features. All cultural materials noted on the surface within the highway right-of-way were collected for analysis, as were artifacts encountered in excavation units. These materials are summarized later in this chapter. Artifacts noted elsewhere on the surface of features in the detailed mapping zone were inventoried by feature and are summarized in those discussions.

Features

Twenty-three features were at least partly mapped and described (Fig. 7.1). Field limits were often difficult to define in the mapped area, though outside that zone some fields are better delineated. A combination of colluvial and eolian processes has caused soil to build up against alignments that face the terrace interior, obscuring those edges in many places. Eolian deposits also cover much of the surface of the fields, especially where they are anchored by vegetation. This made it difficult to discern many alignments and to define the full extent of others. Several fields seem to overlie others, and it is possible that some materials used to build later features were salvaged from earlier fields, further obscur-

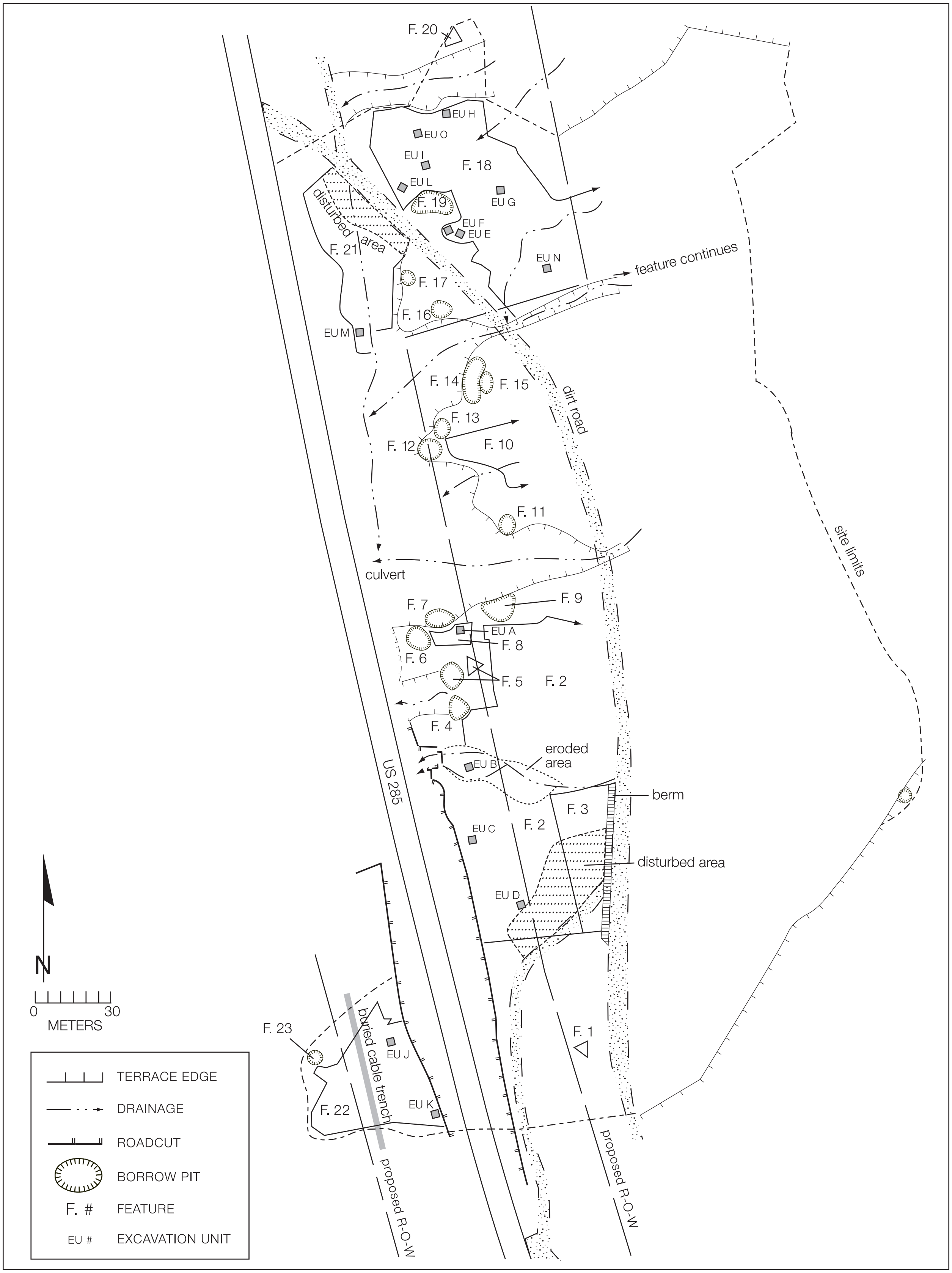


Figure 7.1. Plan of LA 105703.

ing alignments. Livestock grazing has also caused damage, displacing elements in cobble alignments and blurring feature edges. Along the terrace edge this seems to have exacerbated damage caused by erosion.

LA 105703 has sustained quite a bit of modern damage, though most features seem remarkably intact. Several dirt roads cross the site, one of which bisects it and has been graded, forming a berm along its west side that probably covers parts of farming features. The east edge of this road is incised into the terrace, affecting features bordering it on that side. It was not possible to determine whether several features are truncated by the road or originally extended across it. Other tracks remain unimproved, but traffic over them has obscured or damaged alignments and field surfaces. A considerable amount of modern trash has been dumped on the site surface, and dumping continued to occur while we were conducting our fieldwork. A zone next to Feature 22 was bladed for a billboard, and a buried telephone cable also crosses this feature. The U.S. 285 right-of-way passes through the site from north to south, truncating Features 2 and 22. Finally, grading along the east edge of the highway may have removed part of Feature 21, though erosion could also have been responsible for this damage.

Feature 1

Feature 1 consists of a series of cobble alignments that measure 4.5 by 4.1 m and cover 9 sq m (Fig. 7.2). Since this field was in the detailed examination zone, it was completely mapped. From the surface this feature appears to contain no artificial fill, but this was difficult to substantiate because it is at the base of a shallow slope adjacent to a gully and is badly eroded. Most alignments are covered by colluvial sands and silts that washed in from uphill. An undetermined portion of this feature was concealed in this way.

Alignments, a single element high and wide, were built with locally obtained cobbles and small boulders (10–20 cm long cobbles predominate). The few small boulders are 35–50 cm long. Elements were mostly placed end-to-end, though some side-by-side placement also occurs. Most elements were set on their broadest surfaces, but a few were set upright. Surface indications suggest that alignments in this feature were arranged in a gridded pattern, forming multiple compartments.

As noted earlier, this feature did not seem to have been artificially mulched. Feature fill consists of a silty sand containing 40–50 percent gravels and pea gravels. Whether this represents materials deposited by erosion or artificial fill was impossible to determine from surface examination alone. Since the alignments are a single element high, the fill is probably 8 to 10 cm thick. Vegetational density is not visibly different from adjacent areas that did not contain farming features. No cultural materials were noted on the surface of Feature 1.

Feature 2

Feature 2 is a large, irregular, gravel-mulched plot that measures 96.5 by 55 m and covers roughly 3,479 sq m (Fig. 7.2). Since this field was partly outside the detailed examination zone, the entire feature was not mapped. However, only a small part of the northwest corner of this feature was outside that area, so most of it is shown in Figure 7.2. Since Feature 2 extends into project limits, three excavation units were used to examine it. The measurements supplied for this feature were estimated from what remains of it. A dirt road truncates Feature 2 on the east side (Fig. 7.1), so we are uncertain whether it once extended across the road into an unmapped area that contains many alignments. In addition, the feature is truncated on the southwest by the U.S. 285 roadcut and on the south by extensive gullying that has obscured or removed much of the boundary alignment in that area. A small gully that runs east-west through the approximate center of Feature 2 has obscured or removed alignments and fill in that area, and erosion along a large gully that forms its north edge has removed much of the boundary alignment in that area as well. Perhaps 40–50 percent of the remaining surface of this feature is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long; the small boulders that occur are 25–40 cm long. Building

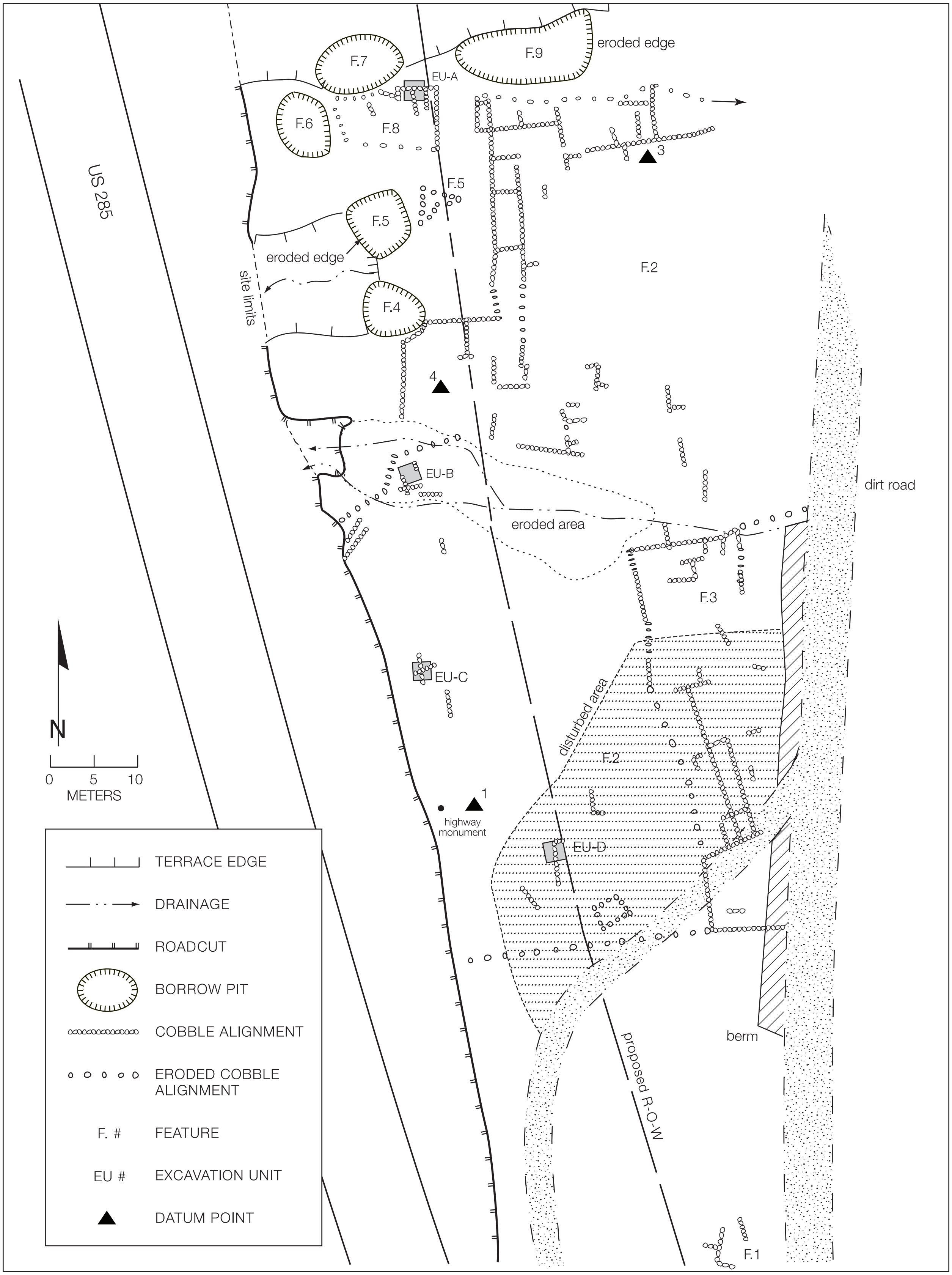


Figure 7.2. Features 1 through 9, LA 105703.

elements were mostly placed end-to-end, though some were placed side-to-side. While most elements were set on their broadest surfaces, uprights also occur. The north part of the feature appears to be subdivided into multiple compartments, and most or all of the rest of the field was probably also subdivided in this way. Most interior alignments are now concealed by sediments. Some areas contain large, noncontiguous, evenly spaced elements that are sometimes bordered by alignments. These larger elements are occasionally arranged in discernible patterns, though more often any patterning has been obscured by the buildup of sediments.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 12 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably 5–10 cm thick and seems to contain more pea gravels than do similar features at sites investigated further south in the valley. No differences were noted in on- and off-feature gravel or vegetational densities.

Surface artifacts in the right-of-way were collected. Cultural materials noted on the surface of the feature outside the right-of-way were inventoried and left in place. Chipped stone artifacts were common (136 were recorded). Gray rhyolite dominated this assemblage, comprising 72 core flakes, 35 angular debris, 8 cores, and 1 tested cobble. Other materials were less abundant and included andesite (2 cores, 1 angular debris), red rhyolite (2 core flakes), massive quartz (1 core flake, 1 angular debris), quartzite (1 core flake, 1 tested cobble), and Pedernal chert (1 core flake). While chipped stone debris was distributed across the feature, it tended to occur in clusters suggestive of individual chipping episodes. The only temporally diagnostic artifacts recorded were 2 Biscuit A bowl sherds, 1 Biscuit B bowl sherd, and 1 Biscuit B jar sherd. Though a considerable amount of historic trash is present, it was not recorded because it is of recent derivation and in some cases was discarded while investigations at the site were ongoing.

Feature 3

Feature 3 is a rectangular gravel-mulched plot that measures 44 by 12.5 m and covers at least 696 sq m (Fig. 7.2). Since this field was in the detailed examination zone, it was completely mapped. The east side of the feature is truncated by an improved dirt road, and grading has thrown up a berm on the west side of the road that probably covers part of Feature 3. It was impossible to determine how far east this field may once have extended. Only about 20–30 percent of the feature surface is obscured by sediments that have infiltrated the gravel mulch and are anchored by vegetation.

Boundary and interior subdividing alignments, a single element high and wide, were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long; the small boulders that occur are 25–40 cm long. Elements in boundary alignments were mostly set end-to-end on their broadest surfaces, though some side-by-side placement also occurs. Conversely, most elements in interior subdividing alignments were set side-by-side on their broadest surfaces, but some uprights were also noted. Surface indications suggest that the interior of this feature is subdivided into multiple compartments. Numerous cobbles and small boulders occur in areas where alignments were not defined, and their patterning suggests that they represent the visible elements of alignments that are mostly concealed by sediments.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 12 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are only one element high, the mulch is probably 10–12 cm thick. Feature 3 appears to have been built on top of the east edge of Feature 2 and is distinctly mounded 10–12 cm above the adjacent surface of that earlier field, suggesting sequential construction. No variation in surface gravel or vegetational densities were noted between on- and off-feature areas.

All cultural materials seen on the feature surface were inventoried. Only chipped stone artifacts were found, including gray rhyolite (22 core flakes, 5 angular debris, 1 core), red rhyolite (1 core flake, 2 angular debris), and andesite (1 tested cobble). No temporally diagnostic artifacts were noted.

Feature 4

Feature 4 is an oval terrace-edge borrow pit measuring 8.6 by 5.9 m, with a maximum depth of 0.93 m (Fig. 7.2). It is near Feature 2 and was probably the source of some of the materials used to build that gravel-mulched field. This pit is cut into a fairly steep slope and appears to have been enlarged by erosion.

Feature 5

Feature 5 is an oval terrace-edge borrow pit measuring 8.7 by 5.9 m, with a maximum depth of 0.75 m (Fig. 7.2). It is near Feature 2 and was probably the source of some of the materials used to build that gravel-mulched field. This pit is cut into a fairly steep slope and appears to have been somewhat enlarged by erosion. Just east of Feature 5 and in possible association is a cluster of cobbles that appears to be a stockpile of building materials.

Feature 6

Feature 6 is a round terrace-edge borrow pit measuring 7.1 by 6.9 m, with a maximum depth of 0.91 m (Figs. 7.2 and 7.3). It is near Features 2 and 8 and was probably the source of some of the materials used to build those gravel-mulched fields. This pit may have been partly filled by sediments washing in from the adjacent terrace top, though the depth of any such deposits was undetermined.

Feature 7

Feature 7 is an oval terrace-edge borrow pit measuring 7.2 by 6.8 m, with a maximum depth of 1.34 m (Fig. 7.2). It is near Features 2 and 8 and was probably the source of some of the materials used to build those gravel-mulched fields. This pit may have been partly filled by sediments washing in from the adjacent terrace top, but the depth of those deposits was undetermined.

Feature 8

Feature 8 is a small rectangular gravel-mulched plot that measures 12.0 by 7.0 m and covers about 64 sq m (Fig. 7.2). This field is almost completely within the right-of-way, so the entire feature was mapped, and one excavation unit was used to examine its structure. Perhaps 50 to 60 percent of

Figure 7.3. Feature 6, a terrace-edge borrow pit at LA 105703.

the field surface is covered by sediments that have infiltrated the mulch and are anchored by vegetation. Boundary and interior alignments are mostly covered by eolian sediments, and elements in boundary alignments on the south, west, and north sides have been displaced by erosion.

Excavation showed that boundary and interior alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. A few small boulders were also used; they are 25–30 cm long. Building elements were usually placed end-to-end and on their broadest surfaces, though occasional cobbles were placed upright or sideways. Most visible cobbles are patterned in a way that suggests they are parts of alignments, though an area in the southeast corner of the feature may contain a pattern of noncontiguous, evenly spaced elements.

The mulch is composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single course high, the mulch is probably 8–10 cm thick. No differences in on- and off-feature gravel and vegetational densities were noted.

Feature 9

Feature 9 is a large, oval, terrace-edge borrow pit measuring 7.6 by 6.7 m, with a maximum depth of 0.94 m (Fig. 7.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Features 2 and 8 and was probably the source of some of the materials used to build one or both of those gravel-mulched fields. The southeast side of this feature may have been somewhat enlarged by erosion, and sediments have built up in the bottom of the pit to an undetermined depth. No artifacts were found in association with this feature.

Feature 10

Feature 10 is an irregularly shaped gravel-mulched plot that measures about 35 by 20.5 m and covers roughly 537 sq m (Fig. 7.4). Since this field was partly outside the detailed examination zone, the entire feature was not mapped. Only the western 60 percent fell within the mapping zone, so the full extent of the feature was estimated by pacing. Perhaps 40–50 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. The east edge of this feature (which is outside the detailed examination zone) is covered by an earth berm related to maintenance of an adjacent dirt road. Thus, it was not possible to determine whether that edge was truncated by the road or originally continued across it into an area that contains more gravel-mulched plots.

Boundary and interior subdividing alignments are a single element high and wide (Figs. 5.2 and 7.5); they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 12–25 cm long. Small boulders were also commonly used as elements in alignments; they are 25–50 cm long. Most elements were placed end-to-end and set on their broadest surfaces, though interspersed with these in some alignments are occasional elements set sideways or upright. This feature is well preserved and highly subdivided. In areas that are partly covered by sediments, the patterning of elements that do not visibly abut other elements suggests that they represent buried alignments rather than noncontiguous, evenly spaced large elements. However, the latter pattern may occur in a few places. A small rock pile at the southeast edge of the feature seems to be a materials stockpile.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably 5–12 cm thick. No mounding above the terrace was seen, but a difference in surface gravel densities was noted between on- and off-feature areas. Where not obscured by sediments, gravels cover 80–90 percent of the feature surface. In adjacent off-feature areas, surface gravel density is only 50–60 percent. No similar variation in vegetative density was noted.

All cultural materials seen on the surface of this feature were inventoried. Gray rhyolite,

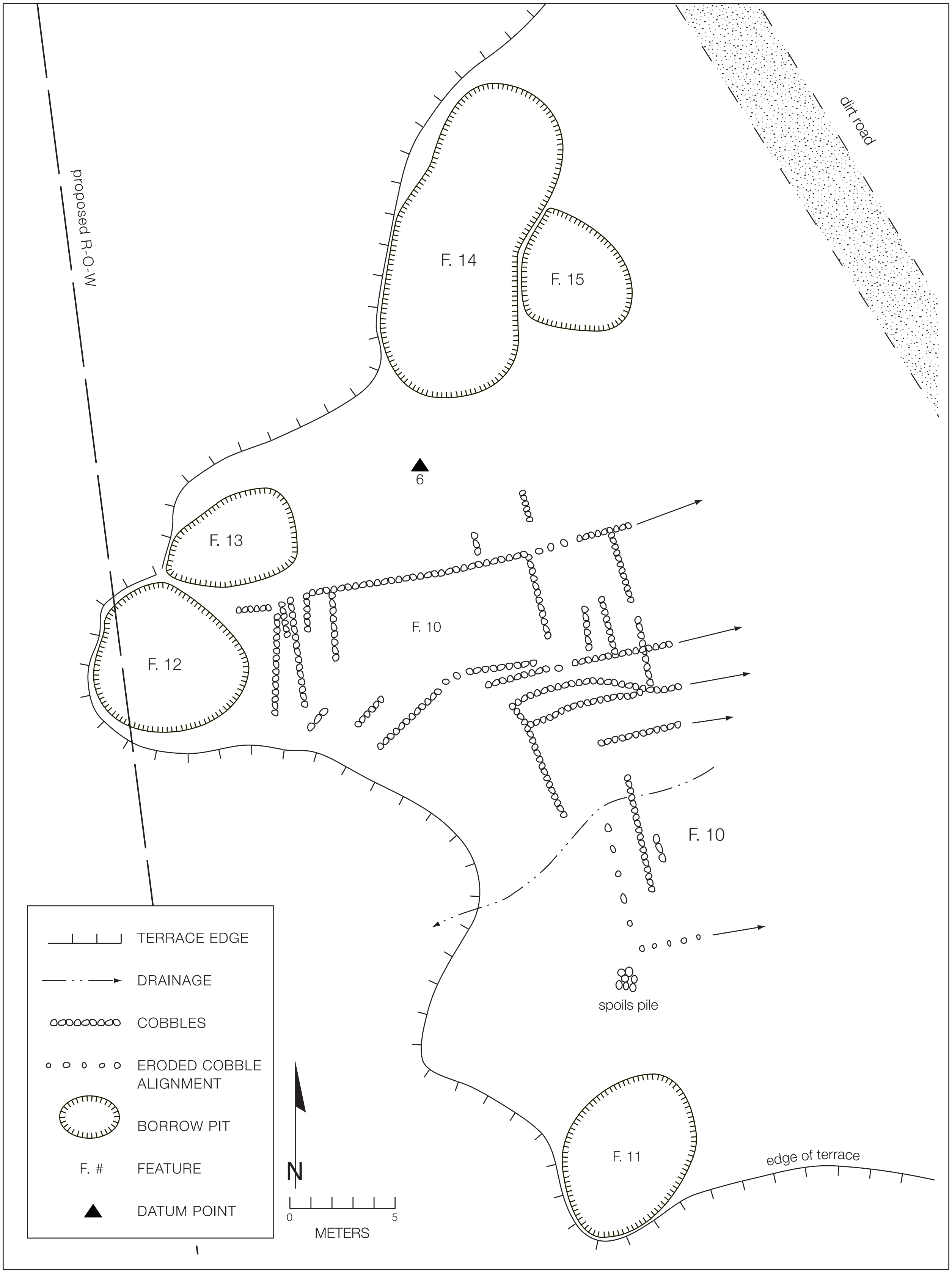


Figure 7.4. Features 10 through 15, LA 105703.

Figure 7.5. Cobble alignments and mulched surface in Feature 10, LA 105703.

which dominated this assemblage, comprised 89 core flakes, 58 angular debris, and 5 cores. Other materials included andesite (4 core flakes, 3 cores, 1 tested cobble), red rhyolite (6 core flakes, 5 angular debris), and massive quartz (5 core flakes, 7 angular debris). While chipped stone artifacts are scattered across the surface of the feature, they tend to cluster in areas, suggesting discrete chipping stations. No temporally diagnostic artifacts were noted.

Feature 11

Feature 11 is a large, oval, terrace-edge borrow pit measuring 8.9 by 6.1 m, with a maximum depth of 0.76 m (Figs. 5.4 and 7.4). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 10 and was probably the source of some of the materials used to build that gravel-mulched field. The lower part of this feature is filled with cobbles and small boulders, which may have been sorted out of the gravels and discarded as too large for mulch. Nine pieces of chipped stone were found in the bottom of this feature and appear to represent a small chipping station. Materials noted included gray rhyolite (four core flakes, three angular debris, one core), and quartzite (one tested cobble).

Feature 12

Feature 12 is a large, nearly round terrace-edge borrow pit measuring 9.3 by 8.9 m, with a maximum depth of 0.27 m (Fig. 7.4). This feature extends into the right-of-way and was mapped but not excavated. It is next to Feature 10 and may have been a source of some of the materials used to build that gravel-mulched field. Though not shown on the feature map, this pit is slightly lobed on its northeast side, and the lobe is separated from the main pit by a low berm of cobbles and small boulders. This configuration is evidence of two episodes of use. The first episode created the main part of the borrow pit, and the lobe and berm were created by the second use. The berm appears to represent spoils discarded while obtaining gravel for mulch.

Feature 13

Feature 13 is an oval terrace-edge borrow pit measuring 7.4 by 6.8 m, with a maximum depth of 0.35 m (Fig. 7.4). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 10 and may have been a source of some of the materials used to build that gravel-mulched field. It was dug so close to Feature 12 that the two pits became joined and together resemble an 8. This pit has been partly filled by eolian and colluvial sediments to a depth of perhaps 10–20 cm, and larger elements discarded as spoils are scattered across the bottom of the feature. No cultural materials were found in association.

Feature 14

Feature 14 is a very large terrace-edge borrow pit measuring 18.6 by 6.7 m, with a maximum depth of 0.42 m (Fig. 7.4). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 10 and may have been a source of some of the materials used to build that gravel-mulched field. From the surface appearance of this feature, it seems to be a series of four linked borrow pits. Feature 15 represents a more distinct fifth pit. Each pit is separated from adjacent pits by low mounds of cobbles and gravels, which represent the eroded edges of borrow areas. With Feature 15, then, this complex probably represents at least five distinct episodes of use. There appears to be 10–20 cm of sediments built up in the bottom of this feature. All cultural materials visible on the surface were inventoried. They are dominated by gray rhyolite (28 core flakes, 10 angular debris, 1 core). Other materials in the chipped stone assemblage are red rhyolite (2 core flakes, 1 angular debris) and quartzite (1 core flake). These materials occurred in several clusters, suggesting the presence of discrete chipping stations. Temporally diagnostic artifacts included 2 Biscuit A bowl sherds and 6 Biscuit B bowl sherds.

Feature 15

Feature 15 is a small oval terrace-edge borrow pit measuring 6.1 by 3.6 m, with a maximum depth of 0.63 m (Fig. 7.4). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 10 and may have been a source of some of the materials used to build that gravel-mulched field. As noted in the discussion of Feature 14, this borrow pit is one of a series of linked pits indicative of at least five episodes of use. Since it was the most distinct of the linked borrow pits, it was given a separate feature number and was probably used after Feature 14. There seems to be 20–30 cm of sediments built up in the bottom of this pit. The small array of surface artifacts noted is comprised of chipped stone and includes gray rhyolite (one core flake, one angular debris, one core) and andesite (two core flakes).

Feature 16

Feature 16 is an oval terrace-edge borrow pit measuring 8.6 by 7.7 m, with a maximum depth of 0.58 m (Fig. 7.6). It is in the right-of-way and was mapped but not excavated. This borrow pit is near Feature 18 and was probably a source of some of the materials used to build that gravel-mulched field. The center of the pit contains a pile of cobbles and gravels that may represent spoils, but which is partly obscured by 10–20 cm of sediments that have built up in the bottom of the feature.

Feature 17

Feature 17 is an oval terrace-edge borrow pit measuring 7.8 by 4.8 m, with a maximum depth of 0.39 m (Fig. 7.6). It is in the right-of-way and was mapped but not excavated. This borrow pit is near Feature 18 and was probably a source of some of the materials used to build that gravel-mulched field. Eolian and colluvial sediments have built up to an undetermined depth in the bottom of this feature.

Feature 18

Feature 18 is a large series of connected features, some of which are of quite intricate construction. It measures about 70 by 67.5 m and covers roughly 2,715 sq m (Fig. 7.6). Since this field was partly

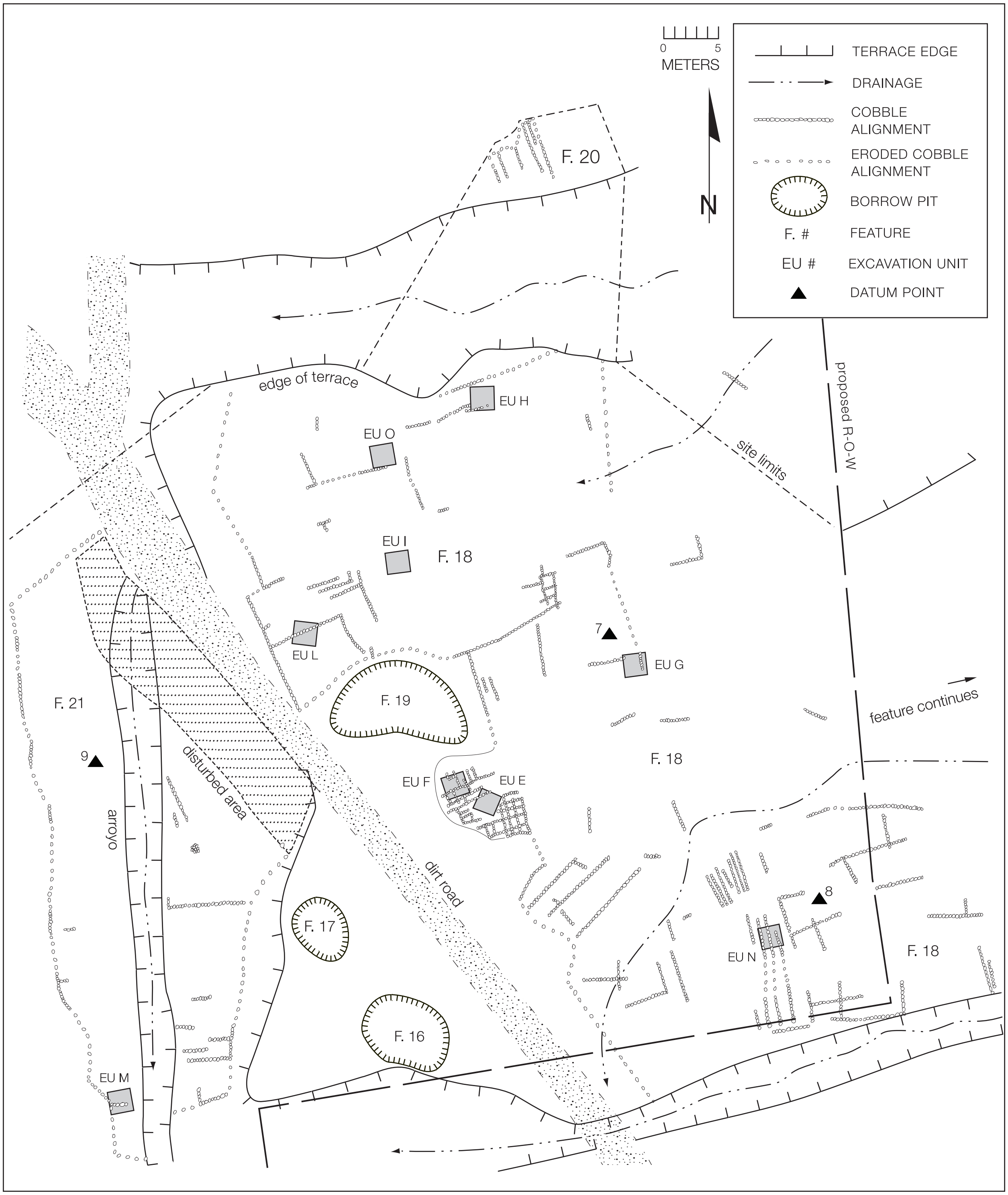


Figure 7.6. Features 16 through 21, LA 105703.

outside the detailed examination zone, all of it was not mapped. On the north, the feature extends to the south edge of a large arroyo, which has truncated several alignments. An improved dirt road forms the west boundary of the feature but does not seem to have damaged it. The south boundary is a large gully, which may have truncated part of the feature. The southeast sector of Feature 18 extends another 40 m east along this gully. Over two-thirds of the feature was mapped, and seven excavation units were used to examine it. This level of effort was needed because of the large expanse of feature in the right-of-way and the great diversity of construction techniques noted during surface examination.

Unfortunately, many internal subdividing alignments have been covered by eolian and colluvial sediments, though this was less of a problem in the southern third and west-central section of the feature. The southern third of the feature contains numerous parallel alignments that run perpendicular to a hillslope. In places alignments also run parallel to the slope, suggesting that at least part of this area was subdivided into small rectilinear plots. The west-central section of the feature is intricately gridded into numerous small cells resembling a checkerboard. As discussed later, excavation showed that this pattern is more widespread than suggested by our mapping of surface alignments.

Nearly all boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. The only known exception to this is a 4 m length of alignment at the southeast edge of the feature outside the detailed examination zone, which appears to be two to three elements wide and may be a checkdam. Cobbles predominate in all alignments, and most are 10–25 cm long. Small boulders are common in the south and east sections of the feature; most are 25–35 cm long, though some range up to 40 cm long. These larger elements are rare in the checkerboard area. Surface indications suggested that most elements were set end-to-end, though in places a few elements were set sideways. Most elements were placed on their broadest surfaces except in the checkerboard area, where upright placement predominates. The area north of Feature 19 around EU-L contains a series of patterned, evenly spaced large cobbles and small boulders.

The mulch is mostly composed of gravels and pea gravels, though small cobbles up to 12 cm long occur. Their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Small cobbles were the main material used for mulching in some areas, as detailed in the discussions of excavation units. Since the alignments are a single element high, most of the mulch is probably 5–12 cm thick. No differences were noted in on- and off-feature gravel or vegetational densities. All artifacts seen on the surface of the feature within the right-of-way were collected. No effort was made to inventory materials outside this zone, since the surface collection inside construction limits was considered to be representative.

Feature 19

Feature 19 is a large, oval, terrace-edge borrow pit measuring 14.9 by 9.8 m, with a maximum depth of 0.65 m (Fig. 7.6). It is near Feature 18 and was probably the source of some of the materials used to build that gravel-mulched field. This feature has been slightly damaged by a dirt road that runs along its west edge.

Feature 20

Feature 20 is a small irregularly shaped gravel-mulched plot that measures 5.5 by 5 m and covers about 19 sq m (Fig. 7.6). This field is within the right-of-way, so the entire feature was mapped. About 80 percent of its surface is covered by sediments that have infiltrated the mulch and are anchored by vegetation. Feature 20 is slightly mounded above the adjacent terrace surface, though the mounding is only 5–8 cm high in the center of the feature, where it is best preserved. The south edge of the plot has been removed by a small active gully. Because of the small size of this feature and its badly deteriorated condition, it was not excavated.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. The few small boulders used in this feature are up to 30 cm long. Elements in all alignments were set end-to-end and on their broadest surfaces. The configuration of the remaining alignments suggests that this feature was originally rectangular with boundary alignments on all four sides. The interior of the feature was subdivided into multiple elongated cells by interior subdividing alignments running north to south.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 8 cm long also occur. The mulch appears to be about 10 cm thick in a cross section of the feature in an arroyo wall. Cobbles are more common in the cross section than was evident from the surface, suggesting that only larger rocks were sorted out for use as building elements. No variation in surface gravel or vegetational densities were noted between on- and off-feature areas.

Feature 21

Feature 21 is an irregularly shaped gravel-mulched plot that measures 55.0 by 24.5 m and covers roughly 820 sq m (Fig. 7.6). This field has been disturbed by construction of a dirt road and erosion. Some parts have been removed and others covered by sediments, so these measurements are incomplete. Mechanical disturbance associated with construction and maintenance of the dirt road has removed the northeast quarter of the feature. A gully subdivides the field into east and west sectors and removed the central portion of the feature. About 40–50 percent of the mulch surface in the east sector is obscured by eolian and colluvial sediments that have infiltrated the mulch and are anchored by vegetation. About 60–70 percent of the mulch surface in the west sector is similarly covered. This field was within project boundaries, and a single excavation unit was used to examine its structure and fill.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 8–25 cm long. Small boulders were only rarely used in the construction of this feature; they are 25–40 cm long. Most elements in the east sector were set end-to-end, though some were set sideways. While both types of placement occur in the same alignment, no cases were noted where sideways placement predominated, though only end-to-end placement occurred in several alignments. Most elements seem to have been set on their broadest surfaces. Occasional upright placement occurred but did not dominate any alignments. Few alignments were visible in the west sector of the feature because of sedimentation, but those that could be seen contain elements that were predominantly set sideways, especially in the west boundary alignment. End-to-end placement occurs in other alignments but does not dominate them. All elements were set on their broadest surfaces; no uprights were observed in this zone.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Some variation in the size and frequency of cobbles in the mulch was seen between the east and west sectors of the feature. Cobbles were much more abundant and larger in the east sector than in the west. This was especially true of an area at the base of the terrace below two borrow pits, Features 16 and 17. While the greater frequency of cobbles in this area could be attributed to discard while sorting through materials from the borrow pits, this is unlikely. Cobbles in the east sector mulch, which are up to 12–15 cm long, appeared to be components of the mulch rather than spoils. Most cobbles in the west sector mulch are only 5–8 cm long. Excavation suggested that the mulch was 5–7 cm thick in this feature. Vegetation seemed to be slightly denser on the feature than on the adjacent unmulched surface.

Feature 22

Feature 22 is a large, irregular, gravel-mulched plot that measures 39.5 by 38.0 m and covers roughly 936 sq m (Fig. 7.7). This field extends into the construction zone and was completely mapped. Two excavation units were used to examine the structure and fill of this feature. The east edge of Feature 22 is truncated by U.S. 285, and it is unknown how far it originally extended in that direction. A buried cable trench has been cut through the approximate center of the remaining section of the feature and has damaged that area. In addition, the southwest corner of the feature was bladed to facilitate construc-

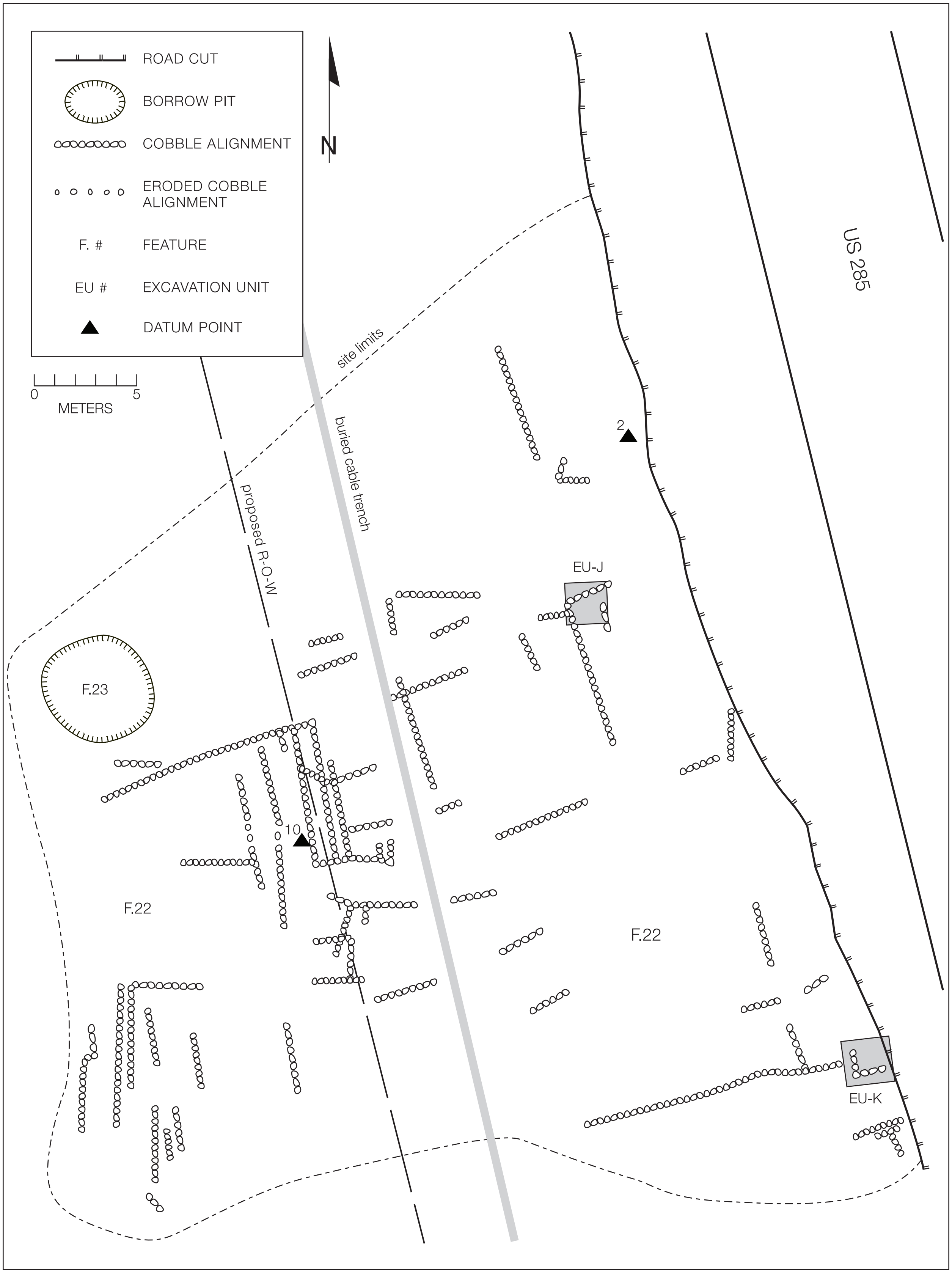


Figure 7.7. Features 22 and 23, LA 105703.

tion of a billboard. About 50–75 percent of the feature surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally available cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long; the few small boulders that were used are 25–45 cm long. Most alignments contain a mixture of elements set end-to-end or sideways. Upright placement is common and mixed with elements set on their broadest surfaces. Upright placement tends to predominate in alignments where elements were mostly set sideways. The distribution of visible alignments in this field suggests that it was divided into multiple cells, many of which seem to have been quite small.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. The mulch was 13–17 cm thick in the excavation unit and is probably of a similar depth elsewhere in the feature. Vegetational density was not noticeably heavier on the feature than in adjacent off-feature areas.

Feature 23

Feature 23 is a round terrace-edge borrow pit that is 5.5 m in diameter, with a maximum depth of about 0.25 m (Fig. 7.7). It is near Feature 22 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have filled the bottom of this feature to an unknown depth. No cultural materials were found in association with this feature.

Discussion of Surface Information

As noted above, LA 105703 is atypical of the fields examined during this project in that it was built along the edge of a low eroded terrace on the east side of the Rio Ojo Caliente, rather than on a high terrace. The location of the other fields on the higher terrace was probably a precaution against cold air drainage through the valley bottom. LA 105703 may not have been sited as advantageously to avoid that danger, but an important aspect of site location was apparently the presence of abundant gravels and cobbles for building features. Some of the most intricate farming features examined during this study were found at LA 105703. The west-central section of Feature 18 contains an area that was subdivided into a checkerboard of small cells. A somewhat lusher growth of vegetation occurred in an adjacent area directly southwest of the checkerboard and may indicate the location of a seep. If so, this part of the feature may have been used to grow plants that required more water than the usual crops grown in mulched fields. As discussed below, excavation showed that this pattern of small cells was more widespread than surface indications suggested and was mulched in a variety of ways. Again, this may indicate that a different type of crop was usually planted in these fields.

Some evidence of multiple construction episodes was noted at LA 105703. Feature 3 was built on the back edge of Feature 2 and is mounded above the surface of that earlier field. Several borrow pits are also configured in a way that suggests they were used as sources of building materials on multiple occasions. This is especially true of Features 12 and 13, which appear to encroach upon one another, and Features 14 and 15. A possible stockpile of building materials between Features 2 and 5 indicates that some areas may have still been under construction at the time of abandonment.

Farming features were not restricted to the detailed examination zone. Alignments continued to the east, outside the mapped area. They included a few contour terraces in the northeast section of the site near the base of a hill. A few checkdams were also noted, crossing shallow drainages uphill from the detailed examination area. Features are better preserved and more visible in upslope areas because they have not been subjected to the same degree of erosion and sedimentation.

Table 7.1 presents basic information on the chipped stone assemblage collected from the construction zone at LA 105703. A total of 1,058 chipped stone artifacts were recovered from the surfaces of 12 features. The largest percentage came from Feature 18 (34.9 percent), followed by

Table 7.1. Chipped stone artifacts collected from features within the highway right-of-way at LA 105703 (material type by morphology)

Feature No.	Material Type	Angular Debris	Core Flakes	Cores	Hoes
2	Chert	-	2	-	-
	Rhyolite	44	85	7	-
	Andesite	-	1	-	-
	Quartzite	1	2	-	-
	Massive quartz	1	3	-	-
3	Rhyolite	1	1	-	-
6	Rhyolite	1	3	1	-
7	Rhyolite	6	4	1	-
12	Rhyolite	15	17	-	-
	Quartzite	1	-	-	-
14	Rhyolite	6	19	2	-
	Quartzite	-	1	-	-
16	Rhyolite	4	14	3	-
17	Rhyolite	4	9	3	-
18	Chert	-	2	-	-
	Pedernal chert	-	1	-	-
	Obsidian	-	1	-	-
	Rhyolite	98	218	31	2
	Andesite	1	6	1	-
	Welded tuff	2	1	-	-
	Quartzite	-	3	-	-
	Massive quartz	-	2	-	-
19	Rhyolite	11	16	-	-
21	Pedernal chert	-	1	-	-
	Igneous undifferentiated	-	1	-	-
	Rhyolite	69	128	12	-
	Andesite	2	2	-	-
	Welded tuff	-	1	-	-
	Quartzite	-	2	1	-
	Massive quartz	-	2	-	-
22	Pedernal chert	-	1	-	-
	Rhyolite	49	114	6	-
	Andesite	3	1	1	-
	Quartzite	-	2	-	-
	Massive quartz	-	2	-	-

Feature 21 (20.9 percent), Feature 22 (16.9 percent), and Feature 2 (13.8 percent). These four gravel-mulched fields were largely within the highway right-of-way. Other fields that barely extended into the right-of-way and borrow pits tended to produce few chipped stone artifacts. Overall, the assemblage was heavily dominated by a variety of rhyolites, which comprise 94.9 percent of the chipped stone artifacts collected from feature surfaces. Other than Pedernal chert and obsidian, which together comprised only 0.4 percent of the assemblage, materials reduced at LA 105703 were available on-site in gravel deposits. The only formal tools recovered were two crudely chipped hoes. Otherwise, only reduction debris (core flakes, angular debris, and cores) was recovered, suggesting that raw-material quarrying and initial reduction were important activities. This possibility is addressed in greater detail in a later chapter. Since these artifacts were collected from feature surfaces, they were produced after the fields were built and while they were still in use, or after they were abandoned.

Twenty-nine sherds were also recovered during surface collection, all biscuit wares. Over a third were recovered from Feature 18, including nine Biscuit B sherds and one unpainted biscuit ware sherd. Slightly more than a quarter of the pottery came from Feature 16, which yielded six Biscuit B sherds and two unpainted biscuit ware sherds. Three Biscuit B and one Biscuit A sherds were recovered from the surface of Feature 2, and four Biscuit B sherds were found on Feature 21. An undifferentiated biscuit ware sherd was recovered from Feature 12, and two unpainted biscuit ware sherds were found on Feature 8. Biscuit B is by far the dominant type in this assemblage, comprising 75.9 percent. Only a single Biscuit A sherd (3.4 percent) was identified.

In addition to the assemblage of cultural materials that was collected within project limits, a surface inventory was conducted in the area upslope from Feature 18. Chipped stone artifacts dominated this assemblage, and the most common material was gray rhyolite, most of which occurred in clusters of from two to eight artifacts, suggesting numerous discrete chipping episodes. They included 120 core flakes, 28 angular debris, 23 cores, and 1 tested cobble. Other chipped stone materials inventoried were red rhyolite (6 core flakes, 1 angular debris, 5 cores), andesite (3 core flakes, 1 core), massive quartz (1 core flake, 3 angular debris, 3 cores), and chert (1 core flake). Pottery was comparatively scarce through the same zone and included 2 Biscuit B sherds (1 bowl, 1 jar) and an unidentified biscuit ware bowl sherd.

Results of Excavation

Fourteen 2 by 2 m excavation units were used to examine subsurface deposits and construction techniques in five features at LA 105703. Except for Feature 20, all gravel-mulched fields that extended into construction limits were examined. As noted earlier, Feature 20 was not examined in this detail because of its small size and badly deteriorated condition. When possible, excavation was conducted in natural stratigraphic units.

Three basic soil strata were defined in excavation units. Stratum 1 was comprised of the eolian and colluvial sediments that partly covered most features, Stratum 2 was the layer of mulch, and Stratum 3 was the original terrace surface. Excavation generally halted when Stratum 3 was encountered. More detailed descriptions of strata are included in the discussions of individual excavation units.

Feature 2

Three excavation units were used to examine parts of Feature 2 that extended into the right-of-way. EU-B was placed in an eroded zone near the west-central section of the boundary alignment. The other units were placed in the southwest section of the feature: EU-C near the edge of the U.S. 285 roadcut, and EU-D adjacent to a disturbed area near the right-of-way edge (Fig. 7.2).

Even though EU-B was placed in an eroded area, preservation was very good. Stratum 1 was a thin mantle of brown sandy loam with an average thickness of 1.8 cm. Stratum 2 contained a matrix of unsorted pea gravels, gravels, and small cobbles infiltrated by dark brown sandy soil. The layer of mulch was 10.0 to 15.5 cm thick and had a mean thickness of 13.3 cm. A sample taken from the mulch yielded corn and cotton pollen. A lateral fragment of a rhyolite core flake in Stratum 2 was the only artifact recovered from EU-B.

With the mulch removed, a series of cobble alignments was revealed in EU-B (Figs. 7.8 and 7.9). These interior subdividing alignments appear to form small rectangular cells in this part of the feature. Parts of at least six cells were encountered in EU-B (Fig. 7.8). The only cell that was completely exposed measured 1.25 m east-west by 0.85 m north-south. As Figure 7.8 shows, most cobbles were placed end-to-end, though a few were set sideways. Most cobbles were also placed on their broadest surfaces, though a few were set upright, especially in the northwest corner of the excavation unit. All exposed alignments were one element high and wide.

EU-C was placed near the edge of the U.S. 285 roadcut in an area thought to contain two perpendicular interior subdividing alignments (Fig. 7.2). Stratum 1 was a relatively thin layer of tan sandy loam containing 20–30 percent pea gravels that ranged from 1–7 cm thick and averaged 2.9 cm. Two chipped stone artifacts were recovered from Stratum 1: a rhyolite core flake and a multidirectional rhyolite core. Stratum 2

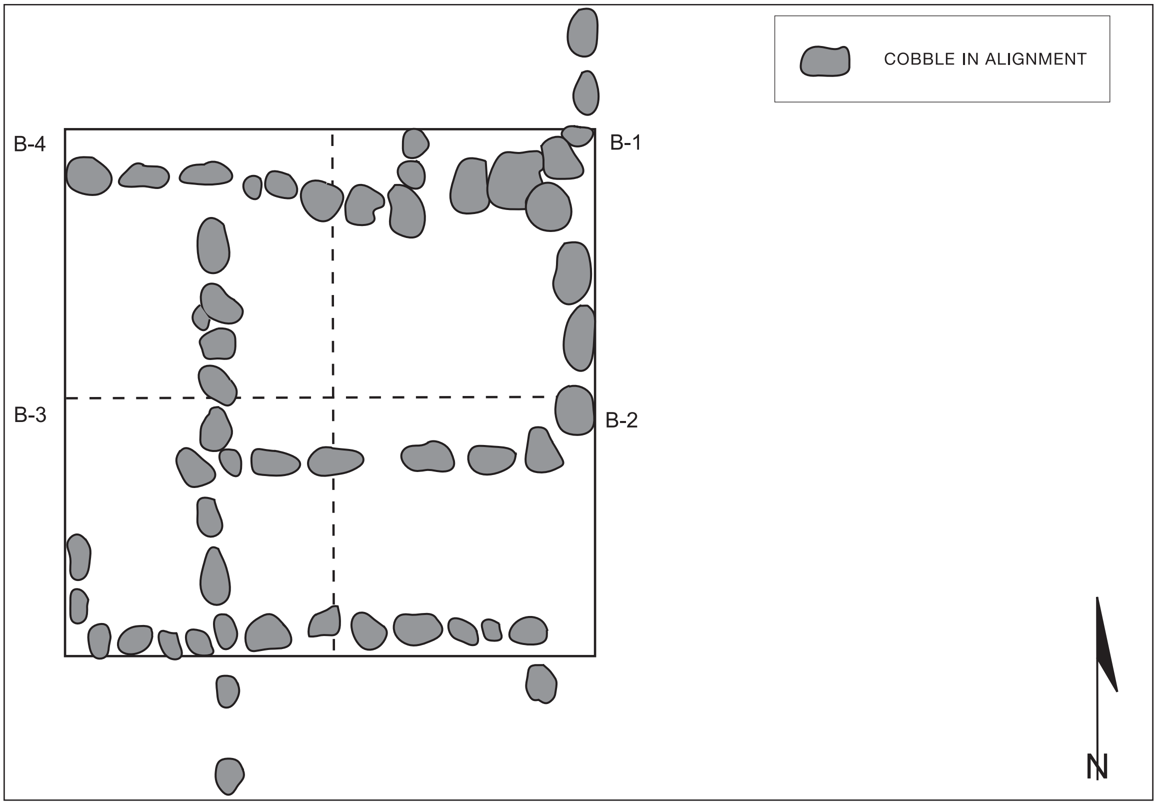


Figure 7.8. Postexcavation plan of EU-B in Feature 2, LA 105703.

Figure 7.9. Cobble alignments in EU-B after excavation, looking west.

was a matrix of pea- to fist-sized gravels and cobbles that were infiltrated by dark tan sandy soil. The layer of mulch was 2–11 cm thick and had a mean thickness of 6.4 cm. A sample taken from the mulch yielded high concentrations of corn and cotton pollen (see Appendix 1). Other artifacts recovered from this stratum included five rhyolite flakes, two pieces of rhyolite angular debris, and two undifferentiated biscuit ware sherds.

Removal of the mulch revealed a series of cobbles placed in no discernible pattern (Figs. 7.10 and 7.11). Indeed, about a quarter of the cobbles were removed during excavation because they were floating in the gravel mulch (Fig. 7.10). Since no alignments were identified in this excavation unit, no discrete cells were identified.

EU-D was placed near the edge of the right-of-way in a part of Feature 2 that contained surface evidence of two perpendicular and intersecting cobble alignments (Fig. 7.2). This area had also sustained damage from vehicular traffic, and preservation seemed to be moderate. Stratum 1 was a thin layer of brown loamy sand containing quite a few pea gravels; it ranged from 0 to 3 cm thick, with a mean thickness of 1.0 cm. Stratum 2 was a matrix of unsorted pea gravels, medium- to large-sized gravels, and cobbles that had been infiltrated by a tan loamy sand. The layer of mulch was 3 to 9 cm thick, with a mean thickness of 5.6 cm. A sample taken from the mulch yielded no pollen from domesticated plants. A piece of rhyolite angular debris was the only artifact recovered from this layer.

Removal of the mulch revealed two probable interior subdividing alignments (Fig. 7.12). These alignments were perpendicular to one another and appear to have originally met near the northwest corner of Grid D-1. However, vehicular traffic over this area moved several elements, disrupting the joint between these alignments. Numerous cobbles that form no discernible pattern were also exposed, especially in Grids D-1 and D-2. These cobbles appear to have been used as mulch rather than as building elements.

Feature 8

One excavation unit was used to examine the section of Feature 8 that extends into the right-of-way (Fig. 7.1). EU-A was placed along the north edge of the feature to expose a section of the north boundary alignment and an interior subdividing alignment that were visible from the surface. Stratum 1 was a thin mantle of dark tan loamy sand containing about 15 percent pea gravels, which probably represent the top of the mulch. It was 0–3 cm thick across the excavation unit and averaged 1.2 cm. One rhyolite core flake was recovered from Stratum 1. Stratum 2 was a matrix of medium to large gravels and some small cobbles that had been infiltrated by a dark tan loamy sand. A sample taken from the mulch yielded a high concentration of corn pollen. A single rhyolite core flake was also recovered from this stratum.

Removal of the mulch revealed several cobble alignments as well as numerous cobbles that did not appear to form alignments and were probably part of the mulch (Figs 7.13 and 7.14). The north boundary alignment was somewhat disarticulated and ran through the north third of Grids A-1 and A-3, extending to the west outside the excavated area. The natural terrace surface was encountered during excavation on the north side of this alignment, indicating that our assessment of its function was correct. An interior subdividing alignment ran north-south through the west edge of Grids A-3 and A-4. Two other possible interior subdividing alignments were noted during excavation that were not visible from the surface. One paralleled the north boundary alignment and ran east-west along the north edge of Grid A-2, extending into Grid A-3. The second paralleled the definite interior subdividing alignment and ran north-south along the east edge of Grid A-3. Two cobbles in the south-central part of Grid A-3 may have been the remains of a short alignment that once connected the two north-south interior subdividing alignments. These results suggest that this part of Feature 8 may have been subdivided into a series of small cells. Most cobbles in the alignments were set end-to-end on their broadest surfaces, though a few examples of sideways placement were also noted.

Feature 18

Eight excavation units were used to examine parts of Feature 18 that extended into the construction zone. EU-E through EU-G were placed

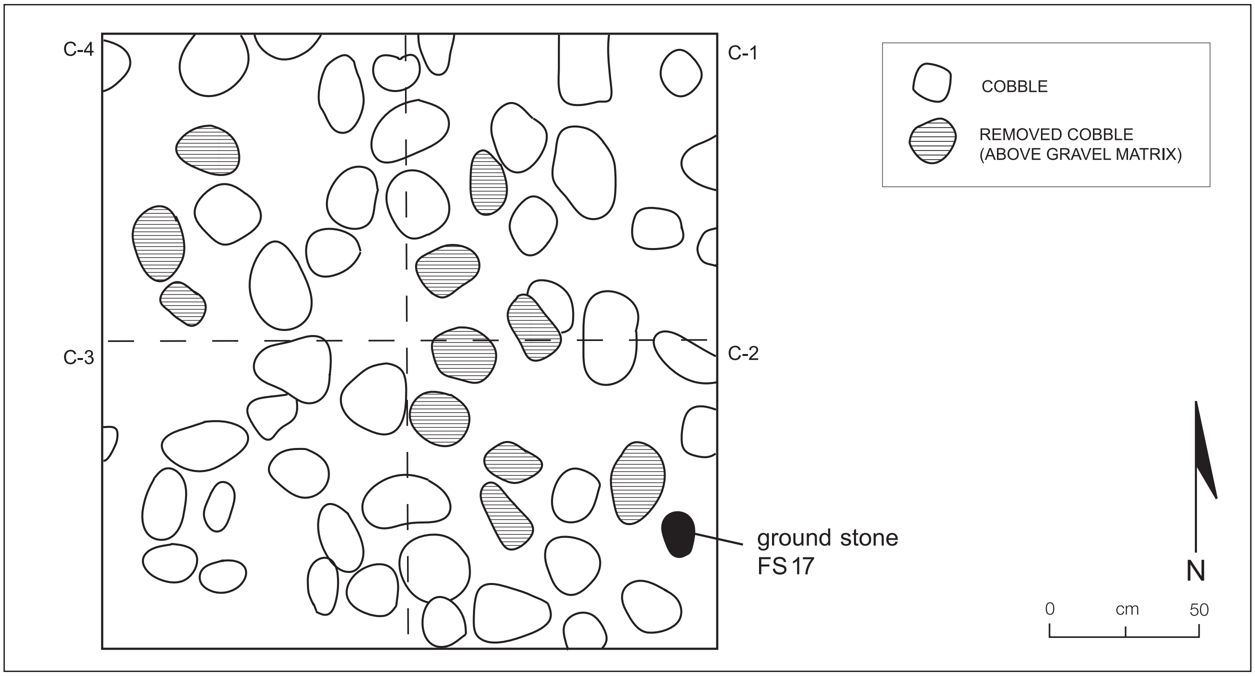


Figure 7.10. Postexcavation plan of EU-C in Feature 2, LA 105703.

Figure 7.11. EU-C in Feature 2 at LA 105703, looking west.

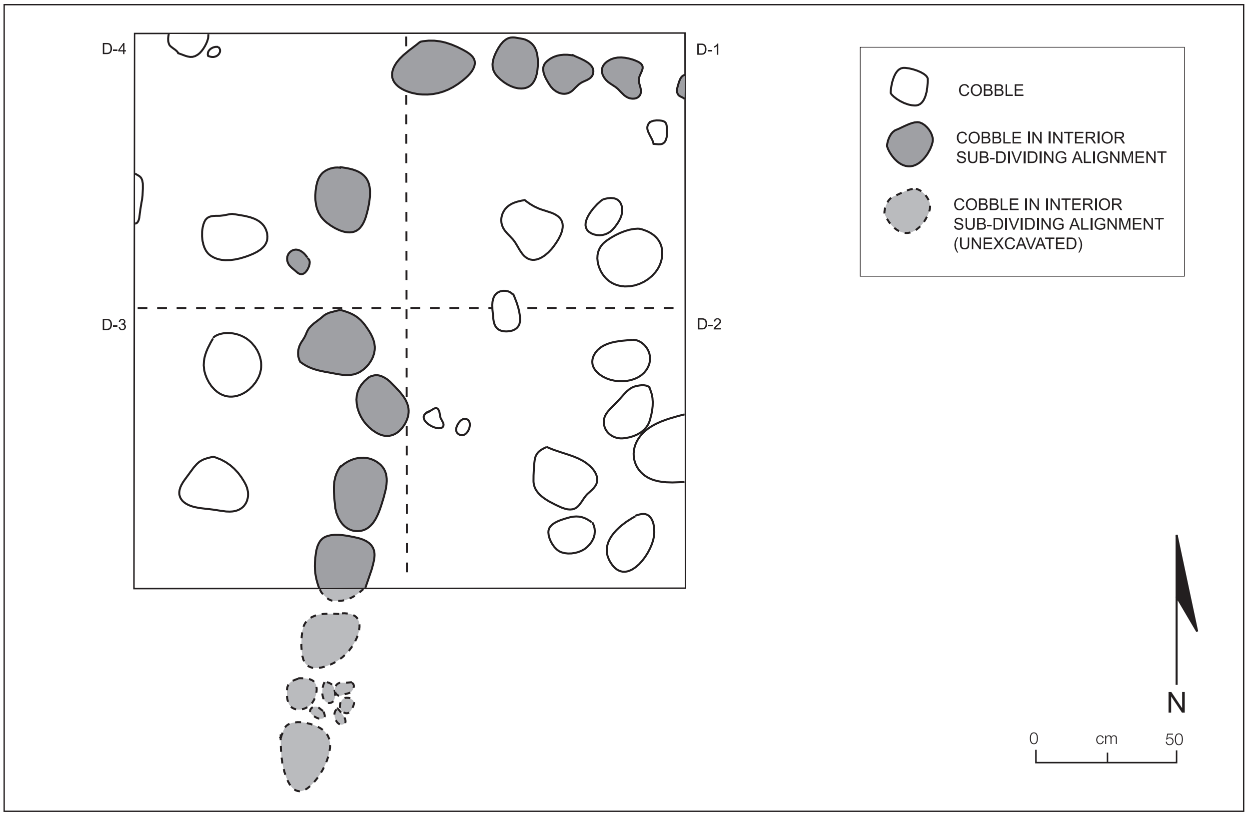


Figure 7.12. Postexcavation plan of EU-D in Feature 2, LA 105703.

in the central part of the feature and allowed us to examine the most intricately gridded section of Feature 18. The north part of the feature was the most heavily sedimented section; consequently few good alignments were visible in that area, and EU-H, EU-I, EU-L, and EU-O were used to examine the structure and fill of that part of the feature. EU-N was used to investigate a series of parallel alignments in the south part of the feature (Fig. 7.6).

EU-E was excavated in the west-central part of the feature in an area that from surface inspection seemed likely to contain an intricate system of small cobble-bordered cells. Stratum 1 was a very thin layer of dark tan loamy sand containing 10–15 percent pea gravels ranging from 0 to 2 cm thick and averaging 0.5 cm. Stratum 2 was a matrix of unsorted pea gravels and small- to medium-sized gravels above a layer of intentionally placed cobbles. The gravel layer was 5–9 cm thick, with a mean thickness of 8 cm. The cobble layer was not removed from most of the excavation unit and added another 3–7 cm to the thickness of the mulch. Underlying the mulch was a sterile sand that constituted the original terrace surface. A sample taken from the mulch yielded a low to moderate concentration of corn pollen. Two Biscuit B sherds were recovered from Stratum 2.

Removal of the mulch revealed an intricately constructed section of farming plot (Figs. 7.15 and 7.16). Four complete and five or six partial cells were exposed. The cells were about 50 cm wide and 50–55 cm long with walls formed of upright cobbles and boulders. The floor of each cell was lined with a layer of cobbles a single element deep placed on their broadest surfaces with spaces between. Gravel mulch was then applied, covering the cobble mulch and filling the spaces between them. Much of the cobble base course was removed from cells in Grids E-1 and E-2 before we realized what it was. Since elements used to build alignments were predominantly set upright, the cobble mulch probably represents a base course for drainage, and the gravels represent the main layer of mulch, which was applied right after the base course was laid. Otherwise, cobbles in the interior subdividing alignments

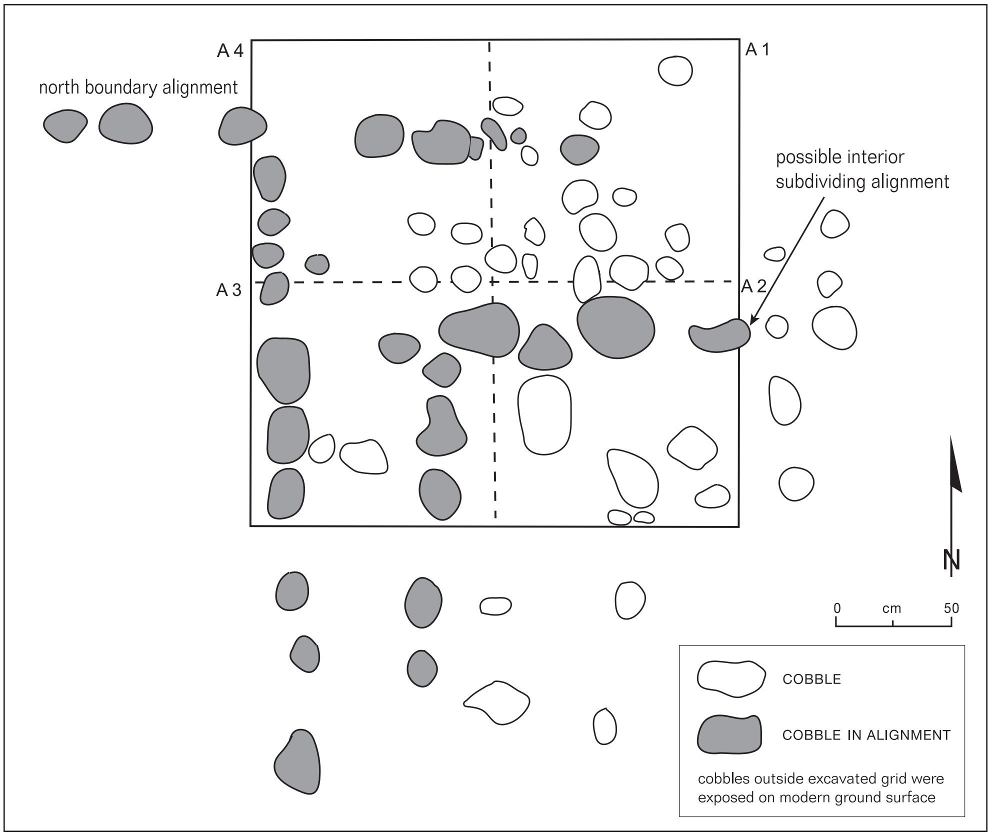


Figure 7.13. Postexcavation plan of EU-A in Feature 8, LA 105703.

Figure 7.14. EU-A in Feature 8 at LA 105703, looking south.

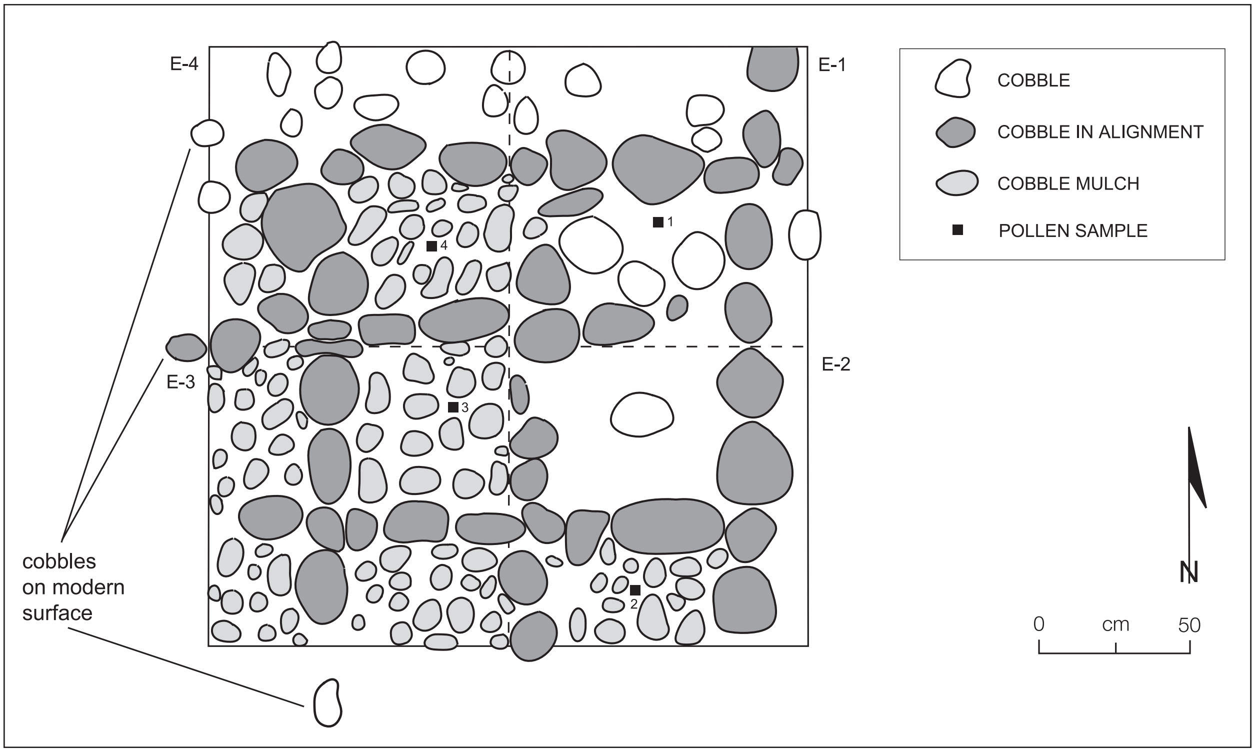


Figure 7.15. Postexcavation plan of EU-E in Feature 18, LA 105703.

Figure 7.16. EU-E in Feature 18 at LA 105703, looking northeast.

would be unsupported and prone to collapse. Thus, only one construction and use episode appears to be represented.

EU-F was excavated almost directly northwest of EU-E to help investigate the same set of features (Fig. 7.6). Stratum 1, a thin layer of dark tan loamy sand containing numerous pea gravels and a few larger gravels, was 0–5 cm thick and averaged 1.9 cm. A rhyolite core flake was collected from the surface of this stratum, and two Biscuit B sherds and a piece of rhyolite angular debris were recovered by screening. Stratum 2 was essentially the same as defined in EU-E. It consisted of two layers: pea gravels and gravels overlying a layer of cobbles that lined the original terrace surface. Together these layers were 5–20 cm thick, with a mean thickness of 10.3 cm. A sample taken from the mulch contained a low to moderate concentration of corn pollen. Four rhyolite core flakes and three rhyolite angular debris were also recovered from this layer.

When the mulch was removed, an intricate section of farming plot identical in construction to the section uncovered in EU-E was exposed (Figs. 7.17 and 7.18). Two complete and nine partial cells were found. The fully exposed cells were 80 cm long by 50–70 cm wide; partly exposed cells were 40–50 cm wide. The floor of each cell was lined with a layer of cobbles a single element deep placed on their broadest surfaces. Spaces were left between cobbles in some cells, while in others they were closely packed together (Fig. 7.17). Part of the cobble mulch was removed from the northeast quarter of the excavation unit to expose the terrace surface. Most elements were set end-to-end and upright, though a few were placed sideways and upright (Fig. 7.18). As noted above, this type of construction suggests that the cobble mulch represents a base course for drainage, and the gravels represent the main layer of mulch that was probably applied immediately after the base course was laid. Thus, only one construction and use episode appears to be represented.

EU-G was used to examine the south end of a fairly long alignment in the east-central part of Feature 18 (Fig. 7.6). Elements were widely spaced in most of this alignment. We were uncertain whether this meant that much of it was sedimented over, or had been displaced, or represented a series of large evenly spaced elements. Stratum 1 was a fairly thick layer of tan sandy loam and duff from nearby trees, which also contained some pea gravels. This layer was 0–10 cm thick and had a mean thickness of 4.1 cm. Two rhyolite core flakes were recovered from Stratum 1. Stratum 2 was a matrix of pea gravels, gravels, and cobbles that had been infiltrated by a dark brown loamy sand. The layer of mulch was 4–18 cm thick and averaged 9.9 cm. Besides a rhyolite core flake and a rhyolite angular debris, a peach pit was recovered from this layer. Since the pit was not exposed in situ, we are uncertain whether it came from the upper part of the unit, which would connote fairly recent deposition, or was from deeper in the stratum. A sample taken from the mulch yielded a high corn pollen concentration.

Excavation in this unit exposed a possible north-south trending cobble alignment (Figs. 7.19 and 7.20). Other cobbles exposed in this unit were floating in the gravel mulch and were undoubtedly part of the mulch. Some elements in the section of interior subdividing alignment that was uncovered seem to have been displaced, and the alignment does not extend completely across the excavation unit. This may indicate a greater degree of displacement than at first seemed possible, or that the alignment was never continuous.

EU-H was excavated in the north sector of Feature 18 to examine a short segment of interior subdividing alignment visible from the surface (Fig. 7.6). Stratum 1 was a moderately thin layer of dark tan loamy sand containing some pea gravels and occasional gravel. It was 0–6 cm thick with a mean thickness of 2.2 cm. Stratum 2 was a matrix of pea gravels and gravels that had been infiltrated by a dark tan loamy sand. The layer of gravel mulch was 2–8 cm thick and averaged 3.4 cm. It was underlain by a layer of small- to medium-sized cobbles that was a single element thick north of the interior subdividing alignment and up to two elements thick on the south side (Figs. 7.21 and 7.22). Cobbles in this layer of mulch looked like they were poured in rather than placed and were tightly packed, with no dominant orientation. A sample taken from the mulch yielded a moderate corn pollen concentration. A rhyolite core flake was also recovered from this layer.

Removal of the gravel mulch revealed a sec-

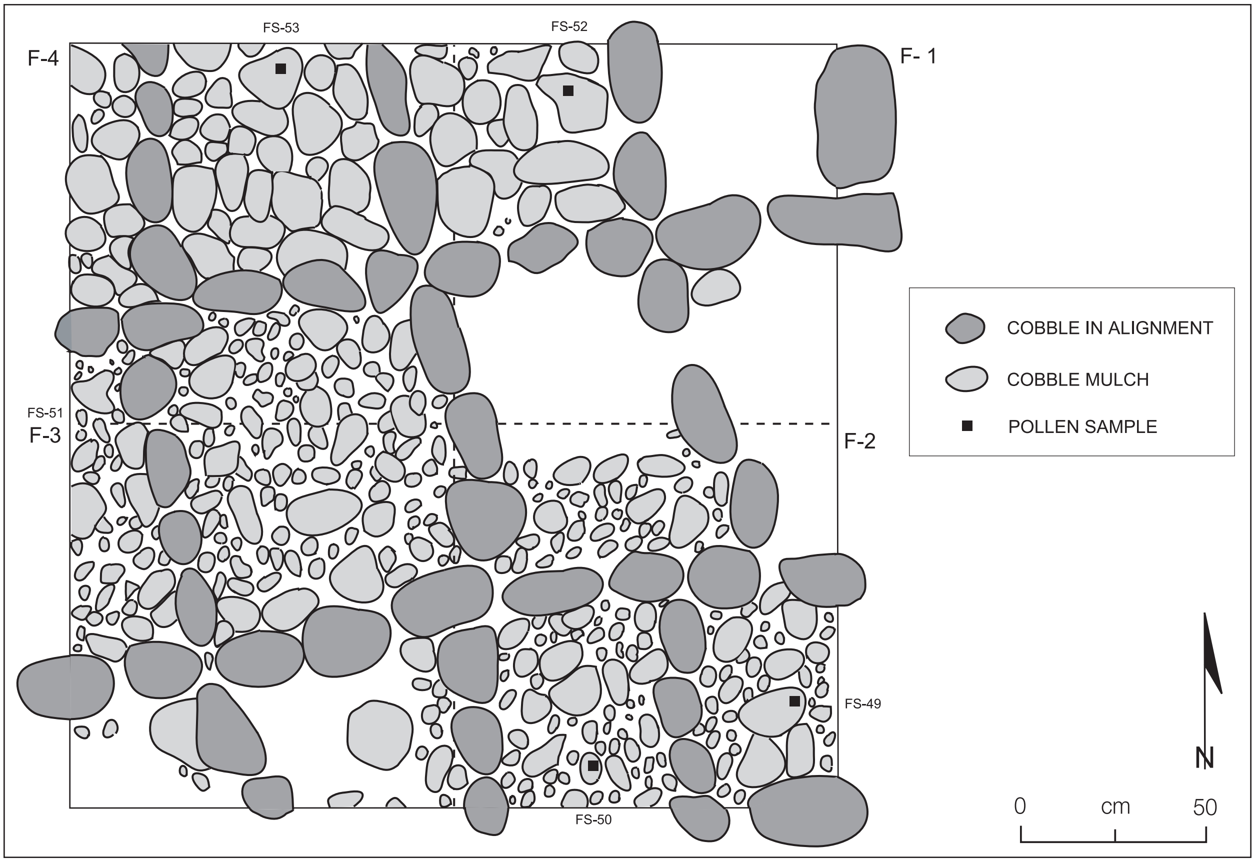


Figure 7.17. Postexcavation plan of EU-F in Feature 8, LA 105703.

Figure 7.18. EU-F in Feature 18 at LA 105703, looking west.

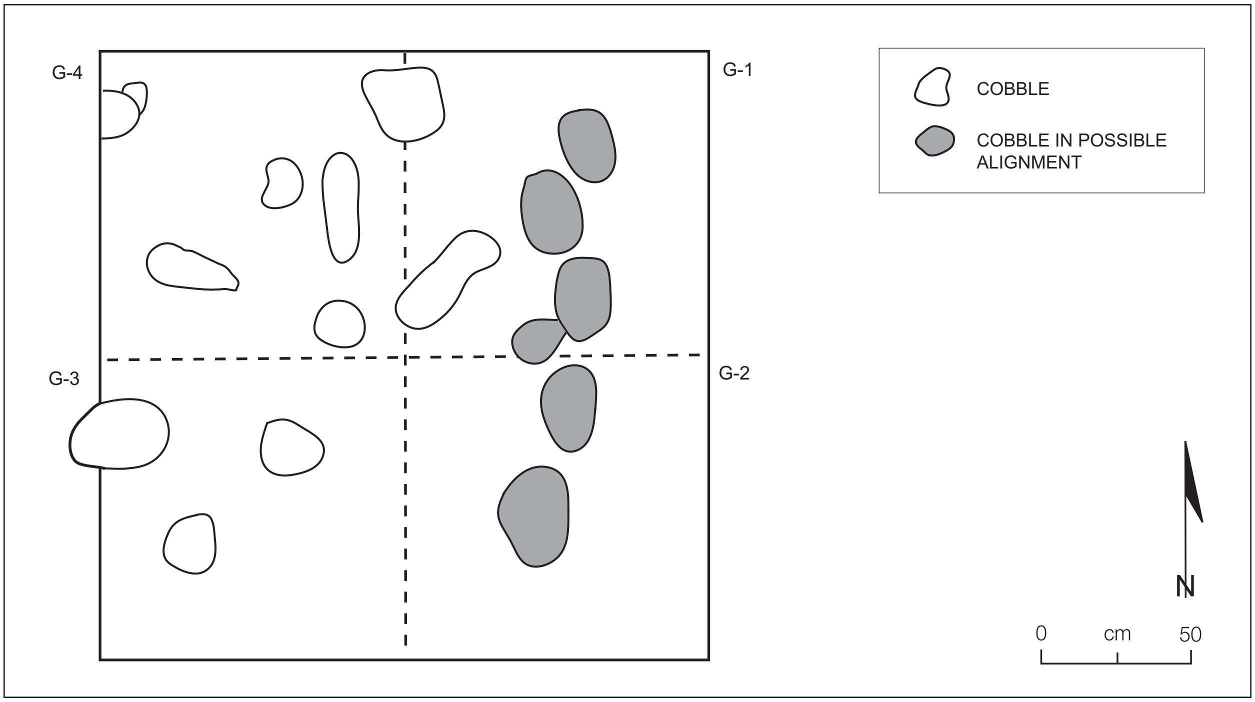


Figure 7.19 Postexcavation plan of EU-G in Feature 18, LA 105703.

Figure 7.20. EU-G in Feature 18 at LA 105703, looking north.

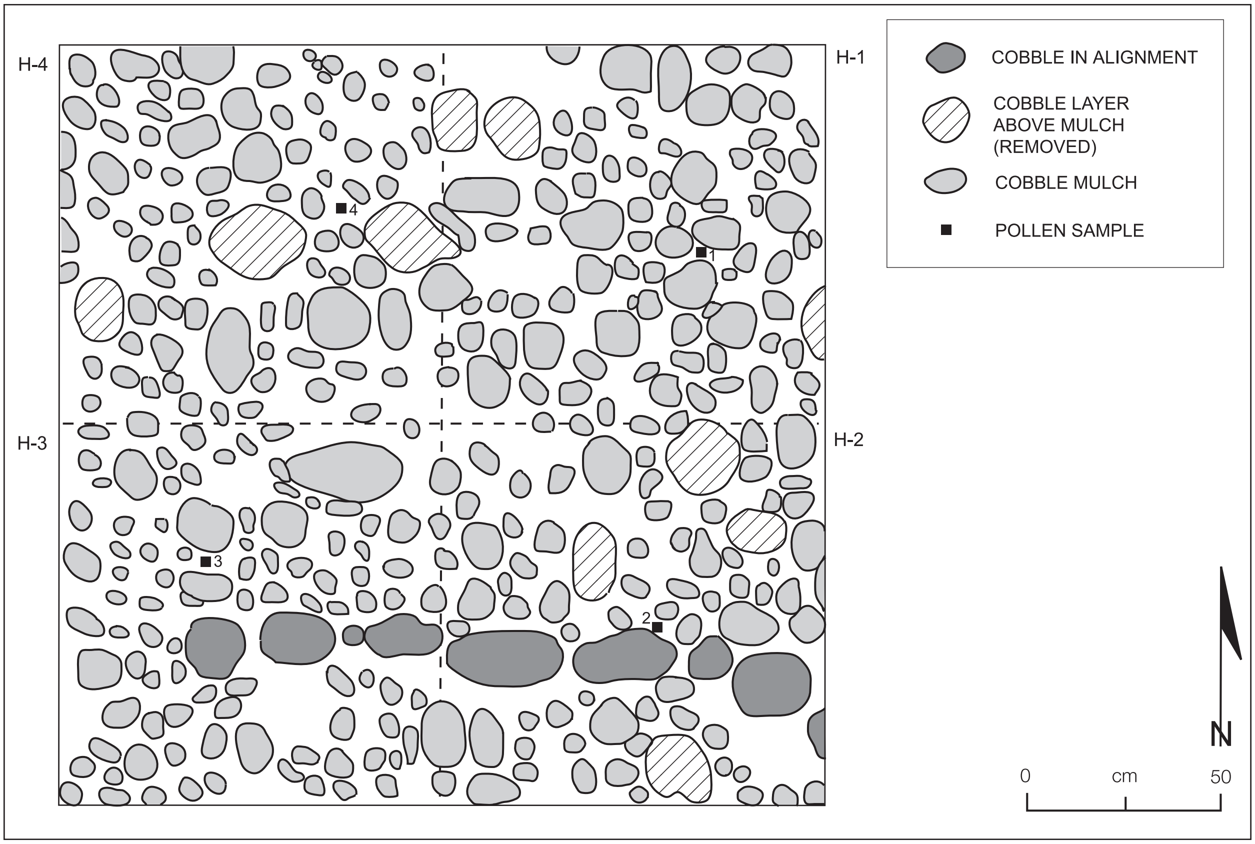


Figure 7.21. Postexcavation plan of EU-H in Feature 18, LA 105703.

Figure 7.22. EU-H in Feature 18 at LA 105703, looking east.

tion of interior subdividing alignment running east-west through Grids H-2 and H-3, though some elements appeared to be missing from its west end (Fig. 7.21). The remainder of this excavation unit was covered by cobble mulch (Fig. 7.22), and some cobbles also occurred as floaters in the upper layer of mulch.

EU-I was placed in the north-central section of Feature 18 to investigate an area with no surface indications of alignments (Fig. 7.6). Stratum 1 was a moderate to thick layer of tan sandy loam containing some pea gravels. It was 0–7 cm thick, with a mean thickness of 2.8 cm. An undifferentiated biscuit ware sherd and a piece of rhyolite angular debris were the only artifacts recovered from this layer. Stratum 2 was a matrix of pea gravels, gravels, and small cobbles that had been infiltrated by a brown sandy loam. The gravel mulch was 2–11 cm thick, averaging 7.2 cm. It was underlain by a layer of cobbles through much of the unit, which averaged 7.5 cm thick. Thus, the entire mulch layer had a mean thickness of 14.7 cm. A pollen sample taken from the mulch yielded a low concentration of corn pollen. Two Biscuit B sherds and a piece of rhyolite angular debris were also recovered from this unit.

Excavation exposed at least one east-west trending alignment and a pavement of cobble mulch in this unit (Fig. 7.23). Elements in the definite interior subdividing alignment were mostly set end-to-end, though some sideways placement also occurred. All elements in this alignment were set upright. Again, this type of construction suggests that the cobble mulch was a base course for drainage and that the gravels represent the main layer of mulch, which was probably applied immediately after the base course was laid. Thus, only one construction and use episode appear to be represented. While excavators thought they noted several other alignments in this unit, examination of excavation notes and drawings suggest that only the alignment shown in Figure 7.23 was definite, and that others probably represented cobble floaters in the gravel mulch.

