A PROPOSED TESTING PLAN FOR THE CIVIL WAR SITE OF CAMP LEWIS, ALONG NM 63, PECOS NATIONAL HISTORICAL PARK, SAN MIGUEL COUNTY, NEW MEXICO

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Archaeological Testing at the Civil War Site of Camp Lewis, along NM 63, Pecos National Historical Park, San Miguel County, New Mexico

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ADMINISTRATIVE SUMMARY

The New Mexico State Highway and Transportation Department (NMSHTD) requested that the Office of Archaeological Studies (OAS), Museum of New Mexico, conduct an archaeological testing program at Camp Lewis, a temporary Civil War camp (LA 121192). The site is within the boundaries of Pecos National Historical Park, San Miguel County, New Mexico. The testing program focused on the identification, evaluation, and documentation of potential artifacts and features that might be within the project area and related to Camp Lewis (121192), Kozlowski's Station (LA 86076), the Santa Fe Trail (LA 38648), and Greer Garson's Forked Lightning Ranch. These resources overlap in the project area and are collectively referred to as Camp Lewis for this project. The purpose of the project was to provide for roadway rehabilitation and bridge replacement along NM 63 within Pecos National Historic Park.

Pedestrian survey, metal detector survey, and geophysical investigation were used to identify and document cultural material across the project area. Fifteen test pits were excavated to further evaluate and document subsurface cultural material in the area of land alteration associated with the bridge replacement

Pedestrian survey, metal detector survey, and geophysical survey found artifacts with precontact, Camp Lewis, general nineteenth century, and twentieth century affiliations. Cultural material in the bridge alignment locality was sparse and test pits consistently verified that previous land-altering activities had thoroughly mixed the fill and compromised the interpretive integrity of the material. Five potential anomalies identified by the geophysical survey are well outside of the construction zone and will not be affected by the proposed road realignment. The nature and cultural affiliation of these anomalies were not determined by the testing program.

The testing program has determined that the site area overlapping the proposed project area is not likely to yield information beyond that already documented. No further archaeological investigations within the construction zone are recommended.

MNM Project 41.689
NMSHTD Project No. TPM-0063(6)-01, CN 2075, Task No.4300-7
NMCRIS Project No. 43985
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Archaeological Resource Protection Act permit PECO-02-1

CONTENTS

FIGURES

TABLES

CHAPTER 1

Introduction

The New Mexico State Highway and Transportation Department (NMSHTD) requested that the Office of Archaeological Studies (OAS), Museum of New Mexico, conduct an archaeological testing program at Camp Lewis (LA 121192), a temporary Civil War camp. The site is within the boundaries of Pecos National Historical Park, San Miguel County, New Mexico (Fig. 1). The testing program focused on the identification and evaluation of potential artifacts and features that might be within the project area, and be related to Camp Lewis (121192), Kozlowski's Station (LA 86076), the Santa Fe Trail (LA 38648), and Greer Garson's Forked Lightning Ranch. These locations overlap in the project area, but are referred to collectively as Camp Lewis for this project. The purpose of the project is to provide for roadway rehabilitation and bridge replacement along NM 63 within Pecos National Historic Park. The testing program followed the procedures included in the previously approved testing plan (Appendix 1). Fieldwork was conducted from June 14 to July 19, 2002, by OAS archaeologists Charles Hannaford (project director) assisted by Jessica Badner, Susan Moga, Rick Montoya, Steve Post, and Natasha Williamson. About 84 worker-days were expended during the field phase. The testing program was conducted under Archaeological Resource Protection Act permit PECO-02-1.

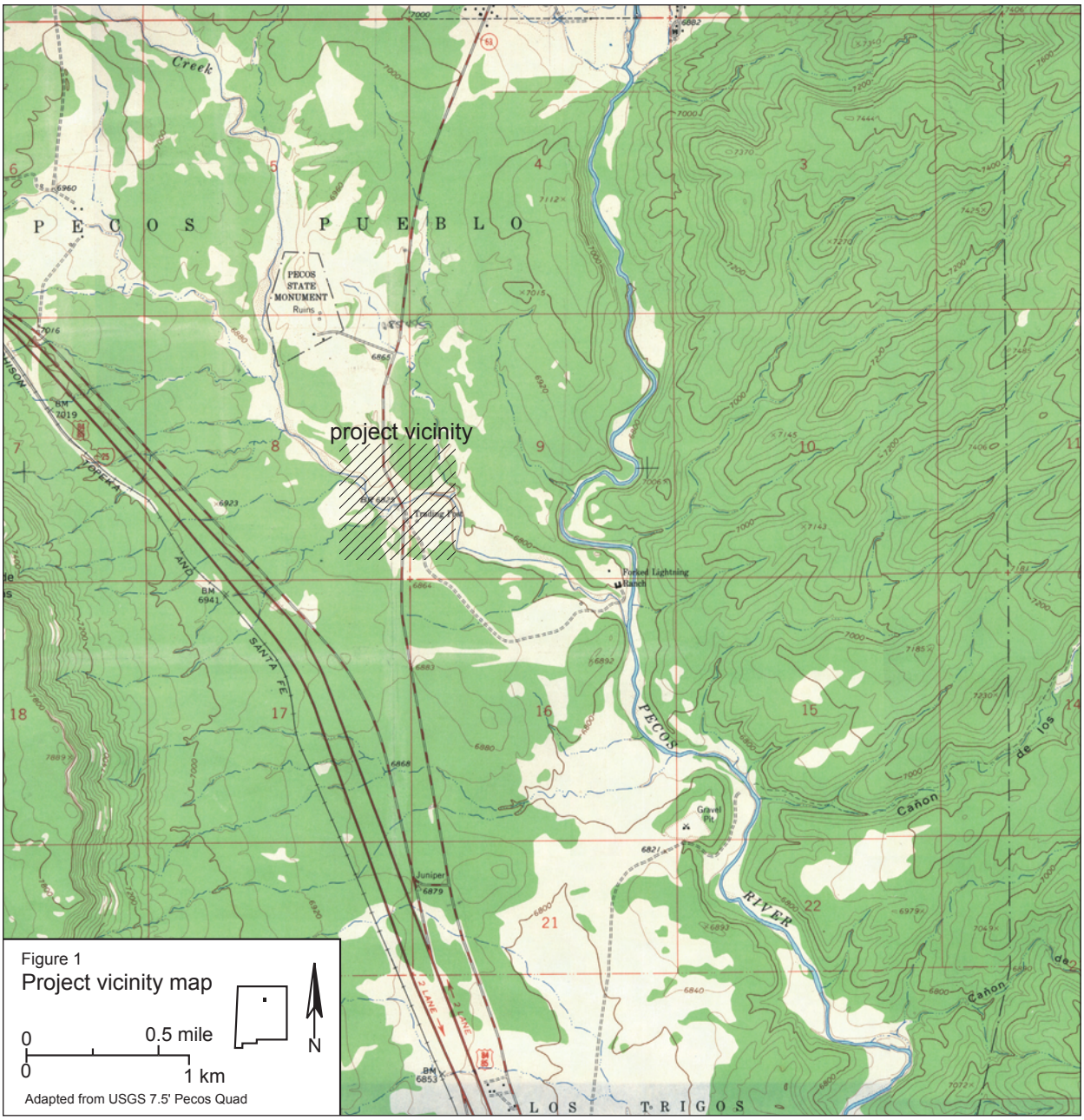

Figure 1
Project vicinity map

Adapted from USGS 7.5' Pecos Quad

CHAPTER 2

Environment

The following environmental highlights are largely abstracted from more detailed environmental descriptions prepared for earlier survey and testing documents associated with the proposed roadway rehabilitation and bridge replacement along NM 63 (Lent 1992; Gaunt 1998). Additional environmental information can be found in the inventory survey of Pecos National Historical Park (Head and Orcutt 2002). The reader is referred to these documents for detailed overviews of the environmental setting.

The project area is on the south terrace overlooking Glorieta Creek (Fig. 2). The north edge of the project drops into the currently entrenched flood plain of Glorieta Creek. The southern extent of the project extends up a hill slope and then across a relatively level hilltop. Site elevation ranges from 6,801 feet (2,073 m) in the flood plain to 6,850 feet (2,088 m) on the hilltop. Prewitt loam soil occurs on terraces along Glorieta Creek. This soil consists of a thick layer of reddish brown loam and reddish brown clay loam extending to a depth of 1.5 m below the surface. Red sandstone bedrock is exposed in the flood plain of Glorieta Creek at a depth of more than 5 m below the surface. River cobbles deposited by past alluvial action are common on the hill slope.

Vegetation consists of piñon-juniper woodland. The east side of NM 63 is characterized by a tall and rather dense old growth of piñon and juniper (Fig. 3). The west side of the highway was chained during ranching activities in the past to produce open meadow grazing land.

Figure 2. Bridge replacement locality.

The west side of the highway is mainly meadowland consisting of mixed grasses, sage, and a sporadic new growth of juniper trees averaging about 5 feet in height (Fig. 4).

Glorieta Creek currently has only a semiannual flow, but an important variable for local settlement is the presence of a major spring in the flood plain of Glorieta Creek just east of the bridge. The spring is surrounded by a growth of water-sensitive plants. The spring still has a strong flow, suggesting that output in the past was probably substantial and that the water table was higher. The presence of this strong spring was undoubtedly important to the prehistoric use of the area, the location of Kozlowski's Station, and planned stops along the Santa Fe Trail.

Figure 3. East side of NM 63.

Figure 4. West side of NM 63.

CHAPTER 3

Archaeological Background

The reader is referred to Appendix 1 for a comprehensive archaeological overview of the project area. Additional information can be found in the original survey (Lent 1992) and testing (Gaunt 1998) reports associated with the proposed roadway rehabilitation and bridge replacement along NM 63. The inventory survey of Pecos National Historical Park also provides relevant background material (Head and Orcutt 2002).

CHAPTER 4

Testing Results

The project area can be divided into two main investigation parcels based on the effect that land alteration associated with the proposed road reconstruction and bridge replacement will have on potential cultural resources (Fig. 5). The area of the bridge replacement along the west right-of-way will be most affected by land-altering activities. This area begins around highway station 171+52 and extends north to the terrace edge of Glorieta Creek. There is no land-altering effect associated with road reconstruction on the east right-of-way from highway station 167 to the bridge, and on the west right-of-way between highway stations 167 and 171+52. A 6-m buffer area was investigated outside of the existing right-of-way fence on both the east and west sides of the highway, and along the west boundary of the area of take at the bridge-replacement locality (Fig. 5). This south end of the project includes the area where the Camp Lewis site boundary was extended east of NM 63 by Haecker's (1998) survey.

Condition

Past mechanical and natural processes have transformed the interpretive integrity of the project area—most severe were the extreme land-altering activities associated with the previous road approach to the old bridge across Glorieta Creek. The old road approach encompassed completely the area affected by the new bridge replacement, and construction activities have severely altered the subsurface fill. Each test pit found modern refuse and asphalt in almost every level to a depth of about 1.0 m below the surface. Asphalt was found in several auger holes at a depth of 1.5 m below the surface.

In addition, a subsurface telephone line transects the length of the bridge replacement parcel. The telephone line was mechanically excavated to a depth of 70 to 80 cm below the surface and was found in both Test Pit 6 (690N 499E) and Test Pit 8 (699N 498E). These test pits indicate that the utility line runs about 1 to 2 m west of the existing right-of-way fence.

The north edge of the bridge replacement parcel is transected by a ranch road passing through the cattle guard and extending west across the site. The road is about 6 m wide and contains iron-rich gravel and cobble fill that affected both the metal detector and the geophysical magnetic survey. This gravel and cobble road paving was scattered across the entire north site area and along the edges of NM 63. The rock was the source of numerous targets during the metal detector and geophysical magnetic survey.

Lastly, the entire right-of-way contains numerous rodent holes. Copious rodent holes were found in every test pit and were an additional cause of severe mixing. Researchers should be aware that a large portion of the area west of NM 63 was cleared by chaining in the past to produce the open grass-covered ranch land. Juniper and piñon were stacked and burned, and the resulting scattered charcoal introduced a major source of "tainted" charcoal across the site.

Field Methods

The testing program followed field methods outlined in the data recovery plan (Appendix 1). The archaeological investigation began by establishing a 1-by-1-m grid system over the project area (Fig. 5). The primary datum was located at 500N 500E at an arbitrary elevation of 100.00 m. The grid system was aligned with the highway right-of-way (352 degrees) and does not designate magnetic or true north. Grids are provenienced from the southwest corner. Test pits were provenienced in relation to the grid system, whereas individual artifacts discovered during the surface survey and metal detector survey were assigned point-specific proveniences. Pedestrian, metal detector, and electromagnetic ground conductivity surveys were used to identify and document cultural material across the project area. Test pits were employed to further evaluate and document subsurface cultural material only in the area of land alteration associated with the bridge replacement (Fig. 6). Test pits were excavated in arbitrary 10-cm levels.

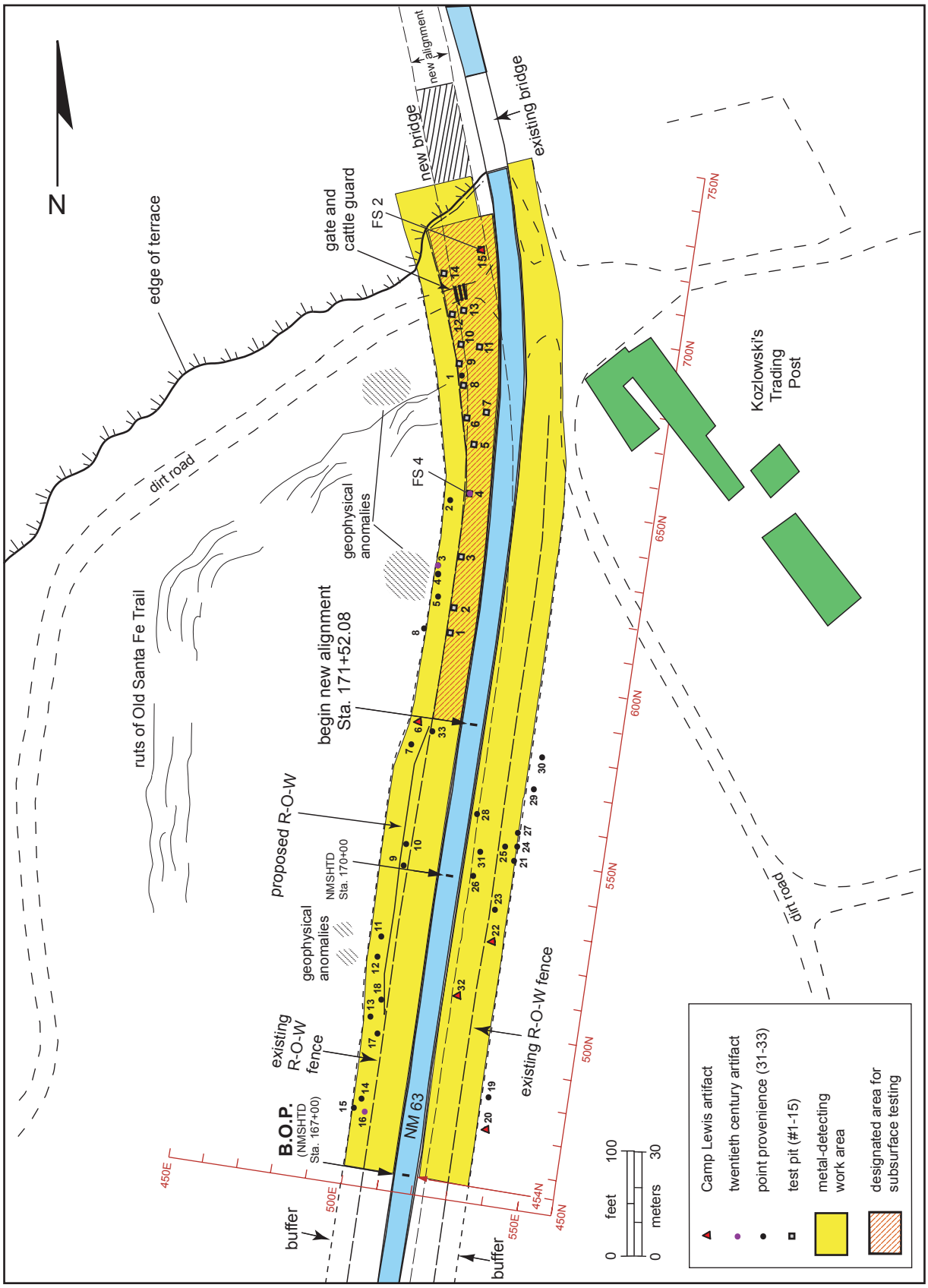

Figure 5. Project area map showing test pits, artifact distributions, and geophysical anomalies.

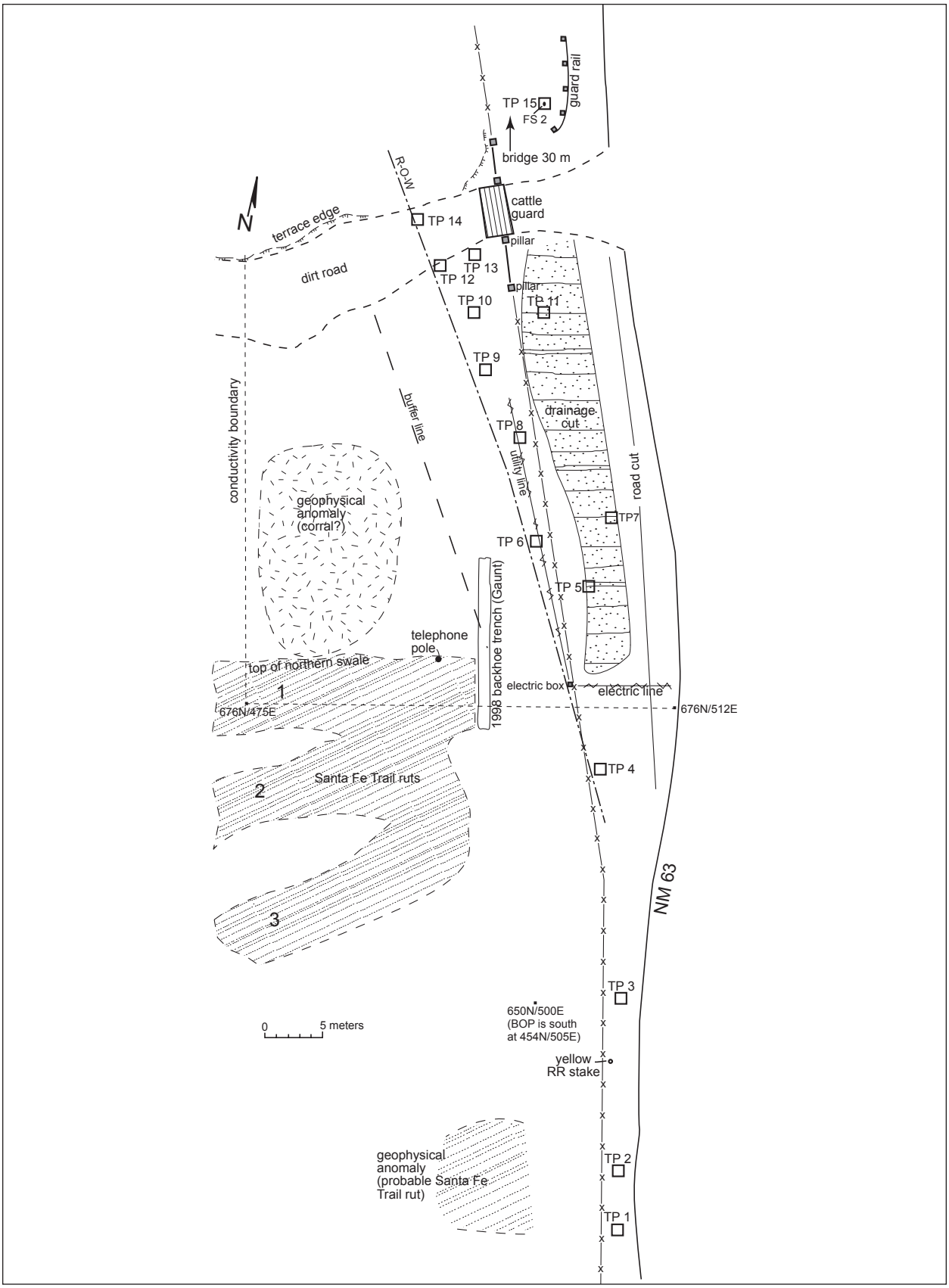

Figure 6. Detail of bridge alignment locality evaluated with test pits.

Pedestrian Survey

Initially, a pedestrian survey of the project area was accomplished by archaeologists standing shoulder to shoulder and walking transects parallel to the existing right-of-way fence. This procedure resulted in the location of 10 surface artifacts (Tables 1 and 2). A horseshoe (Test Pit 3) and a chert flake (Test Pit 7) were the only surface artifacts found in the area designated for subsurface testing. The remaining surface artifacts were found in the heavily wooded area characterizing the buffer zone along the east right-of-way. No features were identified other than the previously recorded depression located in the buffer zone of the east right-of-way (Haecker 1998:11). This depression may be related to the Camp Lewis occupation, but the area will not be affected by the road rehabilitation. A previously tested segment of the Santa Fe Trail crosses the right-of-way between the 670N and 680N grid lines (Gaunt 1998:27-30). A second area between 625N and 650N may also

Table 2. Artifacts from test pits.

Test Pit	Location	Level	Artifact Type
1	630N 507E	2	glass fragment
		5	glass fragment
			obsidian biface fragment
		7	chalcedony flake fragment
		8	chalcedony flake fragment
2	635N 507E	2	glass fragment
		4	glass fragment
		6	chalcedony flake fragment
3	650N 507E	surface	horseshoe
4	670N 507E		no artifacts
5	686N 504E		no artifacts
6	690N 499E		no artifacts
7	692N 506E	surface	chert flake fragment
8	699N 498E		no artifacts
9	705N 495E		no artifacts
10	710N 494E	4	historic earthenware sherd
11	710N 500E		no artifacts
12	714N 491E		no artifacts
13	715N 494E		no artifacts
14	718N 489E		no artifacts
15	728N 500E	1	metal strap for securing crates

Table 1. Surface survey and metal detector survey artifacts.

Point Provenience Number	Location		Depth	Artifact Type
	North	East		
1	682.99	499.04	8 cm	square nail
2	648.20	503.41	22 cm	hole-in-top can
3	629.94	502.23	22 cm	sanitary can
4	626.21	502.19	7 cm	lard can
5	617.59	503.25	16 cm	chain link
6	582.31	503.40	4 cm	square nail
7	576.91	501.89	8 cm	horseshoe fragment
8	610.83	499.75	surface	hole-in-top can
9	555.29	504.97	9 cm	Spencer cartridge case
10	545.39	503.65	3 cm	round nail
11	521.55	502.85	3 cm	wire
12	515.58	501.68	2 cm	can fragment
13	499.04	502.57	11 cm	cast iron fragment
14	474.63	503.15	4 cm	horseshoe
15	471.16	502.08	17 cm	square nail
16	471.99	502.57	surface	can fragment
17	494.70	504.79	7 cm	horseshoe
18	502.73	504.10	6 cm	rivet
19	481.53	537.06	5 cm	round ball for buckshot or pistol
20	472.68	539.72	surface	tin-cup handle
21	550.25	536.35	6 cm	chain link
22	524.11	534.89	surface	square nail
23	534.95	531.85	3 cm	rivet
24	548.44	536.85	surface	metal strap for securing crates
25	549.21	535.70	surface	metal strap fragment
26	541.54	534.30	4 cm	two metal strap fragments
27	550.82	537.74	surface	square nail fragment
28	557.47	534.19	surface	indeterminate metal scrap
29	569.26	538.21	5 cm	indeterminate metal scrap
30	579.89	539.50	3 cm	cast iron lug from pot or kettle
31	552.74	529.82	surface	indeterminate metal scrap
32	508.21	528.96	4 cm	grommet
33	577.33	506.86	3 cm	rivet

represent a secondary Santa Fe Trail rut, but no ruts are preserved within the right-of-way.

Metal Detector Survey

Archaeological investigations proceeded with a two-part metal detector survey. Charlie Haecker, who conducted the initial metal detector investigations at Camp Lewis (Haecker 1998), was lent by the National Park Service and used his expertise to conduct the metal detector survey. Haecker conducted sweeping transects parallel to the right-of-way. Targets were marked with pin-flags and locations were investigated by a recovery team with a second metal detector to ensure that marked items were recovered. The metal detector survey identified 725 targets, of which only 24 were identified as historic artifacts and collected. The bulk of the targets consisted of recent road litter, and included car parts, beverage cans, fence wire, and iron-rich gravel and cobbles associated with nearby NM 63. This recent refuse was not collected. Artifact density was low, and artifacts were scattered diffusely throughout the project area. Only one square nail (PP 1, see Fig. 5) and a metal strap fragment (Test Pit 15) were found within the area most affected by land-altering activities.

A second magnetometer sweep of the project area by Sunbelt Geophysics (Appendix 2: Fig. 3) identified about 300 additional magnetic targets missed during the initial metal detector survey, but the majority of those investigated were found to be cobbles and gravel with magnetic signatures. This material was concentrated at the north end of the project area on the access road east of the cattle guard (centered at 710N 500E), along the dirt road leading west of the cattle guard (centered at 710N 475E), and on the cobble-covered terrace slope in the vicinity of the 625N to 650N grid lines. The magnetometer sweep was apparently more sensitive to the naturally occurring iron-rich rock common in the area. Additional recent roadside trash and fencing staples comprised the bulk of the targets located east of the right-of-way fence. No new historic artifacts were identified or collected.

Geophysical Investigations

In addition to the supplemental metal detector survey, a two-phase electromagnetic ground conductivity survey was conducted by Sunbelt Geophysics (Appendix 2). Phase 1 was a large square unit that completely overlapped the most affected area at the bridge realignment, and extended well outside of the project area to the west (Appendix 2: Fig. 1). This large swath provided excellent coverage of both the project area and the adjacent area to the west. No anomalies were found within the project area, but an area outside of the right-of-way to the west centered within the 685N to 700N and 475E to 490E grid lines may be a possible target (Appendix 2: Fig. 6). The roughly circular anomaly is in a slight topographic low and is adjacent to Santa Fe Trail ruts on the south. The anomaly has no surface visibility and the nature of the possible feature is unknown (Fig. 7). Speculation was that the anomaly could be a corral.

Phase 2 was a linear electromagnetic ground conductivity survey along the edges of approximately 250 m of highway (Appendix 2: Fig. 1). The initial scope of work was planned to correspond with the area covered by the metal detector survey, but heavy tree cover along the east right-of-way necessitated a change of survey area to better accommodate the geophysical technology. An approximately equal area of land was substituted and surveyed on the more open west side of the highway. No anomalies were encountered within the project area, but four possible anomalies were identified outside of the right-of-way and the associated buffer.

A possible secondary Santa Fe Trail rut descends the terrace in the area of the 640N line on the west side the highway (Fig. 8). This was probably a segment of the trail less used than the more dominant trail segments crossing the site some 30 m to the north (see Boyer et al. 2002:411-419). The rut is 3 to 4 m wide, and 30 to 50 m west of the right-of-way, but no rut was preserved within the project area. An area of increased conductivity west of the buffer may be indicative of compacted soil associated with this possible Santa Fe Trail segment (Appendix 2: Fig. 8).

Two possible anomalies are located on the west side of the road in the area of 520N 485E. Both anomalies are well outside of the project area and are characterized by areas of increased magnetic strength consistent with accumulations of magnetic stones or fire-alteration of the magnetic minerals in the soil. The anomalies had no surface visibility and the exact nature of the possible features is unknown. The two anomalies are within the site boundary of LA 85503, a precontact Rio Grande Classic period (A.D. 1325-1540) site previously tested by Gaunt (1998:48-51). A cobble mound possibly representing a fieldhouse is located about 23 m west of the right-of-way. The anomalies could represent extramural features associated with this precontact site. However, Santa Fe Trail ruts probably associated with the secondary segment described above are also located about 25 m west of the right-of-way, and a .58 caliber cartridge was found on the site. The two anomalies could just as easily have Camp Lewis or Santa Fe Trail period affiliations. Compounding the problem was the presence of abundant iron-rich cobbles on the terrace

Figure 7. Anomaly area.

Figure 8. Possible secondary Santa Fe Trail rut descending terrace.

edge at this locality. The anomalies could, therefore, simply represent natural phenomena.

Lastly, a magnetic anomaly coincident with a circular ring of partially buried stones was located at 530N 545E. This area is on the east side of the highway directly east of the two anomalies at LA 85503. The boundary of this precontact site extends east of the highway and includes two concentrations of fire-cracked cobbles and a depression (Gaunt 1998:48-50). The anomaly is well east of the highway right-of-way and is probably associated with one of these previously recorded thermal features. A nearby depression (centered at grid 572N 536E) may be associated with the extramural features (Gaunt 1998:50). However, Haecker (1998:53-54) felt that the depression, as well as the other rock-lined features such as the fieldhouse and the thermal features, should be carefully investigated to determine whether they indeed represented Anasazi features, or Camp Lewis related campfires and tent pads.

Test Units

Fifteen 1-by-1-m test pits were excavated in the bridge alignment area (see Fig. 6). Pedestrian, metal detector, and geophysical surveys demonstrated that there were no artifact concentrations, features, or anomalies within the bridge alignment area. Twelve test pits were specified in the testing design in the event that no anomalies or artifact concentrations were discovered by the various survey techniques. Fifteen test pits were, therefore, considered more than adequate to evaluate the subsurface nature of the bridge alignment locality. The test pits were excavated to an average depth of 1.0 m below the surface, and an additional auger test was extended down a further 1.0 m from the base of each grid. The test pits had similar soil profiles, which were characterized by a massive layer of fairly compact red clay extending to an average depth of 1.0 m below the surface. This was followed by thick brown clay that extended to a depth of at least 2.0 m below the surface. Cultural material included 13 artifacts recovered from six individual grids (see Table 2). Subsurface fill was found to be extremely mixed—from construction activities associated with the old road bed, compounded by the presence of extensive rodent burrows. Occasional flecks of charcoal were noted in the test pits, but the soil is essentially clean with no cultural staining. The test pits discovered no subsurface features in the project area and revealed that subsurface fill in the right-of-way was very mixed with little interpretive integrity.

Test Pit 1 (630N 507E). Test Pit 1 was located at the south end of the area designated for subsurface testing. The geophysical survey had revealed an anomaly of compacted soil possibly associated with a Santa Fe Trail rut east of the 500E buffer line (Appendix 2: Fig. 8). There was no surface visibility of a rut east of the right-of-way. The test pit was excavated to a depth of 120 cm below the surface (Fig. 9). Soil was a homogenous layer of red clay. An auger test was extended a further 1.0 m below the base of the test pit. No cultural material was found in the auger test. The thick brown clay was encountered at a depth of 2.0 m below the surface.

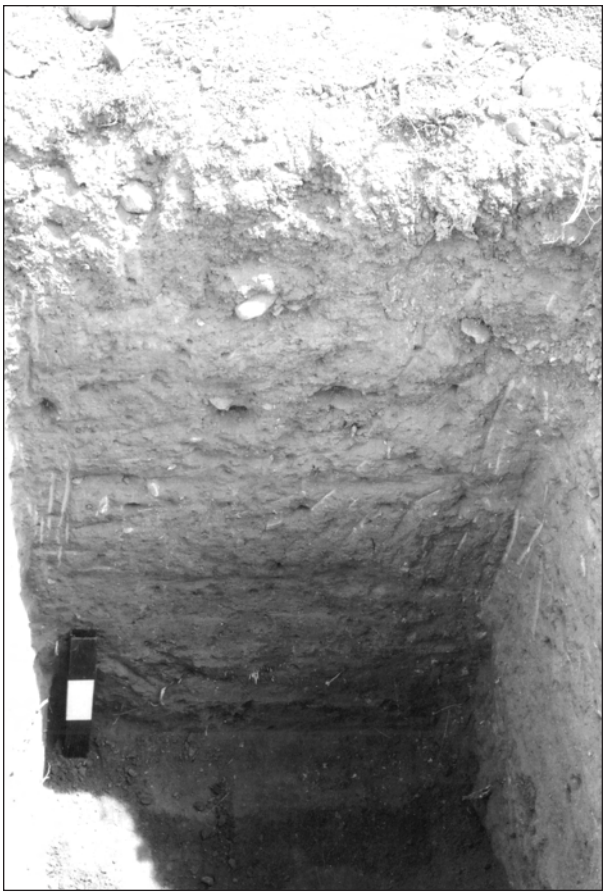

Figure 9. Test Pit 1 south profile.