EU-L was placed in the northwest part of Feature 18 to study an area where two cobble-bordered plots were suggested by surface inspection (Fig. 7.6). Stratum 1 was a thin to moderately thick layer of tan sandy loam containing some pea gravels. It was 0–5 cm thick, with an average thickness of 2.2 cm. One rhyolite core flake was recovered from this layer. Stratum 2 was a matrix of unsorted pea gravels and gravels that had been infiltrated by a dark tan loamy sand. The

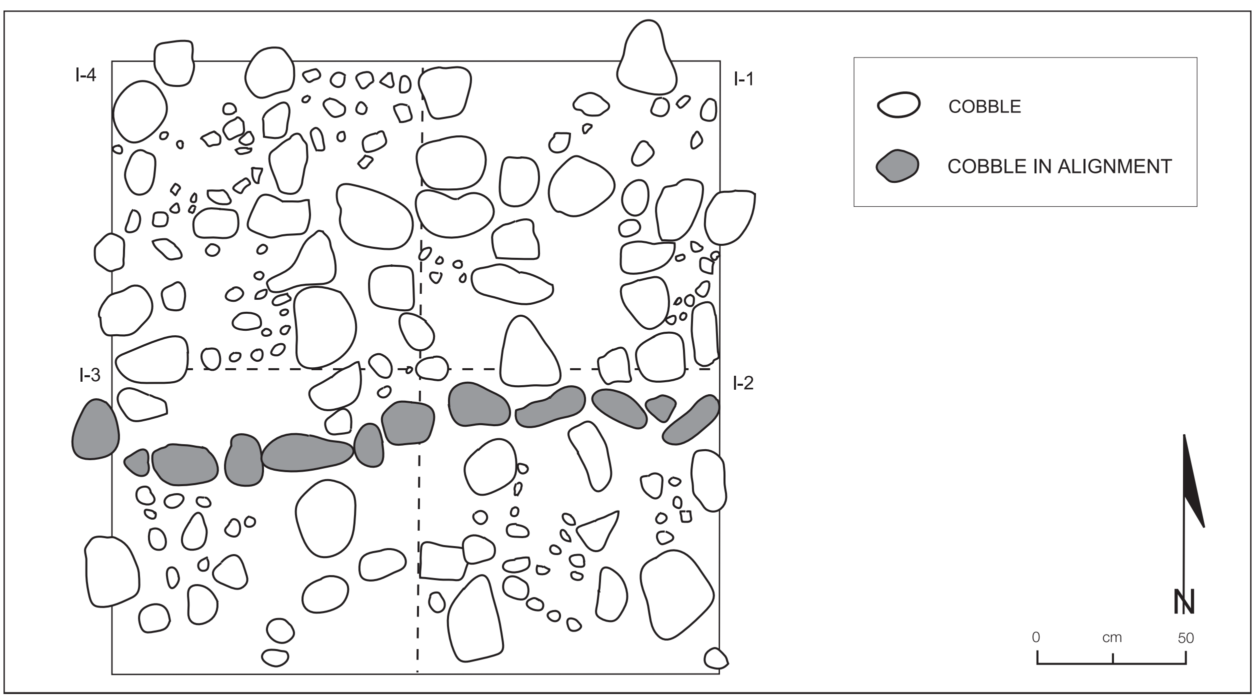


Figure 7.23. Postexcavation plan of EU-I in Feature 18, LA 105703.

gravel-mulch layer was 1–12 cm thick, with a mean thickness of 6.5 cm. A cobble mulch underlying the gravel mulch consisted of 6–8 cm long cobbles that were set on their broadest surfaces in a layer a single element thick. The cobble layer was an average of 8.0 cm thick and with the gravel layer comprised a mulch that averaged 14.5 cm thick. A soil sample from the mulch yielded no pollen from domesticated species. Eight rhyolite core flakes and three rhyolite angular debris were recovered from this layer.

Excavation in this unit exposed a pattern of noncontiguous, evenly spaced large cobbles and small boulders, forming at least four east-west trending alignments (Figs. 7.24 and 7.25). These elements formed a series of open cells that measured 40–50 cm on a side. Six complete and at least six partial cells were exposed in this excavational unit. The function of the larger evenly spaced elements is unknown, but they may simply have served to demarcate boundaries between crop rows. As Figure 7.25 shows, the evenly spaced boulders and cobble mulch were set on the same surface.

EU-N was placed in the south section of Feature 18 to examine a series of what appeared to be parallel interior subdividing alignments (Fig. 7.6). Visible elements were widely spaced, and most alignments seemed to be covered by sediments. Stratum 1 was a thin mantle of tan loamy sand containing some pea gravels, which probably represented the top of the mulch. This layer was 1–5 cm thick across the excavation unit and averaged 2.5 cm. Stratum 2 was a matrix of unsorted pea gravels, gravels, and small cobbles that had been infiltrated by a tan loamy sand. A sample taken from the mulch yielded a high concentration of corn pollen. No artifacts were recovered from either stratum in this excavational unit.

No alignments were exposed as the mulch was removed from this unit. Instead, a series of patterned but noncontiguous and evenly spaced large cobbles/small boulders was found (Figs. 7.26 and 7.27). These elements formed a series of open cells that measured about 80 cm long and wide. Three complete and at least four partial cells were exposed. The function of the larger evenly spaced elements is not known, but they may have been used to demarcate boundaries between crop rows.

EU-O was placed 8 m west of EU-H in the north part of Feature 18 to investigate an alignment that was defined from surface observation (Fig. 7.6). Stratum 1 was a moderately thick layer of tan sandy loam containing a few pea gravels. It was 2–5 cm thick, with a mean thickness of 3.3 cm. Stratum 2 was a matrix of unsorted pea gravels, gravels, and small cobbles that had been infiltrated by a dark tan sandy loam. This layer of mulch was 2–13 cm thick and averaged 6.9 cm. Excavation ended on top of a layer of cobble mulch, which was 5–7 cm thick. Both layers of mulch together probably averaged 12–14 cm thick. A sample taken from the mulch yielded no pollen from domesticated plants, and no artifacts were recovered from this unit.

Excavation in this unit exposed at least one cobble alignment and a series of noncontiguous, evenly spaced large cobbles/small boulders (Figs. 7.28 and 7.29). An interior subdividing alignment ran east-west through the south half of Grids O-2 and O-3 (Fig. 7.28). As can be seen in Figure 7.29, most cobbles in this alignment were set end-to-end and upright. This probably indicates that the cobble and gravel-mulch layers were laid at the same time, otherwise the unsupported cobbles in this alignment would have collapsed. North of the interior subdividing alignment was a series of noncontiguous, evenly spaced large elements forming a series of open cells that measured 50–70 cm on a side. Four complete and at least six partial cells were exposed. Directly south of the interior subdividing alignment was a series of smaller cobbles that seemed to form a second alignment that was not visible from the surface (Fig. 7.28). This alignment could simply be a section of mulch where cobbles were set in a fairly standard pattern, creating a false alignment. Then again, it could be evidence of an earlier field that was covered when this section of Feature 18 was built. While the former is more likely, the latter cannot be completely discounted. The cobble mulch was a single element thick, and nearly all cobbles were set on their broadest surfaces and packed fairly tightly.

Feature 21

One excavation unit was used to examine Feature 21 (Fig. 7.6). EU-M was placed in the southwest part of the feature to investigate short sections of

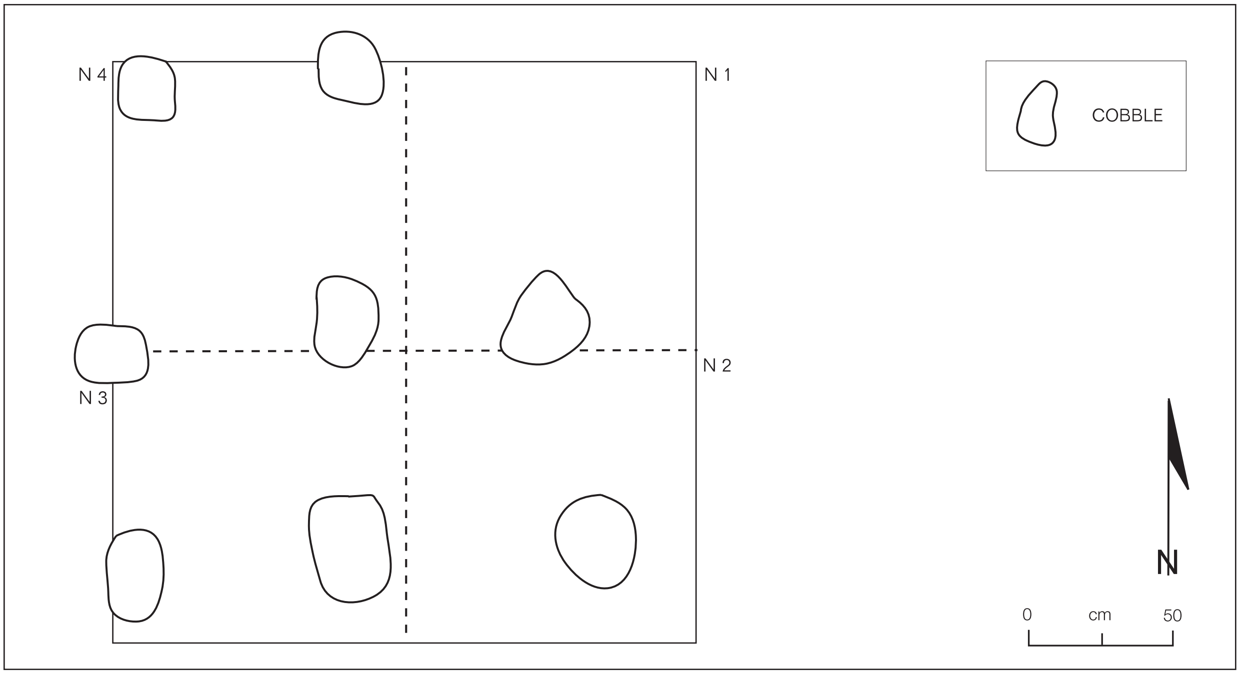


Figure 7.24. Postexcavation plan of EU-L in Feature 18, LA 105703.

Figure 7.25. Patterned boulders and cobble mulch. EU-L in Feature 18, LA 105703, looking east.

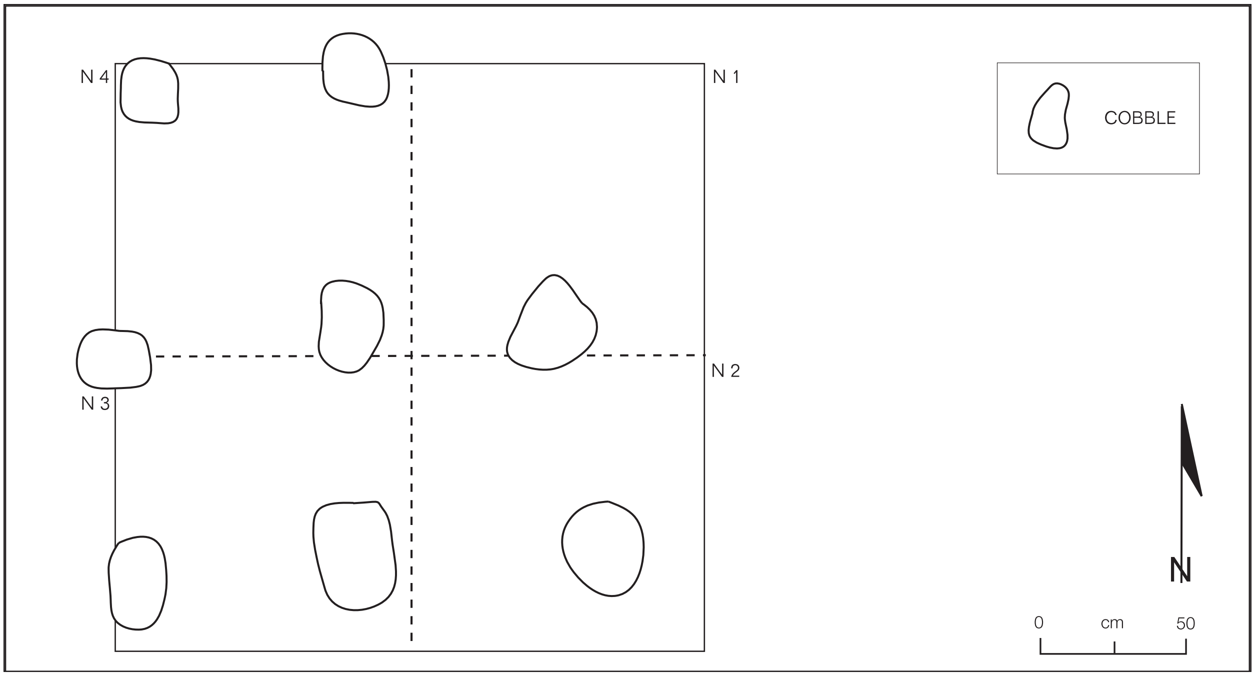


Figure 7.26. Postexcavation plan of EU-N in Feature 18, LA 105703.

Figure 7.27. EU-N in Feature 18 at LA 105703, looking south.

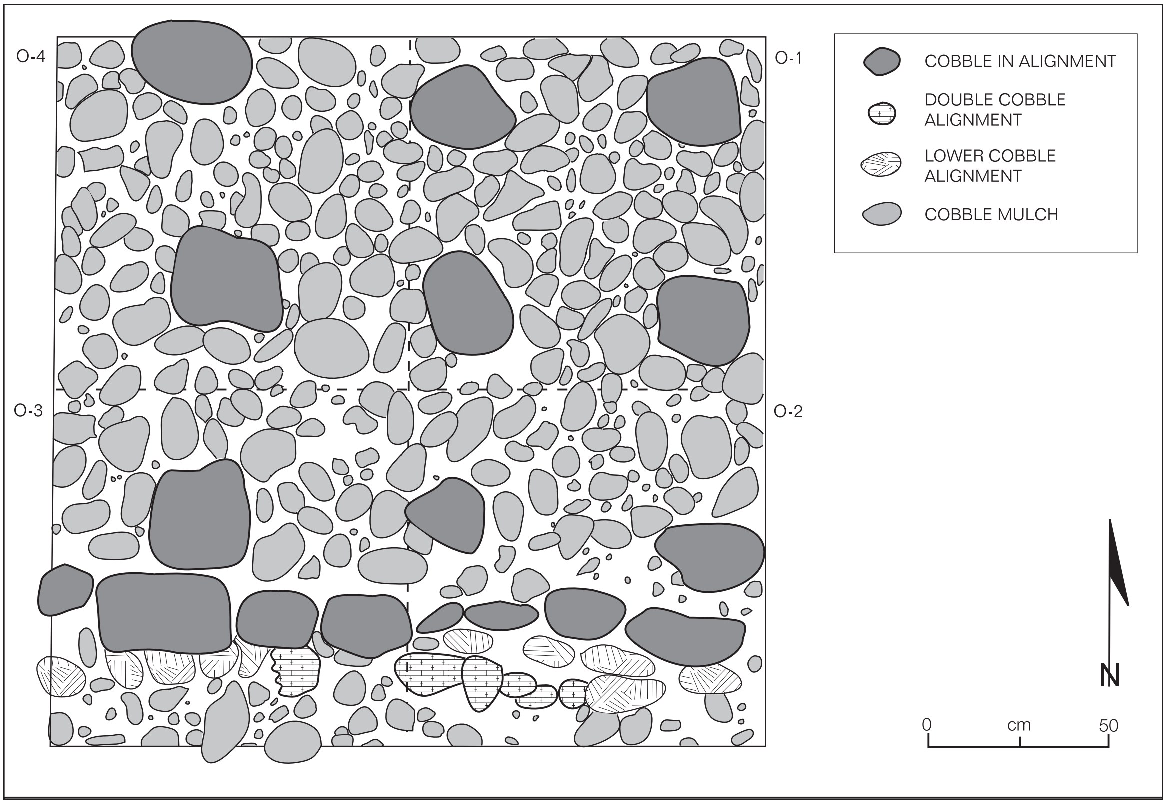


Figure 7.28. Postexcavation plan of EU-O in Feature 18, LA 105703.

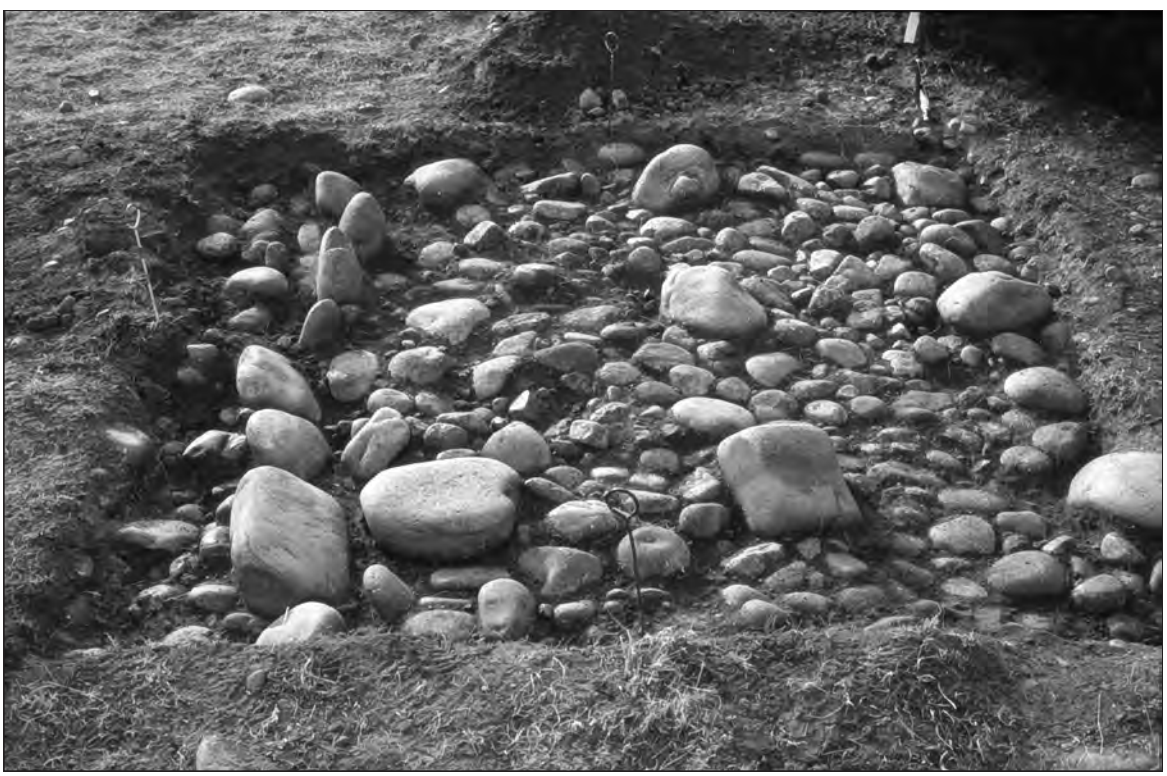


Figure 7.29. Interior subdividing alignment to the right and patterned, noncontiguous, evenly spaced boulders to the left. EU-O in Feature 18, LA 105703, looking west.

a boundary alignment and an interior subdividing alignment that were defined from surface indications. Stratum 1 was a thin layer of dark tan sandy loam containing a moderate amount of pea gravels. It was 0–4 cm thick, with a mean thickness of 0.8 cm. An undifferentiated biscuit ware sherd and a rhyolite core flake were recovered from this layer. Stratum 2 was a matrix of unsorted pea gravels, gravels, and small cobbles that had been infiltrated by a dark tan sandy loam. This layer of mulch was 4–17 cm thick, with an average thickness of 9.75 cm. A sample taken from the mulch yielded a moderate concentration of corn pollen. Other cultural materials recovered included an undifferentiated biscuit ware sherd and a unidirectional rhyolite core.

Excavation in this unit uncovered a partly disarticulated boundary alignment running through the north half of Grids M-1 and M-4 (Figs. 7.30 and 7.31). No sign of the interior subdividing alignment that was defined from surface observation was found, and it is likely that what was originally thought to be the alignment was actually a series of small cobbles floating in the gravel mulch that only seemed to be aligned. Though no evidence of a cobble mulch layer was found, small cobbles were very common in the gravel mulch, indicating that only larger elements were sorted out for use as building elements.

Feature 22

Two excavation units were used to investigate parts of Feature 22 that extend into the right-of-way (Fig. 7.7). EU-J was placed in the north-central part of the feature a few meters west of the edge of U.S. 285. EU-K was directly adjacent to the roadcut in the south part of the feature.

EU-J was excavated in an area where two perpendicular interior subdividing alignments were indicated by surface observation (Fig. 7.7). Stratum 1 was a very thin mantle of dark tan sandy loam which contained about 10 percent pea gravels. This stratum was 0–3 cm thick and had a mean thickness of 0.3 cm. Stratum 2 varied through this unit. To the north and west of the alignments in Grids J-1, J-3, and J-4, it was a matrix of unsorted pea gravels, gravels, and small cobbles that was infiltrated by a brown sandy loam. To the south and east of the alignments in Grids J-1, J-2, and J-3, this matrix overlay a cobble mulch layer. Overall, Stratum 2 was 2–14 cm thick, with a mean thickness of 8.2 cm. A sample from the mulch yielded a moderate to high corn pollen concentration and three pieces of rhyolite angular debris.

Removal of the mulch exposed two perpendicular alignments that met just northwest of the center of the unit and were a single element high and wide (Figs. 7.32 and 7.33). Most cobbles were set sideways on their broadest surfaces, though a few were placed end-to-end. At 8–10 cm long, elements in the cobble mulch were mostly smaller than those used in the alignments. They appeared to have been poured into the plot in a haphazard fashion, with no attention paid to orientation. The results of excavation in this unit were interesting, since it represents the juxtaposition of two different methods of mulching: gravel mulch, and layered cobble and gravel mulch.

EU-K was used to investigate two perpendicular alignments that were identified from surface observation (Fig. 7.7). Excavation showed that these alignments were actually part of a boundary alignment at the south edge of the feature. Stratum 1 was a fairly thick layer of light gray brown gravelly sandy loam. It was 2–11 cm thick, with a mean thickness of 6.8 cm. This layer of soil was thicker outside the feature in Grid K-3. Five rhyolite core flakes and six pieces of rhyolite angular debris were recovered from this soil layer. Stratum 2 was confined to the area within the feature. It was a matrix of unsorted medium to large gravels, at the base of which was a thin layer of medium-grained sand and pea gravels that appeared to have been intentionally placed. Below these materials was a layer of cobble mulch, and excavation ended at the top of that mulch. The gravel-mulch layer was 3–15 cm thick, with an average thickness of 6.7 cm. Elements in the cobble mulch were predominantly placed on their broadest surfaces, so that the layer was probably 3–5 cm thick. This suggests that the entire mulch layer was 10–12 cm thick. A sample taken from the mulch yielded a moderate concentration of corn pollen. Two Sapawe Micaceous sherds, one micaceous utility sherd, four rhyolite core flakes, three pieces of rhyolite angular debris, and a multidirectional rhyolite core were recovered from this layer.

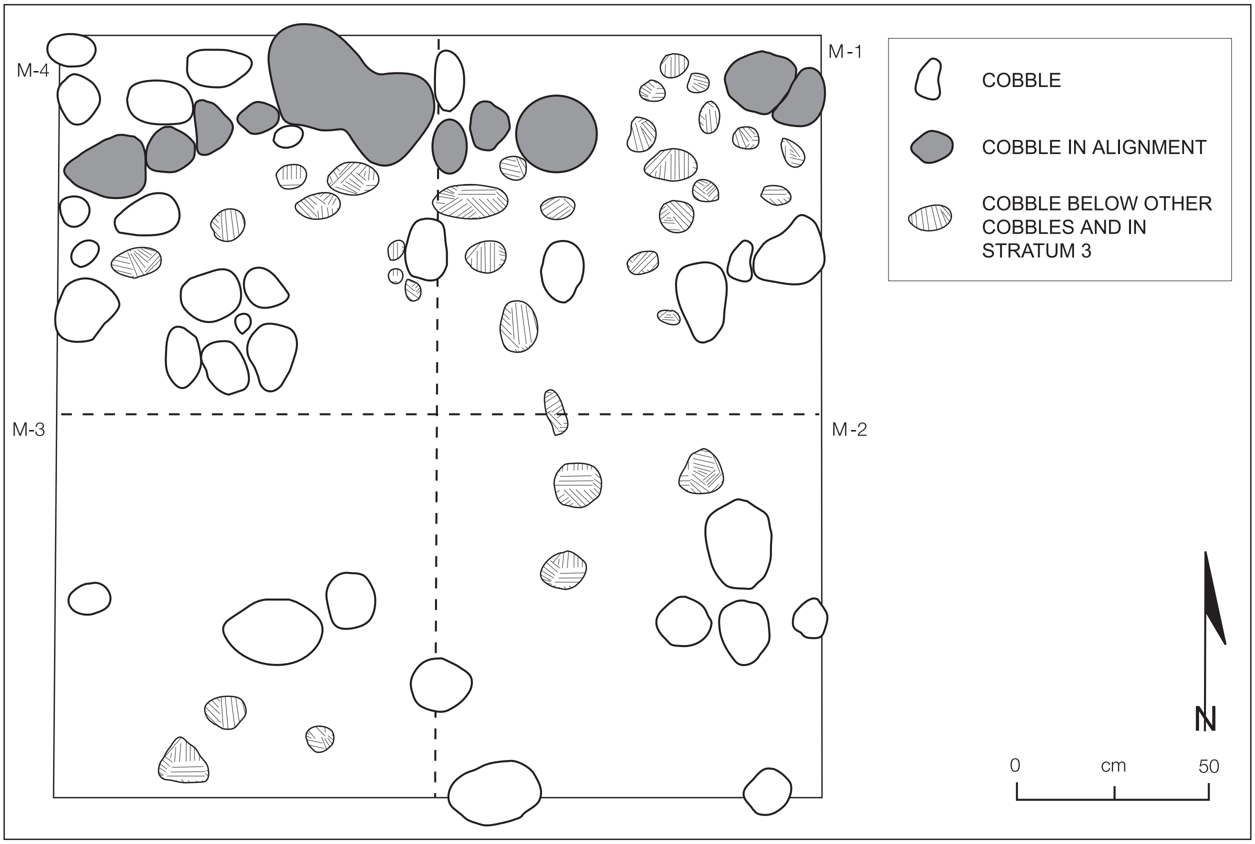


Figure 7.30. Postexcavation plan of EU-M in Feature 21, LA 105703.

Figure 7.31. EU-M in Feature 21 at LA 105703, looking south.

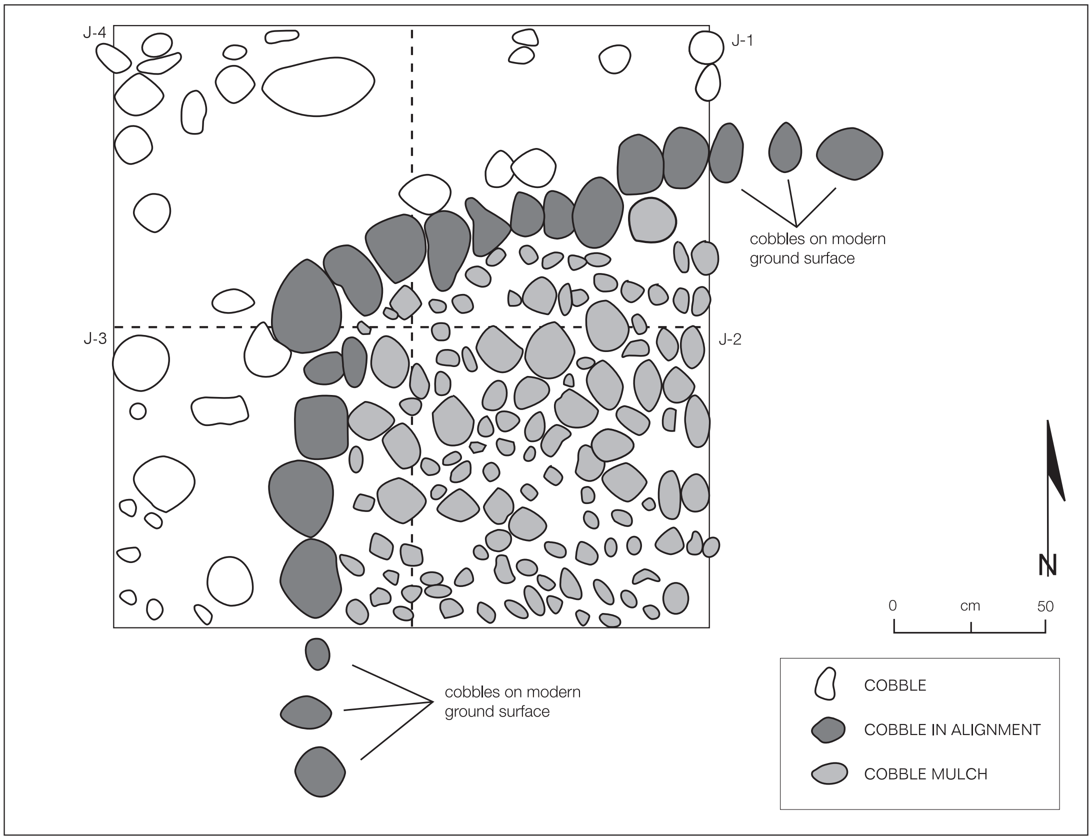


Figure 7.32. Postexcavation plan of EU-J in Feature 22, LA 105703.

Figure 7.33. EU-J in Feature 22 at LA 105703, looking east.

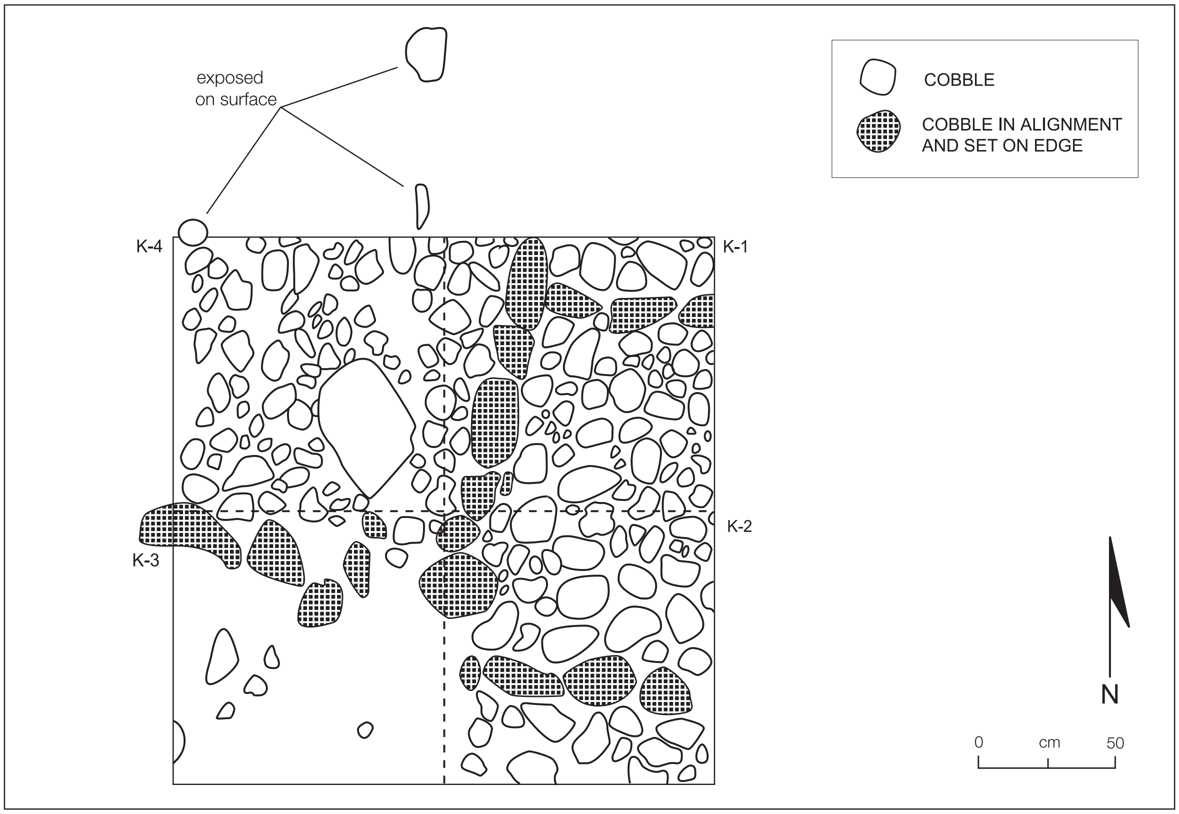


Figure 7.34. Postexcavation plan of EU-K in Feature 22, LA 105703.

Figure 7.35. EU-K in Feature 22 at LA 105703, looking south.

Removal of the gravel mulch exposed several alignments, showing that this area at the south edge of Feature 22 was subdivided into smaller cells (Figs. 7.34 and 7.35). Distinct differences were seen in the matrix within the feature and outside it: the soil outside the feature contained fewer and smaller gravels and pockets of red clay. Most cobbles in the alignments were set end-to-end, though a few were set sideways; all were placed upright (Fig. 7.34). Part of the boundary alignment was displaced, creating a small break in the northwest part of Grid K-3. Parts of at least three cells were exposed and seemed much larger than those that were seen in other features, with a length of up to 1.3 m and a width of at least 80 cm. A boulder was set into the matrix in Grid K-4, but its function was uncertain.

Summary

LA 105703 contained one of the largest expanses of farming features available for investigation during this project. More excavation units were dug at this site than at any of the others, producing data that were both comparable with and quite different from those acquired at other sites. LA 105703 is atypical in that it is not situated at the edge of a high terrace. However, it is in an area that contains important prerequisites for field construction: an abundant and easily accessed source of gravels and cobbles, and a wide expanse of flat surface. Evidence of two domesticated crops was found in pollen samples from LA 105703. Both corn and cotton were grown there, perhaps together in the same plots or sequentially in plots, since cotton pollen never occurs without corn pollen. However, some excavation units only yielded corn pollen, suggesting that this plant was monocropped.

Five gravel-mulched fields were investigated, three by multiple excavation units. Excavation in Features 2, 18, and 22 showed that those fields were more intricately built than suggested by surface indications. Sections of each of these features were subdivided into small cells. Feature 18 demonstrated a particularly complex construction style. Most elements in internal subdividing alignments in EU-E, EU-F, and EU-I were set upright, and there was evidence of two layers of mulch: a layer of predominantly pea gravels and gravels over a layer of cobbles. This pattern of intricately subdivided cells with two layers of mulch also occurred in Feature 22 but was found nowhere else in the study area.

A second configuration encountered in Feature 18 consisted of a series of large cobbles or small boulders set in a noncontiguous pattern of evenly spaced elements. This configuration was found in EU-I, EU-N, and EU-O. In the latter case, it was accompanied by two layers of mulch—gravels in an upper layer and cobbles in a lower layer. Features were configured in a more normal pattern elsewhere on the site, and elements occurred in contiguous alignments, mostly set on their broadest surfaces. Mulch consisted of unsorted pea gravels, gravels, and small cobbles.

Quite a bit of evidence of sequential feature construction was found at LA 105703. The most obvious was the relationship between Features 2 and 3, in which the latter had been partly built over the former and was mounded above its surface. Feature 18 provided other evidence of this process, though it was more indirect. Because Feature 18 was large and so much of it was within project limits, we were able to investigate numerous areas and found quite a bit of variation in structure. That variation suggests that Feature 18 was built over a period of time in stages rather than in a single episode. Its genesis was probably a series of individual features that eventually grew together as construction continued, acquiring the appearance of a single coherent system when, in actuality, several individual fields probably continued to be represented.

Artifacts were recovered from both strata encountered within excavation units. Materials found in Stratum 1 postdate the construction and probably the use of farming features at this site. Artifacts from Stratum 2 came from the materials used to build the farming features and therefore predate their construction, or they were deposited as the features were in use or being built. Thus, the occurrence of Biscuit B sherds in three excavation units is important and points toward construction during the Late Classic period.

Chapter 8. LA 105704

James L. Moore

LA 105704 is a small farming site on land administered by the USDI Bureau of Land Management. The site is roughly oval and bounded on the west by U.S. 285 and on the east by a slope. This site is atypical of the area in that it is small and discrete, containing only a few features. It measures 74 m north-south by 38 m east-west and covers 2,812 sq m (0.28 ha). About 53 percent of the remaining section of site extended into the right-of-way. We were uncertain whether LA 105704 originally extended further west, since none of the features identified there seemed to have been truncated by highway construction. However, the absence of borrow pits in this area suggests that part of the site was removed during earlier highway construction. In-field pottery analysis indicated that LA 105704 was used during the Classic period.

Vegetative cover is moderate on the site, and the plant cover is similar in on- and off-feature areas. Grasses are the most common plants and include grama, three-awn, and muhly. Other common plants include rabbitbrush, sagebrush, snakeweed, narrowleaf yucca, prickly pear, barrel cactus, and cholla. Small juniper and piñon trees are growing across the site area and have spread onto the farming features.

Field Procedures

A detailed map of the entire site was prepared. All associated features are within the proposed right-of-way, and only a diffuse artifact scatter continues outside project boundaries. Data recovery concentrated on the surface description of features and sample excavation of selected areas within features. Excavation focused on Features 1 and 2. Feature 1 was sampled with two excavation units, and Feature 2 by one excavation unit. All cultural materials noted on the surface within the highway right-of-way were collected for analysis, as were artifacts encountered in excavation units. These materials are summarized later in this chapter.

Features

Four features were mapped and described (Fig. 8.1). Field limits were difficult to identify in many cases because of the amount of damage caused by erosion. A combination of colluvial and eolian processes have caused soil to build up against alignments that face the terrace interior, obscuring those edges in many places. Eolian deposits also cover much of the surface of the fields, especially where they are anchored by vegetation. This made it difficult to discern many alignments and define the full extent of others. Livestock grazing may also have caused damage, displacing elements in cobble alignments and blurring feature edges. Along the terrace edge this seems to have exacerbated damage caused by erosion.

LA 105704 has also sustained quite a bit of modern damage, though the prehistoric features were fairly intact. An unimproved dirt road runs along the east side of the site and may have truncated the east edge of Feature 1. The west edge of the terrace was removed during an earlier highway construction phase and, as noted above, we were uncertain whether sections of the features were removed at that time. Modern trash was also noted on the surface of the site.

Feature 1

Feature 1 is a small irregularly shaped gravel-mulched plot that measures 15 by 12 m and covers roughly 160 sq m (Fig. 8.1). Since this field was in the detailed examination zone, it was completely mapped. The southeast part of the feature was truncated by an unimproved dirt road, and it is uncertain how much of the field extended into that zone. About 60–70 percent of the surface of this feature is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. Feature 1 is currently separated from Feature 2 by a small incised gully, and it is possible that they were once parts of the same field.

Boundary and interior subdividing align-

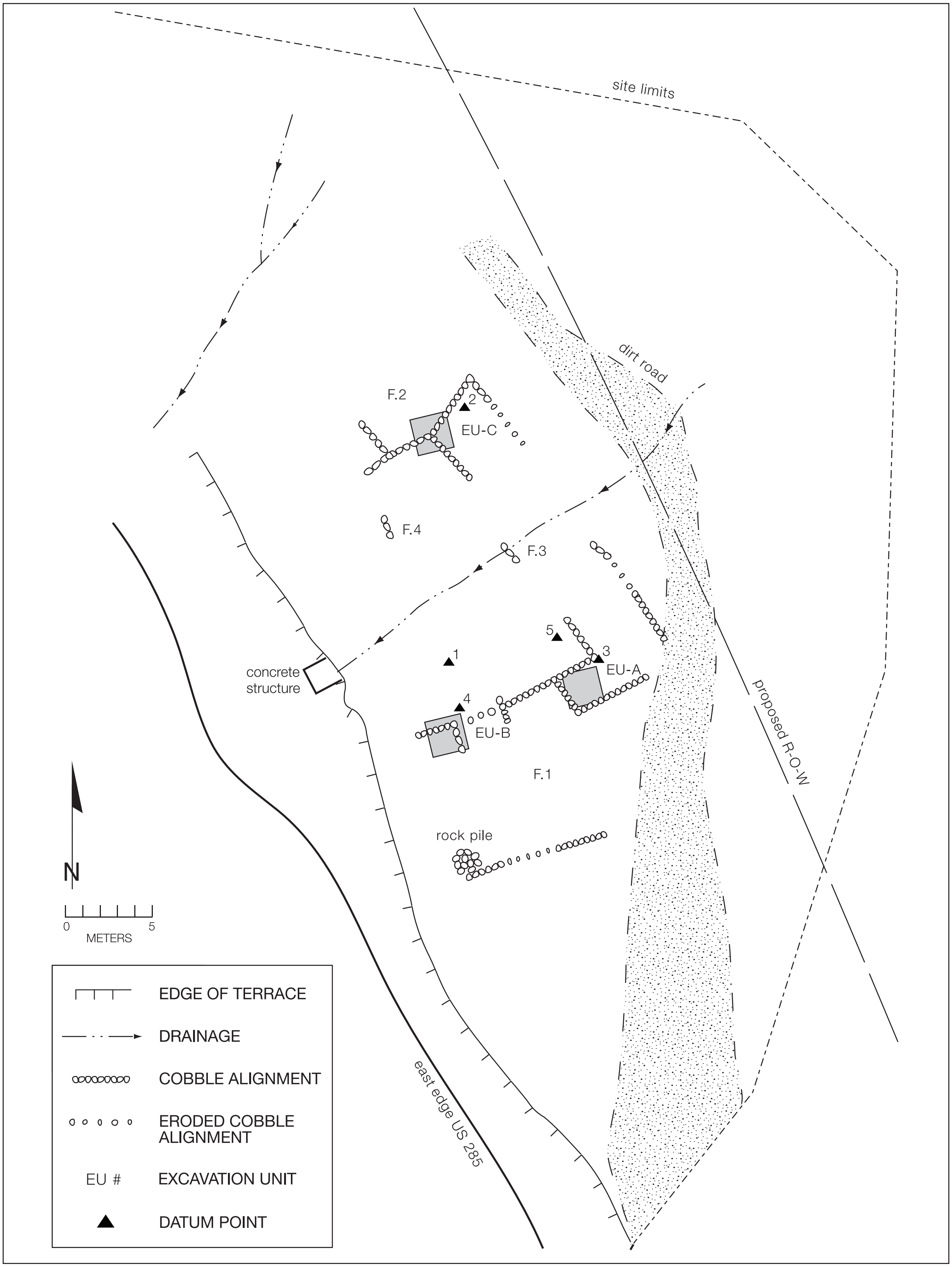


Figure 8.1. Plan of LA 105704.

ments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. The few small boulders that occur are 25–30 cm long. Most elements in alignments were set end-to-end and on their broadest surfaces, though sideways placement was also common. Surface indications suggested that this feature was subdivided into several smaller compartments. The mulch is mostly composed of unsorted pea gravels and gravels, though small cobbles were also common, and their frequency on the surface suggests that only larger elements were sorted out for use as building elements. Since the alignments are only a single element high, the mulch is probably 10–15 cm thick. No variation in surface vegetation or gravel densities was noted between on- and off-feature areas.

Feature 2

Feature 2 is a small irregularly shaped gravel-mulched plot that measures 8 by 6 m and covers about 48 sq m (Fig. 8.1). Since this field was in the detailed examination zone, it was completely mapped. The east edge of the feature may have been truncated by an unimproved dirt road, and it is uncertain whether the field extended into that zone. About 60–70 percent of the surface of this feature is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. Feature 2 is currently separated from Feature 1 by a small incised gully, and it is possible that they were once parts of the same field.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. The few small boulders that occur are 25–30 cm long. Most elements in alignments were set end-to-end and on their broadest surfaces, though sideways placement was also common. Surface indications suggested that this feature was subdivided into several smaller compartments. The mulch is mostly composed of unsorted pea gravels and gravels, though small cobbles are also common, and their frequency on the surface suggests that only larger elements were sorted out for use as building elements. Since the alignments are only a single element high, the mulch is probably 10–15 cm thick. No variation in surface vegetation or gravel densities was noted between on- and off-feature areas.

Feature 3

Feature 3, which appears to be a checkdam, is a short alignment of cobbles crossing an incised gully between Features 1 and 2 (Fig. 8.1). The alignment is 1.0 m long and is two elements wide and one high. The intact nature of the feature, its position uphill from a concrete drainage structure, and its presence in a modern gully suggests that it is a historic feature and not associated with the prehistoric fields.

Feature 4

Feature 4 is a short alignment of cobbles crossing a shallow incised gully at the south edge of Feature 2, which appears to be a checkdam (Fig. 8.1). The alignment is 1.1 m long and consists of a linear alignment of three cobbles, with a possible intersecting alignment represented by a cluster of three small cobbles on the east side near the center of the main alignment. This feature is situated just above the head of a small erosional channel, and its placement suggests two possible functions: it could be a historic checkdam, similar to Feature 3, or it could be a section of the west wall of a large cell in Feature 2. While the latter is more likely, the former cannot be ruled out.

Surface Information

LA 105704 seemed to contain only one or two small farming plots of limited size. These features were on a low, relatively level hilltop, and little room was available for other features. Surface examination of the part of the site outside project limits showed that it contained a low-density artifact scatter. Fourteen artifacts were inventoried in that area. The only sherd found was from a Biscuit A bowl. The remaining artifacts were chipped stone dominated by rhyolite (6 core flakes, 1 angular debris, 1 tested cobble), followed by quartzite (3 core flakes, 1 biface), and andesite (1 core flake). Another 19 artifacts were collected from the portion of LA 105704 within the right-of-way (Table 8.1). Nearly three-quarters of this small assemblage is comprised of rhyolite, a somewhat higher proportion than in the area inventoried outside the right-of-way. Other materials were represented by only one or two specimens apiece, and no pottery was recovered from this area.

Table 8.1. Chipped stone artifacts collected within highway right-of-way at LA 105704 (material type by morphology)

Material Type	Angular Debris	Core Flakes	Cores
Gabbro	-	-	2
Rhyolite	1	7	6
Andesite	-	1	-
Quartzite	-	-	1
Massive quartz	-	-	1

Results of Excavation

Three 2 by 2 m excavation units were used to examine subsurface deposits and construction techniques in the gravel-mulched farming plots at LA 105704. Three basic soil strata were defined in excavation units. Stratum 1 represents the eolian and colluvially deposited sediments that mostly covered both features. The layer of mulch contained by these features was designated Stratum 2. Stratum 3 was the original terrace surface, and excavation generally halted when this layer was encountered. However, since this was the first site where excavations were conducted in farming features during this project, we were still getting a feel for excavation techniques and the stratigraphy that was encountered. For this reason, Stratum 1 and the upper part of Stratum 2 were usually removed together as the first 10 cm excavation level at LA 105704. Thus, depth measurements for these strata are combined.

Feature 1

Two excavation units were used to examine Feature 1 (Fig. 8.1). EU-A was placed in the east-central part of the feature, overlapping a possible boundary alignment and two probable interior subdividing alignments. EU-B was placed in the west-central part of the feature, where two perpendicular interior subdividing alignments intersected.

EU-A, placed in a part of Feature 1 that was partly disturbed by an unimproved dirt road and erosion, intersected parts of three alignments (Fig. 8.1). Stratum 1 was a fairly thin layer of light brown silty sand containing up to 10 percent pea gravels; it was 2–4 cm thick. Stratum 2 was a matrix of unsorted pea gravels, gravels, and small to large cobbles that was infiltrated by brown silty sand. Together, these strata were 4–14 cm thick, with a mean thickness of 7 cm. Thus, Stratum 2 was up to 10 cm thick and averaged 3–5 cm. A sample taken from the mulch yielded a low corn pollen concentration. No artifacts were recovered from this excavation unit.

With the mulch removed, sections of three alignments and a scatter of large cobbles were exposed (Fig. 8.2). The alignments appeared to be partly disarticulated interior subdivisions forming three sides of a cell that was originally at least 2 m to a side. Small cobbles were removed with the rest of the mulch during excavation. The smaller cobbles and a few larger ones were floating in the gravel matrix of Stratum 2, indicating that they were components of the mulch. Thus, not all large cobbles had been sorted out before this material was used to mulch the field. All exposed alignments were a single element high and wide, as suggested by surface indications.

EU-B was placed near the edge of U.S. 285 on the west side of the feature (Fig. 8.1). Stratum 1 was a thin layer of light brown sandy loam containing a fair amount of pea gravels. Quite a bit of juniper duff was noted on the surface. Stratum 2 was a matrix of unsorted pea gravels, gravels, and small cobbles that was infiltrated by a light brown sandy loam. Together, these strata were 4–10 cm thick, with a mean thickness of 7 cm. Thus, the mulch was probably 5–6 cm thick. A sample taken from the mulch yielded a low to moderate corn pollen concentration. No associated artifacts were recovered from this excavation unit.

Excavation revealed a section of interior subdividing alignment running east-west through the center of Grids B-1 and B-4, with a jumble of cobbles to either side (Fig. 8.3). No evidence of the perpendicular alignment that was defined from surface observations was found. Cobbles in the east-west alignment were partly disarticulat-

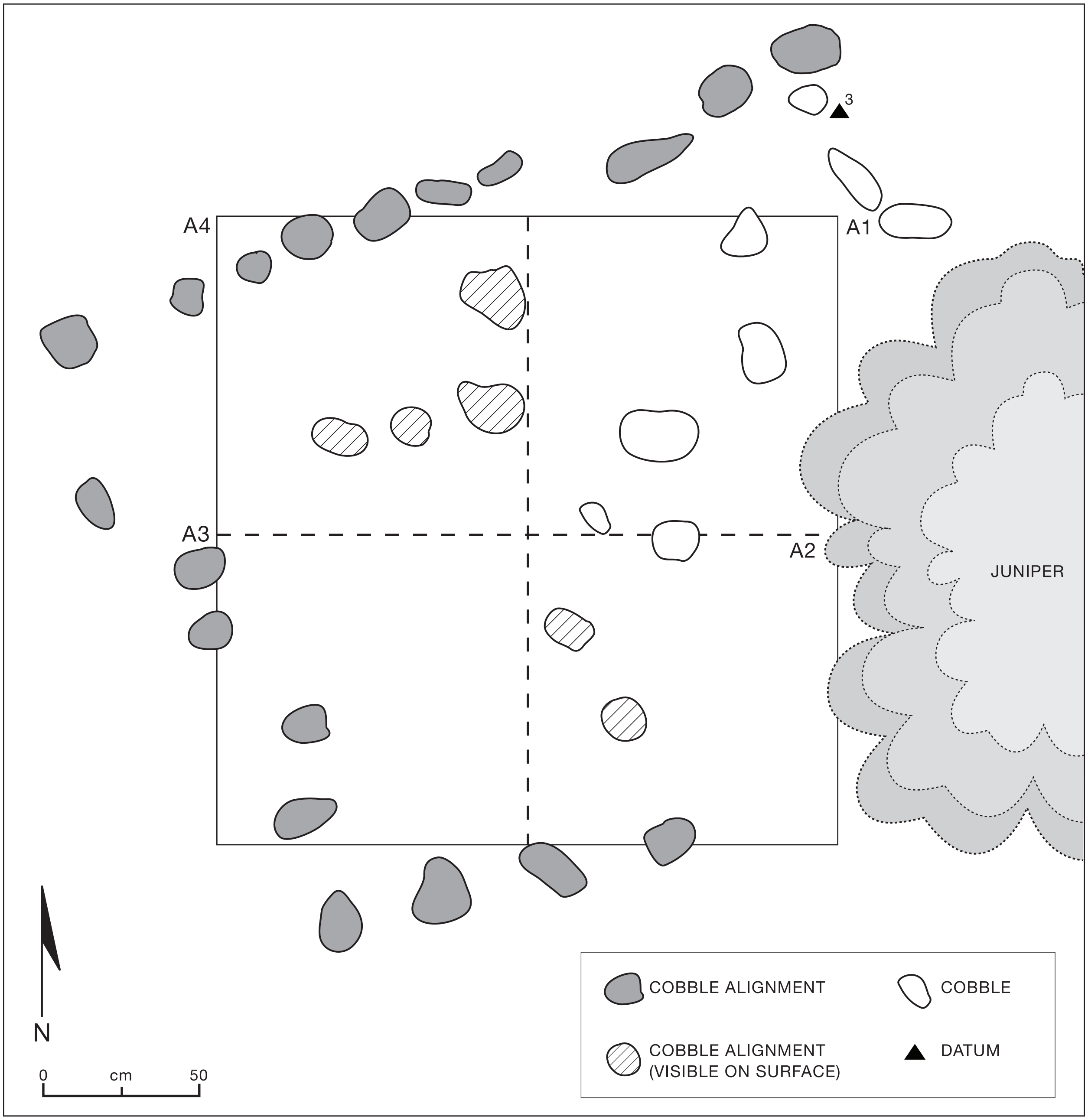


Figure 8.2. Postexcavation plan of EU-A in Feature 1, LA 105704. Shaded rocks are in alignments.

ed, especially in the west part of Grid B-4. Small cobbles were removed with the rest of the mulch during excavation. The smaller cobbles and some larger ones were floating in the gravel matrix of Stratum 2, indicating that they were components of the mulch. Thus, not all large cobbles had been sorted out before this material was used to mulch the field. The alignment was a single element high and wide, as suggested by surface indications. Most elements were set end-to-end, though a few were placed sideways.

Feature 2

One excavation unit was used to examine Feature 2 (Fig. 8.1). EU-C was placed in the central part of the feature to examine the intersection of two perpendicular interior subdividing alignments. Stratum 1 was a thin layer of light brown sandy loam containing some pea gravels. Stratum 2 was

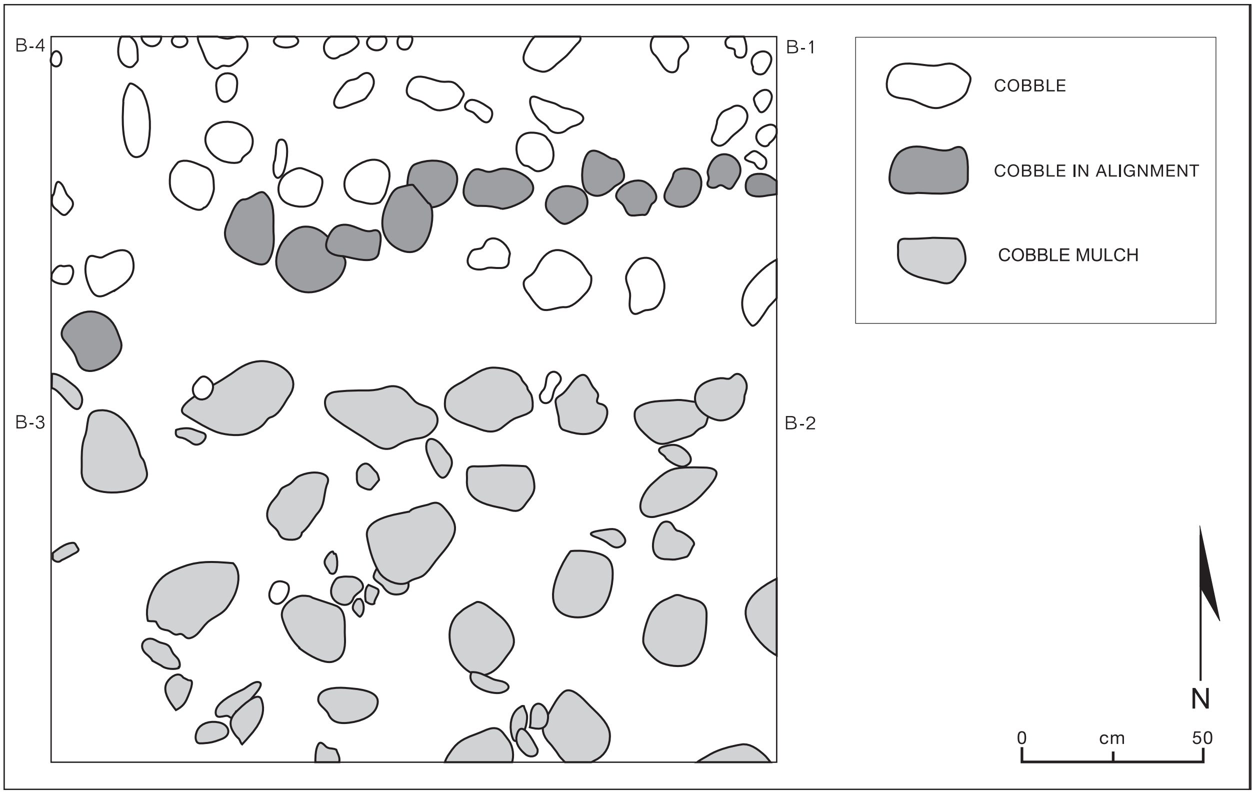


Figure 8.3. Postexcavation plan of EU-B in Feature 1, LA 105704. Shaded rocks are in alignments.

a matrix of unsorted pea gravels, gravels, and cobbles that was infiltrated by a light brown sandy loam. Together these strata were 6–23 cm thick, with a mean thickness of 14.4 cm. Thus, the layer of mulch was probably 10–12 cm thick. A sample taken from the mulch yielded a high corn pollen concentration. No artifacts were recovered from this excavation unit.

With the mulch removed, sections of two perpendicular interior subdividing alignments were exposed (Fig. 8.4). A southwest-northeast trending alignment ran from the west edge of Grid C-3 to the northeast corner of Grid C-1, and a southeast-northwest trending alignment ran from the southwest corner of Grid C-2 to the northeast corner of Grid C-3, intersecting the other alignment at that point. These alignments appear to have divided this part of Feature 2 into three fairly large cells, one on the north side of the southwest-northeast trending alignment, and two on its south side. A number of other cobbles that did not appear to be parts of any alignments were also exposed, some of which were floating in the gravel matrix. Thus, only larger cobbles appear to have been separated out for use as building stones when this feature was being constructed. Most elements in the exposed sections of alignments were set end-to-end and on their broadest surfaces, though there were a few examples of sideways placement.

Summary of Findings

LA 105704 was the smallest, worst-preserved, and probably most atypical of the sites examined during this study. The remains of two small gravel-mulched fields were found at this site, as well as two probable historic checkdams. Though the latter could not be directly dated, their positions across shallow gullies that were both actively cutting and that appeared to have developed fairly recently argued against a prehistoric origin. This site was probably larger originally, but much of it seems to have been removed by earlier episodes of road construction. This may have contributed to the apparent atypical location of LA 105704. It may have originally been set near the edge of a

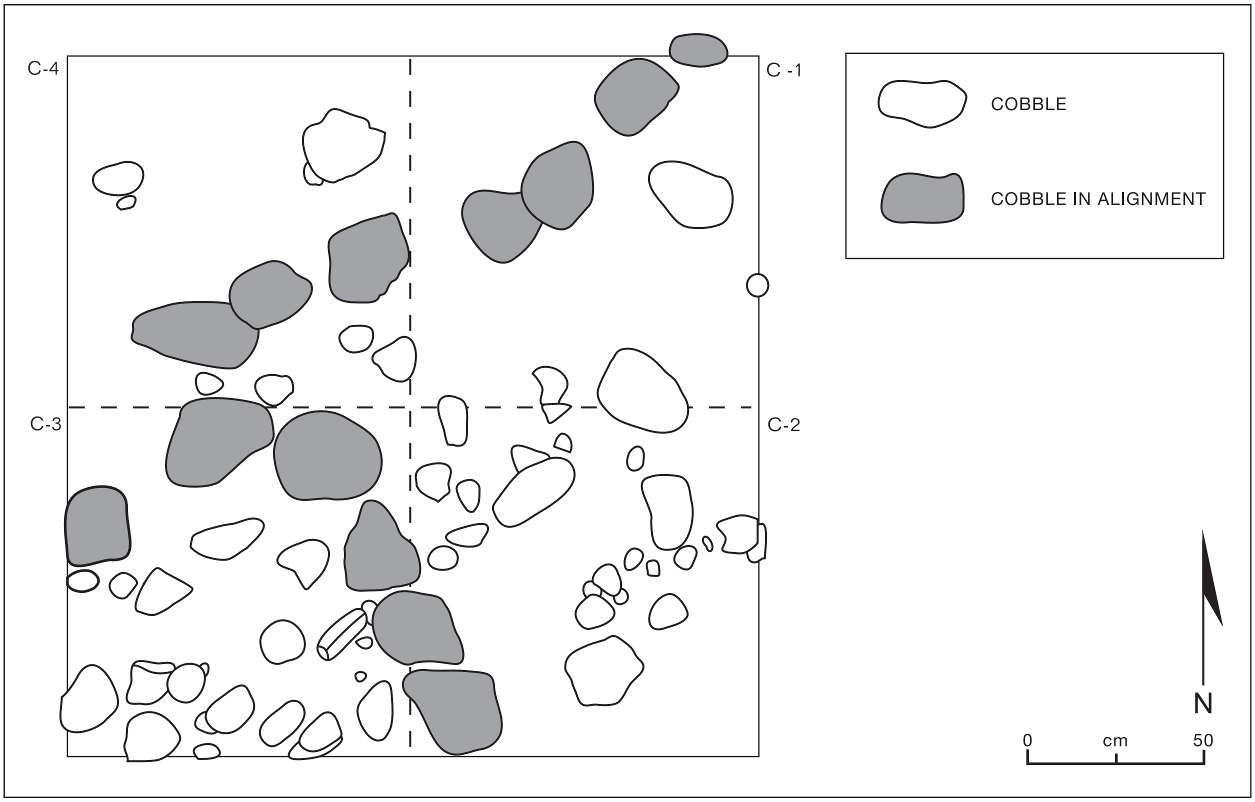


Figure 8.4. Postexcavation plan of EU-C in Feature 2, LA 105704. Shaded rocks are in alignments.

small section of relatively flat terrace top, bounded on the west by the terrace edge and on the east by a slope up to a higher section of terrace. The terrace edge is now gone, and with it any evidence of the borrow pits used to obtain materials for feature construction.

Excavation showed that some alignments defined during surface inspection did not really exist, and others that were not visible from the surface did. Both features were essentially built in the same fashion and seem to have been subdivided into fairly large cells. Mulch consisted of an unsorted mixture of pea gravels, gravels, and small cobbles. Corn pollen was recovered from all three excavation units, suggesting that these features may have been monocropped.

Chapter 9. LA 105705

James L. Moore

LA 105705 is a large farming site on State Trust land administered by the New Mexico State Land Office. It occupies a roughly C-shaped area bounded by the main terrace edge overlooking the Ojo Caliente Valley on the west and arroyos formed by intermittent tributary drainages on the north and south. The east boundary of the site is formed by the edge of the farming features, and intermittent drainages separate this site from LA 105708 to the south and LA 105706 to the north (Fig. 9.1). These arbitrary boundaries were used to maintain the original numbering system and restrict LA 105705 to a manageable size. It is unlikely that they replicate the prehistoric land tenure system.

LA 105705 measures 225 m north-south by 312 m east-west and covers about 45,500 sq m (4.55 ha). The site may have extended slightly further to the west, but that area is within the current U.S. 285 right-of-way and has been removed. Only about 7 percent of the site extends into the right-of-way, comprising a narrow sliver along its west edge. In-field pottery analysis indicated that LA 105705 was used during the Classic period.

Vegetation is moderate on the site, and the plant cover is generally similar in on- and off-feature areas. However, distinct differences were noted in a few places and are discussed in individual feature descriptions. Grasses are the most common plants and include grama and muhly. Other common plants include rabbitbrush, snakeweed, prickly pear, barrel cactus, and cholla. Small junipers occur at the terrace edge but have not spread onto field surfaces. Free-growing lichens were noted on several fields, but they are not as common as on some of the other sites that were investigated.

Field Procedures

Detailed mapping was restricted to the section of the site that extended into the U.S. 285 right-of-way and an adjacent 25+ m wide zone. This area comprises a sample of about 21 percent of the site, and all cultural features within this zone were mapped and recorded in detail. An eroded borrow pit (Feature 14) was the only feature that extended into project limits. Since excavation of this feature would have provided few data that were not available from surface examination, no subsurface studies were conducted, and work focused on the description and photographing of surface features in the mapped area. All cultural materials noted on the surface within the highway right-of-way were collected for analysis. Artifacts noted elsewhere on the surface in the detailed mapping zone were inventoried by feature and are summarized in those discussions.

Features

Seventeen features were partly mapped and described (Fig. 9.1). The locations of eight additional terrace-edge borrow pits are shown on the site plan, but since they were outside the detailed examination zone, they were not described in detail or assigned feature numbers. With one exception, feature limits are fairly well defined. That exception is Feature 11, which has suffered considerable damage from the construction of a water storage facility. A corral to the east of that facility obscures part of the surface of LA 105705, but damage is probably minimal since that area does not appear to have been bladed. A combination of colluvial and eolian processes has caused soil to build up against alignments that face the interior of the terrace, obscuring those boundaries in many places. Eolian deposits also cover much of the surface of the fields, especially where they are anchored by vegetation. This made it difficult to discern many alignments and to define the full extent of others. Livestock grazing has also caused damage, displacing elements in cobble alignments and blurring feature edges. Along the terrace edge this seems to have exacerbated damage caused by erosion. Other surface disturbances include a trail (LA 118549) that runs along the west edge of the site next to U.S. 285 and extends into site limits near Features 13 and

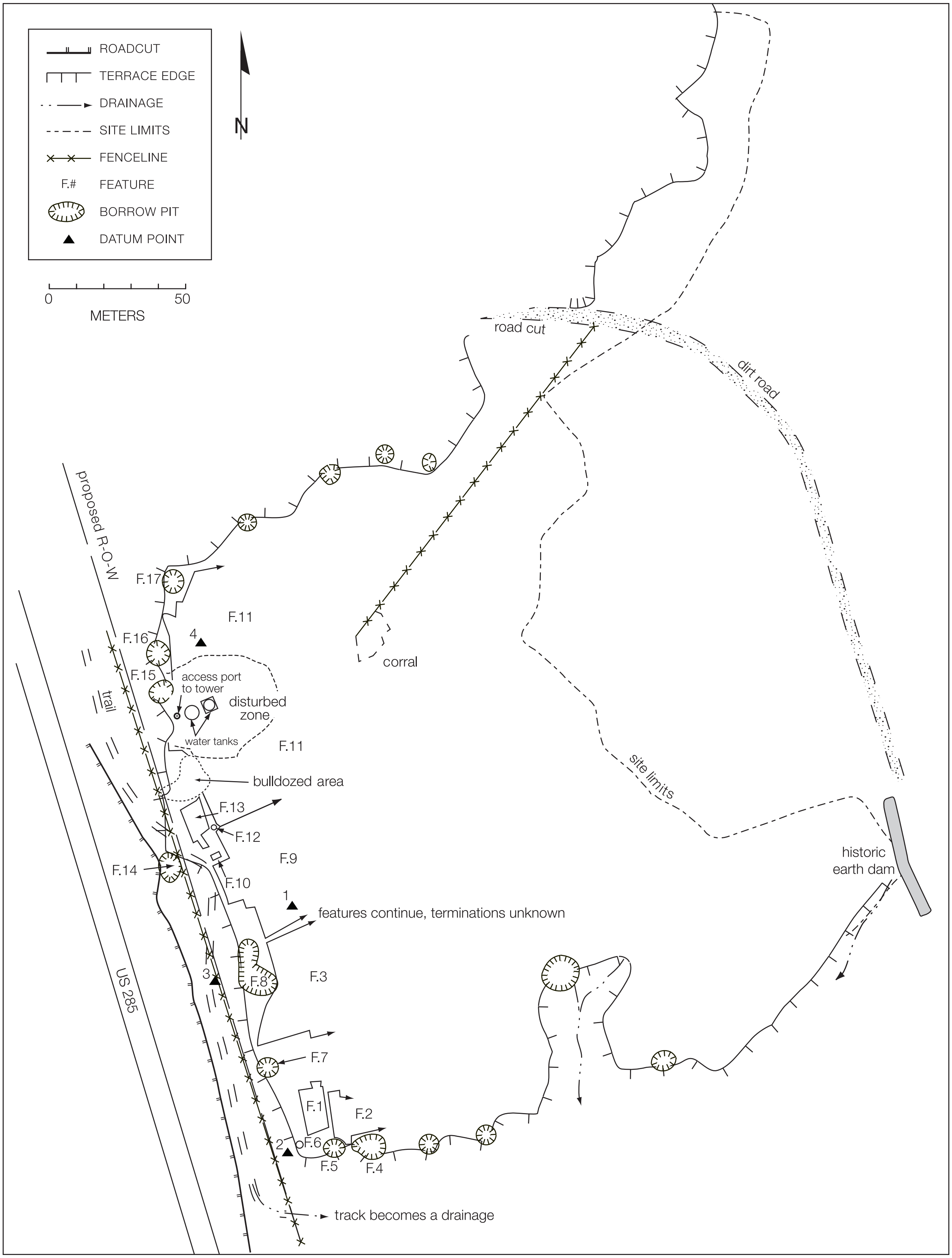


Figure 9.1. Plan of LA 105705.

14. An unimproved dirt road crosses the north part of the site, providing access to the terrace top from U.S. 285. The southeast section of the site has been slightly disturbed by construction of a modern earth dam.

Feature 1

Feature 1 is a small rectangular gravel-mulched plot that measures 18.2 by 8.8 m and covers 129.4 sq m (Fig. 9.2). Since this field was in the detailed examination zone, the entire feature was mapped. Perhaps 50–60 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 12–25 cm long. The few small boulders noted were 25–35 cm long. Though most elements in boundary alignments were placed sideways, some were set end-to-end. Most elements were also placed on their broadest surfaces, though occasional uprights occur. Interior subdividing alignments were built in a similar fashion, though there seemed to be more of a mix of end-to-end and sideways placement. Surface indications suggest that the interior of the feature was highly subdivided, though only a few of these alignments were actually visible.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably 8–10 cm thick. There is also a distinct

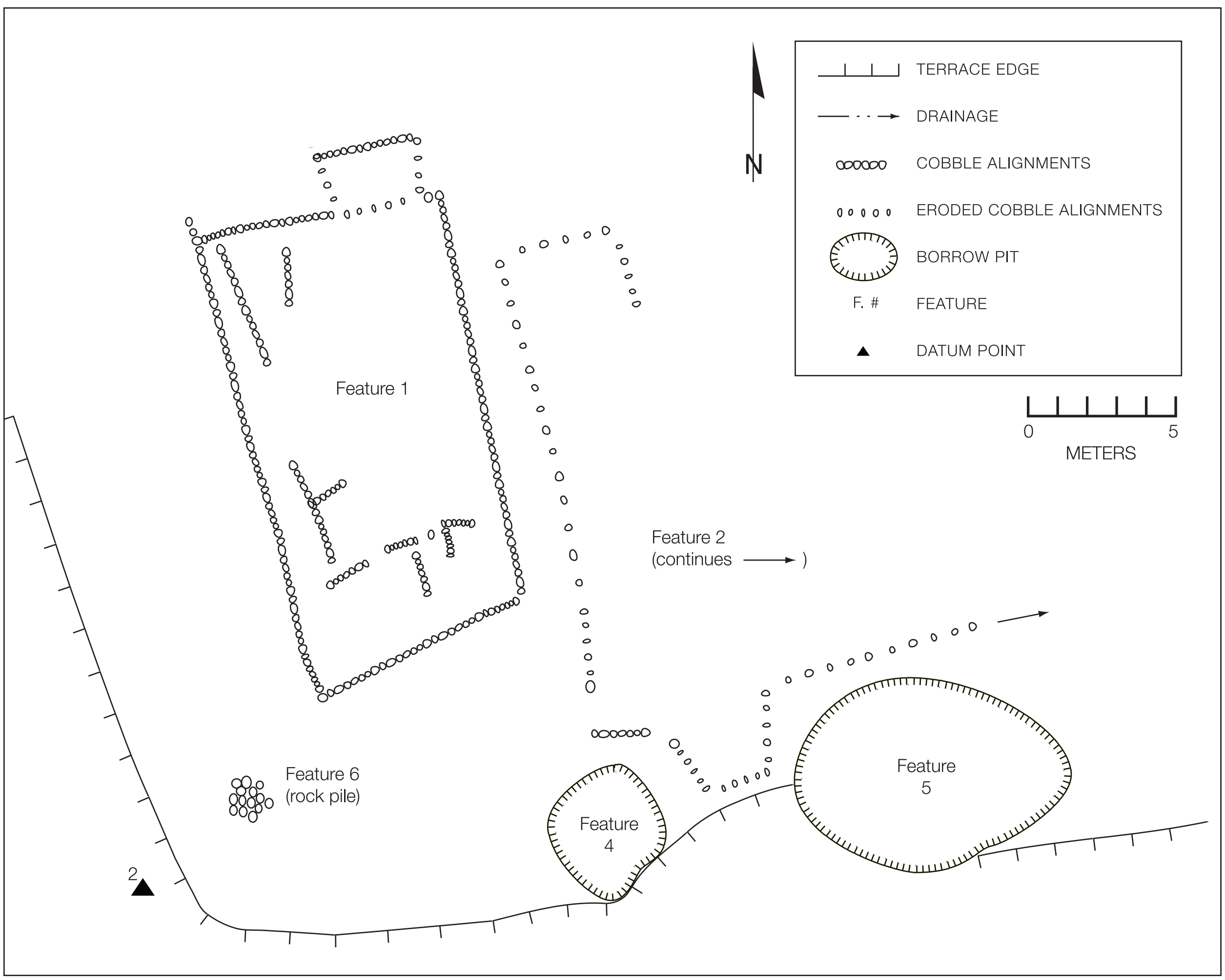


Figure 9.2. Features 1, 2, 4, 5, and 6 at LA 105705.

mounding to Feature 1, particularly on the west side, where it is 5–10 cm higher than the terrace. The mounding is not quite as distinct on the east side, where it is only 2–4 cm high in places. No differences in vegetative density were noted between on- and off-feature areas.

All cultural materials noted on the surface of this feature were inventoried. They totaled 19 chipped stone artifacts and 1 sherd. All chipped stone artifacts were gray rhyolite; they included 13 core flakes, 3 angular debris, and 3 cores. The only cluster of artifacts noted contained 9 pieces of debitage and 2 cores. The remaining chipped stone artifacts were scattered across the feature. The single sherd was a fragment of a Biscuit A bowl.

Feature 2

Feature 2 is a large, irregularly shaped gravel-mulched plot that measures approximately 76 by 36 m and covers roughly 2,700 sq m (Fig. 9.2). Since this field was mostly outside the detailed examination zone, the entire feature was not mapped. Only the west 14 m fell within the mapping zone, so the full extent of the feature was estimated by pacing. The section of feature that was mapped in detail is poorly preserved and has been heavily affected by sedimentation and livestock grazing. Perhaps 50–60 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. The few small boulders noted are 25–35 cm long. Elements in the west half of the feature were predominantly placed side-by-side and on their broadest surfaces, though occasional uprights occur. End-to-end placement predominates in the east half of the feature, though some elements were placed sideways. Again, though most rest on their broadest surfaces, some elements were placed upright.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 8 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably 8–12 cm thick. No mounding was visible in the part of the feature within the detailed examination zone because of sedimentation and livestock-caused damage. A distinct difference was noted in surface gravel densities between on- and off-feature areas. Where not obscured by sediments, gravels cover 70–80 percent of the feature surface. In adjacent off-feature areas, surface gravel densities are only 20–30 percent. No variation in vegetative density was noted between on- and off-feature areas.

All cultural materials noted on the feature were inventoried. Only 21 chipped stone artifacts were recorded, and no clusters of artifacts were defined. Gray rhyolite predominated, including 11 core flakes, 5 angular debris, and 1 core. Other materials were scarcer and included andesite (2 core flakes), Pedernal chert (1 angular debris), and red rhyolite (1 core flake). No temporally diagnostic artifacts were found on this feature.

Feature 3

Feature 3 is a large, irregularly shaped gravel-mulched plot that measures approximately 34 by 26 m and covers roughly 600 sq m (Fig. 9.3). Since this field was partly outside the detailed examination zone, the entire feature was not mapped. Only the west 75 percent fell within the mapping zone, so the full extent of the feature was estimated by pacing. Perhaps 60–70 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 15–25 cm long. Small boulders are also relatively common, particularly in boundary alignments. They measure 25–45 cm long. Building elements were usually placed side-by-side, though some cobbles were placed end-to-end. While most elements were set on their broadest surfaces, upright cobbles are also common. Indeed, it is possible that the latter predominate, since sediments conceal most internal alignments. Cobbles have been displaced by grazing livestock, particularly in the west part of the south boundary alignment and around Feature 8.

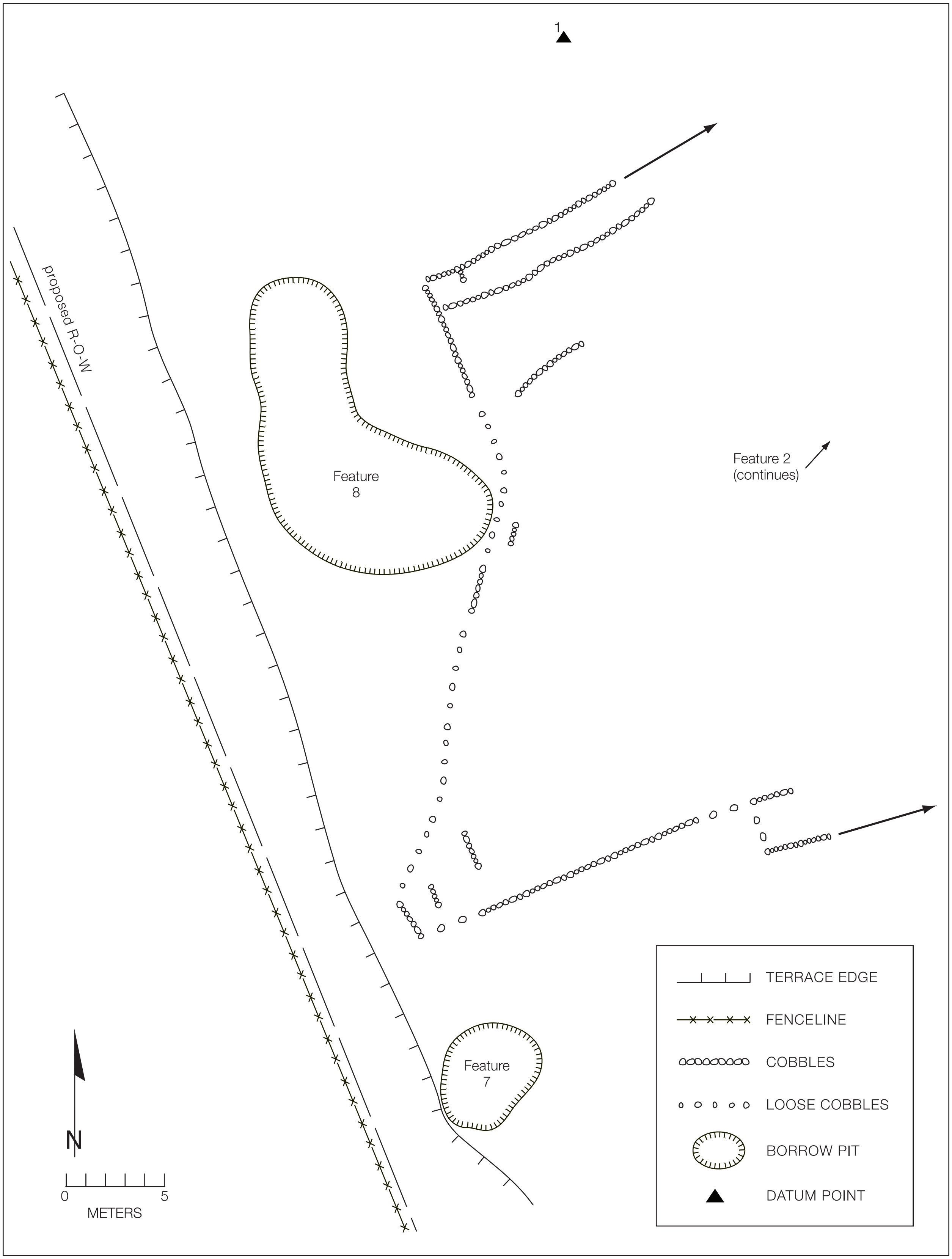


Figure 9.3. Features 3, 7, and 8 at LA 105705.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably up to 15 cm thick, and the feature is mounded above the terrace to that height along its south, west, and north edges. The east edge of the feature is indistinct because of heavy sedimentation. A difference in surface gravel densities was noted between on- and off-feature areas. Where not obscured by sediments, gravels cover 50–80 percent of the feature surface. In adjacent off-feature areas, surface gravel densities are only 20–30 percent. No variation in vegetational density was noted between on- and off-feature areas.

All cultural materials noted on the surface of the feature were inventoried. Chipped stone artifacts were common, and a total of 107 were recorded. Gray rhyolite dominated this assemblage, comprising 64 core flakes, 20 angular debris, and 4 cores. Other materials were less abundant and included andesite (10 core flakes, 2 angular debris, 1 core), massive quartz (1 core flake, 1 angular debris), and red rhyolite (1 core flake, 1 angular debris, 2 cores). Most chipped stone occurred in clusters of 3–30 artifacts, especially in the southwest corner of the feature. The only temporally diagnostic artifact noted was a Biscuit B sherd from an unidentified vessel.

Feature 4

Feature 4 is a small round terrace-edge borrow pit measuring 10.85 by 9.0 m, with a maximum depth of 1.3 m (Fig. 9.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 2 and was probably the source of some of the materials used to build that gravel-mulched field. Some sediments have built up in the south end of the pit, though the terrace slope drops steeply away in that area. No associated cultural materials were noted.

Feature 5

Feature 5 is an oval terrace-edge borrow pit measuring 6.3 by 5.9 m, with a maximum depth of 1.0 m (Fig. 9.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 2 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have not filled the interior of this feature to any appreciable extent, mostly because the terrace slope drops steeply away on its south end. No associated cultural materials were noted.

Feature 6

Feature 6 is a small rock pile near the intersection of the west and south edges of the terrace (Fig. 9.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This feature measures 2.2 by 1.3 m and stands about 0.17 m high. Cobbles were used to construct this feature and average 30 by 20 by 10 cm in size. The rock pile may originally have stood higher, but it has collapsed and spread as elements became dislodged (Fig. 9.4). Three chipped stone artifacts were the only cultural materials noted near this feature.

The function of this feature cannot be defined for certain, though we can hazard a few guesses. If it is indeed associated with other prehistoric features on the site, as seems likely, it may represent a material stockpile or boundary marker. Similar rock piles were observed in adjacent areas outside project limits. However, they do not always occur directly adjacent to fields or borrow pits as would be expected if they served as stockpiles. Indeed, Feature 6 is nearly 10 m away from the nearest borrow pit, so a stockpile function seems unlikely. It could also represent the remains of a shrine, though this function is similarly difficult to verify. However, as discussed in a later chapter, rock piles were (and are) often used as shrines, and we feel that Feature 6 likely served this function.

Feature 7

Feature 7 is a small oval terrace-edge borrow pit measuring 5.1 by 4.2 m, with a maximum depth of 0.63 m (Fig. 9.3). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 3 and was probably the source of some of the materials used to build that gravel-mulched field. Some sediments have built up along the

Figure 9.4. Feature 6, a partly disarticulated rock pile at LA 105705.

southwest rim of the pit, though the terrace slope drops steeply away in that area. No associated cultural materials were noted.

Feature 8

Feature 8 is a medium-sized kidney-shaped terrace-interior borrow pit measuring 17.5 by 11.5 m, with a maximum depth of 0.62 m (Fig. 9.3). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Features 3 and 9, and it was probably the source of some of the materials used to build one or both of those gravel-mulched fields. Sediments have built up to an undetermined thickness in the bottom this pit. Five chipped stone artifacts (four gray rhyolite, one andesite) were noted in association.

Feature 9

Feature 9 is a large irregularly shaped gravel-mulched plot that measures about 40 by 26 m and covers roughly 890 sq m (Fig. 9.5). Since this field was partly outside the detailed examination zone, the entire feature was not mapped. Only the west 75 percent fell within the mapping zone, so the full extent of the feature was estimated by pacing. Perhaps 60–70 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. The east boundary alignment is very indistinct because of this process and colluviation. In addition, the north edge of the feature is covered by part of Feature 11, so that boundary is also uncertain.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 12–20 cm long, though some are as long as 25 cm. A few small boulders were also used, and they are 25–35 cm long. Building elements were usually placed side-by-side and upright, though occasional cobbles were placed end-to-end on their broadest surfaces. An intricately subdivided area in the west-central part of the feature especially demonstrates these characteristics. Indeed, it is likely that most, if not all, of the feature was originally subdivided in this way, but most interior alignments are concealed by sediments.

The mulch is mostly composed of unsorted

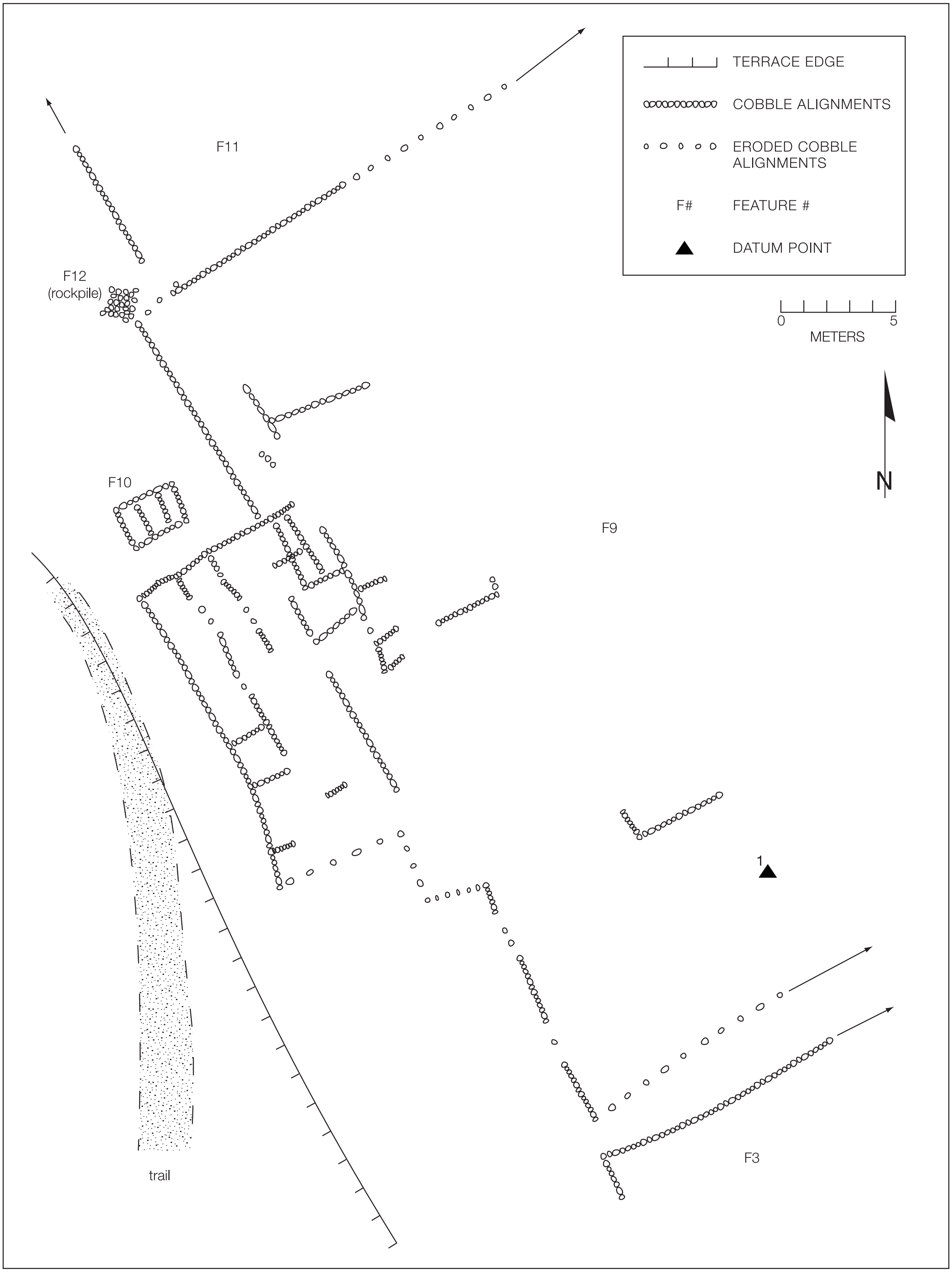


Figure 9.5. Features 9, 10, and 12 at LA 105705.

gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably 8–12 cm thick. No mounding above the terrace was seen, but a difference in surface gravel densities was noted between on- and off-feature areas. Where not obscured by sediments, gravels cover 70–80 percent of the feature surface. In adjacent off-feature areas, surface gravel densities are only 10–20 percent. No similar variation in vegetative density was noted between on- and off-feature areas.

All cultural materials noted on the surface of the feature were inventoried. Only 11 pieces of chipped stone were found, dominated by gray rhyolite (seven core flakes, one angular debris, one core), though a few andesite artifacts were also noted (one core flake, one angular debris). No temporally diagnostic materials or clusters of artifacts were found.

Feature 10

Feature 10 is a small rectangular gravel-mulched plot that measures 2.9 by 2.0 m and covers 5.8 sq m (Fig. 9.5). Since this feature was in the detailed examination zone it was completely mapped. About 70 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles. Most cobbles are 12–20 cm long, but some are as long as 25 cm. About 90 percent of the building elements were placed side-by-side, and the rest were placed end-to-end. Similarly, about 90 percent of elements are upright, but some were occasionally set on their broadest surfaces.

The mulch is mostly composed of unsorted gravels and pea gravels, but some small cobbles up to 8 cm long also occur. Since the alignments are a single element high, the mulch is probably 8–12 cm thick. The feature is mounded 2–5 cm above the terrace, and a difference in surface gravel densities was noted between on- and off-feature areas. Where not obscured by sediments, gravels cover 50–70 percent of the feature surface. In adjacent off-feature areas, surface gravel densities are only 10–20 percent. Vegetation is slightly denser on the feature than in nearby areas.

Four pieces of chipped stone were the only cultural materials noted on the surface of this feature. All were gray rhyolite (three core flakes, one angular debris). No temporally diagnostic artifacts were found.

Feature 11

Feature 11 is a large, irregularly shaped gravel-mulched plot that measures about 95 by 25 m and covers roughly 2,300 sq m (Fig. 9.6). Since this field was partly outside the detailed examination zone, the entire feature was not mapped. The central sector of the feature was badly damaged during construction of a water storage facility, and blading has removed part of the west boundary alignment and adjacent interior subdividing alignments in the south sector. The central sector has been entirely removed by mechanical equipment or is obscured to the point that no alignments are now visible.

Only the west 80 percent of Feature 11 was in the detailed examination zone, so its full extent was estimated by pacing. Perhaps 50–60 percent of the surface in the south sector and 60–70 percent in the north sector is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. The east boundary alignment is very indistinct because of this process and colluviation. The south edge of the feature overlaps the north part of Feature 9 and is mounded 5–8 cm above that feature. This suggests sequential construction in which Feature 11 was built later than Feature 9, perhaps after the earlier feature was no longer productive and was abandoned. Otherwise, it is unlikely that Feature 11 would have partly covered Feature 9. A slight mounding was also visible in the north sector of the feature, where the mulched surface is 3–5 cm higher than the terrace.

Boundary and interior subdividing alignments are a single element high and wide and were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 12–25 cm long. A few small boulders were also used and are 25–35 cm long. Building elements were usually placed side-by-side and on their broadest surfaces in the south

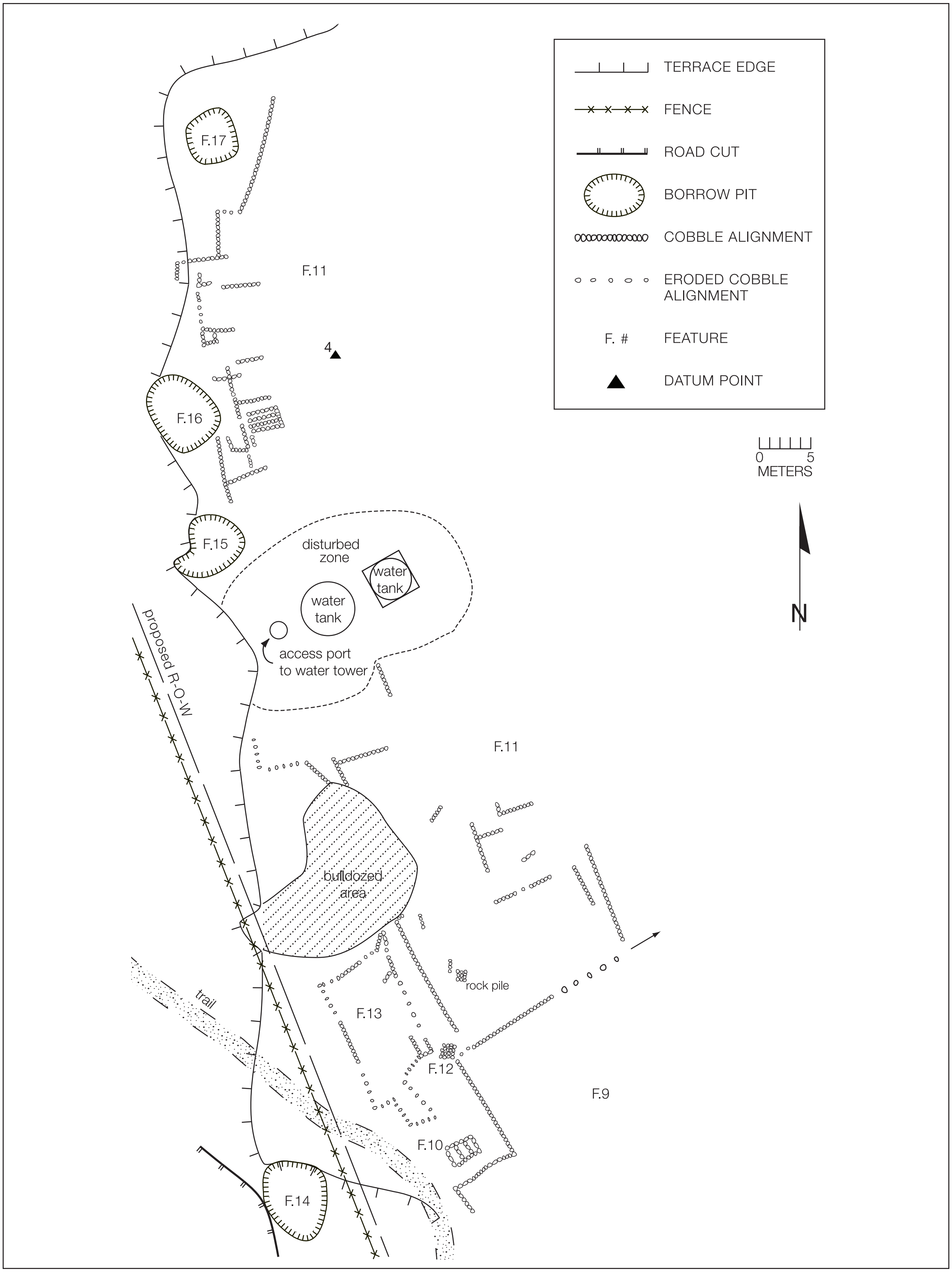


Figure 9.6. Features 11 through 17 at LA 105705.

sector, though some were set end-to-end. In contrast, cobbles were mostly placed end-to-end in the north sector, and upright elements are common and may predominate in that area. However, side-by-side placement also occurs. An intricately subdivided section is built mostly of cobbles set side-by-side and upright. Within the detailed examination zone there are visual differences between the north and south sectors that seem indicative of separate features. However, there is less disturbance outside this zone on the east side of the feature, and in that area there is no evidence of a break that would denote the existence of more than one field.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 8 cm long also occur. Their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably 5–10 cm thick. A difference in surface gravel densities was noted between on- and off-feature areas. Where not obscured by sediments, gravels cover 60–70 percent of the feature surface. In adjacent off-feature areas, surface gravel densities are only 25–30 percent. No variation in vegetative density was noted between on- and off-feature areas.

A small rock pile is near the southwest corner of Feature 11 (Fig. 9.7), but it was difficult to determine what it represents. While it may be a stockpile of construction materials, its presence on the surface of a feature on which construction seems to have been completed is inconsistent with this function. It more likely represents a boundary alignment or the remains of a shrine.

Only cultural materials within the detailed examination zone were inventoried. Artifacts were sparse in this area. They included five gray rhyolite core flakes, two andesite core flakes, and one gray rhyolite core. Only three flakes were in the south sector (two rhyolite, one andesite); the remaining artifacts were in the north sector. Cultural materials were widely scattered, and no temporally diagnostic materials or clusters of artifacts were observed.

Feature 12

Feature 12 is a small rock pile between three gravel-mulched fields (Features 9, 11, and 13). Though this feature was outside construction limits, it was in the detailed examination zone and was mapped (Fig. 9.5). It measures 2.0 by 1.6 m and stands only a single element high. This feature contains 20–30 cobbles which are mostly 15–25 cm long (Fig. 9.8). The rock pile may once have stood higher, but this is unlikely. No associated artifacts were noted.

The function of this feature cannot be defined for certain, but it probably represents a material stockpile, especially since it is next to three gravel-mulched fields. While it is also possible that this feature represents the remains of a shrine or boundary marker, this is less likely, since there is no evidence that it was ever more than a single element high, which might preclude its use for either of those functions. However, since some shrines consist of small cobble pavements, this possibility cannot be ruled out.

Feature 13

Feature 13 is a small irregularly shaped gravel-mulched plot that measures 17.4 by 6.8 m and covers 92.7 sq m (Fig. 9.6). Since this feature was in the detailed examination zone it was completely mapped. This plot is not well preserved, and its north boundary is indistinct because of mechanical disturbance caused by construction of a water storage facility. About 50–60 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. Most boundary alignments and interior subdividing alignments are indistinct because of this process and colluviation.

Boundary alignments and the few visible interior subdividing alignments are a single element high and wide, and were built with locally obtained cobbles and small boulders. Cobbles were used to construct all alignments, and most are 12–20 cm long. Though too few segments are visible to be certain, a side-by-side and upright placement of building elements appears to dominate, though end-to-end placement also occurs, and many elements were placed on their broadest surfaces.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 8 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the

Figure 9.7. Small rock pile associated with Feature 11 at LA 105705.

Figure 9.8. A probable materials stockpile, Feature 12, LA 105705.

alignments are a single element high, the mulch is probably 5–10 cm thick. This feature is mounded 3–5 cm above the terrace, and a difference in surface gravel densities was noted between on- and off-feature areas. Where not obscured by sediments, gravels cover 60–75 percent of the feature surface. In adjacent off-feature areas, surface gravel densities are only 20–30 percent. Vegetation on the feature seemed slightly denser than in adjacent off-feature areas.

All cultural materials noted on the surface of the feature were inventoried. They included one gray rhyolite core flake, one andesite core flake, and one gray rhyolite core. No temporally diagnostic materials or clusters of artifacts were found.

Feature 14

Feature 14, an oval terrace-edge borrow pit measuring 10.9 by 9.9 m, has a maximum depth of 0.83 m (Fig. 9.6) and is within construction limits. This borrow pit is near several gravel-mulched fields (Features 9, 10, 11, and 13) and was probably the source of some of the materials used to build one or more of them. It is cut into a fairly steep slope and appears to have been enlarged by erosion. This was the only feature at LA 105705 that extended into the right-of-way. Cultural materials noted on the surface included one piece of chipped stone and three fragments of amethyst glass.

Feature 15

Feature 15 is an irregularly shaped terrace-edge borrow pit measuring 8.2 by 7.1 m, with a maximum depth of 0.63 m (Fig. 9.6). Though Feature 15 was outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 11 and was probably the source of some of the materials used to build that gravel-mulched field. There seemed to be a buildup of sediments in the bottom of this pit, and it was slightly damaged during construction of an adjacent water storage facility. No associated cultural materials were noted.

Feature 16

Feature 16 is an oval terrace-edge borrow pit measuring 9.2 by 6.8 m, with a maximum depth of 0.52 m (Fig. 9.6). Though Feature 15 was outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 11 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have built up to an undetermined depth in the bottom of this pit. The only associated cultural materials were two pieces of chipped stone.

Feature 17

Feature 17 is a small oval terrace-edge borrow pit measuring 5.5 by 4.6 m, with a maximum depth of 0.22 m (Fig. 9.6). Though Feature 17 is outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 11 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have built up to an undetermined depth in the bottom of this pit. No associated cultural materials were noted.

Discussion of Surface Information

A few topics remain to be discussed concerning LA 105705, including its basic configuration, the distribution of cultural materials across the site, and the presence of unrecorded features nearby. Although only one terrace-interior borrow pit was mapped, several others occur but were outside the detailed examination zone. All are next to gravel-mulched fields, and it is likely that those features were the last to be constructed. While gravel mulching dominates at this site, the corral (Fig. 9.1) sits upon a feature that may be cobble mulched, or that at least contains a much larger proportion of cobbles than any of the described fields. Interestingly, many gridded plots seem to be separated by “aisles” that are clear of mulch. Only where Feature 11 covers Feature 9 was any overlapping noted. This may indicate that LA 105705 was not used as long or as intensively as many of the other farming sites examined during this study. It may also be important that the trail (LA 118549) ascends to the top of the terrace at LA 105705, providing direct access to those farming features.

Pottery was rare at LA 105705. Only five sherds were observed on the surface, including a Biscuit A bowl sherd from Feature 1 and a Biscuit B sherd from a vessel of indeterminate form from Feature 3. Three additional sherds were noted during the recording of transects across the remainder of the site, including two Biscuit B bowl sherds and an unidentified biscuit ware sherd from an indeterminate vessel type.

Conversely, 160 chipped stone artifacts were recorded outside the detailed examination zone, and 25 were collected within project limits. Gray rhyolite dominated the recorded assemblage and included 78 core flakes, 8 angular debris, and 14 cores. Other materials in the recorded assemblage were red rhyolite (10 core flakes, 1 angular debris, 2 cores), andesite (36 core flakes, 1 angular debris, 2 cores), massive quartz (4 core flakes), obsidian (1 biface), Pedernal chert (1 projectile point), silicified wood (1 core flake), and quartzite (1 core flake). An inventory of the chipped stone artifacts recovered from the surface of LA 105705 is provided in Table 9.1. Rhyolites also dominate this small assemblage, comprising 64 percent. Andesite is second in abundance at 20 percent, followed by quartzite at 16 percent.

Table 9.1. Chipped stone artifacts collected within highway right-of-way at LA 105705 (material type by morphology)

Material Type	Angular Debris	Core Flakes	Cores
Rhyolite	5	8	3
Andesite	-	4	1
Quartzite	1	2	1

While these assemblages are discussed in more detail in a later chapter, a few notes concerning their distribution are in order. The collection zone within the right-of-way was limited to an area at the top of the terrace slope between the existing roadcut and the east edge of the right-of-way. This did not include the trail (LA 118549), which was collected separately. Most of the artifacts recovered from this area were found in the uppermost 5 m wide transect at the edge of the right-of-way. Very few artifacts were found on the slope below this level. Most artifacts recorded during transecting occurred in small clusters near the terrace edge, apparently indicating the locations of individual chipping episodes. In general, the further we were from the terrace edge, the fewer artifacts we noted. An exception was the zone directly northeast of the corral, where an area between the northern intermittent drainage and farming features contained nearly 25 percent of the recorded artifacts, including the only formal tools (a biface fragment and an unidentified projectile point. While no hearths or pottery were noted in that area, it is possible that it represents a small occupational zone associated with the fields. However, this is much less certain than at other sites examined during this study.

In general, then, most chipped stone artifacts on the surface of LA 105705 occurred near the edge of the terrace. While some chipped stone artifacts were noted on individual features in the detailed examination zone, they were not necessarily in direct association. The distribution of these artifacts suggests that, with the exception of the possible occupation area, most are related to a series of chipping episodes, possibly unassociated with farming activities. Thus, it is not certain whether most chipped stone artifacts represent procurement activities conducted by people farming this area or are indicative of a later use.

Finally, during cursory examination of a small, high terrace to the east, we found a probable small garden plot situated in a nearly level portion of the terrace slope, and a field on top. The latter measures about 12–15 m on a side and is gravel mulched. This feature may have been noted during Bugé's (1984) study of the area.

Chapter 10. LA 105706

James L. Moore

LA 105706 is a large farming site on State Trust land administered by the New Mexico State Land Office. It occupies the end of a terrace finger overlooking the Ojo Caliente Valley and is irregularly shaped. The terrace edge comprises the west boundary of the site, while the east perimeter is formed by the edge of the farming features. On both the north and south it is bounded by intermittent drainages; the north drainage forms an arbitrary boundary with LA 105707 (Fig. 10.1). Unrecorded farming features occur on another small terrace finger across the drainage to the south, but they are not contiguous with those at LA 105706 and are outside project limits, so they were not examined. These arbitrary boundaries were used to maintain the original numbering system and restrict LA 105706 to a manageable size. It is unlikely that they replicate the prehistoric land tenure system.

The site measures 295 m north-south by 120 m east-west and covers about 23,120 sq m (2.31 ha). It may once have extended slightly further west, but that area is within the current U.S. 285 right-of-way and has been removed. Only about 0.5 percent of LA 105706 extends into the right-of-way, comprising a narrow sliver along the west edge of the site. In-field pottery analysis indicated that LA 105706 was used during the Classic period.

Vegetation is moderate on the site, and the plant cover is generally similar between on- and off-feature areas. Grasses are the most common plants and include grama and muhly. Other common plants are rabbitbrush, snakeweed, prickly pear, and cholla. Small junipers occur at the terrace edge and in some borrow pits but have not spread to field surfaces. Snakeweed seemed more common in off-feature areas, particularly in small unincised drainages.

Field Procedures

Detailed mapping was restricted to the section of the site that extends into the U.S. 285 right-of-way and an adjacent 25 to 30 m wide zone. This area comprises a sample of about 10 percent of the site, and all cultural features within this zone were mapped and recorded in detail. Two borrow pits (Features 1 and 2) are the only features that extend into project limits. Since excavation of these features would have provided few data that were not available from surface examination, no subsurface studies were conducted, and data recovery focused on the surface description and photographing of features in the mapped area. All cultural materials noted on the surface within the highway right-of-way were collected for analysis. These materials are summarized later in this chapter. Artifacts noted elsewhere on the surface in the detailed mapping zone were inventoried by walking transects across the surface and are summarized later in this chapter.

Features

Four features were at least partly mapped in detail and described (Fig. 10.1). The locations of eight additional terrace-edge borrow pits are shown on the plan, but since they were outside the mapped area, they were not described in detail or assigned feature numbers. Most feature perimeters are fairly well defined, but some field boundaries are partly obscured. A combination of colluvial and eolian processes have caused soil to build up against alignments that face the interior of the terrace, obscuring those boundaries in many places. Eolian deposits also cover much of the surface of the fields, especially where they are anchored by vegetation. This made it difficult to discern many alignments and to define the full extent of others. Livestock grazing has likewise caused damage, displacing elements in cobble alignments and blurring feature edges. Along the terrace edge this seems to have exacerbated damage caused by erosion. Other surface disturbances include a trail (LA 118549) that runs along the west edge of the site next to the U.S. 285 road-cut.

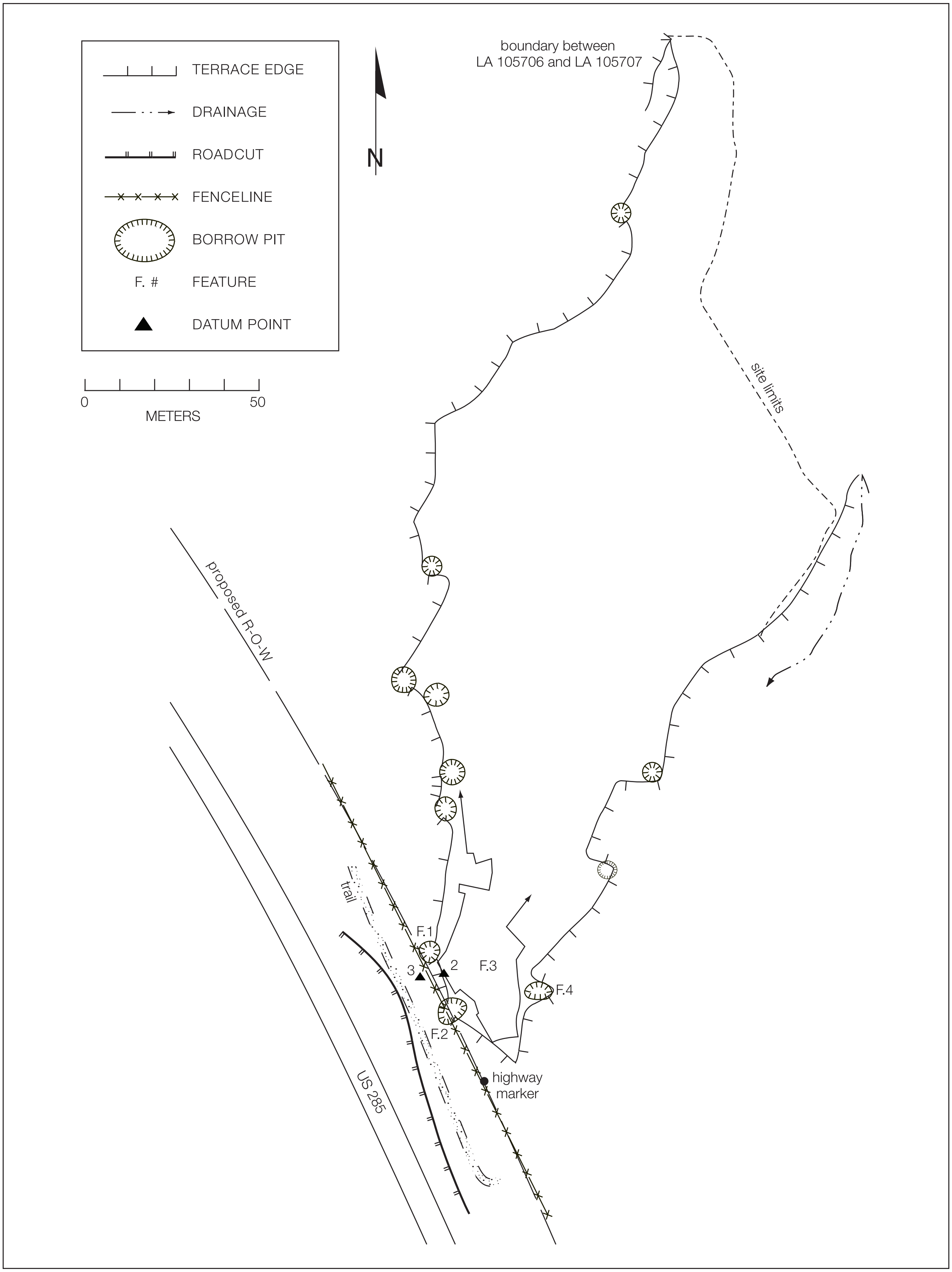


Figure 10.1. Plan of LA 105706.

Feature 1

Feature 1 is an oval terrace-edge borrow pit measuring 7.5 by 5.6 m, with a maximum depth of 1.2 m (Fig. 10.2). Less than 5 percent of Feature 1 was within project boundaries, and it was completely mapped. This borrow pit is next to Feature 3 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of the pit to an undetermined depth. No associated cultural materials were noted.

Feature 2

Feature 2 is an oval terrace-edge borrow pit measuring 10.2 by 8.0 m, with a maximum depth of 1.8 m (Fig. 10.2). About half of Feature 2 was within project boundaries, and it was completely mapped. This borrow pit is next to Feature 3 and was probably the source of some of the materials used to build that gravel-mulched field. This pit is somewhat eroded, and there did not appear to be much buildup of sediments in the bottom of the feature. No associated cultural materials were noted.

Feature 3

Feature 3 is a large gravel-mulched plot that measures about 65 by 24 m and covers a minimum of 1,860 sq m. (Fig. 10.2). Since this field was partly outside the detailed examination zone, the entire feature was not mapped. The full extent of the feature was estimated by pacing, and only the west 48 percent fell within the mapping zone. About 50–60 percent of the surface of Feature 3 is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. Small boulders, 25–50 cm long, are also rather common. Though most elements in boundary and interior subdividing alignments were placed end-to-end, some were set sideways. Most elements were also placed on their broadest surfaces, though occasional uprights were noted. Surface indications suggest that the interior of the feature was highly subdivided, though only a few alignments were clearly visible. Large cobbles and small boulders were evenly spaced across much of the feature but do not occur as continuous alignments. They resemble the pattern of noncontiguous, evenly spaced large elements seen in parts of Feature 18 at LA 105703 and probably functioned similarly.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur. Their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably 10–15 cm thick. The feature is slightly mounded above the terrace, but in most places this is no more than 2–5 cm. No differences in vegetative density were noted between on- and off-feature areas. Cultural materials associated with this feature were not inventoried separately.

Feature 4

Feature 4 is an oval terrace-edge borrow pit measuring 9.1 by 4.3 m, with a maximum depth of 1.7 m (Fig. 10.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 3 and was probably the source of some of the materials used to build that gravel-mulched field. This pit is somewhat eroded, and there did not appear to be much buildup of sediments in its bottom. No associated cultural materials were noted.

Surface Information

The farming features at this site cover the end of a narrow terrace finger and form part of a string of farming features extending from at least LA 105707 on the north to beyond LA 105708 on the south, broken only by deeply incised drainages tributary to the Rio Ojo Caliente. A brief reconnaissance on top of a higher terrace to the east showed that it was also used for farming and that similar features are common there. Those features may have been noted during Bugé's (1984) study of the area.

Only terrace-edge borrow pits were observed

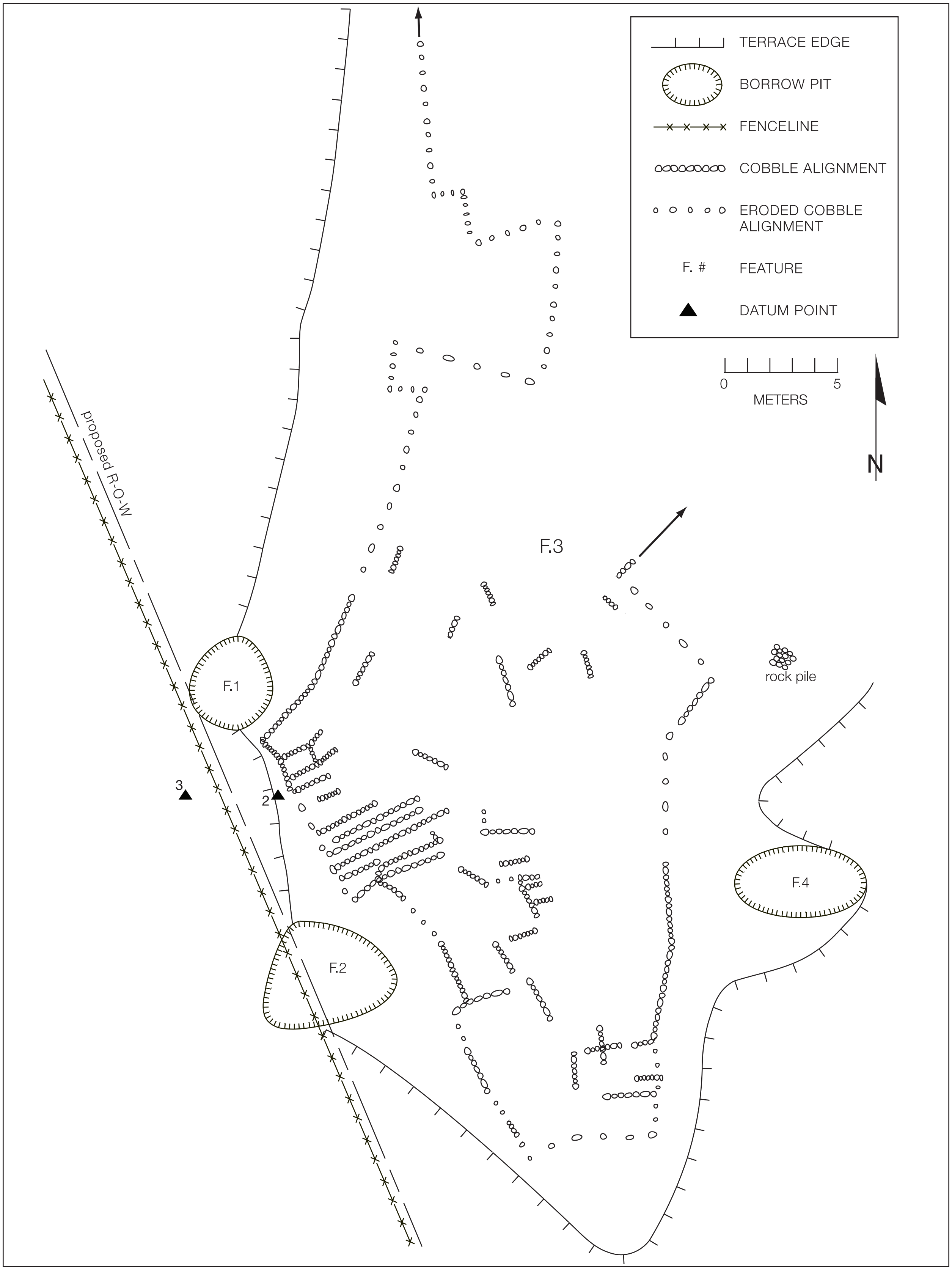


Figure 10.2. Features 1 through 4, LA 105706.

at LA 105706, and there was no evidence of a superimposition of fields, as is common elsewhere in the project area. This could indicate that the site saw a more limited duration of use. Of course, it must be remembered that the definition of these features as a single coherent entity is entirely arbitrary. Thus, we cannot be certain whether they represent an isolated landholding or were associated with other features in a more complex land tenure system. It should also be noted that the trail (LA 118549) does not ascend to the top of the terrace in this area.

A 1.4 by 1.2 m rock pile just outside the east boundary of Feature 3 and north of Feature 4 may represent an associated stockpile of building materials (Fig. 10.3). Conversely, it could also be the remains of a collapsed rock-pile shrine. The location and configuration of the rock pile provide no clue as to which possibility (if either) may be correct, so no conclusion concerning its actual function can be ventured.

Pottery was rare at LA 105706. Only six pieces were observed on the surface. Most were fragments of bowls and included 3 Biscuit A sherds and 1 Biscuit B sherd. A single fragment of a Biscuit B jar was also noted, as was a piece of an indeterminate Biscuit B vessel. Conversely, 65 chipped stone artifacts were recorded while walking transects across the site. Gray rhyolite dominated this assemblage and included 43 core flakes, 2 angular debris, and 6 cores. Other materials observed were red rhyolite (4 core flakes, 1 core), andesite (3 core flakes), Pedernal chert (1 angular debris), quartzite (1 core flake, 1 angular debris, 1 core), and massive quartz (2 core flakes). Most chipped stone artifacts occurred near the terrace edge, which borders the farming features on three sides. In addition, 7 chipped stone artifacts were collected within project limits (Table 10.1); rhyolite comprises a slight majority of these artifacts, followed closely by massive quartz. The collection zone within the right-of-way was limited to an area at the top of the terrace slope between the existing roadcut and the east edge of the right-of-way. This did not include the trail (LA 118549), which was collected separately. Most artifacts recovered from this area were found in the highest 5 m wide transect, at the edge of the right-of-way; few were found on the slope below this level. Many chipped stone artifacts occurred in small clusters near the terrace edge. The distribution of these artifacts suggests that most are related to a series of chipping episodes, possibly unassociated with farming activities. Thus, it is not certain whether most chipped stone artifacts represent procurement activities conducted by people farming this area or are indicative of a later use.

Figure 10.3. Rock pile between Features 3 and 4, LA 105706.

Table 10.1. Chipped stone artifacts collected within the highway right-of-way at LA 105706 (material type by morphology)

Material Type	Angular Debris	Core Flakes	Cores
Rhyolite	-	3	1
Massive quartz	1	1	1

Chapter 11. LA 105707

James L. Moore

LA 105707 is a large farming site on State Trust land administered by the New Mexico State Land Office. It occupies a roughly C-shaped area bounded by the main terrace edge overlooking the Ojo Caliente Valley on the west and arroyos formed by intermittent tributary drainages on the north and south (Fig. 11.1). The east boundary of the site is formed by the edge of the farming features, and an intermittent drainage separates it from LA 105706 to the south. Though the terrace north of LA 105707 is outside project limits, reconnaissance in that area indicated that farming features also occur there and are separated from LA 105707 by a drainage. These arbitrary boundaries were used to maintain the original numbering system and restrict LA 105707 to a manageable size. It is unlikely that they replicate the prehistoric land tenure system.

The main section of LA 105707 is roughly rectangular, with a long narrow finger extending north. It measures 458 m north-south by 160 m east-west and covers about 38,740 sq m (3.87 ha). The site may once have extended slightly further west, but that area is within the current U.S. 285 right-of-way and has been removed. Only about 1.1 percent of this site extends into the right-of-way, comprising a narrow sliver along its west edge. In-field pottery analysis indicated that LA 105707 was used during the Classic period.

Vegetation is moderate on the site, and plant cover is generally similar between on- and off-feature areas. However, distinct differences were noted in a few places and are discussed in feature descriptions. Grasses are the most common plants and include grama and muhly. Other common plants include rabbitbrush, snakeweed, sage, prickly pear, and cholla. Small junipers and piñons occur mostly at the terrace edge, though a few junipers have established themselves on field surfaces and within borrow pits. Free-growing lichens are common on the surfaces of several fields.

Field Procedures

This was the first extensive farming site to be examined during this project, and the original data recovery plan called for each site to be completely mapped in detail (Wiseman and Ware 1996). However, as work proceeded it became obvious that to do so would consume far more time than was available for the project as a whole. Thus, the data recovery plan was altered, and detailed mapping was limited to parts of sites within the right-of-way and an adjacent zone extending about 25 m beyond the right-of-way edge. Because data recovery at LA 105707 was already in progress at the time of this decision, a more extensive zone was examined in detail, comprising an area within the right-of-way and an adjacent 160 m wide zone. This provided a sample of about 69 percent of the site. Two borrow pits (Features 2 and 14) are the only features that extend into project limits. Since excavation of these features would have provided few data that were not available from surface examination, no subsurface studies were completed, and data recovery focused on the surface description and photographing of features in the mapped area. All cultural materials noted on the surface within the highway right-of-way were collected for analysis. These materials are summarized later in this chapter. Artifacts noted elsewhere on the surface in the detailed mapping zone were inventoried by feature and are summarized in those discussions.

Features

Twenty-four features were mapped in detail and described (Fig. 11.1). Parts of the site outside the mapped area contain gravel-mulched fields and terrace-edge borrow pits. Feature limits are fairly well defined, but some field boundaries are partly obscured. A combination of colluvial and eolian processes have caused soil to build up against alignments that face the interior of the

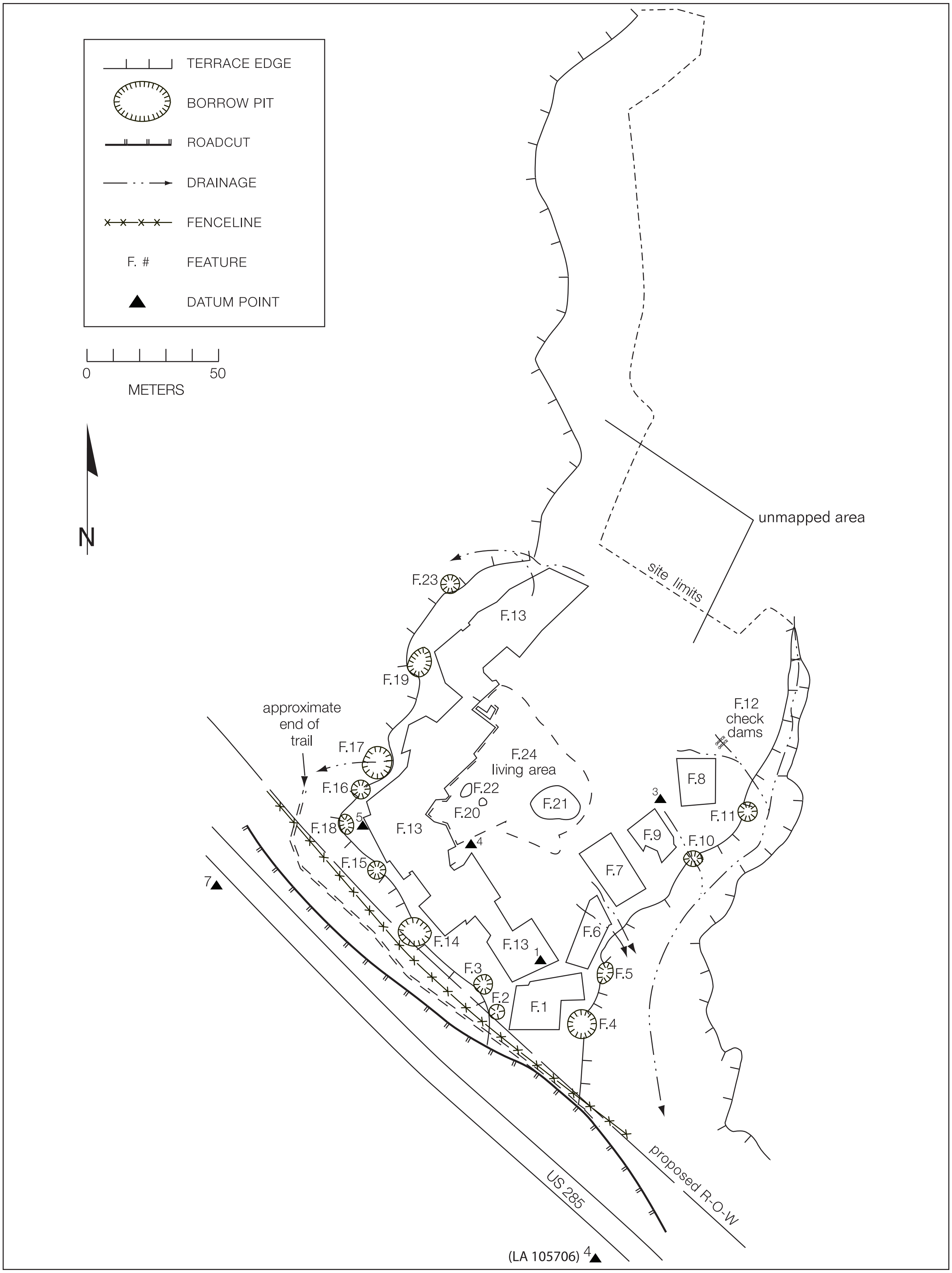


Figure 11.1. Plan of LA 105707.

terrace, obscuring those boundaries in many places. Eolian deposits cover much of the surface of the fields, especially where they are anchored by vegetation. This made it difficult to discern many alignments and to define the full extent of others. Livestock grazing has also caused damage, displacing elements in cobble alignments and blurring feature edges. Along the terrace edge this seems to have exacerbated damage caused by erosion. Other surface disturbances include a trail (LA 118549) that runs along the west edge of the site next to the U.S. 285 roadcut.

Feature 1

Feature 1 is an L-shaped gravel-mulched plot that measures 30.2 by 22.2 m and covers 533.8 sq m (Fig. 11.2). Since this field was in the detailed examination zone, it was completely mapped. Much of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long; the few small boulders noted were 25–40 cm long. Elements in alignments were placed side-by-side or end-to-end, and both techniques were sometimes used in the same alignment. Most elements were set on their broadest surfaces. Surface indications suggest that the interior of the feature was highly subdivided, though only a few internal alignments were clearly visible.

The mulch is mostly composed of unsorted

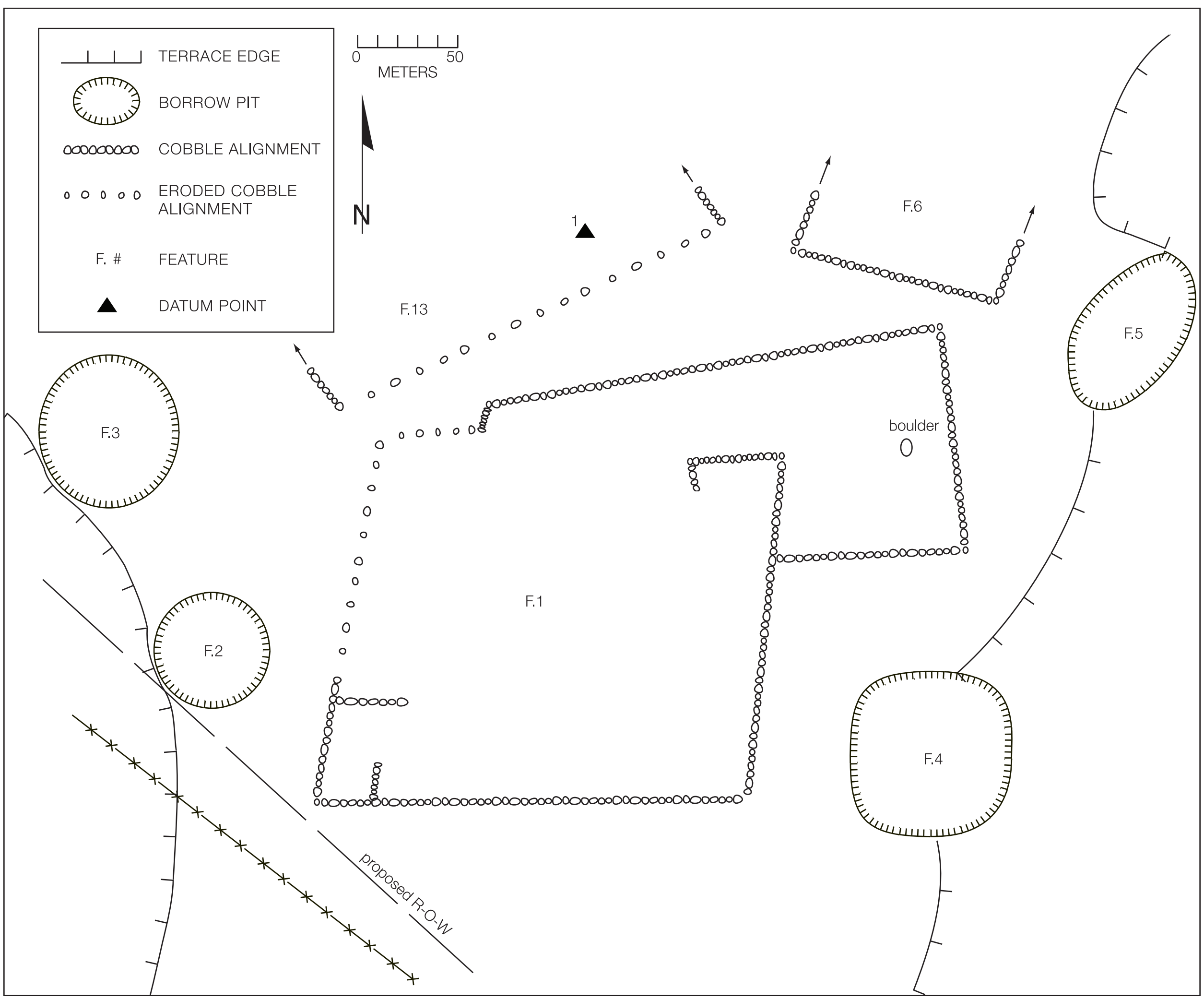


Figure 11.2. Features 1 through 5, LA 105707.

gravels and pea gravels, though small cobbles up to 8 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably up to 10 cm thick. There is also a distinct mounding to this feature, and its surface is 5–10 cm higher than the adjacent terrace. No differences in gravel or vegetative density were noted between on- and off-feature areas.

All cultural materials noted on the surface of this feature were inventoried. They included four core flakes (two gray rhyolite, one andesite, one Pedernal chert) and a two-holed shell button. The latter was of historic derivation and thus of much later date than the feature. No other temporally diagnostic artifacts were found on the surface of this feature.

Feature 2

Feature 2 is a round terrace-edge borrow pit measuring 9.1 m in diameter, with a maximum depth of 0.3 m (Fig. 11.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 1 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of the pit to an undetermined depth. Two pieces of chipped stone were noted in the feature, but no temporally diagnostic artifacts are present.

Feature 3

Feature 3 is an oval terrace-edge borrow pit measuring 8.9 by 7.2 m, with a maximum depth of 0.4 m (Fig. 11.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 1 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of the pit to an undetermined depth. Four pieces of chipped stone were noted in the feature, but no temporally diagnostic artifacts are present.

Feature 4

Feature 4 is an oval terrace-edge borrow pit measuring 12.5 by 10.0 m, with a maximum depth of 1.0 m (Fig. 11.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 1 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of the pit to an undetermined depth. Two pieces of chipped stone were noted in the feature, but no temporally diagnostic artifacts are present.

Feature 5

Feature 5 is an oval terrace-edge borrow pit measuring 10.1 by 6.7 m, with a maximum depth of 0.4 m (Fig. 11.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 1 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of the pit to an undetermined depth. Two pieces of chipped stone were noted in the feature, but no temporally diagnostic artifacts are present.

Feature 6

Feature 6 is a rectangular gravel-mulched plot with a possible extension to the north that is separated from the main feature by a gully and is of undetermined shape. The main part of the feature measures 25.3 by 14.6 m and covers 369.4 sq m (Fig. 11.3). If the eroded section to the north is indeed part of this feature, its total measurements are 40.6 by 14.6 m, and it covers 596.2 sq m. Since this field was in the detailed examination zone, it was completely mapped. Much of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments and are 10–25 cm long; the few small boulders noted are 35–40 cm long. Elements in alignments were placed side-by-side or end-to-end, and both techniques were used in the same alignment in some cases. Most elements were also set on their broadest surfaces. Surface indications suggest that the interior of the feature was subdi-

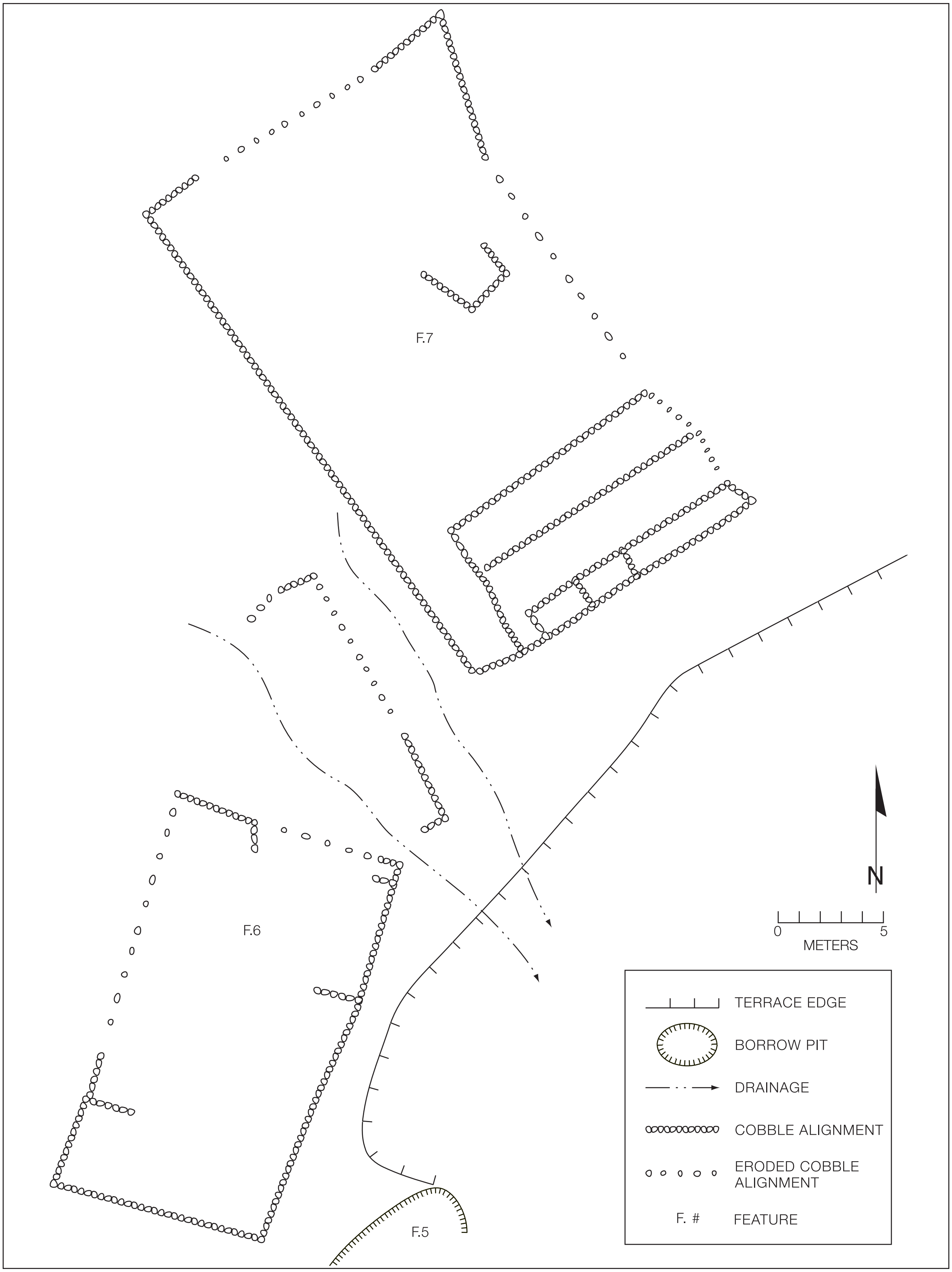


Figure 11.3. Features 6 and 7, LA 105707.

vided, though only a few internal segments were clearly visible.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 8 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Where the mulch is not concealed by sediments, gravels cover 50–80 percent of the surface. This feature is distinctly mounded, particularly along the east edge, where it is 10–15 cm higher than the terrace, and the gravel-mulch layer is probably of an equivalent depth. The vegetative cover is slightly denser on the feature than it is in nearby off-feature areas.

All cultural materials noted on the surface of this feature were inventoried. They included six gray rhyolite core flakes, one gray rhyolite core, and two andesite core flakes. Ceramic artifacts included a Biscuit B sherd and a small fragment of a Glaze Red rim, both from unidentifiable types of vessels.

Feature 7

Feature 7 is a rectangular gravel-mulched plot that measures 35.0 by 21.6 m and covers 721.0 sq m (Fig. 11.3). Since this field was in the detailed examination zone it was completely mapped. About 50–60 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 15–25 cm long; the few small boulders noted were 25–35 cm long. Elements were predominantly placed end-to-end, though in some areas side-by-side placement was mixed in. Most elements were also set on their broadest surfaces. Surface indications suggest that the feature interior is heavily subdivided, though internal alignments were clearer in some areas than in others.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 8 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since all observed alignments are a single element high, the layer of mulch is probably 8–12 cm thick. Gravels cover 60–90 percent of the feature surface where not obscured by sediments. In adjacent off-feature areas, surface gravel densities are only 10–40 percent. The vegetative cover is also somewhat denser on the feature than it is in nearby off-feature areas.

All cultural materials noted on the surface of this feature were inventoried. Chipped stone artifacts were relatively common, but no temporally diagnostic materials were found. Gray rhyolite dominated the assemblage and included 35 core flakes, 8 angular debris, and 1 core. The only other material recorded was andesite, which was represented by 2 core flakes.

Feature 8

Feature 8 is a nearly square gravel-mulched plot that measures 19.4 by 17.2 m and covers 333.7 sq m (Fig. 11.4). Since this field was in the detailed examination zone, it was completely mapped. Except for the southeast third of the feature, the surface is almost completely obscured by eolian and colluvial sediments that are anchored by vegetation. In addition, most of the east boundary alignment and adjacent interior subdividing alignments are almost completely covered by colluvial deposits.

Boundary and interior subdividing alignments are a single element high and wide and were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 15–25 cm long. Few small boulders were noted. Elements were predominantly placed end-to-end, though in some areas side-by-side placement was mixed in. Most elements were also set on their broadest surfaces. Surface indications suggest that the feature interior may be heavily subdivided, though subdividing alignments are most obvious along the east edge.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Even though no mounding was noted, since all observed alignments are a single element high, the layer of mulch is probably 8–12 cm thick. Where not obscured by sediments, gravels cover

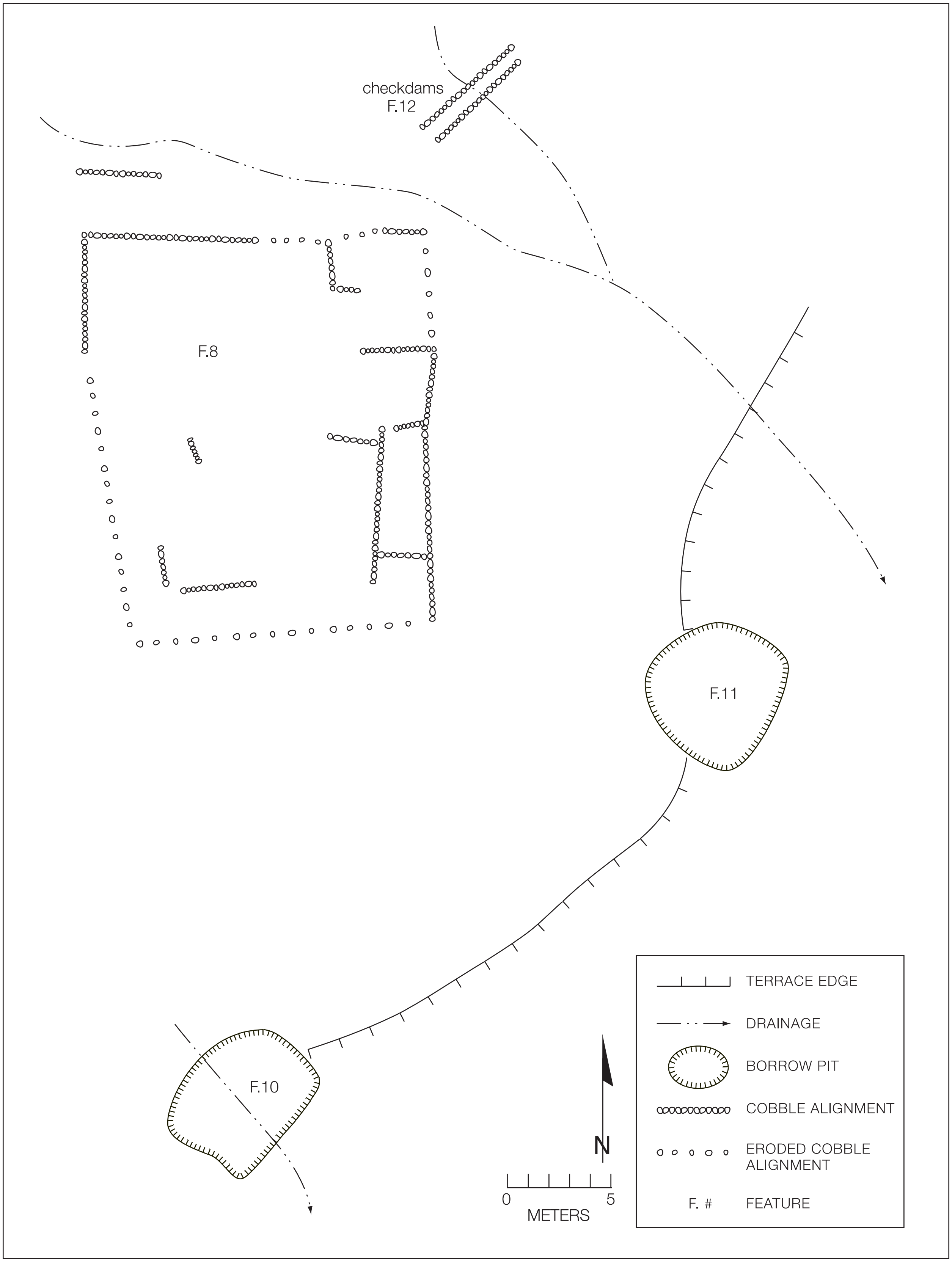


Figure 11.4. Features 8, 10, 11, and 12, LA 105707.

50–90 percent of the feature surface. The vegetative cover is somewhat different on the feature than it is in nearby off-feature areas, which contain a heavier growth of snakeweed and less grass.

All cultural materials noted on the surface of this feature were inventoried. Chipped stone artifacts were not particularly common, consisting of seven gray rhyolite core flakes. Eight sherds were also noted, including seven fragments of the same Biscuit A bowl and one sherd from an unidentified biscuit ware vessel.

Feature 9

Feature 9 is an irregularly shaped gravel-mulched plot that measures 19.0 by 15.0 m and covers at least 213 sq m (Fig. 11.5). Since this field was in the detailed examination zone, it was completely mapped. Though some boundaries are indistinct, this is one of the best preserved and most intact features at the site. About 40–60 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide and were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 15–25 cm long; the few small boulders noted were 30–40 cm long. Elements were mostly placed end-to-end, though side-by-side placement was also common. Most elements were set on their broadest surfaces. Surface indications suggest that the feature interior is heavily subdivided. Many elements in boundary alignments are visibly displaced by erosion, giving those edges a choppy appearance.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. The feature surface is mounded 10–15 cm higher than the adjacent terrace, so the layer of mulch is at least that thick. Where not obscured by sediments, gravels cover 60–90 percent of the field surface. This is a much denser gravel cover than on the adjacent terrace, where gravels cover only 10–15 percent of the surface (Fig. 11.6). Vegetation is also visibly denser on the field.

All cultural materials noted on the surface of this feature were inventoried. Chipped stone artifacts were not common; materials included gray rhyolite (three core flakes, one angular debris), andesite (one core, one core flake), and red rhyolite (one core flake). No sherds or other temporally diagnostic materials were noted.

Feature 10

Feature 10 is an oval terrace-edge borrow pit measuring 7.8 by 6.4 m, with a maximum depth of 0.7 m (Figs. 11.4 and 11.5). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 9 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of the pit to an undetermined depth. One piece of chipped stone was noted in the feature, but no temporally diagnostic artifacts are present.

Feature 11

Feature 11 is a round terrace-edge borrow pit measuring 7.5 by 7.4 m, with a maximum depth of 0.6 m (Fig. 11.4). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 8 and was probably the source of some of the materials used to build that field. Sediments have built up in the bottom of the pit to an undetermined depth. Three pieces of chipped stone were noted in the feature, but no temporally diagnostic artifacts are present.

Feature 12

Feature 12 consists of at least two possible alignments spanning a minor drainage north of Feature 8 that appear to represent the remains of a series of checkdams (Fig. 11.4). The possible dams have been breached, and many elements are scattered by erosion or covered by colluvium and do not form coherent alignments. Elements used to build the feature consist of large cobbles and small boulders 20–60 cm long. The best-preserved alignments are 5.4 and 6.2 m long, and extend for 2–3 m along the gully. No associated artifacts were noted. Though the lack of tempo-

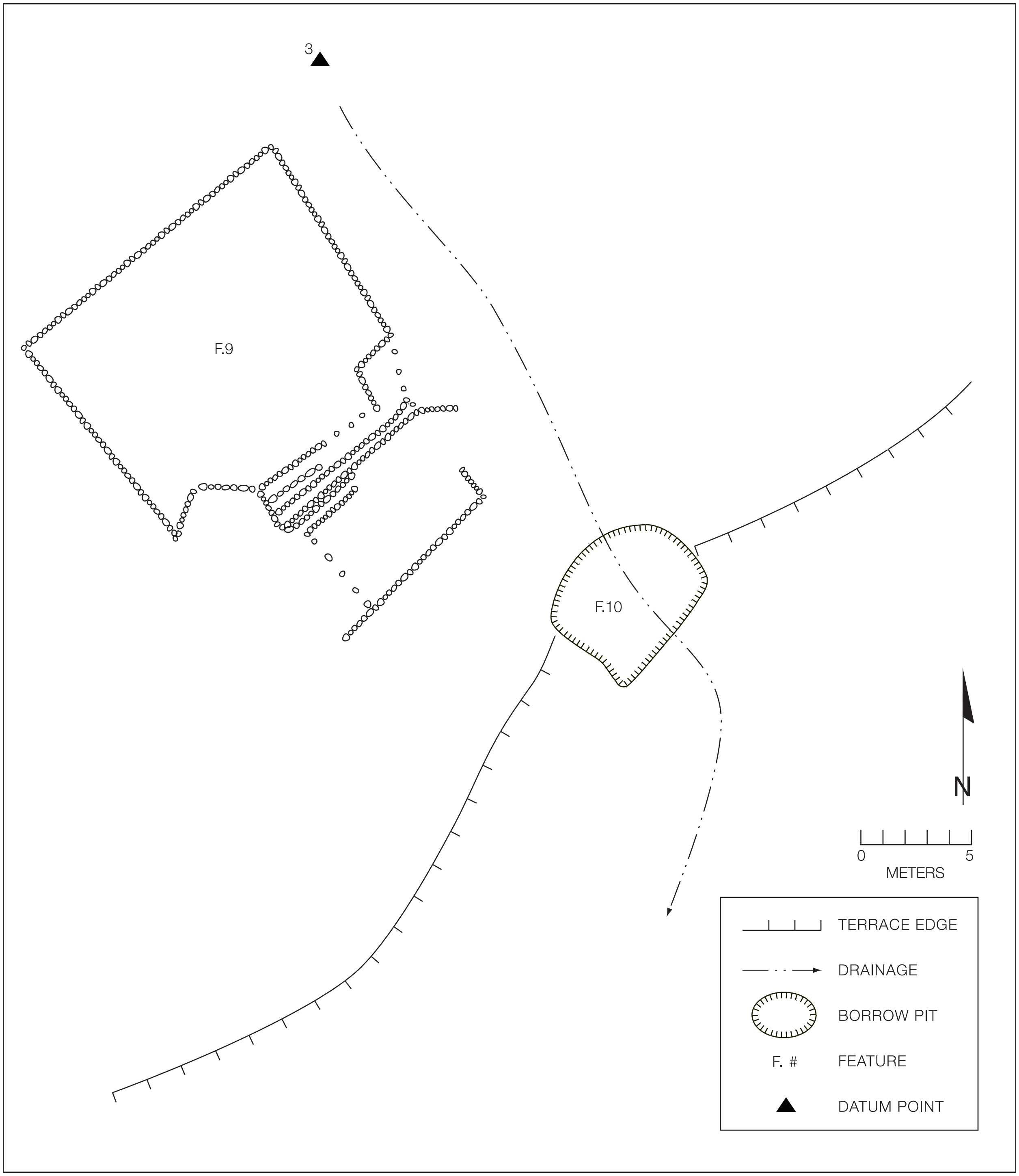


Figure 11.5. Features 9 and 10, LA 105707.

Figure 11.6. Feature 9, LA 105707, showing contrast between densities of gravel and vegetation on the field and the adjacent terrace surface.

rally diagnostic materials precludes assigning a date to this feature, it is probably associated with other farming features at the site and thus of Classic period affinity.

Feature 13

Feature 13 is an irregularly shaped gravel-mulched field that measures 150 by 132 m and covers 5,066.5 sq m (Fig. 11.7). Since this field was in the detailed examination zone, it was completely mapped. Feature 13 is very large and complex, and preservation varies from excellent to poor. Several individual plots are probably represented, which grew together by accretion or were so closely placed that erosion has blurred their boundaries and erased distinctions between them. About 50–60 percent of the field surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide and were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 15–25 cm long. Small boulders are also common, and most are 30–40 cm long, though some larger boulders also occur. Most elements were placed end-to-end, though side-by-side placement was common. Most elements were set on their broadest surfaces, but uprights also occur. Surface indications suggest that the feature interior is heavily subdivided. The outer perimeter of this field follows the terrace edge rather closely, usually 4–6 m away. Vegetation is visibly denser on the field surface and is dominated by grasses. While grasses also dominate on the terrace, snakeweed is much more common there than on the field.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. The feature surface is mounded 8–12 cm higher than the terrace in places, indicating that the layer of mulch is at least that thick. Where not obscured by sediments, gravels cover 60–90 percent of the field surface, but density varies across the feature and is heavier in areas next to the terrace edge. Colluvium has built up behind alignments adja-

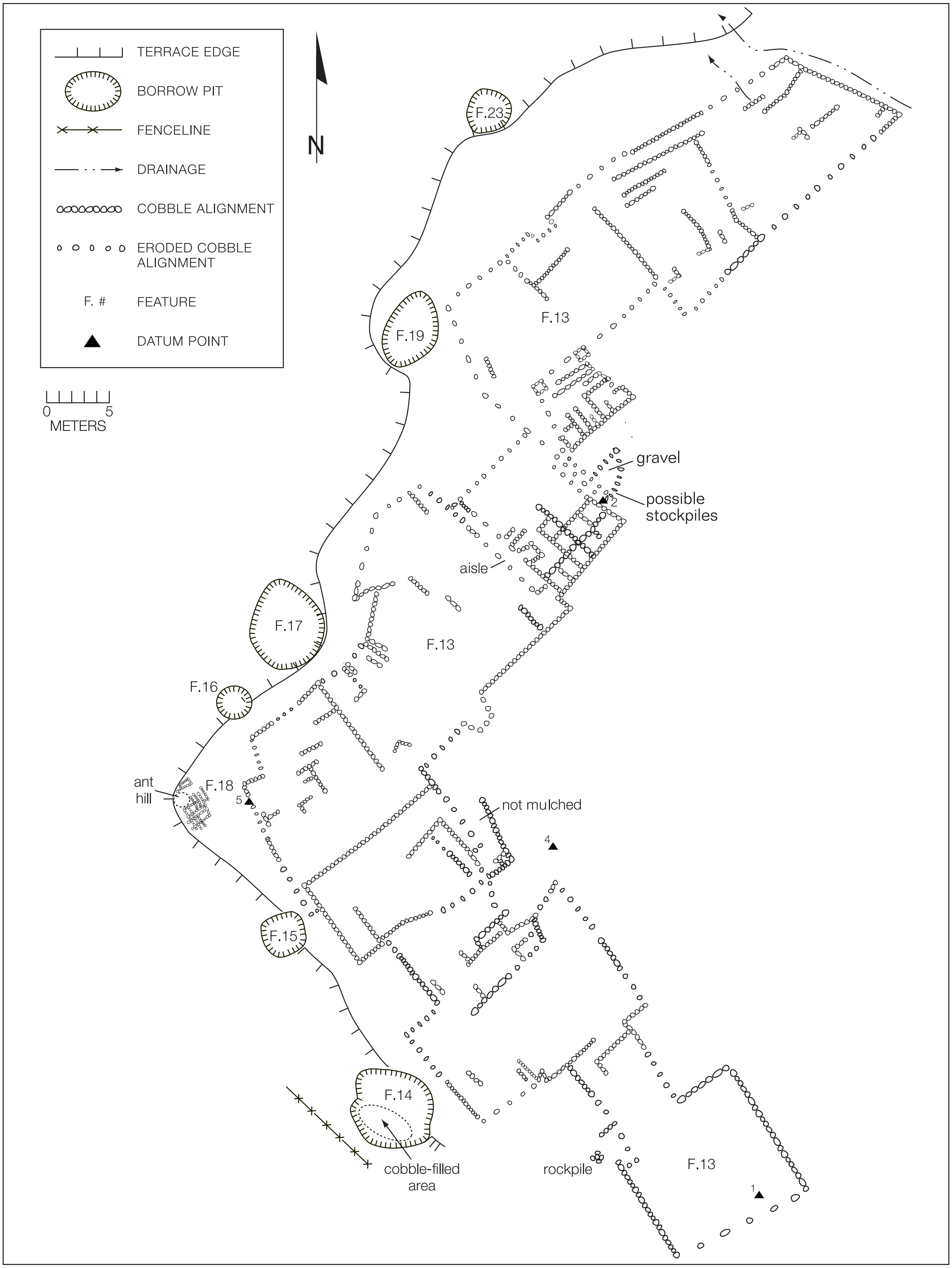


Figure 11.7. Features 13 through 19 and 23, LA 105707.

cent to the terrace interior, partly obscuring them, and in many cases it spills over onto the field. This is a much denser gravel cover than is visible in the zone between terrace and feature edges. It is possible that this discrepancy was caused by raking the area outside the field to obtain gravels for mulching, but it is more likely that it simply represents the original density of gravels on the terrace. Indeed, in areas away from fields there is little surface gravel to be seen. In addition, evidence of both eolian and colluvial deposition was noted on and around the fields. Thus, even if the terrace were raked to obtain gravels for mulching, this probably could not be distinguished from surface indications alone.

Because of the size of this feature, several observations were made that were not possible at other plots. An unmulched area in the south leg of the feature (Figs. 11.7 and 11.8) may represent a planned extension of the field that was never completed. A narrow "aisle" in the northeast-southwest leg may represent a break in the feature. However, two adjacent gravel-mulched plots meet at the south end of the aisle, so the feature was considered continuous. Still, it is possible that the aisle represents a boundary between plots. An area east of the aisle but not directly adjacent to it seems to contain stockpiles of materials consisting of separate concentrations of cobbles and gravels (Fig. 11.9). This may be another planned extension that was never completed. Directly north of the stockpiles is a well-preserved area that seems to represent a later addition to the field. It partly overlays another plot, and its surface is mounded 5–10 cm higher than that of the earlier plot. This is the only area at LA 105707 where evidence of sequenced field construction is obvious. The juxtaposition of the later plot and stockpiles is probably significant, though it is impossible to determine any direct connection at this level of examination.

All cultural materials noted on the surface of this feature were inventoried. The chipped stone assemblage, dominated by gray rhyolite, included 70 core flakes, 16 angular debris, and 10 cores. Other materials included red rhyolite (4 core flakes, 3 angular debris), andesite (12 core flakes, 1 core), and Pedernal chert (2 core flakes, 1 angular debris). Sherds were not as common as chipped stone and included 6 Biscuit A bowl sherds, 4 Biscuit B bowl sherds, and 2 sherds from unidentified biscuit ware bowls. The Biscuit A sherds were mostly clustered together, as were the Biscuit B sherds, suggesting that they represent two vessels.

Feature 14

Feature 14 is a large double terrace-edge borrow pit measuring 12.6 by 12.2 m, with a maximum depth of 1.2 m (Fig. 11.7). It extends up to and slightly within project limits but was not excavated because the area available for detailed examination was too small to provide any data that could not be obtained from surface examination. Since this feature was in the detailed examination zone, it was completely mapped. It sits next to Feature 13 and was probably the source of some of the materials used to build that gravel-mulched field. From the way this borrow pit is configured, it is likely that the lower or southwest section was excavated first. The larger upper section was subsequently used to procure materials for construction of nearby fields, and rejected cobbles and small boulders were tossed into the lower pit, nearly filling it (Fig. 11.10). Sediments have built up in the upper section to an undetermined depth. No associated cultural materials were noted.

Feature 15

Feature 15 is a nearly round terrace-edge borrow pit measuring 5.8 by 5.2 m, with a maximum depth of 0.6 m (Fig. 11.7). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Features 13 and 18 and was probably the source of some of the materials used to build one or both of those gravel-mulched fields. Sediments have built up in the bottom of the pit to an undetermined depth. One piece of chipped stone was noted in the feature, but no temporally diagnostic artifacts are present.

Feature 16

Feature 16 is a small, shallow, nearly round terrace-edge borrow pit measuring 4.6 by 4.1 m, with a maximum depth of 0.3 m (Fig. 11.7). Though outside construction limits, it was in the detailed examination zone and was mapped.

Figure 11.8. Alignments in an unmulched area of Feature 13, LA 105707. Note the lack of surface gravel in comparison with mulched fields like Feature 9 (Fig. 11.6).

Figure 11.9. Cobble stockpile in Feature 13, LA 105707.

Figure 11.10. Looking downslope at Feature 14, showing the pile of discarded cobbles and boulders in the lower section.

This borrow pit is next to Features 13 and 18, and it was probably the source of some of the materials used to build one or both of those gravel-mulched fields. Sediments have built up in the bottom of the pit to an undetermined depth. Four pieces of chipped stone were noted in the feature, but no temporally diagnostic artifacts are present.

Feature 17

Feature 17 is a large oval terrace-edge borrow pit measuring 12.5 by 9.7 m, with a maximum depth of 1.2 m (Fig. 11.7). Though outside construction limits, it was in the detailed examination zone and was mapped. This pit is next to Feature 13 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of the pit to an undetermined depth. Two pieces of chipped stone were noted in the feature, but no temporally diagnostic artifacts are present.

Feature 18

Feature 18 is a small irregularly shaped gravel-mulched plot that measures 7.4 by 3.8 m and covers about 28 sq m (Fig. 11.7). Since this field was in the detailed examination zone it was completely mapped. While some boundary alignments are indistinct, and the gravel shield from a large anthill covers part of its surface, this is one of the best preserved features at LA 105707. About 40–50 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles, most of which are 15–20 cm long. Elements were mostly placed end-to-end, though some side-by-side placement also occurs. While most elements were set on their broadest surfaces, many were set upright. Surface indications suggest that the feature interior is heavily subdivided into small cells measuring 0.8–1.0 m long by 0.4–0.5 m wide (Fig. 11.11).

The mulch is mostly composed of unsorted

Figure 11.11. Small cobble-bordered cell in Feature 18, LA 105707.

gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. The feature surface is mounded 5–10 cm higher than the terrace, indicating that the layer of mulch is at least that thick. Where not obscured by sediments, gravels cover 60–80 percent of the field surface, and vegetation is visibly denser than on the adjacent terrace surface (Fig. 11.12).

All cultural materials noted on the surface of this feature and directly adjacent to it were inventoried. Chipped stone artifacts were rather common, though gray rhyolite was the only material type represented, and included 11 core flakes, 5 angular debris, and 1 core. The only temporally diagnostic artifact noted was a Biscuit A bowl sherd.

Feature 19

Feature 19 is a large oval terrace-edge borrow pit measuring 10.9 by 8.9 m, with a maximum depth of 1.0 m (Fig. 11.7). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 13 and was probably the source of some of the materials used to build that field. Sediments have built up in the bottom of the pit to an undetermined depth. Three pieces of chipped stone were noted in the feature, but no temporally diagnostic artifacts are present.

Feature 20

Feature 20 is a cluster of 20–30 cobbles measuring 2.3 by 1.6 m, which appears to be related to the use of a thermal feature (Fig. 11.13). Most of the cobbles are quartzite, though some rhyolite elements also occur. Many cobbles are partly oxidized, while others exhibit heat-spalling and thermal cracking. There is no real structure to this feature, and it is uncertain whether it represents a deflated hearth or roasting pit, or discards from a similar feature. However, considering that the terrace surface appears to have been aggrading since the site was abandoned, the latter is more likely. Thus, it is possible that an undisturbed buried thermal feature is located nearby.

Figure 11.12. Feature 18 at LA 105707, showing the greater density of gravels on the field surface versus the adjacent terrace surface in the foreground.

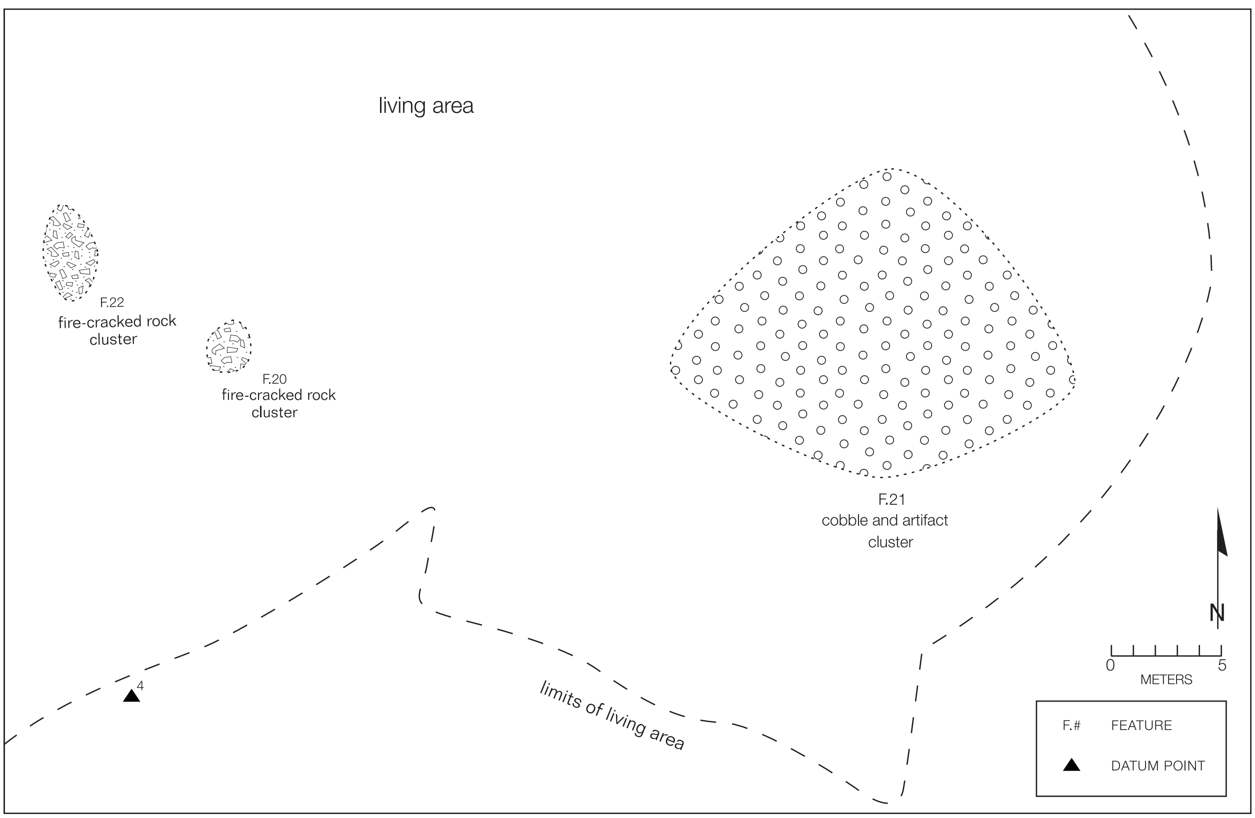


Figure 11.13. A portion of Feature 24 at LA 105707, showing the relationship between Features 20, 21, and 22.

Feature 21

Feature 21 is a rather heavy concentration of cobbles, small boulders, fire-altered rock, and chipped stone artifacts that measures 16 by 13 m (Fig. 11.13). Most cobbles and small boulders cluster in a 5 by 4 m area and include 20–30 elements 10–40 cm long. Quartzite is the most common material, but rhyolite and andesite also occur. It is possible that these materials represent the remains of one or more temporary field structures, but this was impossible to determine from surface observations alone.

The rest of the feature contains a scatter of chipped stone artifacts, cobbles, and numerous fragments of heat-spalled and cracked rock. At least two clusters of cobbles were noted; one is 1.5 m in diameter, and the other is 2.0 m in diameter (Fig. 11.14). These could be the remains of thermal features, but this is uncertain. Unfortunately, the area in which this feature occurs is one of the few parts of the terrace interior that has been actively eroded. While we can probably attribute the higher surface density of artifacts to that process, it may also have moved elements about. Thus, this area could also simply represent a discard zone. Unfortunately, Feature 21 was outside the construction zone and could not be examined in more detail, so we lack the data needed to make a more accurate assessment of its function.

As noted above, Feature 21 contains a rather heavy concentration of chipped stone artifacts, and a sample of about 50 percent was examined. Gray rhyolite, the most common material noted, comprised 123 core flakes, 40 angular debris, and 4 cores. Other materials occurred in much smaller quantities and included andesite (9 core flakes, 4 angular debris), massive quartz (1 core flake, 7 angular debris), red rhyolite (2 core flakes, 1 angular debris), quartzite (2 core flakes), Pedernal chert (1 core flake, 2 angular debris), and chert (1 core flake, 1 angular debris). An andesite mano fragment was the only piece of ground stone found in this area. It is part of a mano of indeterminate form and was ground on only one surface. No temporally diagnostic materials were found in this feature.

Figure 11.14. Probable deflated thermal feature in Feature 21, LA 105707.

Feature 22

Feature 22 is an oval cluster of 20+ pieces of fire-cracked rock measuring 4.5 by 3.0 m, which appears to be related to the use of a thermal feature (Fig. 11.13). There is no real structure to this feature, and it is uncertain whether it represents a deflated hearth or roasting pit, or discards from a similar feature. However, since the area in which it occurs has suffered from erosion, this debris probably represents the deflated remains of a thermal feature. Fifteen pieces of chipped stone were noted in the general vicinity of this feature, primarily comprised of gray rhyolite, though some andesite artifacts and a chert core flake were also noted.

Feature 23

Feature 23 is an oval terrace-edge borrow pit measuring 8.1 by 7.2 m, with a maximum depth of 0.5 m (Fig. 11.7). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 13 and was probably the source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of the pit to an undetermined depth. Three pieces of chipped stone were noted in the feature (two rhyolite, one andesite), but no temporally diagnostic artifacts are present.

Feature 24

Feature 24 consists of a scatter of artifacts and several possible thermal features occupying a central location in the site, mostly adjacent to Feature 13. Features 20, 21, and 22 occur within Feature 24 but were recorded separately because they represent distinct clusters of cultural materials. This probable occupational zone measures 63 by 60 m and covers about 2,700 sq m (Fig. 11.1). Colluvial wash appears to have eroded the east part of the scatter (including Feature 21), but the area next to the interior edge of Feature 13 does not seem eroded and may be covered by a mantle of colluvial and eolian sediments.

Features 20 and 22 occur near one another and are surrounded by a concentration of chipped stone artifacts similar to those in Feature 21. In addition, fragments of two separate trough metates (andesite and granite) were noted nearby. Chipped stone artifacts are scattered across the rest of Feature 24, but no other concentrations of materials were noted.

A detailed inventory of all artifacts was not attempted because of time limitations and the amount of cultural materials contained by Feature 24. The 50-percent sample from Feature 21 is representative of the chipped stone artifacts that occur in the rest of this feature. However, we did examine the surface for any temporally diagnostic artifacts or tools that might be present. The only temporally diagnostic artifact found was a Biscuit A bowl sherd. Besides the metate fragments noted above, ground stone tools include a fragment of an andesite mano of undetermined form, a quartzite one-hand rocker mano, and a second fragment from the granite trough metate noted above. Chipped stone tools include a Polvadera obsidian arrow point tip, an obsidian arrow point tip, two obsidian corner-notched arrow points, an obsidian drill base, a Polvadera obsidian retouched tool that was discarded after being broken during manufacture, and a Pedernal chert biface fragment.

Surface Information

Several important aspects of LA 105707 still need to be discussed or expanded upon. Farming plots at this site tend to follow the edge of the terrace, whether adjacent to the Ojo Caliente Valley proper or along secondary drainages that have deeply dissected the terrace. Only terrace-edge borrow pits were noted; thus, there is only limited evidence of sequential field construction. This evidence consists of two areas that appear to represent uncompleted field extensions and a plot that was partly built over an earlier field. Outside the detailed examination zone, fields continue along an intermittent drainage on the northwest edge of the site, and that area contains no further evidence of sequential field construction. Since the terrace edge delimits most of LA 105707 on three sides (Fig. 11.1), it is likely that there was not enough space to expand fields beyond a certain size. If so, the paucity of evidence of sequential field construction may simply mean that limits on the amount of space available in this location were reached before it became necessary or desirable to replace or supplement existing fields with plots situated more to the interior of the terrace.

It is interesting to note that the trail (LA 118549) ascends to the terrace top at the edge of the farming features at LA 105707. Other than the fields in this location, no structures or features that might have provided an attraction for routing the trail to the top of the terrace were identified. Unfortunately, however, the tip of the terrace directly west of the trail was removed decades ago. Thus, it was not possible to determine whether any such features might have once been present in that area. At this time, we can only assume that the trail ascended to the top of the terrace at LA 105707 to provide more direct access to the farming features there.

Limited reconnaissance on top of a higher terrace northeast of LA 105707 showed that it also contains extensive farming features. Since that area is well outside the construction zone, those features were neither recorded nor assigned a site number. However, they were probably noted during Bugé's (1984) study of the region. They are similar to the features investigated during this project but do not seem to have suffered as much erosional impact.

No definite shrines were found at this site, though a few features at LA 105707 and on the high terrace to the northeast may have functioned as such. A small rock pile on the east side of the southern extension of Feature 13 may be a shrine, but it is also very near that field and could represent a stockpile of construction materials. However, when compared with the probable stockpiles mapped as part of the same feature, that function seems less likely. Several rock piles were noted on the high terrace to the northeast and could represent shrines or boundary markers. A boulder set within Feature 1 seems out of place. It resembles a similar boulder at LA 105709 (discussed in a later chapter) and may represent a small field shrine. Finally, the unusual configuration of Feature 14 may indicate some special significance. Unfortunately, there are no correlates in the literature on Pueblo shrines that was examined, so this remains speculative.

The presence of an occupational zone next to the farming features at LA 105707 is very important, since few (if any) have been noted during previous studies in this region. It is unfortunate that temporally diagnostic artifacts are rare in that area, but the few that were recorded suggest that Feature 24 was occupied while the farming features were in use. The presence of a single Biscuit A bowl sherd in Feature 24 is not highly significant, though it does provide a tentative Classic period date for the occupational zone. The presence of parts of at least two trough metates is also indicative of a Pueblo occupation, though this artifact class is not nearly as time-sensitive as pottery.

The only other temporally diagnostic artifacts found in Feature 24 were corner-notched arrow points. This style of projectile point is often associated with the Early Developmental period, and in the past the presence of such artifacts has often resulted in assignment to that temporal period. Indeed, the author used such logic to assign an Early Developmental affinity to a scatter of artifacts on a similar farming site in the Chama Valley (Moore 1992). However, the results of research near Pecos show that corner-notched projectile points were made and used by Pueblos into the early historic period (Moore 2003). Indeed, this style also remained popular into the Late Pueblo period in the Highland Mogollon region (Moore 1999a). Thus, corner-notched projectile points may have a limited utility as temporally diagnostic artifacts; they came in with the introduction of the bow, and in some areas were manufactured until replaced by metal points. Like the trough metate fragments, they are merely indicative of a Pueblo occupation in this region.

Though the evidence is slim at this point, it is likely that Feature 24 represents an occupational zone used at the same time as the fields. Rather than basing this assertion on a suite of highly sensitive temporal indicators, we base it on the proximity of Feature 24 to fields and comparisons with other sites in the project area. As discussed in more detail in a later section, similar occupational zones were identified at two to three other sites and in general display a paucity of diagnostic artifacts (though in one case pottery was common). Thus, the similarity of the occupational zone at LA 105707 to the other examples is probably a good indication that it functioned in the same way and was closely related to use of the nearby fields.

A fairly intensive use is indicated for the occupational zone. Several activities appear to have occurred there, including core reduction, tool manufacture, hunting, and vegetal food processing. The remains of at least three thermal features were documented and are probably indicative of food preparation by roasting or stone boiling. While no structures were noted, our examination was not detailed enough to define temporary field shelters. Such remains are often quite ephemeral, sometimes no more than a short cobble alignment and nearby discard zone next to a field, such as was found at LA 71189 near Pot Creek Pueblo (Moore and Levine 1994). This type of shelter would be virtually invisible on the surface. The presence of numerous unburned large cobbles and small boulders on Feature 24, often occurring in clusters, may be indicative of the presence of such structures in subsurface contexts. This possibility is strengthened by the general paucity of cobbles and boulders away from the terrace edge. Those present on the surface of Feature 24 were almost certainly moved there by the prehistoric occupants of the site. Coupled with the presence of thermal features and artifact concentrations, the existence of one or more temporary shelters used while cultivating the adjacent fields is quite likely.

In addition to the artifacts inventoried on feature surfaces, a small number of chipped stone artifacts were collected from the section of site that extends into the right-of-way (Table 11.1). Rhyolite is by far the dominant material, comprising 97 percent of this small assemblage. The only other material present is Pedernal chert, which is represented by a single artifact (3 percent). However, the presence of this artifact in the assemblage is potentially significant because Pedernal chert does not occur naturally in gravel deposits in this part of the Ojo Caliente Valley. No tools were identified among the collected artifacts.

Table 11.1. Chipped stone artifacts collected within the highway right-of-way at LA 105707 (material type by morphology)

Material Type	Angular Debris	Core Flakes	Cores
Pedernal chert	-	1	-
Rhyolite	4	25	3

Chapter 12. LA 105708

James L. Moore and Jeffrey L. Boyer

LA 105708 is a large farming site on State Trust land administered by the New Mexico State Land Office. It occupies an irregular oval area and is bounded by the main terrace edge overlooking the Ojo Caliente Valley on the west and by arroyos formed by intermittent tributary drainages on the north and south. The east boundary of the site is formed by the edge of the farming features. Intermittent drainages separate this site from LA 105705 to the north and an unrecorded series of farming features to the south that are completely outside project limits (Fig. 12.1). These arbitrary boundaries were used to maintain the original numbering system and restrict LA 105708 to a manageable size. It is unlikely that they replicate the prehistoric land tenure system.

LA 105708 measures 392 m north to south by 169 m east to west, and covers about 38,234 sq m (3.82 ha). The site may have extended further west, but that area is in the current U.S. 285 right-of-way and has been removed. Only 3.9 percent of LA 105708 extends into the right-of-way, comprising a narrow sliver along the southwest edge of the site. In-field pottery analysis indicated that LA 105708 was used during the Classic period.

Vegetation is moderate on the site, and the plant cover is generally similar between on- and off-feature areas. However, distinct differences were noted in a few places and are discussed in individual feature descriptions. Grasses were the most common plants noted, including grama, muhly, three-awn, and Indian ricegrass. Other common plants include rabbitbrush, snakeweed, cholla, prickly pear, and narrowleaf yucca. Small junipers occur at the terrace edge, but only a few have spread onto the surface of the fields. Free-growing lichens were common on some fields.