Cultural material included three flakes, a tiny obsidian biface fragment, and two small fragments of historic glass (see Table 2). The artifacts were mixed with recent glass and asphalt, which were both present in each level to a depth of 1.0 m below the surface. There were no indications of subsurface trail ruts, or any noticeable change in soil compaction. The flakes and biface fragment are probably associated with material washing down the terrace slope from LA 85503 located some 30 m to the southwest. The test pit showed that the artifacts were recovered from extremely mixed contexts with no remaining interpretive integrity.

Test Pit 2 (635N 507E). Test Pit 2 was located 5 m north of Test Pit 1 to further evaluate the possible Santa

Fe Trail rut and to see if additional Precolumbian artifacts were present below the surface. There were no surface indications of a trail rut or other features in the area (Fig. 10) The test pit was dug to a depth of 120 cm below the surface. Soil was a homogenous layer of red clay. An auger test was extended an additional 1.0 m below the base of the test pit. As with Test Pit 1, the thick brown clay layer was found at a depth of 2.0 m below the surface.

Cultural material included two small historic glass fragments and a single chert flake (see Table 2). The artifacts were mixed with recent glass and asphalt from each level to a depth of 70 cm below the surface. There were no indications of Santa Fe Trail ruts or culturally stained soil. The test pit again indicated that the artifacts were recovered from mixed deposits with no interpretive integrity. Precontact material was limited to the single chert flake that probably washed down the terrace slope from LA 85503.

Test Pit 3 (650N 507E). Test Pit 3 was spatially located to ensure systematic coverage about every 20 m across the site. The grid was placed over a horseshoe found on the surface. The test pit was dug to a depth of 1.0 m below the surface. An auger test was extended an additional 1.0 m below the base of the test pit. Soil was a thick layer of red clay. No subsurface artifacts or culturally stained soil were found in the test pit. The horseshoe appeared to be of recent origin, associated with either the Forked Lightning Ranch, or a recent item that might have fallen form a passing vehicle.

Test Pit 4 (670N 505E). Test Pit 4 was spatially located to ensure systematic placement of test pits every 20 m across the site. The buried utility line was about 1.0 m to the west and the highway was about 8 m to the east. There were no surface cultural manifestations at this locality. The test pit was dug to a depth of 90 cm below the surface. An auger test was extended to a depth of 120 cm below the surface. Soil was the thick layer of red clay with brown clay, which appeared at 90 cm and extended to an unknown depth. The test pit was completely void of cultural material.

Test Pit 5 (686N 504E). Test Pit 5 was located in the area of the Santa Fe Trail ruts tested by Gaunt (1998:27-30). Ruts were visible west of the buffer zone, but not within the right-of-way. A shoulder cut and drainage ditch are present along the road at this locality. The test pit was dug to a depth of 1.0 m below the surface. An auger test was extended to a depth of 120 cm below the surface. Soil was the thick layer of red clay to a depth of 70 cm, followed by brown clay. No evidence of trail ruts was encountered, and no artifacts or culturally stained soil were noted in the test pit.

Figure 10. Test Pit 2 before excavation.

Test Pit 6 (690N 499E). Test Pit 6 was in the area of Santa Fe Trail ruts tested by Gaunt (1998:27-30). There were no surface cultural manifestations at this locality (Fig. 11). The test pit was dug to a depth of 1.0 m, and an auger test was extended to a depth of 2.0 m below the surface. The red clay layer extended to a depth of 1.75 m, and was followed by the brown clay layer. The utility line was encountered along the east edge of the test pit at a depth of 80 cm below the surface. The test pit was void of cultural material.

Test Pit 7 (692 506E). Test Pit 7 was in the vicinity of Santa Fe Trail ruts tested by Gaunt (1998:27-30), and over a chert flake found on the surface. Several metal detector survey targets had been found in this area, but all were modern refuse. The test pit is at the bottom of a drainage ditch; the highway is about 3 m to the east. The trench was dug to a depth of 40 cm below the surface, and an auger test was extended to a depth of 1.35 m below the surface. The highway base course extended to a depth of 30 cm, and was followed by the thick layer of red clay. The fill was extremely mixed with asphalt, which extended to a depth of 70 cm below the surface. No subsurface cultural staining or artifacts were found in the trench. The test pit verified that the highway shoulder was mixed and had no interpretive integrity.

Test Pit 8 (699N 499E). Test Pit 8 was in the area of Santa Fe Trail ruts tested by Gaunt (1998:27-30). There were no surface cultural manifestations in the area. The trench was dug to a depth of 70 cm, and an auger test was extended to 1.2 m below the surface. The soil was the red clay layer to a depth of 1.2 m, followed by the thick brown clay. The utility line was encountered along the east edge of the test pit, which lacked evidence of subsurface cultural material.

Test Pit 9 (705N 495E). Test Pit 9 was located judgmentally to ensure complete coverage of the primary take area associated with the bridge alignment. There were no surface cultural manifestations in the area. The trench was dug to a depth of 90 cm, and an auger test was extended to 1.4 m below the surface. The soil was a single thick layer of red clay. The test pit was void of cultural material.

Test Pit 10 (710N 494E). Test pit 10 was located judgmentally in the north site area to ensure complete coverage of the primary take area associated with the bridge alignment. There were no surface cultural manifestations in the area. The trench was dug to a depth of 1.0 m, and an auger test was extended to 1.2 m below the surface. The entire soil profile consisted of the red clay layer. A single earthenware sherd—probably from a flower pot—was recovered from Level 4 (see Table 2). The sherd was associated with asphalt and numerous rodent holes. This area is just south of the ranch access road and directly west of Kozlowski's Trading Post. The common sherd could be associated with either the Forked Lightning Ranch or the earlier Kozlowski Trading Post. No other cultural material was encountered. The test pit shows that the locality contains mixed fill with no interpretive integrity.

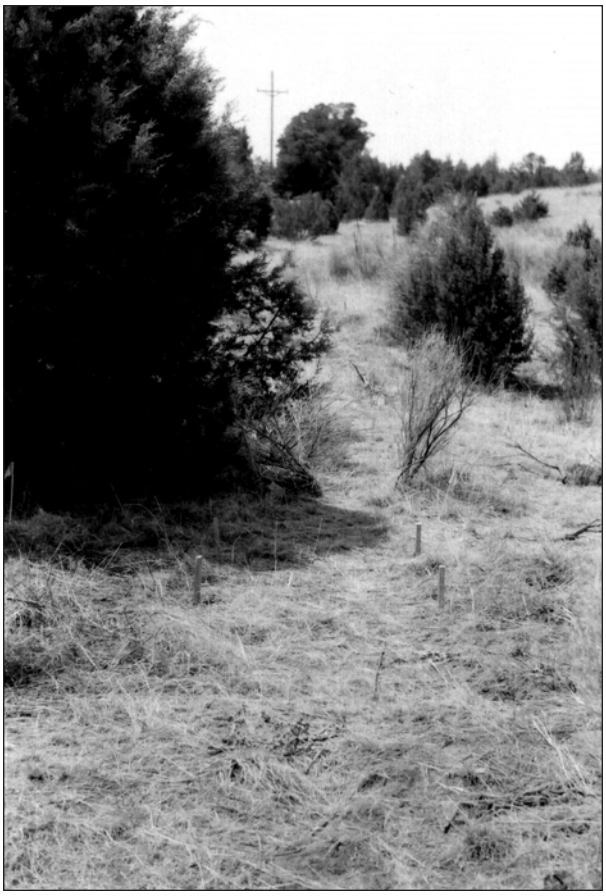

Figure 11. Test Pit 6 before excavation.

Test Pit 11 (710N 500E). Test Pit 11 was located judgmentally in the north site area and along the edge of a drainage ditch between the highway and the right-of-way fence. There were no surface cultural manifestations, although numerous metal detector targets had been encountered in this area. The targets were all recent road-related trash and gravel with magnetic signatures. The trench was dug to a depth of 1.0 m, and an auger test continued to 1.3 m below the surface. Thick asphalt from the old road bed extended to 70 cm below the surface. This was followed by red clay to a depth of 1.0 m. The red clay layer rested on the thick brown clay layer at just over 1.0 m below the surface. The fill in this test pit had been completely mixed by the old road bed. No metal artifacts were encountered, but recent beer-bottle glass extended to 1.0 m below the surface. The fill in this area had no interpretive integrity.

Test Pit 12 (714N 491E). Test Pit 12 was located judgmentally at the north edge of the site beside the old dirt access road. Metal detector targets had been encountered along the road, but all were cobbles and gravel pavement with magnetic signatures. The trench was excavated to a depth of 1.0 m, and auger-tested to 1.5 m below the surface. The soil profile consisted of the red clay layer to a depth of 1.0 m followed by the thick brown clay layer. The test pit was void of cultural material.

Test Pit 13 (715N 494E). Test Pit 13 was located judgmentally at the north edge of the site beside the old dirt access road (Fig. 12). The pit was located along the road to investigate metal detector targets encountered in the area. The investigated targets all turned out to be cobble and gravel road pavement with magnetic signatures. The trench was excavated to a depth of 1.0 m, and auger-tested to a depth of 1.5 m below the surface. The soil profile consisted of mixed red and brown clay. The fill in this area had been completely mixed by the old road alignment to the bridge. The test pit was void of cultural material.

Test Pit 14 (718N 489E). Test Pit 14 was located judgmentally at the north terrace edge overlooking Glorieta Creek. The pit was located on the dirt access road to investigate metal detector targets found in the area, all of which turned out to be cobbles and gravel with magnetic signatures. The trench was excavated to a depth of 1.0 m, plus an auger test to 1.6 m below the surface. The soil profile was mixed red and brown clay with cobbles and asphalt extending to 70 cm below the surface. The fill had been totally altered by the old road alignment to the bridge. No subsurface cultural material was encountered.

Test Pit 15 (728N 489E). Test Pit 15 was located over a metal strap fragment found at the north end of the site. The strap fragment was on the surface about 1.0 m west of the guard rail fence (Fig. 13). This strap fragment is similar to metal reinforcing strap fragments recovered by Haecker (1998:30-31) during his Camp Lewis investigations. They were used to bind wooden packages or crates, and the artifact is probably related to the Camp Lewis occupation (Fig. 14). The grid was excavated to a depth of 30 cm, with an auger test to 1.0 m below the surface. The initial 30 cm was composed almost entirely of broken up asphalt chunks from the old road bed. This was followed by mottled red and brown clay to a depth of 1.0 m below the surface. Cultural material was confined to asphalt and recent bottle glass to a depth of 70 cm below the surface. No additional historic period artifacts were recovered. The test pit shows that the fill has been extremely mixed by the old road bed construction and demolition. Although associated with the Camp Lewis occupation, the metal strap is from a redeposited context with no remaining interpretive integrity.

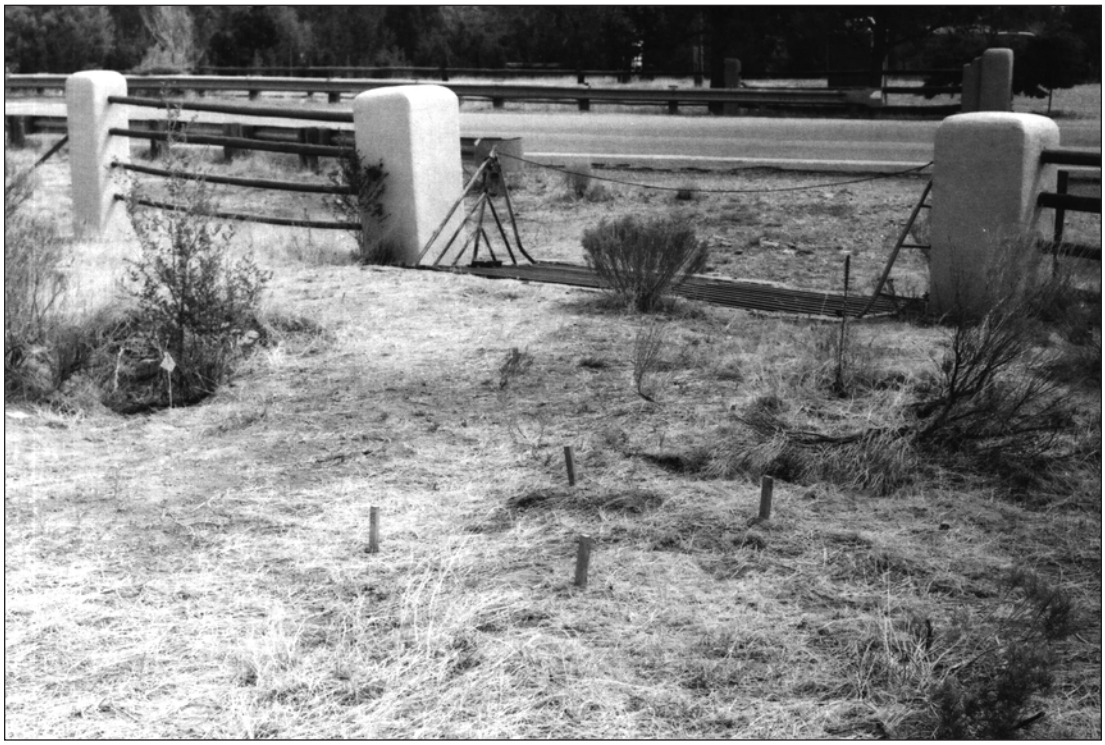

Figure 12. Test Pit 13 before excavation.

Figure 13. Test Pit 15 before excavation.

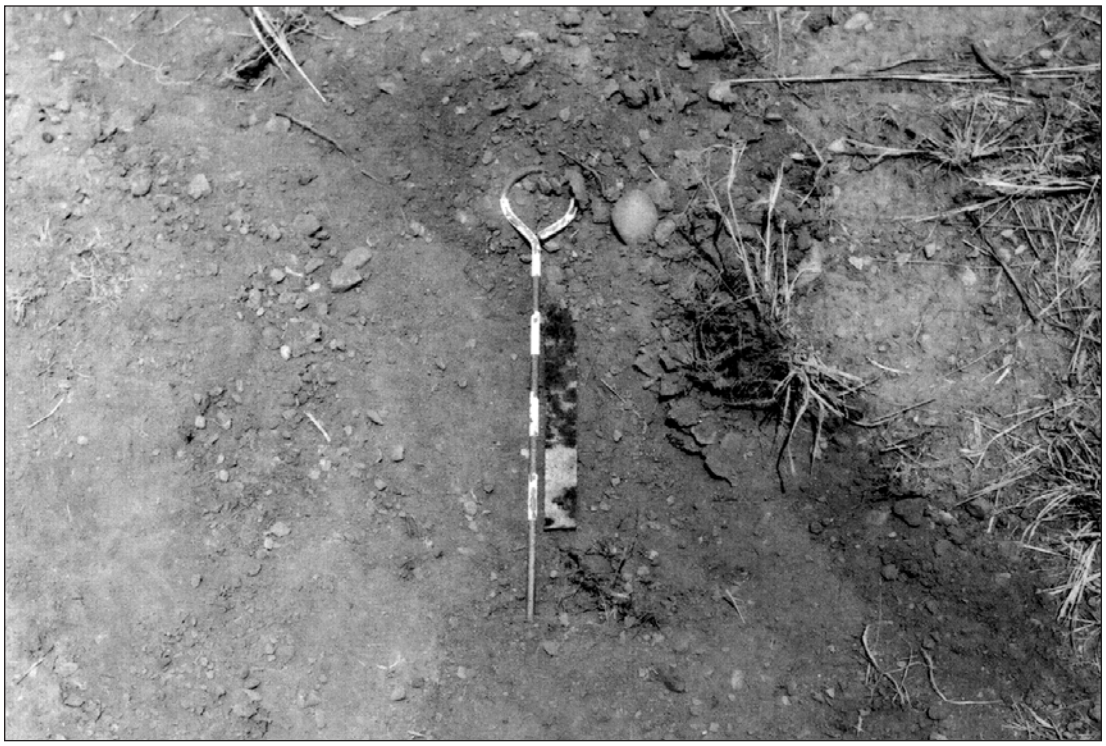

Figure 14. Detail of metal strap fragment from Test Pit 15.

Stratigraphy

The fifteen 1-by-1-m test pits and auger tests demonstrate a similar stratigraphic profile across the site. An initial layer of red clay loam (5YR 4/6 yellow-red) extends from the surface to an average depth of 1.0 m below the surface. The clay becomes more consolidated and compact with depth and contains abundant flecks of caliche. Soil consistency is grainy at the surface, becoming increasingly blocky with depth. A vertical arroyo face along Glorieta Creek just south of the site shows that the red clay layer is 3.0 m thick at this locality (Fig. 15).

Cultural material is confined to the red clay layer and was found to a depth of 80 cm below the surface in grid 630N 507E at the south end of the site. However, the layer has been largely mixed by past construction activities associated with the old road alignment. Recent glass, can fragments, and asphalt were consistently mixed with the sparse precontact and historic period artifacts. Artifact content is low and further mixed by extensive rodent burrowing throughout the layer. The layer contains a light scattering of charcoal flecks, but is essentially clean of cultural staining. No occupation surfaces were discernible within the thick layer, which had essentially lost all interpretive integrity from mechanical activities associated with the old road alignment that completely overlapped the tested area.

The red clay layer is followed by an abrupt transition to a thick brown clay (5YR 3/3 dark reddish brown) at an average depth of 1.0 m below the surface. This brown clay is very compact and has a platey consistency. The thickness of this brown clay layer was not determined. No cultural material was found in the lower brown clay layer.

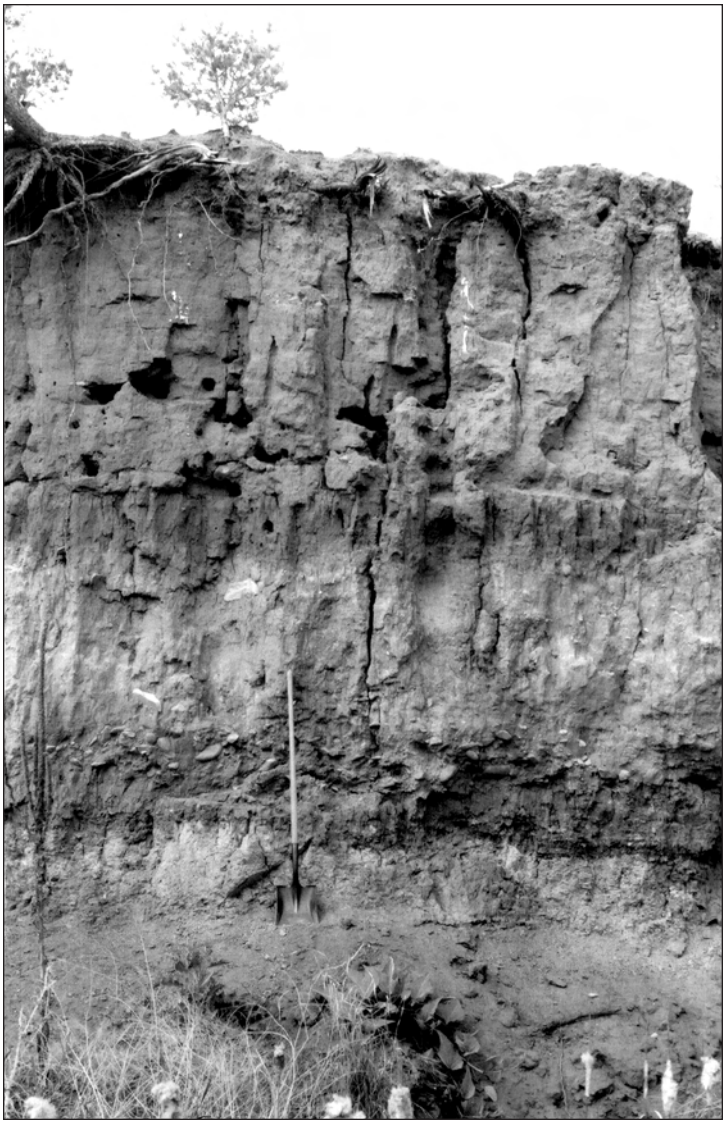

Figure 15. Soil profile along Glorieta Creek just west of the site.

CHAPTER 5

Material Culture

The testing program recovered 45 artifacts: five precontact period chipped stone artifacts, and 40 historic period artifacts. The artifacts are described below.

Precontact Period Artifact Descriptions

Five precontact artifacts were recovered from the site: four flake fragments and a small biface fragment. One flake was found on the surface, and the remaining three flakes and the biface fragment were recovered from two test pits. The artifacts lack temporal sensitivity and were recovered from mixed deposits. The small assemblage is probably associated with LA 88503 dating from the Rio Grande Classic period (A.D. 1325-1540).

Flake fragment (FS 1, grid 692N 506E, surface). This white chert flake fragment measures 31 mm wide by 33 mm long by 12 mm thick. The flake fragment does not have a platform and exhibits no cortex. The flake is the by-product of core reduction; the edges show no indication of modification.

Biface fragment (FS 7, grid 630N 507E, Level 5). This tiny obsidian biface fragment measures 9 mm long by 9 mm wide by 4 mm thick. The transparent obsidian is probably from the Jemez Mountains. The artifact is most likely the broken tip of a projectile point. The fragment was too small to determine projectile point type.

Flake fragment (FS 8, grid 630N 507E, Level 7). This white translucent chalcedony flake fragment with dark mossy inclusions measures 20 mm long by 20 mm wide by 9 mm thick. The flake fragment has a single platform and exhibits no cortex. The flake is the by-product of core reduction; the edges show no evidence of secondary modification or use.

Flake fragment (FS 9, grid 630N 507E, Level 8). This white translucent chalcedony flake fragment measures 39 mm long by 18 mm wide by 5 mm thick. The flake has a multifaceted or retouched platform and exhibits no cortex. The flake fragment is the by-product of core reduction; the edges show no evidence of secondary modification or use.

Flake fragment (FS 12, grid 635N 507E, Level 6). This gray chalcedony flake fragment measures 22 mm wide by 35 mm long by 10 mm thick. The flake has a multifaceted platform and exhibits no cortex. The flake fragment is the by-product of core reduction; the edges show no evidence of secondary modification or use.

Historic Period Artifact Descriptions

Forty historic period artifacts were recovered from the site (Table 3). Seven artifacts were recovered from test pits, and the remaining 33 were recovered either from the surface or as a result of the metal detector survey (see Tables 1 and 2). The majority of the artifacts are assigned a general nineteenth century affiliation. Although these artifacts may overlap both the Civil War Camp Lewis and the Kozlowski's Trading Post occupations, their generalized nature precludes a more finely tuned temporal assignment. The bulk of the artifacts are generally associated with the long-term use of the area as a Santa Fe Trail stop and watering hole during the nineteenth century. Five artifacts are probably related to the Camp Lewis occupation during the Civil War, and three artifacts from the twentieth century may be associated with the Forked Lightning Ranch.

Metal reinforcing strap fragment (FS 2, grid 728N 500E, Level 1). This strap fragment measures 155 mm long by 20 mm wide (Fig. 16a), and has two square nail holes spaced about 130 mm apart. The strap was used to bind wooden packages and crates such as ammunition and ration boxes. Similar strap fragments were commonly found during Haecker's (1998:30-31) Camp Lewis investigations. The fragment was found in redeposited fill at the north end of the project. The artifact is probably associated with the Civil War occupation of Camp Lewis.

Earthenware sherd (FS 3, grid 710N 494E, Level 4). This small non-Pueblo body sherd, which measures less than 10 by 10 mm, may be from a flower pot. The nondescript sherd dates from the nineteenth century.

Table 3. Historic period artifacts.

Functional Category Artifact Type	Camp Lewis	Nineteenth Century	Twentieth Century
Clothing/equipment			
poncho grommet	1		
rivet/burr		1	
Hardware			
cut nails		4	
cut box nails	2		
cut nail and washer (rivet/burr)		1	
rivet/burr		1	
metal reinforcing strap	1		
barrel hoop		1	
Horse/wagon equipment			
horseshoes		3	1
chain		4	
Food storage/consumption			
hole-in-top can		2	
sanitary can			1
bail can		1	
key-opened coffee can			1
kettle fragment		1	
tin-cup handle	1		
Arms			
Spencer rimfire cartridge*		1	
.41 caliber lead ball		1	
Unknown			
earthenware sherd		1	
bottle glass		3	
metal scrap		6	
indeterminate cast iron		1	
Total	5	32	3

*Post-Camp Lewis

Horseshoe (FS 4, grid 650N 507E, surface). This complete machine-made horseshoe is for a light riding or saddle horse. It has six remaining nails and no heel caulks. The horseshoe is heavier than the older nineteenth century horseshoes found on the site, and is not as worn. It was found beside the highway and could be associated with the Forked Lightning Ranch.

Bottle glass (FS 6, grid 635N 507E, Level 2). This small (15 by 15 mm) fragment from an unidentifiable bottle type is heavily opalescent and dates from the nineteenth century.

Bottle glass (FS 7, grid 630N 507E, Level 5). This brown glass fragment from an unidentifiable bottle type is 10 by 10 mm and dates from the nineteenth century.

Bottle glass (FS 11, grid 635N 507E, Level 4). This small (10 by 10 mm) aqua glass fragment from an unidentifiable bottle type is heavily opalescent and dates from the nineteenth century.

Cut nail (FS 20, PP 1). This straight nail fragment is 100 mm long, and is probably in the range of a 20d common siding nail, but the lower third (approximately) of the nail is missing. The nail dates from the nineteenth century, and was found on the Santa Fe Trail ruts west of Kozlowski's Trading Post.

Hole-in-top can (FS 21, PP 2). The top of this poorly preserved rectangular hole-in-top can, possibly a meant container, measures 58 by 79 mm; it dates from the nineteenth century.

Sanitary can (FS 22, PP 3). This sanitary can is 112 mm tall and has a diameter of about 91 mm. It dates from the twentieth century, and could be associated with the Forked Lightning Ranch. The can was found in the area of a possible secondary branch of the Santa Fe Trail west of the highway.

Bail can (FS 23, PP 4). The remaining fragment of this poorly preserved bail can with a wire handle is 165 mm tall. The can would have had a friction lid; these cans sometimes held lard or grease. The "pails" were used secondarily as a general container. The can dates from the nineteenth century, and was found in the area of a possible secondary branch of the Santa Fe Trail west of the highway.

Chain link fragment (FS 24, PP 5). This chain link fragment was found in the area of a possible secondary branch of the Santa Fe Trail west of the highway. The iron stock from which the link was made had a diameter of 9 mm, but the size of the link is unknown. The chain link probably represents a wagon part dating from the nineteenth century.

Cut box nail (FS 25, PP 6). This slightly curved 8d cut box nail (38 mm long) was probably pulled from a hard-tack ration box or ammunition box (Haecker 1998:30-31). The nail was found near the terrace slope on the west side of the highway and is probably associated with the Civil War occupation of Camp Lewis (Fig. 16b).

Horseshoe branch (FS 26, PP 7). This very worn horseshoe branch, which has a well-worked heel caulk, is from a light riding or saddle horse. The machine-made horseshoe fragment dates from the nineteenth century.

Hole-in-top can (FS 27, PP 8). This poorly preserved hole-in top can has no measurable dimensions. The can was found in the area of a possible secondary branch of the Santa Fe Trail west of the highway. The can dates from the nineteenth century.

Spencer rimfire cartridge (FS 28, PP 9). This empty rimfire cartridge case bears the headstamp "SAW" (Sage Ammunition Works), a Middleton, Conn., company that manufactured Spencer cartridges between 1864 and 1866 (Haecker 1998:35). The case is 29 mm long with a 15-mm base, and was probably a .56-56 caliber rifle-carbine cartridge (Fig. 16c). Interestingly, the cartridge postdates, and therefore was not deposited during, the Camp Lewis occupation. The cartridge was found in the central area of the project area on the west side of the highway.

Round-headed cut nail (FS 29, PP 10). This round-headed cut nail or tack is 29 mm long. The straight 3d nail dates from the nineteenth century.

Chain link fragment (FS 30, PP 11). This broken chain link is made from 2.5-mm diameter stock; the link was about an 25 mm long. It dates from the nineteenth century and was probably a wagon part.

Cut can fragment (FS 31, PP 12). A fragment of an unidentified type of can was cut into a triangular shape measuring about 58 mm wide by 38 mm tall. The can fragment dates from the nineteenth century; the function of the artifact is unknown.

Chain link replacement (FS 32, PP 13). This artifact is a possible chain link replacement wrought from a flattened piece of iron measuring 15 mm wide and 4 mm thick (Fig. 17a). The iron piece has been hammered into an oval shape about 38 mm long. The artifact probably represents an expediently made replacement link or wagon part dating from the nineteenth century.

Horseshoe (FS 33, PP 14). This artifact is a complete machine-made horseshoe for a light riding or saddle horse. It has two remaining nails and well-worn heel caulks. The horseshoe is probably associated with civilian use of the Santa Fe Trail during the nineteenth century (Haecker 1998:32-33).

Cut nail (FS 34, PP 15). This straight, complete, 10d cut nail is 76 mm long. It is a common siding nail that was apparently dropped; it dates from the nineteenth century.

Key-opened coffee can (FS 35, PP 16). This key-opened coffee can has a diameter of 127 mm and a height of 79 mm. The can was found on the south end of the site on the west side of the highway. The can dates from the twentieth century and could be associated with the Forked Lightning Ranch.

Horseshoe branch (FS 36, PP 17). This horseshoe branch has one remaining nail and a well-worn heel caulk. The horseshoe, which dates from the nineteenth

Figure 16. Camp Lewis 1862 occupation artifacts.

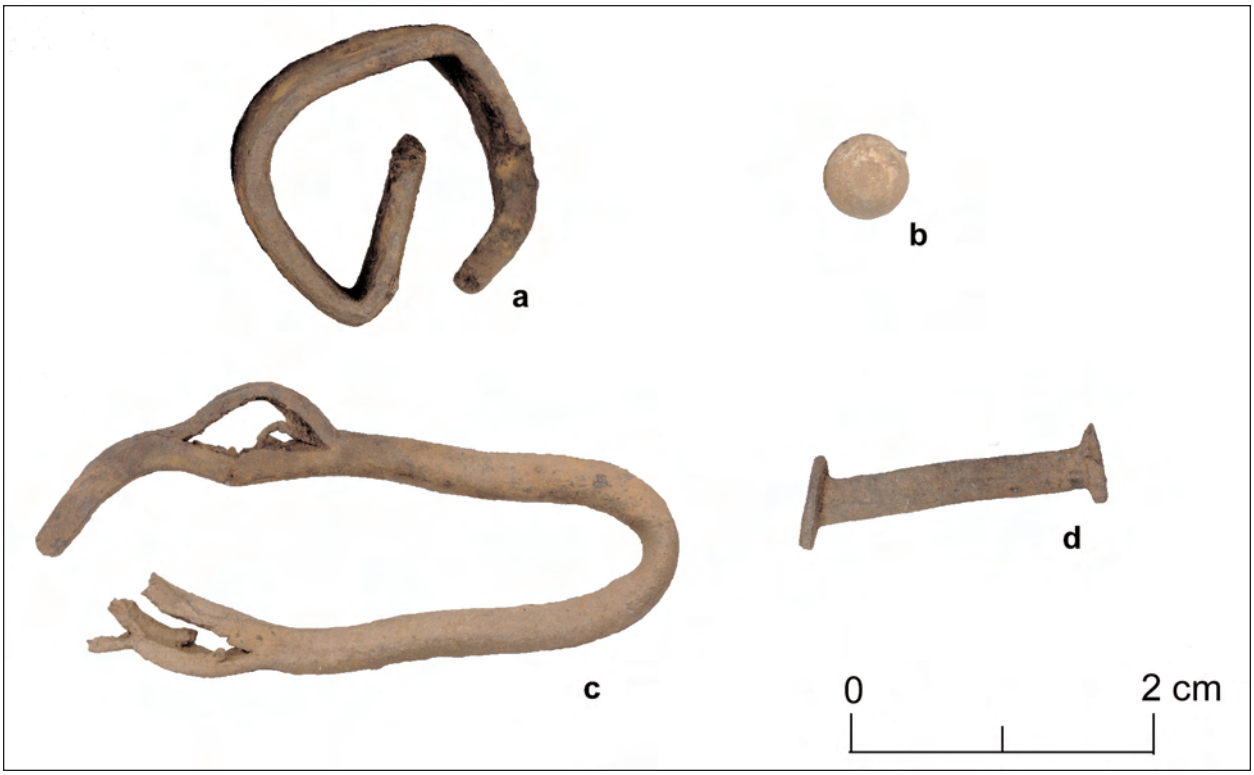

Figure 17. Selected nineteenth century artifacts.

century, was machine-made for a light riding or saddle horse.