Field Procedures

Detailed mapping was restricted to the section of site that extends into the U.S. 285 right-of-way and an adjacent 25 m wide zone. This area comprises a sample of about 14 percent of the site, and all cultural features within this zone were mapped and recorded in detail. Several features were partly or wholly within project limits, including two gravel-mulched fields (Features 3 and 9) and four borrow pits (Features 8, 10, 11, and 12). Data recovery efforts concentrated on surface description of features in the mapped area and sample excavation of fields within project limits. The latter focused on Features 3 and 9, each of which was sampled by three excavation units. Since excavation of borrow pits would have provided few data that were not available from surface examination, no subsurface studies were conducted in those features. All cultural materials noted on the surface within the right-of-way were collected for analysis, as were artifacts encountered in excavation units. These materials are summarized later in this chapter. Artifacts noted elsewhere on the surface of features in the detailed mapping zone were inventoried by feature and are summarized in those discussions.

Features

Seventeen features were at least partly mapped and described (Fig. 12.1). An additional terrace-edge borrow pit is shown on the site plan, but since it was outside the detailed examination zone, it was not described or assigned a feature number. Field limits were often difficult to define in the mapped area, though outside that zone some fields are much better delineated. A combination of colluvial and eolian processes have caused soil to build up against alignments that face the terrace interior, obscuring those edges in many places. Eolian deposits also cover much of the surface of the fields, especially where they are anchored by vegetation. This made it difficult to discern many alignments and to define the full extent of others. Several fields appear to overlie others, and it is possible that some materials used to build later features were salvaged from earlier

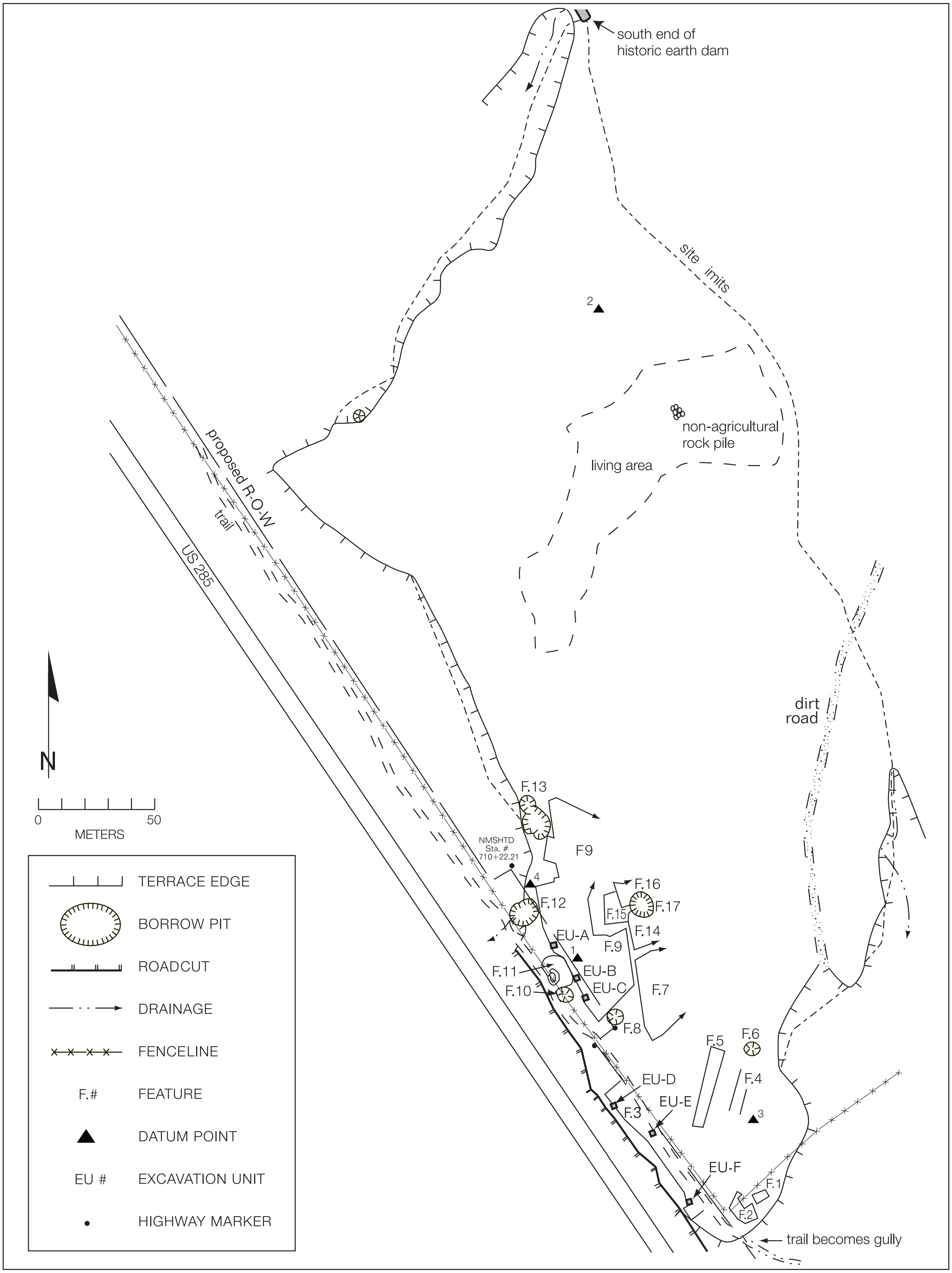


Figure 12.1. Plan of LA 105708.

fields, further obscuring alignments. Livestock grazing has also caused damage, displacing elements in cobble alignments and blurring feature borders. Along the terrace edge this seems to have exacerbated damage caused by erosion. Other surface disturbances include a trail (LA 118549) that runs along the west edge of the site next to U.S. 285 and enters the site between Features 2 and 3. An unimproved dirt road traverses the southeast section of the site, crossing several gravel-mulched fields. For the most part, this has simply obscured field surfaces rather than cutting through them.

Feature 1

Feature 1 is a small rectangular gravel-mulched plot that measures 6.2 by 4.4 m and covers 24.2 sq m (Fig. 12.2). Since this field was in the detailed examination zone it was completely mapped. About 40–50 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. The few small boulders that were also used are 30–45 cm long. Elements were mostly placed end-to-end, though some side-by-side placement also occurs. Most elements were set on their broadest surfaces, but a few were set upright. Surface indications suggest that the feature interior is subdivided into multiple compartments. Grasses seem denser and taller on the field, but this may be illusory because the feature is outside a fence and has not been grazed recently.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are one element high, the mulch is probably 8–12 cm thick. The field was not visibly mounded above the terrace surface, and no differences in gravel or vegetative density were noted between on- and off-feature areas. No cultural materials were found on the surface of this feature.

Feature 2

Feature 2 is a small irregularly shaped gravel-mulched plot that measures 13.6 by 9.7 m and covers 83.6 sq m (Fig. 12.2). Since this field was in the detailed examination zone, it was completely mapped. About 40–50 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. A few small boulders were also used and are 25–35 cm long. Elements were mostly placed end-to-end, though some side-by-side placement also occurs. Most elements were set on their broadest surfaces, but a few were set upright. Surface indications suggest that the feature interior is highly subdivided into multiple compartments. Many large cobbles and small boulders embedded in the mulch may indicate a pattern of noncontiguous, evenly spaced elements. Grasses seem denser and taller on the field, but this may be illusory because the feature is outside a fence and has not been grazed recently. Most alignments on the interior side of the feature are obscured by colluvial sediments washing down a slope to the east, while elements in alignments along the terrace edge are displaced by erosion and livestock grazing.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 12 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are one element high, the mulch is probably 8–12 cm thick. The field was not visibly mounded above the terrace surface, and no differences in gravel or vegetative density were noted between on- and off-feature areas.

All cultural materials noted on the surface of this feature were inventoried. Gray rhyolite dominated the chipped stone (three core flakes and two angular debris). A quartzite core flake was also noted. All but one piece of angular debris clustered together in the southeast corner of the feature near the terrace edge. Four sherds from the same Biscuit A bowl were also observed.

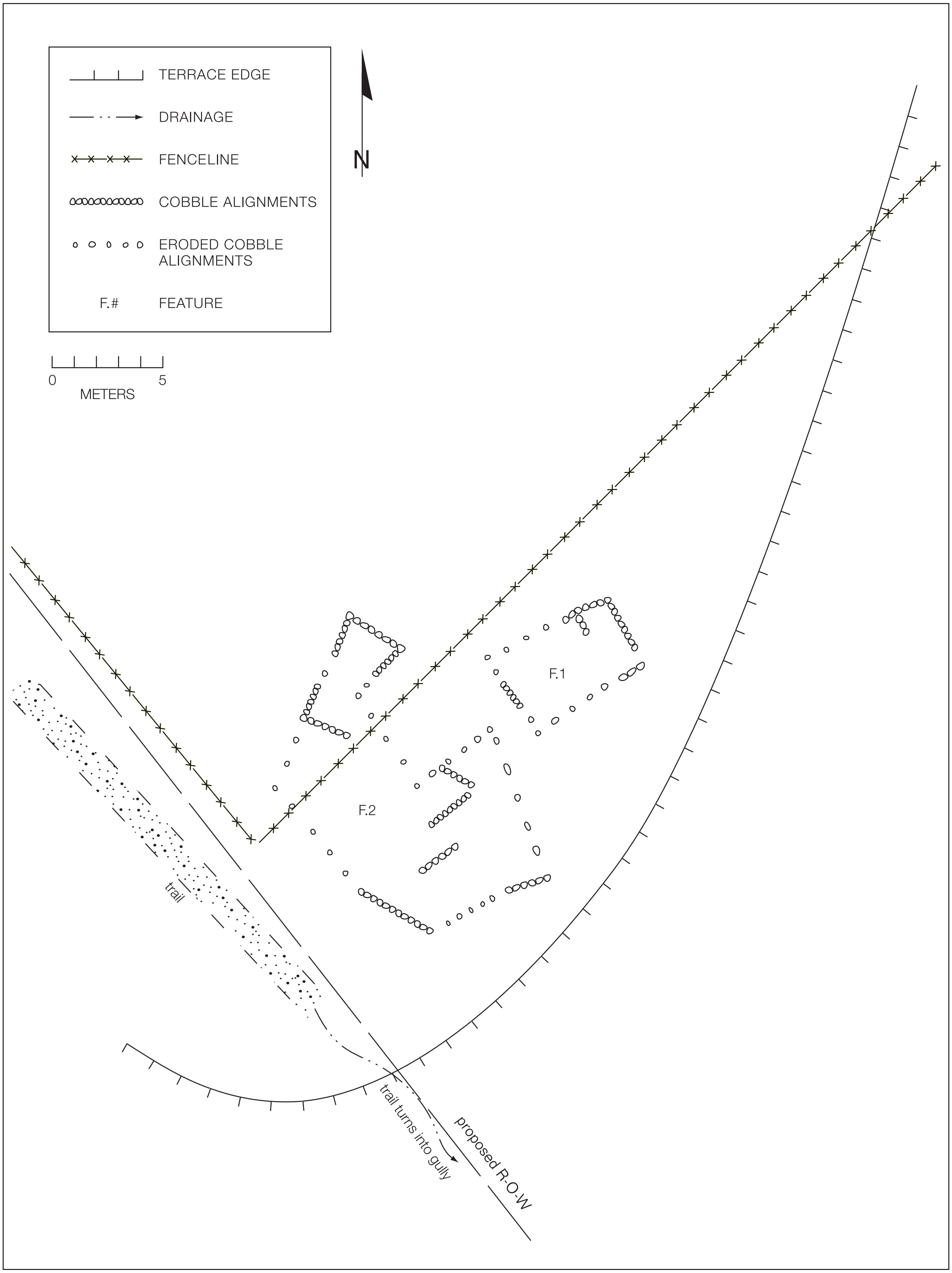


Figure 12.2. Features 1 and 2, LA 105708.

Feature 3

Feature 3 is a long, narrow gravel-mulched plot that measures 65.5 by 9.5 m and covers about 393 sq m (Fig. 12.3). Since this field was within project boundaries, it was completely mapped, and three excavation units were used to examine its structure. This feature has been severely affected by cultural activities and erosion. Although the end of the terrace was removed during an earlier episode of highway construction, Feature 3 does not seem to have been damaged. From surface indications it seemed likely that the side of the feature that faces the terrace interior was damaged by construction of a prehistoric trail (LA 118549). Soil is bermed along the west side of the trail and initially appeared to cover part of the back edge of the feature. However, excavation showed that this was unlikely and that the feature never extended as far as the trail. Erosion along the terrace edge has displaced numerous elements from alignments and spread mulch onto the adjacent terrace surface. About 60–70 percent of the feature surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. A few small boulders were also used and are 25–40 cm long. Elements were mostly placed end-to-end, though some side-by-side placement also occurs. Most elements were set on their broadest surfaces, but a few were set upright. Surface indications suggest that the feature interior is highly subdivided into multiple compartments at both ends. Unfortunately, the central part of the feature is so badly obscured by sediments that it was not possible to determine what the original configuration was in that area. However, the presence of many large cobbles and small boulders embedded in the mulch may indicate that a pattern of noncontiguous, evenly spaced elements prevails over much of the feature. Vegetational density is not visibly different from that of adjacent ungrazed areas that do not contain farming features.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 12 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are one element high, the mulch is probably 10–15 cm thick. The field is mounded 5–10 cm above the terrace surface in some places. No differences in gravel density were noted between on- and off-feature areas.

Feature 4

Feature 4 is a small contour-terrace system containing two alignments on a west-southwest-facing slope (Fig. 12.4). Since this feature was in the detailed examination zone, it was completely mapped. The alignments are relatively straight and measure 19.4 and 11.9 m long; both were built from locally obtained cobbles and small boulders. They are a single element high and wide, and are spaced about 0.4 m apart. While most elements were placed end-to-end, some were placed sideways. In most cases placement seemed dependent on element size, so that larger rocks were placed end-to-end and smaller elements sideways, perhaps to maintain an even wall thickness. Cobbles predominate in both alignments, and most are 10–25 cm long. A few small boulders were also used, and they are 25–30 cm long. Many elements are slightly displaced by erosion and livestock grazing. There may have once been more than two alignments on the slope, but good surface evidence of others was not found.

Sediments have built up behind the terrace walls and are 10–12 cm thick. Since there does not appear to be any difference between sediments behind the terrace walls and on the adjacent hill slope, it is likely that this buildup occurred naturally. No cultural materials were in obvious association with this feature.

Feature 5

Feature 5 is a long, rectangular gravel-mulched plot that measures 35.2 by 6.2 m and covers about 196.4 sq m (Fig. 12.4). Since this feature was in the detailed examination zone, it was completely mapped. About 50 percent of the surface of this feature is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. In addition, colluvial wash has buried most of the

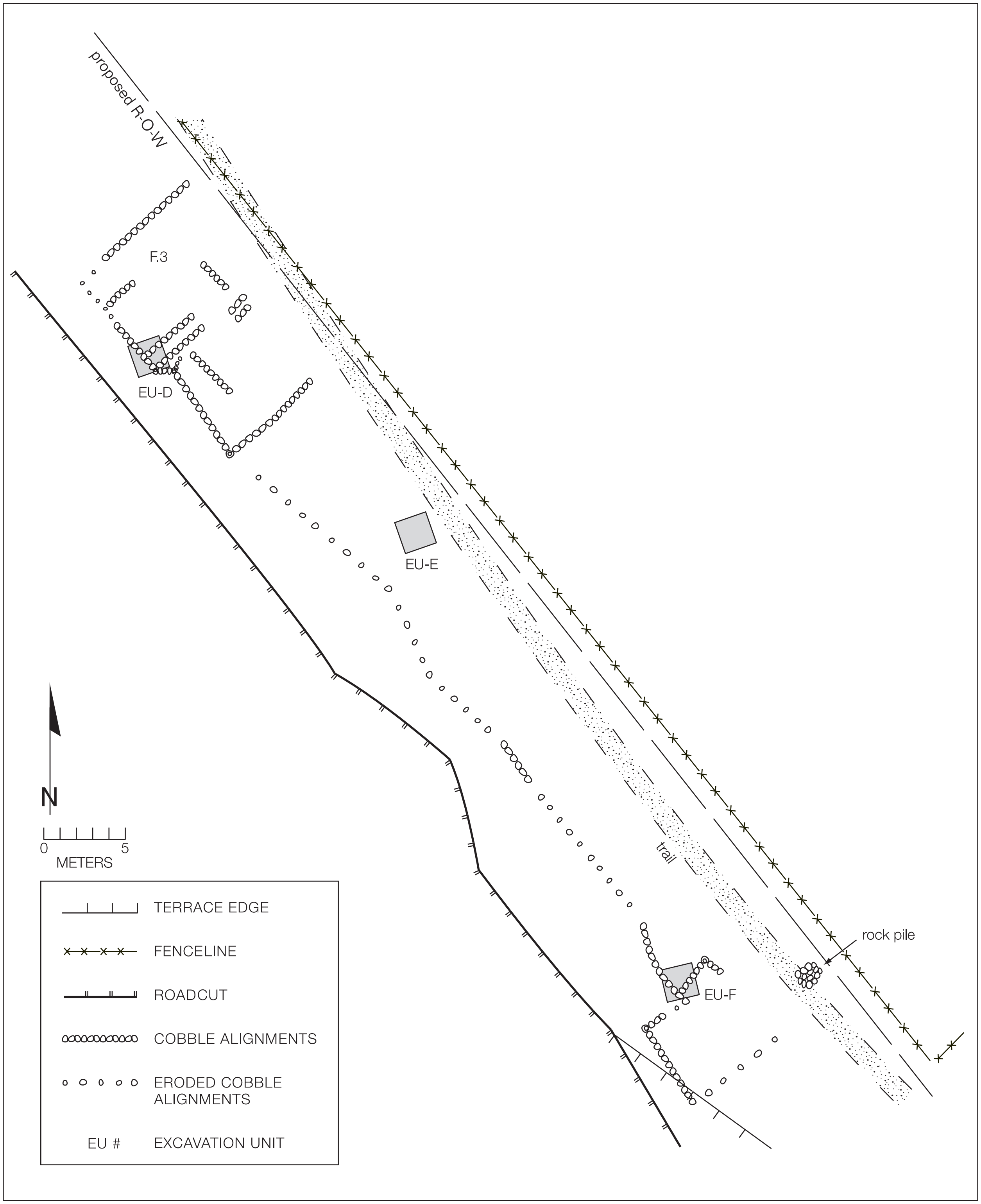


Figure 12.3. Feature 3, LA 105708.

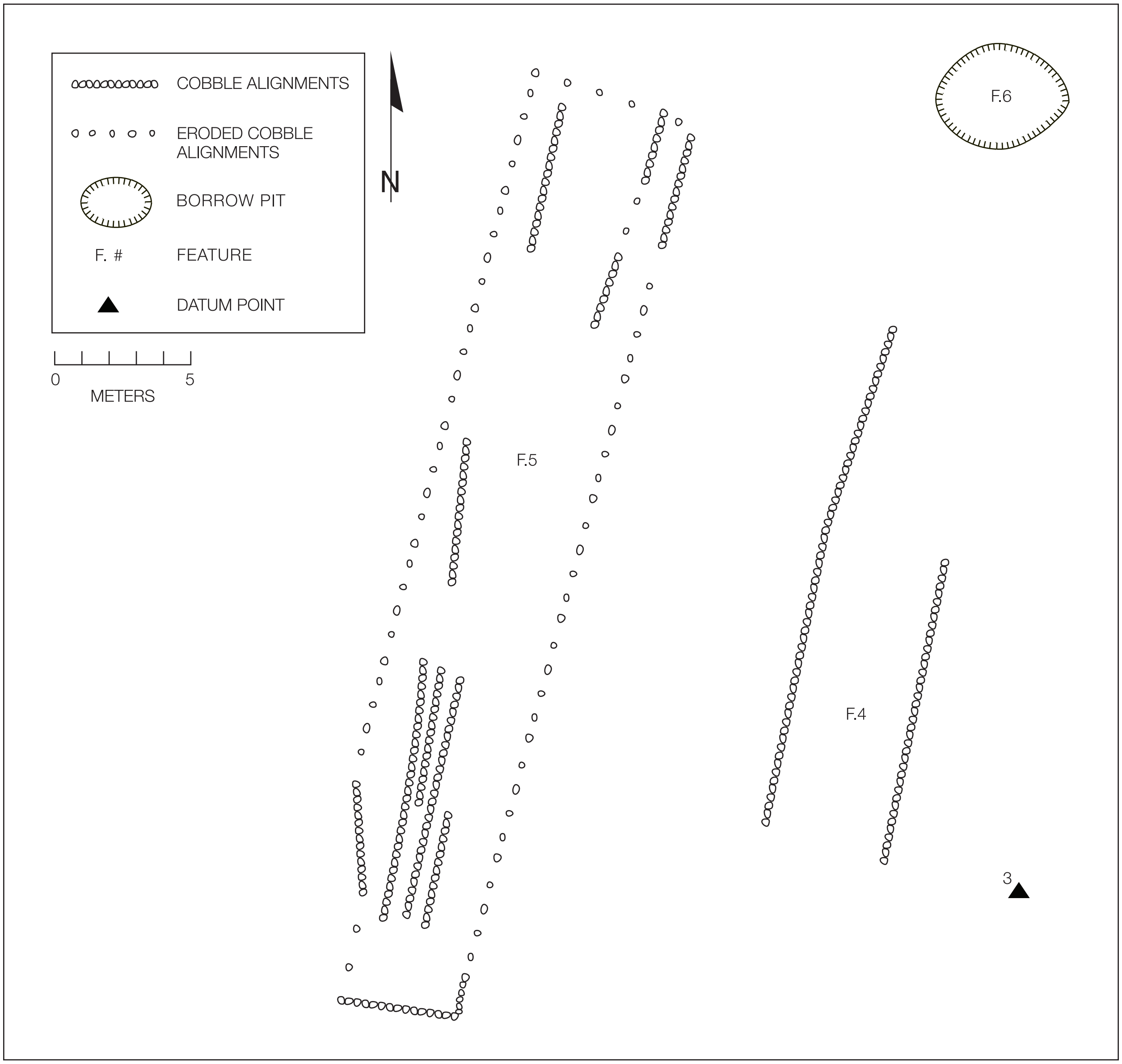


Figure 12.4. Features 4, 5, and 6, LA 105708.

east edge of the feature. A similar process has scattered elements from the west side of the feature, and in conjunction with livestock grazing appears to have contributed to the deterioration of most boundary alignments. Several interior subdividing alignments were visible, however, suggesting that the field was subdivided into many long, parallel plots.

Boundary and interior subdividing alignments are a single element high and wide, and they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–20 cm long. Small boulders are also quite common in the feature, and they are 25–40 cm long. Elements were mostly placed end-to-end, though some side-by-side placement also occurs. All visible elements were set on their broadest surfaces, and no uprights were noted. Vegetation is somewhat denser on the field than in adjacent off-feature areas.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 12 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are one element high, the mulch is probably 8–15 cm thick. The field is not visibly mounded above the adjacent terrace surface, and no differences in gravel density were noted between on- and off-feature areas. The only artifacts noted on the surface of this feature were a gray rhyolite core and core flake. No temporally diagnostic materials were found.

Feature 6

Feature 6 is a small oval terrace-interior borrow pit measuring 5.6 by 4.1 m, with a maximum depth of 0.6 m (Fig. 12.4). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is near an unmapped gravel-mulched field and was probably the source of some of the materials used to build that feature. Sediments have built up in the bottom of the pit to an undetermined depth. No artifacts were noted in association with this feature.

Feature 7

Feature 7 is a large irregularly shaped gravel-mulched plot that measures 35.4 by about 32 m and covers roughly 1,200 sq m (Fig. 12.5). Since this field was mostly outside the detailed examination zone, the entire feature was not mapped. Only the west 13 m were in the mapping zone, so the full extent of the feature was estimated by pacing. About 40–50 percent of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–20 cm long. Small boulders are also common, and most are 25–35 cm long. Elements were predominantly placed end-to-end, though some side-by-side placement also occurs. Most elements were also placed on their broadest surfaces, but a few were set upright. Surface indications suggest that the feature interior is highly subdivided into compartments. Parts of the field are dotted by cobbles and small boulders set into the gravel mulch, which may indicate that a pattern of noncontiguous, evenly spaced elements prevails over much of the feature.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 12 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. This feature is distinctly mounded, particularly along the west edge, where it is 10–15 cm higher than the terrace. The gravel-mulch layer is probably of an equivalent depth. No differences in gravel or vegetative density were noted between on- and off-feature areas.

This field abuts the east edge of Feature 9, which is fairly indistinct. It is likely that Feature 7 actually overlaps Feature 9 in that area. The presence of terrace-interior borrow pits at the northeast and southeast corners of Feature 7 in addition to this overlap may be evidence of sequential construction. If so, Feature 7 was built after Feature 9, and much of the mulch for that field was probably obtained from borrow pits on the interior of the terrace rather than along its margin. Thus, this field may be part of a second tier of later features built along the interior edge of the first tier of fields, which was situated at the terrace edge.

All cultural materials noted on the surface of this feature were inventoried. Gray rhyolite dominated the chipped stone (ten core flakes, seven angular debris, one core, and one tested cobble). Other materials included andesite (three core flakes, two cores) and red rhyolite (one core flake). No temporally diagnostic materials were noted.

Feature 8

Feature 8 is an oval terrace-interior borrow pit measuring 6.6 by 5.9 m, with a maximum depth of 0.5 m (Fig. 12.5). It is partly within construction limits and was completely mapped. This borrow pit is next to Feature 9 and was probably the source of some of the materials used to build that field. Sediments have built up in the bottom of the pit to an undetermined depth. Artifacts noted in association with this feature included two pieces of chipped stone and a Biscuit B bowl sherd.

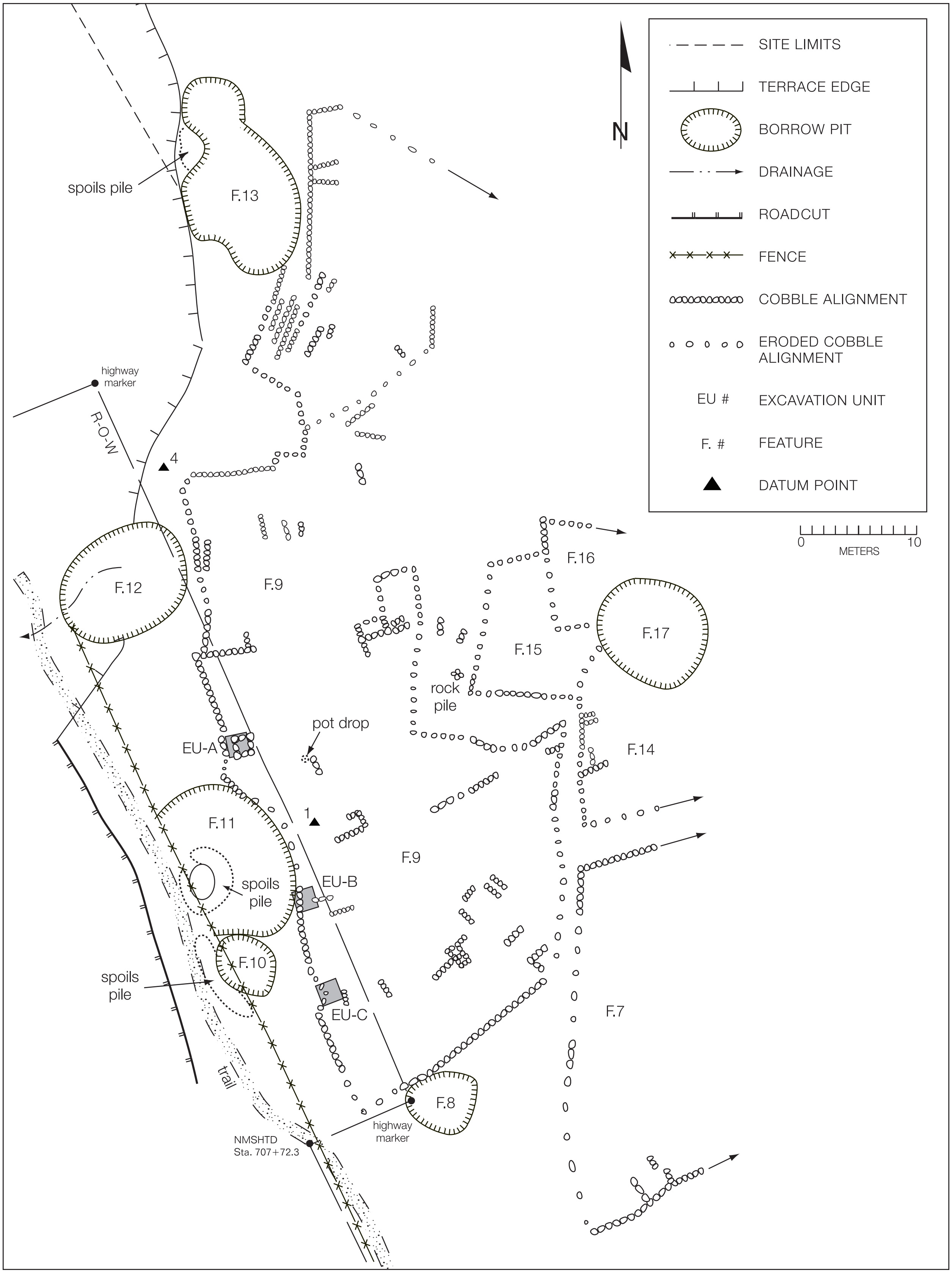


Figure 12.5. Features 7 through 17, LA 105708.

Feature 9

Feature 9 is a large irregularly shaped gravel-mulched plot that measures 98.0 by at least 28.4 m and covers a minimum of 2,800 sq m (Fig. 12.5). Since this field was partly outside the detailed examination zone, the entire feature was not mapped. However, only a small part of the north section of the feature was outside this area, so most of it is shown in Figure 12.5. Since Feature 9 extends into project limits, three excavation units were used to examine it. The east edge of this field is very indistinct but does not appear to extend under Features 14, 15, and 16, as it does under Feature 7. However, these fields do seem to have been built later than Feature 9, and some of the elements used to construct them may have been salvaged from it. This may have contributed to the deterioration of the east edge of Feature 9. About 40–50 percent of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. Small boulders occur rarely and are 25–40 cm long. Most elements were placed end-to-end, though some side-by-side placement occurs. Most elements were also placed on their broadest surfaces, but a few were set upright. Surface indications suggest that the feature interior is subdivided into multiple compartments. Parts of the field are dotted by large cobbles set into the gravel mulch, suggesting that a pattern of noncontiguous, evenly spaced elements prevails in those areas.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 12 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. This feature is mounded 2–5 cm higher than the adjacent terrace. The gravel-mulch layer is probably 5–15 cm thick over most of the feature. No differences in gravel or vegetative density were noted between on- and off-feature areas.

Artifacts found within project limits were collected for analysis; they are discussed in a later chapter. Other cultural materials noted on the surface of the feature were inventoried and left in place. The latter were dominated by chipped stone artifacts. Materials noted included gray rhyolite (44 core flakes, 12 angular debris, 1 core) and andesite (12 core flakes, 8 angular debris, 2 cores). Artifacts observed outside project limits included 1 Biscuit B bowl sherd, 3 Tewa Gray jar sherds, and 3 pieces of amethyst glass.

Feature 10

Feature 10 is an oval terrace-edge borrow pit measuring 7.2 by 6.2 m, with a maximum depth of 0.7 m (Fig. 12.5). It is within construction limits but was not examined in detail because excavation would have provided few data that were not available from surface examination. This borrow pit is near Feature 9 and was probably the source of some of the materials used to build that field. Sediments have built up in the bottom of the pit to an undetermined depth. The trail (LA 118549) runs along the west edge of Feature 10 and is separated from it by a low berm, which is quite distinct though it is only 10–20 cm high. It was not possible to determine whether the berm represents spoils from the borrow pit or material removed from the trail to clear it. While the former is more likely, it is also possible that the spoils were supplemented by materials removed from the trail.

Feature 11

Feature 11 is a large, nearly round terrace-edge borrow pit measuring 13.6 by 13.0 m, with a maximum depth of 1.6 m (Fig. 12.5). It is within construction limits, but it was not examined in detail because excavation would have provided few data that were not available from surface examination. This borrow pit is near Feature 9 and was probably the source of some of the materials used to build that field. Interestingly, a smaller borrow pit was excavated at the bottom of the larger pit, near its west edge. The smaller pit measures 3.4 by 2.2 m and is nearly surrounded by a spoils pile except on the north side (Fig. 12.6). The trail (LA 118549) runs along the west edge of the feature and appears to truncate it, since there is nothing to demarcate the east edge of the trail from the borrow pit in that area. While it is possible that the elaboration of the borrow pit was related to the presence of the trail, we have no way of deter-

Figure 12.6. Feature 11 at LA 105708, showing the smaller interior borrow pit and spoils pile in the center of the photo, and the trail (LA 118549) just outside the fence.

mining this for certain. However, this feature is similar to another borrow pit near the trail at LA 105707, and both may have had some significance beyond field construction and maintenance.

Feature 12

Feature 12 is an large, oval terrace-edge borrow pit measuring 9.1 by 7.1 m, with a maximum depth of 1.5 m (Fig. 12.5). It is within construction limits, but it was not examined in detail because excavation would have provided few data that were not available from surface examination. This borrow pit is near Feature 9 and was probably the source of some of the materials used to build that field. Because of its position at the edge of the terrace, this borrow pit is open to the west. A small erosional drainage heads in the bottom of the pit, and it is impossible to determine how much of its current depth is attributable to gullying. The only artifacts noted in association with this feature were two pieces of chipped stone.

Feature 13

Feature 13 is a large, irregularly shaped terrace-edge borrow pit measuring 19.5 by 12.1 m, with a maximum depth of 1.3 m (Fig. 12.5). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is near Feature 9 and an unmapped gravel-mulched plot and was probably the source of some of the materials used to build those fields. Sediments have built up to an undetermined depth in the bottom of the pit, and a small spoils pile occurs along its northwest edge. The irregular shape of this feature may be indicative of multiple episodes of use. The central section of the pit seems to represent the original excavation, while lobes on the north and south may be indicative of later reuse of the feature to obtain more materials for the construction of adjacent fields. No artifacts were noted in association with this feature.

Feature 14

Feature 14 is a large irregularly shaped gravel-mulched plot that measures a maximum of 43 by 39 m and covers roughly 1,700 sq m (Fig. 12.5). Since this field was mostly outside the detailed examination zone, the entire feature was not mapped. Only the westernmost 7 m were within the mapping zone, so the full extent of the feature was estimated by pacing. For the most part, only the area within the detailed examination zone is described. About 50 percent of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and they were built with locally obtained cobbles, most of which are 10–20 cm long. Elements were mostly placed end-to-end, though side-by-side placement is also common. All elements in the detailed examination zone were placed on their broadest surfaces; no uprights were noted.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 12 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. This feature is distinctly mounded, particularly along the west edge, where it is 5–10 cm higher than the terrace. The gravel-mulch layer is probably of equivalent depth. No differences in gravel or vegetative density were noted between on- and off-feature areas.

This field overlaps the east edge of Feature 15 and was probably built at a later time. Two adjacent terrace-interior borrow pits may have provided some of the materials used to construct this feature. Like Feature 7, this field probably represents part of a second tier, or later phase, of construction. No artifacts were noted on the portion of Feature 14 within the detailed mapping zone.

Feature 15

Feature 15 is a small irregularly shaped gravel-mulched plot that measures 14.0 by 11.4 m and covers roughly 114.2 sq m (Fig. 12.5). Since this field was in the detailed examination zone, it was completely mapped. About 60–70 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

All alignments are a single element high and wide, and they were built with locally obtained cobbles, most of which are 10–25 cm long. All visible elements were placed end-to-end, and most were set on their broadest surfaces, though a few uprights were noted.

The mulch is mainly composed of unsorted gravels and pea gravels, though small cobbles up to 14 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. The layer of mulch is probably 8–12 cm thick. No differences in vegetative density were noted between on- and off-feature areas.

Sedimentation has concealed most boundary and internal subdividing alignments in this feature. Indeed, only two short segments of boundary alignments and no internal subdividing alignments were visible from the surface. Most of the feature edges are marked by a sudden decrease in surface gravel density. Where the mulch is visible, gravels cover 70–80 percent of the surface, while they cover only 10–40 percent of the surface in adjacent off-feature areas. There is also a barely perceptible mounding about 2–5 cm high at the feature's west edge. In contrast, Features 14 and 16 seem to cover the east edge of this small field and are distinctly mounded 5–10 cm above its surface. Feature 15 was probably built before Features 14 and 16, and most likely belongs in the first tier of fields along with Feature 9. The subsequent construction of adjacent fields may have contributed to the deterioration of Feature 15, and some building elements may have been removed for use in the later features. Indeed, a pile of cobbles between Features 9 and 15 could be evidence of this process (Fig. 12.7). However, it is also possible that it is a small rock pile shrine.

All cultural materials noted on the surface of this feature were inventoried. Gray rhyolite dominated the chipped stone (five core flakes, two angular debris, and one core). The only other chipped stone artifact noted was a red rhyolite angular debris. The only temporally diagnostic artifacts were two Biscuit A bowl sherds.

Feature 16

Feature 16 is a large irregularly shaped gravel-mulched plot that measures 34 by 24 m and cov-

Figure 12.7. Small rock pile between Features 9 and 15, LA 105708.

ers roughly 820 sq m (Fig. 12.5). Since this field was mostly outside the detailed examination zone, the entire feature was not mapped. Only the westernmost 5 m were within the mapping zone, so the full extent of the feature was estimated by pacing. About 50–60 percent of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 15–25 cm long. Small boulders are also common, and they are 25–35 cm long. Elements were mostly placed end-to-end, though they are occasionally interspersed by elements placed sideways. Most elements were also set on their broadest surfaces, though uprights are also fairly common. Surface indications suggest that the feature interior is subdivided into multiple compartments. However, cobbles are very common on the surface of this feature. Most occur in clusters with no evidence of arrangement in alignments, suggesting that larger elements were important in the mulching strategy applied to this field. This type of mulching makes most interior subdividing alignments difficult to discern; indeed, none were visible in the section of field within the mapping zone.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 16 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. This field is distinctly mounded 10–12 cm higher than the adjacent terrace. The gravel-mulch layer is probably of equivalent depth. Gravels cover 60–70 percent of the field surface where the mulch is visible. In contrast, gravels cover only 15–20 percent of the adjacent terrace surface. Vegetation is also visibly denser on the field than in nearby off-feature areas.

This field overlaps the east edge of Feature 15 and seems to have been built at a later time. A nearby terrace-interior borrow pit (Feature 17) may have provided some of the necessary materials. Like Features 7 and 14, this field probably represents part of a second tier, or later phase, of construction. All cultural materials noted on the surface of this feature were inventoried. Gray rhyolite dominated the chipped stone (ten core flakes, seven angular debris, one core, and one tested cobble). Other materials included andesite (three core flakes, two cores) and red rhyolite (one core flake). No temporally diagnostic materials were noted.

Feature 17

Feature 17 is a large, round terrace-interior borrow pit measuring 11.0 m in diameter, with a maximum depth of 0.9 m (Fig. 5.6 and 12.5). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is near Features 14, 15, and 16, and it was probably a source of some of the materials used to build one or more of those fields. Sediments have built up in the bottom of this pit to an undetermined depth. Associated artifacts included ten pieces of chipped stone.

Feature 18

Feature 18 is a large scatter of chipped stone and ceramic artifacts that bisects the farming features at LA 105708, dividing them into north and south sections (Fig. 12.1). Farming features bound the scatter on the south and along most of its north perimeter, are sparse to the east, and do not occur on the west. This feature is outside the detailed examination zone, but it was mapped because an understanding of its location and basic structure is crucial to the discussion of this site. The artifact scatter is irregular in shape, measures 156 by 70 m, and covers approximately 4,900 sq m. Since this feature bisects the fields at LA 105708, it may represent a boundary zone separating farming areas controlled by different corporate groups.

Although internal characteristics of this feature are not shown on the plan, its configuration suggests that it represents a residential zone. Between four and six clusters of burned and fire-cracked rock were noted and probably represent the remains of thermal features. The assemblage is dominated by chipped stone artifacts, and only a few sherds were noted. Artifact density is relatively high, and most chipped stone artifacts occur in clusters. A sample of around 55 percent of surface artifacts was recorded and is discussed later.

No evidence of any structures was noted, but it is likely that field shelters were erected in this zone and were probably fairly insubstantial, perhaps meant only to provide shade on hot summer days. Temporary shelters similar to the Hopi *kishoni*, or uncovered shade (Mindeleff 1891:217), could have been used without leaving surface indications. Ramadas could also have been built and would be similarly invisible on the modern ground surface as long as partial stone walls were not appended to them. Unfortunately, since this feature was completely outside project limits, excavation was not an option, so it was not possible to explore this area for the remains of shelters or other features.

Surface Information

Like several other farming sites examined during this study, LA 105708 is rather elongated and follows the edge of the terrace that forms the east boundary of the Ojo Caliente Valley. Its north and south borders are arbitrary and almost certainly do not represent aspects of the prehistoric land tenure system. However, the presence of an apparent residential area (Feature 18) that bisects the site suggests the existence of a boundary between farming areas controlled by different corporate groups. Unfortunately, whether those groups were from the same or different villages was impossible to determine.

When compared to most of the other farming sites examined, LA 105708 seems rather wide and contains numerous terrace-interior borrow pits ringed by gravel-mulched fields that display a definite mounding above the natural terrace surface. Gravel-mulched fields that follow the edge of the terrace are not as highly mounded and are in a worse state of preservation than those on the interior. Both types of fields have been subjected to the same range of erosional impacts, though those on the terrace edge are somewhat more susceptible to slope wash. Even so, the inside edges of those plots, which have almost certainly been subjected to the same erosive forces as the fields on the interior of the terrace, display greater evidence of deterioration.

Because of this, there seems to be two tiers of fields at this site. The original tier mostly follows the edge of the terrace and was probably built with materials from terrace-edge borrow pits.

Features 1, 2, 3, 9, and 15 represent this tier of fields within the detailed examination zone. A second tier seems to have been built at a later time and is situated toward the interior of the terrace, adjacent to terrace-interior borrow pits. This tier is represented by Features 7, 14, and 16 within the detailed examination zone. All three of these features appear to overlap fields of the first tier and are mounded above their surfaces. The highly deteriorated nature of some parts of the first tier fields suggests that materials were salvaged from them for building the later fields.

LA 105708 is one of the few sites where the trail (LA 118549) ascends to the top of the terrace, providing direct access to the farming features. Indeed, the trail cuts behind Feature 3, and a berm on its east side may overlap the edge of that field, though our excavations provided no evidence of this. The relationship between the trail and Feature 11, an elaborate double terrace-edge borrow pit, is also interesting to speculate upon. The large outer pit almost certainly represents the original borrow area, which was probably used to build Feature 9. The purpose of the smaller interior pit is more difficult to explain. While it may represent reuse of the borrow pit as a materials source, it is also possible that it had a less practical function associated with the trail. A ritual use is possible, though highly speculative. For now, the meaning behind this type of feature must remain a mystery.

Limited reconnaissance on top of a higher terrace east of LA 105708 showed that it also contains extensive farming features. Since that area is well outside the construction zone, those features were neither recorded nor assigned a site number. However, it is likely that they were previously noted during Bugé's (1984) study of the region. In general, they are similar to the features investigated during this study, though they usually do not appear to have suffered as much erosional impact. There is also no evidence of terrace-interior borrow pits in that area.

No definite shrines were found at this site. However, several rock piles were noted that may have served this function. A low rock pile was found on the east edge of the trail near the south end of Feature 3 (Fig. 12.3). A second small rock pile was found in the area between Features 9 and 15 (Fig. 12.5), though, as discussed earlier, it may be a stockpile of building materials. Again, Feature 11 may have served in a ritual capacity, but no modern cognate for this form has yet been documented.

A total of 101 chipped stone artifacts were collected from the sections of farming features that extended into the highway right-of-way (Table 12.1). Most came from Features 3 (44; 43.6 percent) and 9 (40; 36.9 percent). Others were collected from Features 11 (15; 14.9 percent) and 12 (2; 2.0 percent). Overall, this small assemblage is dominated by rhyolites (85.1 percent), and andesite (9.9 percent) is the only other material that can be considered common. The other materials that occur in this assemblage are represented by only one or two specimens apiece. Only reduction debris (angular debris, core flakes, and cores) was identified in this small assemblage, suggesting that raw-material quarrying and initial reduction were the most important chipped stone reduction-related activities conducted near the west edge of the terrace, where this assemblage was collected. This possibility is addressed in greater detail in a later chapter. Since these artifacts were collected from feature surfaces, they were produced either after the fields were built and while they were still in use, or after they were abandoned.

Table 12.1. Chipped stone artifacts collected from features within the highway right-of-way at LA 105708 (material type by morphology)

Feature No.	Material Type	Angular Debris	Core Flakes	Cores
3	Pedernal chert	-	1	-
	Gabbro	-	1	1
	Rhyolite	8	19	5
	Andesite	2	4	1
	Massive quartz	1	1	-
9	Rhyolite	5	29	3
	Andesite	-	3	-
11	Rhyolite	3	10	-
12	Rhyolite	1	1	-

A comparatively large number of sherds was also recovered from these farming features. This was especially true of Feature 9, which yielded 18 unpainted biscuit ware sherds, 1 Classic period nonmicaceous utility ware sherd, and 2 clusters of sherds thought to represent pot drops. The first probable pot drop contained 74 sherds from an unpainted biscuit ware vessel, and the second was composed of 39 sherds from a micaceous utility ware vessel. Feature 3 yielded a single Biscuit B sherd and 4 unpainted biscuit ware sherds, six Classic period nonmicaceous utility ware sherds were found in Feature 10, and Feature 11 contained 3 unpainted biscuit ware sherds and 1 micaceous utility ware sherd. Biscuit B is the only type with a comparatively restricted temporal range identified in this small assemblage, and it is interesting that all but one specimen of this type were recovered from the layer of gravel mulch in EU-B.

In addition to the artifacts collected within project limits, a sample of the surface assemblage in Feature 18 was also inventoried. As noted earlier, Feature 18 is a probable residential zone that contains most of the surface artifacts noted at LA 105708. About 55 percent of the artifacts visible in Feature 18 were recorded, and they serve as a sample of the overall assemblage from the large section of site that could not be surface collected. The recorded chipped stone assemblage was dominated by gray rhyolite (475 core flakes, 141 angular debris, 13 cores, and 3 tested cobbles). Andesite was also common (227 core flakes, 28 angular debris, 4 cores, and 1 biface). Other materials observed in Feature 18 included red rhyolite (17 core flakes, 2 angular debris), obsidian (2 core flakes, 2 angular debris, 1 biface, 5 projectile points), Pedernal chert (12 core flakes, 7 angular debris, 1 scraper, 1 drill), other cherts (3 core flakes), and massive quartz (1 core flake, 1 angular debris).

The distribution of artifacts in this inventory is very interesting. Together, gray rhyolite and andesite comprise nearly 95 percent of the debitage and all of the cores, yet they make up only about 11 percent of the formal tools. No formal tools were made from gray rhyolite, and only one was andesite. Materials used most frequently for tool manufacture were obsidian and Pedernal chert. These materials comprised only 2.5 percent of the debitage assemblage and none of the cores, yet nearly 89 percent of the formal tools. While gray rhyolite and andesite were most commonly reduced in this feature, they were only rarely turned into formal tools. Indeed, the paucity of both Pedernal chert and obsidian suggests that tools made from those materials were produced elsewhere and only used and discarded at this location.

Chipped stone artifacts dominate the Feature 18 assemblage. However, a few ground stone tools and ceramic artifacts were also recorded. The ground stone consists of fragments from a trough metate and a slab metate, both made from quartzite. Seven sherds were noted, including four from Biscuit A bowls, one from a Biscuit B jar, one from an unidentified glaze-on-red bowl, and one from a micaceous jar. The small ceramic assemblage is indicative of a Classic period date that is somewhat earlier than the date indicated by the pottery recovered from EU-B. The sizes of the projectile points suggest that they were all used on arrows. Three were corner-notched, and one was side-notched; a fifth specimen was represented by only a tip. As temporal indicators, projectile points are not as sensitive as pottery. Corner-notched points were used from the Early Developmental period until at least the seventeenth century. The side-notched form probably first appeared during the Late Developmental period and was used into the historic period. Thus, both types of points observed in Feature 18 were used during the Classic period, and neither disagrees with nor strongly supports the ceramic dates.

The residential area at this site appears to have been heavily used. Chipped stone artifacts tend to occur in clusters throughout this zone, though a light scatter covers the whole area. Several activities are represented, including core reduction, hunting, and vegetal processing. The remains of at least four thermal features were noted, and the presence of several more is likely. These features are probably indicative of food preparation by roasting or stone boiling. While no structures were found, our examination was not detailed enough to define temporary field shelters. However, coupled with the presence of thermal features and artifact concentrations, the existence of one or more temporary shelters that were used while cultivating nearby fields is quite likely.

Results of Excavation

Six 2 by 2 m excavation units were used to examine subsurface deposits and construction techniques in Features 3 and 9. These were the only gravel-mulched fields that extended into project limits at this site. They appear to represent series of individual plots constructed closely together or large fields that grew by accretion. The soil strata are discussed first, followed by descriptions of the excavation units.

Excavation was conducted in natural stratigraphic levels. Because of the paucity of materials recovered during excavation, only the fill from two 1 by 1 m grids within each excavation unit was screened through 1/4-inch mesh hardware cloth, and all artifacts recovered in this fashion were collected for analysis. Plans of rock alignments and other rocks that appeared to have been intentionally placed within each excavation unit were drawn before and after excavation. This enabled us to compare surface indications with the actual configurations of alignments and details of construction. It also allowed us to compare detailed studies of small sections of the fields with the more cursory observations made during site mapping. Variations between these views revealed that the features are more intricately built and subdivided than surface observations suggest.

Soil Strata

Three strata were encountered during excavation at LA 105708. Stratum 1 was uppermost and consisted of a layer of eolian sediments deposited on the surface of the fields since the time of abandonment and anchored in place by vegetation. This layer was a pale brown to brown silty sand of variable thickness, ranging up to 11 cm. In addition to these sediments, there was some mixing with the underlying gravel mulch, so this layer also contained small (pea to marble size) gravels and pebbles. Alignments as well as the gravel mulch were sometimes concealed beneath a mantle of this material.

The layer of gravel mulch that was applied to the terrace surface between cobble alignments was designated Stratum 2, and it underlay the thin mantle of eolian sediments (Stratum 1). Its thickness was variable, ranging from 2 to 12 cm in excavation units. This stratum contained unsorted small (pea to marble size) gravels, larger gravels, and small cobbles, but perhaps 30–40 percent of it was a brown silty sand. The latter probably represents eolian-deposited sediments (i.e., Stratum 1) and soil that infiltrated and clogged the mulch. It was impossible to determine whether these sediments were deposited when the field was in use or after it was abandoned, but deposition during both periods is likely.

Stratum 2 was apparently placed directly upon the original terrace surface. Though this surface was configured somewhat differently from trench to trench, it was always designated Stratum 3. Excavation usually halted when this layer was encountered, so detailed descriptions were not written. However, Stratum 3 is usually a brown or dark brown silty sand or loam that contained few gravels, especially compared to Stratum 2.

Feature 3

Three excavation units were used to examine Feature 3 (Fig. 12.3). EU-D was placed at the north end of the feature along its west edge to examine a north-south cobble alignment thought to represent the west boundary of the feature and two perpendicular interior subdividing alignments. EU-E was placed near the center of Feature 3 in an area without surface indications of alignments. This unit was on the west side of the trail (LA 118549), where it passed through Feature 3, and its placement had two intentions. First was to determine whether alignments actually occur in that area. Second was to determine whether the berm that lined the west side of the trail covered farming features. This was important for defining the age of the trail: if the berm covered farming features, then the trail was not constructed so as to avoid the features and therefore postdates them. Conversely, if no features were evident beneath the berm and the trail was built to avoid them, then the trail was probably contemporaneous with the farming sites through which it passes. EU-F was placed near the south end of Feature 3 to examine a north-south cobble alignment thought to be the west boundary of the feature and its intersection with a perpendicular interior subdividing alignment that appeared to be the north boundary of a rectilinear plot.

The area in which EU-D was placed was eroded and not well preserved. Stratum 1 was very thin in this unit, ranging from 0 to 3 cm thick. This may be due to its location near the break of terrace slope at the top of the existing roadcut, resulting in slope wash that removed part of the eolian stratum or impeded its deposition. Support for this is found in the observation that, while some cobbles comprising the west alignment were set upright, several were found lying on their sides in Stratum 2, suggesting that they had fallen over. Additionally, Figure 12.8 shows that several large cobbles were found immediately east of the alignment, and they may have been moved out of line by the same process. Stratum 2 was more variable in thickness, ranging from 3 to 11 cm, though it was most often 3–8 cm thick. A sample from the mulch yielded a high corn pollen concentration. Two chipped stone artifacts were also recovered, a piece of rhyolite angular debris from Stratum 1 and a rhyolite core flake from Stratum 2.

As shown in Figures 12.8 and 12.9, excavation revealed parts of the west boundary alignment and two perpendicular alignments. The larger sizes of cobbles in the north-south alignment and the southern east-west alignment suggests that they may comprise boundaries of a plot system or set of plots that were a subset of Feature 3. The northern east-west alignment may represent an internal plot division, since its cobbles are smaller than in the other alignments. Additionally, the larger cobbles were often set sideways, while smaller cobbles in the northern east-west alignment were most often set end-to-end. These differences indicate internal subdivisions within the field.

Although the cobble alignments revealed during excavation were at least partly visible before excavation, the variation in size of cobbles and construction of the alignments actually present was not apparent until they were uncovered. The long axis of plots revealed by excavations in EU-D runs east-west and suggests internal alignment spacing of about 1 m. No north-south plot alignments were revealed by excavation, so the

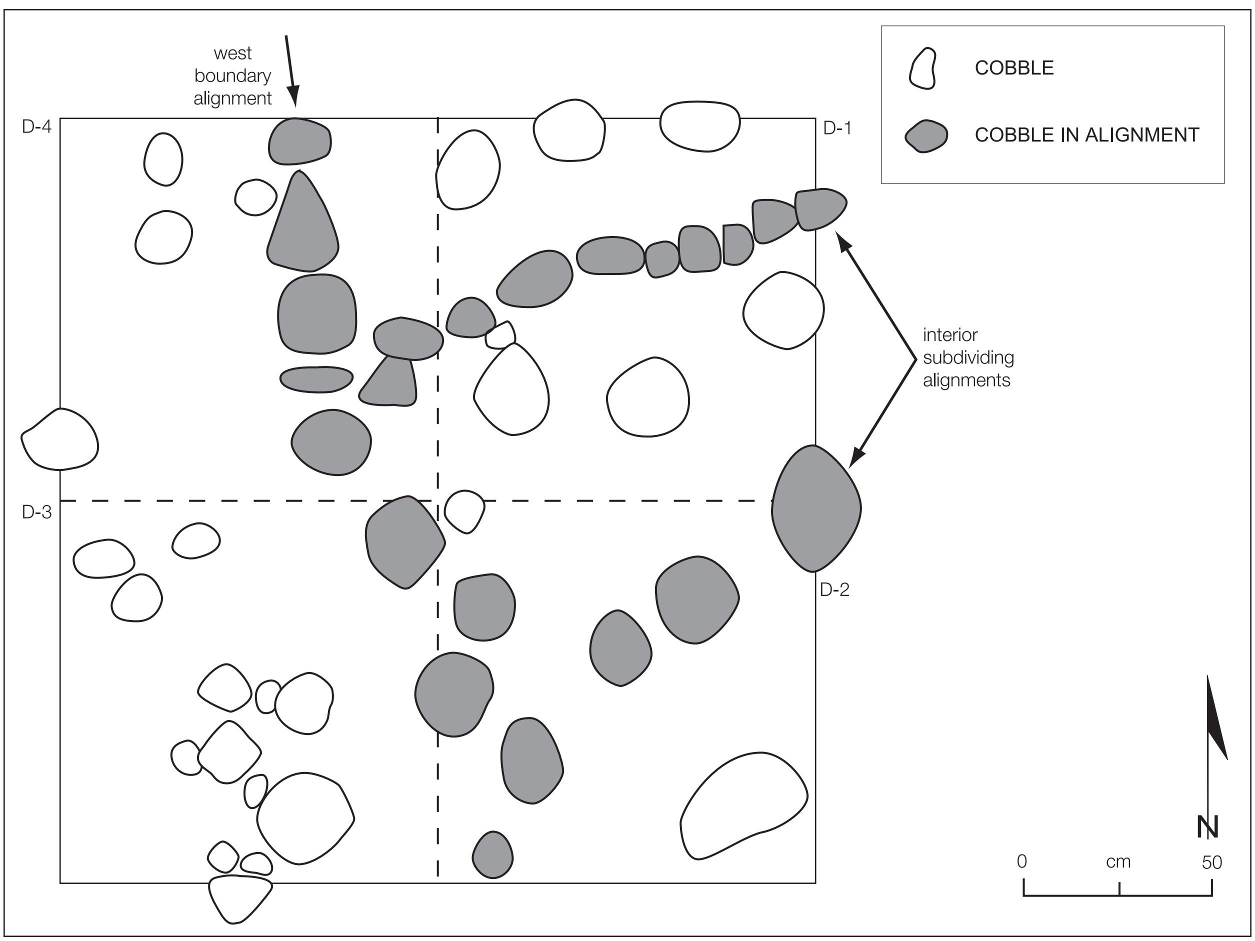


Figure 12.8. Postexcavation plan of EU-D in Feature 3 at LA 105708. Shaded rocks are in alignments.

Figure 12.9. EU-D in Feature 3, LA 105708, looking east.

actual size(s) of internal plots cannot be defined.

EU-E was excavated near the center of Feature 3 in an area without surface indications of alignments or other features. Stratum 1 was thicker in this unit than in EU-D, ranging from 2 to 8 cm, but it was 4–6 cm thick in most grids. This stratum was described by excavators as a sandy, silty loam containing some small and medium (pea to golf ball size) gravels, but in smaller amounts than Stratum 1 in EU-D. Similar variation was recorded in Stratum 2, which ranged from 0 to 11 cm thick but was 3 to 4 cm thick in most units. Excavators observed that gravels and small to medium cobbles were present, but the gravels did not form a discernible mulch layer, and the cobbles did not form alignments (Figs. 12.10 and 12.11). The thickness of Stratum 1 is probably the result of erosion from the trail berm and eolian deposition. Stratum 2 in EU-E was probably not the same as Stratum 2 in EU-D or EU-F, since there was no clear evidence of intentionally placed cobbles or gravel mulch. There is, therefore, no indication that this part of Feature 3 was the location of formal farming features. However, the fact that the few cobbles observed were found beneath Stratum 1 suggests that the trail was excavated into the prehistoric ground surface and the berm was placed on that ground surface, showing that it was probably a prehistoric feature. A sample from Stratum 2 yielded a high corn pollen concentration. A rhyolite core flake was recovered from the surface; an andesite core flake, two rhyolite core flakes, and a possible ground stone artifact came from Stratum 1; and three micaceous utility sherds and a rhyolite core flake were recovered from Stratum 2.

EU-F was excavated near the south end of Feature 3. Stratum 1 was 0–11 cm thick in this excavation unit, but it was quite variable and often thin, averaging 4–5 cm. It was thinnest in the western grids, probably due to erosion near the edge of the terrace. Stratum 2, the gravel-mulch layer, was generally thicker, ranging up 19 cm thick but averaging over 6 cm. Interestingly, while Stratum 1 was thinnest on the west side, Stratum 2 was thickest on the west side, ranging from 1 to 19 cm thick in Grids F-3 and F-4 (average 6.25–10.25 cm), compared to thicknesses of 0–9 cm in Grids F-1 and F-2 (average 4.25–5.5

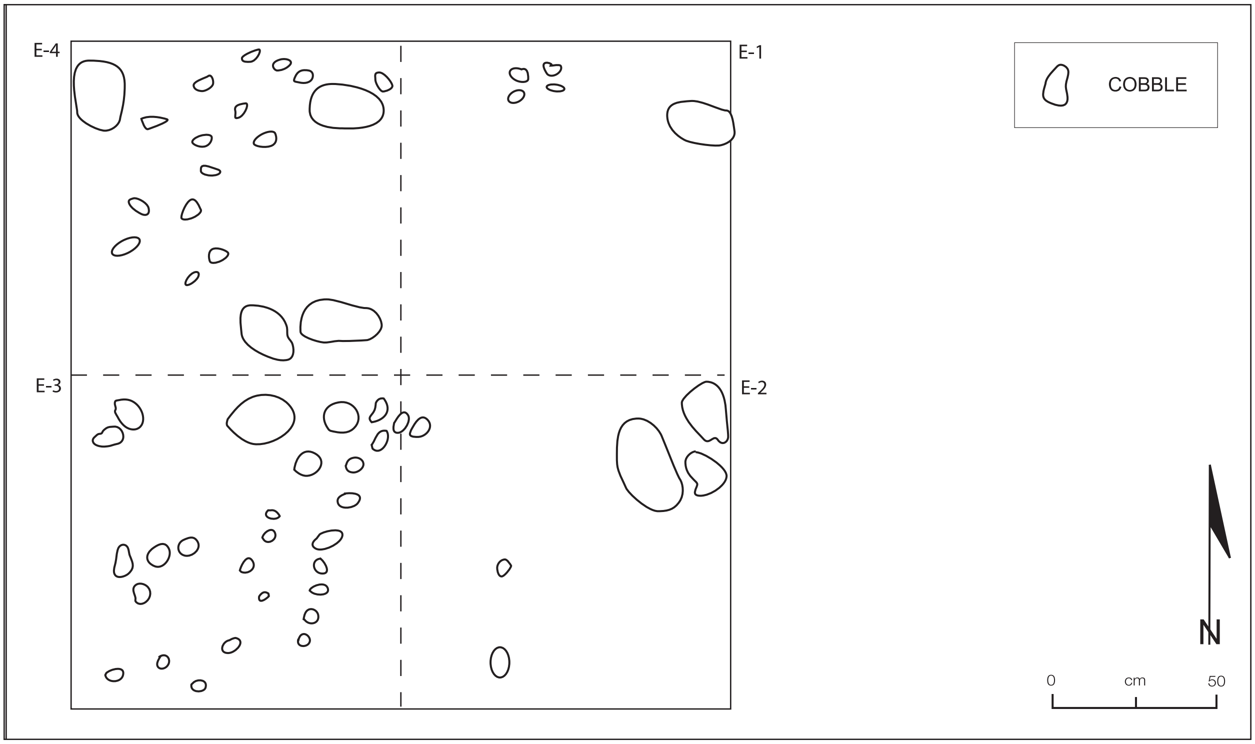


Figure 12.10. Postexcavation plan of EU-E in Feature 3, LA 105708, showing lack of alignments in the distribution of subsurface cobbles.

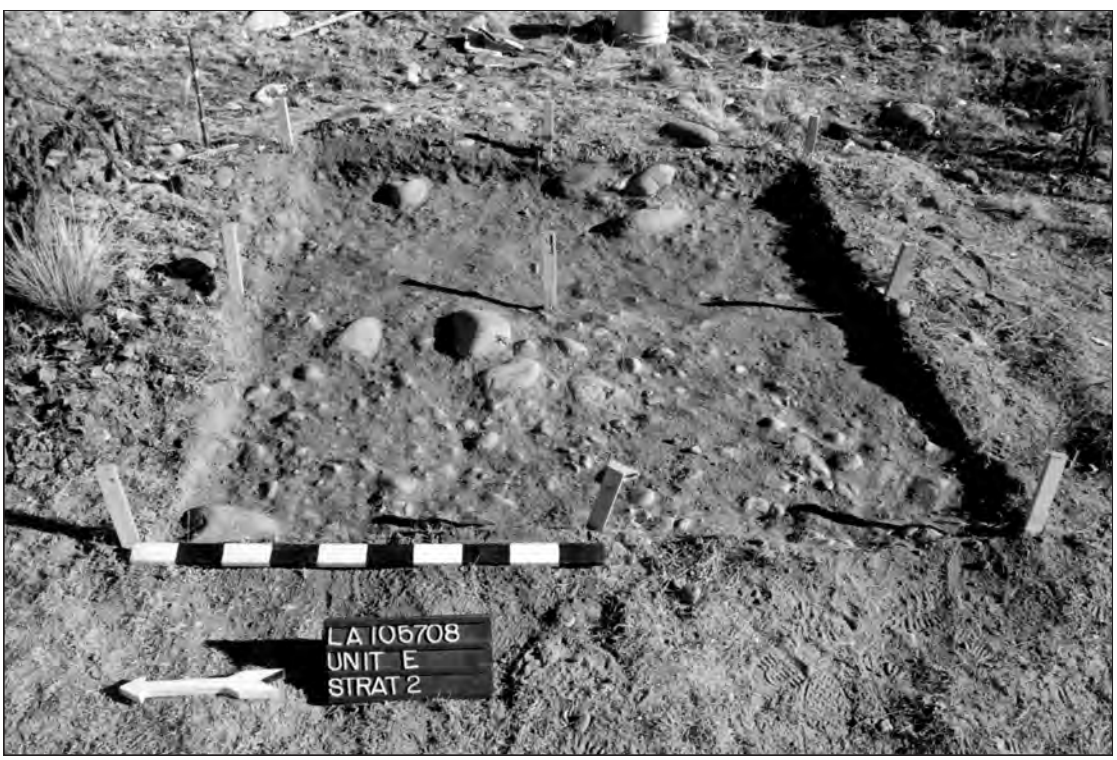


Figure 12.11. EU-E in Feature 3, LA 105708, looking east, showing the lack of alignments in the distribution of subsurface cobbles.

cm). This points to intentional spreading and leveling of the gravel-mulch layer on the shallow slope above the terrace edge. A sample from the mulch contained no pollen from domesticated plants. Two rhyolite core flakes and a Pedernal chert core flake were recovered from Stratum 2.

Figures 12.12 and 12.13 show that the west boundary alignment consisted of relatively large cobbles connected by slightly smaller cobbles. Most of the smaller cobbles appear to have been moved west out of alignment, probably because of erosion near the terrace edge, as we saw in EU-D. Running east-west and perpendicular to the boundary alignment was an alignment that apparently consisted of smaller cobbles. We could not determine the placement of the cobbles in the boundary alignment. However, cobbles in the east-west alignment appear to have been placed end-to-end, as we saw in the interior alignment at EU-D. This suggests that the east-west alignment was not a boundary, but probably an interior subdividing alignment. This notion is supported by the presence of Stratum 2, the gravel-mulch layer in Grids F-1 and F-4, which were north of the east-west alignment, as well as in Grids F-2 and F-3. The large, isolated cobbles may represent internal plot dividers, but we cannot be sure of this.

Like EU-D, excavations in EU-F revealed variation in cobble sizes and alignment construction within Feature 3. Also like EU-D, the long axis of plots within the field around EU-F runs east-west, but we cannot define spacing between alignments or sizes of plots. However, variation in thickness of Stratum 2 across EU-F provided data on placement of the gravel mulch within the field.

Feature 9

Three excavation units were used to examine Feature 9 (Fig. 12.5). EU-A was placed near the north end of the part of this very large feature that extends into project limits. It was used to examine a small cobble mound thought to be a farming plot or a historic grave near a long north-south cobble alignment considered to be the west boundary alignment. EU-B was placed in the central part of Feature 9 to examine a north-south cobble alignment that may have been the west boundary of the feature and its intersection with a short, perpendicular, east-west alignment. EU-C was placed near the southwest corner of Feature 9 to examine the same north-south alignment investigated in EU-B and thought to be the west boundary alignment.

The area in which EU-A was placed contained a concentration of cobbles of unknown function or derivation. Stratum 1 was described by excavators as more clayey than the silty, sandy soil encountered in most excavation units. It was relatively thick and ranged from 2 to 10 cm thick but was mostly 2–5 cm thick. It was thicker on the east side of the unit, averaging 5.5– 6.75 cm, and thinner on the west side, averaging 3.25–4.25 cm. This was probably the result of erosion near the feature boundary. Stratum 2 was also thicker in this unit, ranging from 3 to 13 cm and averaging 7–11.5 cm. Again, the stratum was thicker in the east half (average thickness of 9.75–11.5 cm) than in the west half (average thickness of 7.25–9 cm). However, variation between the east and west halves of Stratum 2 was not as great as in Stratum 1, suggesting that Stratum 2 was more evenly spread during construction and less affected by later erosion. A sample from the mulch contained no pollen from domesticated plants. Six chipped stone artifacts were recovered from this excavation unit. Stratum 1 yielded two rhyolite core flakes, and Stratum 2 contained three rhyolite core flakes and a piece of rhyolite angular debris.

Excavation in EU-A revealed that the small mound of cobbles, which was mostly in the east half of the excavation unit, was placed on top of Stratum 2, the gravel-mulch layer. It was within Stratum 1, and its cobbles were placed directly on top of the gravels in Stratum 2 (Figs. 12.14 and 12.15). Whether it was placed there during or after use of the field is not known, though there was no clear evidence of an extended period of time between use of the field and placement of the cobble pile. The pile, which was oval to subrectangular, measured 1.35 m north-south by 1.05 m east-west and appeared to consist of a "ring" of cobbles surrounding a smaller pile of cobbles. Whether it represents division of plot space after deposition of the gravel mulch or some other function is not known. When it was removed prior to excavation of Stratum 2, definition of cobble alignments within EU-A became very difficult.

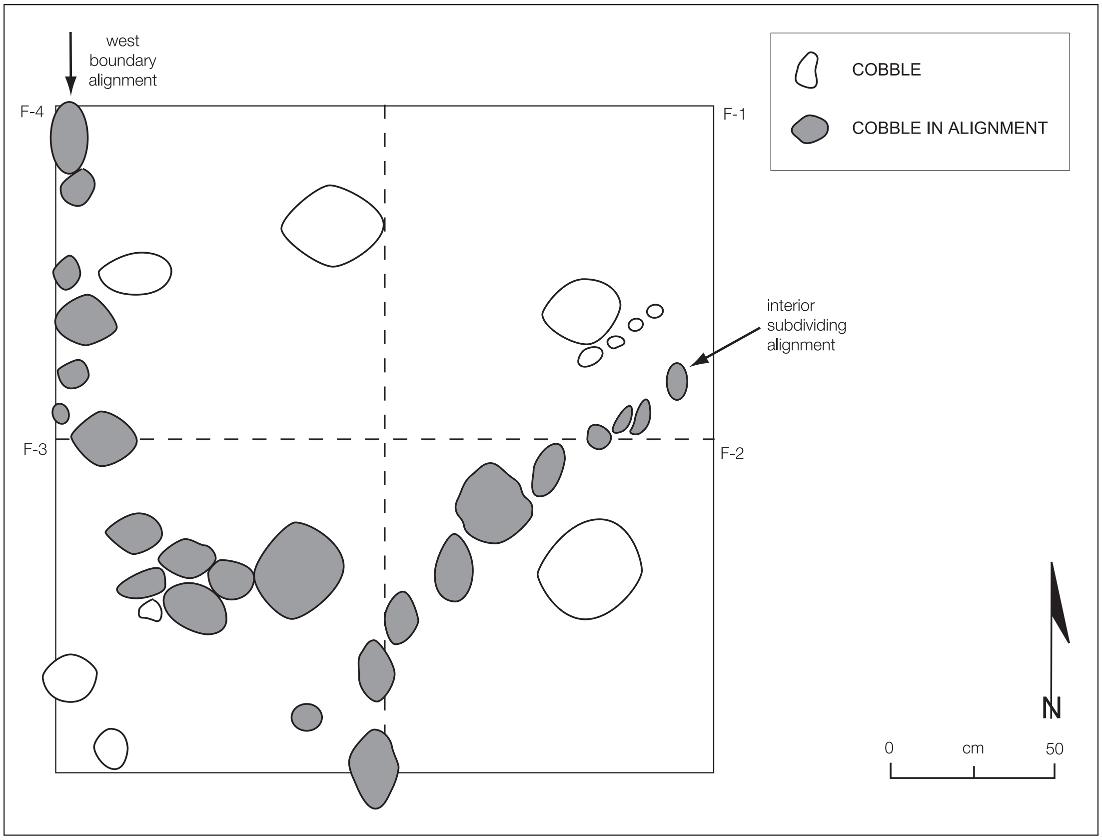


Figure 12.12. Postexcavation plan of EU-F in Feature 3, LA 105708. Shaded rocks are in alignments.

Figure 12.13. EU-F in Feature 3, LA 105708, looking east.

Figure 12.14. Cobbles piled on top of gravel mulch in EU-A, Feature 9, LA 105708.

Figure 12.15. Gravel-mulch surface under the pile of cobbles in EU-A, Feature 9, LA 105708.

Figures 12.16 and 12.17 show that two possible alignments were present. One ran north-south through the center of the excavation unit. The other ran northwest-southeast through Grid A-3 and intersected the first alignment near the south edge of the excavation unit. Since descriptions of other excavation units included some large gravels and small cobbles in the gravel mulch comprising Stratum 2, it is entirely possible that these alignments were actually small cobbles within that stratum rather than subdividing walls.

EU-B was used to investigate a possible boundary alignment. Stratum 1 was very thin, ranging from 0 to 4 cm thick but averaging 0.5–1.25 cm. In contrast, Stratum 2 was 0–11 cm thick, averaging 3.25–8.25 cm. Stratum 2 was thickest in Grids B-2 and B-3, the south half of the excavation unit. However, only in Grid B-2 was the stratum appreciably thicker than in other units (average of 8.25 cm, compared to 3.25–4.25 cm in other units). Whether this reflects intentional construction variation or some other factor is not clear. A sample from the mulch yielded a fairly high corn pollen concentration. Two ceramic artifacts were recovered from Stratum 1—a Biscuit B sherd and an unpainted biscuit ware sherd. Stratum 2 contained 5 Biscuit B sherds, 24 unpainted biscuit ware sherds, 2 rhyolite core flakes, 1 rhyolite angular debris, 1 rhyolite core, and 1 chert core flake. The high frequency of artifacts recovered from EU-B, including those grids that were not screened, contrasts distinctly with other excavation units at LA 105708, which yielded few artifacts. Clearly, most artifacts recovered from this unit were associated with the gravel-mulch layer, showing that they were likely deposited during the construction or use of the garden plot.

Excavation in EU-B revealed a single north-south cobble alignment running through the center of the excavation unit (Figs. 12.18 and 12.19). The alignment was not well defined, however, since several elements seemed to be missing, and many other cobbles of varying sizes were present in the fill. Another alignment may have been present, running perpendicular to the first alignment through the north half of the unit. In Figure 12.18, that possible alignment is seen as a series of cobbles set end-to-end through Grid B-4. It may have extended across Grid B-1, connecting to two cobbles exposed on the modern ground surface immediately east of the excavation unit. Whether other alignments were present is difficult to discern. However, if the east-west series of cobbles was an actual alignment, it suggests that the north-south alignment was not the west boundary in this area and that plots were present on both sides of the north-south alignment. Thus, excavations in EU-B suggest that Feature 9 is more extensive and complex than indicated by surface evidence.

EU-C was also used to investigate the potential boundary alignment. Stratum 1 in this unit was 2–10 cm thick and averaged 3–5 cm. In contrast, Stratum 2 was 0–12 cm thick but averaged 2.5–9.25 cm, showing that it was thicker than the eolian topsoil. In a situation not recorded in other units, excavators observed that Stratum 1 was separated from Stratum 2 by a thin (less than 1 cm thick) lens of small (pea to marble size) gravels. Since eolian processes would not have deposited these gravels, we can assume that they were not part of Stratum 1 and were intentionally placed on top of the gravel-mulch layer. The function of these small gravels is unclear. A sample from the mulch yielded a high corn pollen concentration. Two rhyolite core flakes were recovered from Stratum 2, one of which was found at the top of Stratum 3, the original terrace surface. The latter may have been left there before deposition of the gravel mulch, or it may have been included in the gravel mulch.

Excavation in EU-C revealed two parallel cobble alignments running north-south almost 1 m apart (Figs. 12.20 and 12.21). One alignment followed the east edge of the excavation unit, while the other ran just east of the unit's west edge. Adjacent to the west alignment was another series of cobbles. The excavators suggest that there may have been a double alignment of cobbles along that side of the excavation unit, although not enough of that series of cobbles was exposed to confirm this observation. Interestingly, observations during excavation of Stratum 2 also suggest that an alignment of small, upright cobbles and large gravels was present along the east side of the west alignment. This alignment lined the west side of the plot and appeared to separate the gravel-mulch layer (Stratum 2) from the larger cobble alignment.

Although no perpendicular east-west cobble

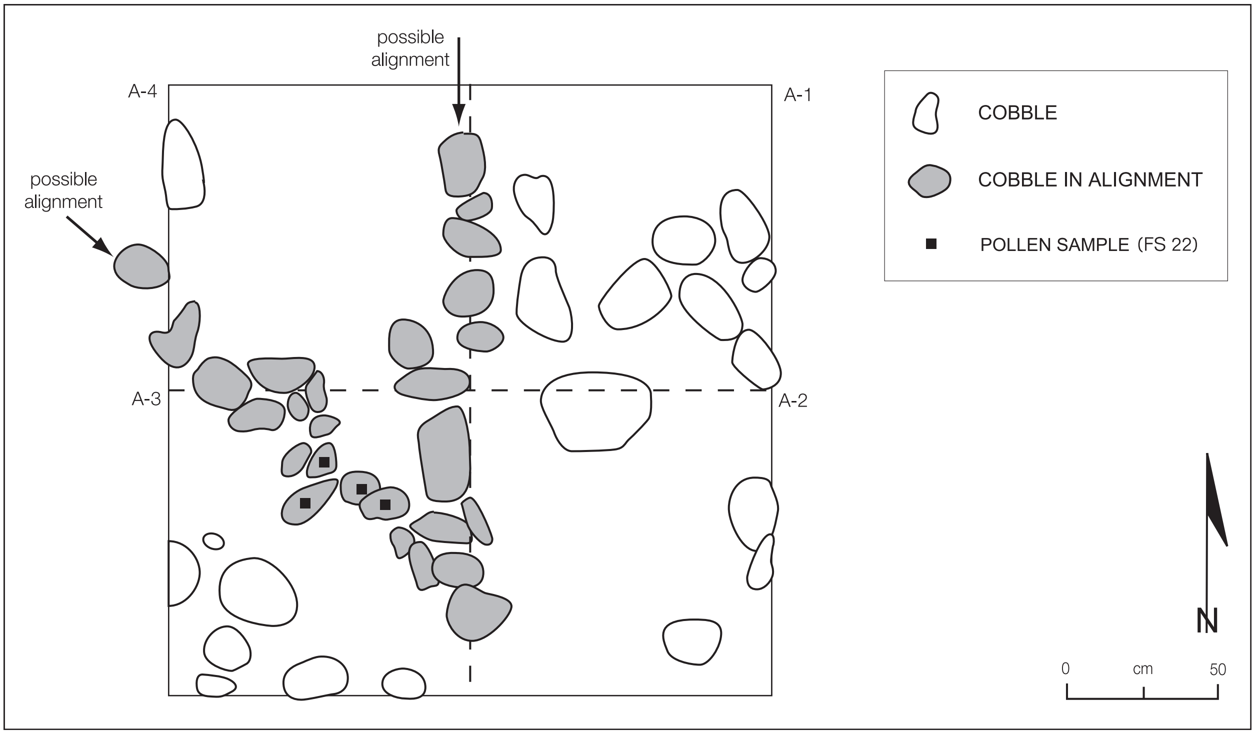


Figure 12.16. Postexcavation plan of EU-A in Feature 9, LA 105708. Shaded rocks are in alignments.

Figure 12.17. EU-A in Feature 9, LA 105708, looking east.

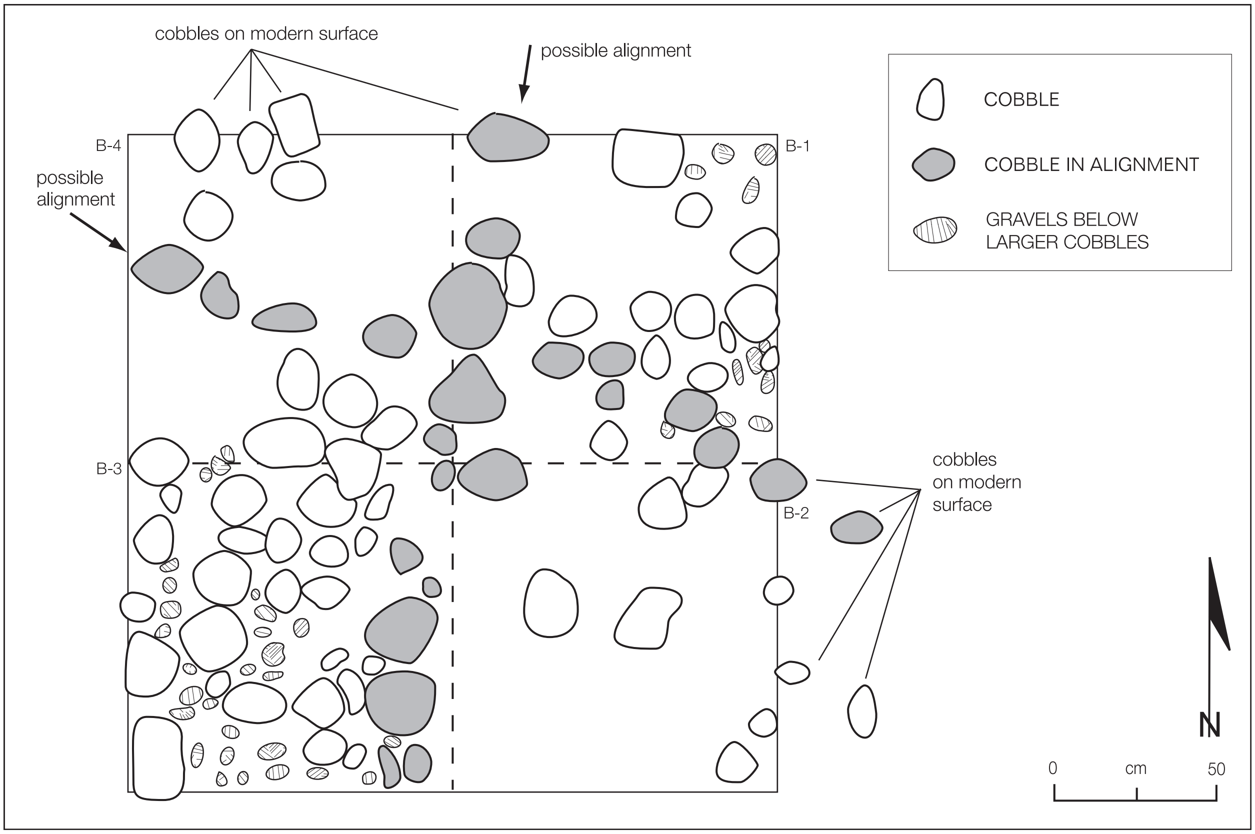


Figure 12.18. Postexcavation plan of EU-B in Feature 9, LA 105708. Shaded rocks represent possible alignments.

Figure 12.19. EU-B in Feature 9, LA 105708, looking south.

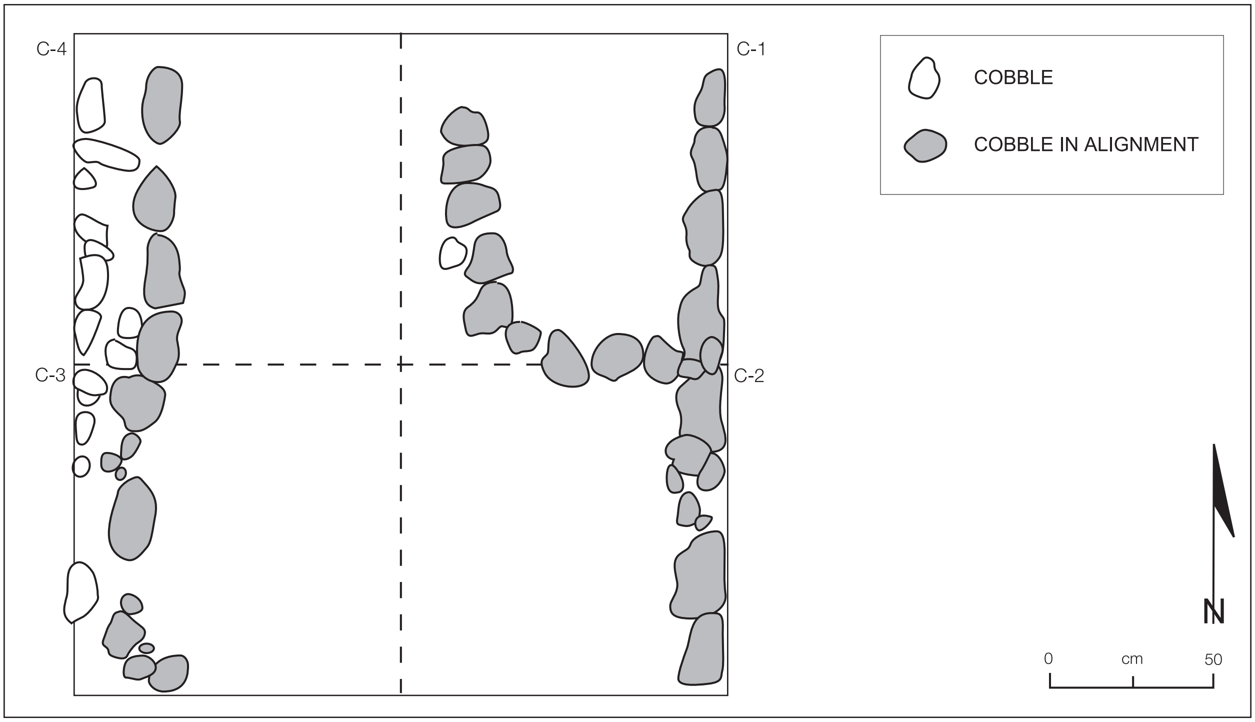


Figure 12.20. Postexcavation plan of EU-C in Feature 3, LA 105708. Shaded rocks are in alignments.

Figure 12.21. EU-C in Feature 9, LA 105708, looking east.

alignments were found in EU-C, Figure 12.20 shows that a short, curved alignment was recorded in Grid C-1 and connected to the east cobble alignment. While the east and west alignments were built by laying cobbles end-to-end, the short, curved alignment was less formal in construction, suggesting that subdivision of space within plots was sometimes more expedient than the division of plots represented by the two parallel alignments.

Summary of Findings

Though LA 105708 was a large site that contained numerous farming features, two gravel-mulched fields were the only features within project limits considered capable of providing more information than was available from surface examination alone. Feature 3 was on a small lower terrace below the main section of site. In this position, Feature 3 was badly eroded near the terrace edge and more heavily covered with eolian and colluvial sediments. This feature may also not have been contiguous, as surface indications suggested. No good evidence of farming was found in EU-E, which was placed near the center of the field as defined from the surface. Thus, surface indications suggesting that Feature 3 was contiguous across the front of this lower terrace may have been incorrect, and more than one small gravel-mulched plot could have been present in this area. However, excavation of EU-E did suggest that the trail (LA 118549) was a prehistoric feature.

Evidence of prehistoric farming was found in the other two excavation units used to investigate Feature 3. The west boundary alignment was defined in both cases, and interior space was subdivided into smaller plots with an east-west orientation. In neither case was a more intricate pattern revealed by excavation than was originally visible from the surface. Thus, excavation in this feature showed that some of our conclusions concerning its structure that were made on the basis of surface information alone were correct, while others were wrong.

Feature 9 was the other farming plot investigated at this site. Deterioration along the west edge of this feature affected our ability to fully interpret our findings. While it is possible that the west boundary alignment was as defined from surface indications in this area, there were hints that the feature may have extended farther west toward the edge of the terrace. This would mean that at least some sections of the west boundary alignment were actually interior subdividing alignments, but this was not clearly demonstrated. The pile of cobbles placed on top of a section of gravel-mulched field in EU-A was similarly difficult to interpret. Since there is evidence of sequential feature construction elsewhere on the site, these cobbles could represent a material stockpile placed on an abandoned plot in preparation for further construction. However, this rock pile was also similar to others defined by this study that seem to have served as small field shrines, so it could instead represent a later ritual feature.