Rivet (FS 37, PP 18). This sheared rivet has a rounded head and a diameter of 5 mm; the remaining fragment is 25 mm long. The rivet is probably a general wagon part dating from the nineteenth century.

.41 lead ball (FS 38, PP 19). The .40/41 caliber round lead ball was common to a variety of nineteenth century civilian percussion rifles as well as to Derringer percussion pocket pistols (Garavaglia and Worman 1985). The ball does not have a casting line and has one small facet, but does not appear to have been fired (Fig. 17d). It was found in the heavily wooded area on the east side of the highway. The ball dates from the nineteenth century, but is probably not associated with the military occupation of Camp Lewis.

Tin-cup handle (FS 39, PP 20). What was possibly a tin-cup handle was recycled by cutting off both ends (Fig. 16d) to leave a segment 43 mm long and 15 mm wide. The secondary function of the modified handle is unknown. Tin cups were a common piece of equipment in soldiers' mess kits. The handle was found in the heavily wooded southeast corner of the project area. The handle segment is most likely associated with the Civil War occupation at Camp Lewis.

Modified chain link (FS 40, PP 21). An apparent iron chain link was modified by pounding the ends flat, then splitting the flattened sections to form two eyelets (Fig. 17c). The iron stock from which the link was made was 5 mm in diameter. The link measures 81 mm long and 33 mm wide. The function of the modified link is unknown. The original link was probably associated with a wagon part dating from the nineteenth century.

Cut box nail (FS 41, PP 22). This cut box nail is 38 mm long (Fig. 16e). The slightly curved 4d nail was probably obtained from an empty hard-tack ration or ammunition box (Haecker 1998:30-31). The nail was found on the heavily wooded east side of the highway, and probably dates from the Camp Lewis Civil War occupation.

Rivet/burr (FS 42, PP 23). This combination rivet/burr has a diameter of 8 mm. These objects were commonly used to reinforce a variety of material, including leather and clothing; the rivet/burr is of the size commonly observed on Levi's pants. The rivet/burr is assigned a general nineteenth century date because of its commonness.

Metal scrap with rivet (FS 43, PP 24). A metal fragment with a rivet at one end has been cut into a rough triangular shape measuring 46 mm long and 28

mm wide. This could be a recycled piece of brass or copper, but the function of the modification is unknown. The item is assigned a general nineteenth century affiliation.

Barrel hoop fragment (FS 44, PP 25). This barrel hoop fragment is 229 mm long and 28 mm wide; it is assigned a general nineteenth century affiliation.

Metal scrap (FS 45, PP 26). Two small pieces of metal scrap represent modified pieces of brass or copper. The pieces of cut scrap are roughly rectangular; they measure 18 by 8 mm, and 20 by 13 mm. The function of the cut metal is unknown, and they are assigned a general nineteenth century affiliation.

Cut nail fragment (FS 46, PP 27). This straight cut-nail fragment is 38 mm long; it lacks the head, so the original length could not be determined. The nail dates from the nineteenth century.

Metal scrap (FS 46, PP 28). This artifact consists of a small cut piece of copper or brass that has been scrunched into a shapeless wad measuring about 20 by 13 mm. The function of the metal scrap in unknown and the item is assigned a general nineteenth century affiliation.

Metal scrap (FS 47, PP 29). This scrap of rolled iron, about 51 mm long and 20 mm thick, is of unknown function, and is assigned a general nineteenth century affiliation.

Cast iron fragment (FS 48, PP 30). This C-shaped fragment of cast iron has been chiseled off from a larger unknown object. The rounded stock from which the object was made has a diameter of 11 mm. The remaining C-shaped fragment measures about 25 by 25 mm and has the appearance of half a chain link. The function of the artifact is unknown. The piece is assigned a general nineteenth century affiliation.

Cast iron fragment (FS 49, PP 31). This piece of slightly curved cast iron could be from a kettle or Dutch oven. It measures 43 by 38 mm by 2.5 mm thick, and is assigned a general nineteenth century affiliation.

Poncho grommet (FS 50, PP 32). This artifact is similar to a poncho grommet recovered from Camp Lewis by Haecker (1998:26-27). This grommet has a diameter of 16 mm and an interior diameter of 10 mm. The grommet may have been part of a Civil War era rubber poncho and is probably associated with the Camp Lewis occupation (Fig. 16g).

Cut nail and washer (FS 51, PP 33). This artifact appears to be an expediently manufactured rivet/burr constructed from a fragment of 16d (approximately) cut nail and an iron washer with a diameter of 9 mm (Fig. 17d). It is seemingly a makeshift rivet and burr type fastener with a length of 41 mm. The fastener would have secured an object measuring about 36 mm. The item is assigned a general nineteenth century affiliation.

CHAPTER 6

Discussion

The intent of the testing program was the identification, evaluation, and documentation of potential artifacts and cultural features within the proposed roadway rehabilitation and bridge replacement along NM 63. This was accomplished by pedestrian survey, metal detector survey, and geophysical investigations. Artifacts were found from the precontact period, the Camp Lewis Civil War period, the general nineteenth century, and from the twentieth century (see Table 3).

Precontact Period

Cultural material relating to the precontact period consisted of five chipped stone artifacts. The small assemblage is composed mainly of secondary chert and chalcedony core reduction flakes along with one small obsidian biface fragment. The lithic debitage showed no evidence of secondary use or modification. The artifacts were recovered from three individual test pits (see Table 2). Four of the artifacts were from two grids at the south end of the tested area (see Fig. 6). These artifacts were from mixed deposits containing asphalt, historic period glass, and recent roadside refuse. The remaining chert flake was found on the surface near the road shoulder some 50 m north of the other artifacts. The context—on the surface along the road shoulder and resting on a grass clump—suggests that this flake had been discarded from a passing vehicle.

The three flakes and biface fragment from the two southernmost test pits are probably associated with material washing down the terrace slope from LA 85503 some 30 m to the south. This precontact period site was previously tested by Gaunt (1998:48-51) and site elements are present on both sides of the highway. The artifacts recovered during the present project were all small items that apparently washed down from the main site area and were redeposited at the base of the terrace. Subsurface fill in the test pits lacked culturally stained soil suggestive of use surfaces or primary cultural deposits.

Gaunt dated the occupation to the Rio Grande Classic period (A.D. 1325-1540) based on ceramics found on the site. The small lithic assemblage recovered during the current project lacks temporally sensitive artifacts and provides little additional information on site interpretation. Gaunt (1998:50) had similar chalcedony flakes from two artifact concentrations on the west side of the highway along with three projectile points. The small obsidian biface recovered during this project is probably the tip of an unidentifiable projectile point. The transparent obsidian is an intrusive material type originating in the Jemez Mountains.

In addition to the small lithic assemblage recovered in the test pits, the geophysical investigation found three anomalies within the boundaries of LA 85503. The anomalies were well outside the right-of-way buffer zone on both sides of the highway. The anomaly on the east side of the highway is probably associated with one of the cobble thermal features previously recorded by Gaunt (1998:49). Two anomalies near grid 520N 485E on the west side of the highway have no surface visibility but are consistent with accumulations of magnetic stones or possibly fire-alteration of the magnetic minerals in the soil (Appendix 2: Fig. 7). These anomalies are west of Gaunt's (1998:49) test pits and are preserved outside of the right-of-way in the general vicinity of Structure 1, described as a low cobble mound possibly representing a fieldhouse. The anomalies may represent extramural features of unknown function associated with the fieldhouse.

Camp Lewis 1862 Civil War Occupation

Five artifacts might date from the 1862 Civil War encampment of Camp Lewis (see Table 3 and Fig. 5). The artifacts are all nondescript items. No specific Civil War buttons or ammunition were recovered. Three of the artifacts are hardware in the form of two cut box nails and a metal reinforcing strap fragment. This hardware was probably derived from empty hard-tack ration and ammunition boxes, which had been used for firewood or disintegrated in place (Haecker 1998:30). Haecker found these nails to be both widely scattered across the site and

concentrated within areas of charcoal matrix, suggesting use of the crates as firewood. One nail found during this project was within the boundary of the LA 85503 precontact site on the west side of the road. The other nail was found in the heavily wooded area east of the highway. Haecker (1998:46) found several similar cut box nails and other Civil War era artifacts along an overlapping transect on the east side of the highway. The single metal reinforcing strap fragment was found at the north end of the project at grid 728N 500E. This artifact was from a redeposited context along the shoulder of the highway. The metal reinforcing strap fragment was the only Civil War related artifact found within the tested area of the site. One of Haecker's (1998:47) seven transects that extended across the project area to the edge of Kozlowski's Spring found no Civil War era artifacts. The primary Camp Lewis encampment was probably centered on the level terrace top south of the 600N grid line, and was present on both sides of the road. The more sloping terrain in the area of the bridge relocation apparently experienced a more transitory occupation, epitomized by soldiers crossing the locality on their way to the spring for water.

The single clothing/equipment artifact was a poncho grommet. Haecker (1998:27) found a similar poncho grommet during his Camp Lewis investigation. The grommet was found along the highway shoulder on the east side of the highway, and was one of the few artifacts found by metal detector between the road and the existing right-of-way fence.

A food storage/consumption artifact consisted of a tin-cup handle. Haecker (1998:43) found three similar tin-cup handles during his work at Camp Lewis. The tin cup was an essential part of a soldier's mess kit. The handle had been modified by cutting off both ends, but the purpose of this modification is unknown. The handle was found at the southern end of the site and east of the highway.

No specific anomalies associated with the Camp Lewis occupation were found during the geophysical investigations. However, Haecker (1998:53-54) felt that the depression as well as the other rock-lined features such as the fieldhouse and the thermal features within the bounds of LA 85503 should be carefully investigated to determine whether they indeed represented precontact features, or Camp Lewis related (or reused) campfires and tent pads. The three anomalies discussed under the precontact section above should not, therefore, be completely excluded from the realm of possible Camp Lewis related features. The presence of Santa Fe Trail ruts within 25 m of these features on the west side of the highway combined with both a cut box nail and a .58 caliber cartridge (Gaunt 1998:48) found in the vicinity may lend credence to this warning. The presence of the tin-cup handle, poncho grommet, and cut box nail lends support to Haecker's (1998:45-46) contention that at least some intrasite mess units extended east of the highway. This heavily wooded area may be less picked over by collectors than the primary grass-covered open area west of the highway.

General Nineteenth Century Occupation

Thirty-two artifacts were assigned a nineteenth century affiliation (see Table 3). In most cases the generalized nature of these artifacts overlaps the entire temporal range of the Santa Fe Trail/Kozlowski Trading Post/Camp Lewis occupation, but they cannot be confidently assigned a more finely tuned temporal affiliation. The artifacts from the wooded east side of the highway overlap a transect from which Haecker (1998:46) recovered several Camp Lewis era artifacts. The artifacts assigned a general nineteenth century affiliation may be part of, or mixed with, Camp Lewis related activities that occurred in this area. In general, the nineteenth century artifacts were lightly scattered along the length of the project area, but only four artifacts found during the metal detector survey were recovered between the road and the existing right-of-way fences (see Fig. 5). The majority of the artifacts were found in the buffer zone either side of the highway. No artifacts were recovered from the strip immediately adjacent to the Kozlowski Trading Post on the east side of the highway. Three pieces of glass and an earthenware vessel fragment were recovered from test pits with mixed subsurface deposits (see Table 2). The remaining artifacts were found during the metal detector survey at depths that ranged from surface contexts to 22 cm below the surface (see Table 1).

The clothing/equipment category is represented by a single small rivet/burr recovered from the wooded area on the east side of the highway. The small size suggests association with either clothing or possibly leather equipment.

The hardware category consisted mainly of cut nails, rivet/burrs, and a single barrel hoop fragment. The cut nails were straight, suggesting that they had been dropped and lost. The nails were scattered across the site. One cut box nail was modified for use as a rivet/burr. Both rivet/burrs may have been associated with wagon hardware. A single barrel hoop fragment was recovered from the wooded east side of the highway.

Horse/wagon equipment was represented by three horseshoes and four chain links. Horseshoes are represented by two well-worn fragments, and one complete but worn shoe. The worn nature of the horseshoes suggests association with the Santa Fe Trail. Their replacement is a common activity that might be expected at a Santa Fe Trail stop. Similarly, the four chain links are in

the size category that suggests association with wagon hardware. The links are either broken or show secondary modification, most likely repairs occurring at the Santa Fe Trail stop and watering hole.

The food storage/consumption category consists of two hole-in-top cans, a bail can, and a probable cast iron kettle fragment. The two hole-in-top cans are in the proximity of Santa Fe Trail ruts on the west side of the highway, whereas the bail can was recovered from the wooded area east of the highway. The kettle fragment was also recovered east of the highway.

The arms category contains a Spencer rimfire cartridge case and a .41 caliber lead ball. Interestingly, the empty cartridge was manufactured by the Sage Ammunition Works between 1864 and 1866, and thus postdates the Camp Lewis occupation. Haecker (1998:35) recovered an unfired cartridge with the same headstamp during his Camp Lewis investigations. The cartridge case was found on the west side of the road within the bounds of the LA 85503 precontact site. Santa Fe Trail ruts are about 25 m west of this locality.

The .41 caliber lead ball was not military issue ammunition. The .41 caliber ball was common to a variety of nineteenth century civilian percussion rifles as well as to Derringer percussion pocket pistols. The ball was found on the wooded east side of the highway. Although not military issue, the ball might have been associated with a soldier's privately owned pocket pistol. However, this was a common caliber used over a fairly long period during the nineteenth century.

The unknown category contained three small fragments of glass, an earthenware sherd, and miscellaneous metal scrap. The glass fragments were recovered from two test pits with mixed subsurface deposits at the south end of the tested area. The small fragments could not be specifically identified as to bottle type, although they are most likely from beer and wine bottles. A single earthenware sherd was from a test pit with mixed subsurface deposits. The small undecorated body sherd is from an unidentified vessel form. Seven pieces of metal scrap form the largest portion of the category. Materials include cast iron (1), copper or brass (5), and one cut can fragment. All but the cut can fragment are concentrated in the wooded area east of the highway and within the bounds of LA 85503, the precontact site. The function of the modified metal scrap is unknown, but the items are located in the proximity of the thermal features and a depression previously recorded as precontact site elements. As mentioned, the presence of both precontact and historic period artifacts around these features confuses their actual temporal affiliation.

Two anomalies recorded during the geophysical investigations have been assigned general nineteenth century affiliations. Apparently compacted soil occurs on the west side of the highway between about the 630N and 650N grid lines (Appendix 2: Fig. 8). A probable secondary Santa Fe Trail rut descends the terrace farther to the west of this point, but no swales or ruts are visible in the area of the anomaly. The anomaly is most likely associated with a secondary segment of the Santa Fe Trail, but the anomaly is preserved outside of the right-of-way and was not evaluated by test pits. Two test pits within the right-of-way found mixed subsurface deposits, but no indication of trail ruts.

The most intriguing geophysical anomaly was on the west side of the highway, and bounded approximately by the 685N to 700N and 475E to 490E grid lines (Appendix 2: Fig. 6). This roughly circular area (15 m diameter) with elevated conductivity is set in a slight topographic low and bounded by the Santa Fe Trail on the south. The Santa Fe Trail rut is evident on the magnetic field strength map (Appendix 2: Fig. 4) and was previously tested by Gaunt (1998:27-30). The anomaly is covered with grass and has no surface indications of a feature. It was speculated that this circular area could be a corral, but the anomaly is well outside of the right-of-way and test pits could not be dug to evaluate this speculation.

In addition to the possible corral, a roughly 25-m long diagonal of about six magnetic targets spaced about 3 m apart stretches from 693N 404E to 707N 479E (Appendix 2: Fig. 5). The diagonal gives the impression of a possible fence line. This diagonal of magnetic targets is also outside of the project area and the subsurface nature of the targets was not further evaluated. The large magnetic target appearing north of the diagonal at about 704N 490E (Appendix 2: Fig.5) was visible on the surface as a piece of bent rebar. Very few other magnetic targets are associated with the large anomaly.

Twentieth Century Occupation

Cultural material related to the twentieth century was limited to three artifacts: a sanitary can, a key-opened coffee can, and a horseshoe (see Table 3 and Fig. 5). The food storage/consumption category is represented by the sanitary can and the key-opened coffee can. These cans may date as early as the 1920s to 1930s. The sanitary can was located in the proximity of a secondary Santa Fe Trail rut on the west side of the highway directly west of Kozlowski's Trading Post. The coffee can was found at the south end of the project area.

The horse/wagon equipment category is represented by a single complete horseshoe with six nails. The horseshoe is not worn and appears rather recent. The horseshoe was found on the surface of the road shoulder at grid 650N 507E.

These three twentieth century artifacts may be associated with the operation of the Forked Lightning Ranch; however, they may simply represent refuse tossed along the highway. All remaining artifacts were a combination of road-related litter postdating the 1960s mixed with abundant cobbles and gravel with magnetic signatures. This more obvious recent material and rock were not collected. No geophysical anomalies can be specifically related to the twentieth century Forked Lightning Ranch operation.

CHAPTER 7

Summary and Recommendations

The testing program determined that the site area overlapping the area of take associated with the bridge alignment contains very little cultural material. Pedestrian survey, metal detector survey, and geophysical survey found artifacts with precontact, Camp Lewis, general nineteenth century, and twentieth century affiliations. The majority of this material was associated with the buffer areas along the edges of the right-of-way. Cultural material in the bridge alignment locality was sparse. Fifteen test pits evaluating the nature of the fill consistently verified that subsurface artifact content was low and that previous land-altering activities had thoroughly mixed the fill and compromised the interpretive integrity of the material. Five potential anomalies identified by the geophysical survey are well outside of the construction zone and will not be affected by the proposed road realignment. The testing program has identified, evaluated, and documented cultural material within the right-of-way and has determined that the site area overlapping the proposed project area is not likely to yield information beyond that already documented. No further archaeological investigations within the construction zone are recommended.

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APPENDIX 1

Proposed Testing Plan

MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

A Proposed Testing Plan for the Civil War Site of Camp Lewis, along NM 63, Pecos National Historical Park, San Miguel County, New Mexico

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Timothy D. Maxwell
Principal Investigator

SANTA FE 2002 NEW MEXICO

ADMINISTRATIVE SUMMARY

On February 13, 2002, at Pecos National Historical Park, a meeting was held between representatives of the National Park Service, Pecos National Historical Park (PNHP), the New Mexico State Highway and Transportation Department (NMSHTD), and the Office of Archaeological Studies (OAS), Museum of New Mexico (also present was Marron and Associates). The meeting participants discussed the planned bridge reconstruction along NM 63 in San Miguel County, New Mexico. At this time it was concluded that the OAS was to develop a comprehensive archaeological testing plan for a bridge reconstruction project covering approximately 0.54 acres north of Camp Lewis, a Civil War site (LA 121192); and west of Kozlowski's Station, a Civil War and Santa Fe Trail site (LA 86076) within the boundaries of the PNHP.

The NMSHTD proposes to reconstruct the road and replace the bridge at Glorieta Creek along NM 63. The results of past investigations show that in the project vicinity there are cultural resources from the Territorial period. Field investigation will assess the data potential of artifacts and features that may be within the project area relative to the *National Register of Historic Places* properties, Kozlowski's Station (LA 86076), the Santa Fe Trail (LA 38648), and Camp Lewis (LA 121192). Proposed field methods include nondestructive geophysical remote-sensing techniques, hand excavation within potential cultural features, and mechanical excavation to expose subsurface characteristics of Santa Fe Trail ruts.

NMSHTD Project No. TPM-0063(6)-01, CN 2075, Task No. 4300-7
MNM Project No. 41.689

CONTENTS

Figures

INTRODUCTION

At the request of the New Mexico State Highway and Transportation Department (NMSHTD), the Office of Archaeological Studies (OAS), Museum of New Mexico, proposes to conduct an archaeological testing program north of Camp Lewis, a Civil War site (LA 121192); and west of Kozlowski's Station (LA 86076) within the boundaries of Pecos National Historical Park (Fig. 1; see Appendix 1 for site location information). NMSHTD has developed plans to reconstruct NM 63 and replace the bridge at Glorieta Creek in San Miguel County, New Mexico.

Conventional archaeological survey consisting of pedestrian reconnaissance is inadequate to evaluate the potential artifact distributions and cultural site patterning at Camp Lewis. At the request of and in collaboration with National Park Service personnel (Judy Reed, archaeologist; Charles Haecker; and Dennis Ditmanson, superintendent), the OAS proposes to sample the area using noninvasive techniques of electromagnetic ground conductivity and metal detection. Guided by the geophysical data, standard hand excavation methods will be used to examine anomalies for context, integrity, and extent. Mechanical trenching will be conducted for portions of the Santa Fe Trail within the right-of-way.

Work will be performed in compliance with Section 106 of the National Historic Preservation Act (36 CFR Part 8000), Executive Order 11593 (1972), and the Environmental Policy Act of 1969 (91. Stat 852). The work will be done in accordance with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (Appendix 2). The sections on identification, evaluation, and documentation are pertinent to the testing plan for the proposed road reconstruction and bridge realignment. The Santa Fe Trail (LA 38648) at Pecos National Historical Park is listed on the *State Register of Cultural Properties* and the *National Register of Historic Places*.

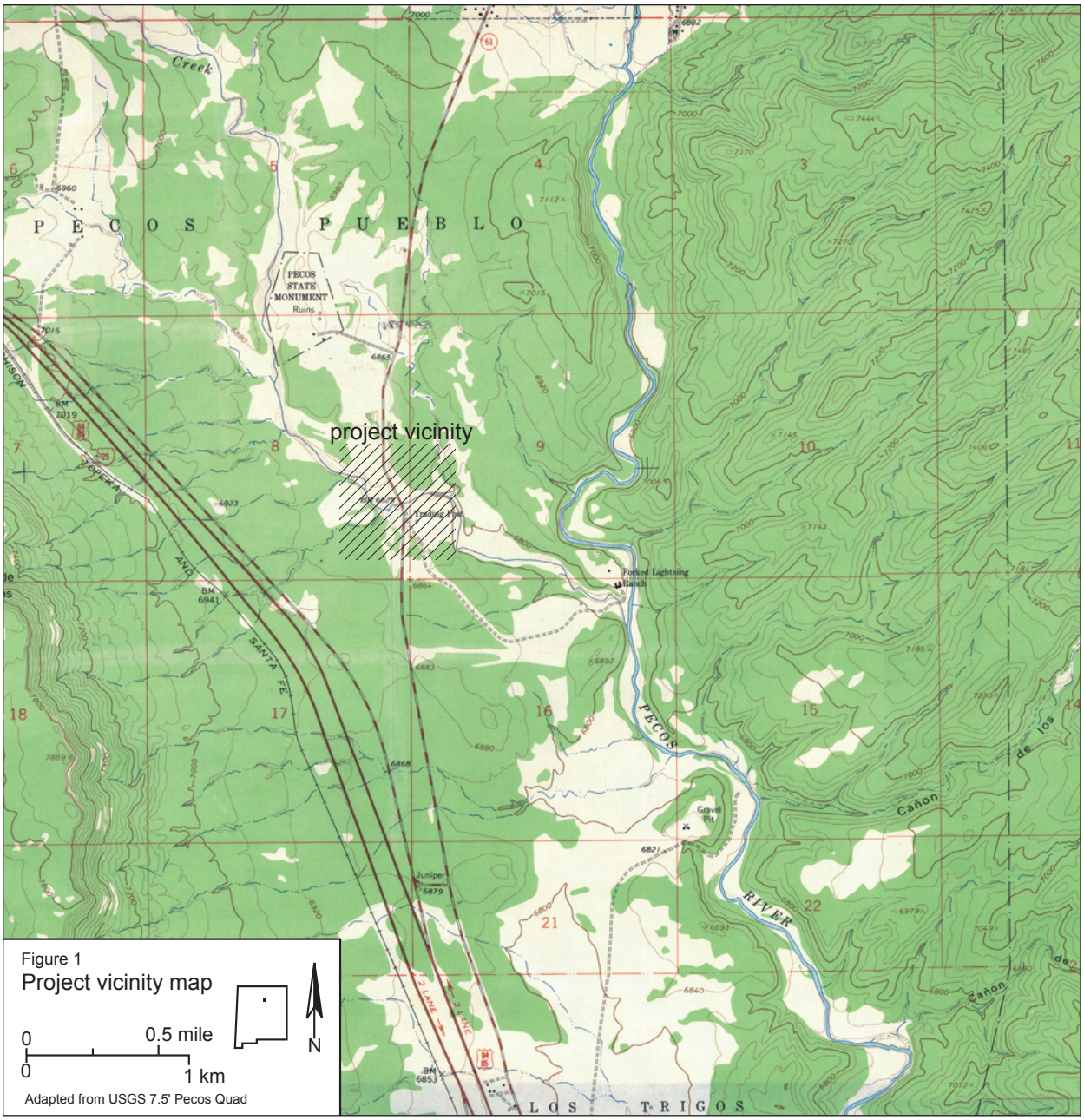

Figure 1
Project vicinity map

2

PREHISTORY AND HISTORY

Forty-six sites within 0.5 km of the project area have evidence of pre-contact Pueblo through historic period occupations. Four of these sites are within or very close to the Camp Lewis site boundary and are discussed in more detail in the following section. Since this area exhibits almost continuous use from A.D. 1200 into the twentieth century and these sites may have bearing on Camp Lewis, a brief discussion of human occupation of the area is provided.

Pre-Columbian Occupation of the Pecos Area

The Pecos area was first sporadically inhabited by nomadic hunters and gatherers during the Archaic period (5000 B.C.-A.D. 400). By the beginning of the Pueblo period (A.D. 400-1600), the population increases in the Upper Pecos Valley may have led to the development of sedentary, agricultural settlements. The first known settlement in the area consisted of a pithouse village (LA 14154) occupied between A.D. 800 and 850. Prior to A.D. 1300, major communities of 200- to 300-room pueblos were established at Rowe (LA 108), Dick's Ruin (LA 276), Arrowhead Ruin (LA 251), Forked Lightning Pueblo (LA 672), Loma Lothrop (LA 277), and other smaller sites in the Pecos area. These early Pueblo III phase (A.D. 1100-1300) sites are believed to be ancestral to Pecos Pueblo, and Forked Lightning Pueblo is thought to have been its immediate predecessor.

Numerous researchers have attempted to account for population influx onto the Pecos mesilla. Mera (1940), Kidder (1958), and Hewett (1904) believe that people from the Pecos Valley moved to Pecos Pueblo because of the continual threat of Plains Indian attacks. The notion of raiding by outside groups, specifically Plains Indians (Apaches), is refuted by Schroeder (Ford et al. 1972:30), Gunnerson (1969), and Nordby (1981). Gunnerson's (1969) work at Pecos has combined historical documentation with archaeological research to demonstrate that Athapaskan speakers (Apaches) were not in the Pecos area until after A.D. 1525. Other archaeologists hypothesize that smaller pueblos consolidated into Pecos to increase the work force necessary for intensive agricultural practices and in particular for the development and implementation of complex irrigation systems. Fliender (1981), on the other hand, believes that the migration from the smaller pueblos to one large community at Pecos was the result of an endemic decrease in the population due to an overly stressed environment.

By A.D. 1450, Pecos Pueblo was the only inhabited village in the Pecos River Valley and consisted of a monumental fortified complex of multistoried buildings around a main plaza (Kidder 1932, 1958).

Spanish Occupation at Pecos

The first European to visit Pecos Pueblo was Captain Hernando Alvarado in 1540, when he was in command of the Coronado expedition (Sanchez 1988). Pecos Pueblo sent a delegation to Zuni to offer peace to Coronado, taking him buffalo hides, shields, and feathered headdresses. Captain Alvarado returned with the Pecos delegation to the pueblo. In 1581, the Rodríguez-Chamuscado expedition visited Pecos, followed by the Espejo-Beltran expedition in 1582. Spanish attempts to conquer the pueblo for Spain were finally successful in 1590 through the efforts of Castaño de Sosa, who fought briefly with the residents of Pecos. The pueblo was left in peace for the next eight years until Oñate occupied New Mexico in 1598. Shortly after his arrival, he sent a delegation of Franciscan priests as missionaries to Pecos. By the early 1620s, a church (the largest European building in New Spain) had been built at the pueblo and continued in operation until 1680, when the Spaniards were forced to leave the territory because of the Pueblo Revolt (Kidder 1962). When Don Diego de Vargas recaptured New Mexico in 1692, a new mission church was established at Pecos, and Spanish occupation continued from this time through 1828. By 1838, due to the devastation of the earlier smallpox epidemic, only 17 to 24 inhabitants remained at Pecos Pueblo.

The move from Pecos Pueblo by the early to mid-nineteenth century has been attributed to the continual stress on the population from diseases introduced by the Spaniards and increased depredation by Plains Indians (Kidder 1962). The last survivors of Pecos eventually left the Upper Pecos Valley in 1838 and sought refuge at Jemez Pueblo (Kidder 1932; Gregg 1990; Nordby and Wait 1979).

The Plains Indian Influence

In 1525 Plains groups attempted to expand their territory into New Mexico by waging war on Pecos Pueblo, the most eastern Pueblo in the Southwest (Kidder 1932; Rasor 1988). Unable to conquer Pecos, the Apache groups retreated to the Plains, and by 1540 an alliance was made between the Pecos inhabitants and the Apaches. This resulted in the development of an extensive trade economy that actually had roots extending back to the 1400s (Rasor 1988). The location of Pecos in the narrow corridor between the eastern plains of New Mexico and the Rio Grande Valley to the west made it an ideal trade center between the two regions.

Rasor (1988) records that the Plains Indians came by the hundreds to trade fairs at Pecos and brought buffalo hides, meat, raw material for stone tools (Alibates chert), and shells for trade. Later on, the Plains groups also traded slaves to the Spaniards for horses (Rasor 1988). In return the Rio Grande Pueblos provided cotton clothing, pottery, obsidian, feathers, turquoise, and food staples.

A peaceful existence between the Plains and Pueblo Indians endured to approximately 1675. The Spaniards recorded that Apache groups often camped outside the walls of Pecos during severe winters, and by the 1690s some were living with the Pecos people (Rasor 1988). It is speculated that due to Comanche harassment, trade between the Pueblos and Apaches ceased after the 1770s. By the 1740s Comanches were a serious threat to Pecos, and numerous residents of the pueblo were killed. Kidder (1962) reports that by 1750 most adult males had been killed by Plains attacks. The pueblo suffered further devastation in 1788 from the Spanish-introduced smallpox epidemic, which killed off all but 180 people.

Tipi-ring sites have been recorded within the immediate vicinity of Pecos Pueblo (Metzger, personal communication, October 1991). Tipi-ring sites with associated Pecos pottery have been suggested as evidence that Plains groups were trading with Pecos (Gunnerson and Gunnerson 1970). These types of Plains sites have been recorded at Anton Chico and to the north near Las Vegas, New Mexico. Also, a burned jacal structure, excavated at Pecos, contained Pueblo and Jicarilla Apache wares (Gunnerson 1988).

The Santa Fe Trail

In the late eighteenth century, when the Spanish land grants were being established in the Pecos River Valley, numerous expeditions brought explorers and traders into New Mexico. At this time, New Mexico was still a territory of Spain, and the Spanish government maintained tight control over its frontier communities. Spain's colonial borders were closed to any type of commerce with foreigners to the east. Spain's new frontier settlements were supposed to have exclusive economic ties with Mexican communities to the south via the Camino Real from Chihuahua. When Mexico gained independence from Spain in 1821, the borders of New Mexico were opened, and trading with the United States began by means of the Santa Fe Trail. The Santa Fe Trail was the first American trans-Mississippi pathway to the West and the only route that entered into another country (Simmons 1988; National Park Service 1963). The trade, centered in Santa Fe, eventually overflowed into the Mexican provinces, where merchants found lucrative markets for their wares.

William Becknell, his companions, and their oxen and mule trains of merchandise were the first easterners to legally travel from Missouri to Santa Fe on what became the Santa Fe Trail. In the autumn of 1821 they were also the first Americans to engage in commerce with the Republic of Mexico. The Santa Fe Trail differed markedly from trails farther north, whose traffic was composed mainly of settlers, ranchers, farmers, and miners trying to reach the Pacific in quest of new homes and opportunities. With time, the trail grew into a well-traveled route. The Santa Fe trade drew Mexican silver coins, furs, wool, and raw material into the United States. It also precipitated a minor economic boom in Santa Fe, which had previously been a depressed frontier area (Simmons 1984, 1988).

The twenty-five years (1821-1846) in which Mexico controlled the western end of the trade along the Santa Fe Trail are generally regarded as the heyday of the trail. During that period many of the most dramatic events associated with the trail's history occurred. These included the initial survey of the route in 1825; the first experiments with military patrols; rocky diplomatic negotiations with Mexico; the travels of Josiah Gregg, whose book, *Commerce of the Prairies*, first publicized the Santa Fe Trail and the American West, as well as describing an assortment of Indian fights and weather disasters (Simmons 1984).

In 1846, during the first year of the Mexican-American War, General Stephen Watts Kearney led his army along the Santa Fe Trail's mountain route and conquered New Mexico. Bringing Santa Fe under the rule of the United States changed the character of the commerce of the trail. However, the route no longer benefitted from international ties. Forts were added to the trail to guard against Indian attacks, and military freight trains became a new business. Diverse travelers now used the Santa Fe Trail. Where once the trail had been populated by merchants and their ox-driven caravans, the late 1840s saw the trail traveled by U.S. Army soldiers, government officials, gold seekers bound for California, Catholic priests and nuns, Protestant missionaries, and Old World immigrants (Simmons 1984; Almaraz 1988).

The Santa Fe Trail, including its two main routes, was over 1,200 miles long. The original route started in Franklin, Missouri, and went southwest through Kansas, where it followed the Kansas River. At what is now the town of Cimarron, in western Kansas, the trail split into two routes. The Cimarron Cut-off crossed the Oklahoma Panhandle, entering New Mexico northeast of Clayton; and the Mountain Branch headed west along the Arkansas River into Purgatory, Colorado, then south through the Raton Pass into New Mexico. These two

routes then converged at La Junta (now Watrous), New Mexico. This later became the site of Fort Union. The Santa Fe Trail headed south and west from La Junta. San Miguel del Vado was the first Mexican settlement encountered by traders prior to the founding of the town of Las Vegas in 1835. The town consisted of a fortified plaza located near a ford (*vado*) on the Pecos River and served as the port of entry for New Mexico (Pratt and Snow 1988).

The Santa Fe Trail left San Miguel and headed north and west into the mountains. The first travelers would have seen Pecos Pueblo still inhabited by a few families. However, after 1838 the pueblo and mission ruins served as a landmark and campsite for Santa Fe Trail travelers (Pratt and Snow 1988). In 1836, the Catholic priest at Pecos left and took up residency at the church at San Miguel. Trail ruts are still visible in part of Pecos National Historical Park and at Fort Lightning Ruin (Kidder 1958:11, Fig. 3a). The main trail lies to the west of the mission across the Glorieta Creek. Some spur-trail ruts to the village of Pecos pass the ruins on the eastern side of the mission (Metzger 1990).

After Pecos, the next settlement encountered was the small village of Pecos, two miles north. Also in this area were three ranches, which would become important sites in the Civil War Battle of Glorieta: Kozlowski's Ranch (1850s), near Pecos Pueblo; Pigeon's Ranch (1850s), further west at the entrance to Glorieta Pass; and Johnson's Ranch (1858), on the west side of Glorieta Pass. The most easily accessible route through the mountain range for Santa Fe Trail travelers was Apache Canyon. After passing through Pecos and Apache Canyon, the trail swung west through Arroyo Hondo and north to Santa Fe (National Park Service 1963; Pratt and Snow 1988).

Kozlowski's Stage Station was in the Pecos Pueblo Grant. The modern headquarters incorporates some of the original walls of Kozlowski's structure. Martin Kozlowski, a Polish immigrant and enlisted man with the Missouri Volunteers, came to New Mexico in 1846 and later acquired land on the Santa Fe Trail. The spot where he settled was adjacent to a spring. With adobe and roof timbers scavenged from the Pecos mission and pueblo, Kozlowski built his ranch house, barn, and corrals. There may already have been a structure at this location, perhaps dating back to 1810. Prior to the Civil War, Kozlowski's Stage Station served as a regular stage stop, and Mrs. Kozlowski would serve meals to passengers en route to and from Santa Fe.

Camp Lewis (LA 121192), across NM 63 from Kozlowski's and south of Glorieta Creek, was a Civil War camp used for a few days as a staging ground for 1350 Union soldiers that fought in the Battle of Glorieta Pass. The camp was named after Captain William H. Lewis, a regular army officer of the U.S. Fifth Infantry. The camp was occupied primarily by members of the First Colorado Volunteers and one company of New Mexico Volunteers. On March 26-28, 1862, this small Union force engaged elements of the Confederate Army under the command of General Henry H. Sibley at nearby Apache canyon and Glorieta Pass (see below for more details on this campaign). Although the camp was occupied by U.S. forces for only three days, the nearby stage stop was used as a field hospital for eight to ten weeks afterwards. The Santa Fe Trail (LA 38648) passes through the site (Haecker 1998 85-86).

Pigeon's Ranch, once a twenty-three room complex, is presently on NM 50. The ranch, established in the 1850s, was another Santa Fe stopover. Alexander Valle, a Frenchman from St Louis, built the combination ranch and Santa Fe Trail hostelry. Today only three adobe rooms, a rubble mound, and stone corral footings remain of the original structure. During the Battle of Glorieta, Pigeons Ranch alternately changed hands between the Union and Confederate forces (Simmons 1984). The site served as a makeshift hospital, a morgue (Simmons 1984), and later the burial ground for 31 Confederate soldiers.

Johnson's Ranch and Stage Station is at Cañoncito at Apache Canyon, west of Pigeon's Ranch (on the old Pecos Highway). In 1858, Anthony Johnson of St. Louis purchased the ranch and built an adobe and rock residence. Johnson's Ranch became a stop for stagecoaches on the last stretch of the Santa Fe Trail before Santa Fe. Confederate troops occupied the ranch during the Battle of Glorieta and used it as their headquarters and supply depot. It was near Johnson's Ranch that Union troops under the command of Major Chivington destroyed the Confederate supply train and forced the Confederates out of New Mexico (Simmons 1984; Swanson 1985).

By the 1870s, the railroad industry was building new rail lines across Kansas into the Southwest. As each new section was being added to the railroad system, only portions of the Santa Fe Trail were being traveled. In 1879, when the train line reached Las Vegas, New Mexico, only 65 miles remained of the Santa Fe Trail's original wagon route to Santa Fe. The railroad reached Santa Fe in 1880, marking the end of the Santa Fe Trail as a major commerce highway (Simmons 1984).

The Battle of Glorieta

During the American Civil War, the Army of the Confederacy was trying to gain control of the Santa Fe Trail in northern New Mexico. Their strategy was to control the proposed Southern Pacific Railroad route near the Mexican border. Uniting the Confederacy with transportation routes to the ports and gold fields of

California and capturing the gold and silver mines in Colorado would have bolstered the economy of the Southern states and given the Confederate Army military and political power over most of the United States. The Confederates also planned to annex a portion of Mexico. This vast territory would be acquired as a slave-based economy stretching from the Pacific to the Atlantic (Swanson 1988).

In February and early March of 1862, the Confederate Army, under the command of Brigadier General Sibley, successfully defeated the Union troops in New Mexico at the battle of Valverde. They occupied a portion of New Mexico along the Rio Grande from El Paso, Texas, north to Santa Fe. Sibley then made plans to capture Fort Union, east of Santa Fe. In its role as the protector of the Santa Fe Trail, Fort Union was the headquarters and supply depot for the Department of New Mexico and the key to controlling the entire territory. Sibley, however, never did make it to Fort Union, nor did he ever have another success in New Mexico. The Battle of Glorieta, which took place along the Santa Fe Trail at Glorieta Pass, was the victory by the Union Army that resulted in Union control over New Mexico. During this same period, Union forces were defeating Confederate troops from Kansas to Missouri, resulting in Union control over everything west of New Orleans (Swanson 1985, 1988).

In late March 1862, Sibley's Texas Rangers advanced toward Glorieta Pass and Fort Union. General Sibley remained in Albuquerque while 300 mounted men under the command of Major Charles Pyron advanced from Santa Fe on the Santa Fe Trail. Pyron stopped at Johnson's Ranch and Stage Stop at the confluence of Apache Creek and Galisteo Creek. At the same time, unknown to the Confederates, Colonel John Slough and his Colorado Volunteers came to the defense of Fort Union. Slough decided to take the initiative and advanced a party of his men, led by Major John M. Chivington, west toward the Confederate lines. The Union troops reached Kozlowski's Ranch and Stage Stop, where they camped at the spring (Swanson 1985; Pratt and Snow 1988).

An initial encounter between the Union and Confederate armies occurred in Apache Canyon on the March 26, 1862. This fight was the first Union victory in New Mexico and has been referred to as the "First Skirmish of Apache Canyon." Chivington abandoned pursuit and withdrew to Pigeon's Ranch, where a hospital was established. Pyron and his Confederate troops retreated to Johnson's Ranch and sent a courier requesting reinforcement from Colonel William Scurry, who had several hundred Texas Rangers and a supply train standing by near Galisteo. The next day Chivington fell back to Kozlowski's Ranch, where he was met by Slough and his backup troops (Swanson 1985).

Both armies, at the opposing ends of Glorieta Pass, simultaneously advanced on the morning of March 28 and fought the Battle of Glorieta at Pigeon's Ranch. Although the battle itself was a Confederate victory, Scurry conceded a defeat after he received word that a Union detachment had diverged over the top of Glorieta Mesa and destroyed the Confederate supply train at Johnson's Ranch. As a result, the Confederate forces retreated from New Mexico, returning to Texas with only one-third of Sibley's original army. The Battle of Glorieta, often called "the Gettysburg of the West," forced the Confederacy to abandon their plans to conquer the West. As a result of these events, the Union Army retained control of one of their main military supply routes, the Santa Fe Trail (Swanson 1985; National Park Service 1990).

Pecos National Historical Park

Documentation of Pecos Pueblo began in 1880, and excavation and preservation treatment began later in the 1900s. By 1965, when the area became a national monument, considerable work had already been conducted to preserve the ruins. From 1965 to the present there have been numerous excavation, stabilization, and reconstruction projects of the Pecos ruins by the National Park Service.

Pecos National Historical Park is situated on the top of a broad, flat, sandstone-capped mesilla approximately one mile west of the Pecos River. Occupation of Pecos Pueblo spanned six centuries, from A.D. 1250 to 1838 (Kidder 1932, 1958). Historians characterize Pecos Pueblo as a frontier community. The inhabitants of Pecos Pueblo had contact with other Pueblo communities, engaged in warfare with the Plains Indians, and eventually became a center of trade between the Pueblo, Plains, and Spanish groups.

Pecos Pueblo was first documented by the Spaniards during the Coronado expedition of 1540, when it was reported that the pueblo had a large population of approximately 2,000 individuals. In the 1830s Josiah Gregg traveled on the Santa Fe Trail. He noted that Pecos was still inhabited by a few Indian families and that it was one of the pueblos converted into a Mexican village (Gregg 1990). Adolph Bandelier visited Pecos in 1880 and made a detailed map as well as an ethnohistorical report of the history of the pueblo (Kidder 1962). Twenty years later, in 1904, E. L. Hewett published a paper on archaeology in the Pecos Valley and gathered information about the pueblo from interviews with two native Pecos Indians living at Jemez. In 1910, K. M. Chapman collected a large sample of the potsherds representative of Pecos Pueblo and was sur-

prised at the wide variety of ceramic types, including black-on-white wares and historic Rio Grande types. Finally, from 1915 to 1925, A. V. Kidder conducted an extensive archaeological excavation in the Pecos area and Pecos Pueblo and participated in the first steps toward stabilizing portions of Pecos Pueblo to make the cultural resource available for interpretation.

In 1935 the site of Pecos was made into a state monument. The lands were eventually acquired by the federal government, and in 1965 the extensive pueblo ruins, Spanish mission church, and associated convento were designated as a national monument by Congress. In 1990, Pecos National Monument was combined with Forked Lightning Ranch and the site of the Battle of Glorieta to make up what is now referred to as Pecos National Historical Park.

THE TESTING PLAN

This archaeological testing plan will assess the data potential of artifacts and features that may be within the project area relative to Camp Lewis (LA 121192) and *National Register of Historic Places* properties, Kozlowski's Station (LA 87076), and the Santa Fe Trail (LA 38648). These three resources overlap in the project area and are collectively referred to as Camp Lewis for this project (Fig. 2). Other cultural resources in the project area, including ranch fences on the east and west side of the road, fence pillars, and a cattle guard, are addressed in the Environmental Assessment document. The work will be done in accordance with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*. With these guidelines, the objective of the project will be the identification, evaluation, and documentation of cultural resources discovered in the project area. Proposed field methods include nondestructive geophysical remote-sensing techniques, hand excavation within potential cultural features, and mechanical excavation to expose subsurface characteristics of Santa Fe Trail ruts. Past archaeological projects and cultural resources within and near the project area are briefly described, followed by the scope of work and testing methods and laboratory procedures.

Sites and Projects in the Vicinity of Camp Lewis

Camp Lewis (LA 121192) is a large Mexican and Territorial period site with a distinct Civil War era component and Santa Fe Trail ruts (LA 38648). It is near Kozlowski's Ranch and Stage Station (LA 86076). Three cultural resources management projects have been completed along NM 63 where it passes and crosses Camp Lewis, the Santa Fe Trail, and Kozlowski's Ranch and Stage Station by the Office of Archaeological Studies (Lentz 1992; Willmer 1993; Gaunt 1998). The National Park Service completed a preliminary assessment of Camp Lewis, defining site limits and potential subsurface features (Haecker 1998). Also, four cultural resources inventories conducted since 1994 identified sites within and near the project area. These projects are briefly described because they are relevant to the current Camp Lewis project.

The Office of Archaeological Studies recorded fourteen sites (LA 85495-LA 85508) and thirty-five isolated occurrences along 8.32 km (5.17 mi) of NM 63 between Rowe and Pecos, New Mexico (Lentz 1992). Four sites were recorded within the 1991 boundaries of Pecos National Historic Park. Ten sites were recorded on private land, eight of which were on Forked Lightning Ranch, several hundred acres of which is now part of PNHP. Portions of the Santa Fe Trail (LA 38648), where it occurs in the vicinity of the project, were relocated and mapped. Associated with the Santa Fe Trail are Kozlowski's stage station (LA 87076) and Kozlowski's spring. Five sites from previous cultural resource inventories were also relocated within the inventory area. Testing was recommended for several sites.

The Office of Archaeological Studies (Willmer 1993) conducted a supplemental inventory of 14 construction maintenance easements (CMEs), three temporary construction permit areas (TCPs), eight work permit areas (WPAs), and five new right-of-way alignments. Two archaeological sites (LA 99939 and LA 99940) were recorded and recommended for testing.

The Office of Archaeological Studies (Gaunt 1998) tested ten sites recorded by Lentz (1992) and Willmer (1993). These were LA 38648 (the Santa Fe Trail), LA 85495-85496, LA 85500, LA 85502-85503, LA 85507-85508, and LA 99939-99940. The program determined that portions of LA 85495 (previously defined as LA 85496, LA 85507, LA 85508, and grouped under the single LA number 85495), LA 85500, LA 85502, LA 85503, LA 99939, and LA 99940 were not likely to yield information on the local prehistory or history beyond that which was already documented, and no further investigations were recommended. The Santa Fe Trail ruts (LA 38648) were mechanically trenched. Evidence of the trail was located within both trench profiles. These features were tested electromagnetically. This survey was conducted using a Geonics EM-31 ground conductivity meter, which identified magnetic anomalies consistent with buried segments of the Santa Fe Trail (Hyndman 1994). The deep or vertical dipole conductivity data was most successful in identifying patterns indicating projected trail ruts. On the west side of NM 63, the testing within Trench A showed the conductivity of the signature of the ruts extending from the hillslope to the west down to a utility pole. One metal artifact of unknown age was recovered from the north side of the trial ruts, 15 cm below the ground surface. Trench B, on the east side of NM 63, exhibited the same stratum identified in Trench A as the Santa Fe Trail ruts.

Haecker (1998), working for the National Park Service, surveyed Camp Lewis (LA 121192). This study showed that numerous artifacts related to that encampment exist adjacent to the Santa Fe Trail, where the trail swings to the west around a fairly level area before descending to Glorieta Creek. Several circular anomalies, possibly caused by travelers or military supply wagons, were defined by a proton magnetometer and infrared imagery. The survey also yielded 300 artifacts, of which between 14.3 percent (n=43) and 31.3 percent

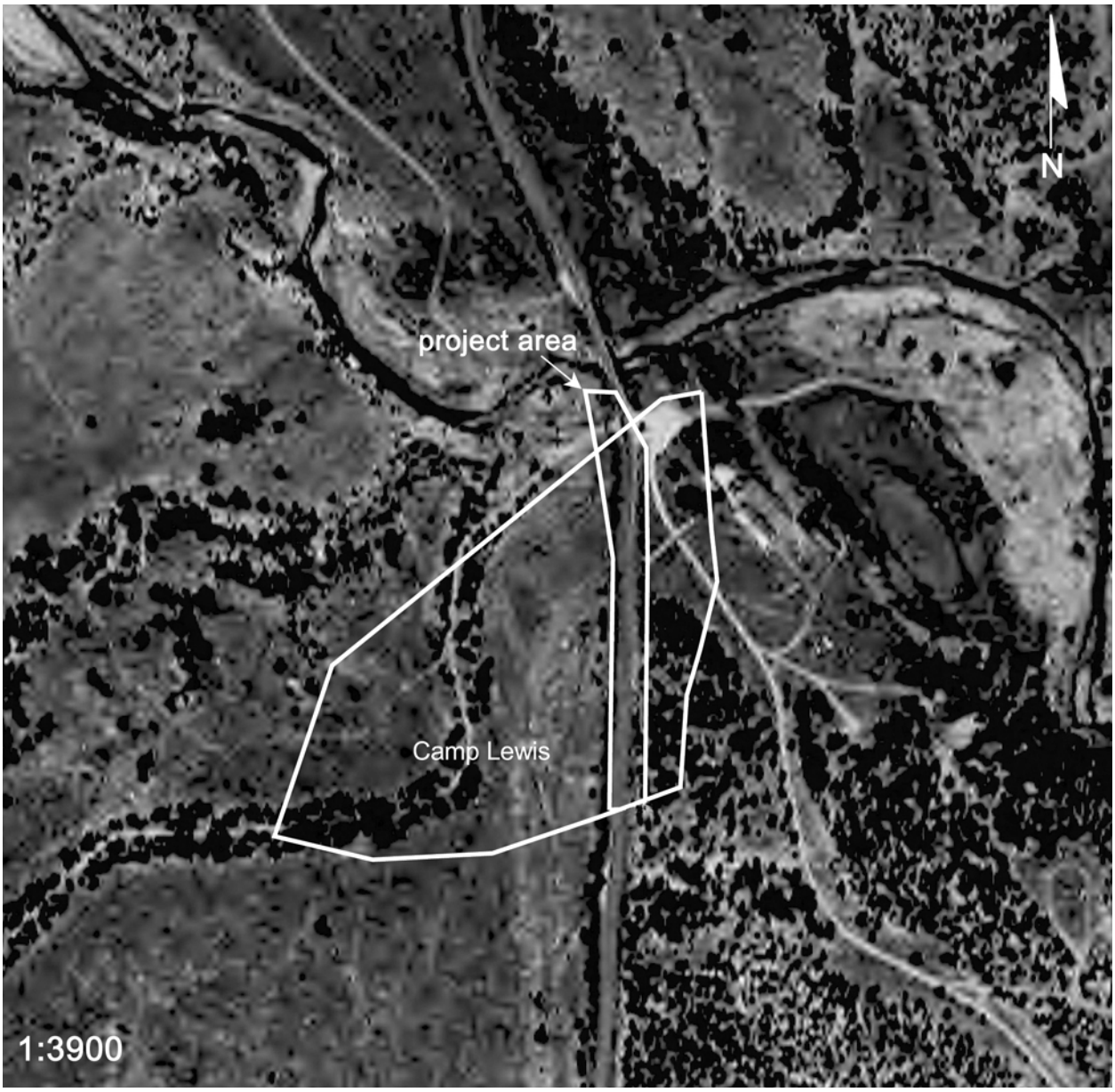

Figure 2. Aerial photograph of Camp Lewis and the project area.

(n=94) are probably related to the Civil War component. Haecker (1998:51) notes that the site has been surface collected for years.

Between 1993 and 1997, an archaeological inventory project conducted by the National Park Service covered 6,416 acres within Pecos National Historic Park (Eininger et al. 1995; Eininger 1996; Head 1997; Cunningham and Eininger 1998). Six hundred twenty-nine new sites were recorded, of which 50 to 60 were previously identified (Head and Orcutt: 2000). Sites from all time periods with a large number of multicomponent sites typified by individual or combined occurrences of architectural, artifact scatter, linear, transportation, and agricultural features. Out of the 629 sites, 43 were found within a 0.5 km radius of the Camp Lewis site (LA 121192). This temporal and functional range of these sites are discussed in more detail as a background to the testing plan.

A review of the site data within a 0.5 km radius of Camp Lewis, Kozlowski's Station, and the Santa Fe Trail identified 43 additional cultural properties or sites, of which four are within or very near the site limits provisionally defined by Haecker (1998). These sites are LA 85503, LA 118831, LA 118868, and LA 119010. The cultural deposits or materials at these sites may have some bearing on the proposed testing plan.

LA 85503 is a multicomponent precontact and historic site. The precontact and early historic component has mound and thermal features with an artifact scatter that contains Santa Fe Black-on-white, Pecos Glaze-on-polychrome, and utility pottery associated with chipped stone debris and corner-notched and unnotched projectile points. The Territorial to Statehood component is an artifact scatter of purple, green, and clear bottle glass, tin cans, and a musket ball. This 9,000 sq m site undoubtedly is major contributor to the non-Civil War cultural deposits at Camp Lewis.

LA 118831 is an artifact scatter dating from the Classic period to the Territorial to Statehood periods. Pottery types include Wiyo Black-on-white and Glaze A, C, and F types numbering fewer than 100. Historic period artifacts included sanitary and soldered seam cans, a barrel hoop, and purple and aqua glass. The site is in the central portion of Camp Lewis. However, the artifacts probably post-date the Civil War occupation and relate to Santa Fe Trail or ranching activities.

LA 118868 was a multicomponent sherd and lithic artifact scatter associated with three ash stains within a 2,465 sq m area. The undecorated red ware indicated a Spanish Contact/Colonial period early date of A.D. 1625. One thermal feature was observed with a moderate density artifact concentration. The other two surface features were suggested to date to the early Statehood period. The sherds, ground stone, and projectile points were observed with abundant reduction debris of chalcedony, quartzite, chert, and obsidian. The thermal features and chipped stone suggest hunting and foraging during the early historic period and camping or transportation-related activities during the early twentieth century.

LA 119010 is a sherd and lithic artifact scatter from the Coalition and late Classic period. The scatter covers an estimated 5,200 sq m. Pottery includes Santa Fe Black-on-white and Glaze E types. Associated lithic debris include debitage, ground stone, and a projectile point, and lithic raw materials include chert and obsidian. No features were observed. This site was a discontinuously used foraging or hunting camp.

These four sites within or near the Camp Lewis site limits indicate that more than Civil War, Santa Fe Trail, and Statehood historic period features and activity areas may exist within the project area. As should be expected for a well-watered location, the occupation history is complex and likely to be mixed. The testing program focuses on identifying all cultural and temporal components within the project area through geophysical remote sensing and hand excavation.

Research Objectives

The research objectives of the Museum of New Mexico's Office of Archaeological Studies testing program at Camp Lewis Pecos augment the existing data collected by Pecos National Historic Park and should determine the potential of the site to yield further information on the prehistory or history of the area.

As Haecker observed (1998:83), only limited inferences can be made from survey data. A testing program at Camp Lewis can provide information on subsurface characteristics that are not evident from visual inspection of the surface. During testing, the primary objectives are:

1. to determine if cultural materials likely to yield important information are present;
2. to determine the vertical and horizontal distribution of artifacts and features;
3. to identify unknown features;
4. to evaluate the density of subsurface cultural deposition, if present;
5. to determine the presence or absence of datable or sensitive materials;
6. to infer the age of the site or site components;
7. to provide the information necessary to make management recommendations based on the results of testing.
8. to provide a permanent record of documentation of cultural resources in the project area according to

Secretary of the Interior's Standards.

Examination of these variables is needed to make informed decisions on future management of the sites. Vertical distribution of artifacts and features are critical for determining the data potential of the site and anticipating the level of effort required if data recovery is necessary.

Testing Procedures

Proposed testing will include geophysical remote-sensing methods, hand excavation within geophysically detected anomalies and artifact concentrations, and mechanical excavation. This combination of methods is suited to identifying subtle near-surface historic artifact distributions and potential buried pit and masonry features, and for documenting linear features that have limited behavioral information. Hand excavation can confirm geophysical results allowing for an assessment of the nature of potential cultural features and deposits.

Metal Detection

Metal detection has been used successfully at the Camp Lewis site, with 300 historic artifacts collected from a 3-percent linear transect sample. It is estimated that thousands of artifacts lie in shallow, buried contexts remaining within the site limit (Haecker 1998:51). The most common metal detectors use "Very Low Frequency (VLF)" technology. VLF technology employs a transmitter and a receiver coil. The transmitter coil pulses downward, while the magnetic field of buried objects pulses upward. The receiver coil detects upward pulsing magnetic fields and sends a signal to the receiver box for analysis. The strength of the signal depends on the depth of the object, the type of metal, and the size of the object (Tyson 2002). A detection depth rule-of-thumb is that metal detectors will signal buried metal artifacts at a depth commensurate with or slightly deeper than the diameter of the search head. Therefore, a metal detector with a 20 cm diameter search head may effectively signal a metal object buried 20 to 30 cm below the surface depending on the artifact size and vertical orientation. Artifacts may be detected up to 60 cm deep if they are large and conditions are optimal (Davenport n.d.:12-14). In stable geomorphological settings or in settings with minimal soil accumulation since the targeted historic period occupation, metal detectors are effective search tools. Metal detectors are especially effective for historic occupations that generated robust iron or steel artifacts or numerous nonferrous metal artifacts. Both of these success factors seem to be operating at the Camp Lewis/Kozlowski's Station site.

Metal detectors have been proven cost-effective and time-efficient tools for determining site limits at Camp Lewis (Haecker 1998). Systematic 100-percent coverage of the project area using metal detector transects will aid in locating period artifacts, which will be collected. These artifacts will aid in evaluating the reliability of the estimated site boundaries for the Civil War camp, provide information on transportation and ranching activities related to pre- and post-Civil War Kozlowski's Station use, and may identify potential activity areas reflecting spatial organization peripheral to Kozlowski's Station.

Electromagnetic Ground Conductivity versus Direct-Current Resistivity

The following discussion of the applicability and advantages and disadvantages of electromagnetic ground conductivity and direct current resistivity was provided to OAS by David Hyndman of Sunbelt Geophysics, Inc., of Albuquerque, New Mexico.

Electromagnetic ground conductivity and direct-current resistivity are two geophysical remote sensing methods applied to archaeological sites and deposits. Theoretically, conductivity is the inverse of resistivity, but the archaeological targets are the same. In practice, there are modest technical differences and significant operational differences. The operational differences give a distinct cost-effective advantage to the electromagnetic conductivity method.

Both methods measure approximately the same physical parameter of the ease of current flow through the soil. Electric current flows in the soil most easily by electrolytic conduction between free charged particles. This requires a supply of moisture, porosity to contain the moisture, permeability to provide a path, and a source of free ions to carry the charge. Any human activity that creates lateral changes in soil moisture, porosity, permeability, or ionic content of the soil may create a measurable anomaly. Generally, human activities in an arid climate increase the conductivity of affected areas by trapping moisture in compacted earth or increasing the availability of free ions. Examples are foundations, hard-packed soil, animal waste in the soil, and middens.

Resistivity measurements are made by directly injecting a current into the soil with electrodes, typically metal rods driven in the ground, and measuring potentials (voltages) with a second set of electrodes. Conductivity measurements are made by inducing currents in the ground with an electromagnetic field generated by a coil, and sensing the strength and phase of the resultant ground response with a second coil. A modern

resistivity meter cost about $5000 and can be home-made by a competent electronic technician following ASTM 57-G. A typical conductivity meter costs $15,000 and requires specialized expertise to fabricate.

Technical Comparison

Resistivity works well in highly conductive soils (wet clays), whereas conductivity does not. Conductivity works well in highly resistive soils (dry sands) where resistivity does not. Most New Mexico soils fall between these two soil types.

Resistivity can provide competent measurements very near fences, buildings, and other surface or subsurface metallic objects which often distort conductivity measurements. Both methods are hampered by high-voltage power lines.

For a given depth of investigation, conductivity provides a measurement for a volume of soil significantly less than resistivity. For example; to probe to a depth of 1 m, a conductivity meter provides the average conductivity of a hemisphere with diameter of approximately 1 m, where resistivity would provide a measurement for a hemisphere of approximately 3 m. This allows conductivity to register a larger relative anomaly (higher signal to noise) for a given target.

Operational Considerations

Conductivity meters are man-packed, self-contained instruments that can be rapidly advanced along data acquisition traverses with the measurements stored in a data logger. No intimate ground contact is needed. Data density is controlled by the clock in the data logger and 25 cm to 50 cm data is common. These data are then transferred to a computer for processing and image preparation. Data processing is minimal, typically involving only positioning and editing prior to generating a two dimensional (or 3-D) color contour map for interpretation. Draft maps are routinely made in the field. Fill-in data or grid expansion are easily accomplished provided that a fixed tuning station is established prior to initial data acquisition.