Preservation was not especially good in the areas that were investigated but still provided enough information to show that plot interiors were highly subdivided and artificially mulched. Indeed, in one case, evidence of more than one layer of gravel mulch may have been found. Since corn pollen was the only evidence of domesticated plants recovered from these features, they may have been monocropped.

Artifacts were recovered from both strata encountered within excavation units. Materials from Stratum 1 postdate the construction and probably use of the farming features at this site. Artifacts found in Stratum 2 were present on the ground surface before the farming features were built, part of the materials used to mulch the plots, or they were deposited as the features were being built and used. Cultural materials that were deposited in the first two ways would predate construction of the farming features, while those deposited in the third way would provide a temporal context for the period in which the features were built and used. The occurrence of several Biscuit B sherds found in the mulch excavated in EU-B is important and points toward construction during the Late Classic period.

Chapter 13. LA 105709

James L. Moore

LA 105709 is a large farming site on land administered by the USDI Bureau of Land Management. It occupies an irregular F-shaped area and is bounded by the main terrace edge overlooking the Ojo Caliente Valley on the west and by arroyos formed by intermittent drainages on the north, south, and southeast (Fig. 13.1). The north drainage forms an arbitrary boundary with unexamined farming features to the north that are outside project limits and were not recorded. Using a drainage for the south and southeast boundary is more problematic. Between that drainage and Forest Road 556 is an area that has been heavily damaged by historic trash disposal and subsequent cleanup. There are some indications that prehistoric farming features occurred in that area, but they have been eradicated by modern activities. If so, the south and southeast boundaries arbitrarily separate the features included in LA 105709 from those in LA 118547 to the south.

LA 105709 measures 570 m north-south by 147 m east-west and covers about 42,200 sq m (4.22 ha). Only about 4.8 percent of the site extended into the right-of-way, comprising a narrow sliver along its southwest edge. In-field pottery analysis indicated that this site was used during the Classic period.

Vegetation is moderate on the site, and plant cover is generally similar between on- and off-feature areas. Grasses were the most common plants noted. They included grama, muhly, and Indian ricegrass. Other common plants include rabbitbrush, snakeweed, prickly pear, narrowleaf yucca, sage, and cholla. Small junipers occur at the terrace edge; though only a few have spread onto the surface of the fields, they are common in and around borrow pits.

Field Procedures

Detailed mapping was restricted to the section of site that extended into the U.S. 285 right-of-way and an adjacent 25 m wide zone, extended to 60 m in one location to allow a complete feature to be mapped. This area comprises a sample of about 28 percent of the site, and all cultural features within this zone were mapped and recorded in detail. Several features were partly or wholly within project limits, including two gravel-mulched fields (Features 1 and 4), a possible temporary structure and adjacent scatter of chipped stone artifacts (Feature 3), a hearth (Feature 8), and a collection of several farming features which may or may not represent a single entity (Feature 6). In addition, a small portion of a shrine (Feature 9) extends into the right-of-way. All cultural materials noted on the surface within the highway right-of-way were collected for analysis, as were artifacts encountered in excavation units. These materials are summarized later in this chapter. Artifacts noted elsewhere on the surface of features in the detailed mapping zone were inventoried by feature and are summarized in those discussions.

Features

Fourteen features were at least partly mapped and described (Fig. 13.1). Nine additional terrace-edge borrow pits are shown on the site plan, but since they were outside the detailed examination zone they were not described or assigned feature numbers. Field limits were often difficult to accurately define in the mapped area, though outside that zone, some fields are much better delineated. A combination of colluvial and eolian processes have caused soil to build up against alignments that face the terrace interior, obscuring those edges in many places. Eolian deposits also cover much of the surface of the fields, especially where they are anchored by vegetation. This made it difficult to discern many alignments and to define the full extent of others. Livestock grazing has also caused damage, displacing elements in cobble alignments and blurring feature borders. Along the terrace edge this seems to have exacerbated damage caused by erosion. Other

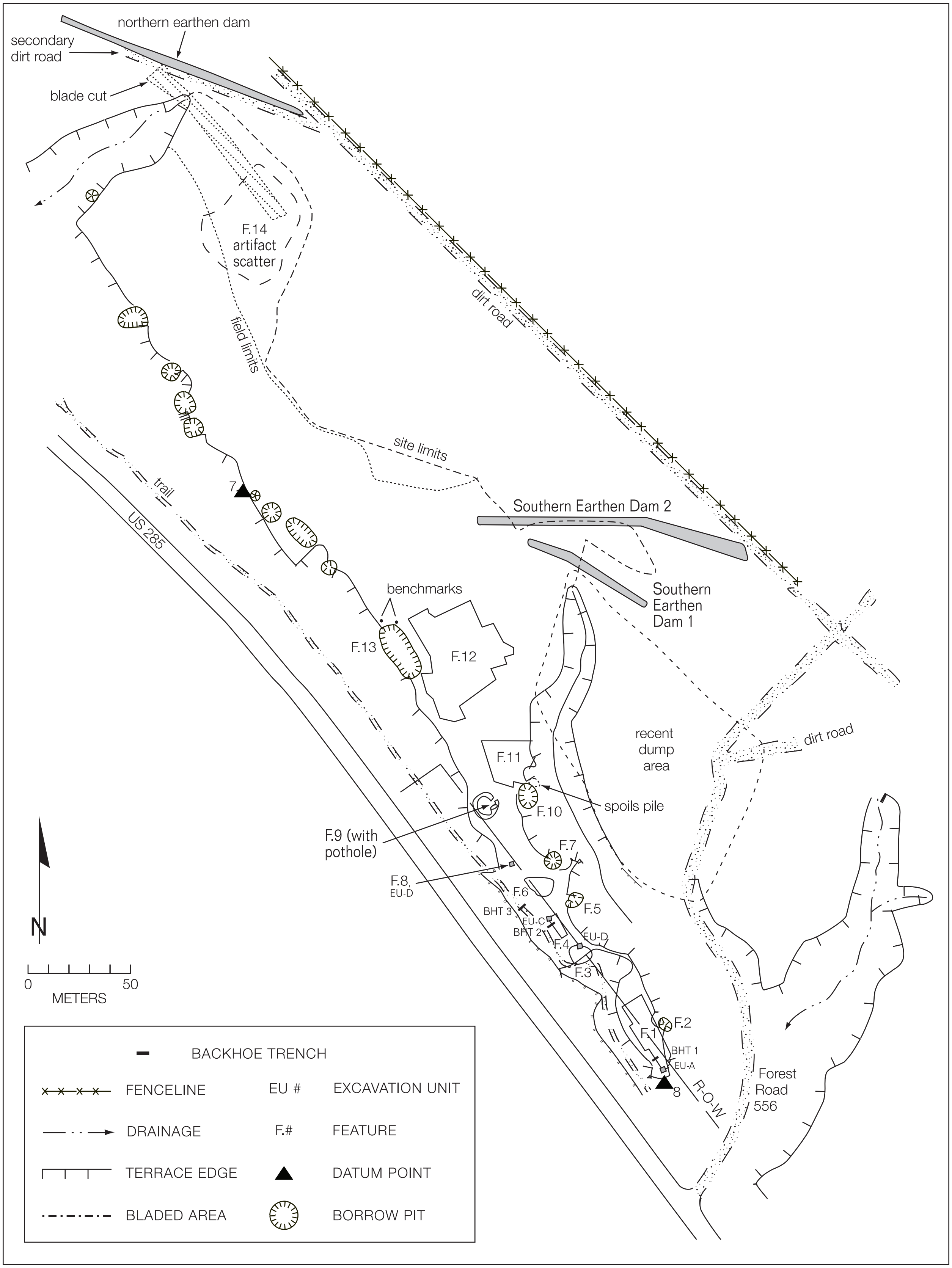


Figure 13.1. Plan of LA 105709.

surface disturbances include a trail (LA 118549), which runs along the west edge of the site next to U.S. 285 and enters site limits near Feature 3. Modern damage includes two earth dams built to control runoff through the south drainage. As mentioned earlier, much of the area between these dams and Forest Road 556 was damaged when it was used as a dump and subsequently cleaned up. A blade cut has damaged the north part of the site. The cut was probably made during construction of a third earth dam just outside the north site boundary.

Feature 1

Feature 1 is a medium-sized rectangular gravel-mulched plot that measures 40 by 14 m and covers about 444 sq m (Fig. 13.2). Since part of this feature extended into project limits and the rest was in the detailed mapping zone, it was completely mapped. One excavation unit and a backhoe trench were used to examine Feature 1. The southeast corner of this feature is at the edge of the terrace and has partly eroded down the terrace slope. Elements in boundary alignments have been displaced by livestock, so the outer edge of the feature was difficult to define in places. About 40–50 percent of the surface of this feature is obscured by eolian sediments that have infiltrated the gravel mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long; the small boulders that occur are 25–30 cm long. Elements in boundary alignments were mostly set end-to-end on their broadest surfaces, though some side-by-side placement also occurs. Some upright elements occur, but they are much less common than those set on their broadest surfaces. Surface indications suggest that the interior of the feature is subdivided into multiple compartments, but since most of the interior subdividing alignments are obscured by eolian sediments, only a few compartments were identifiable from the surface. Many of these compartments appear to have been quite small, measuring less than 1 m per side.

The mulch is mostly composed of unsorted pea gravels and gravels, though small cobbles up to 15 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are only one element high, the layer of mulch is probably 7–10 cm thick. Feature 1 was distinctly mounded 5–10 cm higher than the adjacent terrace surface. No variation in surface gravel or vegetational densities were noted between on- and off-feature areas.

Feature 2

Feature 2 is an oval terrace-edge borrow pit measuring 6.8 by 4.9 m, with a maximum depth of 0.9 m (Fig. 13.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is near Feature 1 and was probably a source of some of the materials used to build that gravel-mulched field. Feature 2 is cut into a fairly steep slope and may have been enlarged a bit by erosion. No artifacts were found in association with this feature.

Feature 3

Feature 3 was the foundation of a possible temporary structure that measured 2.6 by 2.1 m (Fig. 13.3). Surface remains of this feature consisted of a rectangular alignment of cobbles (Fig. 13.4), with a chipping area to the southwest. This feature was within project limits and was completely excavated. The results of that excavation are discussed in detail in a later section of this chapter.

Feature 4

Feature 4 is a small rectangular gravel-mulched plot that measures 13 by 4 m and covers roughly 47 sq m (Fig. 13.3). Since most of this feature extended into project limits, and the rest was in the detailed mapping zone, it was completely mapped. One excavation unit was used to examine Feature 4. Many elements in boundary alignments have been displaced by erosion and livestock, and most interior subdividing alignments are covered by eolian sediments, so only the general outline of the feature was discernible on the surface. About 50–60 percent of the surface of this feature is obscured by eolian sediments that have

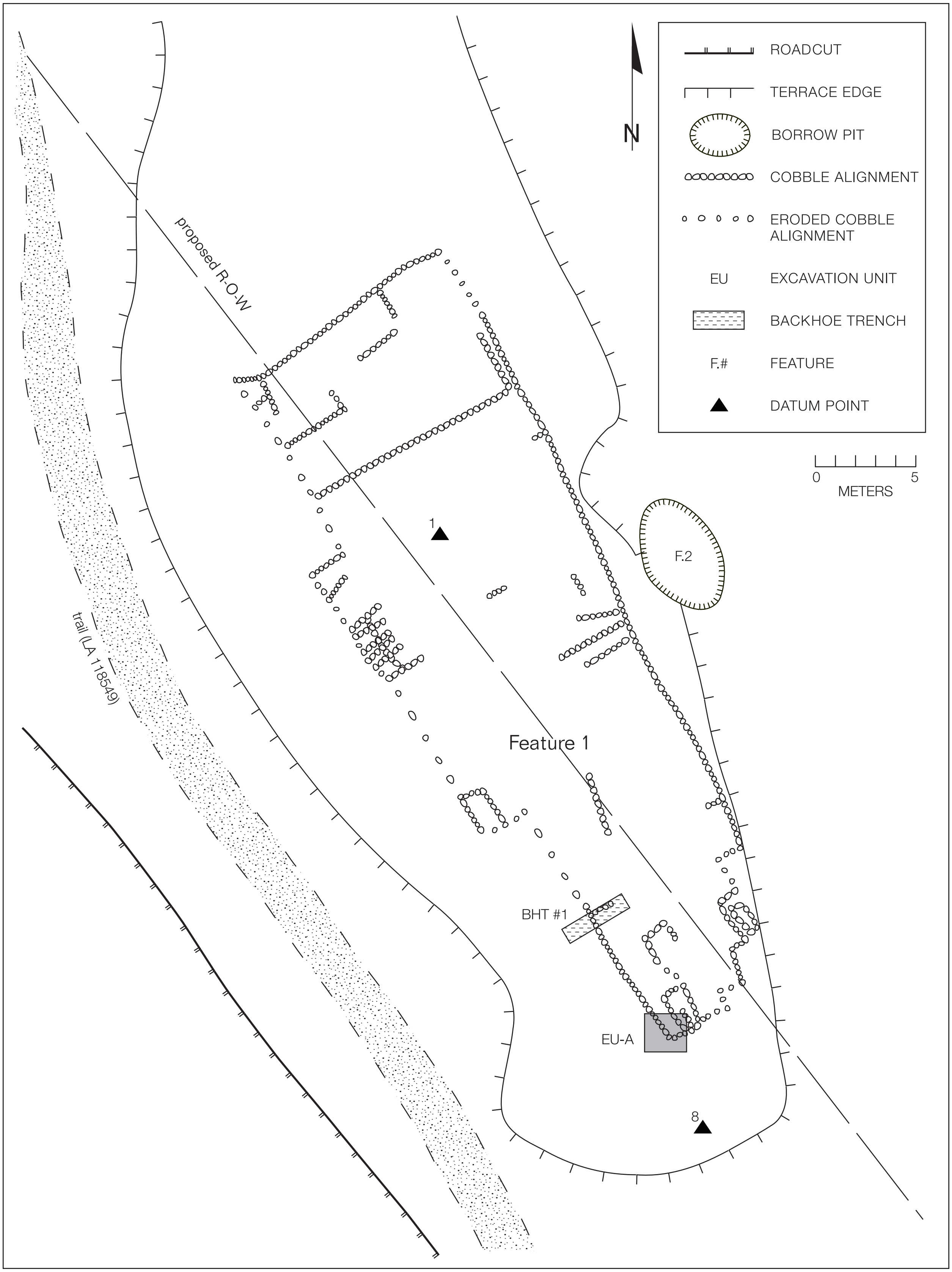


Figure 13.2. Features 1 and 2, LA 105709.

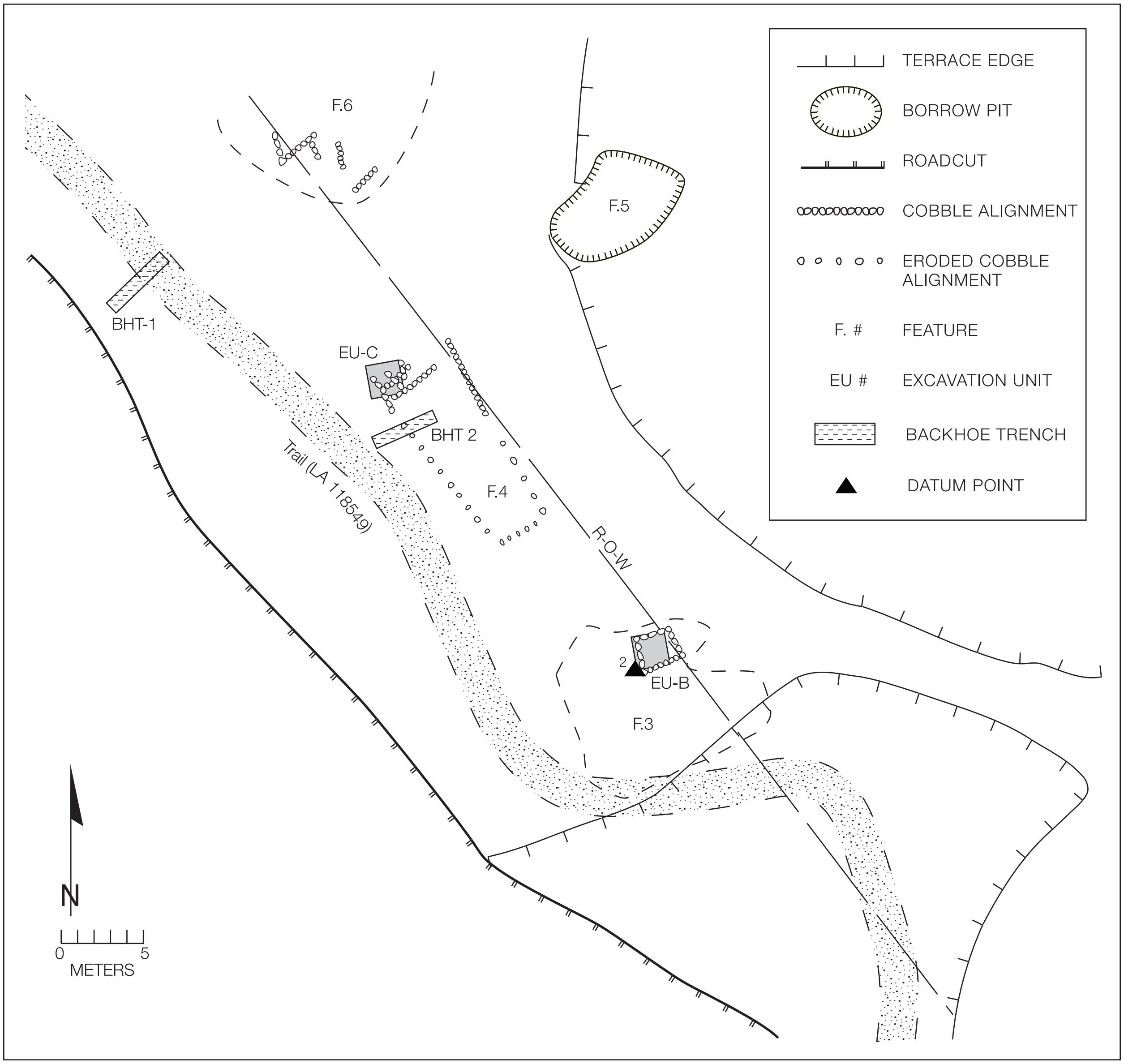


Figure 13.3. Features 3, 4, and 5, LA 105709.

Figure 13.4. Feature 3, a probable structure foundation at LA 105709, before excavation.

infiltrated the gravel mulch and are anchored by vegetation.

Boundary and interior subdividing alignments all appear to be a single element high and wide, and they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 14–25 cm long; the small boulders that occur are 25–30 cm long. Building elements were mostly placed end-to-end on their broadest surfaces, though there was some sideways placement, and occasional elements were set upright. The northwest part of this feature appears to have been subdivided into multiple small cells. Since the rest of the feature was concealed beneath a mantle of eolian sediments, we can only suggest that this building style encompassed the entire field.

The mulch is mostly composed of unsorted pea gravels and gravels, though small cobbles up to 12 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Most of the gravel used to mulch this feature was less than 3 cm in diameter. Since the alignments are only one element high, the layer of mulch is probably 7–10 cm thick. Feature 1 was distinctly mounded 5–7 cm higher than the adjacent terrace surface. Grasses were more common, and snakeweed was much less common on the feature surface than on the adjacent terrace. Gravel densities were also distinctly higher on the feature than on the terrace surface.

Feature 5

Feature 5 is a large kidney-shaped terrace-edge borrow pit measuring 9 by 7 m, with a maximum depth of 0.2 m (Fig. 13.3). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is near Feature 4 and was probably the source of some of the materials used to build that gravel-mulched field. This pit was dug near the top of a steep slope, and erosion has partly blurred its downslope outline. In addition, sediments have partly filled it to an undetermined depth. No artifacts were found in association with this feature.

Feature 6

Several alignments and two rock piles were grouped together as Feature 6 (Fig. 13.5), but it was uncertain whether they represented a single coherent entity or several small unassociated farming features. Since this feature was in the detailed examination zone, it was completely mapped. Only about 10 percent of this feature extended into project limits, and it was not excavated because that part of the feature did not appear likely to yield any information. Much of this feature may have been covered by eolian sediments, though it is more likely that construction of this field was simply never completed, making it seem more obscured than it actually was.

Two factors suggest that this feature represents an uncompleted field. First, the surface of the feature is not visibly higher than the adjacent terrace surface, and there is no evidence of gravel mulch, even in areas that contain cobble alignments. While there was a fairly high concentration of surface gravels in the north part of the feature, that area is next to the terrace edge, and the gravels more likely represent the natural eroded terrace surface. Second, the two rock piles probably represent materials stockpiled in preparation for construction; the central rock pile (Fig. 13.5) contains six or more cobbles that are 10 to 25 cm long, while the northwest rock pile contains seven stones that are 12 to 25 cm long. Thus, it is possible that this feature was abandoned before it was completed or was scheduled for expansion when use of the site was discontinued.

Where alignments are visible, they are constructed of locally obtained cobbles that are mostly 12–25 cm long. Most elements were set end-to-end and on their broadest surfaces. No variation between on- and off-feature vegetative densities were noted.

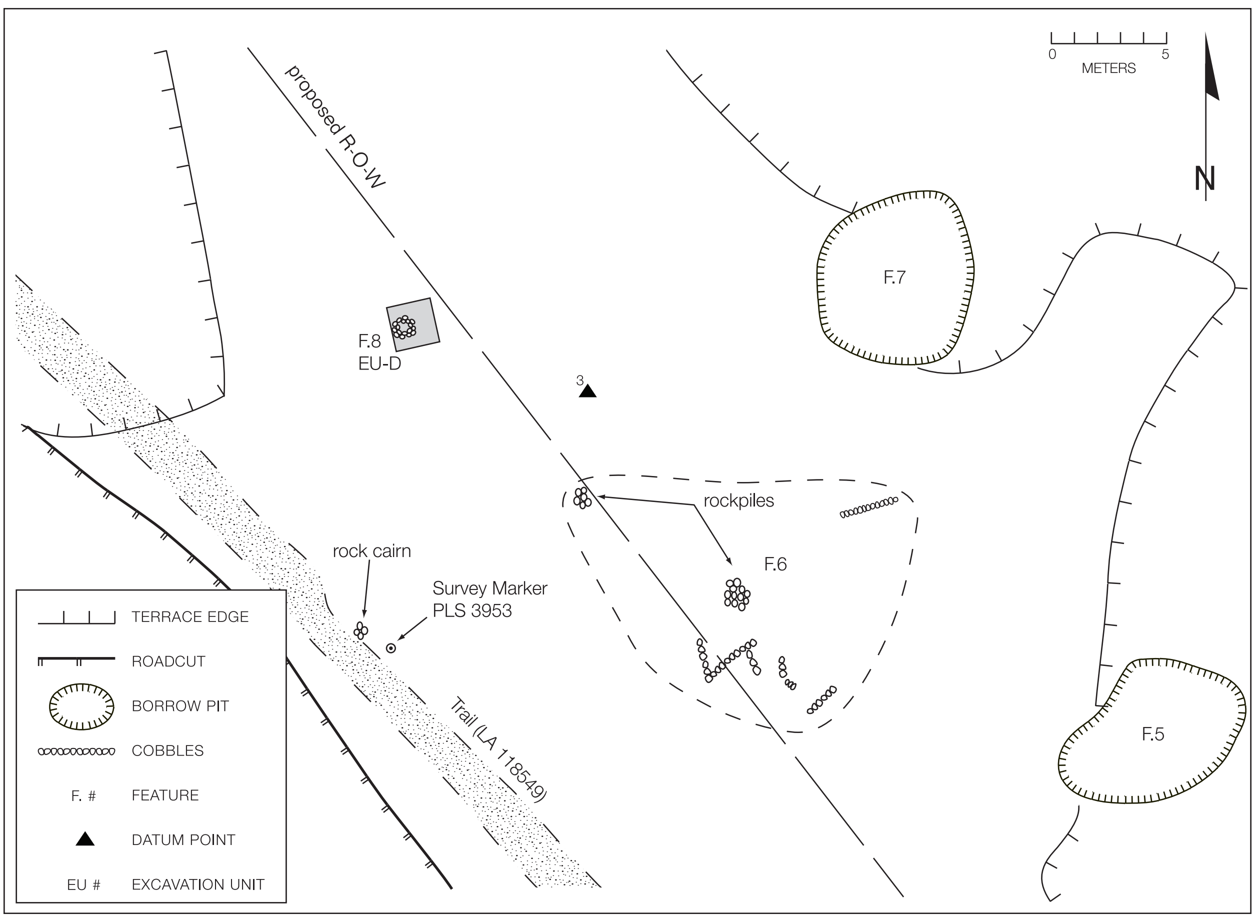


Figure 13.5. Features 6, 7, and 8, LA 105709.

Feature 7

Feature 7 is an oval terrace-edge borrow pit measuring 8.5 by 7 m, with a maximum depth of 0.4 m (Fig. 13.5). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is near Features 4 and 6, and it may be a source of some of the materials used to build those gravel-mulched fields. Feature 7 was dug near the top of a steep slope, and erosion has partly blurred its downslope outline. In addition, sediments have filled it to an undetermined depth. Though associated cultural materials were not inventoried, they included quartzite core flakes and angular debris and gray rhyolite core flakes.

Feature 8

Feature 8 was a small hearth that measured 0.78 by 0.55 m and was located northwest of Feature 6 (Fig. 13.5). Surface indications suggested that this hearth was at least partly cobble-lined, but several elements had become disarticulated (Fig. 13.6). Since this feature was within project limits, it was excavated and is more fully described later.

Feature 9

Feature 9 is a nearly round, ring-shaped shrine, similar to a type often referred to as a world-quarter shrine. The ring measures 14.4 by 13.9 m and is 0.20–0.30 m higher than the adjacent terrace surface (Figs. 13.7 and 13.8). This feature extended slightly into the right-of-way but was 90 percent outside project limits. Because of the sensitive nature of this feature, the section within the right-of-way was not excavated, and our examination was limited to surface documentation. The wall of the enclosure consisted of piled cobbles that had been infiltrated by eolian and colluvial sediments. The elements used to build the feature were obtained locally and consist of waterworn cobbles and small boulders 10–40 cm long. Some gravels were noted on the surface of the mound, suggesting that they might have been included with the cobbles during construction. A 1.4 m wide break in the enclosing mound on the east side probably represents an intentional opening (Fig. 13.9). Most cobbles in the mound were placed with their long axes running parallel with the mound. However, along the south edge of the opening, several cobbles were set with

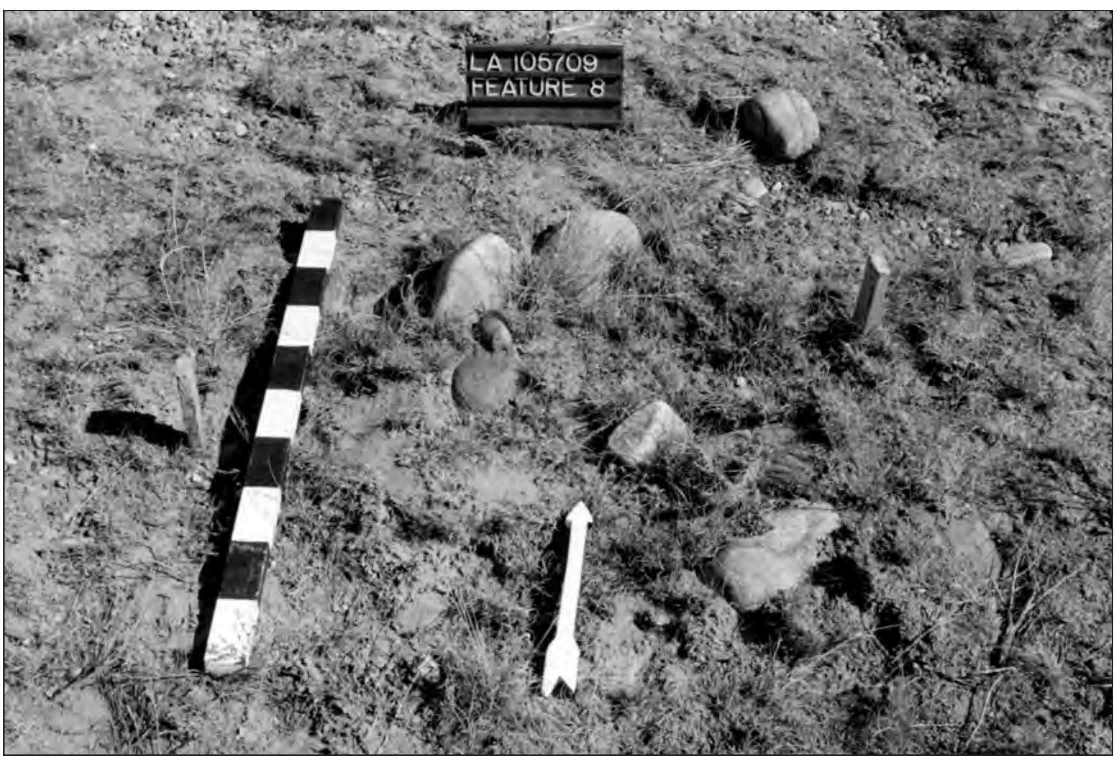


Figure 13.6. Feature 8, a hearth at LA 105709, before excavation.

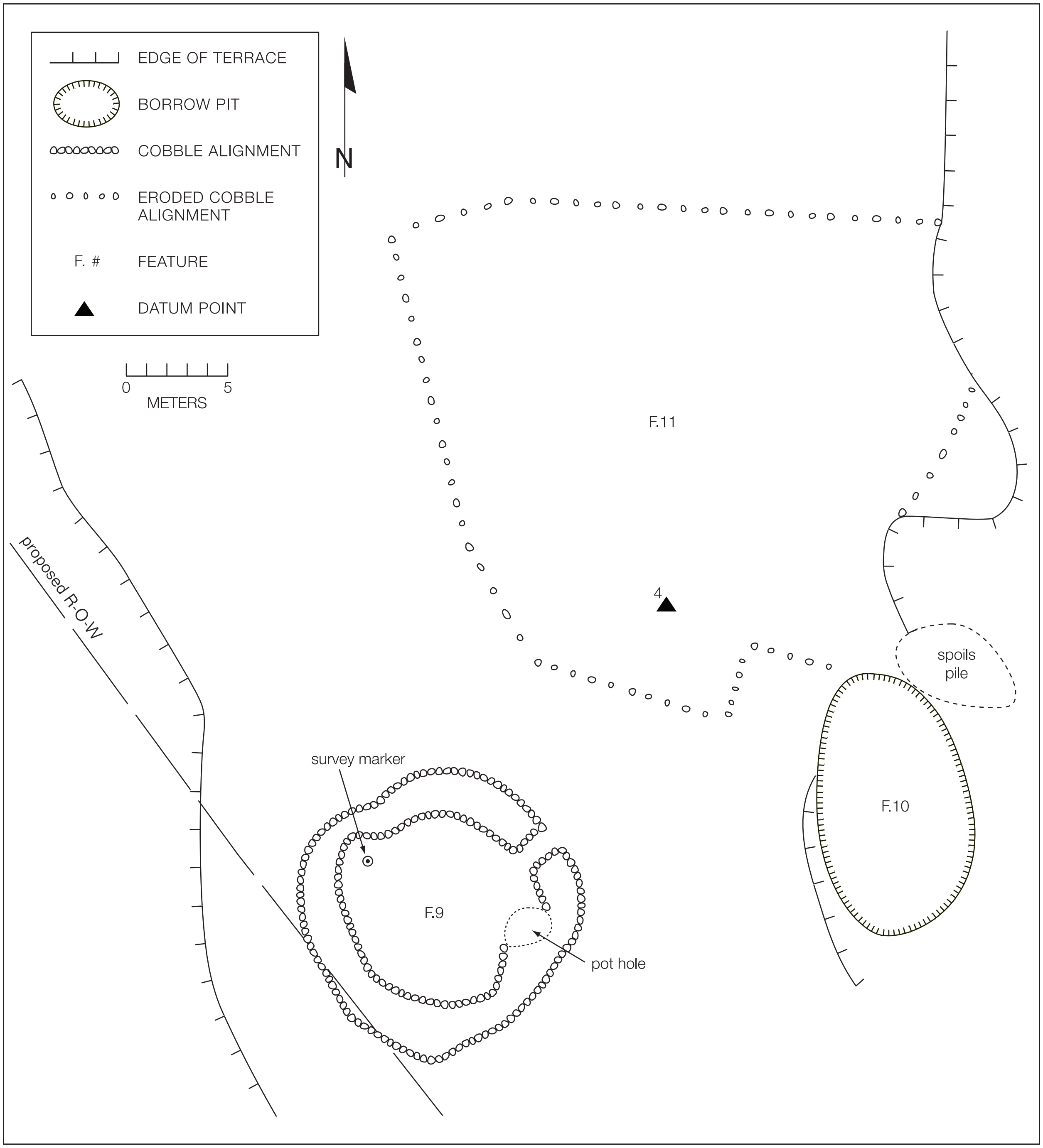


Figure 13.7. Features 9, 10, and 11, LA 105709.

Figure 13.8. Feature 9, a cobble ring shrine at LA 105709.

Figure 13.9. Opening in the enclosing mound of Feature 9, a cobble ring shrine at LA 105709.

their long axes running perpendicular to the mound and were apparently used to line the entrance.

There is some deterioration along the west side of the mound and in its northwest quadrant, which is probably due to erosion and, perhaps, livestock. Cobbles appear to be more scattered in those areas, and the mound is not as high as it is elsewhere in the feature. In addition to this damage, there is a probable pot hole in the southeast quadrant of the shrine measuring 1.9 m northeast-southwest by 1.5 m northwest-southeast. The pothole is 10–15 cm deep and was probably abandoned because no cultural materials were present.

The width of the mound is variable, measuring 2.9 m on the north, 2.9 m on the east, 1.8 m on the south, and 2.3 m on the west. The variation in width is most likely the result of a partial collapse of the enclosure due to erosion and, perhaps, grazing livestock. Thus, the wall of the shrine was probably higher originally. Artifacts inventoried inside the shrine included three pieces of gray rhyolite debitage, two andesite core flakes, an obsidian core flake, and eight fragments of clear glass. Outside the shrine, we found a Biscuit B bowl sherd, a Biscuit A bowl sherd, an indeterminate biscuit ware sherd, three gray rhyolite cores, and a metal condiment lid.

Feature 10

Feature 10 is a large oval terrace-edge borrow pit measuring 10.5 by 9.5 m, with a maximum depth of 0.75 m (Fig. 13.7). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is near Feature 11 and may be a source of some of the materials used to build that gravel-mulched field. It is near the top of a steep slope, and erosion has partly blurred its downslope outline. In addition, sediments have filled the pit to an undetermined depth. A spoils pile or material stockpile is adjacent to the northeast edge of the borrow pit (Fig. 13.7); it measures 7 m east-west by 5 m north-south and probably contains rejected materials. No associated artifacts were noted.

Feature 11

Feature 11 is a fairly large gravel-mulched plot that measures 27 by 25 m and covers about 484 sq m (Fig. 13.7). Since this field was mostly in the detailed mapping zone, it was completely mapped. The northeast and southeast edges of this feature are at the edge of the terrace top and have partly eroded downslope. Only the north boundary alignment was readily discernible; elements in other alignments were displaced by erosion or livestock, or had been mostly covered by eolian sediments. Thus, the edges of this feature were difficult to define.

Visible boundary and interior subdividing alignments are a single element high and wide and were built with locally obtained cobbles and small boulders. Cobbles predominate in all visible alignments, and most are 10–25 cm long. Elements were mostly placed end-to-end and on their broadest surfaces. Since the interior of this field is so heavily covered by sediments, we were unable to determine how or if it is subdivided. Other than a few alignments, the best evidence for the existence of this feature was a heavier concentration of gravels than tended to occur naturally on the terrace surface. Vegetational density is not visibly different from adjacent ungrazed areas that do not contain farming features.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 12 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are one element high, the mulch is probably 10–15 cm thick.

Feature 12

Feature 12 is a large irregularly shaped gravel-mulched plot that measures 59 by 51 m and covers 1,890 sq m (Fig. 13.10). Since this feature was mostly within the detailed examination zone it was completely mapped. There has been a considerable amount of eolian sedimentation on this field, augmented by erosion and displacement of elements in alignments by livestock. Thus, the edges of this feature are very indistinct in places. About 50–60 percent of the surface of this feature is obscured by eolian sediments that have infiltrated the gravel mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide and

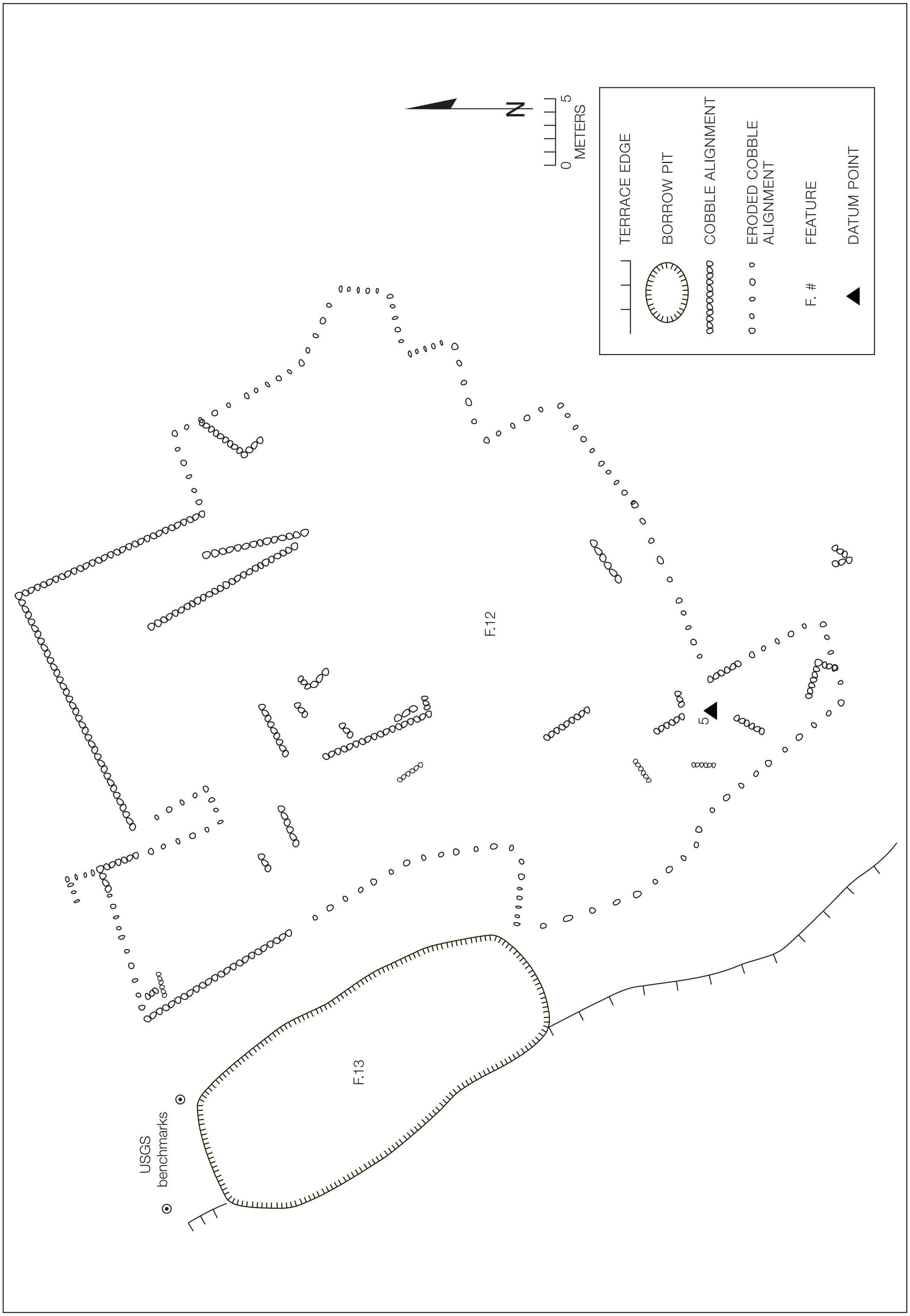


Figure 13.10. Features 12 and 13, LA 105709.

were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. A few small boulders were also used and are 25–40 cm long. Elements were mostly placed end-to-end, though some side-by-side placement also occurs. Most elements were set on their broadest surfaces, but a few were set upright. The edges of this feature were mostly defined by major changes in surface gravel densities. However, enough alignment segments were visible that we could fairly accurately define the shape and extent of the field. A V-shaped wall on the south side of Feature 12 could be the remains of an eroded grid, but it could also be a marker of some sort, since it points at the shrine (Feature 9), which is 30–40 m away.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are one element high, the mulch is probably 8–12 cm thick. This field is mounded 10–15 cm above the terrace surface; no real differences in vegetative density were noted between on- and off-feature areas.

Feature 13

Feature 13 is a large oval terrace-edge borrow pit measuring 17 by 11 m, with a maximum depth of 0.86 m (Fig. 13.10). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is near Feature 12 and may be a source of some of the materials used to build that gravel-mulched field. It was dug near the top of a steep slope, and erosion has partly blurred its downslope outline. In addition, sediments have filled the pit to an undetermined depth.

Feature 14

Feature 14 is a large scatter of chipped stone artifacts and pottery that is directly adjacent to the farming features on the terrace interior at the north end of the site (Fig. 13.1). This scatter measures 50 by 50 m and covers approximately 2,162 sq m. Although no evidence of thermal or structural features was seen, Feature 14 probably served as a temporary living area for farmers attending fields. Artifacts from this feature were included in the general site inventory and so cannot be examined separately. However, we did note that most of the pottery observed at LA 105709 occurred in this feature. Part of Feature 14 was damaged by a blade cut at the north end of the site, which probably occurred during construction of an earth dam.

Surface Information

Another elongated series of farming features follows the edge of the terrace that borders the east edge of the Ojo Caliente Valley. LA 105709 is nearly contiguous with LA 118547 on the south, and had it not been for disturbances caused by the use and cleanup of a historic dump (Fig. 13.1), there may have been no real break between the two collections of farming features. The north boundary seemed a bit more secure, and the features associated with this site extend nearly as far north as Hilltop Pueblo (LA 66288). At that point there seems to be a break in the distribution of fields. However, because reconnaissance was limited in that area, this is uncertain. No evidence of multiple construction episodes was noted in the part of LA 105709 that was examined in detail, and no terrace-interior borrow pits were seen. While all of the features at this site were probably not built at the same time, there was no good evidence for the sequential construction seen at several other sites.

An apparent residential area at the north end of the site consists of a scatter of chipped stone and ceramic artifacts, but no thermal or structural features were noted. Since this feature is toward the interior of the terrace, eolian and colluvial sediments have probably covered any evidence of the latter. Occupation of this area by farmers was probably very sporadic and short term, especially considering the proximity of LA 105709 to both Hilltop Pueblo and Nute.

Two features that set LA 105709 apart from the other farming sites investigated during this study are a possible field structure and a formal shrine. As is discussed in the next section of this chapter, we remain uncertain about the actual nature and date of Feature 3, the possible field structure. There is no doubt about Feature 9, which is a Pueblo shrine that seems to have a fairly close relationship with the trail (LA 118549) that ascends to the top of the terrace near the south end of Feature 1 and descends just before Feature 9 is reached. The trail probably came to the terrace top to provide access to the shrine, and any access to the farming features was of secondary importance.

Numerous artifacts were collected from the portion of LA 105709 that extends into the highway right-of-way. Two methods were used to collect these materials. Artifacts in the chipping area southwest of Feature 3 were collected in 1 by 1 m grids in a 74 sq m area. Artifacts outside this area were collected by point provenience. The chipped stone artifacts in these assemblages are inventoried in Table 13.1. When combined, the assemblages contain 2,196 artifacts, about 70 percent in the grid assemblage and 30 percent in the point-provenienced assemblage. While rhyolite dominates both assemblages, it is more common in the grid collection assemblage (72.6 percent) than in the point-provenienced assemblage (61.0 percent). Andesite is the second most abundant material in both assemblages, but it is more abundant in the point-provenienced assemblage (35.1 percent) than in the grid-collection assemblage (20.3 percent). Massive quartz is more common in the grid-collection assemblage (4.5 percent) than in the point-provenience assemblage (1.2 percent). Cherts comprise slightly more than 1 percent of each assemblage, quartzite makes up slightly less than 1 percent of each, and other materials are rare in both.

Both assemblages are mostly composed of core-reduction debris (angular debris, core flakes, and cores), though other artifact types also occur. The point-provenienced assemblage contains one biface flake, one possible ground stone flake, and three bifaces. Identification of the ground stone flake is questionable, and it may instead be a core flake struck from a flat surface on a heavily waterworn cobble. Two biface flakes were the only other type of artifact identified in the grid collected assemblage. All three biface flakes are andesite, while two of the bifaces are obsidian, and only one is andesite. The andesite biface is complete, generalized in form, and fairly small (3.5 cm long). A second specimen is a small unidentified fragment of an obsidian biface of unknown form. The third specimen is a medial fragment of a medium-sized Polvadera obsidian projectile point.

In addition to chipped stone artifacts, some pottery was recovered from the surface of LA 105709. A Biscuit B sherd and a micaceous utility ware sherd were found in the grid-collected area, and three Biscuit A sherds, four Biscuit B sherds, and one micaceous utility ware sherd were collected by point provenience. The large propor-

Table 13.1. Chipped stone artifacts collected from grids or by point proveniencing within the highway right-of-way at LA 105709 (material type by morphology)

Collection Area	Material Type	Angular Debris	Core Flakes	Biface Flakes	Ground Stone Flakes	Cores	Bifaces
Grid collection	Chert	6	9	-	-	-	-
	Pedernal chert	1	2	-	-	-	-
	Obsidian	2	-	-	-	-	-
	Rhyolite	386	717	-	-	12	-
	Andesite	99	209	2	-	1	-
	Welded tuff	2	2	-	-	-	-
	Quartzite	2	12	-	-	2	-
	Massive quartz	43	26	-	-	-	-
Point provenience	Chert	3	2	-	-	1	-
	Pedernal chert	-	2	-	-	-	-
	Obsidian	-	-	-	-	-	2
	Rhyolite	116	265	-	1	21	-
	Andesite	64	162	1	-	4	1
	Welded tuff	1	1	-	-	-	-
	Quartzite	1	5	-	-	-	-
	Massive quartz	2	6	-	-	-	-

tion of core-reduction debris in both assemblages suggests that raw-material quarrying and initial reduction were important activities in the section of LA 105709 within the highway right-of-way. However, the occurrence of a few biface flakes and formal tools suggests that other chipped stone–related activities also occurred. These possibilities are addressed in greater detail in a later chapter. Since the artifacts in the grid-collection assemblage and most of those in the point-provenienced assemblage did not come from the surface of farming features, it is difficult to determine their relationship to the gravel-mulched fields.

Surface artifacts were inventoried on the main part of the site outside the highway right-of-way using transects spaced 2–3 m apart, and no attempt was made to record them by more specific provenience. Some observations concerning the distribution of cultural materials were made, however. Chipped stone artifacts were most common in the living area (Feature 14), on field surfaces, and at the terrace edge. The array of material types included gray rhyolite (276 core flakes, 41 angular debris, 18 cores, 1 tested cobble), andesite (151 core flakes, 28 angular debris, 3 cores), chert (27 core flakes, 1 angular debris), Pedernal chert (7 core flakes), red rhyolite (6 core flakes, 1 angular debris), quartzite (4 core flakes, 1 angular debris, 1 core), Polvadera obsidian (1 flake, 2 angular debris), and massive quartz (1 core flake). Formal chipped stone tools included a Pedernal chert side-notched arrow point, a Polvadera obsidian medium-sized corner-notched dart point, a Polvadera obsidian arrow point tip, and an obsidian biface fragment. As noted earlier, most of the sherds occurred in the living area (Feature 14). They included Biscuit A (64 bowl sherds), Biscuit B (36 bowl sherds, 2 jar sherds), unidentified biscuit ware (16 sherds), micaceous ware (1 jar, 2 unidentified), and unidentified jar sherds (5).

A large array of historic artifacts was also noted on the surface of the farming features. Glass fragments were the most common artifact type. Several colors were represented, including brown (46), clear (1), green (20), light green (33), and purple (36). Several cans and can fragments were also noted, including 6 aluminum beverage cans and 3 aluminum pull tabs, a rectangular pin hinge can lid, a rectangular key strip meat can, an aluminum pull-type top, the top of a sardine can with a rollback key strip, a quart paint can, a rectangular condiment can top, and a round bayonet-opened can. Other historic artifacts included a large dry cell battery, two bundles of bailing wire, a wooden broom or mop handle, and two fragments of desiccated leather.

Even though the historic dump area had been cleaned up, it still contained quite an array of artifacts dating to the 1960s. No attempt at inventorying all artifacts was attempted; instead, basic artifact categories were recorded. These materials include quite a bit of household trash such as condiment bottles, baby food bottles, coffee cans, beverage bottles, food cans, toothbrushes, tennis shoes, hair curlers, aerosol cans, car seat springs, and broken toys. House furnishings included ceramic toilet fragments, washtubs, bedsprings, garden hose, a barrel hoop, a section of stove pipe, a fragment of an enameled cast iron stove, a mop bail, and Euroamerican pottery. Construction materials included shingles, electric wire, decorative tin screening, milled lumber, fragments of concrete with chicken wire, and firebrick.

Results of Excavation

Four excavation units were used to examine subsurface deposits and construction techniques in Features 1, 3, 4, and 8 at LA 105709. Features 1 and 4 were the only well-preserved and definable farming plots that extended into project limits, Feature 3 was a possible structure, and Feature 8 was a probable historic hearth. Considering the variability in types of features investigated at this site, soil strata are detailed in excavation unit descriptions.

Excavation was conducted in natural strata. Because of the paucity of materials recovered during excavation, only the fill from two 1 m by 1 m grids within each excavation unit in farming plots was screened through 1/4-inch mesh hardware cloth to collect artifacts, though cultural materials noted in the other grids were also collected. Plans of rock alignments in farming features and other rocks that appeared to have been intentionally placed within each excavation unit were drawn before and after excavation. This enabled us to compare surface indications with the actual configurations of alignments and internal construction details. It also allowed us to compare detailed views of small sections of features with the more cursory examinations possible during site mapping. All construction elements were similarly mapped for surface and subsurface exposures in other features.

Feature 1

EU-A was placed at the southwest corner of Feature 1 to examine the intersection of two boundary alignments and the internal structure of this gravel-mulched plot (Fig. 13.2). In order to expose an interior subdividing alignment that was visible on the surface, excavation continued a bit to the east, outside the excavation unit proper. Stratum 1, a layer of eolian and colluvially deposited sediments, occurred on top of and outside the feature. On top of Feature 1, Stratum 1 was a 1–4 cm thick layer of brown sandy loam containing about 40 percent pea gravels. The mean thickness of this unit was 2 cm, and it was 1–4 cm thick. Stratum 1 had the same composition outside the feature as within. It was 1–15 cm thick, with an average of 5.7 cm. In this area, Stratum 1 covered a very cobbly soil that represented the original terrace surface. Colluvial movement seemed to have removed the top of the gravel-mulch layer from the feature, depositing it in a narrow downslope band, which was augmented by eolian sediments. Similar processes led to the development of Stratum 1 on the feature. Gravels from the top of the mulch became mixed with eolian sediments. Three rhyolite artifacts were recovered from Stratum 1—a core flake and two angular debris.

Stratum 2 was a very gravelly brown sandy loam. It was 6–11 cm thick and had a mean thickness of 8.3 cm. The upper 3–4 cm contained mostly pea- to medium-sized gravels (2–3 cm long). The lower 3–4 cm was also very gravelly, but the gravels were smaller. No distinct break was discernible between these layers, and it was impossible to determine whether two separate layers of mulch were present, or a layer of mulch above a naturally gravelly surface. Considering the structure of the adjacent terrace surface, however, it is likely that two layers of mulch were present. A sample taken from the mulch yielded a moderate concentration of corn pollen. No artifacts were recovered from this stratum.

Surface indications suggested that EU-A was placed over the southwest corner of Feature 1 at the intersection of two boundary alignments. A single interior subdividing alignment also seemed to be present (Fig. 13.11). However, excavation revealed a more complex situation. Three interior subdividing alignments occurred within EU-A, all running parallel to the west boundary alignment (Fig. 13.12). Figure 13.13 shows EU-A with Stratum 1 removed. The surface of the gravel-mulched field was clearly distinct from the adjacent terrace, and some cobbles in interior subdividing alignments were visible, but the alignments themselves were indistinct. With the mulch removed, the interior subdividing alignments were much clearer (Fig. 13.14).

Elements in alignments were predominantly set end-to-end and on their broadest surfaces, though some sideways placement was visible after excavation, and a few of the stones that were set sideways were also placed upright. There are several intriguing aspects to the configuration of the exposed section of Feature 1. First, the interior subdivision of this field is much more complex than is immediately apparent from the surface, though there are some hints of this complexity. Surface observations suggested that some parts of Feature 1 were intricately subdivided (Fig. 13.2). Results of excavation in EU-A indicate that the level of subdivision is even higher than was suggested by the surface appearance of areas that were not heavily covered by sediments. Though the interior subdividing alignments exposed in EU-A ran parallel to the west boundary alignment, they appeared to have been truncated by a perpendicular alignment about 1 m north of the excavation unit. Thus, rather than creating long linear rows, the interior subdividing alignments seemed to create a series of rectangular cells that were 20–30 cm wide and about 2 m long. Looking at the structure of Feature 1 from the surface, cells with this shape and directionality seem to dominate the south part of the feature, but they do not appear to make up the entire field. This suggests that Feature 1 may not have been built in one construction episode, but over time, and new extensions often took a different form.

Another question raised by excavation in EU-A was whether all of the mulch was applied at

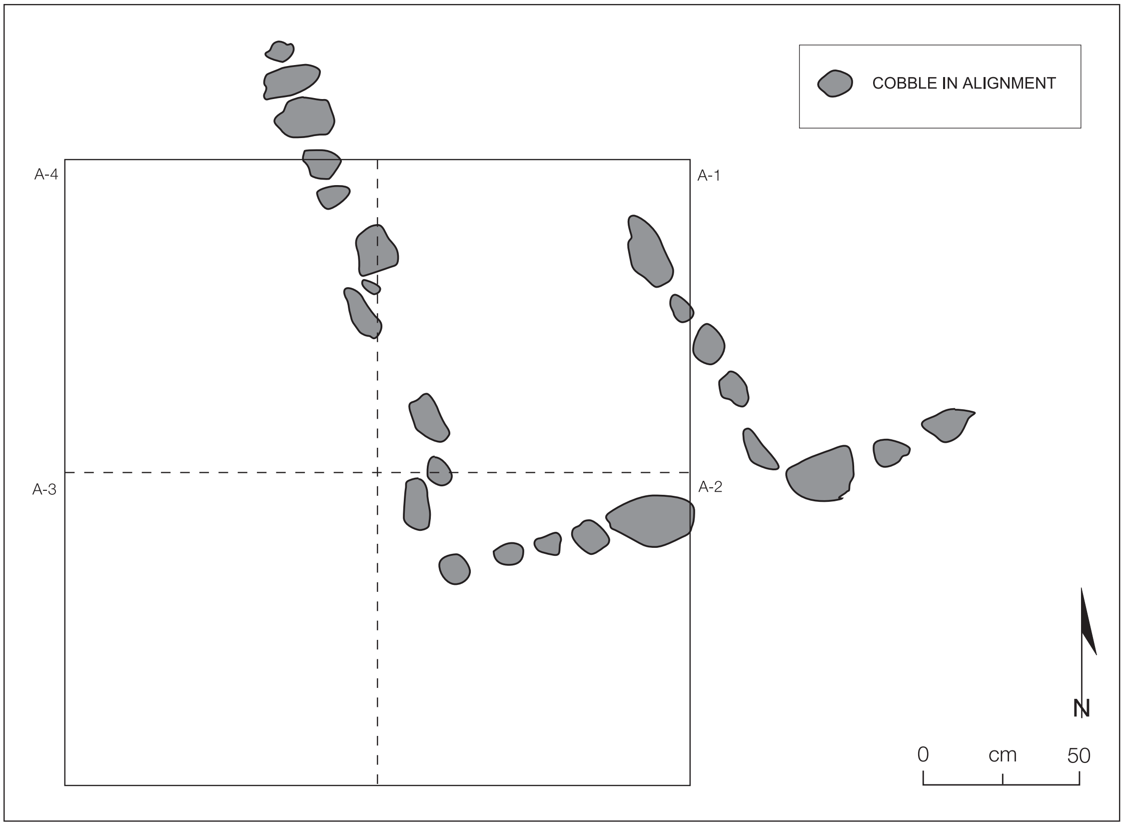


Figure 13.11. Pre-excavation plan of EU-A in Feature 1, LA 105709. Shaded rocks are in alignments.

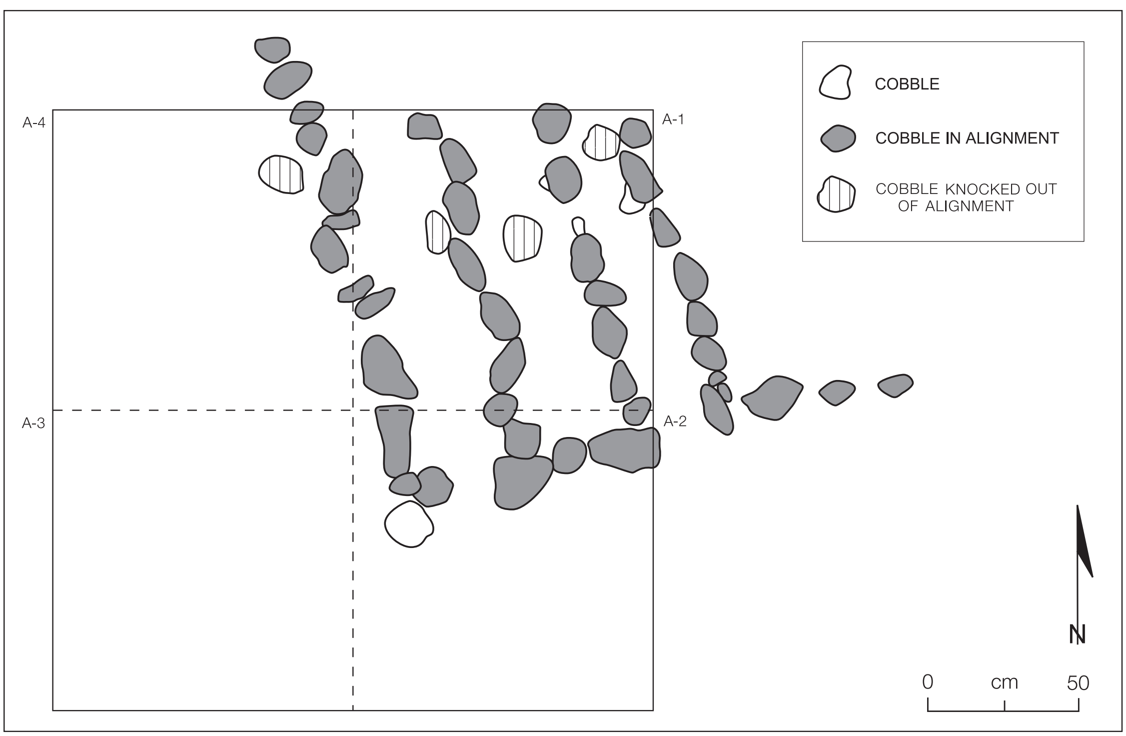


Figure 13.12. Postexcavation plan of EU-A in Feature 1, LA 105709. Shaded rocks are in alignments.

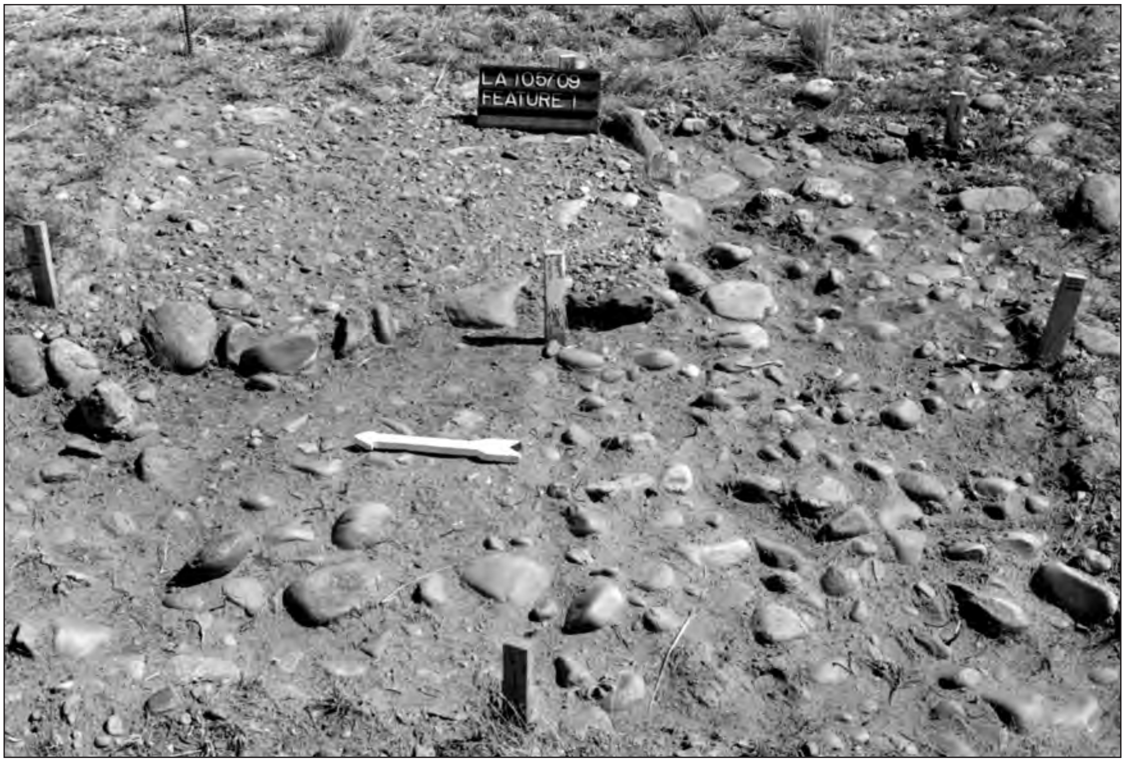


Figure 13.13. EU-A in Feature 1, LA 105709, after removal of Stratum 1.

Figure 13.14. A portion of EU-A in Feature 1, LA 105709, after removal of the gravel mulch.

once or multiple applications occurred. As seen in the description of Stratum 2 above, two layers of gravel mulch seemed visible in this soil unit, though they were not distinct enough for separate excavation. Added to this was the relative invisibility of most interior subdividing alignments after Stratum 1 was removed. Why bother with intricate subdivisions if they become virtually invisible once the field is mulched? Thus, at least two mulch applications appear to be in evidence in EU-A, and the later application mostly obscured the interior subdividing alignments.

Feature 1 was also investigated using a short (4 m long) backhoe trench to help determine the relationship between the gravel-mulched field and the terrace upon which it sits. Figure 13.15 shows a profile of the south wall of Backhoe Trench 1. Strata 1 and 2 were not separated from Stratum 3, the original terrace surface, because of general similarities in structure. Stratum 3 covers the terrace top in this area and contains numerous cobbles and gravels in a yellowish brown sandy clay loam matrix, and it was 20–25 cm thick. Stratum 4 occurred under this surface layer and was a light yellowish brown sandy clay loam containing much caliche and numerous gravels. This layer was 12–30 cm thick. Stratum 5, the deepest soil layer encountered, consisted of a light brown clay. This profile shows why most borrow pits were relatively shallow and predominantly occurred at terrace edges. The gravelly layer used as a source of materials for gravel mulching is relatively thin, only about 30–40 cm thick in this area. Stratum 3 is probably thicker near the terrace edge, since that area also contains materials that have been eroded off the top of the terrace. Since Feature 1 occurred on an eroded terrace finger, Stratum 3 is probably a bit thicker elsewhere, but in most cases it is probably no more than a 1 m thick layer of gravels and cobbles covering the terrace surface.

Feature 3

Feature 3 initially appeared to be an isolated gravel-mulched plot or small structure (Fig. 13.4). Since it occurred within project limits, it was investigated during the excavation of EU-B. A heavy concentration of chipped stone artifacts surrounded Feature 3 and extended toward the south and southwest. This and the shape of the feature suggested that it might be a prehistoric fieldhouse. EU-B was expanded toward the west to allow complete examination of the interior of the feature (Fig. 13.16). Fill in this feature consisted of a tan sandy loam that was 2–14 cm thick, with an average thickness of 5.8 cm. Removal of this soil exposed a rectangular arrangement of cobbles measuring 2.0 m east-west by 1.8 m north-south (Fig. 13.16). A stained area toward the center of the feature was at first thought to be the remains of a hearth, but further examination showed that it was a naturally burned root that was not associated with the feature. The interior surface of the feature was moderately packed dirt, and no formal improvements had been

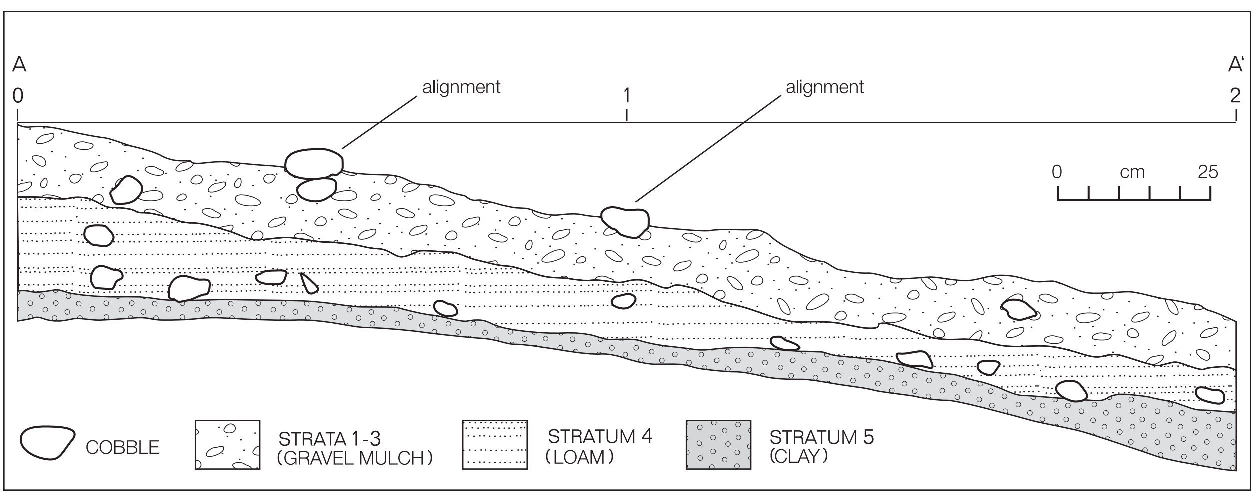


Figure 13.15. Profile of Backhoe Trench 1 in Feature 1, LA 105709.

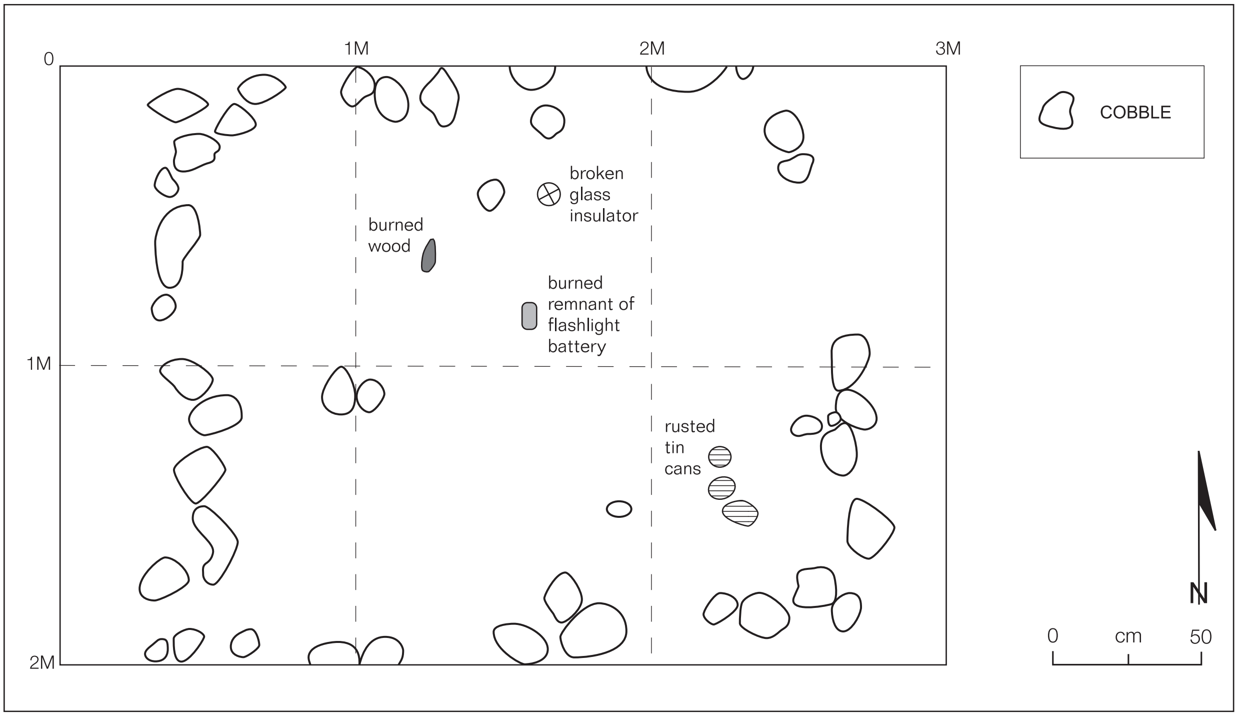


Figure 13.16. Postexcavation plan of Feature 3, LA 105709.

made. While a rhyolite core and core flake were found inside Feature 3, most cultural materials recovered were of historic age, including 18 glass fragments, 2 nails, 3 fragments of metal cans, a battery core, and a bullet. Considering the array of materials found inside the cobble alignments, Feature 3 appears to represent a temporary historic structure of some sort, possibly a tent base or similar informal shelter. Thus, it was not related to the farming features at the site.

Feature 4

EU-C was placed in the northwest section of Feature 4 to examine the internal structure of this field and search for interior subdividing alignments that surface indications suggested would exist. Stratum 1 was a moderately thick layer of pale brown sandy loam containing some pea gravels. It was 2–8 cm thick, with a mean thickness of 6.5 cm. No cultural materials were recovered from this layer of soil. Stratum 2 was a matrix of pea gravels and small to large gravels that had been infiltrated by a pale brown sandy loam. Numerous cobbles up to 15 cm long were floating in this matrix and did not represent construction elements. The gravel mulch was 3–16 cm thick, with a mean thickness of 9 cm. A sample taken from the mulch yielded a high corn pollen concentration. Artifacts recovered from the layer of mulch included a rhyolite core, a piece of rhyolite angular debris, and 26 Biscuit B sherds. Excavation ended at the top of Stratum 3, a very dark grayish brown clay loam containing numerous cobbles.

The sherds recovered from EU-C were found in a unique subfeature. The top of a small boulder was evident in the northwest corner of Grid C-2 before excavation began (Figs. 13.17 and 13.18). Since the boulder did not seem to be part of an interior subdividing alignment, it was removed as part of Stratum 2 fill. The sherds were under the boulder, and when reconstructed proved to be three ceramic tools made from fragments of the same Biscuit B bowl (see Chapter 19). All three tools showed evidence of heavy use as digging implements and were sitting on the original terrace surface with the boulder intentionally placed on top of them. These tools were deposited when the gravel-mulched field was being built and probably were not cached for future use since they were at the bottom of the

Figure 13.17. Boulder (center of photo) in EU-C before excavation of Feature 4, LA 105709. (Signboard has incorrect feature designation.)

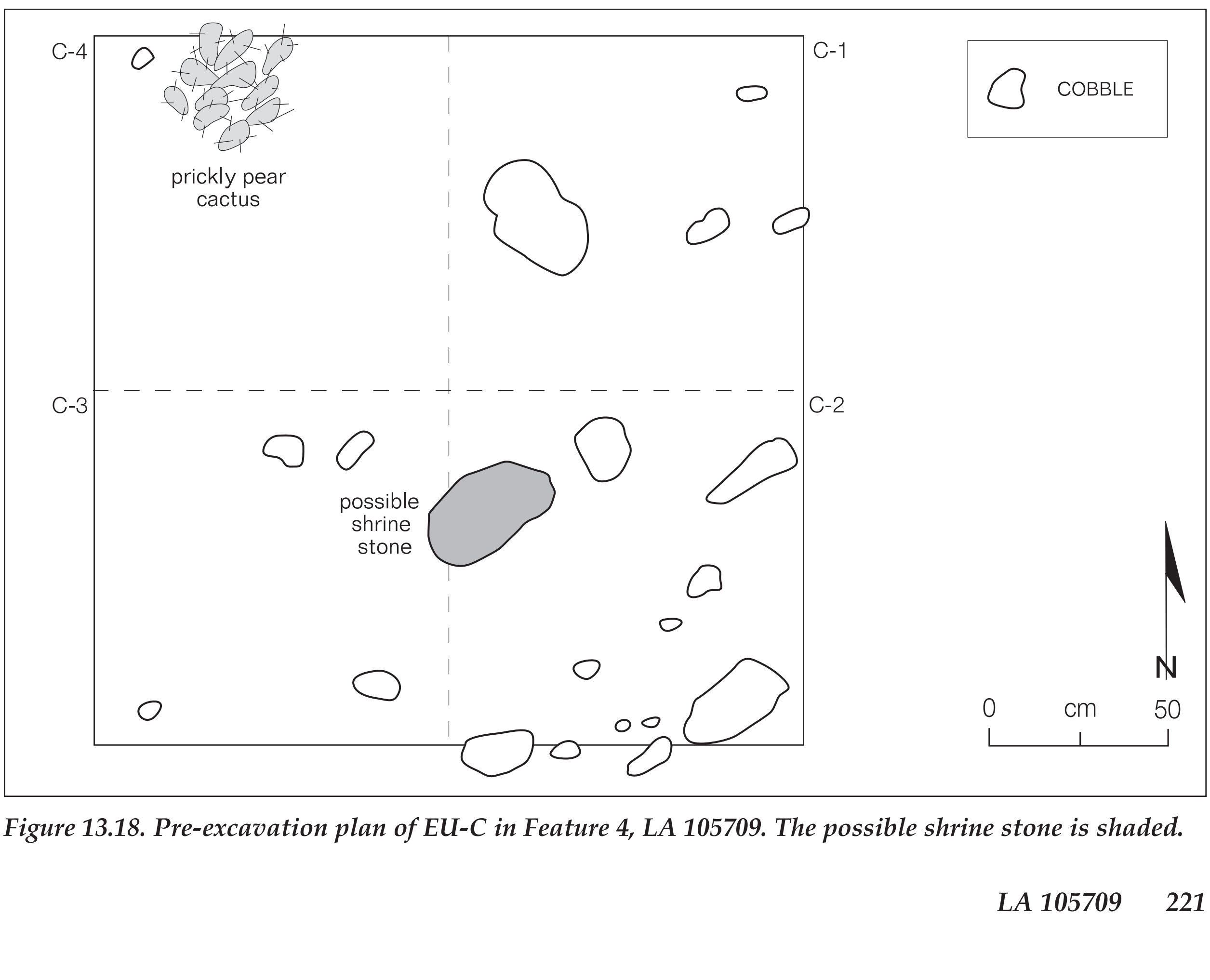


Figure 13.18. Pre-excavation plan of EU-C in Feature 4, LA 105709. The possible shrine stone is shaded.

mulch and under a small boulder, a location that could hardly have been expected to leave them intact and reusable. Thus, some other sort of behavior is represented. This subfeature was probably a small shrine constructed as part of the field.

Removal of the mulch also exposed most of a cell bounded by three interior subdividing alignments in the area excavated and a fourth that was visible on the surface just east of EU-C (Figs. 13.19 and 13.20). Parts of other cells were also undoubtedly exposed, but no consistent interior subdividing alignments were found other than in the southeast part of the excavation unit. The exposed cell measured 1.5 m east-west by 1 m north-south and was bounded by elements that were mostly set end-to-end on their broadest surfaces, though sideways placement was also fairly common, and several elements were set upright (Fig. 13.20). The rest of Feature 4 was probably similarly subdivided, but eolian sediments obscured most interior subdividing alignments.

Feature 4 was also investigated using a short (3.5 m long) backhoe trench to determine the relationship between the gravel-mulched field and the terrace upon which it sits. Figure 13.21 shows a profile of the south wall of Backhoe Trench 2. Stratum 2 (gravel mulch) sat directly on top of Stratum 3, the original terrace surface. Stratum 3 was a yellow brown sandy clay loam containing numerous gravels and cobbles, and it was 20–25 cm thick. Under this was Stratum 4, a light yellowish brown sandy clay loam containing much caliche and numerous gravels and cobbles. This configuration is very similar to what we saw in Backhoe Trench 1 and shows that the soil strata mined for building materials were fairly thin. In this area they appear to be at least 30 cm thick and were probably thicker, since the bottom of Stratum 4 was not reached in the backhoe trench.

Feature 8

EU-D was used to investigate Feature 8, a probable hearth. Though a 2 by 2 m grid was placed over this area, only the feature was excavated. The presence of a hearth was marked on the surface by a semicircle of upright cobbles comprised of at least four elements (Fig. 13.6). Excavation revealed only two more elements adjacent to those visible on the surface (Fig. 13.22). Several other cobbles were scattered across the surface near the remains of this feature and probably represent displaced elements. Thus, this feature has suffered considerable damage from surface traffic, most likely grazing livestock.

The remaining section of this hearth measured 1.25 by 0.88 m and was excavated about 10 cm into Stratum 3. Hearth fill was a 4–9 cm thick layer of pinkish gray sandy loam containing charcoal fragments and gravel (Fig. 13.23). We were uncertain whether Feature 8 was associated with the prehistoric or historic component, since it contained no artifacts.

Summary of Findings

LA 105709 was one of the first sites investigated by this study, and field methods were still being perfected. Even so, our examination of LA 105709 provided data that are mostly consistent with those obtained from other farming sites in the area. In particular, we were able to examine the internal construction of two gravel-mulched fields, which were quite comparable to those seen at other sites. LA 105709 was one of two sites where backhoe trenches were excavated to examine the structure of farming features in relation to the terrace they were built upon. The terrace surface in this area was covered by two strata containing numerous gravels and cobbles, which provided a source of building materials near the terrace edge. Interestingly, these strata seem to be relatively thin, perhaps only 1 m thick or less.

Excavation in Features 1 and 4 showed that those fields were built in a much more intricate manner than was suggested by surface indications. Interior subdividing alignments in Feature 1 created fairly narrow cells that may represent the locations of individual crop rows. A larger cell structure appears to have been used in Feature 4 and probably could have accommodated two or three short crop rows. Analysis of pollen samples from these features showed that corn was grown in each. The lack of pollen from other domesticates may be an indication of monocropping, but this is by no means certain.

Initially it appeared that Feature 3, set within a fairly dense scatter of chipped stone and fairly

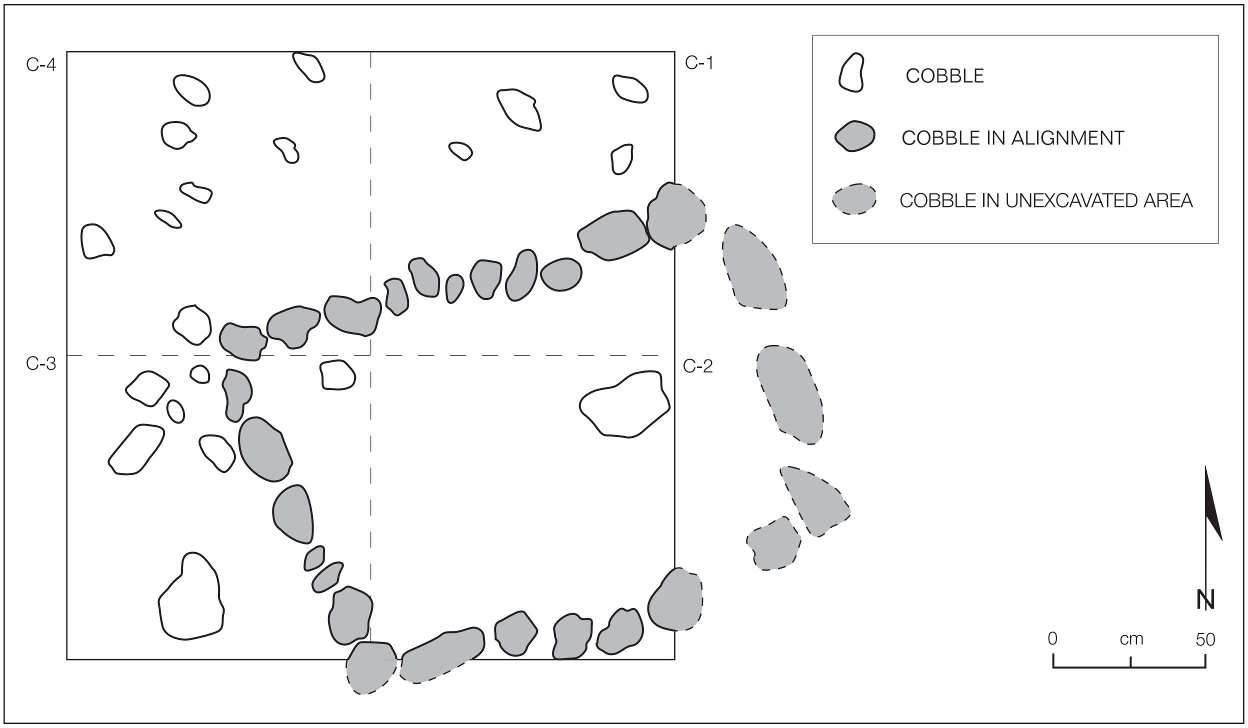


Figure 13.19. Postexcavation plan of EU-C in Feature 4, LA 105709. Shaded cobbles are in alignments.

Figure 13.20. Postexcavation view of exposed cell in EU-C, Feature 4, LA 105709.

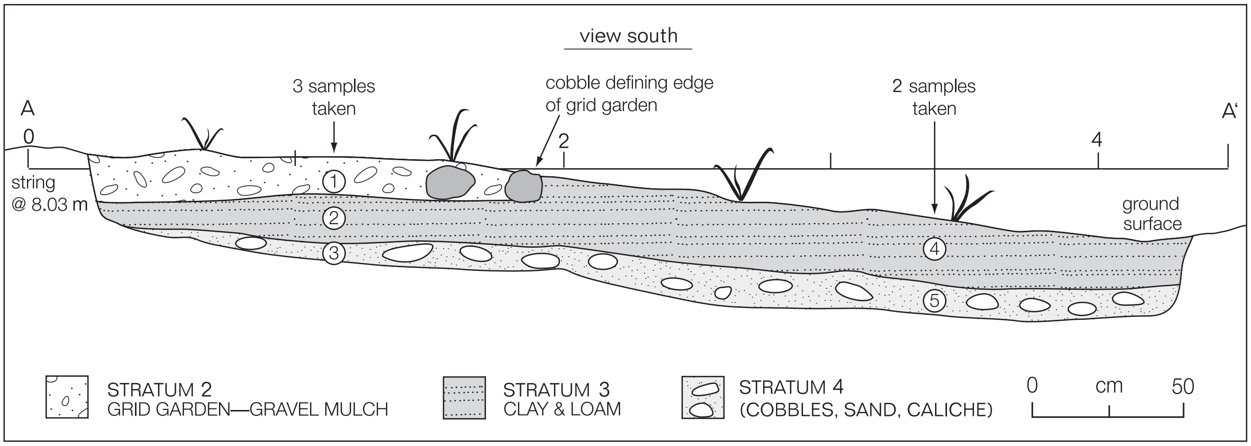


Figure 13.21. Profile of Backhoe Trench 2 in Feature 4, LA 105709.

Figure 13.22. Feature 8, a hearth at LA 105709.

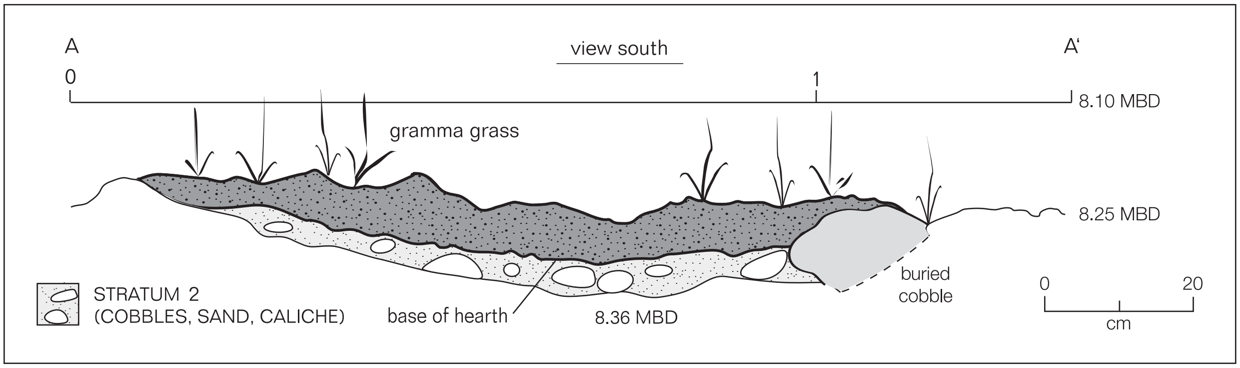


Figure 13.23. Profile of Feature 8, LA 105709.

near an extramural hearth (Feature 8), might represent a living area associated with use of the fields. The presence of a potential field structure was particularly intriguing, since no features of this type were noted at other sites investigated during this study. Unfortunately, the presence of numerous historic artifacts within Feature 3 indicated a historic date for that possible structure and cast doubt on a prehistoric date for Feature 8 as well. While the scatter of chipped stone artifacts might represent a living area similar to those seen at other sites, the density of artifacts and their location on a slope are more suggestive of a single chipping episode that may or may not have been related to the use of this site for farming.

While it is unclear whether the large shrine (Feature 9) was built as part of this farming complex, the probable small shrine in Feature 4 undoubtedly was related to agricultural pursuits. The simplicity of this shrine and its rather innocuous nature argue that similar features may be fairly common in these fields, but they are impossible to identify without excavation and the fortuitous presence of offerings. Several other farming features examined during the course of this project also contained small boulders in rather anomalous situations. While these boulders might represent other simple agricultural shrines in fields, without excavation this remains uncertain.

No direct evidence of sequential construction was found in the features examined in detail at LA 105709. However, variability in construction methods and the possible presence of at least two layers of mulch in Feature 1 may be indicative of continual feature growth and modification throughout their use-life. The presence of three ceramic tools made from sections of a Biscuit B bowl under a boulder that was intentionally placed in a field at the time of construction suggests that at least Feature 4 was built fairly late in the Classic period. Though Biscuit A sherds seem to predominate elsewhere on the surface of LA 105709, Biscuit B sherds comprise at least a third of the decorated pottery assemblage. Thus, most or all of these features were probably built after Biscuit B was first produced, and the entire site probably dates to the Late Classic period.

Chapter 14. LA 105710: The Gavilan Morada Meeting Room, the Candido García Store, and the Archuleta Corrals

Jeffrey L. Boyer

LA 105710 is a large multicomponent site on the east side of U.S. 285 in the community of Gavilan, on land administered by the Bureau of Land Management (see Fig. 1.1). It was first recorded by Marshall (1995). As discussed in Chapter 6, the site's prehistoric component consists of two small hearths and artifacts associated with Hilltop Pueblo that were redeposited in colluvial strata at the base of the terrace. Its historic component is comprised of the meeting house of the Gavilan morada, the Candido García store, and the locations of corrals, pens, and a shed used in the early 1900s by the Archuleta family (Fig. 14.1). The site measures 260 m north-south by 50 m east-west and covers approximately 1.8 ha.