Resistivity measurements require placing two electrodes and advancing at least two potential electrodes for each measurement. The electrodes must be inserted into the ground, with intimate electrical contact, at each station. Most commercially available resistivity systems require four cables (wires) connecting the two current electrodes and the two potential electrodes to the meter. Placement of the electrodes can be affected by rocks, roots, and hard earth, each making the physical task more difficult and contributing to erratic readings. These data acquisition requirements slow resistivity surveying and introduce the chance for error from poor electrode placement.

The term "Twin Probe" resistivity is not common nomenclature among U.S.-based geophysicists. It is assumed that this method is the same as or a variant of the so-called "gradient array" that can be found in the domestic literature. This method entails placing the current electrodes at a wide separation and taking measurements with the potential electrodes within an area between the current electrodes. Generally the measurements are taken in the middle one-third of the spread between the current electrodes. For example, with the current electrodes 30 m apart, there would be a 10 by 10 m "sweet spot." This type of array has the advantage of allowing numerous measurements without moving the current electrodes. Unfortunately, there is a requirement to apply a unique geometric factor to each measurement to account for its position within the current flow. This adds one more data processing step. In addition, the wide separation of the electrodes causes the current to flow deeply, possibly damping the near-surface features, and neighboring surveys can be difficult to merge.

Summary

Assuming there is a limited budget for equipment, a graduate student for labor, and plenty of time, the resistivity method is the way to go. That is exactly why so many resistivity surveys are found in the archaeological literature. There are, in general, no compelling technical reasons to implement a resistivity-based survey. If one is a geophysical contractor, or hiring a geophysical contractor, electromagnetic conductivity surveys are more cost effective, efficient, and reliable.

Further, electromagnetic conductivity survey has been successfully applied to a portion of the project area associated with Kozlowski's Station and Santa Fe Trail ruts. As discussed in the past archaeological projects section, a Geonics EM-31 successfully recognized buried segments of the Santa Fe Trail (LA 38648). The anomalies resolved with the Geonics EM-31 were confirmed by stratigraphic profiles of ruts exposed by backhoe excavation. For this reason, we expect that an electromagnetic conductivity survey of the project area will produce reliable and comparable results, which can be more easily integrated with past work that used the same technology in this general location.

Scope of Work and Methods

The project area can be divided into two main investigation areas based on the effect that land alteration associated with the proposed road reconstruction and bridge replacement will have on potential cultural

resources. There will be no land-altering effect associated with road reconstruction on the east right-of-way from highway station 167 to the entrance of the Kozlowski's Station and on the west right-of-way between highway stations 167 to 174 (Fig. 3). This south end of the project between highway stations 167 to 174 includes the area where the Camp Lewis site boundary was extended east of NM 63 by Haecker's (1998) survey. This is also the location of LA 85503. This pre-contact site, previously tested by Gaunt (1988:48-51), includes the 12 foot proposed right-of-way west of the existing fenceline. Two test pits and five auger holes placed along the right-of-way take found no subsurface cultural resources. Similarly, three test pits and five auger holes within the east right-of-way found no subsurface cultural material. No further work was recommended for the site. The highway centerline remains unchanged at this locality, and the narrow slope limit expansion will not extend beyond the previously tested and cleared site area. These east and south project areas with no land-altering effect will be investigated by metal detecting work with artifact collection accompanied by conductivity survey. Work will be performed between the existing road and the right-of-way fence with an additional 6 m buffer on both the east and west sides (Fig. 3). The metal-detecting work and conductivity will aid in identifying and documenting potential resources in this area. Potential concentrations and anomalies will not be further evaluated by hand trenches, because there will be no associated land alteration incurred by road reconstruction beyond previously cleared areas.

The area of the bridge replacement along the west right-of-way is the primary area of effect by land-altering activities. This project area is estimated to cover 1,226 sq m. The beginning of the take area is at highway station 171+52 and extends north to the terrace edge about 8 m south of the bridge (Fig. 3). This locality consisting of the area between the road and the existing fence and extending west to the new proposed right-of-way along with an additional 6 m buffer will be examined with metal detectors, conductivity survey, hand excavation, and possibly mechanical excavation. As with the project as a whole, the metal detectors and conductivity will aid in identifying and documenting potential resources in this area. Potential concentrations and anomalies will then be investigated by hand-dug test pits to further evaluate and document the nature and integrity of the targets.

The area of the existing road prism including the asphalt road and its subsurface will not be investigated during the project.

The following are the proposed field procedures:

1. At the beginning of the testing program, a baseline for a 1 by 1 m grid system will be established with reference to the main datum set by Charles Haecker, NPS, in 1998. The grid system will cover the entire Camp Lewis project area and will be used to provenience piece-plotted artifacts or features that are identified by metal detection, electromagnetic ground conductivity, or hand excavation. A permanent datum with rebar and a metal tag will be established outside the west right-of-way and buffer at a position on the north-south and east-west axes of the grid.

2. The entire project area will be visually inspected. All surface artifacts and possible rut locations will be pin-flagged and mapped to determine the distribution of surface materials. Brush and shrubs will be cut to ground level using hand tools to facilitate metal detection and electromagnetic ground conductivity.

3. The metal detector sweep will proceed in 2 m wide transects paralleling the long axis of project area. The objective will be to identify and document subsurface cultural resources through 100 percent coverage. Metal detection will be carried out by Charles Haecker. Possible artifact locations will be pinflagged. Each flagged location will be examined by an Office of Archaeological Studies archaeologist using a metal detector and hand excavation tool. Each artifact will be bagged according to Pecos National Historical Park field curation procedures and will be labeled with the site number, field specimen number, approximate recovery depth, and date. All artifacts will be collected with the exception of recent artifacts associated with road trash, which will not be collected. Recent artifacts potentially associated with the Forked Lightning Ranch in operation to 1989 will be collected. All collected artifact locations will be piece-plotted with an electronic transit and prism. These data will be used to generate a site map and refine the area of Camp Lewis overlapping the proposed road project.

4. Following the metal detector work, electromagnetic ground conductivity examination will be conducted to further identify and document potential subsurface cultural resources. The barbed wire from the west right-of-way fence and the east right-f-way fence at the south end of the project will be detached temporarily to minimize electromagnetic interference. At the completion of the testing project the barbed wire will be restrung. Data will be collected at 50 cm intervals within the established grid system. Electromagnetic ground conductivity data will be processed, and graphic representations and interpretations will be provided by the subcontractor. Interpretation will focus on identifying unnatural

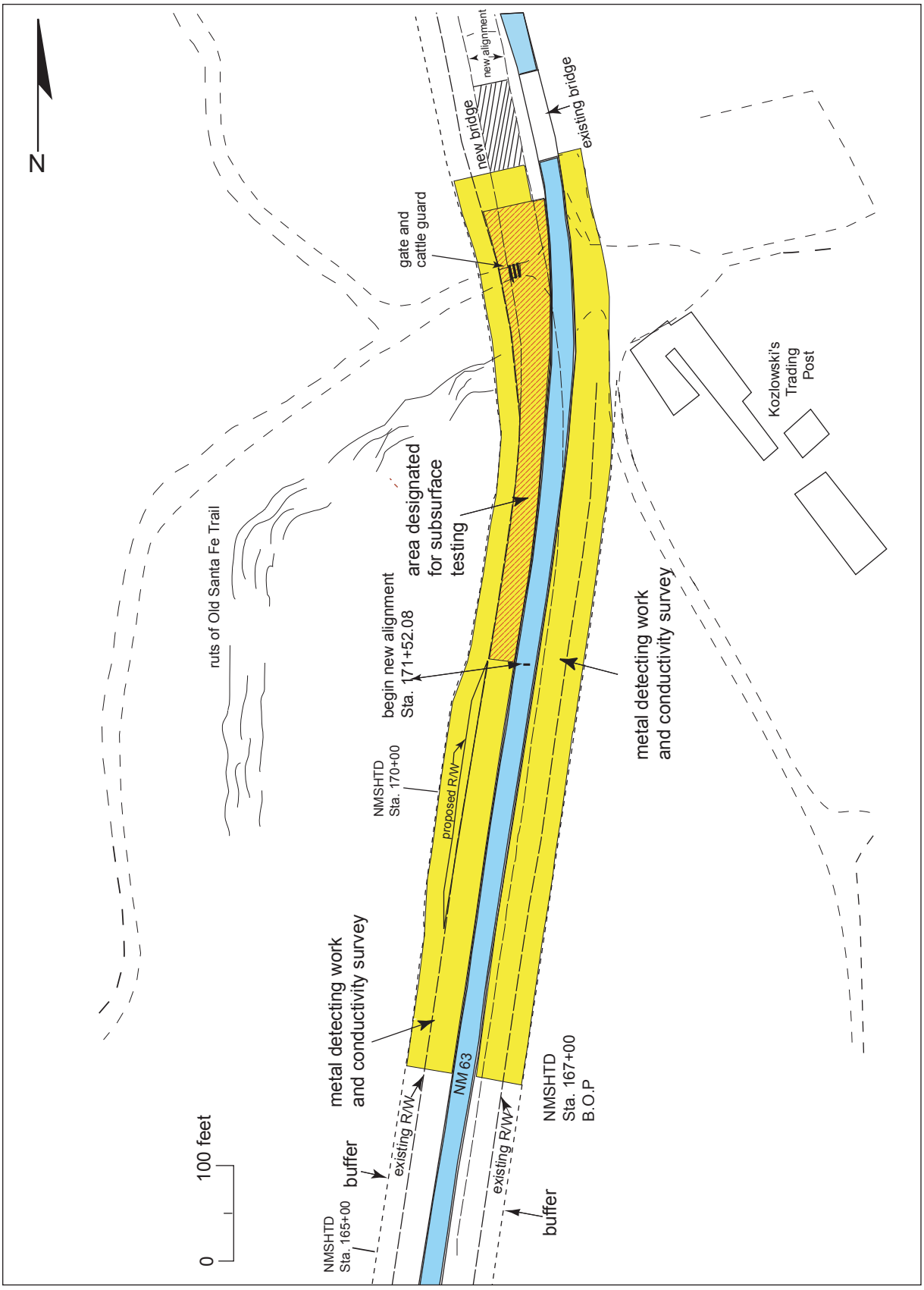

Figure 3. Project area, showing where different methods will be used.

conductivity patterning that may be caused by human activity.

5. One-by-one-meter test pits will be placed in artifact concentrations and within areas exhibiting abnormal but patterned soil resistivity readings. This procedure will aid in evaluating and further documenting the nature and integrity of the demonstrated and possible cultural resources. Excavation will employ typical hand tools. All soil will be screened through one-quarter inch steel mesh. Vertical control will be maintained from a subdatum tied to a remote site datum. Soils will be described according to color, texture, clay and organic content, clastic inclusions, and evidence of natural or cultural intrusions or disturbances. Up to 2 percent of the new and existing west right-of-way (1,226 sq m) will be hand excavated, or a maximum of 24 test pits. Initially, 4 of the 24 test pits will be systematically spaced in nonanomaly and nonartifact concentrations, one every one hundred linear feet, to delineate the subsurface nature of the soil. The remaining 20 test pits will be apportioned to the evaluation of identified target areas. If more than 20 anomalies or concentrations are identified as candidates for investigation, test pits will be placed to investigate representative samples of each type of concentration or class of anomaly. In the event no anomalies or concentrations are found, up to 1 percent of the new and existing right-of-way will be hand excavated by eight additional test pits systematically located across the project area. If test excavations encounter intact features or deposits that are likely to contribute significant information concerning the activities at the site, excavation will cease at that location following complete documentation of the exposed features or deposits.

6. If a cultural deposit, occupation surface, or feature is encountered, the fill will be screened through one-eighth-inch steel mesh. The portion of the cultural deposit, occupation surface, or feature within the 1 by 1 m unit will be excavated. Profiles will be documented, and the cultural deposit, occupation surface, or feature will be described and photographed. Pollen, flotation, and chronometric samples will be collected.

7. Some of the cultural activities associated with Camp Lewis and other historic land use of the area may not leave recoverable artifactual or feature evidence of past activities (Haecker 1998). If profiles of test units or mechanical trenches reveal stratigraphic differences that suggest areas of otherwise undocumented cultural activity (such as fully composted animal waste), soil chemistry samples will be recovered from the profiles along with control samples from adjacent stratigraphic units.

It is also possible that electromagnetic ground conductivity will identify ephemeral or irregular features related to transportation or Civil War camp or field hospital activities. These features may not be distinguishable with the usual hand excavation techniques. Soil chemistry and mechanical analysis will be employed in cases where these possible ephemeral features exist. Human activity or draft animal use may create differences that are discernible through the use of these techniques (Haecker 1998:53).

8. If needed, mechanical excavations will be used to expose stratigraphic profiles across newly identified segments of the Santa Fe Trail not investigated by previous research. All trenching will be discontinued if features other than Santa Fe Trail ruts or other materials are encountered that are likely to yield important information. Although backdirt from mechanical excavation is typically not screened, here it will be inspected and sifted with trowels as it is removed from the trench. A metal detector will be used to examine the trench walls and the backdirt for metal artifacts.

9. Testing with both hand and mechanical equipment will be completed when sterile soil is encountered or sufficient data have been collected to determine if cultural resources exist.

10. An archaeologist will conduct work or be constantly present during activity by others in order to identify, collect, and document cultural resources discovered.

11. All trenches and excavation units will be refilled at the conclusion of fieldwork.

12. The Kozlowski's Station parking lot will be used as a staging station over the course of the project. Up to three vehicles will be parked in the parking lot on a daily basis, and these will be the source of field equipment for the crew. This use should cause no impact to the parking lot.

The Use of Mechanical Equipment

The surface characteristics and artifacts associated with long, linear features are often the only criteria available for the interpretation of the feature (Nials 1983:6-43), and these characteristics are often obscured by recent or historic land modification. To efficiently document and evaluate any new Santa Fe Trail ruts discovered within the project area, we recommend the limited use of mechanical equipment. Long linear features such as roads or trails sometimes require testing techniques specifically designed for that particular resource.

Mechanical or hand trenching of linear features during archaeological excavations may be the most efficient technique for studying such features. Use of mechanical equipment for testing has been pursued successfully by the Bureau of Land Management, the New Mexico Historic Preservation Division, and the National Park Service. Mechanical equipment was used, for example, to study road segments in Chaco Canyon (Vivian and Buettner 1971; Windes 1982; Loose 1974; Obenauf 1980; Brethauer 1978; Marshall 1982; Nials 1983). Within the Santa Fe area, mechanical equipment has been used to study the Santa Fe Trail (Schmader 1990; Post 1990). According to Schmader (1990), the most complete cross section of the trail was obtained by testing with mechanical equipment. Under controlled circumstances, and with narrowly defined research objectives, the limited use of mechanical equipment as an exploratory technique has become an accepted part of archaeological field methodology during the past 20 years. Gaunt (1998: Appendix 1) successfully tested two segments of the Santa Fe Trail within and near the project area. Ruts were encountered, and the profile was tested electromagnetically. Additional investigation of this previously recorded Santa Fe Trail segment will be employed only if conductivity investigations expose potentially new segments in the area to be affected by reconstruction activities.

The testing will be immediately discontinued when features other than stratigraphically defined ruts are identified and it is determined that the feature contains important information. Testing of other cultural deposits will continue until sterile soil is encountered.

All soil recovered from undisturbed contexts will be screened through 1/4 inch mesh, and all artifacts will be removed and bagged for analysis. Artifacts found on floors or other occupational surfaces will be mapped in place and bagged separately.

Human Remains

If human remains or items of cultural significance or sensitivity (as defined by the Native American Graves Protection and Repatriation Act) are inadvertently discovered during the project, all work will stop in that location, and Pecos National Historical Park will initiate consultation with cultural resources specialists and appropriate ethnic groups.

Analysis

Laboratory analysis will be conducted by the staff of the Office of Archaeological Studies and qualified professional consultants. The types of cultural material anticipated and brief descriptions of the kinds of information requirements from each category are presented below.

Ceramic Artifacts

Combined with other types of information, ceramic studies can provide an idea of variation in production and trade as conditioned by economic status, distance from source, and location.

To assign the date, function, and cultural affinity to the ceramic artifacts, a detailed analysis of morphological attributes will be undertaken. Ceramic artifacts will be identified by existing type name and vessel form. Other attributes that will be studied include rim form and cross section; vessel diameter; paste texture and color; temper; surface color and finish; slip; design style; thickness; presumed function; and alteration such as burning, smudging, reuse, and mending. Examination under a binocular microscope will provide detailed information on temper groups and paste characteristics.

Lithic Artifacts

Data on site formation processes, function, and use can be derived from a detailed attribute analysis of the chipped stone collection.

Attributes that will be studied include material type and texture; artifact type; and alterations such as thermal treatment, incidental breakage, and use. A 50 power binocular microscope will be used to identify retouch and wear patterns related to formal and informal tool use. Attributes that will be studied on tools include edge angle, shape, and type of modification or wear. Debitage will be examined for evidence of reduction stage, platform type and modifications, percentage of dorsal cortex, platform lipping, artifact portion, direction of dorsal scarring, and size. These results should allow an evaluation of reduction technology, tool production and use, and raw material procurement strategies.

Faunal Remains

A systematic analysis of faunal materials will include recovery of information on subsistence, season of occupation, and range of activities. Faunal analysis will concentrate on the identification of species, age, elements, and portion to aid in documenting food procurement and consumption patterns. Data concerning the use of faunal materials as tools and information on butchering and processing methods will also be collected.

Floral Remains

Plant remains will be identified to the species level when possible and compared to floral data from other sites. Any discernable patterns will help provide a clearer picture of domesticated and wild plant use during the period of occupation of this sample of sites.

Euroamerican Artifacts

Euroamerican artifacts will be analyzed for attributes indicating time of production and function. The artifact classes will be temporally seriated and combined with testing and ethnohistorical information. This approach will aid in isolating the historic components from one another and from the precontact occupation.

Another objective of the analysis will be to determine the nature, function, and subsistence base of the pre-1916 historic components. The period of occupation can be inferred through diagnostic ceramic types. Subsistence items recovered through excavation will provide economic data and information on the range of activities performed at the site. The variety of tools or tool fragments recovered may be valuable indicators of the range of activities and the economic status of the occupants. This will aid in evaluating the relationship of the artifacts to the Civil War and the Santa Fe Trail.

Absolute Dating Techniques

All contexts exhibiting good dating potential will be fully exploited with the range of appropriate chronometric sampling techniques: tree-ring (dendrochronology), obsidian hydration, archaeomagnetism, and radiocarbon.

Research Results

The final testing and analysis report will be published in the Museum of New Mexico's Archaeology Notes series. The report will contain all important test, analysis, and interpretive results. Included will be photographs, site and feature plans, and data summaries. Field notes, maps, analysis records, and photographs will be deposited with the Archeological Records Management System of the State Historic Preservation Division, currently located at the Laboratory of Anthropology in Santa Fe.

Curation will follow guidelines outlined in *Director's Order #24: NPS Museum Collections Management*. The recovered artifacts will be accommodated by storage space at the Pecos National Historic Park. The project will include a budget (estimated at $2,500 but dependent on the number of artifacts recovered) for the collections management including cataloging, labeling, conservation examination and treatment (including specimen preparation), initial storage of objects and specimens, and organization and storage of project documentation, including appraisal, arrangement, description, finding aid production, and appropriate archival housing. These tasks will be accomplished by contracting with an appropriately trained consultant familiar with the necessary curatorial obligations. Project generated collections will be curated within one year of the completion of fieldwork.

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APPENDIX 2

SECRETARY OF THE INTERIOR'S STANDARDS AND GUIDELINES FOR ARCHEOLOGY AND HISTORIC PRESERVATION

APPENDIX C: SECRETARY OF THE INTERIOR'S STANDARDS AND GUIDELINES FOR ARCHEOLOGY AND HISTORIC PRESERVATION

These standards and guidelines are not regulatory and do not set or interpret agency policy. They are intended to provide technical advice about archeological and historic preservation activities and methods.

The Standards and Guidelines are prepared under the authority of sections 101(f), (g), and (h), and section 110 of the National Historic Preservation Act of 1966, as amended. State Historic Preservation Officers; Federal Preservation Officers including those of the Department of Agriculture, Department of Defense, Smithsonian Institution and General Services Administration; the Advisory Council on Historic Preservation; the National Trust for Historic Preservation; and other interested parties were consulted during the development of the Standards and Guidelines.

Purpose

The Standards and the philosophy on which they are based result from nearly thirty years of intensive preservation activities at the Federal, State, and local levels.

The purposes of the Standards are:

- To organize the information gathered about preservation activities.
- To describe results to be achieved by Federal agencies, States, and others when planning for the identification, evaluation, registration and treatment of historic properties.
- To integrate the diverse efforts of many entities performing historic preservation into a systematic effort to preserve our nation's culture heritage.

Uses of the Standards

The following groups or individuals are encouraged to use these Standards:

- Federal agency personnel responsible for cultural resource management pursuant to section 110 of the National Historic Preservation Act, as amended, in areas under Federal jurisdiction. A separate series of guidelines advising Federal agencies on their specific historic preservation activities under section 110 has been prepared.
- State Historic Preservation Offices responsible under the National Historic Preservation Act, as amended, by making decisions about the preservation of historic properties in their States in accordance with appropriate regulations and the Historic Preservation Fund Grants Management Manual. The State Historic Preservation Offices serve as the focal point for preservation planning and act as a central state-wide repository of collected information.
- Local governments wishing to establish a comprehensive approach to the identification, evaluation, registration and treatment of historic properties within their jurisdictions.
- Other individuals and organizations needing basic technical standards and guidelines for historic preservation activities.

Organization

This material is organized in three sections: Standards; Guidelines; and recommended technical sources, cited at the end of each set of guidelines. Users of this document are expected to consult the recommended technical sources to obtain guidance in specific cases.

Contents

Secretary of the Interior's Standards for Preservation Planning

Preservation planning is a process that organizes preservation activities (identification, evaluation, registration and treatment of historic properties) in a logical sequence. The Standards for Planning discuss the relationship among these activities while the remaining activity standards consider how each activity should be carried out. The Professional Qualifications

Appendix C

Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation

Pages 198-202 (Standards for Preservation Planning), and 229-230 (Preservation Terminology) of Appendix C are omitted deliberately.

It is expected that in many instances historic contexts will overlap geographically. Overlapping contexts are likely to occur in two combinations–those that were defined at the same scale (i.e., textile development in Smithtown 1850-1910 and Civil War in Smithtown 1855-1870) and those defined at different scales (i.e., Civil War in Smithtown and Civil War in the Shenandoah Valley). The contexts may share the same property types, although the shared property types will probably have different levels of importance, or they may group the same properties into different property types, reflecting either a different scale of analysis or a different historical perspective.

As previously noted, many of the goals that are formulated for a historic context will focus on the property types defined for that context. Thus it is critical that the integration of goals include the explicit consideration of the potential for shared property type membership by individual properties. For example, when the same property types are used by two contexts, reconciling the goals will require weighing the level of importance assigned to each property type. The degree to which integration of historic contexts must involve reconciling property types may be limited by the coordinated development of historic contexts used at various levels.

Integration with Management Frameworks

Preservation goals and priorities are adapted to land units through integration with other planning concerns. This integration must involve the resolution of conflicts that arise when competing resources occupy the same land base. Successful resolution of these conflicts can often be achieved through judicious combination of inventory, evaluation and treatment activities. Since historic properties are irreplaceable, these activities should be heavily weighted to discourage the destruction of significant properties and to be compatible with the primary land use.

Recommended Sources of Technical Information

Resource Protection Planning Process. State and Plans Grants Division, 1980. Washington, DC. Available from Heritage Preservation Services (2255), National Park Service, 1849 C Street NW, Washington, DC 20240. Outlines a step-by-step approach to implementing the resource protection planning process.

Resources Protection Planning Process Case Studies. Available from Heritage Preservation Services (2255), National Park Service, 1849 C Street NW, Washington, DC 20240. Reports prepared by State Historic Preservation Offices and others using the planning process.

Planning Theory. Andreas Faludi, 1980. Oxford: Pergamon Press. Constructs a model of planning using concepts borrowed from general systems theory.

Secretary of the Interior's Standards for Identification

Identification activities are undertaken to gather information about historic properties in an area. The scope of these activities will depend on: existing knowledge about properties; goals for survey activities developed in the planning process; and current management needs.

Standard I. Identification of Historic Properties Is Undertaken to the Degree Required To Make Decisions

Archival research and survey activities should be designed to gather the information necessary to achieve defined preservation goals. The objectives, chosen methods and techniques, and expected results of the identification activities are specified in a research design. These activities may include archival research and other techniques to develop historic contexts, sampling an area to gain a broad understanding of the kinds of properties it contains, or examining every property in an area as a basis for property specific decisions. Where possible, use of quantitative methods is important because it can produce an estimate, whose reliability may be assessed, of the kinds of historic properties that may be present in the studied area. Identification activities should use a search procedure consistent with the management needs for information and the character of the area to be investigated. Careful selection of methods, techniques and level of detail is necessary so that the gathered information will provide a sound basis for making decisions.

Standard II. Results of Identification Activities Are Integrated Into the Preservation Planning Process

Results of identification activities are reviewed for their effects on previous planning data. Archival research or field survey may refine the understanding of one or more historic contexts and may alter the need for additional survey or study of particular property types. Incorporation of the results of these activities into the planning process is necessary to ensure that the planning process is always based on the best available information.

Standard III. Identification Activities Include Explicit Procedures for Record-Keeping and Information Distribution

Information gathered in identification activities is useful in other preservation planning activities only when it is systematically gathered and recorded, and made available to those responsible for preservation planning. The results of identification activities should be reported in a format that summarizes the design and methods of the survey, provides a basis for others to review the results, and states where information on identified properties is maintained. However, sensitive information, like the location of fragile resources, must be safeguarded from general public distribution.

Secretary of the Interior's Guidelines for Identification

Introduction

These Guidelines link the Standards for Identification with more specific guidance and technical information. The Guidelines outline one approach to meet the Standards for Identification. Agencies, organizations and individuals proposing to approach identification differently may wish to review their approaches with the National Park Service.

The Guidelines are organized as follows:

Role of Identification in the Planning Process
Performing Identification
Integrating Identification Results
Reporting Identification Results
Recommended Sources of Technical Information

Role of Identification in the Planning Process

Identification is undertaken for the purpose of locating historic properties and is composed of a number of activities which include, but are not limited to archival research, informant interviews, field survey and analysis. Combinations of these activities may be selected and appropriate levels of effort assigned to produce a flexible series of options. Generally identification activities will have multiple objectives, reflecting complex management needs. Within a comprehensive planning process, identification is normally undertaken to acquire property-specific information needed to refine a particular historic context or to develop any new historic contexts. (See the Guidelines for Preservation Planning for discussion of information gathering to establish plans and develop historic contexts.) The results of identification activities are then integrated into the planning process so that subsequent activities are based on the most up-to-date information. Identification activities are also undertaken in the absence of a comprehensive planning process, most frequently as part of a specific land use or development project. Even lacking a formally developed preservation planning process, the benefits of efficient, goal-directed research may be obtained by the development of localized historic contexts, suitable in scale for the project ares, as part of the background research which customarily occurs before field survey efforts.

Performing Identification

Research Design

Identification activities are essentially research activities for which a statement of objectives or research design should be prepared before work is performed. Within the framework of a comprehensive planning process, the research design provides a vehicle for integrating the various activities performed during the identification process and for linking those activities directly to the goals and the historic context(s) for which those goals were defined. The research design stipulates the logical integration of historic context(s) and field and laboratory methodology. Although these tasks may be performed individually, they will not contribute to the greatest extent possible in increasing information on the historic context unless they relate to the defined goals and to each other. Additionally, the research design provides a focus for the integration of interdisciplinary information. It ensures that the linkages between specialized activities are real, logical and address the defined research questions. Identification activities should be guided by the research design and the results discussed in those terms. (See Reporting Identification Results.)

The research design should include the following:

1. *Objectives* of the identification activities. For example: to characterize the range of historic properties in a region; to identify the number of properties associated with a context; to gather information to determine which properties in an area are significant. The statement of objectives should refer to current knowledge about the historic contexts or property types, based on background research or assessments of previous research. It should clearly define the physical extent of the area to be investigated and the amount and kinds of information to be gathered about properties in the area.

2. *Methods* to be used to obtain the information. For example: archival research or field survey. Research methods should be clearly and specifically related to research problems.

Archival research or survey methods should be carefully explained so that others using the gathered information can understand how the information was obtained and what its possible limitations or biases are. The methods should be compatible with the past and present environmental character of the geographical area under study and the kinds of properties most likely to be present in the area.

3. *The expected results* and the reason for those expectations. Expectations about the kind, number, location, character and condition of historic properties are generally based on a combination of background research, proposed hypotheses, and analogy to the kinds of properties known to exist in areas of similar environment or history.

Archival Research

Archival or background research is generally undertaken prior to any field survey. Where identification is undertaken as part of a comprehensive planning process, background research may have taken place as part of the development of the historic contexts (see the Guidelines for Preservation Planning). In the absence of previously developed historic contexts, archival research should address specific issues and topics. It should not duplicate previous work. Sources should include, but not be limited to, historical maps, atlases, tax

records, photographs, ethnographies, folklife documentation, oral histories and other studies, as well as standard historical reference works, as appropriate for the research problem. (See the Guidelines for Historical Documentation for additional discussion.)

Field Survey

The variety of field survey techniques available, in combination with the varying levels of effort that may be assigned, give great flexibility to implementing field surveys. It is important that the selection of field survey techniques and level of effort be responsive to the management needs and preservation goals that direct the survey effort.

Survey techniques may be loosely grouped into two categories, according to their results. First are the techniques that result in the characterization of a region's historic properties. Such techniques might include "windshield" or walk-over surveys, with perhaps a limited use of sub-surface survey. For purposes of these Guidelines, this kind of survey is termed a "reconnaissance." The second category of survey techniques is those that permit the identification and description of specific historic properties in an area; this kind of survey effort is termed "intensive." The terms "reconnaissance" and "intensive" are sometimes defined to mean particular survey techniques, generally with regard to prehistoric sites. The use of the terms here is general and is not intended to redefine the terms as they are used elsewhere.

Reconnaissance survey might be most profitably employed when gathering data to refine a developed historic context—such as checking on the presence or absence of expected property types, to define specific property types or to estimate the distribution of historic properties in an area. The results of regional characterization activities provide a general understanding of the historic properties in a particular area and permit management decisions that consider the sensitivity of the area in terms of historic preservation concerns and the resulting implications for future land use planning. The data should allow the formulation of estimates of the necessity, type and cost of further identification work and the setting of priorities for the individual tasks involved. In most cases, areas surveyed in this way will require resurvey if more complete information is needed about specific properties.

A reconnaissance survey should document:

1. The kinds of properties looked for;
2. The boundaries of the area surveyed;
3. The method of survey, including the extent of survey coverage;
4. The kinds of historic properties present in the surveyed area;
5. Specific properties that were identified, and the categories of information collected; and
6. Places examined that did not contain historic properties.

Intensive survey is most useful when it is necessary to know precisely what historic properties exist in a given area or when information sufficient for later evaluation and treatment decisions is needed on individual historic properties. Intensive survey describes the distribution of properties in an area; determines the number, location and condition of properties; determines the types of properties actually present within the area; permits classification of individual properties; and records the physical extent of specific properties.

An intensive survey should document:

1. The kinds of properties looked for;
2. The boundaries of the area surveyed;
3. The method of survey, including an estimate of the extent of survey coverage;
4. A record of the precise location of all properties identified; and
5. Information on the appearance, significance, integrity and boundaries of each property sufficient to permit an evaluation of its significance.

Sampling

Reconnaissance or intensive survey methods may be employed according to a sampling procedure to examine less-than-the-total project or planning area.

Sampling can be effective when several locations are being considered for an undertaking or when it is desirable to estimate the cultural resources of an area. In many cases, especially where large land areas are involved, sampling can be done in stages. In this approach, the results of the initial large area survey are used to structure successively smaller, more detailed surveys. This "nesting" approach is an efficient technique since it enables characterization of both large and small areas with reduced effort. As with all investigative techniques, such procedures should be designed to permit an independent assessment of results.

Various types of sample surveys can be conducted, including, but not limited to: random, stratified and systematic. Selection of sample type should be guided by the problem the survey is expected to solve, the nature of the expected properties and the nature of the area to be surveyed.

Sample surveys may provide data to estimate frequencies of properties and types of properties within a specified area at various confidence levels. Selection of confidence levels should be based upon the nature of the problem the sample survey is designed to address.

Predictive modeling is an application of basic sampling techniques that projects or extrapolates the number, classes and frequencies of properties in unsurveyed areas based on those found in surveyed areas. Predictive modeling can be an effective tool during the early stages of planning an

undertaking, for targeting field survey and for other management purposes. However, the accuracy of the model must be verified; predictions should be confirmed through field testing and the model redesigned and retested if necessary.

Special survey techniques

Special survey techniques may be needed in certain situations.

Remote sensing techniques may be the most effective way to gather background environmental data, plan more detailed field investigations, discover certain classes of properties, map sites, locate and confirm the presence of predicted sites, and define features within properties. Remote sensing techniques include aerial, subsurface and underwater techniques. Ordinarily the results of remote sensing should be verified through independent field inspection before making any evaluation or statement regarding frequencies or types of properties.

Integrating Identification Results

The results of identification efforts must be integrated into the planning process so that planning decisions are based on the best available information. The new information is first assessed against the objectives of the identification efforts to determine whether the gathered information meets the defined identification goals for the historic context(s); then the goals are adjusted accordingly. In addition, the historic context narrative, the definition of property types and the planning goals for evaluation and treatment are all adjusted as necessary to accommodate the new data.

Reporting Identification Results

Reporting of the results of identification activities should begin with the statement of objectives prepared before undertaking the survey. The report should respond to each of the major points documenting:

1. Objectives;
2. Area researched or surveyed;
3. Research design or statement of objectives;
4. Methods used, including the intensity of coverage. If the methods differ from those outlined in the statement of objectives, the reasons should be explained.
5. Results: how the results met the objectives; result analysis, implications and recommendations; where the compiled information is located.

A summary of the survey results should be available for examination and distribution. Identified properties should then be evaluated for possible inclusion in appropriate inventories.

Protection of information about archeological sites or other properties that may be threatened by dissemination of that information is necessary. These may include fragile archeological properties or properties such as religious sites, structures, or objects, whose cultural value would be compromised by public knowledge of the property's location.

Recommended Sources of Technical Information

The Archeological Survey: Methods and Uses. Thomas F. King. Interagency Archeological Services, U.S. Department of the Interior, 1978. Washington, D.C. Written primarily for the non-archeologist, this publication presents methods and objectives for archeological surveys.

Cultural Resources Evaluation of the Northern Gulf of Mexico Continental Shelf. National Park Service, U.S. Department of the Interior, 1977.

Guidelines for Local Surveys: A Basis for Preservation Planning. Anne Derry, H. Ward Jandl, Carol Shull and Jan Thorman. National Register Division, National Park Service, U.S. Department of the Interior, 1978. Washington, D.C. General guidance about designing and carrying out community surveys.

The Process of Field Research: Final Report on the Blue Ridge Parkway Folklife Project. American Folklife Center, 1981.

Regional Sampling in Archeology. David Hurst Thomas. University of California, Archeological Survey Annual Report, 1968-9, 11:87-100.

Remote Sensing: A Handbook for Archeologists and Cultural Resource Managers. Thomas R. Lyons and Thomas Eugene Avery. Cultural Resource Management Division, National Park Service, U.S. Department of the Interior, 1977.

Remote Sensing and Non-Destructive Archeology. Thomas R. Lyons and James L. Ebert, editors. Remote Sensing Division, Southwest Cultural Resources Center, National Park Service, U.S. Department of the Interior and University of New Mexico, 1978.

Remote Sensing Experiments in Cultural Resource Studies: Non-Destructive Methods of Archeological Exploration, Survey and Analysis. Thomas R. Lyons, assembler. Reports of the Chaco Center, Number One. National Park Service, U.S. Department of the Interior and University of New Mexico, 1976.

Sampling in Archeology. James W. Mueller, editor. University of Arizona Press, 1975. Tucson, Arizona.

Scholars as Contractors. William J. Mayer-Oakes and Alice W. Portnoy, editors. Cultural Resource Management Studies. U.S. Department of the Interior, 1979.

Sedimentary Studies of Prehistoric Archeological Sites. Sherwood Gagliano, Charles Pearson, Richard Weinstein, Diana Wiseman, and Christopher McClendon. Division of State Plans and Grants, National Park Service, U.S. Department of the Interior, 1982. Washington, D.C. Available from Coastal Environments Inc., 1260 Main Street, Baton Rouge, Louisiana 70802. Establishes and evaluates a method for employing sedimentological analysis in distinguishing site areas from non-site areas when identifying submerged archeological sites on the continental shelf.

State Survey Forms. Available from Heritage Preservation Services (2255), National Park Service, 1849 C Street NW, Washington, DC 20240. Characterizes cultural resource survey documentation methods in State Historic Preservation Offices.

Truss Bridge Types: A Guide to Dating and Identifying. Donald C. Jackson and T. Allan Comp. American Association for State and Local History, 1977. Nashville, Tennessee. Technical leaflet #95. Available from AASLH, 172 Second Avenue North, Nashville, Tennessee 37201. Information about performing surveys of historic bridges and identifying the types of properties encountered.

Secretary of the Interior's Standards for Evaluation

Evaluation is the process of determining whether identified properties meet defined criteria of significance and therefore should be included in an inventory of historic properties determined to meet the criteria. The criteria employed vary depending on the inventory's use in resource management.

Standard I. Evaluation of the Significance of Historic Properties Uses Established Criteria

The evaluation of historic properties employs criteria to determine which properties are significant. Criteria should therefore focus on historical, architectural, archeological, engineering and cultural values, rather than on treatments. A statement of the minimum information necessary to evaluate properties against the criteria should be provided to direct information gathering activities.

Because the National Register of Historic Places is a major focus of preservation activities on the Federal, State and local levels, the National Register criteria have been widely adopted not only as required for Federal purposes, but for State and local inventories as well. The National Historic Landmark criteria and other criteria used for inclusion of properties in State historic site files are other examples of criteria with different management purposes.

Standard II. Evaluation of Significance Applies the Criteria Within Historic Contexts

Properties are evaluated using a historic context that identifies the significant patterns that properties represent and defines expected property types against which individual properties may be compared. Within this comparative framework, the criteria for evaluation take on particular meaning with regard to individual properties.

Standard III. Evaluation Results in A List or Inventory of Significant Properties That Is Consulted In Assigning Registration and Treatment Priorities

The evaluation process and the subsequent development of an inventory of significant properties is an on-going activity. Evaluation of the significance of a property should be completed before registration is considered and before preservation treatments are selected. The inventory entries should contain sufficient information for subsequent activities such as registration or treatment of properties, including an evaluation statement that makes clear the significance of the property within one or more historic contexts.

Standard IV. Evaluation Results Are Made Available to the Public

Evaluation is the basis of registration and treatment decisions. Information about evaluation decisions should be organized and available for use by the general public and by those who take part in decisions about registration and treatment. Use of appropriate computer-assisted data bases should be a part of the information dissemination effort. Sensitive information, however, must be safeguarded from general public distribution.

Secretary of the Interior's Guidelines for Evaluation

Introduction

These Guidelines link the Standards for Evaluation with more specific guidance and technical information. These Guidelines describe one approach to meeting the Standards for Evaluation. Agencies, organizations, or individuals proposing to approach evaluation differently may wish to review their approach with the National Park Service.

The Guidelines are organized as follows:

The Evaluation Process
Criteria
Application of Criteria within a Historic Context
Inventory
Recommended Sources of Technical Information

The Evaluation Process

These Guidelines describe principles for evaluating the significance of one or more historic properties with regard to a given set of criteria.

Groups of related properties should be evaluated at the same time whenever possible; for example, following completion of a theme study or community survey.

Evaluation should not be undertaken using documentation that may be out of date. Prior to proceeding with evaluation the current condition of the property should be determined and previous analyses evaluated in light of any new information.

Evaluation must be performed by persons qualified by education, training and experience in the application of the criteria. Where feasible, evaluation should be performed in consultation with other individuals experienced in applying the relevant criteria in the geographical area under consideration; for example, the State Historic Preservation Officer or local landmarks commission.

Evaluation is completed with a written determination that a property is or is not significant based on provided information. This statement should be part of the record.

Criteria

The purposes of evaluation criteria should be made clear. For example, the criteria may be used "to evaluate properties for inclusion in the county landmarks list," or "to implement the National Register of Historic Places program."

For Federal cultural resource management purposes, criteria used to develop an inventory should be coordinated with the National Register criteria for evaluation as implemented in the approved State comprehensive historic preservation plan.

Content of Criteria: Criteria should be appropriate in scale to the purpose of the evaluation. For example, criteria designed to describe national significance should not be used as the basis for creating a county or State inventory. Criteria should be categorical and not attempt to describe in detail every property likely to qualify. Criteria should outline the disciplines or broad areas of concern (history, archeology, architectural history, engineering and culture, for example) included within the scope of the inventory; explain what kinds of properties, if any, are excluded and the reasons for exclusion; and define how levels of significance are measured, if such levels are incorporated into the criteria. If the criteria are to be used in situations where the National Register criteria are also widely used, it is valuable to include a statement explaining the relationship of the criteria used to the National Register criteria, including how the scope of the inventory differs from that defined by the National Register criteria and how the inventory could be used to identify properties that meet the National Register criteria.

Information Needed to Evaluate Properties: The criteria should be accompanied by a statement defining the minimum information necessary to evaluate properties to insure that this information is collected during identification activities intended to locate specific historic properties. Generally, at least the following will be needed:

1. Adequately developed historic contexts, including identified property types. (See the Guidelines for Preservation Planning for discussion of development of historic contexts.)

2. Sufficient information about the appearance, condition and associative values of the property to be evaluated to:

a. Classify it as to property type;
b. Compare its features or characteristics with those expected for its property type; and
c. Define the physical extent of the property and accurately locate the property.

To facilitate distinguishing between facts and analysis, the information should be divided into categories including identification and description of pertinent historical contexts; description of the property and its significance in the historical context; and analysis of the integrity of the property relative to that needed to represent the context.

Usually documentation need not include such items as a complete title history or biography of every owner of a property, except where that information is important in evaluating its significance. Information on proposed or potential treatments or threats, such as destruction of a property through uncontrollable natural processes, is also not needed for evaluation, unless those effects are likely to occur prior to or during the evaluation, thereby altering the significant characteristic of the property. If archeological testing or structural analysis is needed for evaluation, it should not proceed beyond the point of providing the information necessary for evaluation and should not unnecessarily affect significant features or values of the property.

When more information is needed: Evaluation cannot be conducted unless all necessary information is available. (See Information Needed to Evaluate Properties.) Any missing information or analysis should be identified (e.g. development of context or information on the property) as well as the specific activities required to obtain the information (archival research, field survey and testing, or laboratory testing). When adequate information is not available, it is important to record that fact so that evaluation will not be undertaken until the information can be obtained. In some cases needed information is not obtainable, for example, where historical records have been destroyed or analytical techniques have not

been developed to date materials in archeological sites. If an evaluation must be completed in these cases, it is important to acknowledge what information was not obtainable and how that missing information may affect the reliability of the evaluation.

Application of the Criteria within a Historic Context

The first step in evaluation is considering how the criteria apply to the particular historic context. This is done by reviewing the previously developed narrative for the historic context and determining how the criteria would apply to properties in that context, based on the important patterns, events, persons and cultural values identified. (See the discussion of the historic context narrative in the Guidelines for Preservation Planning.) This step includes identification of which criteria each property type might meet and how integrity is to be evaluated for each property type under each criterion. Specific guidelines for evaluating the eligibility of individual properties should be established. These guidelines should outline and justify the specific physical characteristics or data requirements that an individual property must possess to retain integrity for the particular property type; and define the process by which revisions or additions can be made to the evaluation framework.

Consideration of property type and integrity: After considering how the criteria apply to the particular historic context, the evaluation process for a property generally includes the following steps:

1. A property is classified as to the appropriate historic context(s) and property type(s). If no existing property type is appropriate, a new property type is defined, its values identified, and the specific characteristics or data requirements are outlined and justified as an addition to the historic context. If necessary, a new historic context is defined for which values and property types and their integrity requirements are identified and justified.

2. A comparison is made between the existing information about the property and the integrity characteristics or data required for the property type.

a. If the comparison shows that the property possesses these characteristics, then it is evaluated as significant for that historic context. The evaluation includes a determination that the property retains integrity for its type.

b. If the comparison shows that the property does not meet the minimum requirements, one of several conclusions is reached:

(1) The property is determined not significant because it does not retain the integrity defined for the property type.

(2) The property has characteristics that may make it significant but these differ from those expected for that property type in that context. In this case, the historic context or property types should be reexamined and revised if necessary, based on subsequent research and survey.

The evaluation should state how the particular property meets the integrity requirements for its type. When a property is disqualified for loss of integrity, the evaluation statement should focus on the kinds of integrity expected for the property type, those that are absent for the disqualified property, and the impact of that absence on the property's ability to exemplify architectural, historical or research values within a particular historic context.

The integrity of the property in its current condition, rather than its likely condition after a proposed treatment, should be evaluated. Factors such as structural problems, deterioration, or abandonment should be considered in the evaluation only if they have affected the integrity of the significant features or characteristics of the property.

Inventory

An inventory is a repository of information on specific properties evaluated as significant.

Content: The inventory should include:

1. Summaries of the important historic contexts. These may be in the form of an approved plan or analysis of historic contexts important in the history of the geographical area covered by the inventory.

2. Descriptions of significant property types of these contexts, whether or not any specific properties have been identified.

3. Results of reconnaissance surveys or other identification activities, even if the level of information on specific properties identified as part of those activities is not sufficient to evaluate individual properties.

4. Information on individual properties that was used in evaluation.

- Historic contexts are identified by name, with reference to documents describing those contexts, or with a narrative statement about the context(s) where such documents do not exist.
- A description of the property. Part of this description may be a photographic record.
- A statement that justifies the significance of the property in relation to its context(s). This statement should include an analysis of the integrity of the property.
- Boundaries of the property.

- A record of when a property was evaluated and included in the inventory, and by whom.
- Records on demolished or altered properties and properties evaluated as not significant should be retained, along with full description of areas surveyed, for the planning information these records provide about impacts to properties and about the location and character of non-significant properties to prevent redundant identification work at a later time.

Maintenance: Inventory entries should be maintained so that they accurately represent what is known about historic properties in the area covered by the inventory. This will include new information gained from research and survey about the historic contexts, property types, and previously evaluated properties, as well as information about newly evaluated properties. For individual properties, addition of kinds of significance, change in the boundaries, or loss of significance through demolition or alteration should be recorded.

Uses and Availability: An inventory should be managed so that the information is accessible. Its usefulness depends on the organization of information and on its ability to incorporate new information. An inventory should be structured so that entries can be retrieved by locality or by historic context.

The availability of the inventory information should be announced or a summary should be distributed. This may be in the form of a list of properties evaluated as significant or a summary of the historic contexts and the kinds of properties in the inventory. Inventories should be available to managers, planners, and the general public at local, State, regional, and Federal agency levels.

It is necessary to protect information about archeological sites or other properties whose integrity may be damaged by widespread knowledge of their location. It may also be necessary to protect information on the location of properties such as religious sites, structures, or objects whose cultural value would be compromised by public knowledge of the property's location.

Recommended Sources of Technical Information

How to Apply the National Register Criteria. Available from National Register, History & Education (2280), National Park Service, 1849 C Street NW, Washington, DC 20240. Provides detailed technical information about interpretation of the significance and integrity criteria used by the National Register of Historic Places program.

How To Series. Available from National Register, History & Education (2280), National Park Service, 1849 C Street NW, Washington, DC 20240. Discusses application of the National Register criteria for evaluation. Titles include: *How To Establish Boundaries for National Register Properties*; *How To Evaluate and Nominate Potential National Register Properties That Have Achieved Significance Within the Last 50 Years*; *How To Improve Quality of Photos for National Register Nominations*; *How to Apply for Certification of Significance Under Section 2124 of the Tax Reform Act of 1976*; *How To Apply for Certification of State and Local Statutes and Historic Districts*; *How To Qualify Historic Properties Under the New Federal Law Affecting Easements*.

Importance of Small, Surface, and Disturbed Sites as Sources of Significant Archeological Data. Valerie Talmage and Olga Chesler. Interagency Archeological Service, 1977. Washington, D.C. Available from the National Technical Information Service. NTIS Publication Number PB 270939/AS. Discusses the role of small, surface, and disturbed sites as sources of significant information about a variety of prehistoric activities. These types of sites are frequently ignored in the development of regional archeological research designs.

Secretary of the Interior's Standards For Registration

Registration is the formal recognition of properties evaluated as significant. Preservation benefits provided by various registration programs range from honorific recognition to prohibition of demolition or alteration of included properties. Some registration programs provide recognition and other broad benefits while other programs authorize more specific forms of protection.

Standard I. Registration Is Conducted According To Stated Procedures

Registration of historic properties in the National Register of Historic Places must be done in accordance with the National Register regulations published in the Code of Federal Regulations, 36 CFR 60. Registration for other lists or purposes follow an established process that is understood by the public, particularly by those interests that may be affected by registration.

Standard II. Registration Information Locates, Describes and Justifies the Significance and Physical Integrity of a Historic Property

Registers are used for planning, research and treatment. They must contain adequate information for users to locate a property and understand its significance. Additional information may be appropriate depending on the intended use of the register.

Standard III. Registration Information Is Accessible to the Public

Information should be readily available to the public and to government agencies responsible for the preservation of historic properties and for other planning needs.

Secretary of the Interior's Guidelines for Registration

Introduction

These Guidelines link the Standards for Registration with more specific guidance and technical information. They describe one approach to meeting the Standards for Registration. Agencies, organizations, or individuals proposing to approach registration differently may wish to review their approach with the National Park Service.

The Guidelines are organized as follows:
Purpose of Registration Programs
Registration Procedures
Documentation on Registered Properties
Public Availability
Recommended Sources of Technical Information

Purpose of Registration Programs

Registration of historic properties is the formal recognition of properties that have been evaluated as significant according to written criteria. Registration results in an official inventory or list that serves an administrative function. A variety of benefits or forms of protection accrue to a registered property, ranging from honorific recognition to prohibition of demolition or alteration.

Some registration programs provide recognition and other broad benefits or entitlement, while other registrations of properties may, in addition, authorize more specific forms of protection. The application of the registration process should be a logical outgrowth of the same planning goals and priorities that guided the identification and evaluation activities. All registration programs should establish priorities for recognition of their authorized range of properties; provide for confidentiality of sensitive information; and establish a means of appealing the registration or non-registration of a property.

Registration Procedures

Explicit procedures are essential because they are the means by which the public can understand and participate in the registration process. Procedures for registration programs should be developed by professionals in the field of historic preservation, in consultation with those who will use or be affected by the program. Prior to taking effect, procedures should be published or circulated for comment at the governmental level at which they will be used. (Procedures for registration of properties in the National Register of Historic Places and the National Historic Landmarks list, for example, are published in the Federal Register.)

Any registration program should include:

1. A professional staff to prepare or assess the documentation;
2. A professional review, independent of the nominating source, to provide an impartial evaluation of the documented significance;
3. Adequate notice to property owners, elected officials and the public about proposed registrations and the effects of listing, if any; and
4. A means of public participation.

Professional Review: The registration process should include an independent evaluation of the significance of the property and of the quality and thoroughness of the documentation supporting that significance. Such evaluation ensures that significance is adequately justified and that registration documentation meets the technical requirements of the registration process.

State and local preservation programs, concerned with both public and private properties, generally use a review board, panel or commission. This level of professional review has proven to be effective in assessing the significance of properties considered for registration.

Review boards and other forms of independent review should include professionals in the fields or disciplines included in the criteria; representatives of other fields or disciplines may be desirable to reflect other values or aspects of the register. Key personnel must be qualified by education, training or experience to accomplish their designated duties. (See the Professional Qualifications Standards.)

The scope of the independent review should be clearly stated in the registration procedures and should not include issues outside the scope of the applicable criteria for evaluation and other areas specified in the procedures. Generally, independent reviewers should not be involved in any primary research or analysis related to properties under consideration; this information should be gathered and organized prior to review meetings. Documentation presented to the reviewers should be made available to the public prior to review meetings or public hearings. Registration of properties should not take place until review of documentation has been completed.

Public Notice: Adequate notice allows property owners, officials and other interested parties to comment on proposed registrations prior to action by the independent reviewers. The degree of protection and control provided by a registration program may be a factor in determining what constitutes adequate notice. For example, adequate notice of proposed

inclusion in honorific registers may be less complex than that for registration that results in local controls on alteration or demolition of registered properties.

Notice to elected officials and the public is necessary to distribute information about potential registrations of concern to planning and development interests.

Adequate notice to property owners may be accomplished through means ranging from individual notification by mail to publication of a public notice, depending on the nature of the registration program and the number and character of the properties involved.

Public notices and owner notification about proposed registrations should include the dates and times of public meetings and review meetings, the kinds of comments that are appropriate, and how comments will be considered in the evaluation process. The notice should also state where information can be obtained about the registration program, the criteria used to evaluate properties for inclusion, and the significance of specific properties under consideration.

The procedures should include a means of public participation in the form of submission of written comments or a review meeting open to the public or a public hearing.

The procedures should state time periods within which reviews, notices, comments, public hearings, review meetings and appeals will occur. The time periods should be short enough to allow for efficient recognition of historic properties but also allow adequate time for public comment and participation by those affected. Time periods may vary depending on whether activities are carried out at the local, State, or national level. These time schedules should be widely circulated so that the process is widely understood.

Appeal Process: A means of appeal should be included in the registration process to allow for reconsideration of a property's inclusion. Reasons for appeal may range from existence of additional information about the property supporting or refuting its significance to administrative or procedural error. An appeal process should specify to whom an appeal may be made and how the information that is provided will be evaluated. The appeal procedures should also state the time limit, if any, on appealing a decision and on consideration of information and issuance of a decision by the appeal authority.

Documentation on Registered Properties

Documentation requirements should be carefully weighed to provide the information actually needed to reach a registration decision and should be made public. It should be made certain that identification and evaluation activities obtain and record the information necessary for registration. Documentation should be prepared in a standardized format and on materials that are archivally stable and easy to store and retrieve.

Location: The precise location of a historic property must be clearly identified.

Street address, town or vicinity, and county should be provided. Properties should also be located on maps; these may be USGS maps, county planning maps, or city base maps or real estate maps. A uniform system of noting location, such as UTM grid points or longitude and latitude, should supplement mapping. It is recommended that each registration process standardize the preferred choice of maps appropriate to the scope of the process.

Description: An accurate description of a property includes a description of both the current and historical physical appearance and condition of the property and notes the relevant property type(s) for the applicable historic context(s). Discussion should include alterations, deterioration, relocation and other changes to the property since its period of significance.

Significance: A statement of significance should explain why a property meets the criteria for inclusion in the register to which it has been nominated.

This statement should contain at least 3 elements:

1. Reference to the relevant historic context(s);
2. Identification of relevant property types within the context and their characteristics; and
3. Justification that the property under consideration has the characteristics required to qualify it.

Relevant historic contexts can be identified through reference to the preservation plan or other documents where the contexts have been previously described or can be provided by a narrative discussion of the context. (The development of contexts and their use in evaluating properties are discussed in the Guidelines for Preservation Planning and the Guidelines for Evaluation.) A significant property type and its characteristics are identified either through reference to the historic context(s) or by a narrative in the documentation that describes historic contexts. Justification of a specific property is made by systematic comparison of its characteristics to those required for the property type.

Boundaries: The delineation and justification of boundaries for a registered property are important for future treatment activities. It is especially critical when legal restraints or restrictions may result from the registration of properties. Thus, boundaries should correspond as closely as possible to the actual extent and configuration of the property and should be carefully selected to encompass, but not exceed, the extent of the significant resource(s). The selection of boundaries should reflect the significant aspects of the property.

Arbitrary boundaries should not be chosen for ease of description since this can result in the inclusion of unrelated land or in exclusion of a portion of the historic property. Present property lines should not be chosen as property boundaries without careful analysis of whether they are appropriate to the historic property. A single uniform boundary description and acreage should not be applied to a group or class of properties (antebellum plantations, for example) without examination of the actual extent of each property. The selected boundaries should be justified as appropriate to the historic property.

Boundaries should be clearly and precisely described, using a verbal boundary description, legal description, accurate sketch map, or lines drawn on base maps, or a combination of these where needed to specify the limits of the property being registered. When used, maps should show the location of buildings, structures, sites or objects within the boundary.

Updating Information on Registered Properties: A change in the condition of the significant features of a property may require a change in the official registration record. Alteration of a significant architectural feature, for example, could mean that a property is no longer significant for its architectural design.

Additional significance of registered properties may be identified through development of new historic contexts. Research may reveal that a property is significant in other historic contexts or is significant at a higher level. For example, a property previously recognized as of local significance could be found to be of national significance.

A change in location or condition of a registered property may mean that the property is no longer significant for the reasons for which it was registered and the property should be deleted from the registered list.

Public Availability

Lists of registered properties should be readily available for public use, and information on registered properties should be distributed on a regular basis. Lists of properties registered nationally are distributed through publication in the Federal Register and to Congressional Offices and State Historic Preservation Offices. Comprehensive information should be stored and maintained for public use at designated national, State and local authorities open to the public on a regular basis.

Information should be retrievable by the property name, and location, historic context or property type. The specific location of properties that may be threatened by dissemination of that information must be withheld. These may include fragile archeological properties or properties such as religious sites, structures, or objects whose cultural value would be compromised by public knowledge of the property location.

Recommended Sources of Technical Information

How to Complete National Register Forms. National Register Branch, National Park Service, U.S. Department of the Interior, 1977. Washington, D.C. This publication is the standard reference on the documentation requirements of the National Register of Historic Places program.

How To Series. Available from National Register, History & Education (2280), National Park Service, 1849 C Street NW, Washington, DC 20240. These information sheets contain supplementary information about interpreting the National Register criteria for evaluation and documentation requirements of the National Register registration program. Titles include: *How To Establish Boundaries for National Register Properties*; *How To Evaluate and Nominate Potential National Register Properties That Have Achieved Significance Within the Last 50 Years*; *How To Improve the Quality of Photographs for National Register Nominations*; *How To Apply for Certification of Significance Under Section 2124 of the Tax Reform Act of 1976*; *How To Apply for Certification of State and Local Statutes and Historic Districts*; *How To Qualify Historic Properties Under the New Federal Law Affecting Easements*.

Note on Documentation and Treatment of Historic Properties

Documentation and treatment of historic properties includes a variety of techniques to preserve or protect properties, or to document their historic values and information. While documentation activities may be applied to any potentially historic property, generally only those properties that first have been evaluated as significant against specified criteria (such as those of the National Register) are treated. Some commonly applied treatments are preservation in place, rehabilitation, restoration and stabilization; there are other types of treatments also. Documentation and treatment may be applied to the same property; for example, archeological, historical, and architectural documentation may be prepared before a structure is stabilized or before foundations or chimneys or other lost features are reconstructed.

Alternatives for treatment will usually be available, and care should be applied in choosing among them. Preservation in place is generally preferable to moving a property. Over time, the preferred treatment for a property may change; for example, an archeological site intended for preservation in place may begin to erode so that a combination of archeological documentation and stabilization may be required. If a decision is made that a particular property will not be preserved in place, the need for documentation must then be considered.

The three sets of documentation standards (i.e., the Standards for Historical Documentation, Standards for Architectural and Engineering Documentation, and Standards for Archeological

Documentation) as well as the Standards for Treatment of Historic Properties (Preservation, Rehabilitation, Restoration, and Reconstruction) describe the techniques of several disciplines to treat historic properties, and to document or preserve information about their historical values. The integration of planning for documentation and treatment with their execution is accomplished in a statement of objectives, or research design. Because both the goals and appropriate methodologies are likely to be interdisciplinary in nature, the relationship among these various activities should be specified in the research design to ensure that the resulting documentation produces a comprehensive record of historic properties in an efficient manner.

Secretary of the Interior's Standards for Historical Documentation

Historic documentation provides important information related to the significance of a property for use by historians, researchers, preservationists, architects, and historical archeologists. Research is used early in planning to gather information needed to identify and evaluate properties. (These activities are discussed in the Standards and Guidelines for Preservation Planning and the Standards and Guidelines for Identification.) Historical documentation is also a treatment that can be applied in several ways to properties previously evaluated as significant; it may be used in conjunction with other treatment activities (as the basis for rehabilitation plans or interpretive programs, for example) or as a final treatment to preserve information in cases of threatened property destruction. These Standards concern the use of research and documentation as a treatment.

Standard I. Historical Documentation Follows a Research Design That Responds to Needs Identified in the Planning Process

Historical documentation is undertaken to make a detailed record of the significance of a property for research and interpretive purposes and for conservation of information in cases of threatened property destruction. Documentation must have defined objectives so that proposed work may be assessed to determine whether the resulting documentation will meet needs identified in the planning process. The research design or statement of objectives is a formal statement of how the needs identified in the plan are to be addressed in a specific documentation project. This is the framework that guides the selection of methods and evaluation of results, and specifies the relationship of the historical documentation efforts to other proposed treatment activities.

Standard II. Historical Documentation Employs an Appropriate Methodology to Obtain the Information Required by The Research Design

Methods and techniques of historical research should be chosen to obtain needed information in the most efficient way. Techniques should be carefully selected and the sources should be recorded so that other researchers can verify or locate information discovered during the research.

Standard III. The Results of Historical Documentation Are Assessed Against the Research Design and Integrated Into the Planning Process

Documentation is one product of research; information gathered about the usefulness of the research design itself is another. The research results are assessed against the research design to determine how well they meet the objectives of the research. The results are integrated into the body of current knowledge and reviewed for their implications for the planning process. The research design is reviewed to determine how future research designs might be modified based on the activity conducted.

Standard IV. The Results of Historical Documentation Are Reported and Made Available to the Public

Research results must be accessible to prospective users. Results should be communicated to the professional community and the public in reports summarizing the documentation activity and identifying the repository of additional detailed information. The goal of disseminating information must be balanced, however, with the need to protect sensitive information whose disclosure might result in damage to properties.

Secretary of the Interior's Guidelines for Historical Documentation

Introduction

These Guidelines link the Standards for Historical Documentation with more specific guidance and technical information. They describe one approach to meeting the Standards for Historical Documentation. Agencies, organizations or individuals proposing to approach historical documentation differently may wish to review their approaches with the National Park service.

The Guidelines are organized as follows:

- Historical Documentation Objectives
- Research Design
- Methods
- Integrating Results
- Reporting Results
- Recommended Sources of Technical Information

Documentation Objectives

Documentation is a detailed record, in the form of a report or other written document, of the historical context(s) and significance of a property. Historical research to create documentation uses archival materials, oral history

techniques, ethnohistories, prior research contained in secondary sources and other sources to make a detailed record of previously identified values or to investigate particular questions about the established significance of a property or properties. It is an investigative technique that may be employed to document associative, architectural, cultural or informational values of properties. It may be used as a component of structural recording or archeological investigation, to enable interpretation or to mitigate the anticipated loss of a property through conservation of information about its historical, architectural or archeological significance. Documentation generally results in both greater factual knowledge about the specific property and its values, and in better understanding of the property in its historical context. In addition to increasing factual knowledge about a property and its significance in one historical context, documentation may also serve to link the property to or define its importance in other known or yet-to-be defined historic contexts.