Marshall (1995) recorded four features at the site: the morada building, the concrete foundation of a house, an abandoned road north of the morada, and a concrete foundation thought to be the base of a cattleguard at the junction of the abandoned road and the highway. Wiseman returned to LA 105710 during the testing phase of this project (Wiseman and Ware 1996). He observed the morada building and the abandoned road, made no mention of the possible cattleguard, and identified the "house foundation" as the remains of a small store operated by Candido and Manuel García in the early 1930s. He also noted a concentration of wolfberry bushes that corresponded, according to local residents, to the location of corrals used by the Archuleta family in the early 1900s. Both Marshall and Wiseman noted that the morada building is outside the existing right-of-way; in fact, the right-of-way boundary runs along the west wall of the structure. Wiseman focused his testing activities on the area within the right-of-way immediately west of the morada building, limiting his examination to three series of auger tests and a surface artifact inventory.

Because the morada building was outside project limits and could be avoided during planned construction activities, in the data recovery plan Wiseman recommended no archaeological investigations of this structure (Wiseman and Ware 1996). Wiseman also assumed that the García store had been almost completely dismantled and that no archaeological investigations were warranted there. He did recommend ethnohistoric investigations of the morada and the García store. However, during data recovery we determined that more remained of the García store than had previously been thought. Consequently, data recovery investigations of the historic component of LA 105710 focused on excavation of the García store and recording the other site features.

Field Procedures

LA 105710 was mapped with optical and laser transits. Figure 14.1, the site plan, shows the historic site features and excavation areas. During the testing phase, a primary datum was established at the north end of the site near an unnumbered highway right-of-way stake. That datum, originally designated 0/0, was redesignated 500N/500E during data recovery and was used to establish a grid system across LA 105710, oriented to true north.

Although the data recovery plan only called for ethnohistoric investigation of the García store, excavations were conducted there to ensure that the structure truly had no archaeological potential. Excavations at the store began with two 1 by 1 m test units on each side of the long north-south wall foundation. The test units revealed the depth of the foundation and the presence of a floor, indicating that the structure had been built into the hillslope. The interior of the structure was excavated by dividing it into quadrants along lines within the site grid. Each quadrant was excavated to the structure floor by strata defined in the first 1 by 1 m unit within the structure. Vertical control was maintained relative to the elevation of the primary datum. All fill was screened, and all recovered artifacts were collect-

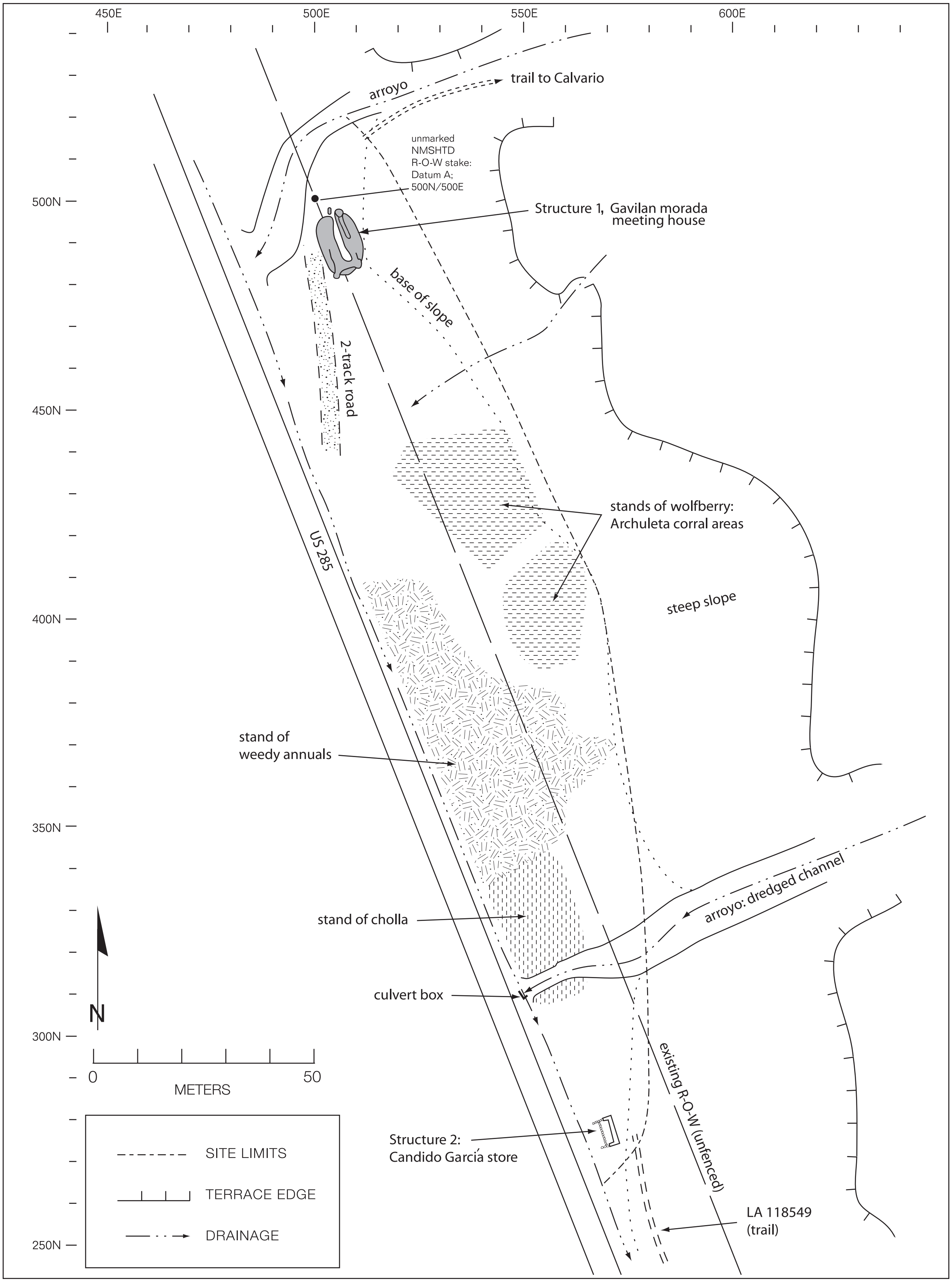


Figure 14.1. Plan of the historic component at LA 105710.

ed. Artifacts on the floor were point-provenienced, photographed, and drawn in place before collection. Portions of the floor were then removed to search for subfloor features. None were found. A series of 1 by 1 m units was excavated around the perimeter of the structure. These units were excavated in 10 cm levels to a surface presumed to represent the historic ground surface.

The morada building was mapped, photographed, and described. No material samples were collected. The corral locations were mapped, but no detailed examinations were conducted.

Results of Investigations

Structure 1: The Gavilan Morada Meeting House

Structure 1 was a single building within a complex of structures and features comprising the Gavilan morada (see Chapter 25 for descriptions of this building and the other structures and features provided by informants). It was a small, approximately rectangular structure constructed of adobe bricks. The building now consists of an elongated C-shaped mound of melted adobe, opening to the northwest (Figs. 14.2–14.5). The mound is 14.2 m long by 9.8 m wide and about 0.5 m tall.

The building measured about 12.2 by 5.5 m (exterior measurements). It was not possible to determine the original wall heights. Based on a standing segment of the east wall, bricks in the structure's walls were laid side-by-side, and the walls were a single brick thick—about 0.5 (Figs. 14.4 and 14.6). The structure's interior space would have measured about 11.2 by 4.5 m (50.4 sq m).

The only door into Structure 1 was in the north wall, seen as the opening in the C-shaped mound (Fig. 14.2). A concrete doorstep, immediately north of the structure (Fig. 14.2), is seen in Figure 14.4 in front of the meter board. There was apparently a *fogón* (corner fireplace) in the northwest corner. Fragments of burned adobe and ceramic flue pipe were present on the mound in that area. No evidence of other interior features or of divisions of internal space was discernible. Fragments of flat glass may reflect the presence of windows, but their locations could not be defined based on surface evidence.

Remnants of adobe plaster were present on the interior surface of the standing wall segment. The exterior of the structure had been finished with cement plaster. Conical buttresses constructed of large cobbles held with adobe mortar and covered with cement plaster were at the northeast, southeast, and southwest corners of the building (Fig. 14.2). Figure 14.5 shows the three buttresses in a view from the south; Figure 14.7 shows a close-up of the southwest buttress.

The three 1 by 1 m test units and two backhoe trenches excavated at LA 105710 were intended to enable the archaeologists to examine the terrace base area because of subsurface artifacts recovered during testing (Chapter 6). They also enabled us to search for historic features within project limits near the morada, but none were found.

The Archuleta Corrals

Although the modern plant community across most of LA 105710 was comprised of grama and other grasses, four distinct areas with very different plant communities were observed. Two of these were stands of wolfberry bushes (*Lycium* sp.) at the base of the gravel terrace in the central portion of the site (Fig. 14.1). One stand was irregularly pentagonal with relatively straight sides that ranged from about 10 to 33 m long. The stand was a maximum of about 40 m long from its southeast-northwest corners by 27.5 m wide from its northeast corner to the center of the southeast side. It encompassed an area of about 536 sq m (0.5 ha).

The second wolfberry stand was an irregularly shaped area immediately southeast of the first. Two sides of this stand were relatively straight. The north side, which ran parallel to the south side of the first stand, was about 17 m long. The southeast side was about 18 m long. Four other sides were less straight or regular. The stand was a maximum of about 30.5 m long by 19.5 m wide and encompassed an area of about 490 sq m (0.5 ha).

In addition to the wolfberry stands, a large, irregularly shaped area characterized by weedy annuals, primarily bassia (*Bassia hyssopifolia*) or

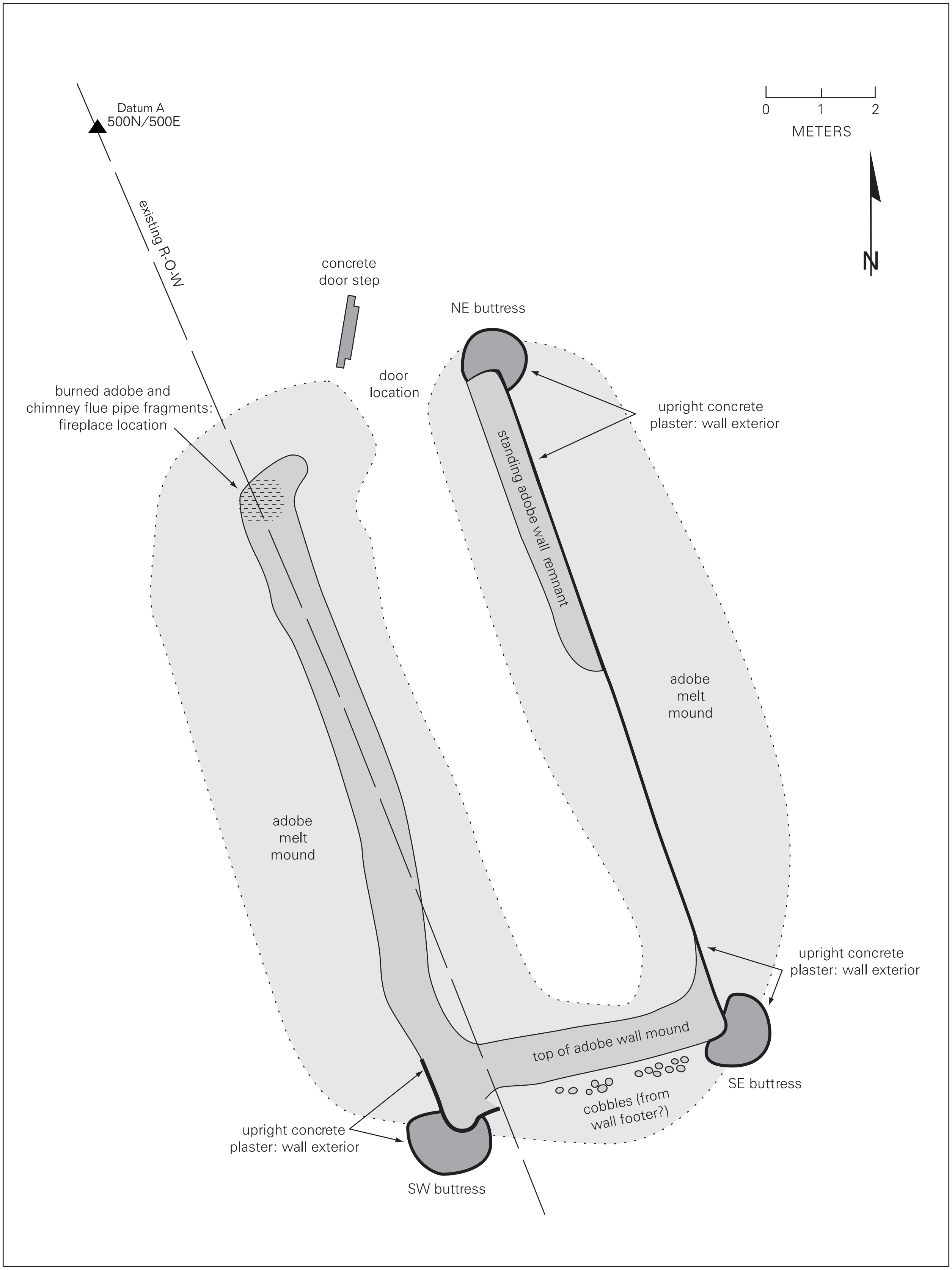


Figure 14.2. Plan of Structure 1, the Gavilan morada meeting house, LA 105710.

Figure 14.3. Structure 1, LA 105710, looking east.

Figure 14.4. Looking southeast through the door in the front of Structure 1, LA 105710.

Figure 14.5. Looking northwest toward the rear of Structure 1, LA 105710.

Figure 14.6. Standing portion of the east wall of Structure 1, LA 105710.

Figure 14.7. Buttress at the southwest corner of Structure 1, LA 105710.

kochia (*Kochia scoparia*), was present southeast of the wolfberry stands, between them and the highway (Fig. 14.1). Immediately south of this area was a roughly rectangular area with a dense growth of cholla cactus (*Opuntia* sp.) (Fig. 14.1). This area was cut by the dredged channel of an arroyo.

The wolfberry stands were identified by Wiseman (Wiseman and Ware 1996) as the location of corrals used by the Archuleta family. One of Goodman's informants (see Chapter 25) identified the central portion of LA 105710 as the location of corrals for cattle and sheep, pens for chickens and pigs, a large wood pile, and a wagon and tack shed, all used by the family of Antonio and Faustina Archuleta. Beyond recording their presence, no other archaeological investigations of these areas were conducted during data recovery. The corrals, pens, and shed are discussed in detail in Chapter 25.

Structure 2: The Candido García Store

Structure 2, at the south end of LA 105710 (Fig. 14.1), was the remains of a small building identified by informants as a store (*tiendita*) owned by Candido García (Wiseman and Ware 1996; see Chapter 25). The store was a small, one-room structure measuring 5.9 m north-south by 3.3 m east-west (exterior measurements) (Fig. 14.8). Remains of the east wall and portions of the north and south walls consisted of a foundation of poured concrete containing medium to large gravels and small cobbles. Poured between forms

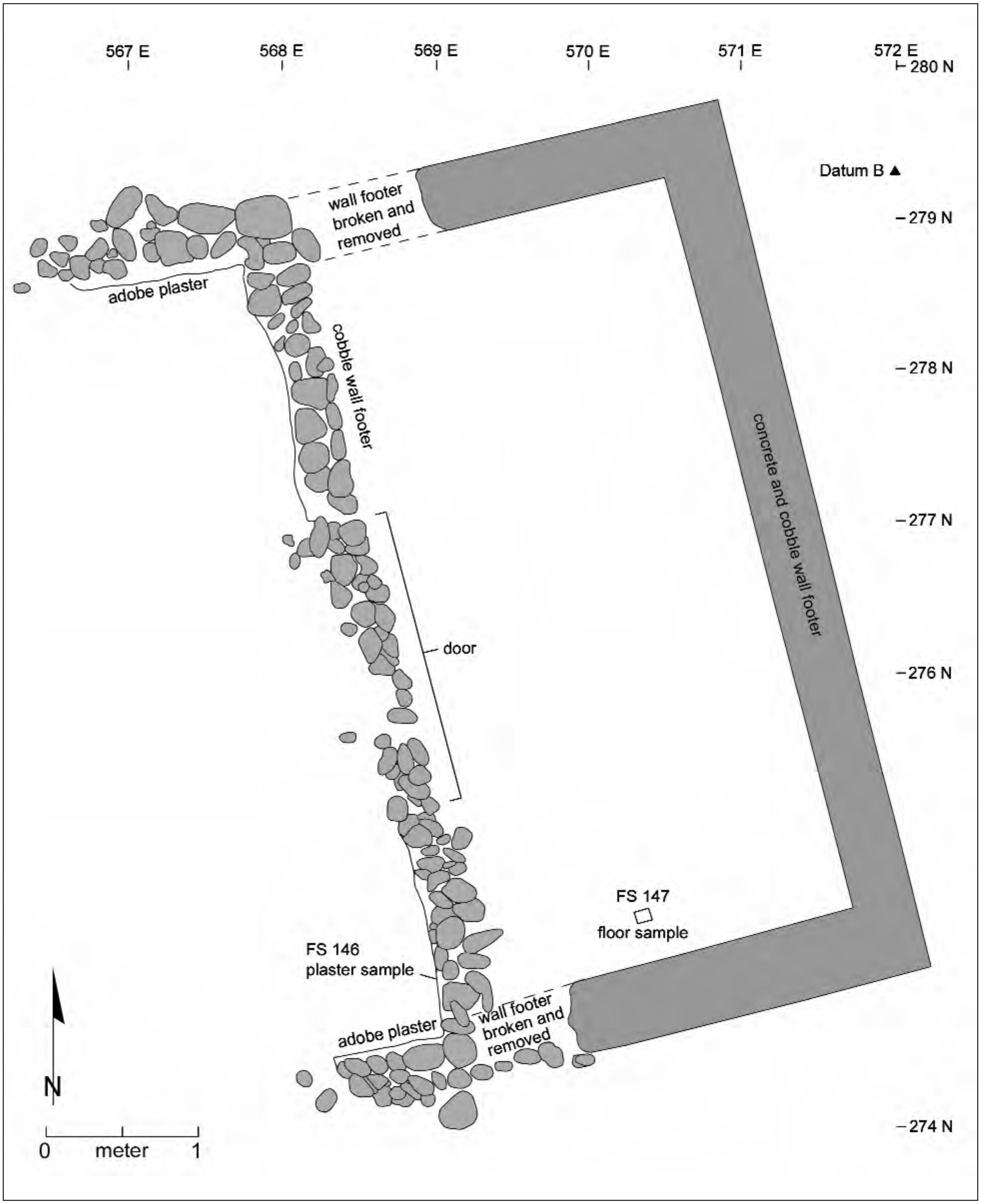


Figure 14.8. Postexcavation plan of Structure 2, the García store, LA 105710.

of milled lumber upon a footer of large cobbles that were probably set in a shallow trench (Fig. 14.9), the foundation was 40 cm thick and 40–45 cm tall, and extended below and just above the historic ground surface. The western ends of the north and south wall foundations and the west wall foundation consisted of footers of large cobbles (Figs. 14.8 and 14.10). The north and south walls extended past the west wall (Figs. 14.8 and 14.10), suggesting that the building had a portal on its west side.

The walls of Structure 2 were apparently constructed of adobe bricks, based on the presence of brick fragments in the structure fill. The thickness of the wall foundation and footers indicates that the bricks were probably set side-by-side and that the walls were one brick thick. Interior wall surfaces and the exterior surface of the west wall had been covered with adobe plaster and a single layer of whitewash plaster. Figure 14.11 shows the plaster in the southeast corner of the portal area, and Figure 14.12 is a detail of the plaster in the same corner. That only single layers of plaster and whitewash were present shows that the structure had a short life. The floor was apparently packed earth.

A probable door location was identified in the approximate center of the west wall (Fig. 14.8), indicated by a single layer of cobbles in the footer that contrasted with multiple layers of cobbles in adjacent northern and southern segments of the west wall (Figs. 14.13 and 14.14). Concentrations of window glass fragments found on the floor inside the south wall and in sediment outside the south wall may have pointed to a window in that wall.

The fill of Structure 2 consisted of three strata. Stratum 1 was reddish-brown melted adobe with brick fragments, probably representing wall plaster and brick material. It was 4–8 cm thick and was present over the structure's packed-earth floor. The adobe material was probably deposited on the floor during dismantling of the structure. Stratum 2 was a 10–30 cm thick layer of light reddish brown, compacted, sandy loam, probably representing natural colluvial and eolian sediments. A thin charcoal lens was recorded within Stratum 2 on the north side of the structure, but there was no indication that it was related to structural burning; indeed, there was no other evidence of structural burning, such as burned plaster, floor, or roof materials. The upper surface of Stratum 2 was undulating, indicating that it had been disturbed by natural erosion. Above Stratum 2 was Stratum 3, which was light brown, loose, sandy loam, also probably representing natural colluvial and eolian sediments. Stratum 3 was 7–17 cm thick; thicker portions were found over more disturbed portions of Stratum 2. The upper surface of Stratum 3 was the modern ground surface, and the combined strata filled Structure 2. Only a thin layer of Stratum 3 covered parts of the wall foundation and footers.

Stratigraphy within Structure 2 showed that, at the time the structure was dismantled, adobe from wall plaster, mortar, and brick fragments was deposited on the structure floor. There was no evidence of structural remodeling prior to dismantling. Evidence of the superstructure was limited to adobe materials in Stratum 1, tar paper fragments on the floor, and window glass fragments on the floor and outside the south wall. This shows that essentially all structural materials were removed from the site when the building was dismantled. Following dismantling, Structure 2 filled with natural colluvial and eolian sediments.

Artifacts recovered from Structure 2 are discussed in Chapter 21. Ethnohistoric information about Structure 2 is presented in Chapter 25. In Chapter 26, the results of archaeological and ethnohistorical investigations of Structure 2 are discussed with regard to research issues defined in the data recovery plan (Wiseman and Ware 1996:63–64).

Figure 14.9. East wall of Structure 2, LA 105710, showing poured foundation on top of cobble footer.

Figure 14.10. Structure 2, LA 105710, looking south.

Figure 14.11. Southeast corner of the portal area along the exterior of the west wall of Structure 2, LA 105710, showing adobe and whitewash plaster.

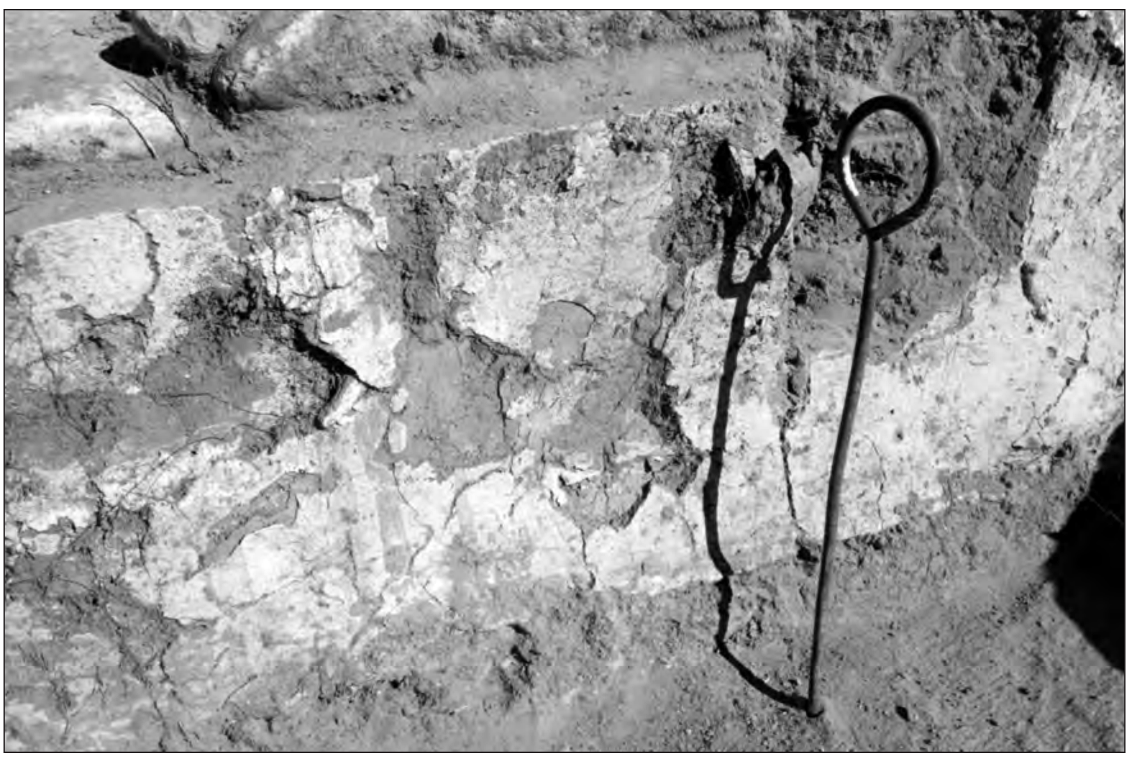


Figure 14.12. Southeast corner of the portal area along the exterior of the west wall of Structure 2, LA 105710, showing detail of adobe and whitewash plaster.

Figure 14.13. Structure 2, LA 105710, after excavation. Meter board is in the probable door location.

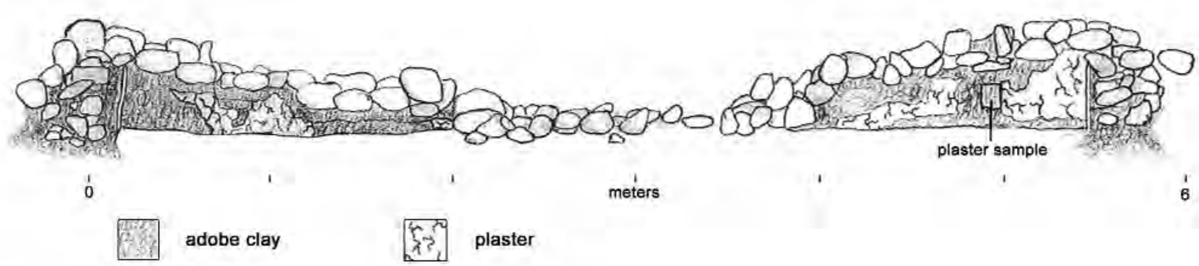


Figure 14.14. Elevation of doorway, Structure 2, LA 105710.

Chapter 15. LA 105713

James L. Moore

LA 105713 is a large farming site on land administered by the USDI Bureau of Land Management. The site is roughly rectangular in shape, with a small finger extending to the northeast and its edges cut by several small drainages. The west site boundary is formed by the edge of the main terrace that overlooks the Ojo Caliente Valley, and it is bounded on the north and south by intermittent drainages. The east boundary is formed by the edge of farming features and the base of a higher terrace. LA 105713 measures 195 m east-west by 190 m north-south, and covers about 37,050 sq m (3.71 ha). Only about .4 percent of the site extends into the U.S. 285 right-of-way, comprising a narrow sliver along the west edge of the site. In-field pottery analysis indicated that LA 105713 was used during the Classic period.

Vegetation is moderate on the site and shows evidence of heavy grazing. Heavy stands of prickly pear and quite a bit of cholla occur. Grasses are the most common plants, including grama and muhly. Other common plants are prickly pear, cholla, rabbitbrush, and snakeweed. Small junipers occur at the terrace edge, and a few have spread onto field surfaces. Junipers are also common on the slope that forms the east boundary of the site, and a few piñons were also seen in that area.

Field Procedures

Detailed mapping was restricted to the section of site that extends into the U.S. 285 right-of-way and an adjacent 25+ m wide zone. This area comprises a sample of about 13 percent of the site, and all cultural features within this zone were mapped and recorded in detail. Three borrow pits (Features 1, 7, and 8) are the only features that extend into project limits. Since excavation of these features would have provided few data that were not available from surface examination, no subsurface studies were conducted, and data recovery focused on the surface description and photographing of features in the mapped area. All cultural materials noted on the surface within the highway right-of-way were collected for analysis and are summarized later in this chapter. Artifacts noted elsewhere on the surface in the detailed mapping zone were inventoried, but they were not separated by feature.

Features

Thirteen features were at least partly mapped and described (Fig. 15.1). The locations of six additional terrace-edge borrow pits are shown on the site plan, but since they were outside the detailed examination zone they were not described or assigned feature numbers. Most feature perimeters are fairly well defined, but some field boundaries are partly obscured, especially those near the terrace edge. A combination of colluvial and eolian processes have caused soil to build up against alignments that face the interior of the terrace, obscuring those boundaries in many places. Eolian deposits also cover much of the surface of the fields, especially where they are anchored by vegetation. This made it difficult to discern many alignments and to define the full extent of others. Livestock grazing has likewise caused damage, displacing elements in cobble alignments and blurring feature edges. Along the terrace edge this seems to have exacerbated damage caused by erosion. Other surface disturbances include a trail (LA 118549) that runs along the west edge of the site next to U.S. 285.

Feature 1

Feature 1 is a large, oval terrace-edge borrow pit measuring 11.0 by 6.1 m, with a maximum depth of 0.75 m (Figs. 15.2a and 15.2b). Only about 15 percent of Feature 1 was within project limits, and it was completely mapped. This borrow pit is next to Features 3 and 4, and it was probably a source of some of the materials used to build one or both of those gravel-mulched fields. Some spoils materials, mostly cobbles, were piled in the

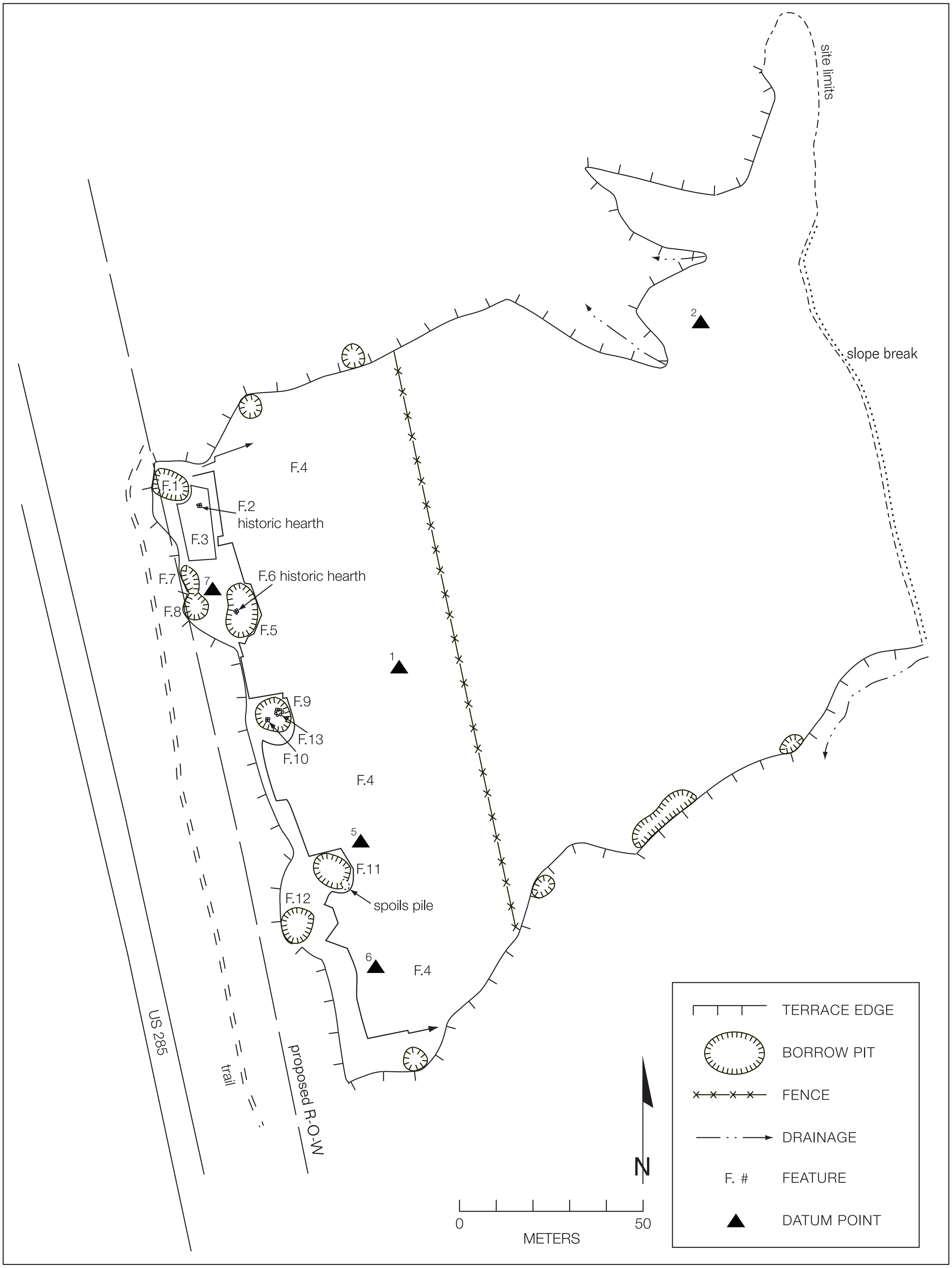


Figure 15.1. Plan of LA 105713.

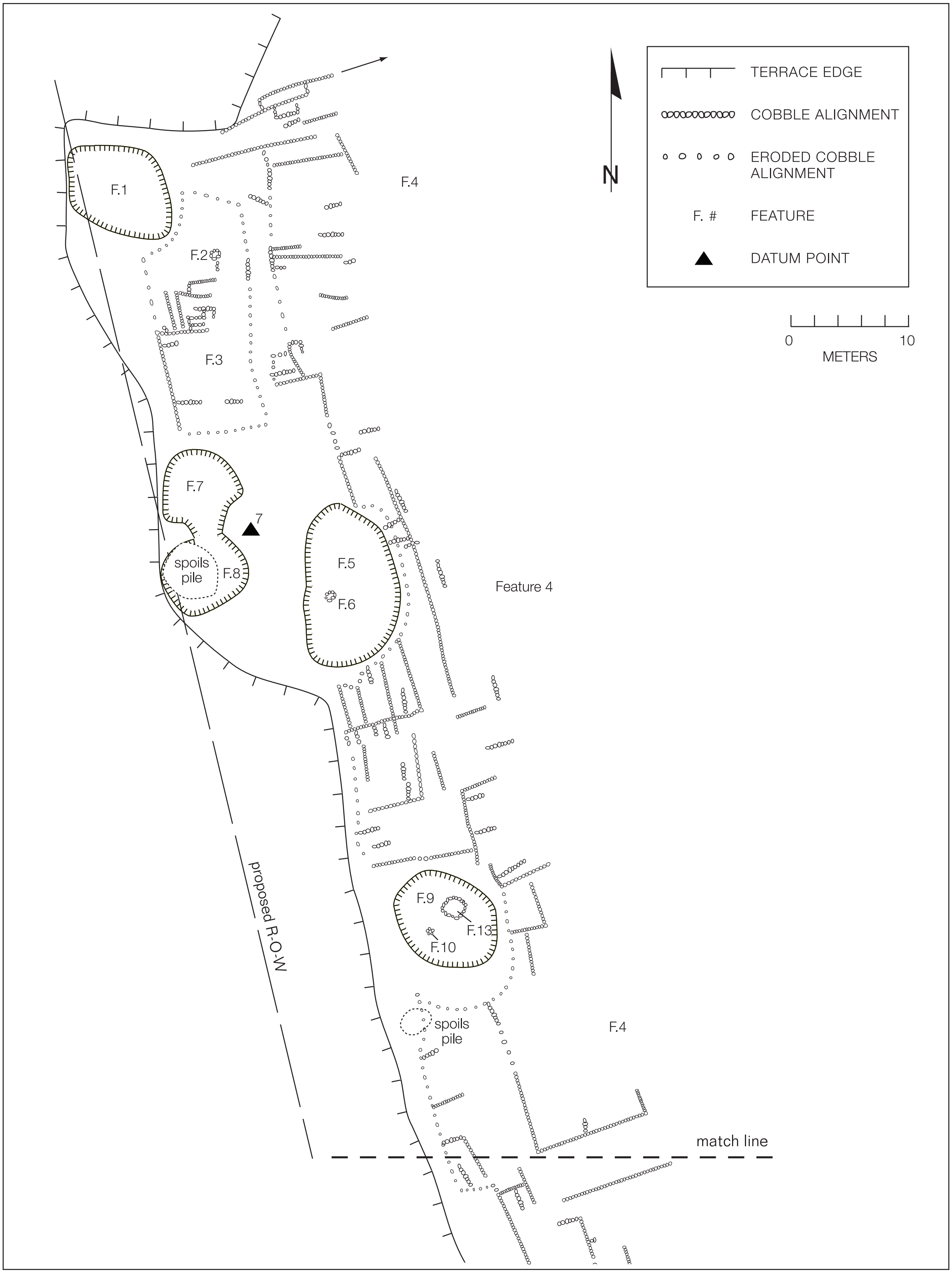


Figure 15.2. Features 1 through 13, LA 105713.

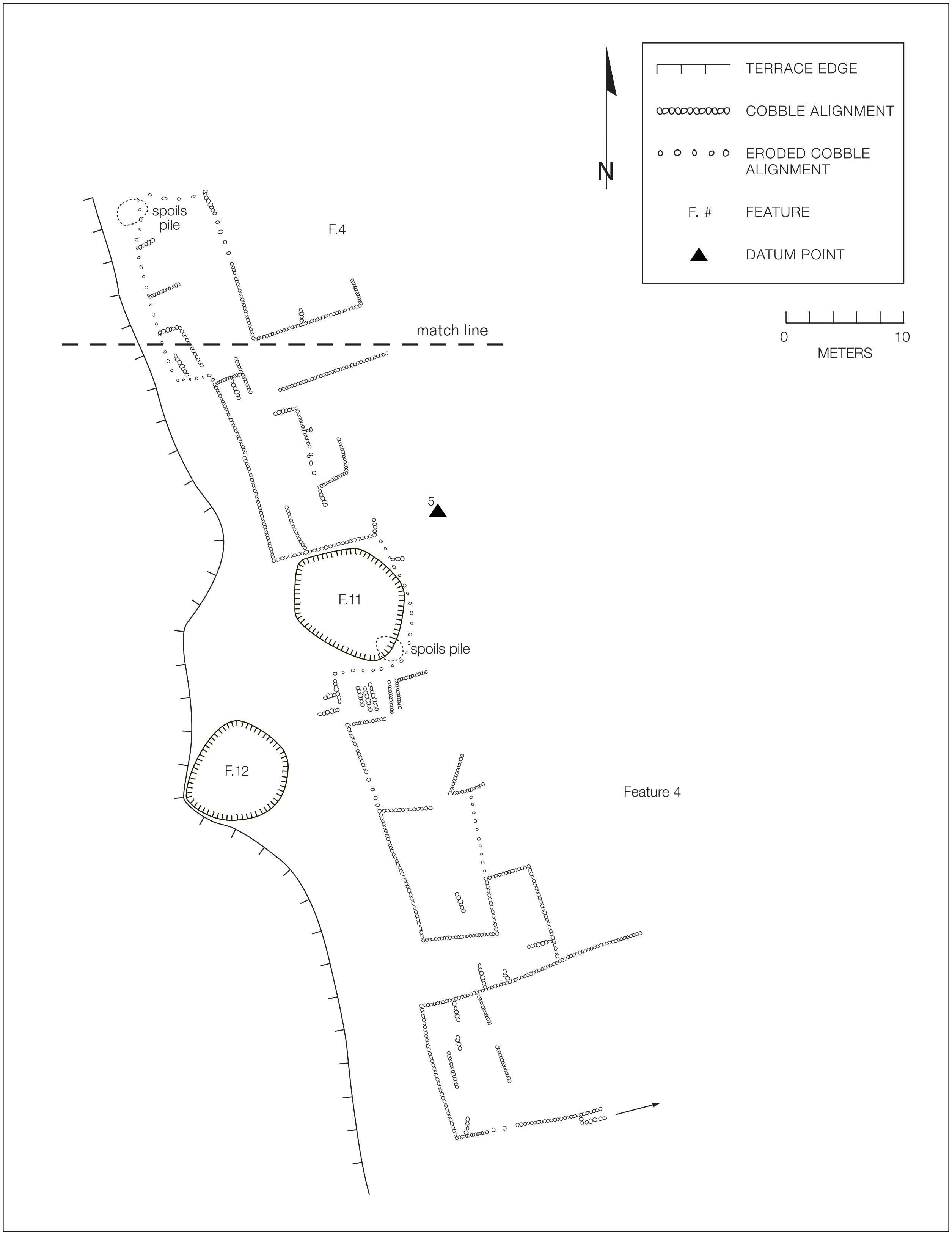


Figure 15.2 (continued).

northeast quadrant of this feature. In addition, some recent historic trash was noted, including glass and aluminum cans.

Feature 2

Feature 2 is a cobble-bordered hearth that measures 0.90 by 0.75 m, with a maximum depth of 0.12 m (Fig. 15.2 and 15.3). It sits on top of Feature 3, a gravel-mulched plot. Though outside construction limits, it was in the detailed examination zone and was mapped. This feature is comprised of 15 cobbles arranged in an oval, with charcoal and burned wood inside the cobble ring. From the condition of the latter, Feature 2 is of recent historic derivation. No other cultural materials were found in association with the hearth.

Feature 3

Feature 3 is a small gravel-mulched plot that measures 21.0 by 9.5 m and covers 187 sq m (Fig. 15.2). Since this field was in the detailed examination zone, it was completely mapped. Much of its surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. The few small boulders that occur are 25–40 cm long. Most elements in alignments were placed end-to-end, though some were set sideways. Most elements were also placed on their broadest surfaces, though a few were set upright. Surface indications suggested that the interior of the feature was highly subdivided, though interior alignments were obscured by eolian sediments across much of this plot.

The mulch is mostly composed of pea gravels and gravels, though small cobbles up to 10–15 cm long are also common, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably 5–10 cm thick. This feature did not appear to be mounded above the adjacent terrace surface, and no real differences in vegetative or

Figure 15.3. Feature 2, a historic hearth, at LA 105713.

gravel densities were noted between on- and off-feature areas.

Feature 4

Feature 4 is a long, irregularly shaped gravel-mulched field that measures 166.5 by 90 m and covers roughly 15,000 sq m (Fig. 15.2). Since this field was mostly outside the detailed examination zone, the entire feature was not mapped. Only the west 20 percent of the feature fell within the mapping zone, so its full extent was measured by pacing. Perhaps 30–40 percent of the field surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide, and they were built with locally obtained cobbles and small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. Small boulders also occur, particularly in boundary alignments, and they are 25–40 cm long. Building elements were mostly placed end-to-end, though some sideways placement was noted. Most elements were also placed on their broadest surfaces, though upright cobbles were fairly common. From the number and placement of alignments traceable on the surface, Feature 4 appears to have been highly subdivided. The variation in patterning of these subdivisions from one end of the feature to the other suggests that it was not all built at one time. Rather, a series of building episodes is probably represented that began with several separate plots, which eventually grew together.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 6+ cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Since the alignments are a single element high, the mulch is probably 5–10 cm thick. No mounding above the terrace was seen, but a difference in gravel densities was noted between on- and off-feature areas, and the field surface was covered by a heavy carpet of gravels. The adjacent terrace surface contains much less gravel and considerably fewer cobbles. No similar variation in vegetative density was noted between these areas.

Feature 5

Feature 5 is a large terrace-edge borrow pit measuring 15.0 by 10.5 m, with a maximum depth of 0.64 m (Fig. 15.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is near Features 3 and 4 and was probably a source of some of the materials used to construct one or both of those gravel-mulched fields. Sediments have built up to an undetermined depth in the bottom of this pit. The only temporally diagnostic artifact noted in association with this feature was an unidentifiable Tewa polychrome series sherd.

Feature 6

Feature 6 is a cobble-bordered hearth that measures 0.90 by 0.80 m, with a maximum depth of 0.19 m (Fig. 15.2). It is situated near the middle of Feature 5, a prehistoric borrow pit. Though outside construction limits, it was within the detailed examination zone and was mapped. This feature is comprised of nine cobbles arranged in an oval. Two beverage cans with aluminum tops and a screw-top juice bottle are in close association with this hearth. The location, condition, and configuration of this feature in conjunction with the associated historic artifacts suggest it is of recent historic derivation.

Feature 7

Feature 7 is a fairly large round terrace-edge borrow pit measuring 8.3 by 8.2 m, with a maximum depth of 0.70 m (Fig. 15.2). Feature 7 extended partly into project limits and was otherwise within the detailed examination zone, so it was mapped. This borrow pit is next to Features 3 and 4 and was probably a source of some of the materials used to build one or both of those gravel-mulched fields. Sediments have built up in the bottom of this pit to an undetermined depth. The south end of Feature 7 opens into a second borrow pit (Feature 8), as discussed in the next section. No associated artifacts were noted.

Feature 8

Feature 8 is a round to oval terrace-edge borrow pit measuring 8.4 by 7.5 m, with a maximum depth of 0.62 m (Fig. 15.2). Feature 8 extended partly into project limits and was otherwise within the detailed examination zone, so it was mapped. This borrow pit is next to Features 3 and 4, and it was probably a source of some of the materials used to build those gravel-mulched fields. The central and northwest quadrants of this pit contain spoils consisting of cobbles and small boulders (Figs. 15.2 and 15.4), probably derived from the excavation of Feature 7, which adjoins Feature 8 on the north. Thus, Feature 8 was probably used before Feature 7. No associated artifacts were noted.

Feature 9

Feature 9 is an oval terrace-edge borrow pit measuring 11.8 by 11.0 m, with a maximum depth of 0.90 m (Fig. 15.2). Feature 9 was within the detailed examination zone, and it was mapped. This borrow pit is next to Feature 4 and was probably a source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of this pit to an undetermined depth. No associated artifacts were noted, but this feature contained two hearths (Features 10 and 13), both of probable historic date.

Feature 10

Feature 10 is a cobble-bordered hearth that measures 0.40 by 0.36 m, with a maximum depth of 0.05 m (Fig. 15.2). This is one of two hearths in the bottom of Feature 9, and it is in the west-central part of that borrow pit. Though outside construction limits, it was within the detailed examination zone and was mapped. This feature is comprised of 10 cobbles arranged in an oval, and small chunks of charcoal occur within (Fig. 15.5). The location, configuration, and contents of this hearth suggest that it is of recent historic derivation.

Feature 11

Feature 11 is a large, nearly round terrace-edge borrow pit measuring 11.0 by 10.7 m, with a maximum depth of 0.71 m (Fig. 15.2). Though outside

Figure 15.4. Feature 8, LA 105713, showing the cobble and boulder spoils in the bottom of the borrow pit.

Figure 15.5. Feature 10, LA 105713, a historic hearth in the bottom of a borrow pit (Feature 9).

construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 4 and was probably a source of some of the materials used to build that gravel-mulched field. A spoils pile containing large cobbles and small boulders is on the southeast edge of this feature and represents materials that were discarded during quarrying. This borrow pit was probably used near the end of the use-life of the adjacent section of Feature 4, since the spoils would have served as building materials if that field had been further expanded.

Feature 12

Feature 12 is a large, oval terrace-edge borrow pit measuring 10.4 by 8.0 m, with a maximum depth of 0.65 m (Fig. 15.2). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 4 and was probably a source of some of the materials used to build that gravel-mulched field. Erosion along the west edge of this pit may have enlarged it a bit, and colluvial fill has built up in its bottom to an undetermined depth. No associated artifacts were noted.

Feature 13

Feature 13 is a cobble-bordered hearth that measures 2.3 by 1.8 m (Fig. 15.2). This is the second of two hearths in the bottom of Feature 9, and it is in the northeast quadrant of that borrow pit. Though outside construction limits, it was within the detailed examination zone and was mapped. This feature is comprised of eight large cobbles or small boulders arranged in an oval, with small chunks of charcoal within. A cholla is growing out of the middle of this feature, and either that or later human activity has scattered the cobble border. The location, configuration, and contents of this hearth suggest that it is of recent historic derivation.

Surface Information

While the preceding discussion describes the basic configuration of LA 105713, other observations were made during examination of this site that are not as easily pigeonholed. LA 105713 essentially occupies the entire top of a terrace remnant, which is bounded by the Ojo Caliente

Valley on the west and intermittent drainages on the north and south. Figure 15.6, a view of the terrace remnant from the slope to the west, shows that junipers occur around the rim of the farming features, though few have as yet managed to invade the terrace top. This photo was taken from near the top of a higher terrace, the base of which forms the east boundary of LA 105713. Cursory examination of the higher terrace showed that it also contains extensive farming features, similar to those at LA 105713.

Most other farming features observed in the unrecorded part of the site are similar to those described above. Between two and four possible terrace-interior borrow pits were noted; however, all of these features are situated near the terrace edge and are probably more properly considered a variant of that type. Features 5 and 11 are good examples of this type of borrow pit. They are positioned near the terrace edge but do not overlap the break in slope, as is common for terrace-edge borrow pits. There were undoubtedly no rules about borrow pit placement; as long as suitable materials were easily available, it did not matter whether the location overlapped the terrace edge or not. The only features outside the detailed examination zone that did not duplicate recorded types was a series of two or three contour terrace walls in the far northeast quadrant of the site, at the base of the slope that forms the east boundary.

The surface of the site shows quite a bit of historic activity, though most of the later use appears to have been transient. Several fairly recent campfire rings were noted and described as features, and a lot of historic trash is scattered across the site. Several hundred historic artifacts were inventoried, but they were not counted since they are unrelated to the prehistoric use. Historic artifact types include bottle glass (green, purple, brown, clear, aqua), aluminum beverage cans, steel food cans, stove parts, enameled cooking and table ware, milled wood, cartridge cases, and miscellaneous metal fragments. The presence of several cartridge cases and metal artifacts with bullet holes through them suggest that much of the trash was used for target practice.

No prehistoric artifacts occurred within the part of LA 105713 that extends into the right-of-way. Thus, an inventory of surface materials that

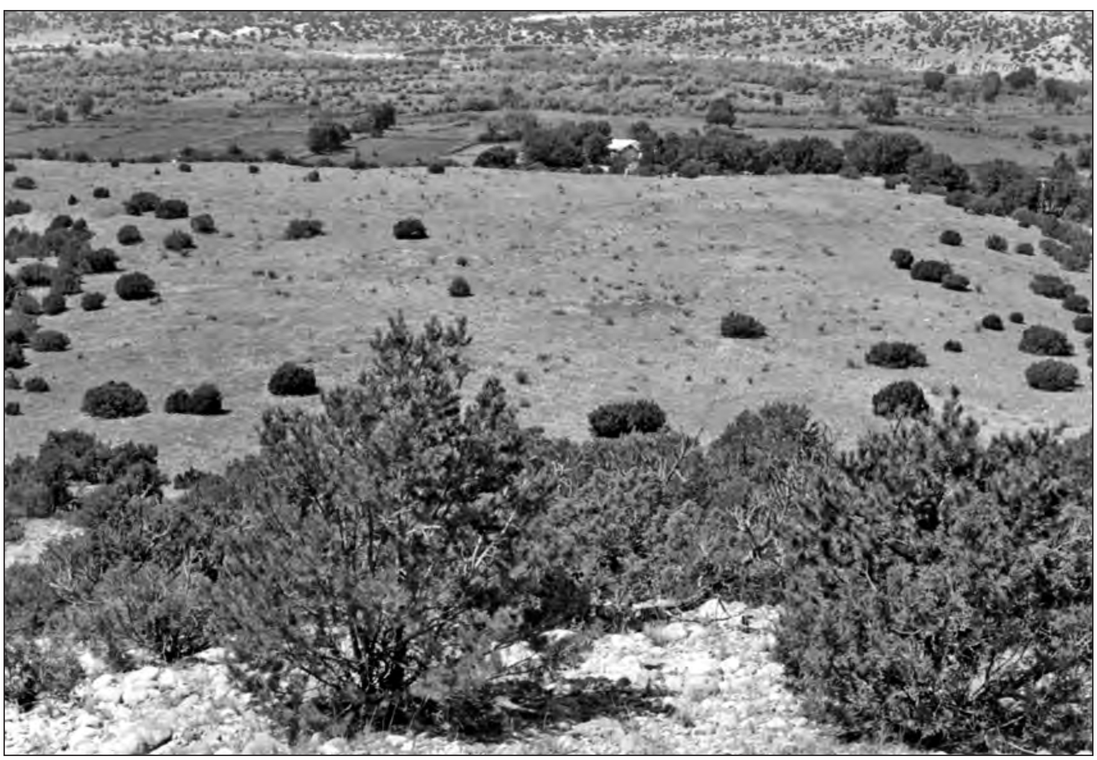


Figure 15.6. LA 105713 from the slope above the site.

was conducted for the remainder of the site provides the only assemblage information. No attempt was made to inventory features individually. Chipped stone artifacts dominated this assemblage, and the most common material type was gray rhyolite. Interestingly, there was no clear evidence of quarrying activities along the edge of the terrace. Most artifacts were found away from the edge and on the surfaces of farming features. Gray rhyolite artifacts included 275 core flakes, 60 angular debris, 41 cores, an axe or hoe, and a chopper. Other materials were far less common and included andesite (10 core flakes, 1 angular debris, 2 cores), red rhyolite (6 core flakes, 5 angular debris, 1 core), quartzite (2 core flakes, 1 angular debris, 1 core), massive quartz (1 core flake, 4 angular debris), and Pedernal chert (1 core flake).

Pottery was less common than chipped stone, but quite a few sherds were seen. Biscuit B, the most common type noted, included 25 bowl sherds, 6 jar sherds, and 1 sherd from an indeterminate type of vessel. Biscuit A sherds, the next most common, included 17 bowl sherds and a sherd from a possible bowl. A single Potsuwi'i Micaceous jar sherd was found, as were 6 sherds of indeterminate type and vessel form. A single possible Tewa polychrome series bowl sherd was also found, as discussed in the Feature 5 description. This historic ware was widely traded to the Spanish population and occurs on Spanish sites dating into the early twentieth century, which is consistent with some of the other types of historic trash noted on the surface of this site.

Chapter 16. LA 118547

James L. Moore

LA 118547 is a large farming site on land administered by the USDI Bureau of Land Management (Fig. 16.1). It occupies a irregular L-shaped area and is bounded by the main terrace edge overlooking the Ojo Caliente Valley on the west, an arroyo formed by an intermittent drainage on the south, and Forest Road 556 on the north. The east boundary is the edge of the farming features, while the south drainage forms an arbitrary boundary with LA 118548 to the south, and Forest Road 556 separates this site from LA 105709 to the north. These arbitrary boundaries were used to maintain the original numbering system and restrict LA 118547 to a manageable size. It is unlikely that they replicate the prehistoric land tenure system.

LA 118547 measures 530 m north-south by 112 m east-west and covers about 49,500 sq m (4.95 ha). It may once have extended slightly further south, but that area is within the current U.S. 285 right-of-way and has been removed. Only 4.6 percent of LA 118547 extends into the right-of-way, comprising a narrow sliver along the west edge of the site. In-field pottery analysis indicated that LA 118547 was used during the Classic period.

Vegetation is moderate on the site, and the plant cover is generally similar between on- and off-feature areas. Grasses, the most common plants noted, include grama, muhly, and Indian ricegrass. Other common plants are rabbitbrush, snakeweed, prickly pear, narrowleaf yucca, sage, and cholla. Small junipers occur at the terrace edge; while only a few have spread onto the surface of the fields, they are common in and around borrow pits.

Field Procedures

Detailed mapping was restricted to the section of site that extends into the U.S. 285 right-of-way and an adjacent 25–30 m wide zone. This area comprises a sample of about 26 percent of the site, and all cultural features within this zone were mapped and recorded in detail. Several features were partly or wholly within construction limits, including two gravel-mulched fields (Features 15 and 23) and 13 terrace-edge borrow pits (Features 1 through 13). Data recovery efforts concentrated on surface description of features in the mapped area and sample excavation of fields within project limits. The latter focused on Feature 15, which was sampled with 12 excavation units and two mechanically excavated trenches. Because most of the part of Feature 23 that extended into project limits was removed during an earlier construction phase and the remaining section was damaged at the same time, no excavation was conducted in that feature.

Since detailed excavation of borrow pits would have provided few data that were not available from surface examination, subsurface investigations were limited to the mechanical trenching of two terrace-edge borrow pits (Features 1 and 2) to examine their structure and obtain samples. Profiles of the trenches were drawn, and two types of samples were taken. Gravel samples were obtained for comparison with gravel mulch from nearby fields to determine whether differences could be discerned that might be attributable to size-sorting. Samples of sediments from the bottoms of the trenched borrow pits were taken for pollen analysis to determine whether they might have been used as planting areas.

All visible surface artifacts within project limits were collected and point provenienced. Parallel transects were walked across the rest of the site, and all visible artifacts outside project limits were recorded and left in place. Artifacts outside project limits were usually not inventoried by feature, but in some cases artifacts from a specific feature were recorded separately and are included in the feature description.

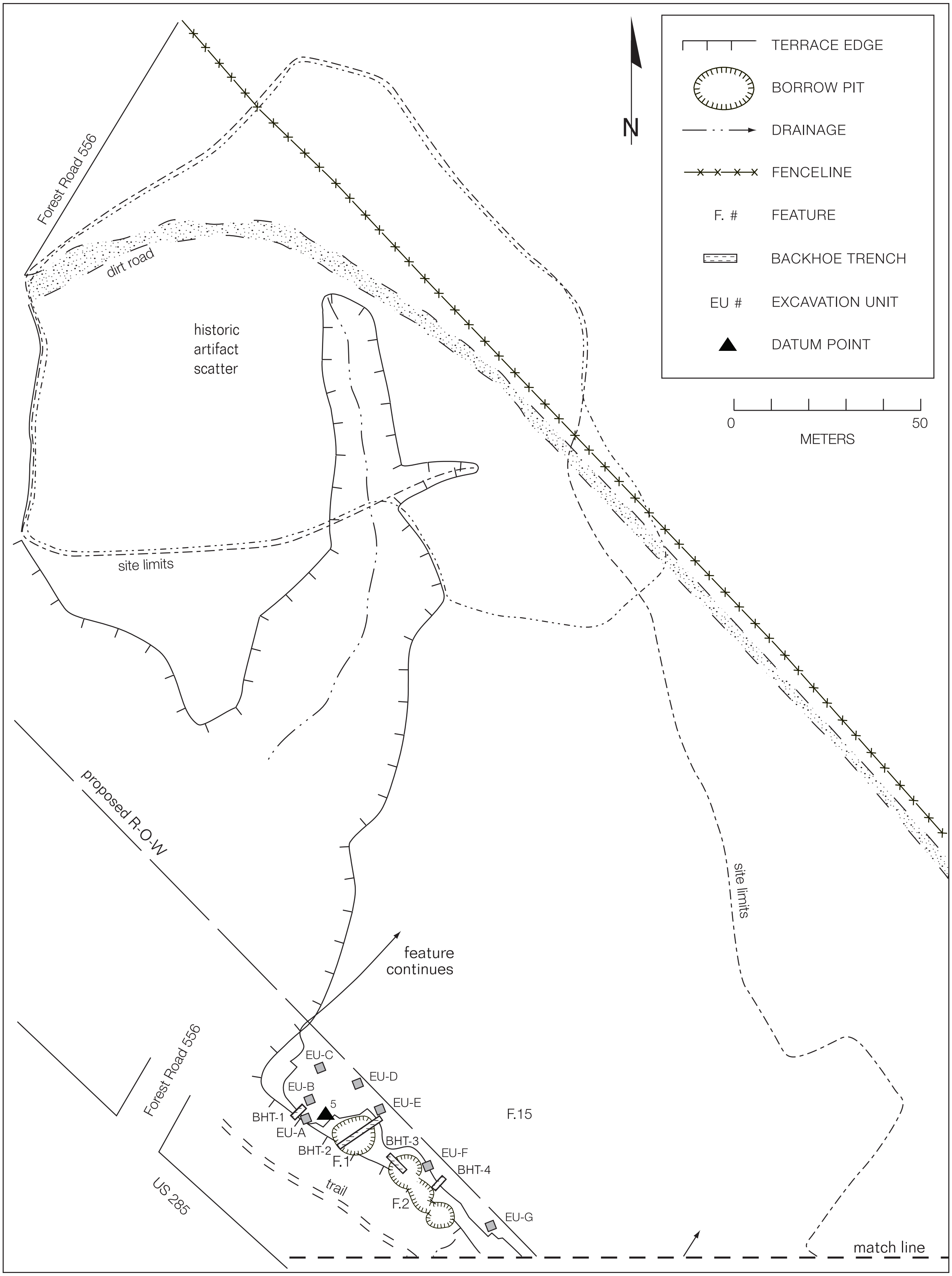


Figure 16.1. Plan of LA 118547.

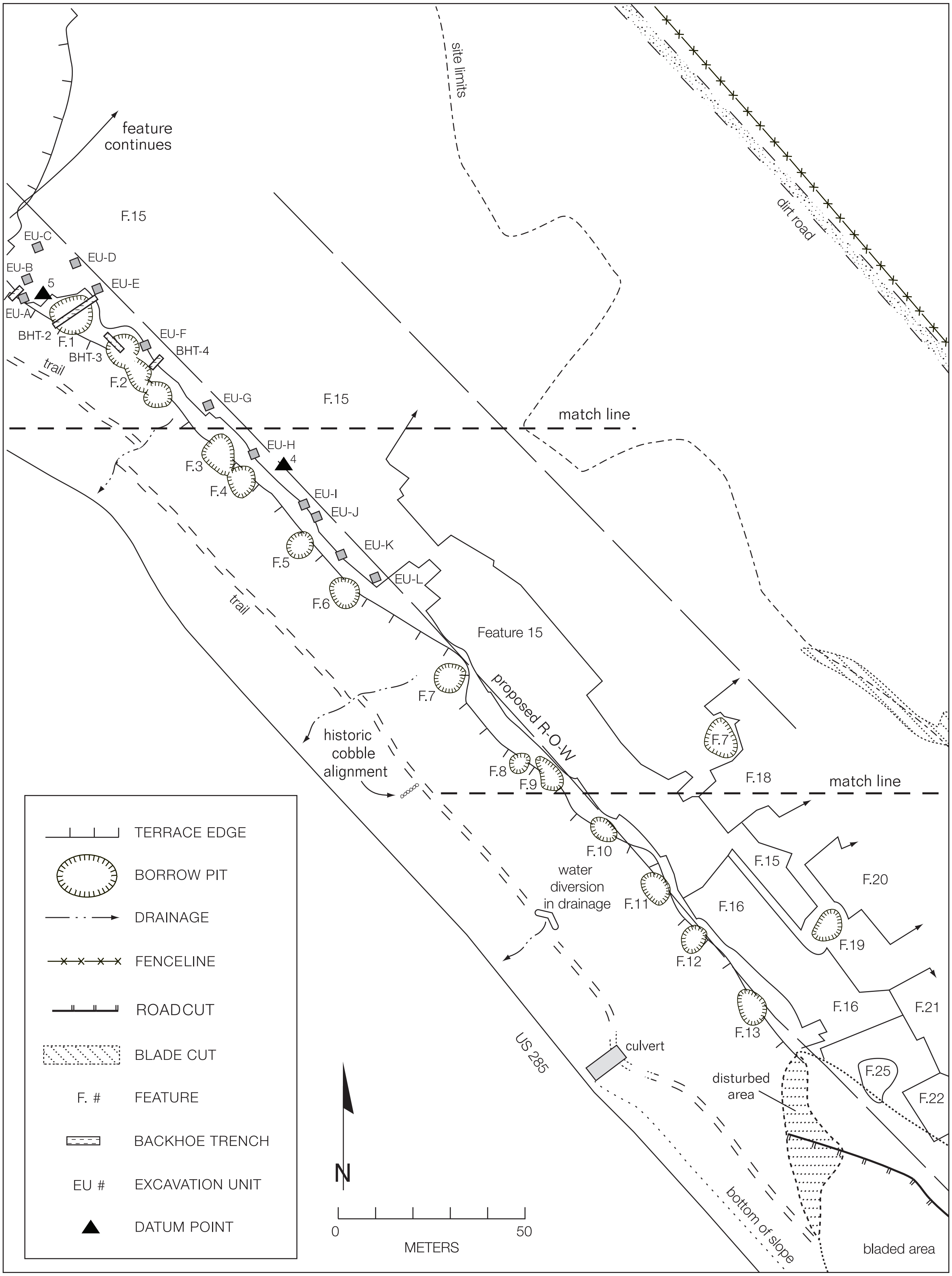


Figure 16.1 (continued).

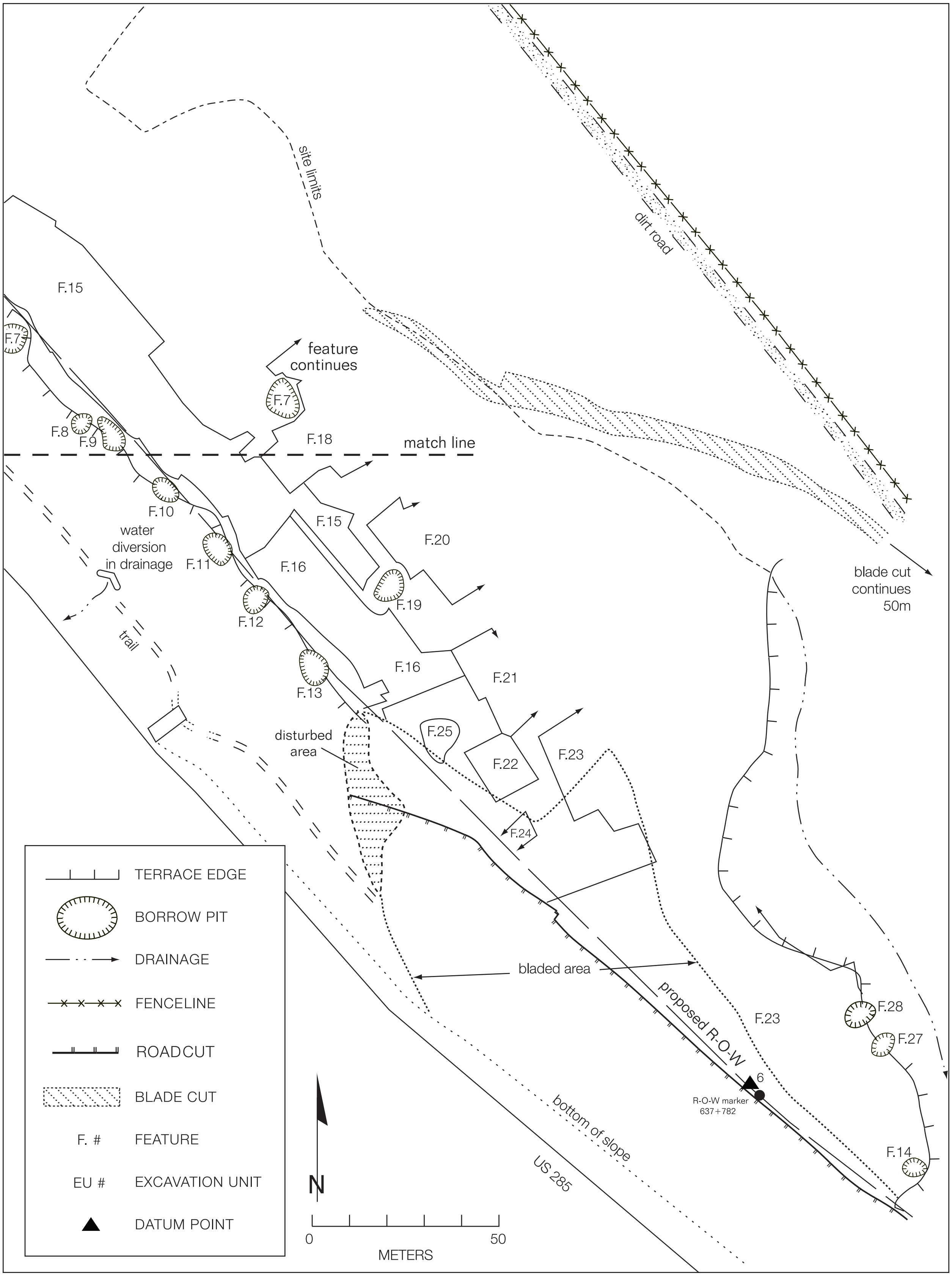


Figure 16.1 (continued).

Features

Twenty-eight features were at least partly mapped in detail and described (Fig. 16.1). With a few exceptions, feature limits were fairly well defined. Those exceptions include Features 15, 16, 23, 24, and 25. Parts of the boundaries of Features 15 and 16 appear to have been obscured by the later construction of Features 18, 20, and 21, which in places cover sections of their boundaries. It is also possible that cobbles were salvaged from alignments in Features 15 and 16 for reuse in the later fields. Features 23, 24, and 25 were damaged during recent road construction, and their west boundaries can no longer be defined.

A combination of colluvial and eolian processes have caused soil to build up against alignments that face the terrace interior, obscuring boundaries in many places. Eolian deposits also cover much of the surface of the fields, especially where they are anchored by vegetation. This made it difficult to discern many alignments and to define the full extent of others. Livestock grazing has also caused damage, displacing elements in cobble alignments and blurring the feature edges. Along the terrace edge this seems to have exacerbated damage caused by erosion. Other surface disturbances include a trail (LA 118549) that runs along the west edge of the site next to U.S. 285 but does not cross into LA 118547. An unimproved dirt road crosses the north part of the site, providing access to the terrace top from U.S. 285. That area has also been used as a modern trash dump. The southeast section of the site has been disturbed by a blade cut associated with construction of a modern earth dam that is outside site limits.

Feature 1

Feature 1 is a large, oval terrace-edge borrow pit measuring 14.0 by 10.1 m, with a maximum depth of 1.1 m (Fig. 16.2). It is completely within project limits, and a mechanically excavated trench, discussed later in the chapter, was used to investigate it. This borrow pit is next to Feature 15 and was probably a source of some of the materials used to build that gravel-mulched field. No associated artifacts were noted.

Feature 2

Feature 2 is a large, three-lobed terrace-edge borrow pit measuring 23.5 by 9.2 m, with a maximum depth of 1.1 m (Fig. 16.2). It is completely within project limits, and a mechanically excavated trench, discussed later in the chapter, was used to investigate it. This borrow pit is next to Feature 15 and was probably a source of some of the materials used to build that gravel-mulched field. The three distinct lobes visible in this feature suggest that it represents a reused borrow location or three adjacent borrow pits that grew together as materials were removed for use. Artifacts noted in association with this feature included a gray rhyolite core and three core flakes. Eolian and colluvial sediments have filled the bottom of this pit to an undetermined depth.

Feature 3

Feature 3 is a large, oval terrace-edge borrow pit measuring 10.4 by 9.5 m, with a maximum depth of 1.7 m (Fig. 16.2). It is completely within project limits and was mapped but not excavated. This borrow pit is next to Feature 15 and was probably a source of some of the materials used to build that gravel-mulched field. It also connects with another borrow pit (Feature 4). These pits represent a reused borrow location or two adjacent borrow pits that grew together as materials were removed for use in a nearby field. Sediments have built up in the bottom of the pit to an undetermined depth. No associated artifacts were noted.

Feature 4

Feature 4 is a nearly round terrace-edge borrow pit measuring 8.0 by 7.7 m, with a maximum depth of 1.5 m (Fig. 16.2). It is completely within project limits and was mapped but not excavated. This borrow pit is next to Feature 15 and was probably a source of some of the materials used to build that gravel-mulched field. As noted above, it connects with Feature 3. Together they represent a reused borrow location or two adjacent borrow pits that grew together as they were used. Sediments have built up in the bottom of this pit to an undetermined depth. No associated artifacts were noted.

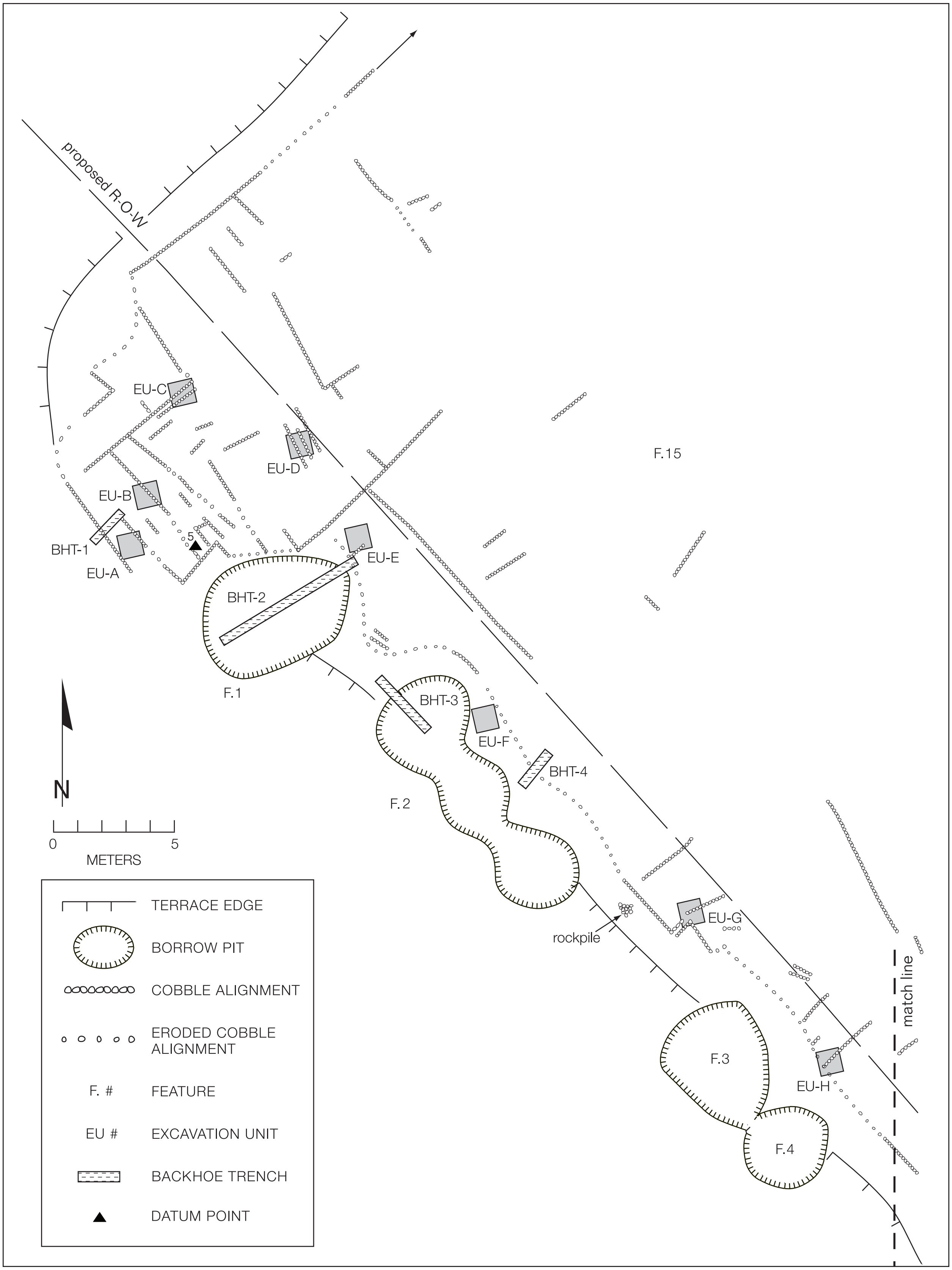


Figure 16.2. Features 1–12 and 15–19, LA 118547.

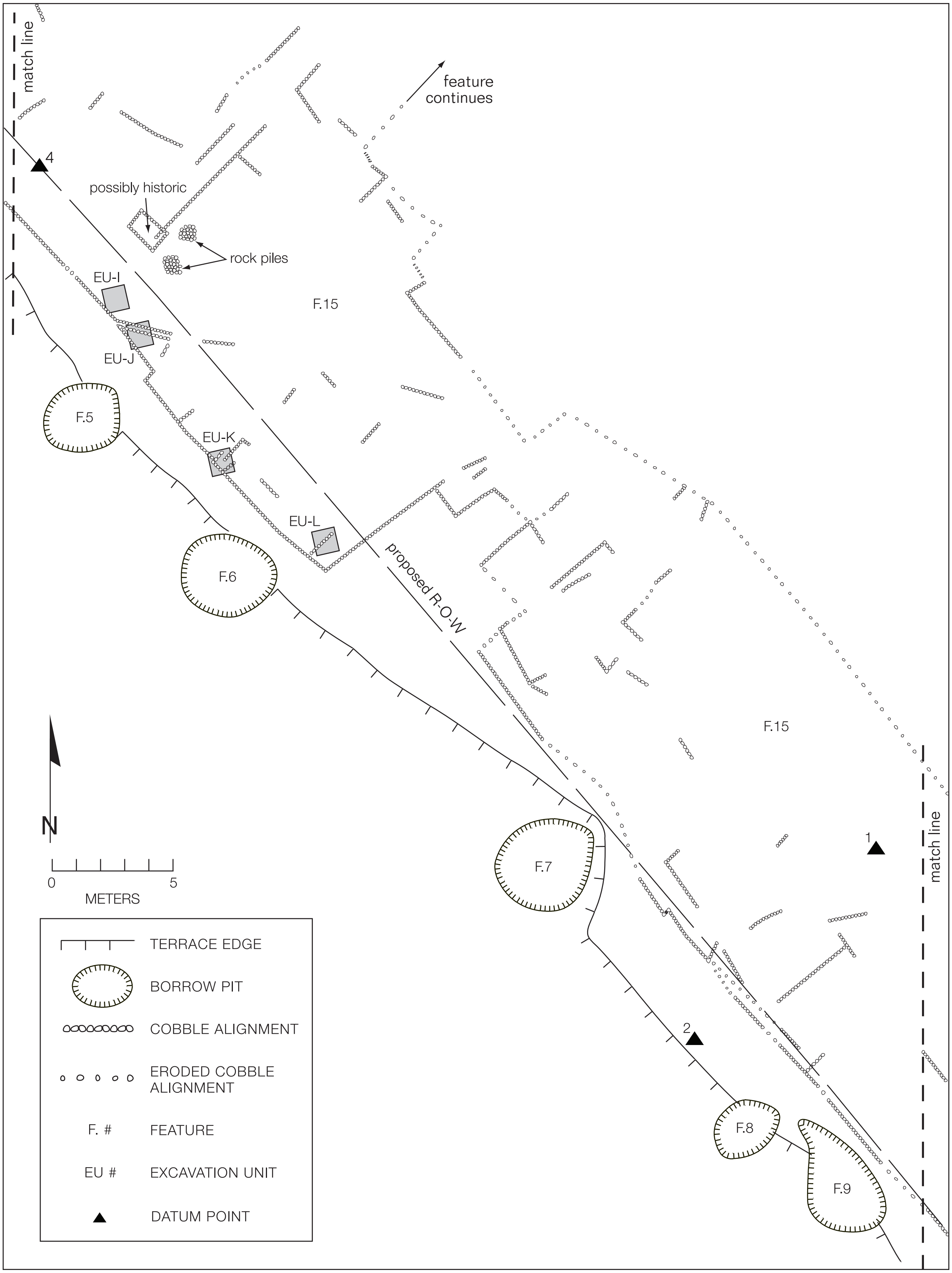


Figure 16.2 (continued).

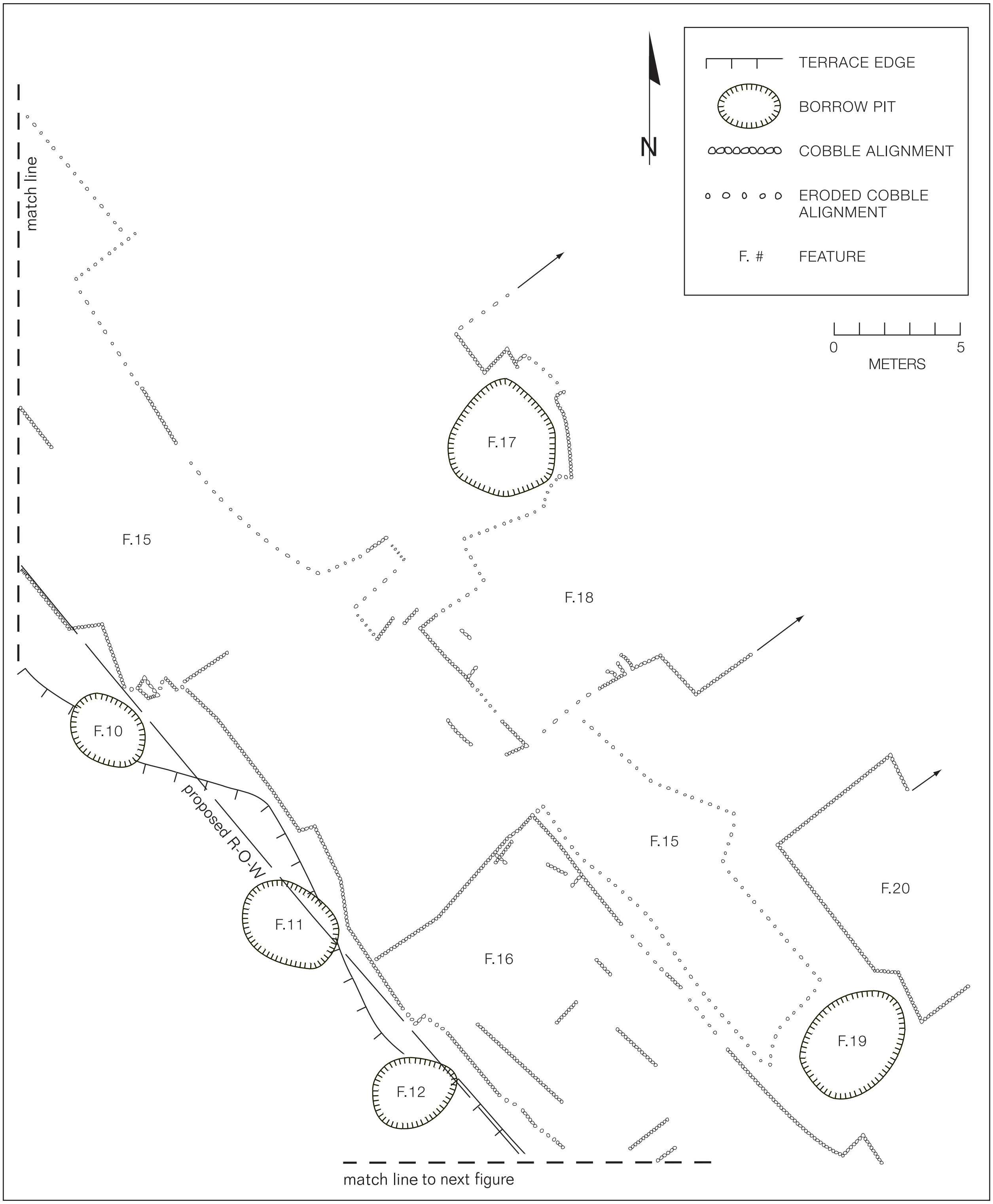


Figure 16.2 (continued).

Feature 5

Feature 5 is an oval terrace-edge borrow pit measuring 7.6 by 6.9 m, with a maximum depth of 1.6 m (Fig. 16.2). It is completely within project limits and was mapped but was not excavated. This borrow pit is next to Feature 15 and was probably a source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of this pit to an undetermined depth. The only artifacts noted in this feature were recent historic materials that date to a much later use of the area.

Feature 6

Feature 6 is a large, round terrace-edge borrow pit measuring 8.3 by 7.8 m, with a maximum depth of 1.6 m (Fig. 16.2). It is completely within project limits and was mapped but not excavated. This borrow pit is next to Feature 15 and was probably a source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of Feature 6 to an undetermined depth. Associated artifacts included two rhyolite core flakes and an andesite core.

Feature 7

Feature 7 is a large, round terrace-edge borrow pit measuring 9.1 by 8.3 m, with a maximum depth of 1.6 m (Fig. 16.2). It is completely within project limits and was mapped but not excavated. This borrow pit is next to Feature 15 and was probably a source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of Feature 7 to an undetermined depth. The only associated artifact was an andesite core flake.

Feature 8

Feature 8 is an oval terrace-edge borrow pit measuring 6.5 by 5.0 m, with a maximum depth of 0.7 m (Fig. 16.2). It is completely within project limits and was mapped but not excavated. This borrow pit is next to Feature 15 and was probably a source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of Feature 8 to an undetermined depth. No associated artifacts were noted.

Feature 9

Feature 9 is a large, teardrop-shaped terrace-edge borrow pit measuring 12.0 by 6.5 m, with a maximum depth of 0.9 m (Figs. 16.2 and 16.3). It is completely within project limits and was mapped but not excavated. This borrow pit is next to Feature 15 and was probably a source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of Feature 9 to an undetermined depth. No associated artifacts were noted.

Feature 10

Feature 10 is an oval terrace-edge borrow pit measuring 7.1 by 5.9 m, with a maximum depth of 1.1 m (Fig. 16.2). It is completely within project limits and was mapped but not excavated. This borrow pit is next to Feature 15 and was probably a source of some of the materials used to build that gravel-mulched field. Because of its position at the edge of the terrace, Feature 10 is open to the west. A small drainage heads in the bottom of the pit, and it is impossible to determine how much of its depth is attributable to gullying. No associated artifacts were noted.

Feature 11

Feature 11 is a large, oval terrace-edge borrow pit measuring 8.8 by 6.9 m, with a maximum depth of 0.7 m (Fig. 16.2). About 80 percent of this feature is within project limits, and it was mapped but not excavated. This borrow pit is next to Features 15 and 16, and it was probably a source of some of the materials used to build one or both of those gravel-mulched fields. Sediments have built up in the bottom of Feature 11 to an undetermined depth. The only artifact noted in association with this feature was a piece of andesite angular debris.

Feature 12

Feature 12 is an oval terrace-edge borrow pit measuring 7.5 by 5.9 m, with a maximum depth of 1.1 m (Fig. 16.2 and 16.4). About 90 percent of this feature is within project limits, and it was mapped but not excavated. This borrow pit is next to Features 15 and 16, and it was probably a

Figure 16.3. Feature 9, a terrace-edge borrow pit, LA 118547.

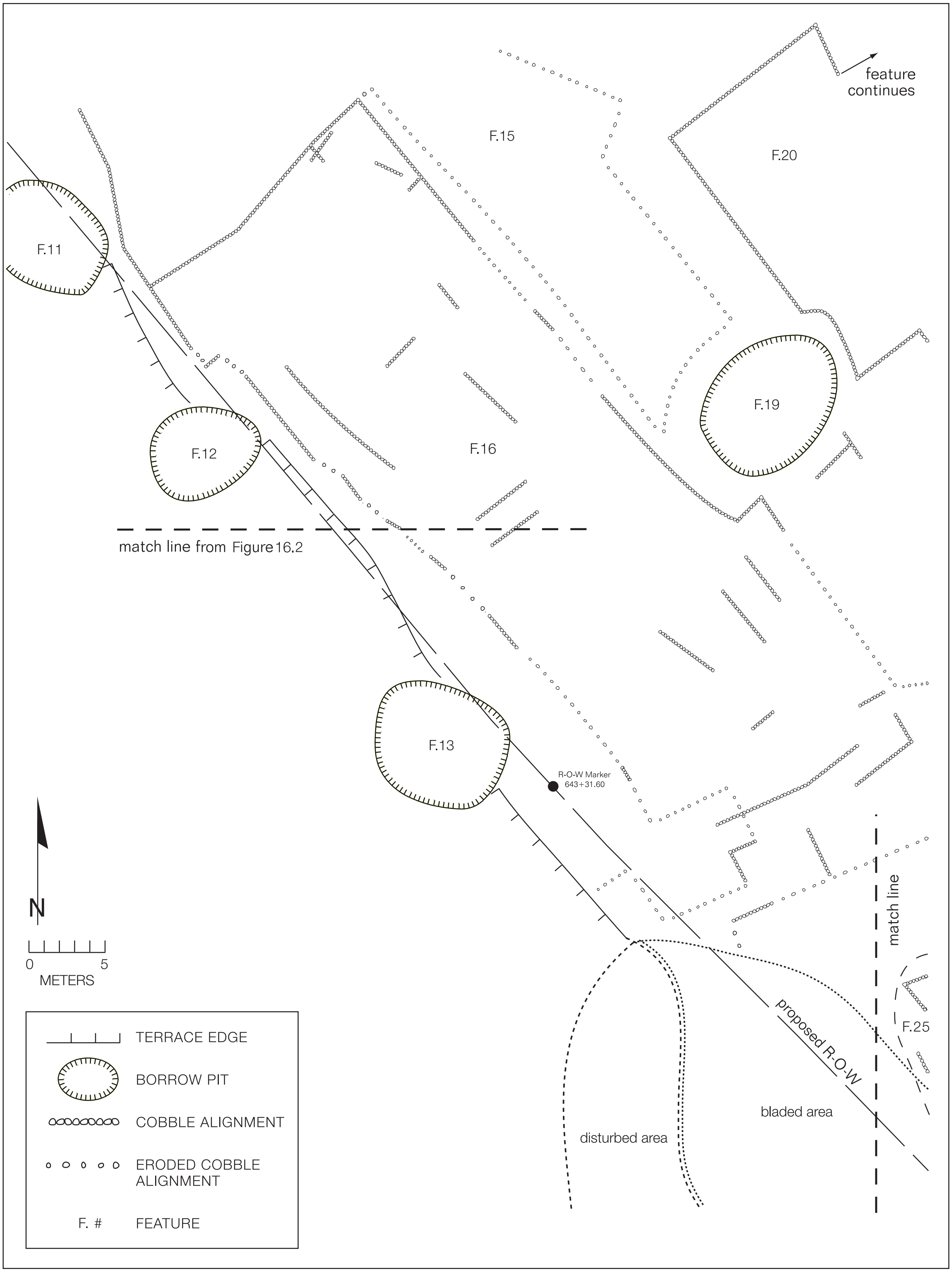


Figure 16.4. Features 12, 13, 16, 19, 20–22, and 24–26, LA 118547.