Documentation should incorporate, rather than duplicate, the findings of previous research. Research may be undertaken to identify how a particular property fits into the work of an architect or builder; to analyze the historical relationship among several properties; or to document in greater detail the historical contexts of properties. The kinds of questions investigated will generally depend on what is already known or understood and what information is needed. For example, documentation of a bridge whose technological significance is well understood, but whose role in local transportation history is not, would summarize the information on the former topic and focus research on the associative values of the property. The questions that research seeks to answer through deed, map or archival search, oral history and other techniques may also relate to issues addressed in structural documentation or archeological investigation; for example, the reasons for and history of modification of a building to be the subject of architectural or engineering documentation.

Research Design

Historical documentation is guided by a statement of objectives, research design or task directive prepared before research is performed. The research design is a useful statement of how proposed work will enhance existing archival data and permits comparison of the proposed work with the results. The purpose of the research design is to define the proposed scope of the documentation work and to define a set of expectations based on the information available prior to the research. Generally, the research design also ensures that research methods are commensurate with the type, quality and source of expected information. The research design for a property should identify:

1. Evaluated significance of the property(ies) to be investigated;
2. Historical, architectural, archeological or cultural issues relevant to the evaluated significance of the property;
3. Previous research on those issues and how the proposed work is related to existing knowledge;
4. The amount and kinds of information required to produce reliable historical analyses;
5. Methods to be used to obtain the information;
6. Types of sources to be investigated; types of personnel required;
7. Expected results or findings based on available knowledge about the property and its context; and
8. Relationship of the proposed historical documentation to other proposed treatment activities; for example, recommendations on the use of documentation in interpretive programs or other aspects of treatment such as anticipated architectural, engineering or archeological documentation.

Research Methods

Research methods should be chosen based on the information needs, be capable of replication and be recorded so that another researcher could follow the same research procedure. Sources should be recorded so that other researchers can locate or verify the information discovered during the search.

Use of Sources: The variety of available written and graphic materials and the number of individuals that can serve as sources, including but not limited to personal records, deed and title books, newspapers, plats, maps, atlases, photographs, vital records, censuses, historical narratives, interviews of individuals and secondary source materials, should be considered in developing the research design. Part of the development of the research design is deciding what kinds of source materials are most likely to contain needed information and at what point in the research process that information will be most valuable. For example, often secondary sources are most valuable for gathering background information, while primary sources are more useful to gather or confirm specific facts. The documentation goals may not require exhaustive investigation of sources, such as deed records or building permits. Research may be kept cost-effective by making careful decisions about when to use particular sources, thereby limiting the use of time-consuming techniques to when absolutely necessary. Decisions about when to gather information may also affect the quality of information that can be gathered. When dealing with large project areas where loss of many properties is anticipated, it is important to gather information from local archival sources and oral histories before project activities destroy or disperse family or community records and residents.

Analysis of the accuracy and biases of source materials is critical in analyzing the information gathered from these sources. Maps, historical atlases and insurance maps should be assessed like written records for errors, biases and omissions; for example, some map sources may omit

structures of a temporary nature or may not fully depict ethnic or minority areas. Likewise, building plans and architectural renderings may not reflect a structure as it was actually built.

Analysis: Analysis should not only focus on the issues defined in the research design, but should also explore major new issues identified during the course of research or analysis. The documentation gathered may raise important issues not previously considered, and further investigation may be important, particularly when contradictory information has been gathered. It is important to examine the implications of these new issues to ensure that they are investigated in a balanced way.

Questions that should be considered in analyzing the information include:

1. Has enough information been gathered to answer the questions that were posed?
2. Do the answers contradict one another? If so, it may be necessary to search for more evidence. If no additional evidence is available, judgments must be based on the available sources, weighing their biases. Conflicts of source materials should be noted.

In general, the more the researcher knows about the general historical period and setting and limitations of the source materials under investigation, the better the individual is prepared to evaluate the information found in the documentary sources investigated. Peer review or consultation with other knowledgeable individuals about the information and the tentative conclusions can be an important part of the analysis.

Integrating Results

The results of documentation must be integrated into the planning process so that planning decisions are based on the best available information. The new information is first assessed against the research design to determine whether the gathered information meets the defined objectives of the research. Then the relevant historic contexts, property types, and treatment goals for those contexts are all adjusted, as necessary, based on the historical documentation results.

Reporting Results

Reports should contain:

1. Summaries of the purpose of the documentation, the research design and methods and techniques of investigation.
2. Sources of facts or analyses so that other researchers can locate the information in its original context. Notation of any conflicts in source materials and how the individual performing the documentation interpreted these conflicts.
3. Sources consulted, including those expected to contain useful information and those that contained no information about the property(ies).
4. Assessment of the accuracy, biases and historical perspective of all sources. This information and that identified in No. 3 may be provided in an annotated bibliography.
5. Discussion of major analyses and results, including conclusions regarding all major research issues identified in the research design, as well as important issues raised in the course of research. The analysis should be summarized in terms of its impact on interpreting the property's significance and expanding or altering the knowledge about the property and its context.
6. Researchers' interpreting of historical events or trends. These interpretations should be clearly identified.

Primary results should be preserved and made accessible in some manner, although they need not necessarily be contained in the report. At minimum, the report should reference the location of notes and analyses.

Results of historic documentation should be made available for use in preservation planning and by the general public. Report formats may vary, depending on the audience and the anticipated uses of the documentation, but professionally accepted rules of report writing should be followed. If reports are of a technical nature, the format of the major scientific journal of the pertinent discipline may be the most appropriate format. Peer review of draft reports is one means of ensuring that state-of-the-art technical reports are produced.

Recommended Sources of Technical Information

Folklife and Fieldwork: A Layman's Introduction to Field Techniques. Peter Bartis. American Folklife Center, Washington, DC, 1979.

Ordinary People and Everyday Life: Perspectives on the New Social History. James B. Gardner and George Rollie Adams, editors. American Association for State and Local History, Nashville, Tennessee, 1983.

The Process of Field Research. Carl Fleischhauer and Charles K. Wolfe. American Folklife Center, Washington, D.C., 1981.

Researching Heritage Buildings. Margaret Carter. Ministry of the Environment, Ottawa, Canada, 1983.

Secretary of the Interior's Standards for Architectural and Engineering Documentation

These standards concern the development of documentation for historic buildings, sites, structures and objects. This documentation, which usually consists of measured drawings, photographs and written data, provides important information on a property's significance for use by scholars, researchers, preservationists, architects, engineers and others interested in preserving and understanding historic properties. Documentation permits accurate repair or reconstruction of parts of a property, records existing conditions for easements, or may preserve information about a property that is to be demolished.

These Standards are intended for use in developing documentation to be included in the Historic American Building Survey (HABS) and the Historic American Engineering Record (HAER) Collections in the Library of Congress. HABS/HAER, in the National Park Service, have defined specific requirements for meeting these Standards for their collections. The HABS/HAER requirements include information important to development of documentation for other purposes such as State or local archives.

Standard I. Documentation Shall Adequately Explicate and Illustrate What is Significant or Valuable About the Historic Building, Site, Structure or Object Being Documented.

The historic significance of the building, site, structure or object identified in the evaluation process should be conveyed by the drawings, photographs and other materials that comprise documentation. The historical, architectural, engineering or cultural values of the property together with the purpose of the documentation activity determine the level and methods of documentation. Documentation prepared for submission to the Library of Congress must meet the HABS/HAER Guidelines.

Standard II. Documentation Shall be Prepared Accurately From Reliable Sources With Limitations Clearly Stated to Permit Independent Verification of the Information.

The purpose of documentation is to preserve an accurate record of historic properties that can be used in research and other preservation activities. To serve these purposes, the documentation must include information that permits assessment of its reliability.

Standard III. Documentation Shall be Prepared on Materials That are Readily Reproducible, Durable and in Standard Sizes.

The size and quality of documentation materials are important factors in the preservation of information for future use. Selection of materials should be based on the length of time expected for storage, the anticipated frequency of use and a size convenient for storage.

Standard IV. Documentation Shall be Clearly and Concisely Produced.

In order for documentation to be useful for future research, written materials must be legible and understandable, and graphic materials must contain scale information and location references.

Secretary of the Interior's Guidelines for Architectural and Engineering Documentation

Introduction

These Guidelines link the Standards for Architectural and Engineering Documentation with more specific guidance and technical information. They describe one approach to meeting the Standards for Architectural Engineering Documentation. Agencies, organizations or individuals proposing to approach documentation differently may wish to review their approaches with the National Park Service.

The Guidelines are organized as follows:

Definitions
Goal of Documentation
The HABS/HAER Collections
Standard I: Content
Standard II: Quality
Standard III: Materials
Standard IV: Presentation
Architectural and Engineering Documentation Prepared for Other Purposes
Recommended Sources of Technical Information

Definitions

These definitions are used in conjunction with these Guidelines:

Architectural Data Form—a one page HABS form intended to provide identifying information for accompanying HABS documentation.
Documentation—measured drawings, photographs, histories, inventory cards or other media that depict historic buildings, sites, structures or objects.
Field Photography—photography, other than large-format photography, intended for the purpose of producing documentation, usually 35mm.
Field Records—notes of measurements taken, field photographs and other recorded information intended for the purpose of producing documentation.
Inventory Card—a one page form which includes written data, a sketched site plan and a 35mm contact print dry-mounted on the form. The negative, with a separate contact sheet and index should be included with the inventory card.

Large Format Photographs—photographs taken of historic buildings, sites, structures or objects where the negative is a 4 X 5", 5 X 7" or 8 X 10" size and where the photograph is taken with appropriate means to correct perspective distortion.
Measured Drawings—drawings produced on HABS or HAER formats depicting existing conditions or other relevant features of historic buildings, sites, structures or objects. Measured drawings are usually produced in ink on archivally stable material, such as mylar.
Photocopy—A photograph, with large format negative, of a photograph or drawing.
Select Existing Drawings—drawings of historic buildings, sites, structures or objects, whether original construction or later alteration drawings that portray or depict the historic value or significance.
Sketch Plan—a floor plan, generally not to exact scale although often drawn from measurements, where the features are shown improper relation and proportion to one another.

Goal of Documentation

The Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) are the national historical architectural and engineering documentation programs of the National Park Service that promote documentation incorporated into the HABS/HAER collections in the Library of Congress. The goal of the collections is to provide architects, engineers, scholars, and interested members of the public with comprehensive documentation of buildings, sites, structures and objects significant in American history and the growth and development of the built environment.

The HABS/HAER Collections

HABS/HAER documentation usually consists of measured drawings, photographs and written data that provide a detailed record which reflects a property's significance. Measured drawings and properly executed photographs act as a form of insurance against fires and natural disasters by permitting the repair and, if necessary, reconstruction of historic structures damaged by such disasters. Documentation is used to provide the basis for enforcing preservation easement. In addition, documentation is often the last means of preservation of a property; when a property is to be demolished, its documentation provides future researchers access to valuable information that otherwise would be lost.

HABS/HAER documentation is developed in a number of ways. First and most usually, the National Park Service employs summer teams of student architects, engineers, historians and architectural historians to develop HABS/-HAER documentation under the supervision of National Park Service professionals. Second, the National Park Service produces HABS/HAER documentation, in conjunction with restoration or other preservation treatment, of historic buildings managed by the National Park Service. Third, Federal agencies, pursuant to Section 110(b) of the National Historic Preservation Act, as amended, record those historic properties to be demolished or substantially altered as a result of agency action or assisted action (referred to as mitigation projects). Fourth, individuals and organizations prepare documentation to HABS/HAER standards and donate that documentation to the HABS/HAER collections. For each of these programs, different Documentation Levels will be set.

The Standards describe the fundamental principles of HABS/HAER documentation. They are supplemented by other material describing more specific guidelines, such as line weights for drawings, preferred techniques for architectural photography, and formats for written data. This technical information is found in the HABS/HAER Procedures Manual.

These Guidelines include important information about developing documentation for State or local archives. The State Historic Preservation Officer or the State library should be consulted regarding archival requirements if the documentation will become part of their collections. In establishing archives, the important questions of durability and reproducibility should be considered in relation to the purposes of the collection.

Documentation prepared for the purpose of inclusion in the HABS/HAER collections must meet the requirements below. The HABS/HAER office of the National Park Service retains the right to refuse to accept documentation for inclusion in the HABS/HAER collections when that documentation does not meet HABS/HAER requirements, as specified below.

Standard I: Content

1. *Requirement:* Documentation shall adequately explicate and illustrate what is significant or valuable about the historic building, site, structure or object being documented.

2. *Criteria:* Documentation shall meet one of the following documentation levels to be considered adequate for inclusion in the HABS/HAER collections.

a. Documentation Level I:
(1) Drawings: a full set of measured drawings depicting existing or historic conditions.
(2) Photographs: photographs with large-format negatives of exterior and interior views; photocopies with large format negatives of select existing drawings or historic views where available.
(3) Written data: history and description.

b. Documentation Level II:
(1) Drawings: select existing drawings, where available, should be photographed with large–

format negatives or photographically reproduced on mylar.
(2) Photographs: photographs with large-format negatives of exterior and interior views, or historic views, where available.
(3) Written data: history and description.

c. Documentation Level III:
(1) Drawings: sketch plan.
(2) Photographs: photographs with large-format negatives of exterior and interior views.
(3) Written data: architectural data form.

d. Documentation Level IV: HABS/HAER inventory card.

3. *Test*: Inspection of the documentation by HABS/HAER staff.

4. *Commentary*: The HABS/HAER office retains the right to refuse to accept any documentation on buildings, sites, structures or objects lacking historical significance. Generally, buildings, sites, structures or objects must be listed in, or eligible for listing in the National Register of Historic Places to be considered for inclusion in the HABS/HAER collections.

The kind and amount of documentation should be appropriate to the nature and significance of the buildings, site, structure or object being documented. For example, Documentation Level I would be inappropriate for a building that is a minor element of a historic district, notable only for streetscape context and scale. A full set of measured drawings for such a minor building would be expensive and would add little, if any, information to the HABS/HAER collections. Large format photography (Documentation Level III) would usually be adequate to record the significance of this type of building.

Similarly, the aspect of the property that is being documented should reflect the nature and significance of the building, site, structure or object being documented. For example, measured drawings of Dankmar Adler and Louis Sullivan's Auditorium Building in Chicago should indicate not only facades, floor plans and sections, but also the innovative structural and mechanical systems that were incorporated in that building. Large format photography of Gunston Hall in Fairfax County, Virginia, to take another example, should clearly show William Buckland's hand-carved moldings in the Palladian Room, as well as other views.

HABS/HAER documentation is usually in the form of measured drawings, photographs, and written data. While the criteria in this section have addressed only these media, documentation need not be limited to them. Other media, such as films of industrial processes, can and have been used to document historic buildings, sites, structures or objects. If other media are to be used, the HABS/HAER office should be contacted before recording.

The actual selection of the appropriate documentation level will vary, as discussed above. For mitigation documentation projects, this level will be selected by the National Park Service Regional Office and communicated to the agency responsible for completing the documentation. Generally, Level I documentation is required for nationally significant buildings and structures, defined as National Historic Landmarks and the primary historic units of the National Park System.

On occasion, factors other than significance will dictate the selection of another level of documentation. For example, if a rehabilitation of a property is planned, the owner may wish to have a full set of as-built drawings, even though the significance may indicate Level II documentation.

HABS Level I measured drawings usually depict existing conditions through the use of a site plan, floor plans, elevations, sections and construction details. HAER Level I measured drawings will frequently depict original conditions where adequate historical material exists, so as to illustrate manufacturing or engineering processes.

Level II documentation differs from Level I by substituting copies of existing drawings, either original or alteration drawings, for recently executed measured drawings. If this is done, the drawings must meet HABS/HAER requirements outlined below. While existing drawings are rarely as suitable as as-built drawings, they are adequate in many cases for documentation purposes. Only when the desirability of having as-built drawings is clear are Level I measured drawings required in addition to existing drawings. If existing drawings are housed in an accessible collection and cared for archivally, their reproduction for HABS/HAER may not be necessary. In other cases, Level I measured drawings are required in the absence of existing drawings.

Level III documentation requires a sketch plan if it helps to explain the structure. The architectural data form should supplement the photographs by explaining what is not readily visible.

Level IV documentation consists of completed HABS/HAER inventory cards. This level of documentation, unlike the other three levels, is rarely considered adequate documentation for the HABS/HAER collections but is undertaken to identify historic resources in a given area prior to additional, more comprehensive documentation.

Standard II: Quality

1. *Requirement*: HABS and HAER documentation shall be prepared accurately from reliable sources with limitations

clearly stated to permit independent verification of information.

2. *Criteria*: For all levels of documentation, the following quality standards shall be met:

a. Measured drawings: Measured drawings shall be produced from recorded, accurate measurements. Portions of the building that were not accessible for measurement should not be drawn on the measured drawings, but clearly labeled as not accessible or drawn from available construction drawings and other sources and so identified. No part of the measured drawings shall be produced from hypothesis or non-measurement related activities. Documentation Level I measured drawings shall be accompanied by a set of field notebooks in which the measurements were first recorded. Other drawings, prepared for Documentation Levels II and III, shall include a statement describing where the original drawings are located.

b. Large format photographs: Large format photographs shall clearly depict the appearance of the property and areas of significance of the recorded building, site, structure or object. Each view shall be perspective-corrected and fully captioned.

c. Written history: Written history and description for Documentation Levels I and II shall be based on primary sources to the greatest extent possible. For Levels III and IV, secondary sources may provide adequate information; if not primary research will be necessary. A frank assessment of the reliability and limitations of sources shall be included. Within the written history, statements shall be footnoted as to their sources, where appropriate. The written data shall include a methodology section specifying name of researcher, date of research, sources searched, and limitations of the project.

3. *Test*: Inspection of the documentation by HABS/HAER staff.

4. *Commentary*: The reliability of the HABS/HAER collections depends on documentation of high quality. Quality is not something that can be easily prescribed or quantified, but it derives from a process in which thoroughness and accuracy play a large part. The principle of independent verification of HABS/HAER documentation is critical to the HABS/HAER collections.

Standard III: Materials

1. *Requirement*: HABS and HAER documentation shall be prepared on materials that are readily reproducible for ease of access; durable for long storage; and in standard sizes for ease of handling.

2. *Criteria*: For all levels of documentation, the following material standards shall be met:

a. Measured Drawings:

- Readily Reproducible: Ink on translucent material.
- Durable: Ink on archivally stable materials.
- Standard Sizes: Two sizes: 19 x 24" or 24 x 36".

b. Large Format Photographs:

- Readily Reproducible: Prints shall accompany all negatives.
- Durable: Photography must be archivally processed and stored.
- Negatives are required on safety film only. Resin-coated paper is not accepted. Color photography is not acceptable.
- Standard Sizes: Three sizes: 4 x 5", 5 x 7", 8 x 10".

c. Written History and Description:

- Readily Reproducible: Clean copy for xeroxing.
- Durable: Archival bond required.
- Standard Sizes: 8 1/2 x 11".

d. Field Records:

- Readily Reproducible: Field notebooks may be xeroxed. Photo identification sheet will accompany 35mm negatives and contact sheets.
- Durable: No requirement.
- Standard Sizes: Only requirement is that they can be made to fit into a 9 1/2 x 12" archival folding file.

3. *Test*: Inspection of the documentation by HABS/HAER staff.

4. *Commentary*: All HABS/HAER records are intended for reproduction; some 20,000 HABS/HAER records are reproduced each year by the Library of Congress. Although field records are not intended for quality reproduction, it is intended that they be used to supplement the formal documentation. The basic durability performance standard for HABS/HAER records is 500 years. Ink on mylar is believed to meet this standard, while color photography, for example, does not. Field records do not meet this archival standard, but are maintained in the HABS/HAER collections as a courtesy to the collection user.

Standard IV: Presentation

1. *Requirement*: HABS and HAER documentation shall be clearly and concisely produced.

2. *Criteria*: For levels of documentation as indicated below, the following standards for presentation will be used:

a. Measured Drawings: Level I measured drawings will be lettered mechanically (i.e., Leroy or similar) or in a handprinted equivalent style. Adequate dimensions shall be included on all sheets. Level III sketch plans should be neat and orderly.

b. Large format photographs: Level I photographs shall include duplicate photographs that include a scale. Level II and III photographs shall include, at a minimum, at least one photograph with a scale, usually of the principal facade.

c. Written history and description: Data shall be typewritten on bond, following accepted rules of grammar.

3. *Test*: Inspection of the documentation by HABS/HAER staff.

Architectural and Engineering Documentation Prepared for Other Purposes

Where a preservation planning process is in use, architectural and engineering documentation, like other treatment activities, are undertaken to achieve the goals identified by the preservation planning process. Documentation is deliberately selected as a treatment for properties evaluated as significant, and the development of the documentation program for a property follows from the planning objectives. Documentation efforts focus on the significant characteristics of the property, as defined in the previously completed evaluation. The selection of a level of documentation and the documentation techniques (measured drawings, photography, etc.) is based on the significance of the property and the management needs for which the documentation is being performed. For example, the kind and level of documentation required to record a historic property for easement purposes may be less detailed than that required as mitigation prior to destruction of the property. In the former case, essential documentation might be limited to the portions of the property controlled by the easement, for example, exterior facades; while in the latter case, significant interior architectural features and non-visible structural details would also be documented.

The principles and content of the HABS/HAER criteria may be used for guidance in creating documentation requirements for other archives. Levels of documentation and the durability and sizes of documentation may vary depending on the intended use and the repository. Accuracy of documentation should be controlled by assessing the reliability of all sources and making that assessment available in the archival record; by describing the limitations of the information available from research and physical examination of the property; and by retaining the primary data (field measurements and notebooks) from which the archival record was produced. Usefulness of the documentation products depends on preparing the documentation on durable materials that are able to withstand handling and reproduction, and in sizes that can be stored and reproduced without damage.

Recommended Sources of Technical Information

Recording Historic Buildings. Harley J. McKee. Government Printing Office, 1970. Washington, D.C.

HABS/HAER Procedures Manual. Historic American Buildings Survey/Historic American Engineering Record, National Park Service, 1980. Washington, D.C.

Photogrammetric Recording of Cultural Resources. Terry E. Borchers. Technical Preservation Services, U.S. Department of the Interior, 1977. Washington, D.C.

Rectified Photography and Photo Drawings for Historic Preservation. J. Henry Chambers. Technical Preservation Services, U.S. Department of the Interior, 1975. Washington, D.C.

Secretary of the Interior's Standards for Archeological Documentation

Archeological documentation is a series of actions applied to properties of archeological interest. Documentation of such properties may occur at any or all levels of planning, identification, evaluation or treatment. The nature and level of documentation is dictated by each specific set of circumstances. Archeological documentation consists of activities such as archival research, observation and recording of above-ground remains, and observation (directly, through excavation, or indirectly, through remote sensing) of below-ground remains. Archeological documentation is employed for the purpose of gathering information on individual historic properties or groups of properties. It is guided by a framework of objectives and methods derived from the planning process, and makes use of previous planning decisions, such as those on evaluation of significance. Archeological documentation may be undertaken as an aid to various treatment activities, including research, interpretation, reconstruction, stabilization and data recovery when mitigating archeological losses resulting from construction. Care should be taken to assure that documentation efforts do not duplicate previous efforts.

Standard I. Archeological Documentation Activities Follow an Explicit Statement of Objectives and Methods That Responds to Needs Identified in the Planning Process

Archeological research and documentation may be undertaken to fulfill a number of needs, such as overviews and background studies for planning, interpretation or data recovery to mitigate adverse effects. The planning needs are articulated in a statement of objectives to be accomplished by the archeological documentation activities. The statement of objectives guides the selection of methods and techniques of

study and provides a comparative framework for evaluating and deciding the relative efficiency of alternatives. Satisfactory documentation involves the use of archeological and historical sources, as well as those of other disciplines. The statement of objectives usually takes the form of a formal and explicit research design which has evolved from the interrelation of planning needs, current knowledge, resource value and logistics.

Standard II. The Methods and Techniques of Archeological Documentation are Selected To Obtain the Information Required by the Statement of Objectives

The methods and techniques chosen for archeological documentation should be the most effective, least destructive, most efficient and economical means of obtaining the needed information. Methods and techniques should be selected so that the results may be verified if necessary. Non-destructive techniques should be used whenever appropriate. The focus on stated objectives should be maintained throughout the process of study and documentation.

Standard III. The Results of Archeological Documentation are Assessed Against the Statement of Objectives and Integrated Into the Planning Process

One product of archeological documentation is the recovered data; another is the information gathered about the usefulness of the statement of objectives itself. The recovered data are assessed against the objectives to determine how they meet the specified planning needs. Information related to archeological site types, distribution and density should be integrated in planning at the level of identification and evaluation. Information and data concerning intra-site structure may be needed for developing mitigation strategies and are appropriately integrated at this level of planning. The results of the data analyses are integrated into the body of current knowledge. The utility of the method of approach and the particular techniques which were used in the investigation (i.e. the research design) should be assessed so that the objectives of future documentation efforts may be modified accordingly.

Standard IV. The Results of Archeological Documentation are Reported and Made Available to the Public

Results must be accessible to a broad range of users including appropriate agencies, the professional community and the general public. Results should be communicated in reports that summarize the objectives, methods, techniques and results of the documentation activity, and identify the repository of the materials and information so that additional detailed information can be obtained, if necessary. The public may also benefit from the knowledge obtained from archeological documentation through pamphlets, brochures, leaflets, displays and exhibits, or by slide, film or multimedia productions. The goal of disseminating information must be balanced, however, with the need to protect sensitive information whose disclosure might result in damage to properties. Curation arrangements sufficient to preserve artifacts, specimens and records generated by the investigation must be provided for to assure the availability of these materials for future use.

Secretary of the Interior's Guidelines for Archeological Documentation

Introduction

These Guidelines link the Standards for Archeological Documentation with more specific guidance and technical information. They describe one approach to meeting the Standards for Documentation. Agencies, organizations or individuals proposing to approach archeological documentation differently may wish to review their approach with the National Park Service.

The Guidelines are organized as follows:

Archeological Documentation Objectives
Documentation Plan
Methods
Reporting Results
Curation
Recommended Sources of Technical Information

Archeological Documentation Objectives

The term "archeological documentation" is used here to refer specifically to any operation that is performed using archeological techniques as a means to obtain and record evidence about past human activity that is of importance to documenting history and prehistory in the United States. Historic and prehistoric properties may be important for the data they contain, or because of their association with important persons, events, or processes, or because they represent architectural or artistic values, or for other reasons. Archeological documentation may be an appropriate option for application not only to archeological properties, but to above-ground structures as well, and may be used in collaboration with a wide range of other treatment activities.

If a property contains artifacts, features, and other materials that can be studied using archeological techniques, then archeological documentation may be selected to achieve particular goals of the planning process-such as to address a specified information need, or to illustrate significant associative values. Within the overall goals and priorities established by the planning process, particular methods of investigation are chosen that best suit the types of study to be performed.

Relationship of archeological documentation to other types of documentation or other treatments: Archeological

documentation is appropriate for achieving any of various goals, including:

1. Collection of base-line data;
2. Problem-oriented research directed toward particular data gaps recognized in the historic context(s);
3. Preservation or illustration of significance which has been identified for treatment by the planning process; or
4. Testing of new investigative or conservation techniques, such as the effect of different actions such as forms of site burial (aqueous or non-aqueous).

Many properties having archeological components have associative values as well as research values. Examples include Native American sacred areas and historic sites such as battlefields. Archeological documentation may preserve information or data that are linked to the identified values that a particular property possesses. Depending on the property type and the range of values represented by the property, it may be necessary to recover information that relates to an aspect of the property's significance other than the specified research questions. It is possible that conflicts may arise between the optimal realizations of research goals and other issues such as the recognition/protection of other types of associative values. The research design for the archeological documentation should provide for methods and procedures to resolve such conflicts, and for the close coordination of the archeological research with the appropriate ethnographic, social or technological research.

Documentation Plan

Research Design: Archeological documentation can be carried out only after defining explicit goals and a methodology for reaching them. The goals of the documentation effort directly reflect the goals of the preservation plan and the specific needs identified for the relevant historic contexts. In the case of problem oriented archeological research, the plan usually takes the form of a formal research design, and includes, in addition to the items below, explicit statements of the problem to be addressed and the methods or tests to be applied. The purpose of the statement of objectives is to explain the rationale behind the documentation effort; to define the scope of the investigation; to identify the methods, techniques, and procedures to be used; to provide a schedule for the activities; and to permit comparison of the proposed research with the results. The research design for an archeological documentation effort follows the same guidelines as those for identification (see the Guidelines for Identification) but has a more property-specific orientation.

The research design should draw upon the preservation plan to identify:

1. Evaluated significance of the property(ies) to be studied;
2. Research problems or other issues relevant to the significance of the property;
3. Prior research on the topic and property type; and how the proposed documentation objectives are related to previous research and existing knowledge;
4. The amount and kinds of information (data) required to address the documentation objectives and to make reliable statements, including at what point information is redundant and documentation efforts have reached a point of diminishing returns;
5. Methods to be used to find the information; and
6. Relationship of the proposed archeological investigation to anticipated historical or structural documentation, or other treatments.

The primary focus of archeological documentation is on the data classes that are required to address the specified documentation objectives. This may mean that other data classes are deliberately neglected. If so, the reasons for such a decision should be carefully justified in terms of the preservation plan.

Archeological investigations seldom are able to collect and record all possible data. It is essential to determine the point at which further data recovery and documentation fail to improve the usefulness of the archeological information being recovered. One purpose of the research design is to estimate those limits in advance and to suggest at what point information becomes duplicative. Investigation strategies should be selected based on these general principles, considering the following factors:

1. Specific data needs;
2. Time and funds available to secure the data; and
3. Relative cost efficiency of various strategies.

Responsiveness to the concerns of local groups (e.g., Native American groups with ties to specific properties) that was built into survey and evaluation phases of the preservation plan, should be maintained in archeological investigation, since such activity usually involves site disturbance. The research design, in addition to providing for appropriate ethnographic research and consultation, should consider concerns voiced in previous phases. In the absence of previous efforts to coordinate with local or other interested groups, the research design should anticipate the need to initiate appropriate contracts and provide a mechanism for responding to sensitive issues, such as the possible uncovering of human remains or discovery of sacred areas.

The research design facilitates an orderly, goal directed and economical project. However, the research design must be flexible enough to allow for examination of unanticipated but important research opportunities that arise during the investigation.

Documentation Methods

Background Review: Archeological documentation usually is preceded by, or integrated with historical research (i.e. that intensive background information gathering including identification of previous archeological work and inspection of museum collections; gathering relevant data on geology, botany, urban geography and other related disciplines; archival research; informant interviews, or recording of oral tradition, etc.).

Depending on the goals of the archeological documentation, the background historical and archeological research may exceed the level of research accomplished for development of the relevant historic contexts or for identification and evaluation, and focuses on the unique aspects of the property to be treated. This assists in directing the investigation and locates a broader base of information than that contained in the property itself for response to the documentation goals. This activity is particularly important for historic archeological properties where information sources other than the property itself may be critical to preserving the significant aspects of the property. (See the Secretary of the Interior's Standards and Guidelines for Historical Documentation for discussion of associated research activities.)

Field Studies: The implementation of the research design in the field must be flexible enough to accommodate the discovery of new or unexpected data classes or properties, or changing field conditions. A phased approach may be appropriated when dealing with large complex properties or groups of properties, allowing for changes in emphasis or field strategy, or termination of the program, based on analysis of recovered data at the end of each phase. Such an approach permits the confirmation of assumptions concerning property extent, content or organization which had been made based on data gathered from identification and evaluation efforts, or the adjustment of those expectations and resulting changes in procedure. In some cases a phased approach may be necessary to gather sufficient data to calculate the necessary sample size for a statistically valid sample. A phased documentation program may often be most cost-effective, in allowing for early termination of work if the desired objectives cannot be achieved.