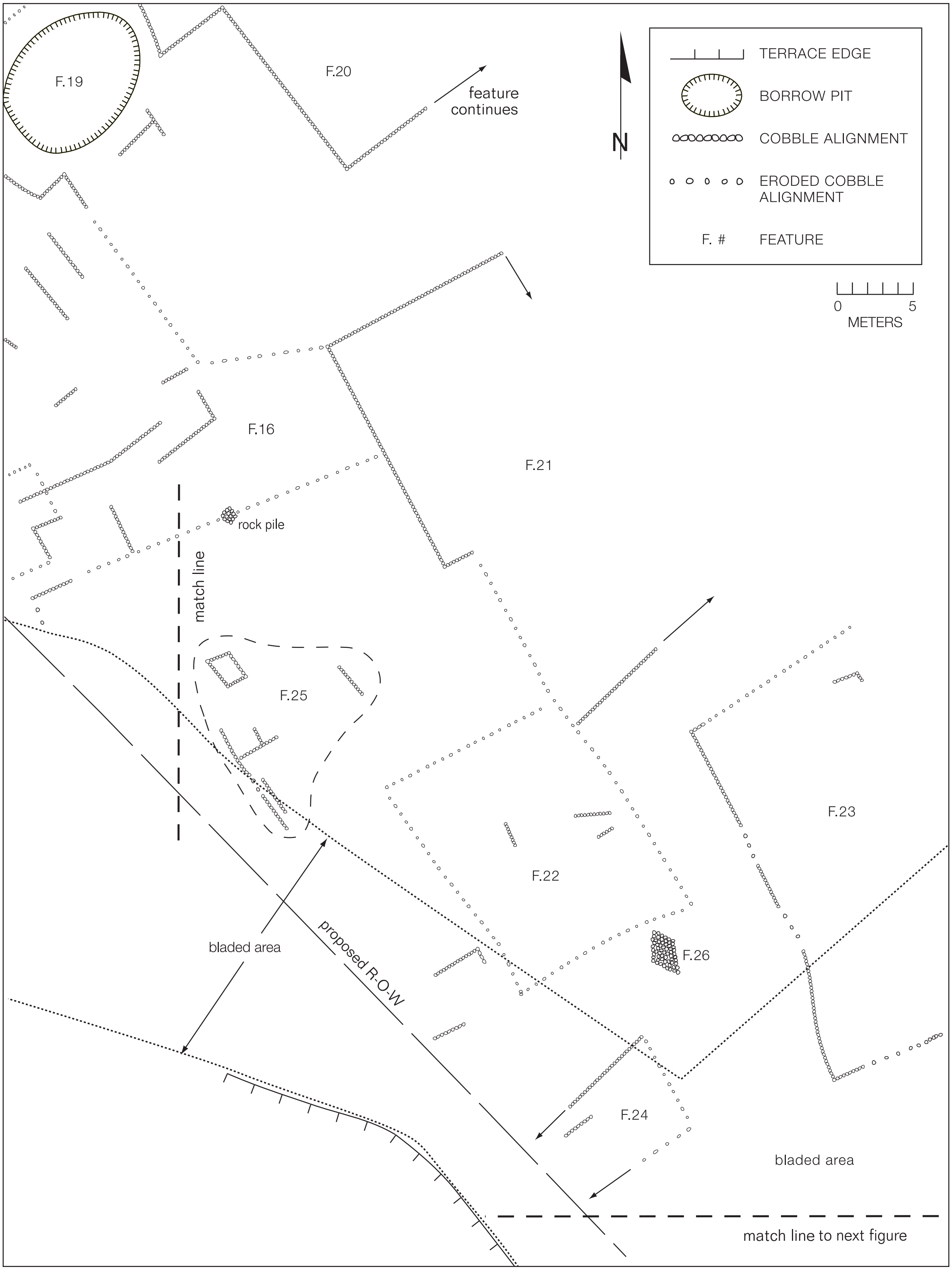


Figure 16.4 (continued).

source of some of the materials used to build one or both of those gravel-mulched fields. Sediments have built up in the bottom of Feature 12 to an undetermined depth. No associated artifacts were noted.

Feature 13

Feature 13 is a large, oval terrace-edge borrow pit measuring 9.6 by 8.3 m, with a maximum depth of 1.4 m (Fig. 16.4). About 90 percent of this feature is within project limits, and it was mapped but not excavated. This borrow pit is next to Feature 16 and was probably a source of some of the materials used to build that gravel-mulched field. Sediments have built up in the bottom of Feature 13 to an undetermined depth. Associated artifacts included two andesite core flakes, a gray rhyolite core, and a modern steel can.

Feature 14

Feature 14 is a small, oval terrace-edge borrow pit measuring 6.6 by 5.5 m, with a maximum depth of 1.5 m (Fig. 16.5). Though entirely outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 23 and was probably a source of some of the materials used to build that gravel-mulched field. Because of its position at the edge of the terrace, Feature 14 is open to the south, and it is impossible to determine how much of its depth is attributable to erosion. The only artifacts noted in association were two gray rhyolite core flakes.

Feature 15

Feature 15 is a very large, irregularly shaped gravel-mulched field that measures 215 m north-south by at least 44 m east-west (Fig. 16.2). The east boundary of the field extended beyond the mapping zone for much of the north half of Feature 15. This field covers at least 6,039 sq m within the detailed examination zone. The unmapped portion of the feature is at least half as large and possibly nearly as large as the mapped section. About 40–50 percent of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. Since Feature 15 extends into project limits, 12 excavation units were used to examine it. They are described later in the chapter.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders (Fig. 16.6). Cobbles predominate in all alignments, and most are 10–25 cm long. Small boulders are also common and range up to 35 cm long. Most elements were set end-to-end, but some side-by-side placement also occurs. Most elements were also set on their broadest surfaces, but uprights are common in some areas. Surface indications suggest that the feature interior is highly subdivided. Parts of the field are dotted by large cobbles and small boulders set into the gravel mulch, which may indicate that a pattern of noncontiguous, evenly spaced elements prevails in those areas.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. This field is slightly mounded in places, particularly along its west edge, where it is 5–8 cm higher than the adjacent terrace surface. The gravel-mulch layer is probably 5–15 cm thick over most of the feature. Gravels are much denser on the surface of the field than they are in adjacent off-feature areas. Where visible on the feature, gravels cover 70–90 percent of the surface. Away from the feature they cover only 10–30 percent. The only area in which this does not hold true is along the terrace edge, where erosion has removed sediments and exposed gravels in densities similar to those seen on the surface of Feature 15. Similarly, grasses were taller and denser on Feature 15 than in adjacent off-feature areas. Interestingly, most of the areas that contain dense growths of grasses are those in which eolian sediments are thicker. The grass clumps are almost certainly helping this process along by trapping and stabilizing more eolian sediments than might otherwise be retained on the surface of the feature.

The west boundary alignment is fairly continuous along the terrace edge but has been nearly eradicated in a few places by slope wash. Livestock grazing has exacerbated this process. It was not possible to determine whether the length of this boundary alignment signified that the entire feature was built and used at one time, or

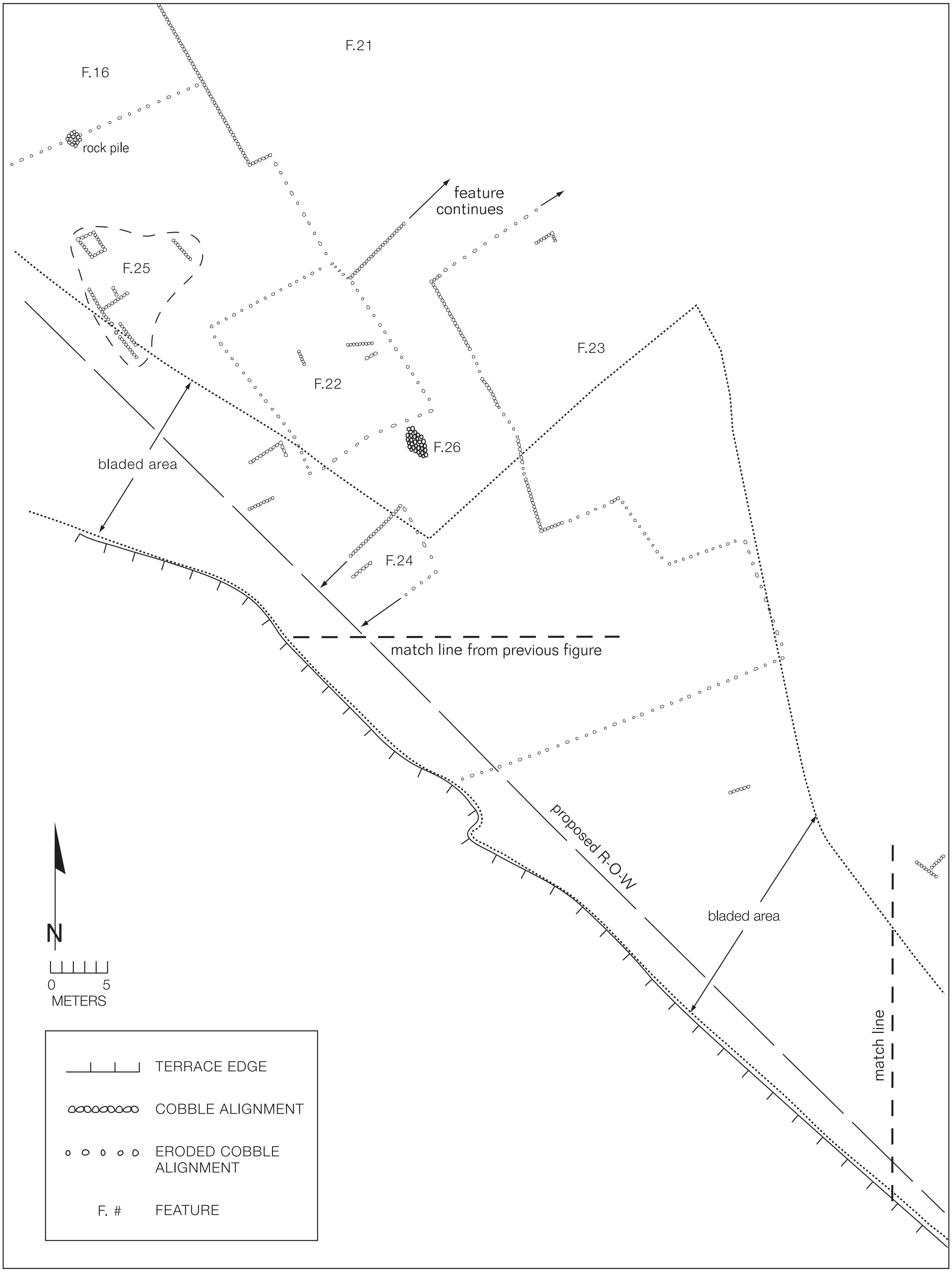


Figure 16.5. Features 14, 23, 27, and 28, LA 118547.

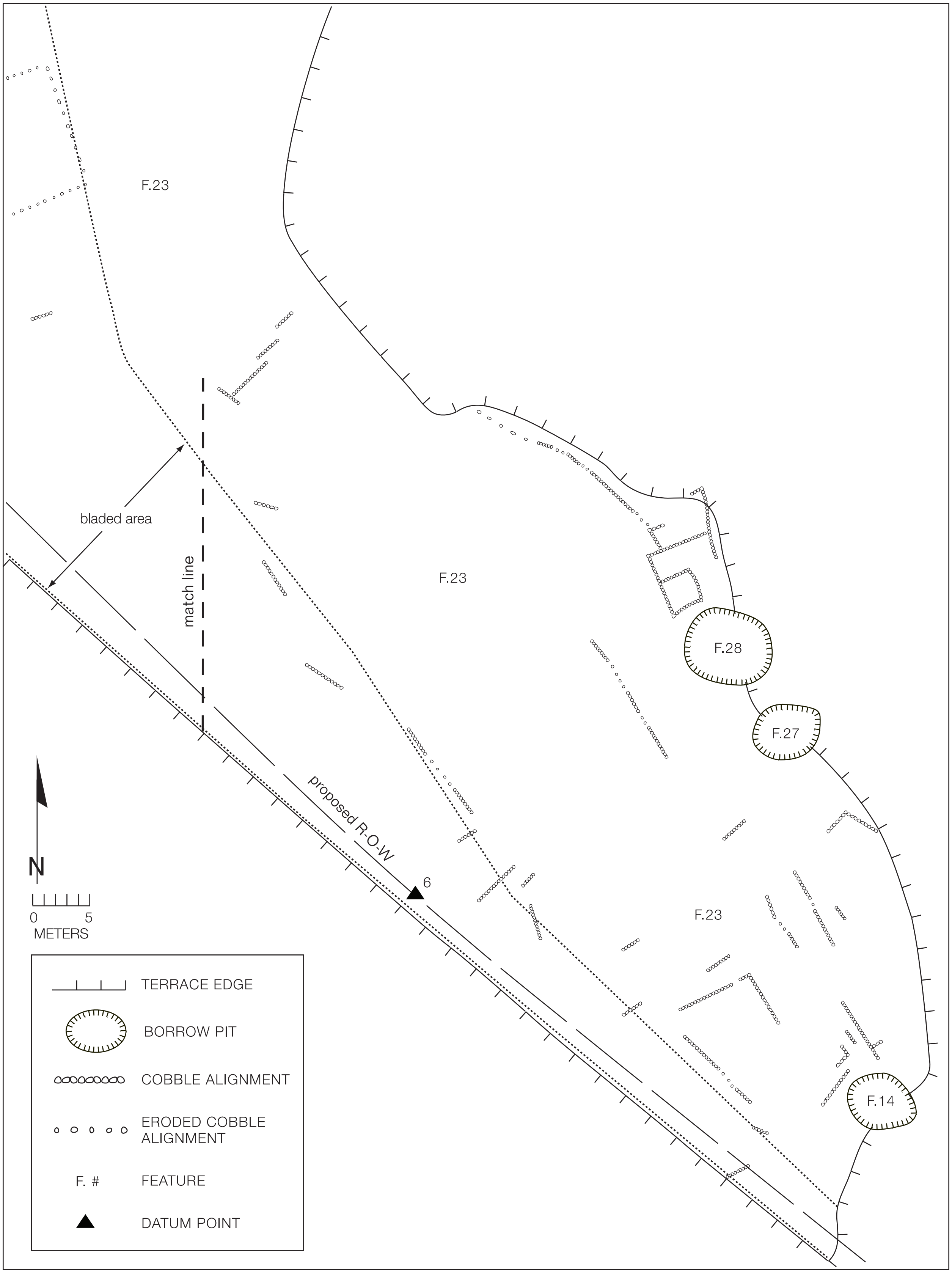


Figure 16.5 (continued).

Figure 16.6. Cobble alignments in Feature 15, LA 118547.

whether it grew through time by accretion. It is more likely that accretional growth eradicated any boundaries that might have existed between individual farming plots.

The east boundary of this field is fairly indistinct, especially near Features 18, 20, and 21. These fields appear to have been built later than Feature 15, and it is possible that some materials were salvaged from the earlier field to build the later plots. This would have contributed to the deterioration of adjacent parts of Feature 15 and could account for its current condition. Conversely, eolian and colluvial deposition could also have obscured alignments toward the interior of the terrace, though it is unlikely that this would have occurred to the degree observed.

Finally, Feature 16 forms part of the south boundary of Feature 15 and seems to have been built later. A cobble alignment separates the features, and the surface of Feature 16 is 5–8 cm higher than Feature 15. Since the east boundary alignment of Feature 15 extends beyond the north edge of Feature 16 (on the east side of that feature), and the west and south boundaries of Feature 15 are fairly indistinct in that area, Feature 16 probably covers much of the south end of Feature 15. The mounding of Feature 16 above Feature 15 adds credence to this and indicates that Feature 16 represents a later construction phase.

In a few areas, cobbles were moved around to form new configurations. Most of these alterations seem to have occurred during the historic occupation of the region, since they are on the surface of the mulch and have not been buried by eolian deposition to any appreciable depth. An example of this type of alteration may represent a historic tent base (Fig. 16.7).

Feature 16

Feature 16 is a large, irregularly shaped gravel-mulched field that measures 62 by 31 m and covers 1,078 sq m (Fig. 16.4). Since this field was entirely in the detailed examination zone, it was mapped. About 40–50 percent of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and small boulders. Cobbles predominate in all align-

Figure 16.7. A historic reconfiguration of cobbles on the surface of Feature 15, LA 118547.

ments, and most are 15–25 cm long. Small boulders are also common and are up to 30–40 cm long. Elements were mostly placed end-to-end but are occasionally interspersed by rocks set sideways. Most elements were set on their broadest surfaces, but uprights also occur. Surface indications suggest that the feature interior is highly subdivided. In some parts of the field, especially near Feature 13, large cobbles and small boulders are set into the gravel mulch and form evenly spaced, noncontiguous alignments.

The mulch is mostly composed of unsorted gravels and pea gravels, though small cobbles up to 8 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. The north boundary alignment also forms part of the south edge of Feature 15. As discussed earlier, Feature 16 covers part of the south end of Feature 15 and represents a later phase of construction, as indicated by the mounding of this field above the surface of Feature 15.

Since boundary and interior subdividing alignments are a single element high, the gravel-mulch layer is probably 5–12 cm thick over most of the feature. Gravels are much denser on the surface of the field than in adjacent off-feature areas. Where visible on the feature, gravels cover 70–90 percent of the surface. Away from the feature they cover only 10–30 percent of the surface. The only area in which this does not hold true is along the terrace edge, where erosion has removed sediments and exposed gravels in densities similar to those on the surface of Feature 16. Similarly, grasses were taller and denser on the field than in adjacent off-feature areas. Most areas that contain dense grasses are also those in which eolian sediments are thickest. The grass clumps are probably helping this process along by trapping and stabilizing more eolian sediments than would otherwise be retained on the surface of the feature.

The southeast part of this field grades into the natural terrace-edge surface, which also contains dense gravels and cobbles that have been exposed by erosion. The field becomes rather indistinct in this area, and it was damaged by earth-moving activities associated with construction along U.S. 285. Thus, it is impossible to determine whether Feature 16 ends where shown in Figure 16.4 or at one time extended further south along the terrace edge. However, a lack of visible cobble alignments in that area suggests that the former is more likely.

Feature 17

Feature 17 is a large, oval terrace-interior borrow pit measuring 13.2 by 11.6 m, with a maximum depth of 0.6 m (Fig. 16.2). Though outside construction limits, it was in the detailed examination zone and was mapped. Sediments have built up in the bottom of this pit to an undetermined depth. As can be seen from Figure 16.2, Feature 17 is closely edged on two sides by Feature 18 and probably served as a source of some of the materials used to construct that field, which was subsequently built partly around it. Associated artifacts included five rhyolite core flakes, one andesite core flake, a Biscuit B sherd, and an aluminum can.

Feature 18

Feature 18 is a medium-sized, irregularly shaped gravel-mulched field that measures a maximum of 34 by 25 m and covers roughly 540 sq m (Fig. 16.2). Since this field was partly outside the detailed examination zone, the entire feature was not mapped. Only the western 80 percent was in the mapping zone, so the full extent of the feature was estimated by pacing. About 40–50 percent of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and a few small boulders. Cobbles predominate in all alignments, and most are 10–20 cm long. The few small boulders average 30–35 cm long. Elements were mostly placed end-to-end except in the south and southeast boundary alignments, where many cobbles were set sideways. Most elements were set on their broadest surfaces, but uprights also occur, especially in the south and southeast boundary alignments. The presence of several short segments of interior subdividing alignments suggests that the feature is highly subdivided.

The mulch is mostly composed of gravels and pea gravels, though small cobbles up to 8 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. This feature is distinctly mounded above both Feature 15 and the adjacent unaltered terrace surface. Where the two fields abut, the surface of Feature 18 is about 5 cm higher than Feature 15 and tends to contain larger gravels. However, in some places the boundary between these fields is indistinct, and they could not be accurately separated by surface assessment alone. The blurring was probably caused by displacement of elements by grazing livestock. The demarcation between Feature 18 and the adjacent unaltered terrace surface is quite distinct. Not only is Feature 18 mounded 10–15 cm above the terrace, the gravel cover is also much denser on the field than in off-field areas. Where the mulch surface is visible on Feature 18, gravels cover 60–90 percent, in contrast with a 20–30 percent coverage on the nearby terrace surface.

Feature 19

Feature 19 is a large, oval terrace-interior borrow pit measuring 12.5 by 10.5 m, with a maximum depth of 0.4 m (Fig. 16.4). Though outside construction limits, it was in the detailed examination zone and was mapped. Sediments have built up in the bottom of this pit to an undetermined depth. As can be seen from Figure 16.4, this feature sits between Features 16 and 20, both gravel-mulched fields. Since part of the west boundary alignment of Feature 20 is curved to accommodate the borrow pit, Feature 19 was probably already in place when Feature 20 was built. If this is correct, Feature 19 probably provided some of the materials used to build Feature 16. However, if Feature 20 grew by accretion, it is also possible that Feature 19 was a source of materials for that field as well. Unfortunately, even with more detailed examination it may be impossible to demonstrate which of these interpretations is more likely. The only associated artifact was a steel beverage can, which is undoubtedly a later intrusion.

Feature 20

Feature 20 is a large, irregularly shaped gravel-mulched field that measures a maximum of 47 by 31 m and covers roughly 1,270 sq m (Fig. 16.4).

Since this field was partly outside the detailed examination zone, the entire feature was not mapped. Only the west 25 percent was in the mapping zone, so the full extent of the feature was estimated by pacing. About 70 percent of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. Two adjacent terrace-interior borrow pits (Feature 19 and an undocumented feature) may have provided materials for the construction of this field.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and a few small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. The few small boulders that were used average 30–35 cm long. Elements were dominantly set end-to-end, but sideways placement was also common, especially along the west edge of the field. Most elements were set on their broadest surfaces, but uprights also occur. The lack of visible interior alignments may indicate that there are few internal subdivisions, but this is unlikely considering the large amount of field surface that is obscured by sediments.

The mulch is mostly composed of gravels and pea gravels, though small cobbles up to 8 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. This feature is distinctly mounded on all but the east edge, which was removed during construction of a low earth berm used for erosion control. Where the boundary alignments are intact, the surface of this field is 5–12 cm higher than the adjacent terrace (Fig. 16.8). A visible difference in surface gravel concentrations makes the break between these edges and the unaltered terrace surface quite distinct. Where the mulch is visible on the field, gravels cover 60–70 percent of the surface. On the adjacent unaltered terrace surface, gravel concentrations are only 10–30 percent.

This field also contrasts sharply with an adjacent extension of Feature 15 (Fig. 16.2). The southern extension of that field has a very gravelly surface that was easily distinguished from the unaltered terrace, but cobbles are lacking in that area, and no boundary alignments were defined. While that extension may represent a

Figure 16.8. A boundary alignment in Feature 20, LA 118547, showing how the field surface is mounded above the adjacent terrace surface.

part of the terrace that was simply mulched with gravel but left unbounded by cobbles, this is unlikely. Instead, most of the cobbles used to build that part of Feature 15 were probably salvaged for reuse in another field, such as Feature 20.

Feature 21

Feature 21 is a medium-sized, irregularly shaped gravel-mulched field that measures a maximum of 26 by 13 m and covers roughly 300 sq m (Fig. 16.4). Since this field was partly outside the detailed examination zone, the entire feature was not mapped. Only the west 60–70 percent was in the mapping zone, so the full extent of the feature was estimated by pacing. About 60 percent of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. This field may be associated with a nearby unrecorded terrace-interior borrow pit that was outside the mapping zone.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and a few small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. The few small boulders noted were 30–40 cm long. Elements were dominantly set end-to-end, but some sideways placement also occurs. Most elements were set on their broadest surfaces, but uprights are common. The presence of several short segments of interior subdividing alignments suggests that the feature interior is highly subdivided. In addition, part of the feature contains small boulders set into the gravel mulch to form evenly spaced, noncontiguous alignments.

The mulch is mostly composed of gravels and pea gravels, though small cobbles up to 8 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Though the edges of this field are fairly distinct, they are only mounded about 2–3 cm higher than the adjacent terrace surface. However, the field interior seems to be mounded as much as 20 cm higher than the adjacent terrace, suggesting that sediments have built up along the edge of the boundary alignments, obscuring the actual degree to which this field is raised above the terrace surface.

It is difficult to place this field within the construction sequence at LA 118547, but there are indications that it may have been built later than some adjacent plots. The southwest corner of Feature 21 abuts the northeast corner of Feature 22, and it is uncertain whether they represent contemporary use. However, since boundary alignments in Feature 21 are in generally better condition, that field may have been built later than Feature 22. Similarly, Feature 21 may overlap part of Feature 16, which also has badly preserved boundary alignments in that area. As suggested before, this may be an indication of material salvaging for reuse in new fields. If so, Feature 21 was built later than both of those other fields. Cultural materials were not inventoried separately for this feature, but a Biscuit A bowl sherd was noted on the surface during mapping.

Feature 22

Feature 22 is a small, rectangular gravel-mulched field that measures 15.2 by 12.8 m and covers 195 sq m (Fig. 16.4). Since this field was within the detailed examination zone it was mapped. About 60–70 percent of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. The boundaries of this feature are fairly indistinct. This is probably partly due to the salvaging of cobbles for reuse elsewhere (perhaps in Feature 21). However, the west edge of the field was probably removed during construction along U.S. 285.

Boundary and interior subdividing alignments are a single element high and wide. They were built with locally obtained cobbles and a few small boulders. Cobbles predominate, and most are 15–25 cm long. No information on element placement was available because of the deteriorated nature of this feature. Similarly, it was not possible to determine whether the interior of the field was subdivided.

The mulch is mostly composed of gravels and pea gravels, though small cobbles up to 10 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. This feature may have been built early in the use of this location and was superseded by other fields away from the terrace edge when it was no longer suitable for use. While cultural materials were not inventoried separately for this feature, numerous chipped stone artifacts were noted, including 40+ gray rhyolite core flakes and 12+ andesite core flakes.

Feature 23

Feature 23 is a large, irregularly shaped gravel-mulched field that measures 113 by 48 m and covers roughly 1,900 sq m (Fig. 16.5). Since this field was partly outside the detailed examination zone, the entire feature was not mapped. Perhaps two-thirds of the field was in the mapping zone, so its full extent was estimated by pacing. The east boundary is a deep tributary drainage, and a series of gravel-mulched plots that line the northwest rim of that drainage may represent a continuation of this field. Though this was uncertain, Feature 23 is probably larger than initially defined. About 50–60 percent of the field surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation.

Boundary and interior subdividing alignments appear to have been a single element high and wide. They were built with locally obtained cobbles and a few small boulders. Cobbles predominate, and most are 10–25 cm long. The few small boulders noted were 30–40 cm long. Elements were dominantly set end-to-end, but some sideways placement also occurs. Most elements were set on their broadest surfaces, but upright placement also occurs, especially when elements were set sideways. The presence of several short segments of interior subdividing alignments suggests that the feature was highly subdivided.

The mulch is mostly composed of gravels and pea gravels, though small cobbles up to 8 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. While little evidence of mounding was visible, the field appears to be 2–5 cm higher than the terrace surface. Where the natural terrace surface is visible next to the field, there are distinct differences in surface gravel concentrations. Gravels cover 60–80 percent of the field surface, while the unaltered terrace surface only has a 20–30 percent gravel cover.

This field comprises the south quarter of the site, and it was impossible to determine whether it represents a single coherent farming complex or developed through time by accretion. The west half of Feature 23 was damaged during the reconstruction of U.S. 285. The east half exhibits little better preservation. A few segments of boundary alignments are visible along the east edge, where erosion seems to have displaced most elements. Only the presence of occasional interior subdividing alignments and a generally heavy cover of gravel on the surface allowed us to define this feature. There seemed to be at least three terrace-edge borrow pits associated with the construction of this field, including Features 14, 27, and 28.

Feature 24

Feature 24 is a small, possibly rectangular gravel-mulched field that measures at least 10.0 by 6.4 m and covers a minimum of 64 sq m (Fig. 16.4). Since this field was in the detailed examination zone, it was mapped. Unfortunately, the west edge of the field was removed during reconstruction of U.S. 285, so its east-west dimensions are uncertain. Much of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. The remaining boundaries of this feature are fairly indistinct, perhaps because of salvaging of cobbles for reuse elsewhere.

Boundary and interior subdividing alignments appear to have been a single element high and wide. They were built with locally obtained cobbles and a few small boulders. Cobbles predominate in all alignments, and most are 10–25 cm long. The few small boulders noted were 25–35 cm long. No information on element placement was available because of the deteriorated nature of this feature. Similarly, it was not possible to determine whether the interior of the field was subdivided.

The mulch is mostly composed of gravels and pea gravels, though small cobbles up to 5 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. The surface of this feature is mounded about 5 cm above the adjacent terrace. Cultural materials were separately inventoried for this feature; they included two gray rhyolite core flakes and two andesite core flakes.

Feature 25

Feature 25 is a small, irregularly shaped gravel-mulched field that measures at least 8 by 7 m and covers a minimum of 40 sq m (Fig. 16.4). Since this field was in the detailed examination zone, it was mapped. Unfortunately, the west edge of the field was removed during reconstruction of U.S. 285, so its east-west dimensions are uncertain. Much of the surface is obscured by sediments that have infiltrated the mulch and are anchored by vegetation. The remaining boundaries are fairly indistinct, perhaps because of salvaging of cobbles for reuse elsewhere.

Boundary and interior subdividing alignments seem to be a single element high and wide. They were built with locally obtained cobbles. Cobbles were used to construct alignments, and most are 10–25 cm long. No information on element placement was available because of the deteriorated nature of this feature. The presence of several short segments of interior subdividing alignments suggests that the feature was highly subdivided. However, because of disturbance and erosional deposition in this area, we are uncertain whether the alignments used to define Feature 25 represent a single coherent field or several small individual features.

The mulch is mostly composed of gravels and pea gravels, though small cobbles up to 5 cm long also occur, and their frequency on the surface suggests that only larger rocks were sorted out for use as building elements. Cultural materials were separately inventoried for this feature and included six gray rhyolite core flakes and two obsidian core flakes.

Feature 26

Feature 26 consists of a roughly rectangular concentration of cobbles that measures 3.2 by 2.6 m and stands 0.2 m above the terrace surface (Fig. 16.4). Approximately 36 cobbles and small boulders are included in the feature, and they are 15–30 cm long (Fig. 16.9). Feature 26 abuts the south edge of a prehistoric field (Feature 22), and the materials used in its construction may have been scavenged from that feature. Conversely, a shallow depression just east of the cobble concentration may have been the source of these materi-

Figure 16.9. Feature 26, LA 118547.

als, since that area is now devoid of cobbles.

The function of Feature 26 is problematic. In some ways it resembles several possible historic graves found at LA 118548 directly south of this site (Levine 1997). However, this could not be determined for certain from surface indications alone. Whatever its function, it appears to postdate the use of this area for farming and is most likely of historic origin. Since it is outside project limits, no further investigations were conducted.

Feature 27

Feature 27 is a small, oval terrace-edge borrow pit measuring 7.8 by 4.3 m, with a maximum depth of 1.4 m (Fig. 16.5). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 23 and was probably a source of some of the materials used to build that gravel-mulched field. Because of its location at the terrace edge, this pit is open to the east, and it is uncertain how much of its depth is attributable to erosion. The only associated artifacts noted were recent historic materials that postdate use of this site for farming.

Feature 28

Feature 28 is a large, oval terrace-edge borrow pit measuring 11.4 by 7.6 m, with a maximum depth of 1.8 m (Fig. 16.5). Though outside construction limits, it was in the detailed examination zone and was mapped. This borrow pit is next to Feature 23 and was probably a source of some of the materials used to build that gravel-mulched field. Because of its location at the terrace edge, this pit is open to the east, and it is uncertain how much of its depth is attributable to erosion. The only associated artifacts noted were recent historic materials that postdate use of this site for farming.

Surface Information

The farming features at this site occur as a narrow band along the west edge of a terrace that forms the east edge of the Ojo Caliente Valley, extending from a deep drainage on the north to a similarly incised drainage on the south. As mentioned earlier, these north and south boundaries are artificial. Rather than ending where large tributary drainages cut through the terrace, the farming features tend to follow the edges of those drainages around their heads and back to the main terrace edge. Thus, LA 118547 is part of a continuous band of farming features that extends from at least LA 118548 on the south to LA 105709 on the north. There, near Hilltop Pueblo, the band of farming features ends at a large arroyo. We were unable to determine how far south the prehistoric fields extend, but survey by Bugé (1984) suggests that they continue at least as far as Ponsipa'akeri, several kilometers to the south.

The configuration of features at LA 118547 is quite striking. The north three-quarters of the site is fairly intact, though it has sustained some damage from erosion and livestock grazing. Two bands of features are visible throughout this zone, one along the terrace edge and a second adjacent to the first but situated away from the edge. The terrace-edge band appears to have been built first. Rather than representing a single planned construction event, the configuration of these features suggests that they represent accretional growth through time. Feature 16, in particular, is illustrative of this process. While this field was included in the terrace-edge band, it was built after Feature 15 and partly overlaps it. Feature 15 probably represents several originally separate farming plots that now appear to be continuous.

Most, if not all, of the terrace-edge borrow pits seem to be related to construction of the terrace-edge band of features. In contrast, the terrace-interior borrow pits are all adjacent to fields built in the second (interior) band and were probably used as material sources during construction of those features. The interior band of fields includes Features 18, 20, 22, and 23, as well as several unmapped fields outside the mapping zone. All of the recorded fields in the interior band are qualitatively distinct from those in the terrace-edge band—their boundary alignments are better preserved and more visible, and their surfaces are clearly mounded above those of the terrace-edge band. In some instances, fields in the interior band seem to overlap those in the terrace-edge band. Boundary alignments in the interior band may be better preserved than those in the terrace-edge band because of the salvaging of construction materials from the earlier (terrace-edge) fields for use in the newer (interior) fields.

If this interpretation is correct, LA 118547 provides evidence of a rather lengthy use of this location for farming. As early fields became less suitable for use, they appear to have been abandoned and replaced. If unused land adjacent to the terrace edge was still available, new fields were built there. Once that area was completely occupied, either by abandoned fields or features that were still being used, construction began on a new band of fields. Since gravels and cobbles are heavy, new pits on the terrace interior that were closer to the building area were used to provide at least some of the needed materials for the interior band of fields.

A considerable number of artifacts were collected or recorded at this site. They indicate both prehistoric and historic uses. Table 16.1 inventories the chipped stone artifacts collected from the surface. Most artifacts were recovered from the zone between the west edge of Feature 15 and the terrace slope, though a few also came from the feature surface. Except for cherts and obsidians, which together comprise only 1.2 percent of the assemblage, materials were immediately available in the gravel deposits that cloak the edge of the terrace. This assemblage is dominated by rhyolites, which comprise just over 75 percent of the collection. Andesite is a distant second at 19.3 percent. Except for quartzite, which makes up 3 percent of the assemblage, other materials are rare and comprise less than 1 percent of the total apiece. Two formal tools were recovered, both Pueblo corner-notched arrow points. Otherwise, only reduction debris (core flakes, angular debris, and cores) was recovered, suggesting that raw-material quarrying and initial reduction were important activities. This possibility is addressed in greater detail in a later chapter. Since most chipped stone artifacts were recovered from the terrace edge in nonfeature areas, we could not determine whether material acquisition occurred before the fields were built, while they were in use, or after they were abandoned. However, it is possible (if not likely) that materials were quarried from the gravel deposits exposed in this area at all those times. In addition to the chipped stone artifacts, three Biscuit B sherds were also collected from the surface.

Numerous prehistoric artifacts were also recorded by walking transects across the part of the site that lay outside the highway right-of-way. The chipped stone assemblage recorded in this way was dominated by gray rhyolite (117 core flakes, 39 angular debris, 20 cores, 2 tested cobbles). Other materials noted were red rhyolite (6 core flakes, 5 angular debris, 1 core), andesite (69 core flakes, 15 angular debris, 4 cores), obsidian (1 core flake), Pedernal chert (3 core flakes), and other cherts (3 core flakes, 1 angular debris). Ceramic artifacts recorded on the surface included 4 Biscuit A bowl sherds, 12 Biscuit B sherds (7 bowl, 4 jar, 1 indeterminate), and one bowl sherd from an unidentified type of pottery.

Historic artifacts were also common on the surface and may represent several different periods of use or trash discard. However, most of these materials date to the last half of the twentieth century and represent numerous trash disposal episodes. Such materials are particularly

Table 16.1. Chipped stone artifacts collected from within the highway at LA 118547 (material type by artifact morphology)

Material Type	Angular Debris	Core Flakes	Cores	Bifaces
Chert	1	-	-	-
Pedernal chert	1	1	-	1
Obsidian	-	1	-	1
Igneous undifferentiated	1	1	-	-
Rhyolite	142	237	19	-
Andesite	42	58	2	-
Welded tuff	-	-	1	-
Quartzite	3	13	-	-
Massive quartz	1	2	-	-

common around the head of the drainage that forms part of the north boundary of the site, but they were not inventoried. The only materials that suggest use of this area before the late 1800s are three olive jar sherds that fit together and suggest use during the Spanish Colonial or Mexican Territorial periods. These sherds were collected from the highway right-of-way, as was a two-hole shell button. Since the manufacture of shell buttons did not begin commercially in the United States until about 1855, it is unlikely that these artifacts were contemporary. Other temporally diagnostic historic artifacts at LA 118547 were recorded in the section of site that extends outside the right-of-way and are indicative of use during the late American Territorial and Statehood periods, ca. 1880 to the present. They included 2 pieces of amethyst glass, 4 fragments of a glass bottle with a 1908 date, 3 hole-in-top cans, 3 fragments of brown glass, 16 pieces of clear glass, 9 aluminum beverage cans, 1 steel beverage can with aluminum top, 1 plastic bottle, and part of an automobile headlight.

Results of Excavation

Twelve excavation units and four mechanically excavated trenches were used to examine subsurface deposits and construction techniques in Feature 15, a large gravel-mulched field at LA 118547. This was the only such feature that extended into project limits at the site. It represents a series of individual plots constructed so closely together that they could not be separated by surface examination alone, or a large field that grew through time by accretion. Mechanically excavated trenches were used to examine subsurface deposits in Features 1 and 2, both terrace-edge borrow pits. The soil strata encountered during excavation are discussed first, followed by descriptions of excavation units and mechanically excavated trenches. Variations in soil strata are detailed in excavation unit descriptions. Excavation was conducted in natural units except in mechanically excavated trenches.

Three basic soil layers were defined in fields during hand excavation. Stratum 1 was uppermost and consisted of a layer of eolian sediments deposited on field surfaces and anchored in place by vegetation. This layer was a pale brown silty sand of variable thickness ranging from virtually nothing up to an average thickness across excavation units of 3.8 cm. In addition to sediments, there was some mixing with the underlying gravel mulch, so about 30 percent of this layer consisted of pea gravels and gravels. Alignments and the gravel-mulch surface were often concealed beneath a thin mantle of this material.

The layer of gravel mulch applied to the terrace surface between cobble alignments was designated Stratum 2, and it underlay Stratum 1. Stratum 2 was variable in thickness, ranging in thickness across excavation units between 7.3 and 12.1 cm. This layer contained mostly unsorted pea gravels, gravels, and small cobbles, but perhaps 30–40 percent was a brown silty sand. The latter probably represents eolian sediments that infiltrated and clogged the mulch. It was impossible to determine whether these sediments were deposited when the field was in use or after it was abandoned, but deposition during both periods is likely.

Stratum 2 was placed directly upon the original terrace surface. Though the terrace surface was configured somewhat differently from trench to trench, it was always designated Stratum 3. Excavation usually halted when this surface was encountered, so detailed descriptions were not generated. However, Stratum 3 usually consisted of a brown silty sand that contained fewer gravels than Stratum 2.

Feature 1

Backhoe Trench 2 was dug through the center of Feature 1 to allow us to examine the structure of that terrace-edge borrow pit, determine how much soil had washed in since it was used, and see if it penetrated through a gravel stratum. It was also used to collect samples of gravel for comparison with materials recovered from the mulch layer in Feature 15, and pollen to help determine if it was used to grow crops.

A 13.2 m long section of terrace sediments was exposed in this trench, and a 3 m long segment of trench near the edge of the feature was profiled (Fig. 16.10). Three strata were defined. The uppermost layer contained a mixture of eolian and colluvially deposited sediments, mostly brown sand and small gravels. This stratum was 15–20 cm thick and occurred only in the

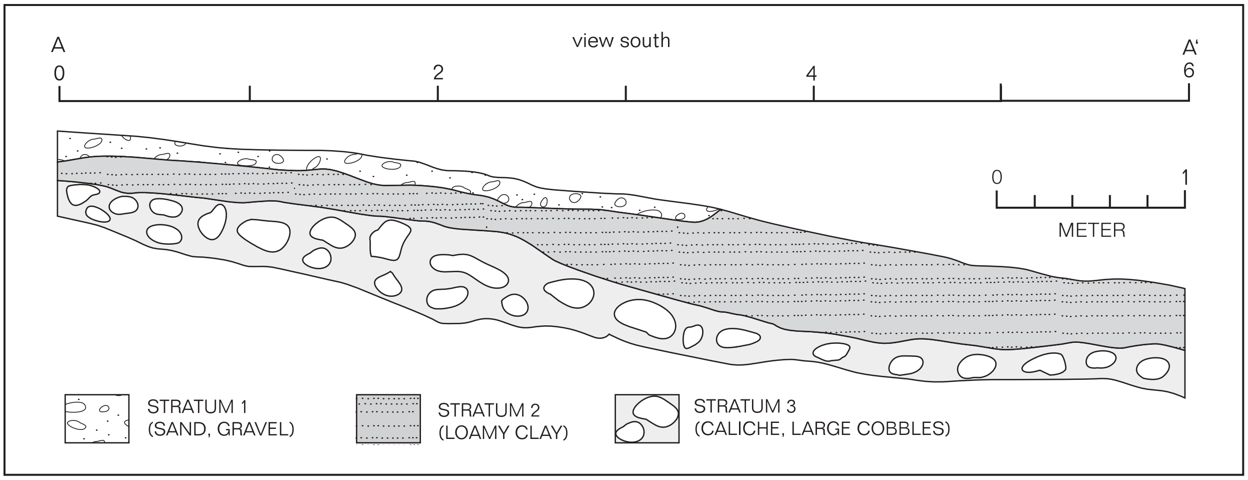


Figure 16.10. Profile of a section of the south wall of Backhoe Trench 2, Feature 1, LA 118547.

east part of the profile. Underlying it was a 10–28 cm thick layer of brown loamy clay. The lowermost layer encountered in this trench was a very pale brown sand containing numerous gravels and large cobbles. Caliche deposits were very common in this stratum. A sample taken from the fill in this feature yielded a moderate concentration of corn pollen.

The borrow pit was a fairly wide, comparatively shallow excavation into a gravel- and cobble-bearing layer. In cross section, the pit was saucer-shaped, and much deeper in the center than at the edges. The two uppermost strata represent sediments deposited since the feature was used. Thus, 18–26 cm of sediments have built up since that time. Exposure of a stratum containing numerous gravels and cobbles in the bottom of the trench indicates that the borrow pit did not completely penetrate the layer of gravels into which it was excavated.

Feature 2

Backhoe Trench 3 was used to examine the north end of Feature 2, a large borrow pit showing evidence of multiple episodes of use. Like Backhoe Trench 2, it was excavated to allow us to examine the structure of the borrow pit, determine how much soil has washed in since it was used, and see if it penetrated through a gravel stratum. It was also used to collect samples of gravel for comparison with materials recovered from the mulch in Feature 15.

A 6.2 m long section of terrace sediments was exposed in this trench, and a 4 m long segment of trench near the north edge of the feature was profiled (Fig. 16.11). Three strata were defined. The uppermost stratum at the north edge of the trench was a 27 cm thick layer of brown sandy soil containing numerous gravels and cobbles. This unit represented the original surface layer in this part of the terrace (Stratum 3). It was absent in most of the borrow pit, and in its place was a 37–46 cm thick layer of very pale brown loamy clay deposited by eolian and colluvial processes. The lowermost stratum exposed throughout this trench was a layer of brown sand containing numerous gravels and cobbles. Caliche deposits were very common in this stratum.

This borrow pit was a fairly wide, comparatively shallow excavation into a gravel- and cobble-bearing layer. In cross section the pit was bowl-shaped and seems to have been excavated to similar depths at its center and along the north edge. A layer of loamy clay represents materials deposited in the feature since it was used. Thus, 37–46 cm of sediments have built up since that time. The exposure of a stratum containing numerous gravels and cobbles in the bottom of the trench indicates that the borrow pit did not completely penetrate the layer of gravels into which it was excavated.

Feature 15

Part of the west edge of the north half of Feature 15 extended into project limits, and twelve excavation units were used to examine that part of the

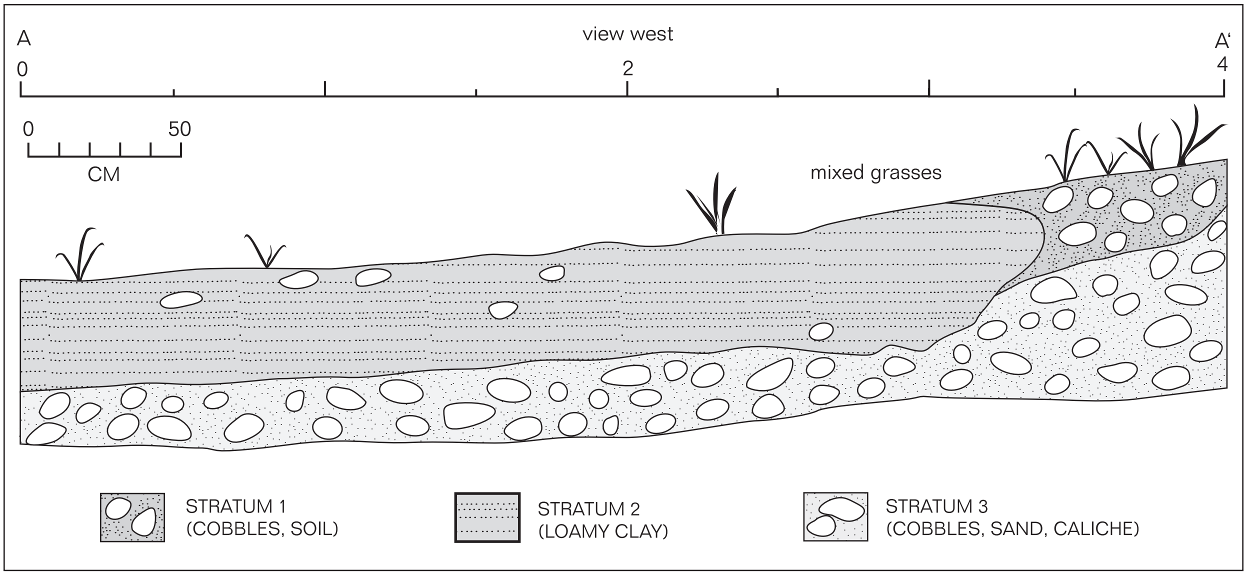


Figure 16.11. Profile of a section of the west wall of Backhoe Trench 3, Feature 2, LA 118547.

feature. Four units (EU-A through EU-D) were in the far northwest part of the field, while the eight remaining units were just inside the edge of the right-of-way, which contained a long, linear section of Feature 15 (Figs. 16.2, 16.4, and 16.5).

EU-A was placed along the west edge of Feature 15 near the northwest corner of the field. It was used to examine the west boundary alignment and a parallel interior subdividing alignment defined during site mapping. Close inspection of the surface in this area before excavation suggested that another parallel alignment might exist between the two that were initially defined. A possible perpendicular alignment joining the boundary and nearest parallel interior alignments was also noted.

Stratum 1 was virtually nonexistent in this unit. Because of its location at a break in slope on the edge of the field, eolian materials that were unable to infiltrate the mulch were probably removed by slope wash. Similarly, much of the layer of mulch may have been washed away, since Stratum 2 was fairly shallow in this area, ranging between 3 and 6 cm thick. A sample from the mulch contained a moderate concentration of corn pollen. Two artifacts were recovered from this excavation unit—a small fragment of bone in Stratum 1, and a piece of rhyolite angular debris in Stratum 2.

As shown in Figures 16.12 and 16.13, excavation exposed part of the west boundary alignment and several connected interior subdividing alignments. All exposed alignments were built in the same fashion. Most cobbles were placed end-to-end on their broadest surfaces, though a few were set sideways and mixed into alignments otherwise dominated by end-to-end placement. Similarly, a few elements were set upright, but this was uncommon. All alignments were a single element high and wide.

This area was more highly subdivided than suggested by the configuration initially visible on the surface. As noted earlier, only two parallel alignments were seen in this area during site mapping. Surface examination before excavation suggested the presence of another parallel alignment and a perpendicular joining it to the west boundary alignment. Excavation revealed that the intervening parallel interior alignment was indeed present, and that the perpendicular alignment joined all three together. Thus, parts of at least three small cells were encountered in this EU (Fig. 16.12). The two southernmost cells were about 1 m wide; their lengths were undetermined, but their long axes trended northwest-southeast, and they were over 1.8 m long.

EU-B was near the northwest corner of Feature 15, a short distance northeast of EU-A. It was used to examine an interior subdividing alignment seen during site mapping. Close inspection of the surface before excavation suggested that a parallel alignment might exist to the

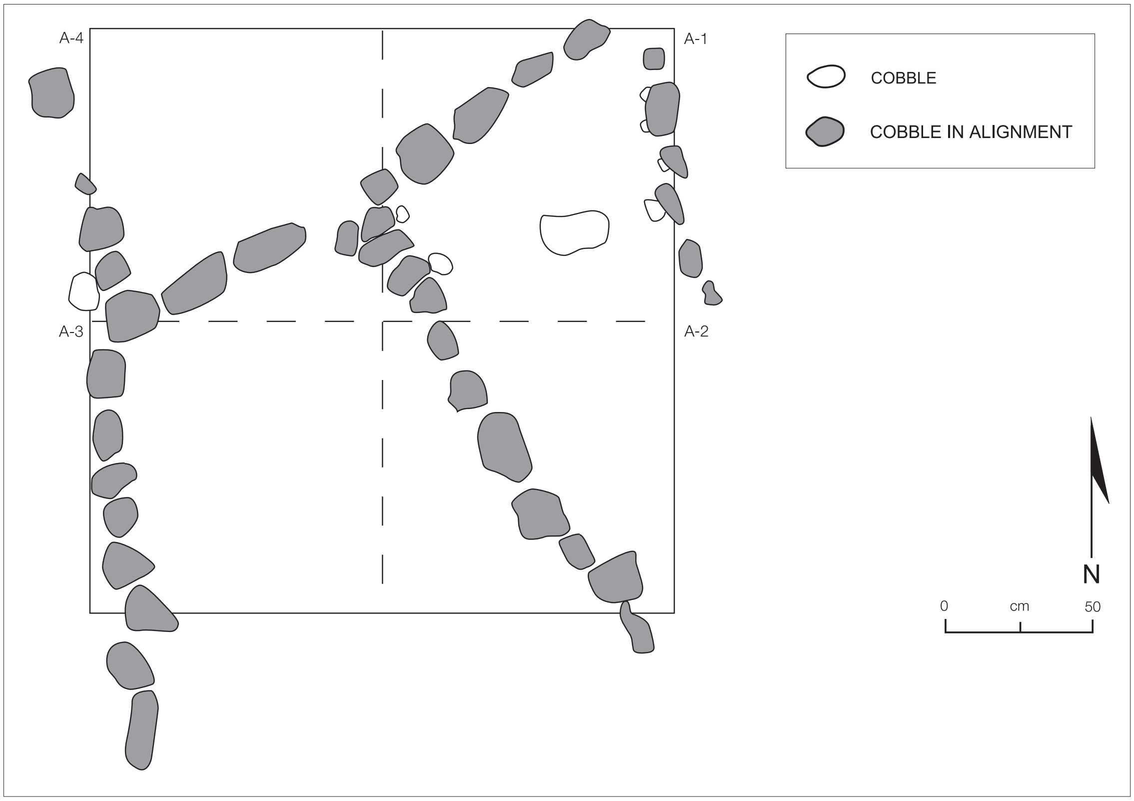


Figure 16.12. Postexcavation plan of EU-A in Feature 15, LA 118547. Shaded rocks are in alignments.

Figure 16.13. Postexcavation view of EU-A in Feature 15, LA 118547.

west, and a perpendicular alignment might crosscut both.

Stratum 1 was an average of 0.5 cm thick in this unit. It yielded six rhyolite core flakes, one piece of rhyolite angular debris, and a blue-banded and fluted rim sherd from a Euroamerican bowl or saucer. The gravel mulch (Stratum 2) was also relatively thin and averaged only 7.3 cm thick. The underlying terrace surface (Stratum 3) was hard packed in places and appeared to contain numerous small gravels. A sample taken from the mulch contained a moderate concentration of cotton pollen and a moderate to high concentration of corn pollen. Five chipped stone artifacts were also recovered from this layer, including two rhyolite core flakes, two rhyolite angular debris, and one rhyolite unidirectional core.

As shown in Figures 16.14 and 16.15, excavation exposed two parallel northwest-southeast trending interior subdividing alignments. Both alignments were built in the same fashion—most cobbles were set end-to-end and on their broadest surfaces, though a few were placed sideways and mixed into alignments otherwise dominated by end-to-end placement. Similarly, a few elements were set upright, but this was uncommon. Both alignments were a single element high and wide.

This area was somewhat more highly subdivided than suggested by the configuration initially visible on the surface. As noted earlier, only one interior subdividing alignment was seen in this area during site mapping. Examination of the surface prior to excavation suggested the presence of another parallel alignment and a possible perpendicular alignment that might join the two. Excavation revealed that the parallel interior subdividing alignment was indeed present, but no perpendicular alignment was found. The western alignment was broken at the north end of the segment exposed in Grid B-3. This break was probably not purposeful, and it reflects postabandonment damage. Parts of at least three small cells were encountered in this unit (Fig. 16.14). While these cells appear to be long and narrow, it was not possible to measure their lengths, and only one width could be obtained. In that instance, the section of exposed cell averaged 0.74 m wide.

EU-C was near the northwest corner of Feature 15, a short distance northeast of EU-B. It was used to examine two parallel interior subdividing alignments noted during site mapping. Close examination of the surface before excavation suggested that a third parallel alignment might exist to the north of these alignments and that the southern alignment might actually consist of evenly spaced, noncontiguous large cobbles.

Stratum 1 had an average thickness of 0.5 cm where it occurred in this unit and yielded 2 rhyolite core flakes, 1 andesite core flake, and 1 quartzite core flake. The gravel mulch (Stratum 2) averaged 10.4 cm thick and contained 49 chipped stone artifacts representing three material types including rhyolite (30 core flakes, 11 angular debris, 1 tested cobble, 2 cores), chert (1 angular debris), and andesite (1 core flake). The soil was more compact toward the bottom of Stratum 2, gravel inclusions became smaller, and most of the chipped stone artifacts were recovered from this zone. The deepest few centimeters of fill excavated as Stratum 2 probably represented the top of the original terrace surface (Stratum 3), and the artifacts found at that level reflect use before the field was constructed. Thus, the gravel mulch was probably only 7–8 cm thick in this unit. A sample taken from the mulch contained a high concentration of corn pollen.

As shown in Figures 16.16 and 16.17, excavation exposed two parallel northeast-southwest trending interior subdividing alignments. Both alignments were built in the same fashion. Most cobbles were set end-to-end and on their broadest surfaces, though a few elements were placed sideways and mixed into alignments otherwise dominated by end-to-end placement. No uprights were noted in this area, and both alignments were a single element high and wide.

This area was pretty much as defined during site mapping—only two parallel alignments were exposed by excavation. The third possible parallel alignment to the north turned out to be nothing more than a few large cobbles floating in the mulch. Parts of three small plots were encountered in this unit (Fig. 16.15). While these plots seemed to be long and narrow, measurement of their lengths was not possible, and only one width could be obtained. In that instance, the section of plot exposed averaged 0.54 m wide.

EU-D was near the northwest corner of Feature 15, a short distance southeast of EU-B and EU-C. It was placed there to examine three

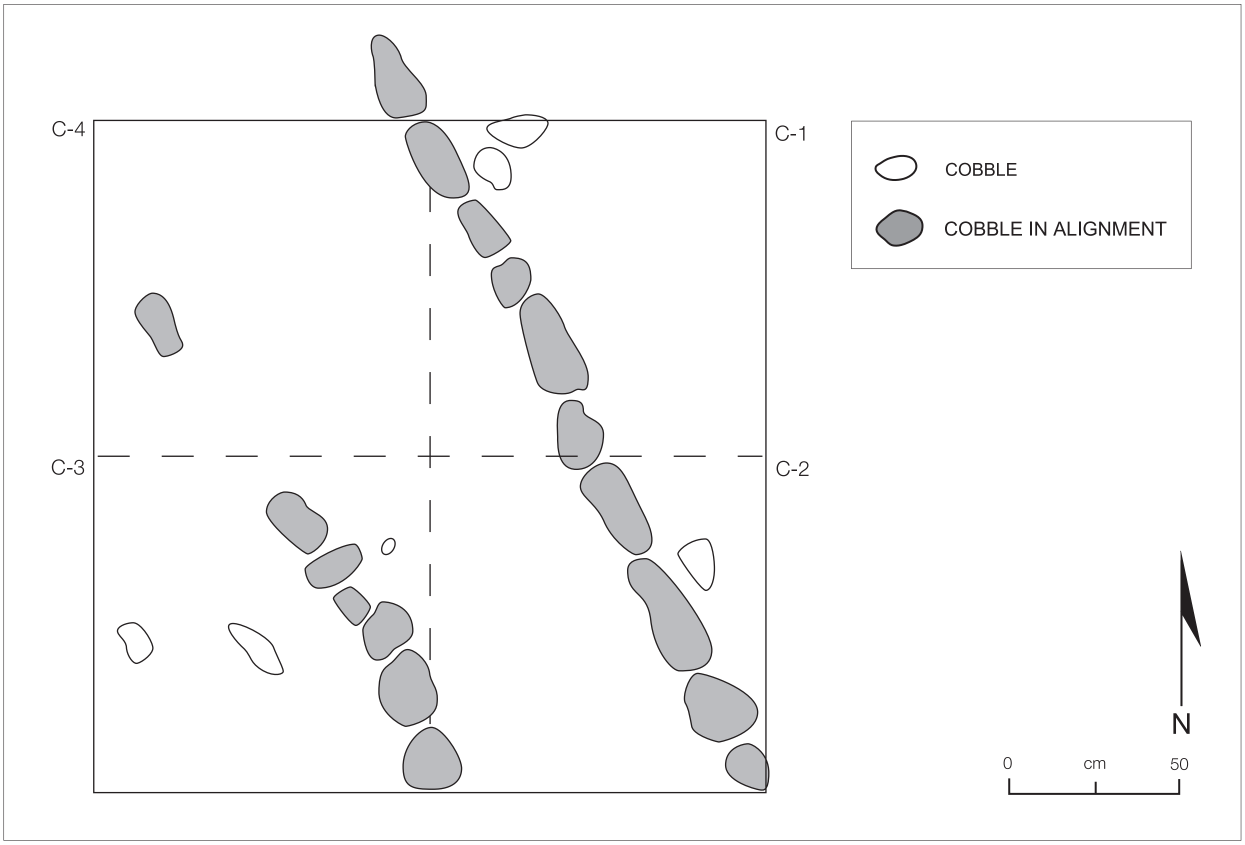


Figure 16.14. Postexcavation plan of EU-B in Feature 15, LA 118547. Shaded rocks are in alignments.

Figure 16.15. Postexcavation view of EU-B in Feature 15, LA 118547.

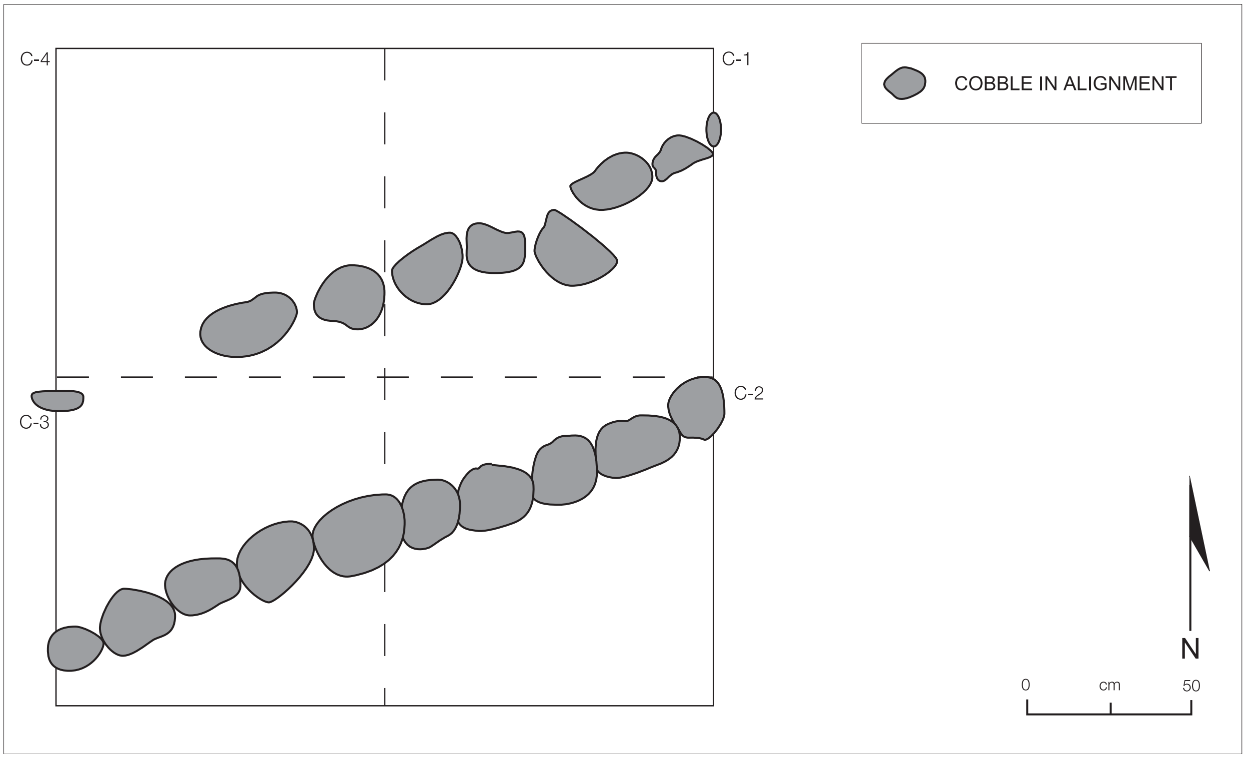


Figure 16.16. Postexcavation plan of EU-C in Feature 15, LA 118547. Shaded rocks are in alignments.

Figure 16.17. Postexcavation view of EU-C in Feature 15, LA 118547.

parallel interior subdividing alignments noted during site mapping. Close examination of the surface before excavation suggested that another parallel alignment might exist to the west. The center alignment of the three defined during site mapping appeared to have a break in it. There was a possibility that two large cobbles east of these alignments may have been part of a fifth alignment, but this could not be determined from surface examination alone.

Stratum 1 averaged 1.4 cm thick where it occurred and yielded three rhyolite core flakes and a Biscuit A sherd. The gravel mulch (Stratum 2) averaged 10.6 cm thick. The lower 3–4 cm of Stratum 2 contained very fine pea gravels (almost coarse sand) mixed with coarse pea gravels, which sat directly atop the original terrace surface and may have been a base course. Cultural materials were somewhat more common in Stratum 2 and included four rhyolite core flakes, two rhyolite angular debris, one rhyolite core, and two andesite angular debris. A sample taken from the mulch contained a fairly low concentration of corn pollen.

As shown in Figures 16.18 and 16.19, excavation exposed five parallel northwest-southeast trending interior subdividing alignments. All alignments were built in the same fashion—most cobbles were set end-to-end and on their broadest surfaces, though a few elements were placed sideways and mixed into alignments otherwise dominated by end-to-end placement. Similarly, a few elements were set upright, but this was uncommon. All alignments were a single element high and wide.

This area was somewhat more highly subdivided than suggested by the configuration of building elements seen on the surface. As noted earlier, three interior subdividing alignments were visible in this area during site mapping. Examination of the surface before excavation suggested the presence of two other parallel alignments. Excavation revealed that these alignments were indeed present. The break noted in the center of the three alignments defined during site mapping was not real and resulted from eolian sediments that had covered the cobbles in that area. Parts of at least four plots were encountered in this unit (Fig. 16.18). These plots are long and narrow, and it was not possible to measure their lengths. They ranged between 0.20 and 0.66 m wide, with an average width of 0.37 m.

EU-E was near the north end of Feature 15, a short distance south of EU-D. It was placed there to examine an area that contained no evidence of interior subdividing alignments during site mapping. Close examination of the surface indicated that several large cobbles were visible and suggested that this area contained a series of evenly spaced, noncontiguous elements. However, since several cobbles were aligned, it was also possible that they represented interior subdividing alignments in which most elements were covered by eolian sediments.

Stratum 1 averaged 1.4 cm thick where it occurred and contained a rhyolite core flake. However thin this stratum was, it tended to cover up to 70 percent of the gravel-mulch surface. The gravel mulch (Stratum 2) was quite distinct with the eolian sediments removed (Fig. 16.20), and it averaged 10.2 cm thick. The lower 2–4 cm of Stratum 2 was a silty sand containing few to abundant pea gravels. Under this layer in Grid E-2 was a slightly reddish sandy clay. The layer of silty sand and gravel may represent a separate base course, or it could be the original terrace surface. If the latter is true, then the mulch was only 6–8 cm thick. Cultural materials in the gravel mulch included a Biscuit B sherd and seven rhyolite core flakes, all of which were found near the top of the stratum, suggesting that they were deposited during or after use of the field. A sample taken from the mulch contained a low concentration of cotton pollen and a moderate concentration of corn pollen.

As shown in Figures 16.21 and 16.22, excavation exposed a series of irregularly spaced large cobbles and small boulders. Two of the smaller cobbles in Grid E-2 were floating in the gravel mulch and probably represent part of that stratum rather than elements used in construction. Bottom depths were measured for construction elements that were completely exposed by excavation, and most were 1–2 cm higher than the defined base of the gravel mulch. This suggests that the lower 2–4 cm of fill represented the original terrace surface rather than a preparatory course. The spacing of elements near the center of the unit suggests that there may have been some attempt to maintain an even distance. Similarly, there may have been some placement in noncontiguous alignments. However, spacing and place-

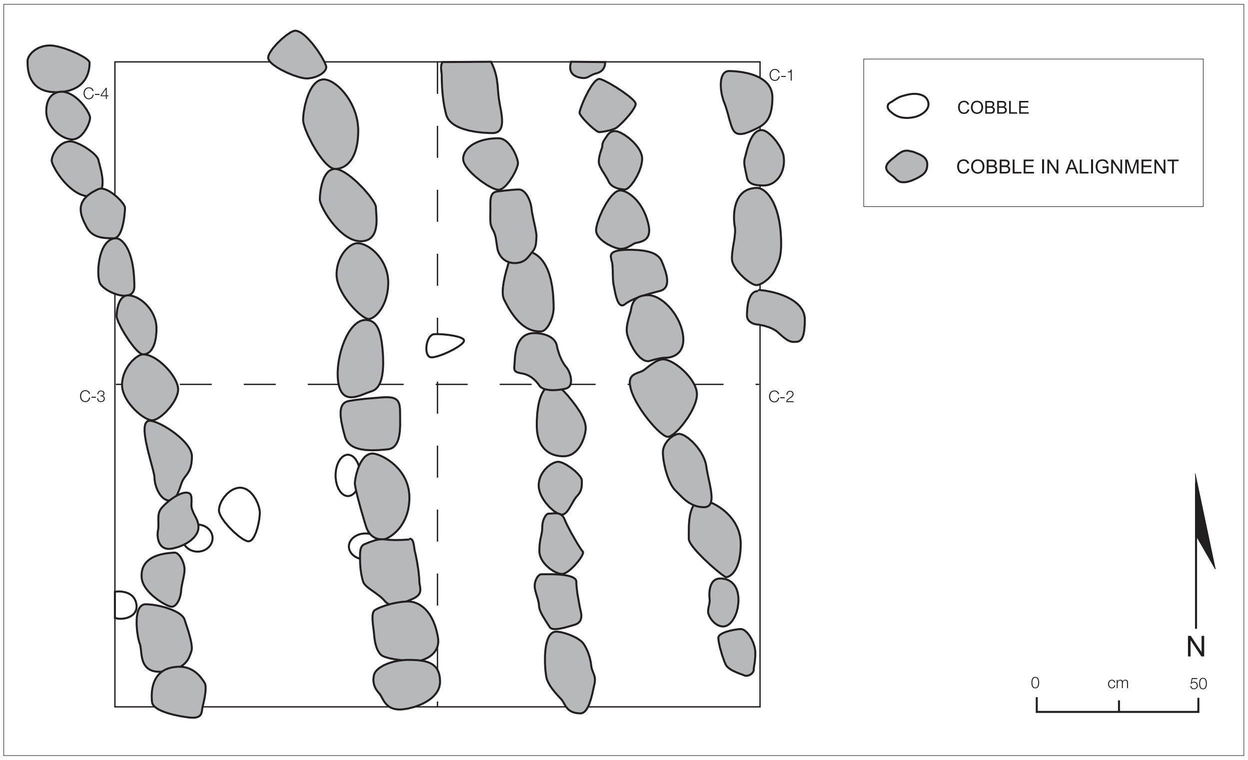


Figure 16.18. Postexcavation plan of EU-D in Feature 15, LA 118547. Shaded rocks are in alignments.

Figure 16.19. Postexcavation view of EU-D in Feature 15, LA 118547.

Figure 16.20. Surface of mulch in EU-E, Feature 15, LA 118547.

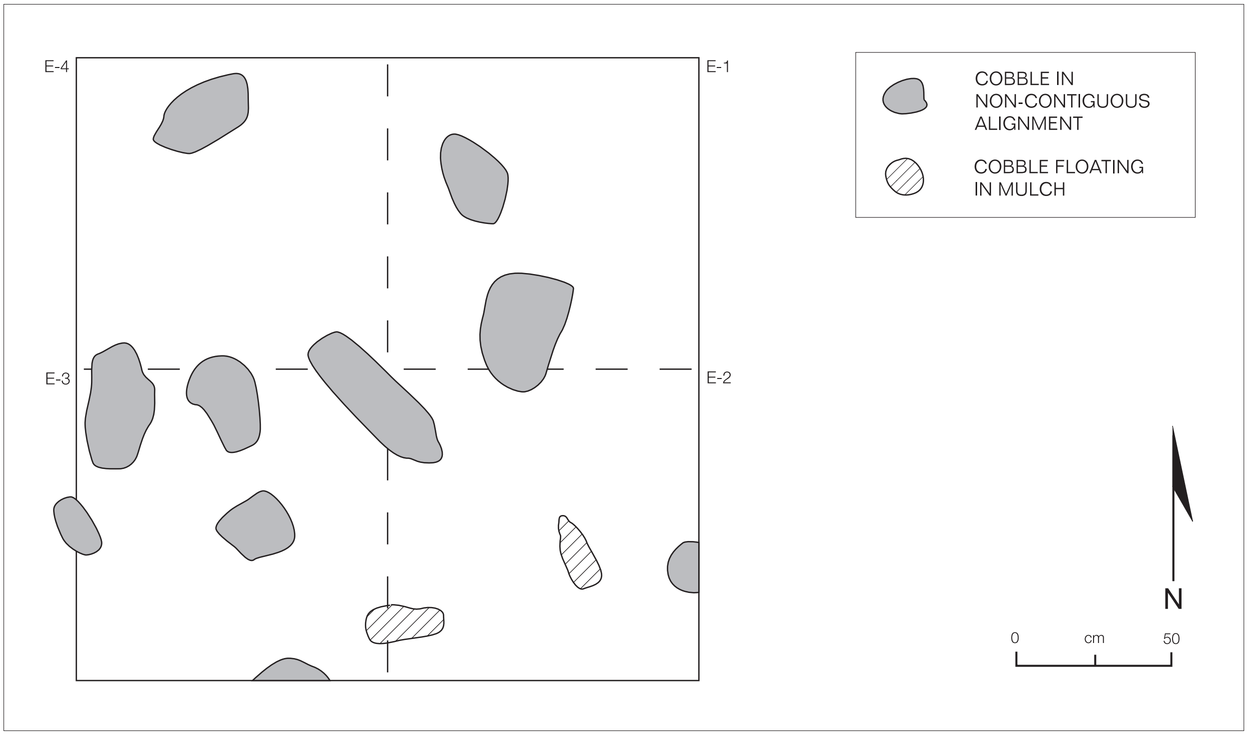


Figure 16.21. Postexcavation plan of EU-E in Feature 15, LA 118547. Shaded rocks are in alignments.

Figure 16.22. Postexcavation view of EU-E in Feature 15, LA 118547.

ment are not as standardized as they were at other sites, LA 105703 in particular. All elements exposed in this EU were set on their broadest surface.

EU-F was near the north end of Feature 15, 17 m south of EU-E. Like EU-E, it was used to investigate an area that contained no surface evidence of interior subdividing alignments during site mapping. Close examination of the surface indicated that several large cobbles were visible and suggested that this area contained a series of evenly spaced, noncontiguous elements. However, since several cobbles were aligned it was also possible that they represented interior subdividing alignments in which most elements were covered by eolian sediments.

Stratum 1 had an average thickness of 2.3 cm and covered nearly the entire surface of the gravel-mulch layer. The gravel mulch (Stratum 2) averaged 12.1 cm thick. The bottom of the mulch was difficult to define in places, and excavation ended when the amount of gravel dropped. Thus, part of the upper terrace surface (Stratum 3) may also have been removed with these materials. Interestingly, small fragments of charcoal were found throughout Stratum 2, and patches of oxidized soil were noted in Grid F-2. The charcoal and oxidized soil may be indications of a surface fire, possibly a natural burn. Cultural materials were uncommon in this unit. Only two rhyolite artifacts—a core flake and piece of angular debris—were recovered from the gravel mulch. A sample taken from the mulch contained a moderate concentration of corn pollen.

As shown in Figure 16.23, excavation exposed a series of irregularly spaced large cobbles. Bottom depths were measured for construction elements that were completely exposed by excavation, and most were 3–5 cm higher than the base of Stratum 2. This suggests that the lower 3–5 cm of fill represented the original terrace surface rather than part of the gravel mulch. The spacing of elements near the center of the unit suggests that there may have been some attempt to maintain an even distance. Similarly, there may have been some placement in noncontiguous alignments. However, spacing and placement are not as standardized as they were at other sites. All exposed elements were set on their broadest surface.

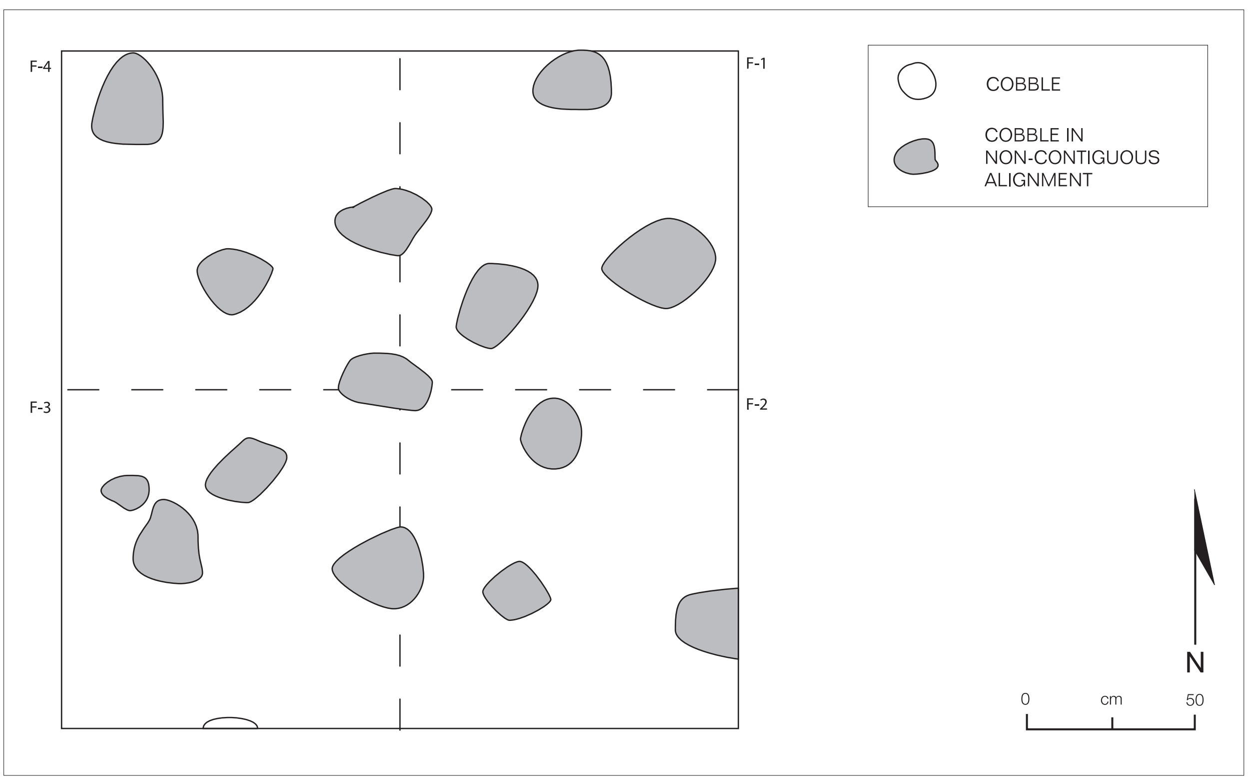


Figure 16.23. Postexcavation plan of EU-F in Feature 15, LA 118547. Shaded rocks are in alignments.

EU-G was excavated in the north-central part of Feature 15, 40 m south of EU-F. It was placed there to examine a corner in the boundary alignment and an interior subdividing alignment that were noted during site mapping. Close examination of the surface before excavation suggested that alignments in this area were either fragmented or covered by a mantle of eolian sediments. The corner was ill-defined, and the interior subdividing alignment was questionable.

Stratum 1 was an average of 3.1 cm thick in this unit. A rhyolite core was found on the surface, and eight rhyolite artifacts—four core flakes and four angular debris—were found in Stratum 1. These materials were either deposited while the field was in use or after it was abandoned. Nearly the entire mulched surface was concealed beneath the mantle of eolian sediments. The gravel mulch (Stratum 2) averaged 8.4 cm thick, but the lower few centimeters contained a high percentage of small pea gravels and probably represented the original terrace surface. Thus, the gravel-mulch layer may have been 1–2 cm thinner than it appeared. Cultural materials recovered from the gravel mulch included six Biscuit A sherds—five of which fit together—and a piece of rhyolite angular debris. A sample taken from the mulch contained no pollen from domesticated plants.

As shown in Figure 16.24, three alignments were exposed in this unit—two that met at a perpendicular to form a corner of the west boundary alignment in Grid G-3, and an interior subdividing alignment that ran across the south edge of Grids G-1 and G-4. All three alignments were built in the same fashion. Most elements were set end-to-end on their broadest surfaces, though a few were placed sideways and mixed into alignments otherwise dominated by end-to-end placement. Similarly, a few elements were set upright. All alignments were a single element high and wide.

Excavation showed that this area was somewhat more complicated than first thought. A corner in the west boundary alignment and a section of an interior subdividing alignment were exposed. In addition, a series of large cobbles on the south side of the interior subdividing alignment seemed to represent an area that was treated similarly to those found in EU-E and EU-F. These cobbles were fairly evenly spaced but formed no definite alignments. This pattern was not replicated on the north side of the interior subdividing alignment, suggesting that it formed a boundary between areas in which different construction techniques were used. The interior subdividing alignment probably intersected the west boundary alignment just outside the excavation unit. Parts of two plots were exposed, but no length or width measurements could be obtained.

EU-H was in the north-central part of Feature 15, 15 m south of EU-G. It was placed there to examine a section of the west boundary alignment and an intersecting interior subdividing alignment noted during site mapping. Close examination of the surface before excavation suggested that the boundary alignment might be missing from this area or was covered by a mantle of eolian sediments. The interior subdividing alignment appeared to be real, though it was broken in places, and a second possible interior subdividing alignment was noted south of the first.

Stratum 1 had an average thickness of 1.5 cm in this unit and concealed nearly the entire surface of the gravel mulch. The gravel mulch (Stratum 2) averaged 9.1 cm thick and contained five artifacts: two rhyolite core flakes, a core, one igneous undifferentiated core flake, and a piece of andesite angular debris. All of the artifacts came from the upper 3–4 cm of mulch and were probably deposited during or after use of the field. A sample taken from the mulch contained a high corn pollen concentration.

As Figures 16.25 and 16.26 show, only one definite alignment was exposed in this unit. A short section of a second very questionable interior subdividing alignment was south of the definite segment. Most elements were set end-to-end and on their broadest surfaces, though a few were placed sideways and mixed into the alignment. No uprights were noted, and the alignment was mostly a single element high and wide, though in places two cobbles appear to have been set abreast.

Excavation showed that this area was more badly damaged than surface indications suggested. Except for a few cobbles, most of the west boundary alignment was displaced, probably by slope wash. Parts of two plots were exposed, but no length or width measurements were possible.

EU-I was in the north-central part of Feature

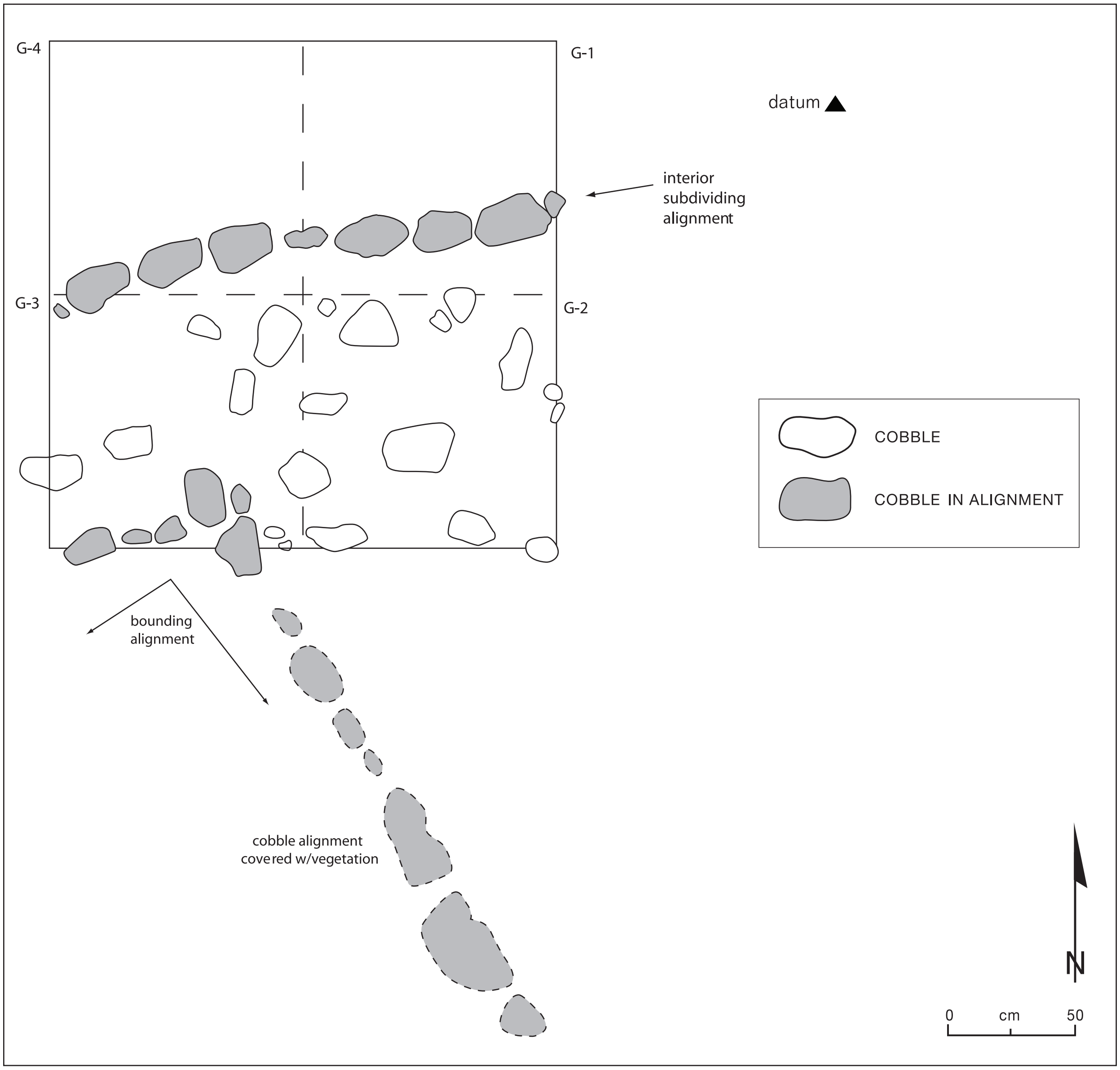


Figure 16.24. Postexcavation plan of EU-G in Feature 15, LA 118547. Shaded rocks are in alignments.

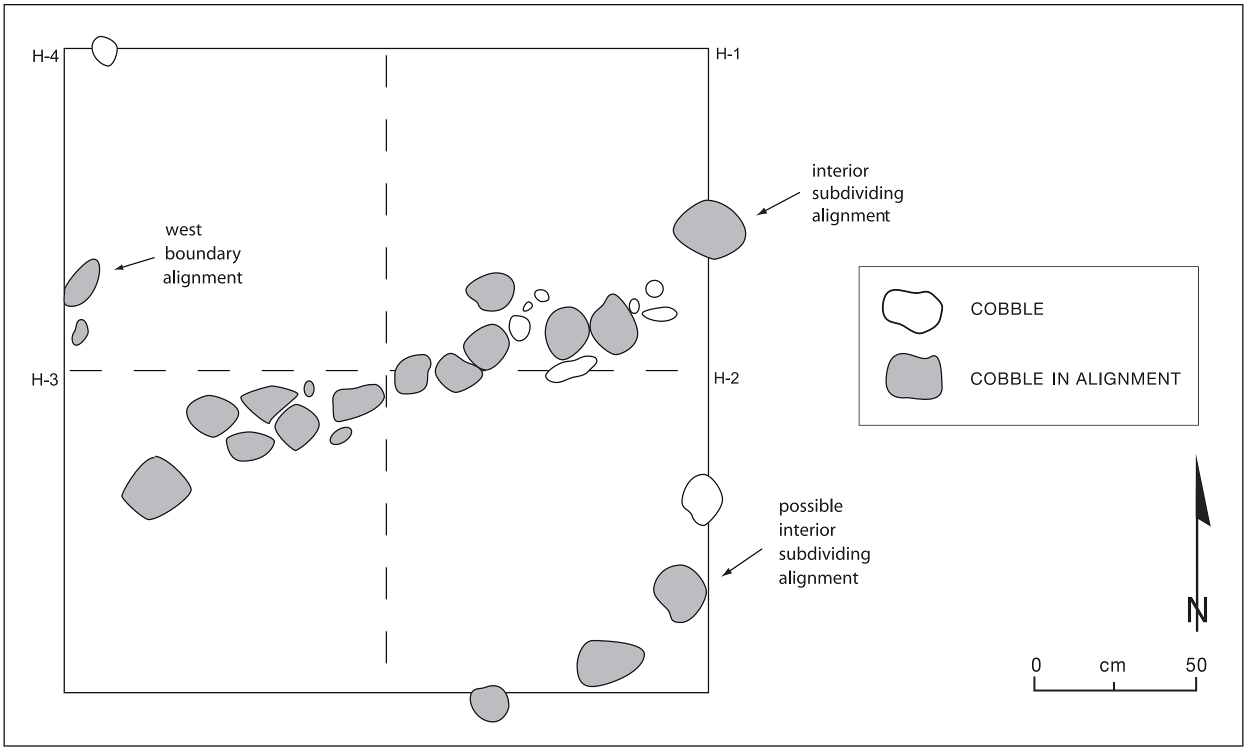


Figure 16.25. Postexcavation plan of EU-H in Feature 15, LA 118547. Shaded rocks are in alignments.

Figure 16.26. Postexcavation view of EU-H in Feature 15, LA 118547.

15, 17 m south of EU-H. It was placed there to examine a section of the west boundary alignment and an adjacent area that seemed to contain no evidence of interior subdividing alignments. Close examination of the surface before excavation suggested the presence of at least one interior subdividing alignment running perpendicular to the boundary alignment. South of that were several large cobbles that were relatively evenly spaced but not contiguous. The west boundary alignment extended through this unit from the northwest corner to the center of the south edge, and the zone outside the field was not excavated.

Stratum 1 had an average thickness of 1.9 cm and concealed nearly the entire surface of the mulch. An andesite core flake was recovered from this layer. The gravel mulch (Stratum 2) was comparatively thin and averaged only 7.6 cm thick. A rhyolite core flake was the only artifact recovered from this layer. A sample taken from the mulch contained both corn and cotton pollen.

As Figures 16.27 and 16.28 illustrate, two alignments were exposed in this unit. Most cobbles were placed end-to-end and on their broadest surfaces, though a few elements were set sideways. Upright placement occurred but was uncommon. All alignments were a single element high and wide. The only exceptions were a few cobbles that were displaced by erosion and resembled a double-coursed alignment.

Excavation showed that the section of field investigated in this unit was more complex than originally thought. The west boundary alignment was relatively intact in this area, though a few elements were displaced. A short segment of interior subdividing alignment was visible in Grid I-1 and probably intersected the boundary alignment at a perpendicular angle, though a break was encountered at the projected intersection. Again, erosion was probably the culprit. South of the interior alignment were several large cobbles set in a regular, relatively evenly spaced pattern. No such patterning was encountered north of the interior subdividing alignment. Thus, the two plots exposed in this unit were configured differently. No length or width measurements were possible.

EU-J was in the north-central part of Feature 15, just south of EU-I. It was placed across a section of the west boundary alignment and three interior subdividing alignments that were noted during site mapping, and it was used to provide a better look at this section of the field, supplementing data gathered from EU-I. Close examination of the surface before excavation suggested that the unit actually contained only two interior subdividing alignments set at an acute angle to the west boundary alignment. What had originally seemed to be the third interior subdividing alignment appeared, upon closer inspection, to be a series of large cobbles that were relatively evenly spaced but not contiguous.

Stratum 1 was moderately thick in this unit, averaging 2.3 cm, and it concealed nearly the entire surface of the mulch. Six chipped stone artifacts were recovered from this soil layer, including two rhyolite core flakes, two pieces of rhyolite angular debris, and two andesite core flakes. Once Stratum 1 was removed, the surface of the mulch and three alignments were clearly visible (Fig. 16.29). The gravel mulch (Stratum 2) averaged only 8.4 cm thick, and it ended near the base of the cobble alignments. A thin layer of sand containing numerous pea gravels occurred at the base of the mulch and probably represented the original terrace surface. Underlying that layer was a clayey sand that contained some cobbles. A rhyolite core flake was the only artifact found in the gravel mulch. All of the artifacts recovered from this excavation unit came from near the surface, suggesting that all were deposited during or after use of the field.

As Figures 16.30 and 16.31 illustrate, three alignments were exposed in this unit. Most cobbles were set end-to-end in all three alignments, though a few elements were placed sideways. Similarly, most cobbles were set on their broadest surfaces, though a few uprights were also noted. The latter were most common in the northernmost interior alignment. All alignments were a single element high and wide.

This was a rather complex section of field. The west boundary alignment was contiguous with the segment exposed in EU-I about 2 m to the north. There was no evidence that the regularly spaced cobbles found in the south section of EU-I continued into EU-J, suggesting that there was an interior subdividing alignment between these areas. Parts of three plots were exposed, and partial measurements were possible for two. The interior alignments created a narrow planting area that averaged about 0.2 m wide. The

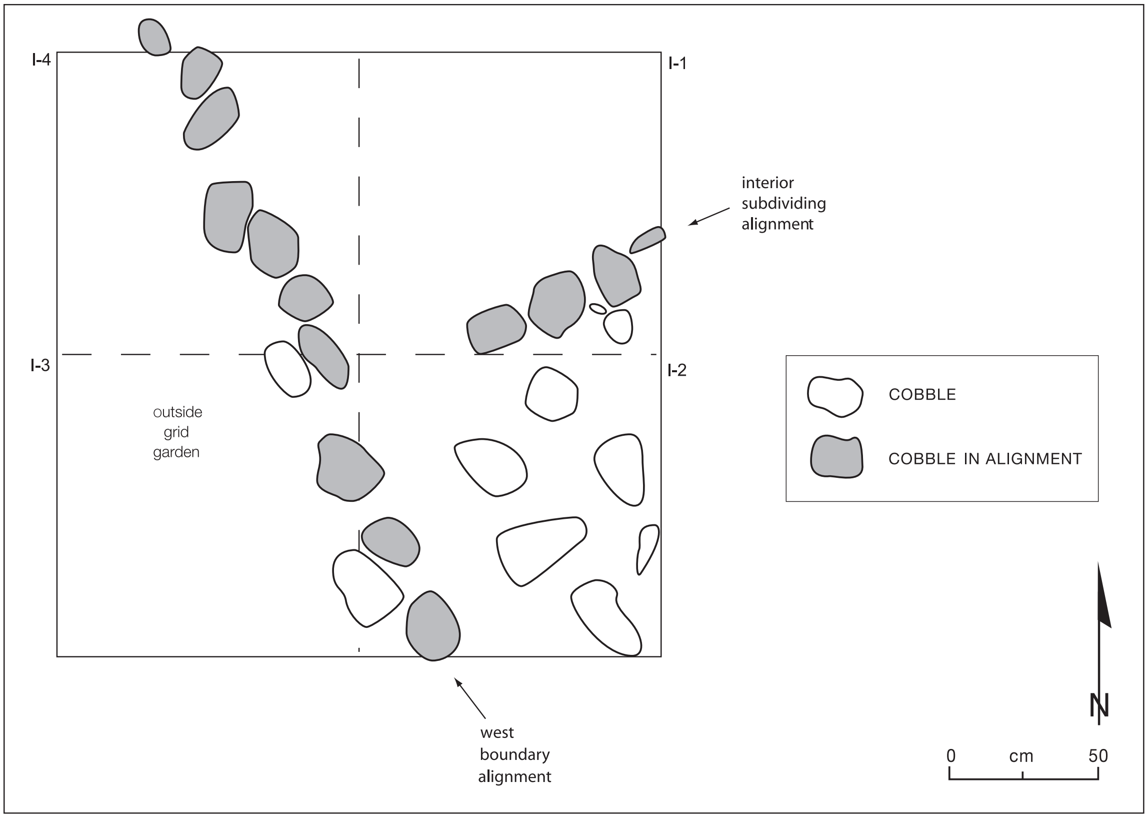


Figure 16.27. Postexcavation plan of EU-I in Feature 15, LA 118547. Shaded rocks are in alignments.

Figure 16.28. Postexcavation view of EU-I in Feature 15, LA 118547.

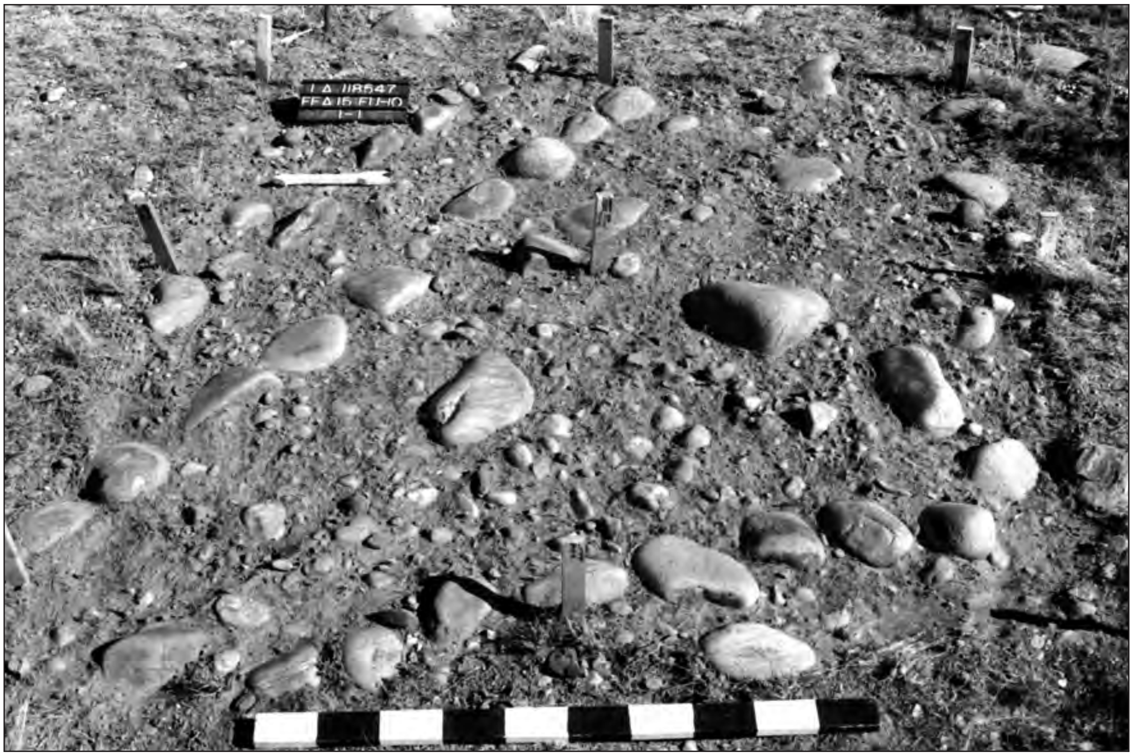


Figure 16.29. EU-J in Feature 15, LA 118547, after the mantle of sediments was removed, showing the surface of the mulch and three cobble alignments.

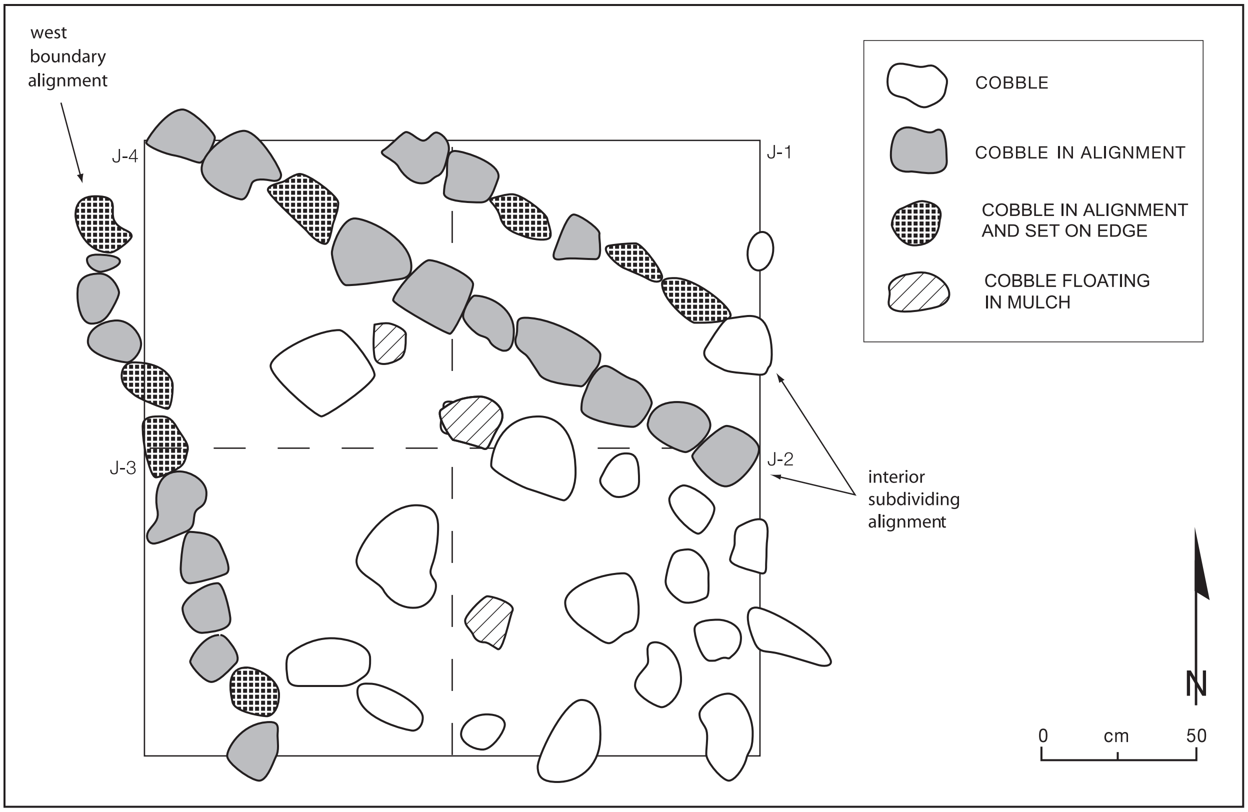


Figure 16.30. Postexcavation plan of EU-J in Feature 15, LA 118547. Shaded rocks are in alignment.

Figure 16.31. Postexcavation view of EU-J in Feature 15, LA 118547.

planting space between the southern interior subdividing alignment and the west boundary alignment varied between 0.6 and 1.6 m wide, and it is almost certain that this plot was larger outside the excavation unit. A series of irregularly spaced cobbles occurred through most of this space. Three of the cobbles in this area seemed to be floating in the gravel mulch, but the remainder rest on the original terrace surface. These elements probably functioned similarly to those that were regularly spaced in other areas.

EU-K was in the central part of Feature 15, 11 m south of EU-J. It was placed across a section of the west boundary alignment and three interior subdividing alignments that were noted during site mapping. Closer examination of the surface before excavation suggested that only the north alignment was real; the others consisted of noncontiguous collections of cobbles. Since part of this unit extended outside the west boundary of the field, only the section within feature boundaries was excavated.

Stratum 1 was an average of 3.8 cm thick in this unit and concealed nearly the entire surface of the mulch. Twelve chipped stone artifacts were recovered from this layer, including five rhyolite core flakes, six pieces of rhyolite angular debris, and one piece of andesite angular debris. The gravel mulch (Stratum 2) averaged 9.8 cm thick and ended on top of a hard, compact, almost clayey soil containing some caliche. Grid K-2 contained about 20 large cobbles floating in the gravel mulch 6–10 cm above the base of the level. Several similar cobbles were also found in the north half of the excavation unit. Stratum 2 contained only one artifact, a Biscuit A sherd. A sample taken from the mulch contained a moderate concentration of corn pollen.

As Figures 16.32 and 16.33 show, two to three alignments were exposed in this excavation unit. Most cobbles were set end-to-end, though a few were placed sideways. Similarly, most cobbles were set on their broadest surfaces, though a few uprights were noted. All alignments were a single element high and wide. Figure 16.32 shows that several large cobbles that were not part of alignments were floating in or on top of the gravel mulch. They may represent a modification of this part of the feature from a simple gravel-mulched area to one containing a series of unevenly spaced, noncontiguous cobbles exposed on the surface. Some of these elements were initially mistaken for sections of interior alignments during mapping, so this part of the feature is not as intricately subdivided as the site plan suggests.

This was a rather complex section of field. The west boundary alignment jogs outward at a point intersected by an interior subdividing alignment. The configuration of these alignments suggests that two separate plots are represented and that they were built at different times. Had construction been concurrent, the boundary alignment would probably be straight, with the interior alignment added after the boundary was complete. Thus, the interior alignment exposed in this area probably served as a boundary alignment until the field was modified. The numerous cobbles floating in gravel mulch add to the complexity of this area and probably indicate another phase of modification, mostly to the zone south of the interior subdividing alignment. Though parts of two plots were exposed, no measurements were possible.

EU-L was in the central part of Feature 15, 8 m south of EU-H. It was placed there to examine a section of interior subdividing alignment near a corner of the west boundary alignment. Examination of the surface suggested the presence of at least one interior subdividing alignment and a large number of irregularly spaced, noncontiguous cobbles.

Stratum 1 was an average of 1.2 cm thick in this unit and concealed much of the mulch surface, especially where it was anchored by grass. The gravel mulch (Stratum 2) averaged 9.4 cm thick and yielded a single chert core flake. A sample taken from the mulch contained a moderate concentration of corn pollen.

As Figures 16.34 and 16.35 show, excavation exposed no alignments in this unit. Instead, numerous irregularly spaced and noncontiguous cobbles were found, many of which rested on the original terrace surface. Perhaps a third of the exposed cobbles were floating in the gravel mulch and represent late additions to the plot or elements in the mulch. This is one of the few areas shown to be less complicated than indicated by the surface configuration of cobbles. Part of a single plot was exposed in this excavation unit, and no measurements of it were possible.

Backhoe Trench 1 was placed near the north-

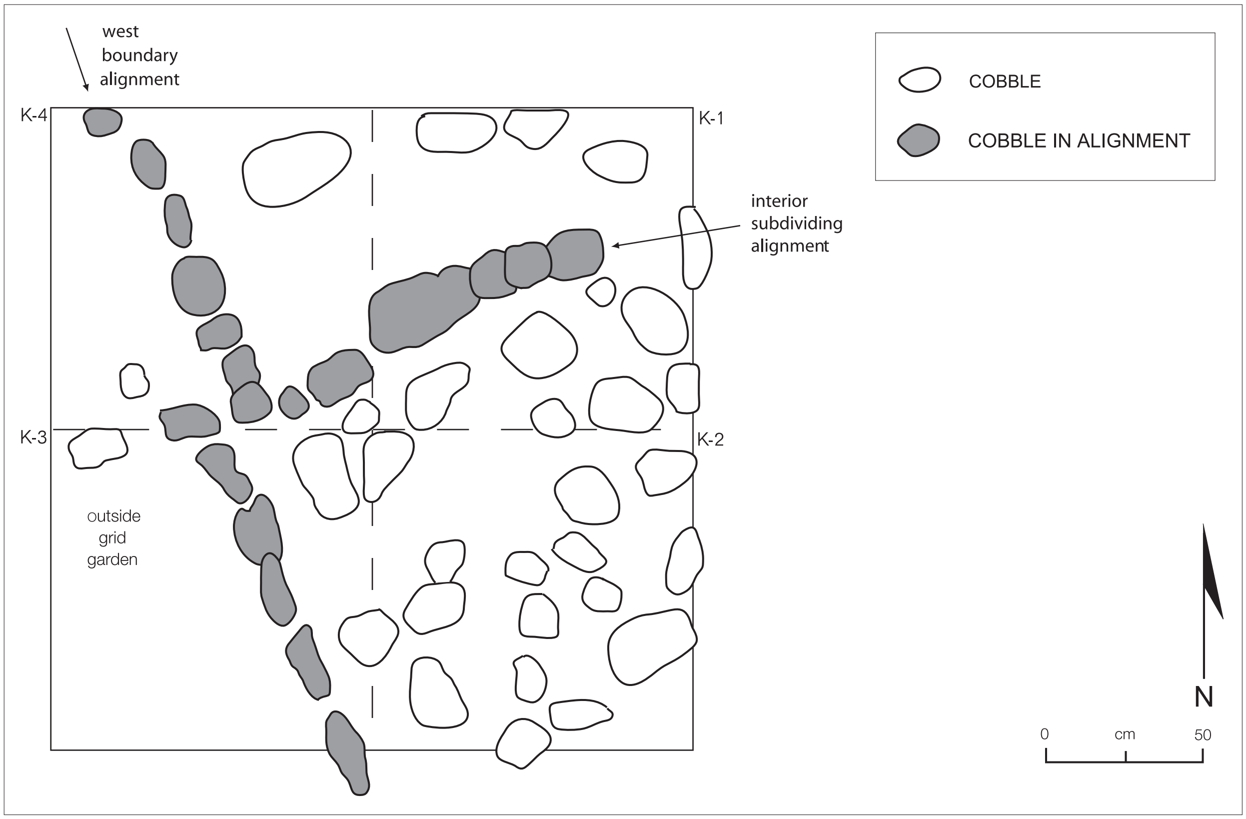


Figure 16.32. Postexcavation plan of EU-K in Feature 15, LA 118547.

Figure 16.33. Postexcavation view of EU-K in Feature 15, LA 118547.

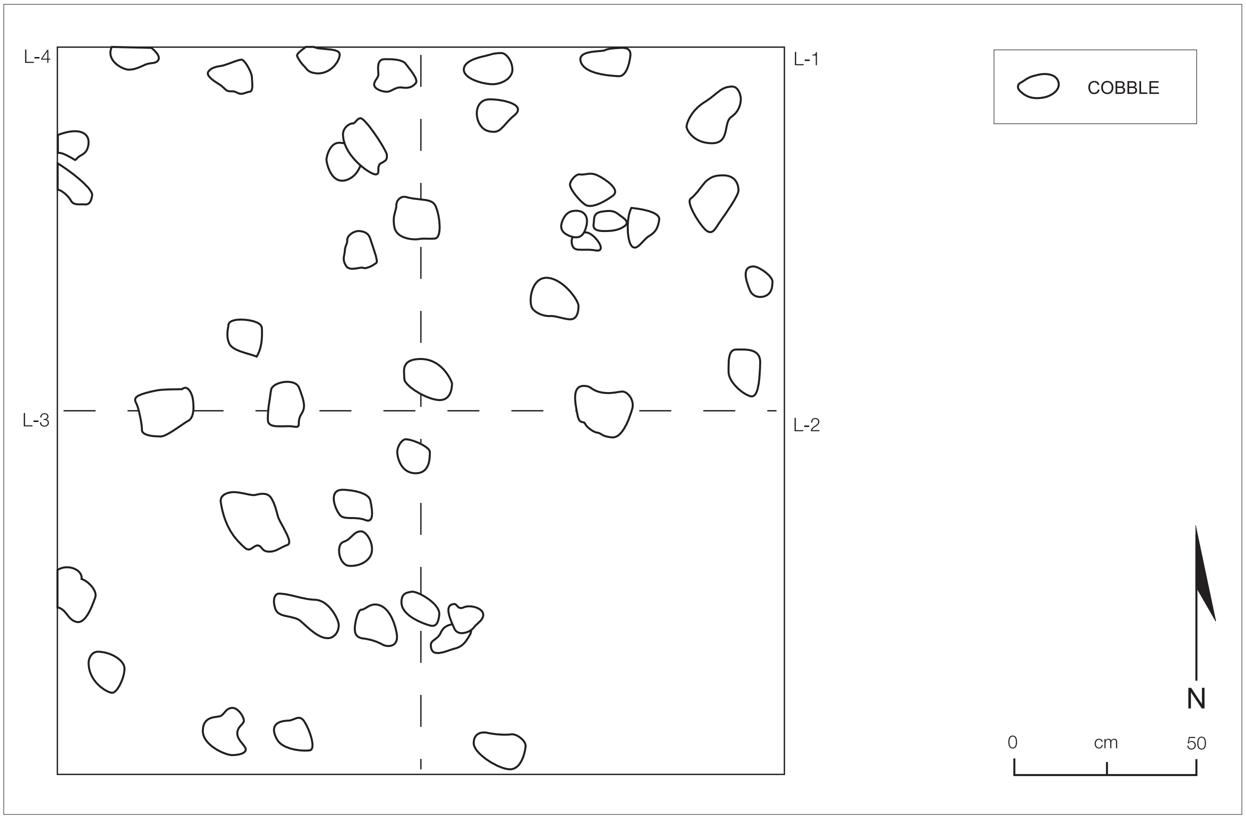


Figure 16.34. Postexcavation plan of EU-L in Feature 15, LA 118547.

Figure 16.35. Postexcavation view of EU-L in Feature 15, LA 118547.

east corner of Feature 15 to examine the structure of natural terrace fill and how the artificially constructed field articulated and compared with it (Fig. 16.2). A 3.4 m long section of the upper terrace sediments was exposed in this trench (Fig. 16.36). The gravel mulch was about 10 cm thick in this area and was distinguishable from the natural terrace fill it partly covered. The uppermost layer of terrace fill (Stratum 3) was a semicompact brown clayey loam containing numerous gravels and cobbles. The lowermost terrace fill layer exposed in the trench (Stratum 4) was a light yellowish brown clayey soil containing numerous gravels and cobbles and a great deal of caliche. A sample taken from the mulch contained a high concentration of corn pollen.

Backhoe Trench 4 was placed in the north-central part of Feature 15 to examine the structure of terrace fill and how the artificially constructed field articulated and compared with it (Fig. 16.2). A 3.2 m long section of upper terrace sediments was exposed in this trench (Fig. 16.37). The gravel mulch was about 12 cm thick in this area and was distinguishable from the layer of terrace fill that it partly covered. However, these strata graded together because the west boundary alignment of Feature 15 was eroded and sediments had washed downslope. The uppermost terrace fill stratum (Stratum 3) was a compact brown clayey loam containing numerous gravels and cobbles. Pea gravels were more common in this layer than they were in the adjacent gravel mulch, and some caliche deposits were noted. The lowermost terrace fill stratum exposed (Stratum 4) was a light yellowish brown clayey soil containing numerous gravels and cobbles and a great deal of caliche.

Summary of Findings

Examination of the surface expression of features at LA 118547 combined with information gathered during excavation provide several insights into the structure and use of this farming site. Surface observations suggested that these fields were built over time rather than in one construction episode. Two tiers of fields were defined, one near the edge of the terrace and a second behind it toward the terrace interior. The terrace-edge tier was built first and was affected by construction of the second tier. Boundary (and possibly interior) alignments are often obscured or absent in the terrace-edge tier, especially in areas adjacent to the terrace-interior tier of fields. This may be due to material scavenging and reuse in which some of the elements used to build alignments for the terrace-edge tier were reused in the terrace-interior tier. Most terrace-edge borrow pits also appear to be associated with the terrace-edge tier of fields, though some were probably used or reused during later construction episodes.

The terrace-interior tier of fields is better preserved than those at the terrace edge and often overlaps them, exhibiting a distinct mounding

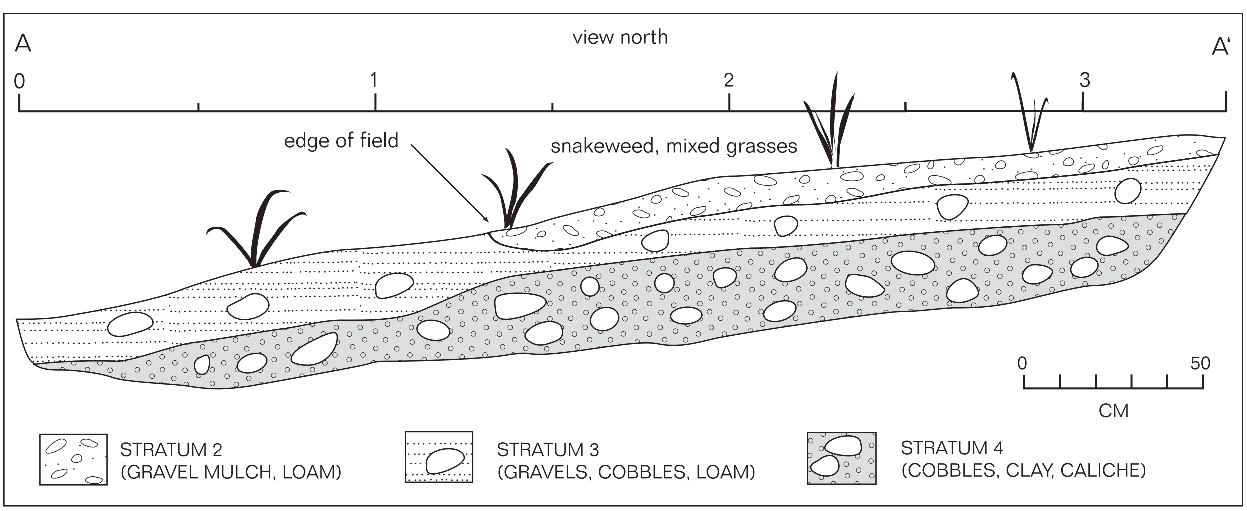


Figure 16.36. Profile of the north wall of Backhoe Trench 1 in Feature 15, LA 118547.

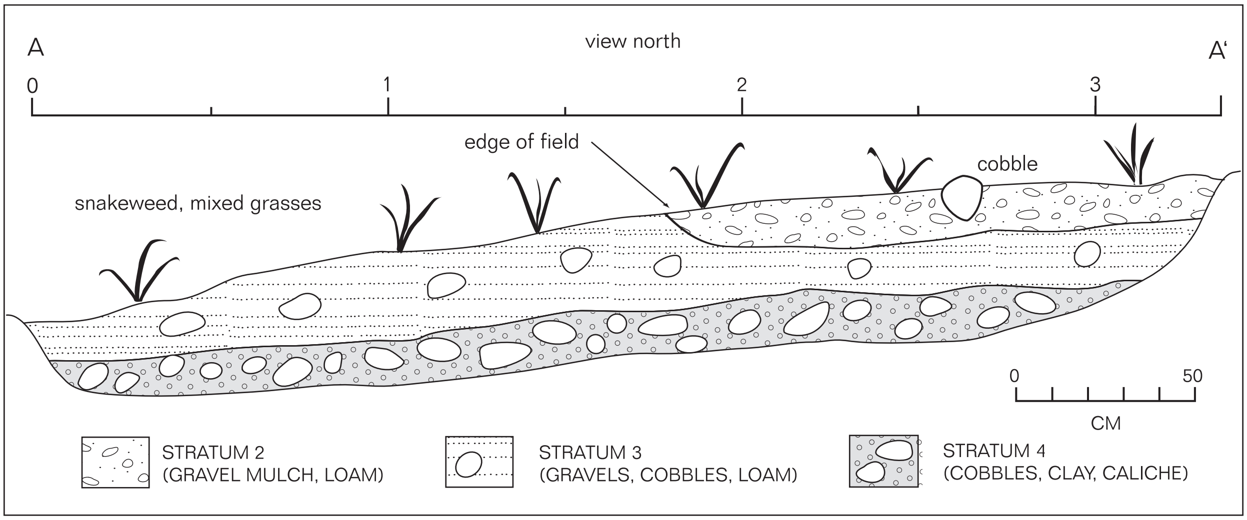


Figure 16.37. Profile of the north wall of Backhoe Trench 4 in Feature 15, LA 118547.

above the earlier field surfaces. The close association of terrace-interior borrow pits with this tier of fields suggests that they were used to obtain materials for constructing the terrace-interior fields. An interesting and potentially significant difference between the two tiers of fields is in their continuity. Fields are continuous along the terrace edge, exhibiting few breaks that are observable from the surface. Fields are more discrete in the interior tier and are not distributed continuously across the site. Indeed, breaks between these plots are quite visible and usually consist of exposures of the original terrace surface.

Some of excavation units provided data that shed light on construction of the terrace-edge fields. EU-G exposed a corner in the west boundary alignment (Fig. 16.24). The lack of any corresponding interior subdividing alignment in articulation with the corner suggests that it probably does not represent an area of accretional growth. In this case the field edge was being stepped back in reaction to variation in elevation at the edge of the terrace. In contrast, however, is EU-J (Fig. 16.30). In this instance, a jog in the west boundary alignment is matched with an interior subdividing alignment, suggesting that this represents an area of accretional growth. One of the plots in this area was added to an existing section of field, and the west boundary alignment simply did not match from one plot to the next, resulting in the jog. While only one such example was found by excavation, circumstantial evidence also suggests that the terrace-edge fields grew accretionally. Eventually, at least some were apparently abandoned and replaced by fields on the terrace interior.

Excavation showed that field structure was usually more complex than surface observations indicated. Some areas were highly subdivided into long, narrow, parallel plots, especially at the north end of Feature 15. Other plots seemed to be wider in proportion to their lengths, but without complete excavation of these areas exact measurement was impossible. Several areas contained collections of noncontiguous and irregularly spaced cobbles and small boulders. Generally, most of these elements rested on the original terrace surface, suggesting that they were purposely placed. Adjacent plots were configured differently in at least one case (EU-I; Fig. 16.27), where one plot contained numerous irregularly spaced cobbles and the other had none. Large cobbles were sometimes found to be floating in the gravel mulch, and could be indicative of intentional placement after fields were built, suggesting feature remodeling to create a new configuration.

One of the most important observations made, however, is that the surface configuration of farming features is usually indicative of feature structure, but cannot always be trusted. Alignments exposed by excavation were not always visible from the surface. In some cases, alignments defined from surface observations did not really exist. Thus, while surface mapping of farming features like these can provide a large amount of data, only excavation can yield more specific and accurate information on feature structure.

Artifacts were recovered from both strata encountered in excavation units. Materials found in Stratum 1 postdate the construction and possibly use of farming features at this site. This is especially true of the Euroamerican sherd recovered from Stratum 1 in EU-B. Artifacts from Stratum 2 either came from the materials used to build the features, were present on the surface when fields were built and therefore predate their construction, or were deposited as the features were being used or built. Evidence from EU-C and EU-D suggest that quarrying activities definitely occurred in places along the terrace edge before farming features were built, and the chipped stone artifacts recovered from the lowermost few centimeters in those units represent those earlier reduction activities. Some artifacts found in Stratum 2 may have come from the surface of the borrow pits from which mulch was obtained. However, it is more likely that most of the artifacts recovered from Stratum 2 (with the exception of those already discussed) were deposited when the fields were in use and reached their subsurface location through natural processes. Since a few sherds of both Biscuit A and B were recovered from the layer of mulch, these features were most likely built and used during the Classic period, and possibly during the later part of the Classic period.

Chapter 17. LA 118549

James L. Moore

LA 118549 is a long linear feature defined as a prehistoric trail, which was initially recorded by Levine (1997) after field studies began. Through the years, the trail has been broken into numerous segments by erosion and construction activities. Most segments noted are within the U.S. 285 right-of-way and traverse the west slope of the terrace that borders the east edge of the Ojo Caliente Valley (Fig. 17.1). In places the trail leaves the right-of-way, but perhaps 95 percent was within project limits. The main exceptions are where the trail ascends to the terrace top or the terrace is cut by large secondary drainages. In the former case the trail sometimes meanders out of project limits for short distances but tends to hug the terrace edge within the right-of-way. In the latter cases it usually curves up tributary valleys, often extending a short distance out of project limits and descending to the valley floor where it can no longer be traced. LA 118549 is visible for a distance of at least 9.2 km, including most of the length of this project. It continues south out of the study area past the Classic period village of Ponsipa'akeri. We found no evidence that the trail continues north beyond project limits.

Field Procedures

A sample of segments adjacent to the farming sites recorded during this project and within project limits was examined and described. Each of these segments was mapped along with features on the adjacent farming sites. Segments were then examined by pedestrian survey, their physical characteristics were recorded and described, and associated artifacts were collected. Subsurface investigations were limited to two mechanically excavated trenches along a segment of the trail south of LA 105710. Profiles of both trenches were drawn, but materials removed during excavation were not screened.

Segments

Trail segments were identified adjacent to seven of the nine farming sites. The southernmost segment was next to LA 118547, and the northernmost was adjacent to LA 105713. Unfortunately, modern disturbances at LA 105703 and LA 105704 have eradicated the trail in those areas, and it is no longer visible on the ground or in aerial photographs. Segments are described from south to north along the right-of-way. Aerial photographs of the project area taken in 1972 were furnished by the NMDOT, and unscaled sections of these photographs are used to illustrate the route of LA 118549 along recorded segments.

The trail was visible far to the south of the project area, but that section was not examined on the ground or described. However, LA 118549 was traced as far south as Arroyo del Pueblo, which is directly south of the ancestral Tewa village of Ponsipa'akeri. In our project area, this part of the trail is divided into discrete segments by deeply incised drainages and remains visible on the west terrace slope at the east edge of the Ojo Caliente Valley but disappears where it descends into drainages. Segments adjacent to LA 105705, LA 105706, LA 105707, and LA 105708 are on State Trust land administered by the State of New Mexico Land Office. Segments adjacent to LA 105709, LA 105713, and LA 118547 are on land administered by the USDI Bureau of Land Management.

Segment adjacent to LA 118547

The segment of LA 118549 adjacent to LA 118547 ran along the west slope of the terrace that forms the east edge of the Ojo Caliente Valley. This segment was bordered on the north and south by deeply incised drainages that have dissected the terrace edge. Though the southernmost section of this segment had been removed by construction when data recovery began, part of its route can be reconstructed using aerial photographs. As

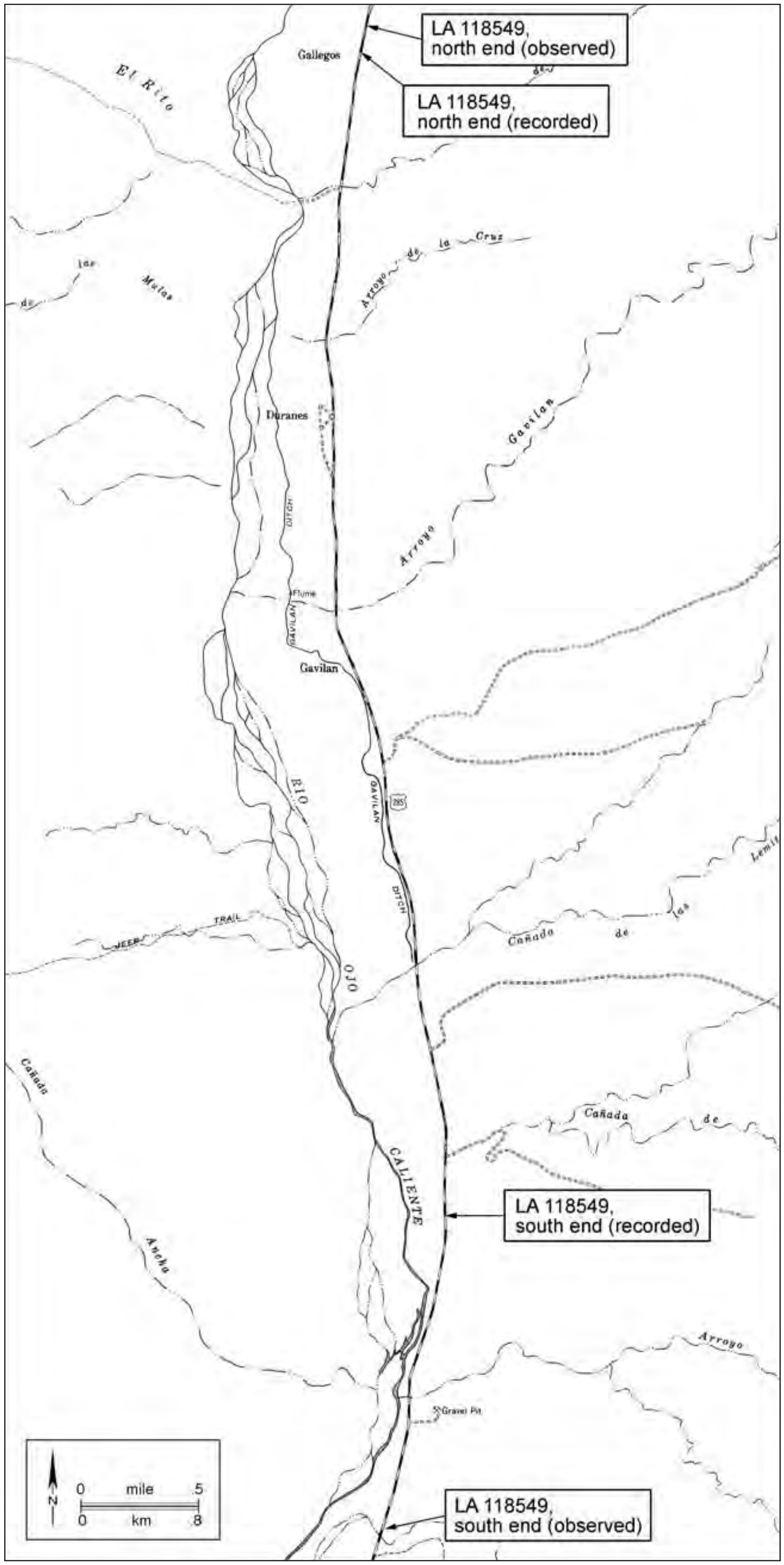


Figure 17.1. LA 118549, with observed and recorded end points.

Figure 17.2 shows, the trail first appeared next to LA 118547 about halfway up the terrace slope, originating in an eroded cutbank. A section of trail is also visible at the south end of the photo, running along the edge of LA 118548—another farming site just outside project limits. The trail swung east when it reached the deeply incised drainage that separates LA 118548 and LA 118549, crossing the valley bottom and curving back to the west before again ascending the terrace slope. This method of crossing drainages was used repeatedly along the trail.

The south 140 m of this segment was removed by construction before data recovery began. We could begin tracing the trail just west of a point parallel with Feature 22 on LA 118547 (see Fig. 16.1). At that point, the trail was about halfway up the terrace slope and, as Figure 17.2 shows, it had maintained that elevation from the time it leveled off after ascending the slope. Where it began, the trail was 1.2 m wide and was incised 15–20 cm deep by erosion. Two parallel shallow gullies cut through the trail 6–10 m north of that point, and a section was missing. Beyond the missing section the trail was no longer incised into the slope and formed a narrow shelf about 1.1 m wide, which soon widened to 1.4 m. Whether the trail attained this configuration through use or active modification of the slope is uncertain. However, since cobbles and boulders were obviously cleared from the trail (Fig. 17.3), both processes were probably factors in creating its current form.

A section of trail was modified to drain into a modern culvert about halfway along this segment (Fig. 16.1). Close examination of this area showed that the trail actually continued unbroken above the culvert, but that section was indistinct and was not visible on aerial photographs. This short section was 1.2 m wide and incised only about 5 cm into the terrace slope. At the south end of the area modified by the culvert, the trail split, and a segment ascended the terrace slope and emerged on top at Feature 11, a terrace-edge borrow pit (Fig. 16.1).

Thirty meters north of the culvert the trail was cut by a drainage that destroyed a 15–18 m long section (Fig. 16.1). An unmortared cobble wall about 1.5 m high and of probable historic age spanned part of this gap, creating a barrier to further erosion (Fig. 17.4). It also created a level area in the drainage, and the trail was redirected slightly to the east around the wall. At this point the trail was a bit below the midpoint of the slope. While the wall may simply have been built to halt downcutting and protect the main road in the bottom of the valley, the detour of the trail around it suggests that use of LA 118549 as a traffic corridor may have continued into the historic period.

Beyond the detour the trail widened to 1.5 m and again had a shelflike cross section and was mostly clear of cobbles (Fig. 17.5). However, colluvial movement resulted in the deposition of some debris on the trail, especially on the east edge, so it may have originally been even wider through this area. About 45 m north of the retaining wall, a cobble alignment 0.45 m wide and 10 m long crossed the trail at a perpendicular (Fig. 17.6). This alignment was two elements wide and was probably not associated with prehistoric use of the trail. We made this assumption because the alignment of cobbles lines up fairly well with a fence on the west side of U.S. 285, so it may represent a property boundary marker.

A drainage cut through the trail 27 m north of the cobble alignment, eradicating a 6–8 m long section (Fig. 16.1). Beyond this drainage the trail retained the same cross section but widened to 1.7 m. About 90 m north of this drainage the trail was cut by another gully, beyond which it was offset toward the terrace top (Fig. 16.1). The gully destroyed any evidence of a connection between these sections. The upper section was 1.4–1.5 m wide and had a low berm that was 10–20 cm high on the downslope side and disappeared after 15 m. This section was nearly two-thirds of the way up the slope, which was the closest the main trail came to the terrace top along this segment. As usual, the surface of this section of trail was nearly devoid of cobbles.

As the trail reached the northwest corner of the terrace finger occupied by LA 118547, it curved eastward around the slope, beginning its descent to the valley floor (Fig. 17.7). The segment ended at Forest Road 556. As was the case at the south end, the missing section of trail curved up the valley for a short distance then crossed the drainage before curving west around the terrace edge on the other side of the valley and heading back upslope to form the segment that ran parallel to LA 105709.

Figure 17.2. Aerial photograph showing the south part of LA 118549, adjacent to LA 118547.

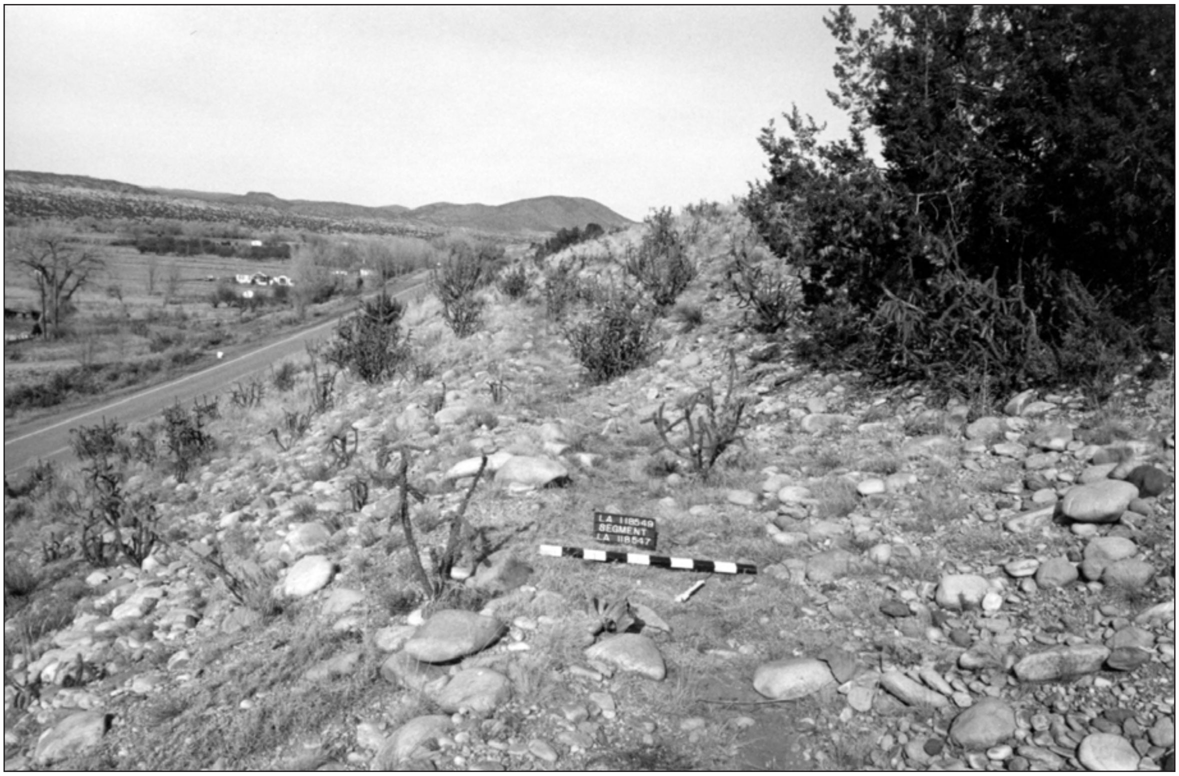


Figure 17.3. The segment of LA 118549 adjacent to LA 118547, illustrating the shelflike cross section of the trail and how it has been cleared of rocks.

Figure 17.4. Probable historic retaining wall built with unmortared cobbles to partly block a drainage cutting through the trail, LA 118547.

Figure 17.5. The north part of the segment of LA 118549 adjacent to LA 118547, showing its shelflike cross section and how it has been cleared of rocks.

Figure 17.6. Cobble alignment crossing the trail along the segment adjacent to LA 118547.

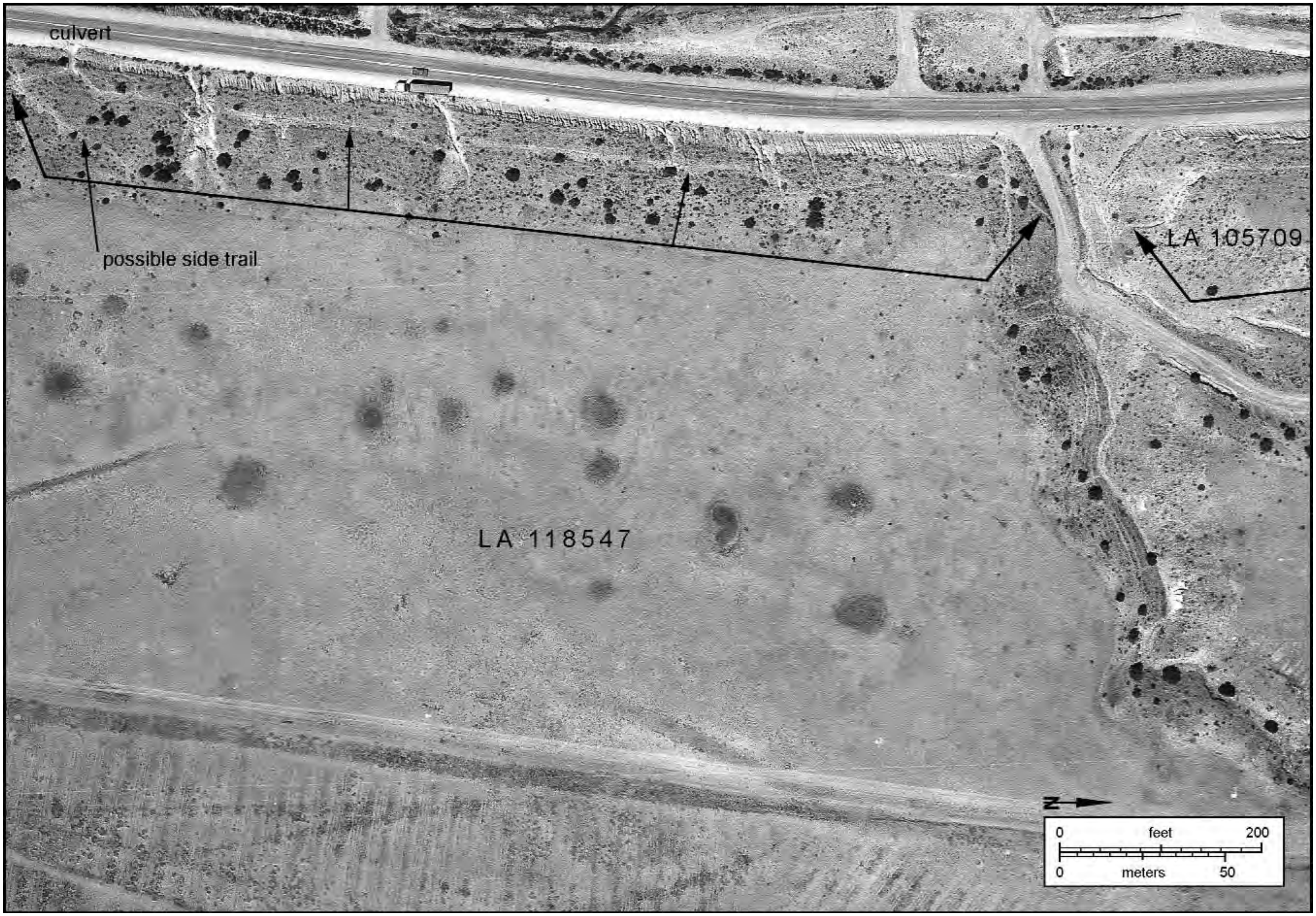


Figure 17.7. Aerial photograph showing the north part of the segment of LA 118549 adjacent to LA 118547.

Ten chipped stone artifacts were collected from this section of trail (Table 17.1). Rhyolite was the most abundant material, comprising 80 percent of this small assemblage. All three materials recovered from this segment are locally available in gravel deposits, and the types of artifacts recovered suggest that they were created by raw-material quarrying.

Segment adjacent to LA 105709

As noted above, the segment of LA 118549 adjacent to LA 105709 was essentially contiguous with the segment that paralleled LA 118547, with a short break in the bottom of the valley that separated those sites. While the section of trail that ascended the terrace slope at the south end of the terrace finger occupied by LA 105709 is clearly visible on the aerial photograph (Figs. 17.7 and 17.8), it was more difficult to define on the ground because it had been used and essentially eradicated by ATV traffic and now forms a distinct gully.

After ascending about four-fifths of the way up the terrace slope, the trail leveled off about 2.5 m below the terrace top and ran north-northwest along the west terrace slope. Through this area the trail formed a shallow swale that was about 1.75 m wide, including a distinct berm on the downslope side. The berm was 0.25–0.30 m high and seemed to be comprised mostly of cobbles and gravels removed from the swale and piled along the outer edge of the trail. The bottom of the swale was mostly devoid of cobbles except for those that had washed in from above. In some places the trail widened to about 2 m, and the berm was similarly higher at 0.30–0.40 m.

The trail almost immediately began to wind upward, paralleling the terrace edge and ascending to the terrace top near Feature 3 at LA 105709 (Fig. 13.1). Through this area the trail remained about 2 m wide, and the berm was 0.30–0.40 m high (Fig. 17.8). The trail remained on top of the terrace and closely paralleled its west edge until it reached a point about 30 m south of a large shrine, Feature 9, at LA 105709 (see Fig. 13.1). At this point the trail began descending from the terrace top and continued to be paralleled on its downslope side by a berm (Figs. 17.9 and 17.10). Erosion has deepened the trail by 15–20 cm through this area. By the time the trail was below Feature 9 it had descended about a third of the way down the slope. The berm disappeared at about that point, and the cross section of the trail became shelflike rather than a shallow swale. The trail continued to descend until it was two-thirds of the way down the terrace slope, where it leveled off.

Small gullies occasionally cut through the trail in this section, eradicating short stretches. The trail was also not as wide through this section as it was on top of the terrace, narrowing to 1.5 m. Colluvial wash had deposited sediments, gravels, and cobbles on much of this section of trail, nearly obscuring it in places. As the trail passed the north edge of Feature 12 at LA 105709 (Fig. 13.1) it began another gentle descent, ending near the foundations of the García store at LA 105710 (Fig. 17.8). From this point to the north edge of Hilltop Pueblo (LA 66288), the trail may

Table 17.1. Chipped stone artifacts collected from within the highway right-of-way at segments of LA 118549 (material type by artifact morphology)

Segment Is Next To	Material Type	Angular Debris	Core Flakes	Cores
LA 105707	Chert	-	1	-
	Pedernal chert	-	-	1
	Rhyolite	11	19	4
LA 105708	Rhyolite	3	5	2
LA 105709	Rhyolite	5	5	1
LA 105713	Rhyolite	4	6	5
	Andesite	-	1	-
LA 118547	Rhyolite	3	4	1
	Andesite	1	-	-
	Quartzite	-	-	1

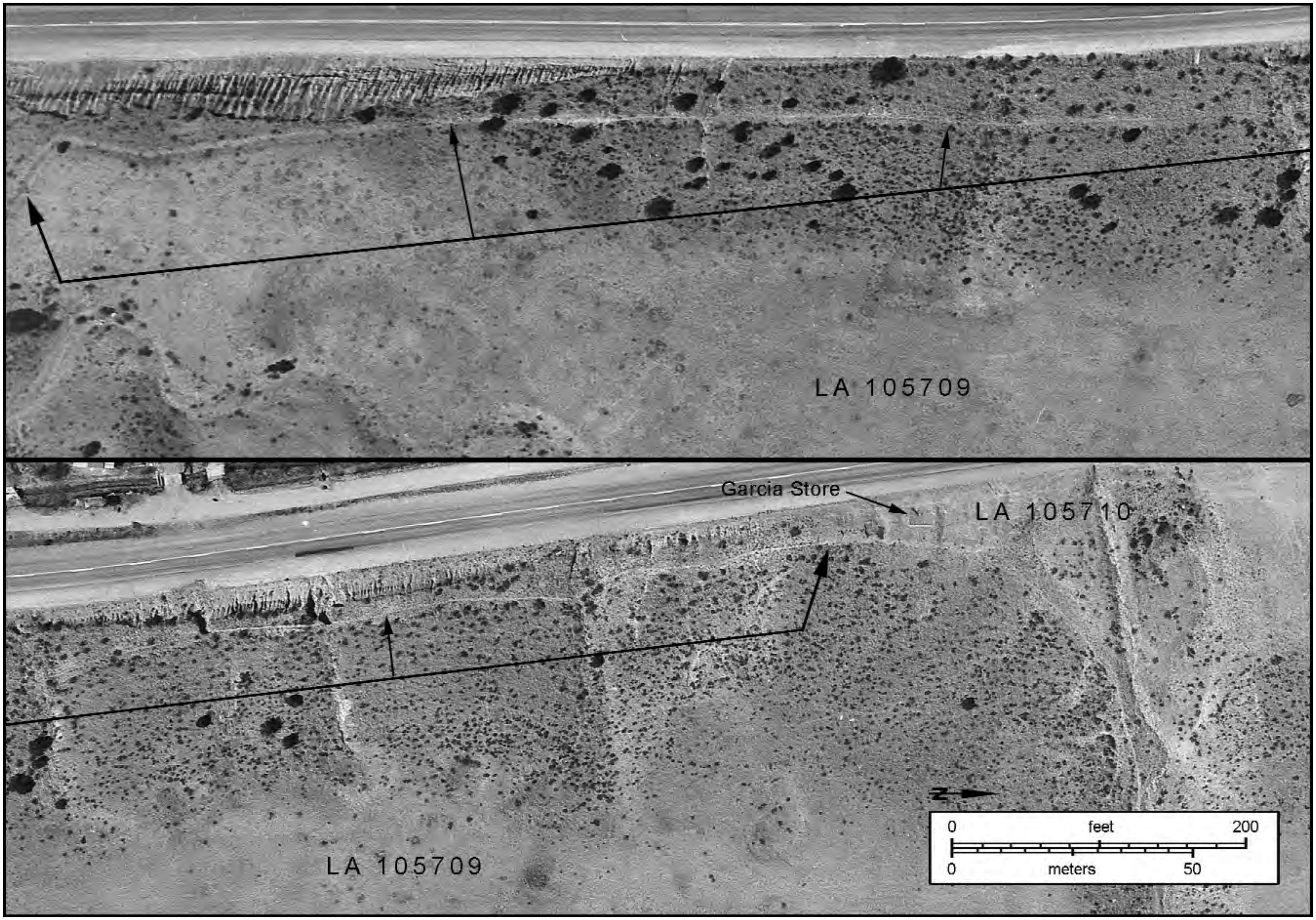


Figure 17.8. Aerial photograph showing the segment of LA 118549 adjacent to LA 105709.

Figure 17.9. South end of segment of LA 118549 adjacent to LA 105709, showing how it followed the contours up to the top of the terrace. Note the distinct berm on the downslope side and the swalelike cross section.

Figure 17.10. Segment of LA 118549 adjacent to LA 105709, showing the descent of the trail from the terrace top and the berm along its downslope side.

have followed the base of the terrace slope, but any evidence of its route through that area has been eradicated by a variety of later historic activities. Another possibility is that the ancestral Tewa villages of Nute and Hilltop Pueblo represented a terminus for this section of trail, and it simply disappeared into an activity zone that surrounded those large residential sites. In any event, there is a large gap in the trail between the segment adjacent to LA 105709 and the next segment adjacent to LA 105708 on the north side of the Arroyo de Gavilan.

Eleven chipped stone artifacts were collected from this section of trail (Table 17.1). All are rhyolite, which is locally available in gravel deposits, and the types of artifacts recovered suggest that they resulted from raw-material quarrying.

Segment adjacent to LA 105708

This segment of trail began at the edge of a deep drainage at the south end of LA 105708. The drainage separates LA 105708 and a series of unrecorded farming features on a terrace finger to the south of that site. These features were not recorded because they were well outside project limits and would not be affected by construction activities. As Figure 17.11 shows, the trail continued south past the terrace finger that contains the unrecorded features and originated at the north edge of the valley formed by Arroyo de Gavilan.

Much of the section of trail that originally ascended the terrace slope at the south edge of LA 105708 had washed away, and the remaining ascending section was deeply eroded (Fig. 17.12). This section of trail ran about 75 m north across a shelf that was 5 m below the top of the terrace, crossing behind (east of) Feature 3 at LA 105708 (see Fig. 12.1). The trail was about 2 m wide through this area, and a berm that was 0.2 m high and 1 m wide ran along its west edge. This part of the trail, a shallow swale in cross section, was mostly devoid of rocks but had been heavily disturbed by rodent activity.

The trail began sloping upward at the north end of Feature 3 (Fig. 12.1). The berm ended at that point, and the trail cross section became shelflike. Materials that were removed or dislodged from this section were deposited directly adjacent to the downslope side of the trail but did not form a berm. This section continued for about 15 m until the trail began to ascend the slope to the terrace top. It was only 1.2–1.3 m wide through this area, and as the ascent began, the berm again appeared and was quite distinct by the time the trail reached the top of the terrace next to Feature 11 at LA 105708, an elaborate double terrace-edge borrow pit (Fig. 12.1). The berm was 0.25–0.30 m high and 1 m wide in this section.

The trail crossed the terrace top west of Feature 11 and almost immediately began to descend again. The berm disappeared at this point, and the trail resumed a shelflike appearance. Soon after the descent began, a 10–15 m long section was removed by a gully that headed in Feature 12 on LA 105708, a terrace-edge borrow pit. The trail was cut 0.2–0.3 m deep from this point until it leveled off near the base of the slope (Fig. 17.13). It remained near the base of the slope for the next 80–100 m. This section of trail continued to have a shelflike cross section, was 1.5 m wide, and was cut by numerous small gullies. The trail then ascended to perhaps a quarter of the way up the slope until it neared the end of the terrace finger occupied by LA 105708, where it ascended until it was one-third of the way up the slope, then curved east around the end of the terrace and disappeared at the drainage that separates LA 105708 from LA 105705 (Fig. 17.14). As the curve around the northwest edge of the terrace finger began, a possible side trail split from the main trail, heading southeast toward the terrace top. While this side trail may have been used prehistorically, it could also be a historic game trail. The side trail seems to continue downslope to the valley bottom, potentially eliminating it as a prehistoric feature and confirming it as a path used by game or livestock (Fig. 17.11).

Ten chipped stone artifacts were collected from this section of trail (Table 17.1). All are rhyolite, which is locally available in gravel deposits, and the types of artifacts recovered suggest that they result from raw-material quarrying.

Segment adjacent to LA 105705

This segment of trail curved up the southwest corner of the terrace finger occupied by LA 105705 (Fig. 17.15). The trail was incised up to 40 cm deep in that area and had become the head of a gully. The incising ended about two-thirds of

Figure 17.11. Aerial photograph showing the segment of LA 118549 adjacent to the south part of LA 105708.

Figure 17.12. Ascending section of trail at the south end of LA 105708, showing erosional damage.

Figure 17.13. Segment of trail adjacent to LA 105708, showing its descent from the terrace top.

Figure 17.14. Aerial photograph showing the segment of LA 118549 adjacent to the north part of LA 105708 and LA 105705.

Figure 17.15. Trail ascending the terrace slope at the south end of LA 105705, showing how it has become incised into the slope.

the way up the slope, and from that point to just below the terrace top the trail had a shelflike cross section, was fairly indistinct, and was 1.0–1.1 m wide.

Another change in the configuration of the trail began about 2.5 m below the top of the terrace slope. At that point a distinct berm appeared on the downslope side of the trail. The berm was 0.2–0.3 m high and 1.0–1.2 m wide, and the trail adjacent to it formed a swale that was 1.3–1.5 m wide. The berm achieved its maximum height as the trail reached the top of the terrace slope, where it was 0.4–0.5 m high and the trail swale was about the same depth.

As the trail crossed the right-of-way fence it widened to 2 m and became shallower, decreasing to a depth of 0.10–0.15 m (see Fig. 9.1). The berm was only 0.15–0.20 m high through that area. As the trail swung back under the fence into the right-of-way, it almost immediately began to descend the slope (Fig. 9.1). The berm continued for about the first 20 m downslope, then disappeared, and the trail again assumed a shelflike cross section except for short areas that were eroded away. Through this area the trail was 1.3–1.5 m wide.

At the north end of the terrace finger, the trail descended toward the valley floor, curving gently eastward up a small valley, where it was truncated by an unimproved road and small drainage (Fig. 17.14). It disappeared at this point and was no longer visible on the ground. A small side trail might have led up to the north end of LA 105705, diverging from the main trail just north of the modern water tank at LA 105705, slanting southeast upslope toward the water tank and ending in a disturbed zone just below it (Fig. 17.14). The side trail was only about 1 m wide. A possible fork in the side trail is visible in Figure 17.14. An upper section heads toward the water tank and probably represents a modern feature. A lower section seems to have proceeded in a southerly direction to the terrace top. Unlike the possible side trail noted in the segment adjacent to LA 105708, there was no evidence that this side trail continued beyond the main trail into the valley bottom. No artifacts were collected from this segment.

Segment adjacent to LA 105706

There was a discontinuity between this segment and the segment adjacent to LA 105705 caused by erosion through the two drainages that separate those sites (Fig. 17.16). As noted above, the trail curved east around the northwest corner of the terrace finger occupied by LA 105705, descending into a narrow valley. At that point it disappeared and did not definitely reappear until it ascended the southwest corner of the terrace finger occupied by LA 105706. However, the trail may have run through a shallow notch that was visible near the end of an eroded terrace finger that separated the two drainages between LA 105705 and LA 105706. Unfortunately, extensive erosion in that area made it impossible to confirm this on the ground.

Where it again became visible, the trail curved gently west out of the northernmost of the two drainages that separate LA 105705 from LA 105706 and ascended the terrace slope (Fig. 17.17). This section of trail was about 1.5 m wide. It ascended the terrace slope at a moderate angle and was incised 2–5 cm deep by erosion. This section of trail had a shelflike cross section and was moderately clear of rocks and cobbles, though some debris had eroded down onto it. The highest point reached by this section was about three-quarters of the way up the terrace slope, and through that area the trail was 1.4–1.5 m wide and 2–3 cm deep. No berming was noted, so the slight depression probably resulted from use.

At the north end of the terrace finger the trail again began to descend the slope. This section was mostly concealed beneath cobbles moved downslope by colluvial wash and was fairly indistinct, so no measurement of width could be obtained. When the trail again became visible at ground level and was clear of debris, it was only one-third of the way up the slope. It retained its shelflike cross section and was 1.2–1.3 m wide. The trail continued to descend the slope fairly rapidly and was slightly incised (ca. 3–5 cm deep) up to the point where it was truncated by a drainage and disappeared. No artifacts were collected from this segment.

Segment adjacent to LA 105707

There was a short break between this segment and the segment adjacent to LA 105706 that resulted from truncation of the end of the terrace finger occupied by LA 105707 by the U.S. 285 roadcut. Thus, this segment of trail began near the top of the terrace slope at the edge of the roadcut (Fig. 17.18) and originally ascended the terrace slope from the south (see Fig. 11.1). The section of trail that crossed the terrace top formed a shallow swale about 0.10–0.12 m deep and 2 m wide at the edge of the roadcut and paralleled the right-of-way fence (Fig. 17.16). The downslope edge was bermed, but most of the berm was removed by the roadcut. Where most intact, the berm was about 0.2 m high and 1.5+ m wide.

After passing Feature 1 on LA 105707 (Fig. 11.1), the trail began to descend the terrace slope at a moderately steep angle. This section was only about 1 m wide and was incised 0.10–0.15 m deep by erosion. There was no evidence of a berm through this area. While the section of trail on top of the terrace was mostly clear of rock, this section was fairly choked by debris, a consequence of colluvial movement.

Runoff down the descending section of trail turned it into a gully. The trail leveled off about halfway down the slope, and at that point the gully cut through the outer edge of the trail, forming an incised channel. Beyond that point the trail followed the same contour for some distance, had a shelflike cross section, and was 1.5 m wide. Though this part of the trail was fairly clear of debris, several small gullies cut through it and erased short sections. About 30 m beyond the point where it leveled off the trail narrowed to 0.75–1.0 m wide. From that point on it was choked with colluvial debris that covered the uphill (east) edge and probably caused the narrowing. While the trail was visible at ground level through this area, it was not quite as distinct as elsewhere. This section remained fairly level and at the approximate midpoint of the terrace slope.

The final section of this segment began when the trail reached the end of the terrace finger and began to descend the slope at a moderate angle. This section was cut by several gullies and was mostly covered by colluvial debris, reducing its visibility considerably. The trail passed under the

Figure 17.16. Aerial photograph of the segments of LA 118549 adjacent to LA 105706 and LA 105707.

Figure 17.17. Trail ascending the terrace slope at the south end of LA 105706.

Figure 17.18. The beginning of the segment of LA 118549 adjacent to LA 105707 at the edge of the roadcut.

right-of-way fence at the north end of the terrace finger (Fig. 11.1) and disappeared about 15 m beyond the fence. Though the trail probably crossed the valley formed by Arroyo de la Cruz, that section was removed by erosion in the valley bottom. On the north side of Arroyo de la Cruz, the trail once again became visible, ascending the terrace slope from the east and winding up toward the top (Fig. 17.19).

Thirty-six chipped stone artifacts were collected from this section of trail (Table 17.1). Rhyolite was the most abundant material, comprising about 95 percent of this small assemblage. Rhyolite and various cherts are locally available in gravel deposits. Pedernal chert is not naturally available in this section of the Ojo Caliente Valley and was probably imported from the Chama Valley to the west. The types of artifacts recovered suggest that, with the exception of the Pedernal chert core, they resulted from raw-material quarrying.

Segment adjacent to LA 105713

Though the trail segment between the Arroyo de la Cruz just north of LA 105707 and LA 105713 was not examined in detail on the ground, it was more or less continuous between those sites (Fig. 17.19). The segment of trail adjacent to LA 105713 was the northernmost part of LA 118549 that was examined in detail. This segment was confined to the west edge of the terrace finger occupied by LA 105713, with discontinuities at both the north and south ends, where deeply incised drainages had eradicated the trail. It began with a section that curved gently upward along the southwest corner of the terrace finger, ascending from the bottom of a drainage to the southeast (Fig. 17.20). This section of trail was severely eroded, so measurements were not possible.

About a third of the way up the slope, the trail leveled off and ran along the west face of the terrace. In this area the trail was about 1.5 m wide and had a shelflike cross section (Fig. 17.21). Soon it again began to gently ascend the terrace slope. This section of trail was mostly clear of debris, but some cobbles and gravels had washed down onto it. As the trail reached the halfway point on the slope, a 5–7 m long segment was covered with colluvial debris. Beyond this point the trail returned to its original configuration (Fig. 17.22) but was only 1.0–1.2 m wide because the east edge was covered by colluvial debris. At the north end of this short section, the trail became difficult to define because it was cut by a gully and mostly covered by colluvial debris.

Short sections of trail remained visible through this area. They were about 1.5 m wide with a shelflike cross section. Other sections were covered by debris or had been erased by gullies (Fig. 17.23). As the trail approached the north end of the terrace, it began ascending the slope more rapidly. Though the ascending section was mostly covered with colluvial debris, it retained its shelflike cross section and remained about 1.5 m wide.

The trail climbed to a point about 2.5 m below the terrace top at the north end of the terrace finger, then leveled off and curved around the northwest corner of the terrace into the next small valley. The level section of trail had a shelflike cross section, and there was no evidence of a berm. From this point the trail descended fairly rapidly toward the northeast for about 20 m. This section was incised 10–15 cm deep by erosion and disappeared into an area covered by colluvial debris. The trail could be followed a short distance north of LA 105713 by sporadic and badly preserved short segments, but it disappeared before LA 105704 was reached. The terminus is probably at Posi'ouinge or further north at Howiri, but modern activities associated with road construction and development of the village of Ojo Caliente have eradicated signs of LA 118549 beyond the northern endpoint shown in Fig. 17.1.

Sixteen chipped stone artifacts were collected from this section of trail (Table 17.1). Rhyolite was the most abundant material, comprising about 94 percent of this small assemblage. Both materials recovered from this segment are locally available in gravel deposits, and the types of artifacts recovered suggest that they resulted from raw-material quarrying.

Summary of Findings

Where it occurred on the terrace slope the trail tended to have a shelflike cross section and was mostly 1.0–1.5 m wide. Where the trail ascended to the terrace top in the recorded segments, the

Figure 17.19. Aerial photograph showing segments of LA 118549 between Arroyo de la Cruz and LA 105713.

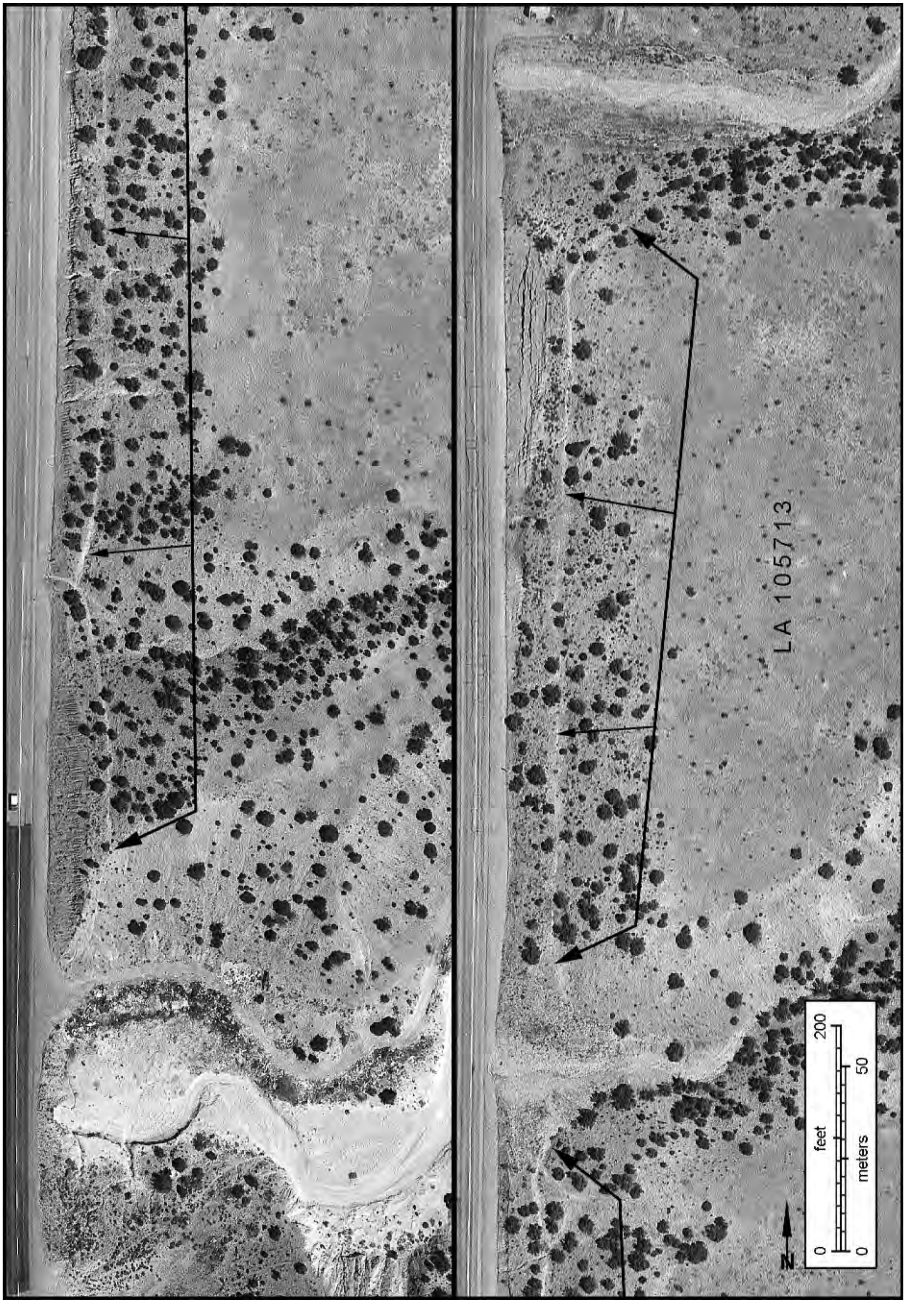


Figure 17.20. Aerial photograph showing the segment of LA 118549 adjacent to LA 105713.

Figure 17.21. Southern section of trail adjacent to LA 105713, showing its shelflike cross section and how it was mostly cleared of rocks.

Figure 17.22. Section of trail adjacent to LA 105713, showing its shelflike cross section and how it has been cleared of rocks.

Figure 17.23. A section of trail adjacent to LA 105713 that can be traced but is mostly covered by colluvial debris.

downslope side was usually bermed, and the surface of the trail was lower than the adjacent terrace, forming a shallow swale. These sections of trail were usually about 2.0 m wide, somewhat wider than those that ran along the slope. The longest and most elaborately bermed terrace top segment noted was near a shrine (Feature 9 at LA 105709).

The trail was cut into segments by numerous erosional channels that drain the terrace and form narrow valleys between fingers along its west edge. Smaller channels cut through trail segments in many places, but enough of the feature remained intact that it could be easily traced. Sections of trail were occasionally transformed into gullies. The trail tends to meander across the west ends of terrace fingers, occasionally ascending to the terrace top and seemingly always descending to the floors of small intervening valleys. There it disappears, only to reappear on the other side of the valley, where it ascends the terrace slope.

Most of our examination of this site was limited to mapping and describing sample segments. However, two mechanically excavated trenches were placed across the trail near LA 105709 and LA 105710. Backhoe Trench 1 was excavated across the section of trail that traverses the terrace top near Feature 6 on LA 105709 (Fig. 13.1). In cross section, this section of trail appears as a shallow swale with a maximum depth of 15 cm and a width of 1.65 m (Fig. 17.24). Two strata were encountered in this trench, an upper layer of yellowish brown colluvium containing some cobbles and gravels, and a lower layer containing numerous cobbles and gravels. Backhoe Trench 2 was excavated across a section of LA 118549 south of the foundations of the García store at LA 105710, just before the trail disappeared into the disturbed zone at that site (Fig. 13.1). In this cross section (Fig. 17.25), the trail had a maximum depth of 7 cm and a width of 1.2 m. Two soil strata were encountered in this trench and were essentially identical to those exposed in Backhoe Trench 1. No evidence of formal construction was noted in either profile.

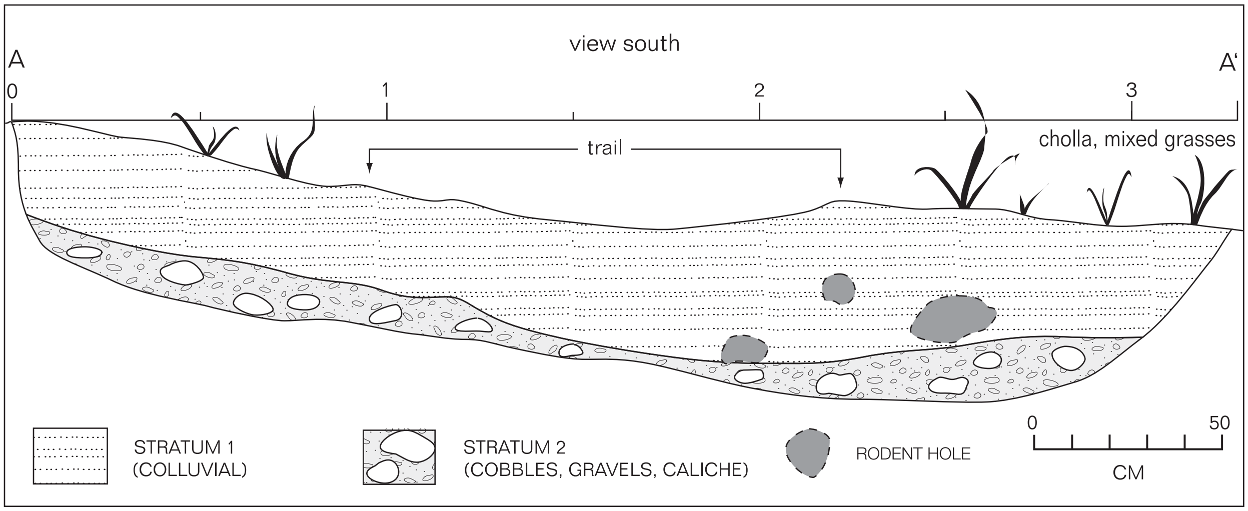


Figure 17.24. Profile of Backhoe Trench 1, LA 118549.

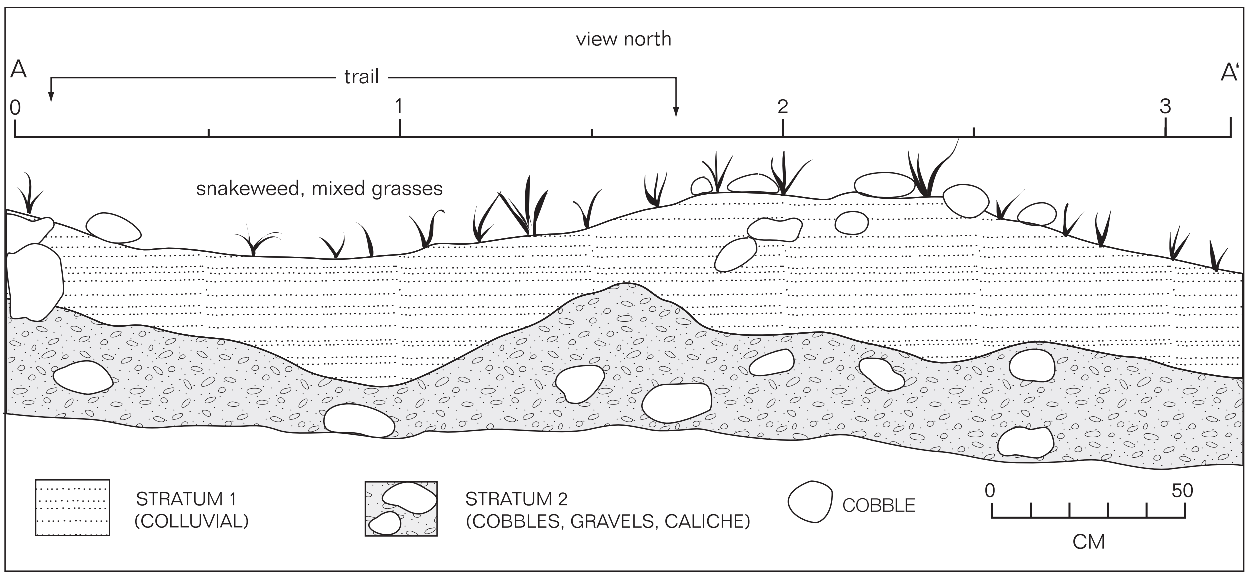


Figure 17.25. Profile of Backhoe Trench 2, LA 118549.

Several lines of evidence suggest that LA 118549 represents a culturally built feature of the prehistoric landscape rather than a historic trail or road-related construct. Interviews with long-term Hispanic residents of the Gavilan area failed to elicit any information concerning LA 118549. There simply seemed to be no folk memory of the trail. Similarly, there is no evidence that a long linear landscape feature of this type was related in any way to road construction. During a field inspection in which several members of the team that was supervising construction along this segment of the highway were shown the sites to aid in protecting them, a section of LA 118549 was pointed out. All agreed that it was not related to road construction. In addition, plans from the initial construction and paving of U.S. 285 in 1939 were obtained and examined (NMSHTD 1939). Nothing remotely resembling the location or configuration of LA 118549 was scheduled for construction in those plans.

In a further attempt to provide a minimum date for LA 118549, two junipers were sectioned within the existing right-of-way in areas scheduled to be removed by slope cuts. One sample was taken from a juniper growing on the east side of the trail below Feature 9 on LA 105709. The second came from the center of the trail below LA 118547. Two counts at different locations were made for the first sample, yielding totals of 80 and 82 rings. The latter was considered the most accurate. Five counts at different locations were made for the second sample, yielding totals of 70, 65, 64, 57, and 56 rings. The first three were considered the most accurate. This sample was very convoluted, and different axes produced different counts because of the way the tree had grown. If LA 118549 was built in conjunction with highway construction, neither tree should predate those building episodes. Since the samples were obtained in 1998, Sample 1 would have begun growing sometime around 1916 to 1918, and Sample 2 around 1928 to 1934. Both trees began growing before the initial construction and paving of U.S. 285, as well as all subsequent road-building episodes.

Harrington (1916) presents a detailed discussion of Tewa ethnogeography, but while he describes numerous trails in the region, there is no mention of any in the Ojo Caliente Valley. This is an interesting omission, but he does note that it was difficult to obtain adequate information on old trails from the Tewas (Harrington 1916:107). Certain ancient trails may have come to be considered sacred, no matter how mundane their original nature might have been. This may have been especially true of trails leading to important shrines or used for ceremonial purposes. One such feature, recorded near San Ildefonso (Moore and Levine 1987), was said to be a sacred hunting trail. Interestingly, that trail was similar in cross section and traversed landforms similar to those crossed by LA 118549.

Harrington (1916:157) notes that the Tewas consider the Ojo Caliente region to be their original homeland. The hot spring at Ojo Caliente is one of the most sacred places in the Tewa world, and it is closely associated with Poseyemu, the Tewa culture hero (Harrington 1916:164). Residents of San Juan Pueblo indicated that they drank water from the hot spring and that this practice probably extended into the past (Harrington 1916:164). The importance extended to the hot spring at Ojo Caliente suggests that visits to that feature were probably common and associated with ritual in prehistoric as well as historic times.

The way in which LA 118549 crosses landforms and certain variations in structure suggests that this trail may have been used for mundane as well as ceremonial purposes. As noted in several segment descriptions, the trail traverses the west face of the terrace that borders the east side of the Ojo Caliente Valley. Whenever it reaches one of the many drainages that dissect that edge of the terrace, the trail curves to the northeast, drops into the valley, and disappears. The trail usually reappears on the opposite side of the valley, curving up the terrace edge to again traverse the west slope. This route seems indicative of foot traffic, with detours up the valleys and, presumably, around the heads of the gullies draining them.

It seems very significant that nearly any time the trail crosses the terrace top it is both wider and more elaborate in form. A berm tends to occur along the downslope side of the trail when it crosses the terrace top, in some cases beginning on the adjacent terrace slope as the trail approaches the top and ending a bit downslope as the trail drops back down to its more usual position. Much of the material used to build the berms probably came from the trail itself, since it often forms a depressed swale in these locations. The most elaborate approaches were seen at LA 105709, where the trail ascended to the terrace top near a shrine then dropped back down the slope just before the shrine was reached. The second example was at LA 105708, where the trail ran past an elaborate borrow pit (Feature 11), which had a second pit in its center that was mostly surrounded by a presumed spoils pile. From these examples, it seems likely that the trail tended to top out on the terrace in ritually significant locations. More mundane approaches to fields were probably similar to the side trails noted along the segments adjacent to LA 105705 and possibly LA 105708.

Thus, the very structure and routing of the trail argue for a prehistoric affinity. No modern highway construction-related feature would become more elaborate as it approached and crossed the terrace top, nor would it be expected to leave the terrace slope. A historic trail built and used by the Spaniards also would not demonstrate those tendencies. This is especially true since the elaborate sections of trail tend to occur near features of probable ritual importance to the prehistoric Pueblo occupants of the region. LA 118549 seems to represent a prehistoric trail linking several large villages and associated fields on the west side of Rio Ojo Caliente. It may have also served as a ceremonial route at times, linking ritually important locales together, perhaps for pilgrimages to the sacred hot spring at Ojo Caliente, though the latter possibility remains tenuous in the absence of more direct evidence of such use.