Explicit descriptive statements of and justification for field study techniques are important to provide a means of evaluating results. In some cases, especially those employing a sampling strategy in earlier phases (such as identification or evaluation), it is possible to estimate parameters of certain classes of data in a fairly rigorous statistical manner. It is thus desirable to maintain some consistency in choice of sampling designs throughout multiple phases of work at the same property. Consistency with previously employed area sampling frameworks also improves potential replication in terms of later locating sampled and unsampled areas. It often is desirable to estimate the nature and frequency of data parameters based on existing information or analogy to other similar cases. These estimates may then be tested in field studies.

An important consideration in choosing methods to be used in the field studies should be assuring full, clear, and accurate descriptions of all field operations and observations, including excavation and recording techniques and stratigraphic or inter-site relationships.

To the extent feasible, chosen methodologies and techniques should take into account the possibility that future researchers will need to use the recovered data to address problems not recognized at the time the data were recovered. The field operation may recover data that may not be fully analyzed; this data, as well as the data analyzed, should be recorded and preserved in a way to facilitate future research.

A variety of methodologies may be used. Choices must be explained, including a measure of cost-effectiveness relative to other potential choices. Actual results can then be measured against expectations, and the information applied later in similar cases.

Destructive methods should not be applied to portions or elements of the property if nondestructive methods are practical. If portions or elements of the property being documented are to be preserved in place, the archeological investigation should employ methods that will leave the property as undisturbed as possible. However, in cases where the property will be destroyed by, for example, construction following the investigation, it may be most practical to gather the needed data in the most direct manner, even though that may involve use of destructive techniques.

Logistics in the field, including the deployment of personnel and materials and the execution of sampling strategies, should consider site significant, anticipated location of most important data, cost effectiveness, potential time limitations and possible adverse environmental conditions.

The choice of methods for recording data gathered in the field should be based on the research design. Based on that statement, it is known in advance of field work what kinds of information are needed for analysis; record-keeping techniques should focus on these data. Field records should be maintained in a manner that permits independent interpretation in so far as possible. Record-keeping should be standardized in format and level of detail.

Archeological documentation should be conducted under the supervision of qualified professionals in the disciplines appropriate to the data that are to be recovered. When the general public is directly involved in archeological documentation activities, provision should be made for training and supervision by qualified professionals. (See the Professional Qualifications Standards.)

Analysis: Archeological documentation is not completed with field work; analysis of the collected information is an integral part of the documentation activity, and should be planned for in the research design. Analytical techniques should be selected that are relevant to the objectives of the investigation. Forms of analysis that may be appropriate, depending on the type of data recovered and the objectives of the investigation, include but are not limited to: studying artifact types and distribution; radiometric and other means of age determination; studies of soil stratigraphy; studies of organic matter such as human remains, pollen, animal bones, shells and seeds; study of the composition of soils and study of the natural environment in which the property appears.

Reporting Results

Report Contents: Archeological documentation concludes with written report(s) including minimally the following topics:

1. Description of the study area;
2. Relevant historical documentation/background research;
3. The research design;
4. The field studies as actually implemented, including any deviation from the research design and the reason for the changes;
5. All field observations;
6. Analyses and results, illustrated as appropriate with tables, charts, and graphs;
7. Evaluation of the investigation in terms of the goals and objectives of the investigation, including discussion of how well the needs dictated by the planning process were served;
8. Recommendations for updating the relevant historic contexts and planning goals and priorities, and generation of new or revised information needs;
9. Reference to related on-going or proposed treatment activities, such as structural documentation, stabilization, etc.; and
10. Information on the location of original data in the form of field notes, photographs, and other materials.

Some individual property information, such as specific locational data, may be highly sensitive to disclosure, because of the threat of vandalism. If the objectives of the documentation effort are such that a report containing confidential information such as specific site locations or information on religious practices is necessary, it may be appropriate to prepare a separate report for public distribution. The additional report should summarize that information that is not under restricted access in a format most useful to the expected groups of potential users. Peer review of draft reports is recommended to ensure that state-of-the-art technical reports are produced.

Availability: Results must be made available to the full range of potential users. This can be accomplished through a variety of means including publication of results in monographs and professional journals and distribution of the report to libraries or technical clearinghouses such as the National Technical Information Service in Springfield, Virginia.

Curation

Archeological specimens and records are part of the documentary record of an archeological site. They must be curated for future use in research, interpretation, preservation, and resource management activities. Curation of important archeological specimens and records should be provided for in the development of any archeological program or project.

Archeological specimens and records that should be curated are those that embody the information important to history and prehistory. They include artifacts and their associated documents, photographs, maps, and field notes; materials of an environmental nature such as bones, shells, soil and sediment samples, wood, seeds, pollen, and their associated records; and the products and associated records of laboratory procedures such as thin sections, and sediment fractions that result from the analysis of archeological data.

Satisfactory curation occurs when:

1. Curation facilities have adequate space, facilities, and professional personnel;
2. Archeological specimens are maintained so that their information values are not lost through deterioration, and records are maintained to a professional archival standard;
3. Curated collections are accessible to qualified researchers within a reasonable time of having been requested; and
4. Collections are available for interpretive purposes, subject to reasonable security precautions.

Recommended Sources of Technical Information

Archeomagnetism: A Handbook for the Archeologist. Jeffrey L. Eighmy, U.S. Department of the Interior, Washington, D.C., 1980.

The Curation and Management of Archeological Collections: A Pilot Study. Cultural Resource Management Series, U.S. Department of the Interior, September 1980.

Human Bones and Archeology. Douglas H. Ubelaker. Interagency Archeological Services, Heritage Conservation and Recreation Service, U.S. Department of the Interior, Washington, D.C., 1980.

Manual for Museums, Ralph H. Lewis, National Park Service, U.S. Department of the Interior, 1976.

Treatment of Archeological Properties: A Handbook. Advisory Council on Historic Preservation, Washington, D.C., 1980

The Secretary of the Interior's Standards for the Treatment of Historic Properties

The Secretary of the Interior's Standards for the Treatment of Historic Properties apply to all proposed development grant-in-aid projects assisted through the National Historic Preservation Fund and are intended to be applied to a wide variety of resource types, including buildings, sites, structures, objects, and districts. These standards, revised in 1992, were published in the July 12, 1995, *Federal Register* and codified as 36 CFR Part 38. They replace the 1978 and 1983 versions of 36 CFR Part 68 titled "The Secretary of the Interior's Standards for Historic Preservation Projects."

Another regulation, 36 CFR Part 67, focuses on "certified historic structures" as defined by the IRS Code of 1986. The "Standards for Rehabilitation" in 36 CFR Part 67 should always be used when property owners are seeking certification for federal tax benefits.

Treatments

There are Standards for four distinct, but interrelated, approaches to the treatment of historic properties—Preservation, Rehabilitation, Restoration, and Reconstruction. The treatment *Preservation* focuses on the maintenance and repair of existing historic materials and retention of a property's form as it has evolved over time. *Rehabilitation* acknowledges the need to alter or add to a historic property to meet continuing or changing uses while retaining the property's historic character. *Restoration* is undertaken to depict a property at a particular period of time in its history, while removing evidence of other periods. *Reconstruction* re-creates vanished or non-surviving portions of a property for interpretive purposes.

In summary, the simplification and sharpened focus of these revised sets of treatment Standards is intended to assist users in making sound historic preservation decisions. Choosing an appropriate treatment for a historic property, whether preservation, rehabilitation, restoration, or reconstruction is critical. This choice always depends on a variety of factors, including the property's historical significance, physical condition, proposed use, and intended interpretation.

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Standards for Preservation

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.

2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

Rehabilitation is defined as the act or process of making possible an efficient compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

Standards for Rehabilitation

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in a such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

Standards for Restoration

1. A property will be used as it was historically or be given a new use which interprets the property and its restoration period.

2. Materials and features from the restoration period will be retained and preserved. The removal of materials or alteration of features, spaces, and spatial relationships that characterize the period will be not be undertaken.

3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate and conserve materials and features from the restoration period will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

4. Materials, features, spaces, and finishes that characterize other historical periods will be documented prior to their alteration or removal.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize the restoration period will be preserved.

6. Deteriorated features from the restoration period will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials.

7. Replacement of missing features from the restoration period will be substantiated by documentary and physical evidence. A false sense of history will not be created by adding conjectural features, features from other properties, or by combining features that never existed together historically.

8. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

9. Archeological resources affected by a project will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

10. Designs that were never executed historically will not be constructed.

Reconstruction is defined as the act of process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

Standards for Reconstruction

1. Reconstruction will be used to depict vanished or non-surviving portions of a property when documentary and physical evidence is available to permit accurate reconstruction with minimal conjecture, and such reconstruction is essential to the public understanding of the property.

2. Reconstruction of a landscape, building, structure, or object in its historic location will be preceded by a thorough archeological investigation to identify and evaluate those features and artifacts which are essential to an accurate reconstruction. If such resources must be disturbed, mitigation measures will be undertaken.

3. Reconstruction will include measures to preserve any remaining historic materials, features, and spatial relationships.

4. Reconstruction will be based on the accurate duplication of historic features and elements substantiated by documentary or physical evidence rather than on conjectural designs or the availability of different features from other historic properties. A reconstructed property will re-create the appearance of the non-surviving historic property in materials, design, color, and texture.

5. A reconstruction will be clearly identified as a contemporary re-creation.

6. Designs that were never executed historically will not be constructed.

Secretary of the Interior's Guidelines for Treatment of Historic Properties

The guidelines for the Secretary of the Interior's Standards for Treatment of Historic Properties, not included here because of their length, may be obtained separately from the National Park Service.

Professional Qualifications Standards

The following requirements are those used by the National Park Service, and have been previously published in the Code of Federal Regulations, 36 CFR Part 61. The qualifications define minimum education and experience required to perform identification, evaluation, registration, and treatment activities. In some cases, additional areas or levels of expertise may be needed, depending on the complexity of the task and the nature of the historic properties involved. In the following definitions, a year of full-time professional experience need not consist of a continuous year of full-time work but may be made up of discontinuous periods of full-time or part-time work adding up to the equivalent of a year of full-time experience.

History

The minimum professional qualifications in history are a graduate degree in history or closely related field; or a bachelor's degree in history or closely related field plus one of the following:

1. At least two years of full-time experience in research, writing, teaching, interpretation, or other demonstrable professional activity with an academic institution, historic organization or agency, museum, or other professional institution; or
2. Substantial contribution through research and publication to the body of scholarly knowledge in the field of history.

Archeology

The minimum professional qualifications in archeology are a graduate degree in archeology, anthropology, or closely related field plus:

1. At least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management;
2. At least four months of supervised field and analytic experience in general North American archeology; and
3. Demonstrated ability to carry research to completion.

In addition to these minimum qualifications, a professional in prehistoric archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the prehistoric period. A professional in historic archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the historic period.

Architectural History

The minimum professional qualifications in architectural history are a graduate degree in architectural history, art history, historic preservation, or closely related field, with coursework in American architectural history; or a bachelor's degree in architectural history, art history, historic preservation or closely related field plus one of the following:

1. At least two years of full-time experience in research, writing, or teaching in American architectural history or restoration architecture with an academic institution, historical organization or agency, museum, or other professional institution; or
2. Substantial contribution through research and publication to the body of scholarly knowledge in the field of American architectural history.

APPENDIX D: DISTRIBUTION/AVAILABILITY OF FINAL CULTURAL RESOURCE REPORTS

Distribution

Copies of final cultural resources reports produced or contracted by the centers, regional offices, and parks should be provided to the following offices and repositories. This list represents a minimal distribution, and additional copies should also be printed to meet anticipated demand by other interested parties.

1 — Assistant Director, National Center for Cultural Resources Stewardship and Partnership Programs

1 — Regional Director

1 — Support Office Superintendent

1 — Cultural Resource Management Bibliography Cluster Coordinator

20-25 — Park

1 — State Historic Preservation Officer

1 — Technical Information Center
Information and Production Services Division
Denver Service Center (DSC-PGT)

1 — Harpers Ferry Center Library

1 — Archeological or preservation center

1 — Files of office producing report

2 — Natural Resources Library
U.S. Department of the Interior
Washington, DC 20240

1 — National Trust for Historic Preservation Library
McKeldin Library
University of Maryland
College Park, MD 20742

1 — Library of Congress
Gifts and Exchange Division
Federal Documents Section
Washington, DC 20540

1 — Smithsonian Institution Libraries
Gifts and Exchange
Washington, DC 20560

Public Access to Cultural Resource Reports and Confidentiality of Archeological and Ethnographic Resource Information

The Archaeological Resources Protection Act (ARPA) uniform regulations provide that federal land managers shall not make available to the public information concerning the nature and location of archeological resources unless the manager finds that disclosure will further the purposes of ARPA and related legislation and will not risk harm to the resources or their sites (see 43 CFR 7.18[a][1]). Section 304 of the National Historic Preservation Act also addresses needs to withhold information about the location, character, or ownership of historic resources in specified cases. Thus, cultural resource reports that contain information about archeological and ethnographic resources must be evaluated to determine whether they should be restricted in their entirety or whether information about sensitive resources should

be appended separately or otherwise flagged for deletion when the reports are made available to the general public.

All cultural resource reports must be reviewed by appropriate cultural resource discipline specialists and certified by superintendents before distribution or microfiching. The completed certification form as shown following must be bound in all final reports, and a completed copy must be contained in each draft copy submitted for review. Ethnographic reports will be reviewed and certified in the National Center for Cultural Resources Stewardship and Partnership Programs until parks, support offices, and other centers have applied cultural anthropologists (ethnographers) on staff.

Report Certification

I certify that [name of report] has been reviewed against the criteria contained in 43 CFR 7.18(a)(1) and upon the recommendation of [name and title of discipline specialist] has been classified as [select from key words below].

_____ _____

Superintendent Date

Classification key words:

"Available" — Making the report available to the public meets the criteria of 43 CFR 7.18(a)(1).

"Available (deletions)" — Making the report available with selected information on site locations and/or site characteristics deleted meets the criteria of 43 CFR 7.18(a)(1). A list of chapters, pages, maps, paragraphs, etc., that must be deleted for each report in this category is attached.

"Not Available" — Making the report available does not meet the criteria of 43 CFR 7.18(a)(1).

APPENDIX 2

Geophysical Investigation Results

SUNBELT GEOPHYSICS P.O. Box 36404 Albuquerque, New Mexico 87176 (505) 922-1140

Geophysical Investigation at the Civil War
Site of Camp Lewis along NM 63,
Pecos National Historical Park, New Mexico

Prepared for:
The Museum of New Mexico
Office of Archaeological Studies
P.O. Box 2087
Santa Fe, New Mexico 87504

David A. Hyndman
Sidney S. Brandwein

May 2003

Introduction

A geophysical investigation has been conducted at the Civil War site of Camp Lewis along NM Highway 63 in the Pecos National Historical Park in San Miguel County, New Mexico. The geophysical efforts were performed in support of an archaeological study in preparation for construction activities along the highway.

The geophysical investigation was designed in two parts. Phase 1 consisted of detailed surveys with four different geophysical instruments over a nearly rectangular area of approximately 1400 square meters (m^2). Phase 2 was a reconnaissance survey along the edges of approximately 250 meters of highway with two geophysical instruments. The positions of the Phase 1 and Phase 2 surveys are shown on an aerial photograph in Figure 1.

Field activities for the geophysical deployment were conducted during June and July 2002. Equipment and technical expertise for the surveys were provided by Sunbelt Geophysics of Albuquerque. Oversight, support, and archaeological guidence were provided by the Office of Archaeological Studies (OAS) of the Museum of New Mexico.

Methodology

Spatial control for the Camp Lewis investigation was established along the highway by OAS. The geophysical data acquisition grids were placed with respect to this control utilizing a transit and tape. The grids consisted of parallel north-south traverses marked with wooden stakes, plastic stemmed pin flags and small dots of spray paint. The grid for the Phase 1 surveys consisted of traverses separated by one meter. The Phase 2 traverses were separated by two meters.

Phase 1 geophysical data were acquired utilizing four different instruments, each able to provide rapid, high-density coverage. These included a Geonics EM-61 high-resolution metal detector, a Geometrics G-858 cesium vapor magnetometer, a Geonics EM-38 ground conductivity meter, and a Geonics EM-31 ground conductivity meter. The Phase 2 reconnaissance was performed with the magnetometer and the Geonics EM-31 conductivity meter. These instruments are shown in Figure 2.

Geophysical data were acquired in a quasi-continuous mode as the instrument operator walked along each traverse, with sampling controlled by a road wheel or a clock internal to the instrument. Data were recorded on a data logger and transferred to a computer for processing and image preparation. The Geosoft OASIS montaj program was used for image preparation.

Figure 1. Camp Lewis
Location of Geophysical Surveys

Geometrics Magnetometer

Geonics EM-38 Conductivity Meter

EM 61 with 15 centimeter antenna

Geonics EM-31 Conductivity Meter

Figure 2. Geophysical Instruments

Phase 1

Metal Detection Survey

A quantitative metal detection survey was conducted utilizing a Geonics EM-61 metal detector with the so called "Hand Held" (HH) antenna. These are 15 cm diameter coils designed for high spatial delineation of small, relatively shallow objects. This survey was performed both to locate subsurface metallic objects of possible historical interest and to identify buried objects that might interfere with subsequent instruments.

The results of the EM-61 survey are presented in Figure 3. Annotations are made for the obstacles and observable (surface) objects that interfered with the EM-61 response. Gaps in the survey coverage are found where clumps of trees, a fence, and a cattle guard obstructed the way. Interference was generated by a telephone cable box with nearby picket, a pole, and the metal in the fence and cattle guard. The edge of the highway's engineered roadbed is indicated on the figure.

Numerous "hits" remain after accounting for the observed metallic objects. These are most prevalent on the eastern edge of the survey, along the side of the highway and in front of the cattle guard. Several small subsurface objects are also observed in the dirt road along the northern edge. There are numerous metallic objects detected in the center of the survey, away from the roads and in an area clear of surface metal. It is likely that many of these are from innocuous debris, and excavation will be required to determine the historic significance of any particular object.

Figure 3 includes the 3 mV and 10 mV contours of the EM-61 data. These contours will be superposed on subsequent images of the magnetometer and electrical conductivity data sets in order to help delineate those features generated by metallic objects.

Magnetic Survey

The magnetic survey was conducted in order to map lateral contrasts in subsurface magnetic properties. Potential targets might include cobbles, architectural stones, fire alteration and iron objects. The magnetometer data are presented in Figure 4, with the EM-61 contours as white lines. These data are dominated by the relatively large response from the fence and cattle guard, a fence picket later found in the trees, and the phone box. The magnetic field is relatively smooth to the west. Most small scale magnetic features can be correlated to metal detected by the EM-61. Others may be magnetic cobbles or small iron objects that were missed by the EM-61.

There is a linear east-west magnetic feature running along 678N. This feature is coincident with undulations in the topography that have been identified as a Santa Fe Trail rut. The magnetic feature is most likely a terrain effect introduced into the data as the instrument operator traversed the rut.

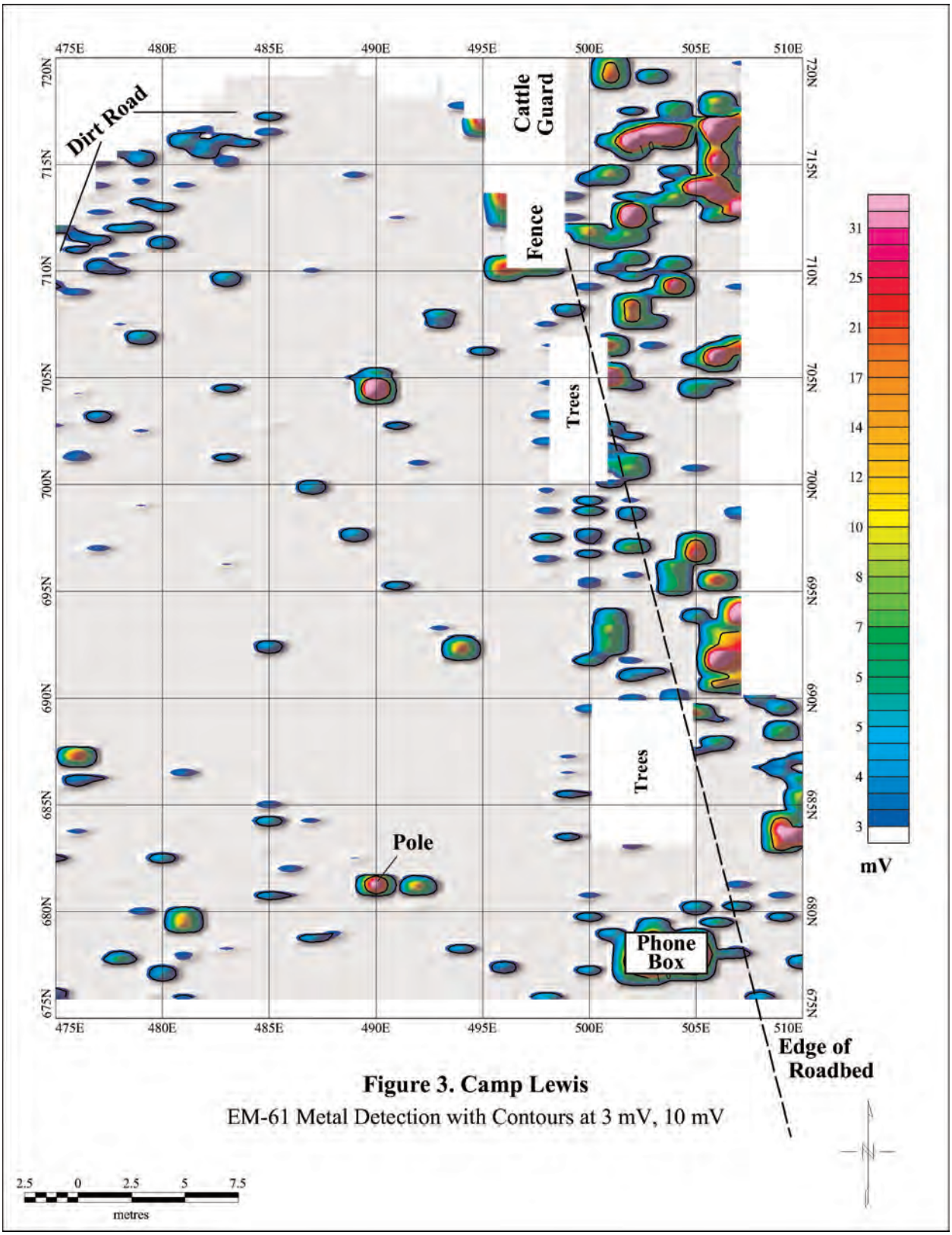

Figure 3. Camp Lewis
EM-61 Metal Detection with Contours at 3 mV, 10 mV

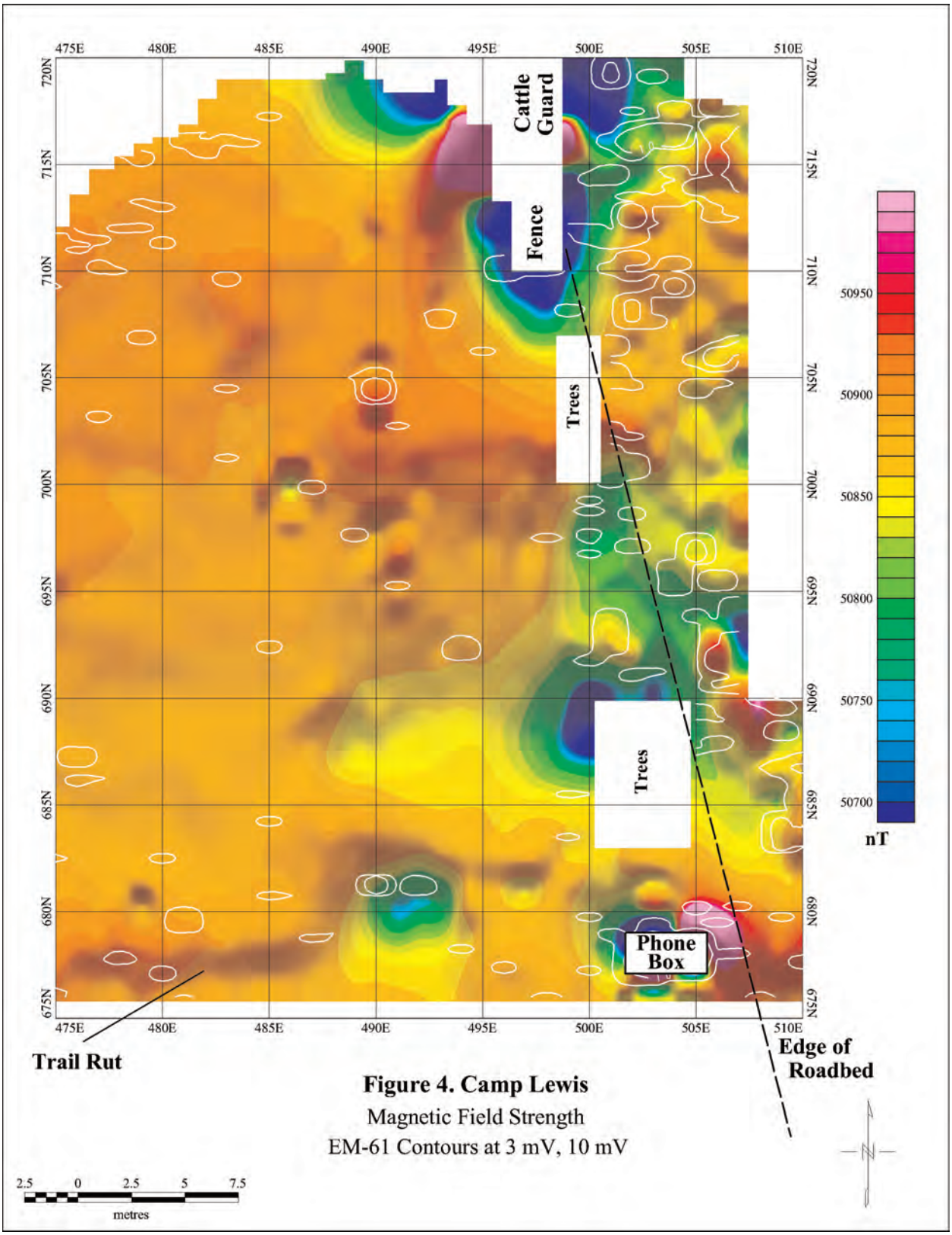

Figure 4. Camp Lewis
Magnetic Field Strength
EM-61 Contours at 3 mV, 10 mV

Electrical Conductivity Survey

The electrical conductivity surveys were conducted with both a Geonics EM-38 conductivity meter and a Geonics EM-31. The EM-38 provides a measurement of the electrical conductivity to a depth of approximately 1.5 meters. The EM-31 investigates deeper, probing to depths of approximately 6 meters. Potential targets might include hard packed earth, foundations, architectural stones, and burial pits.

The shallow EM-38 data are presented in Figure 5. The response along the highway is high (red to pink) due to compaction of the roadbed, local drainage, and a possible contribution from de-icing agents.

An abrupt change is found to the west, just beyond the roadway, where the background conductivity decreases by a factor of 2, to green on the color scale. This background is disturbed by small features that correlate to objects detected by the EM-61 and the trail rut. An approximate 25 m^2 area of elevated conductivity (orange) is observed at 693N, 482E. This area is near but not coincident with the local topographic low.

The deeper EM-31 conductivity data are presented in Figure 6. Again the roadbed dominates the eastern edge of the survey and there is an abrupt change to the west. The measured conductivity falls to the north, where the low values (blue) are generated by terrain effects from the bank of the nearby stream. An area of elevated conductivity is observed immediately north of the ruts, as in the EM-38 data.

Summary of Phase 1

Numerous buried, metallic objects were detected by the EM-61. These were small objects that were missed during a previous qualitative metal detection survey conducted by OAS. Many objects were located away from the roads, where there was little surface debris or other observed sources of noise.

The magnetometer survey was dominated by metal at the surface and yielded little information.

The EM-38 and EM-31 surveys revealed an area of elevated conductivity to the immediate north of the Santa Fe Trail rut. Archaeologists on site suggested that this area might well have been used to corral livestock. This conductivity feature is consistent with organic material mixed with hard packed earth likely to be found at a corral.

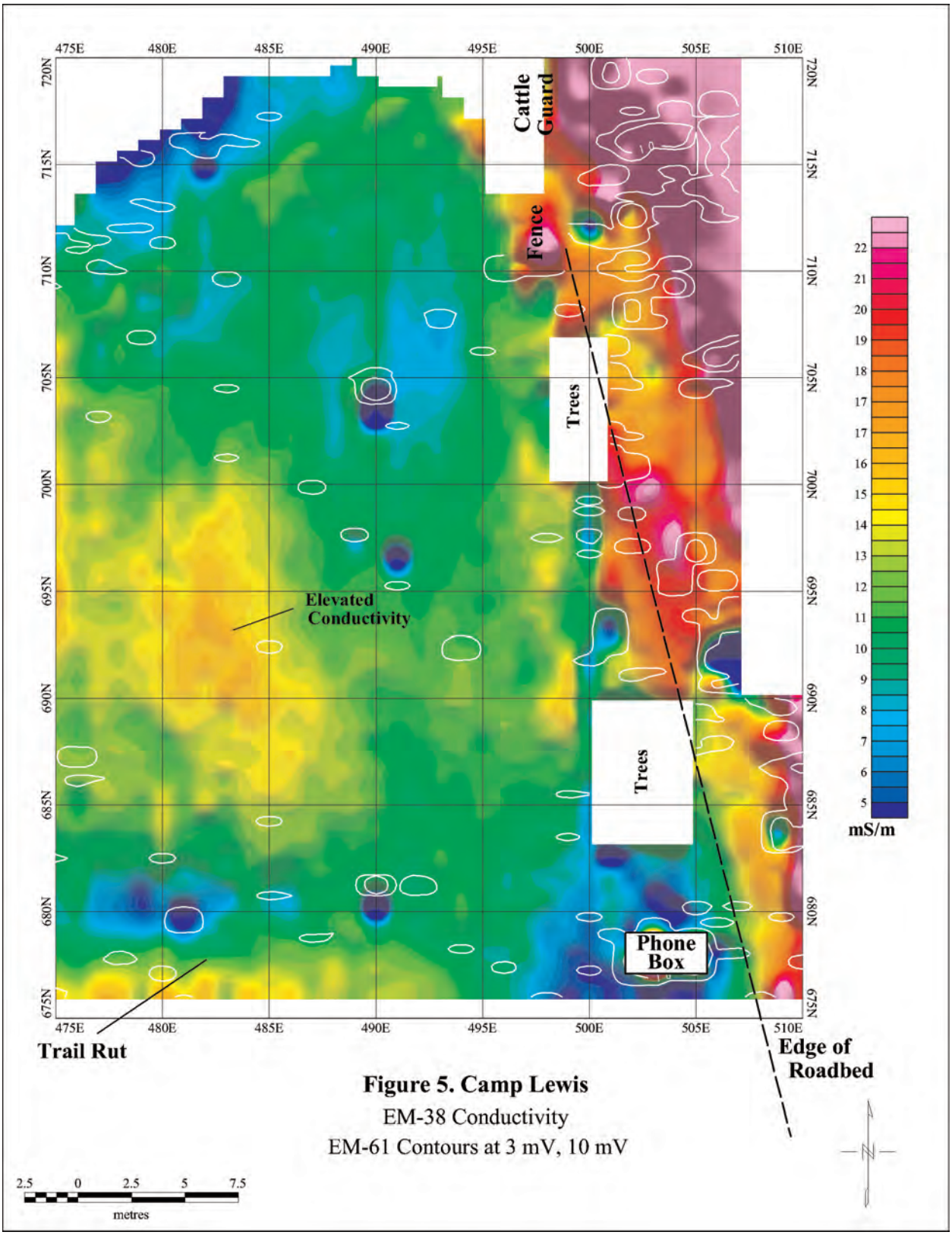

Figure 5. Camp Lewis
EM-38 Conductivity
EM-61 Contours at 3 mV, 10 mV

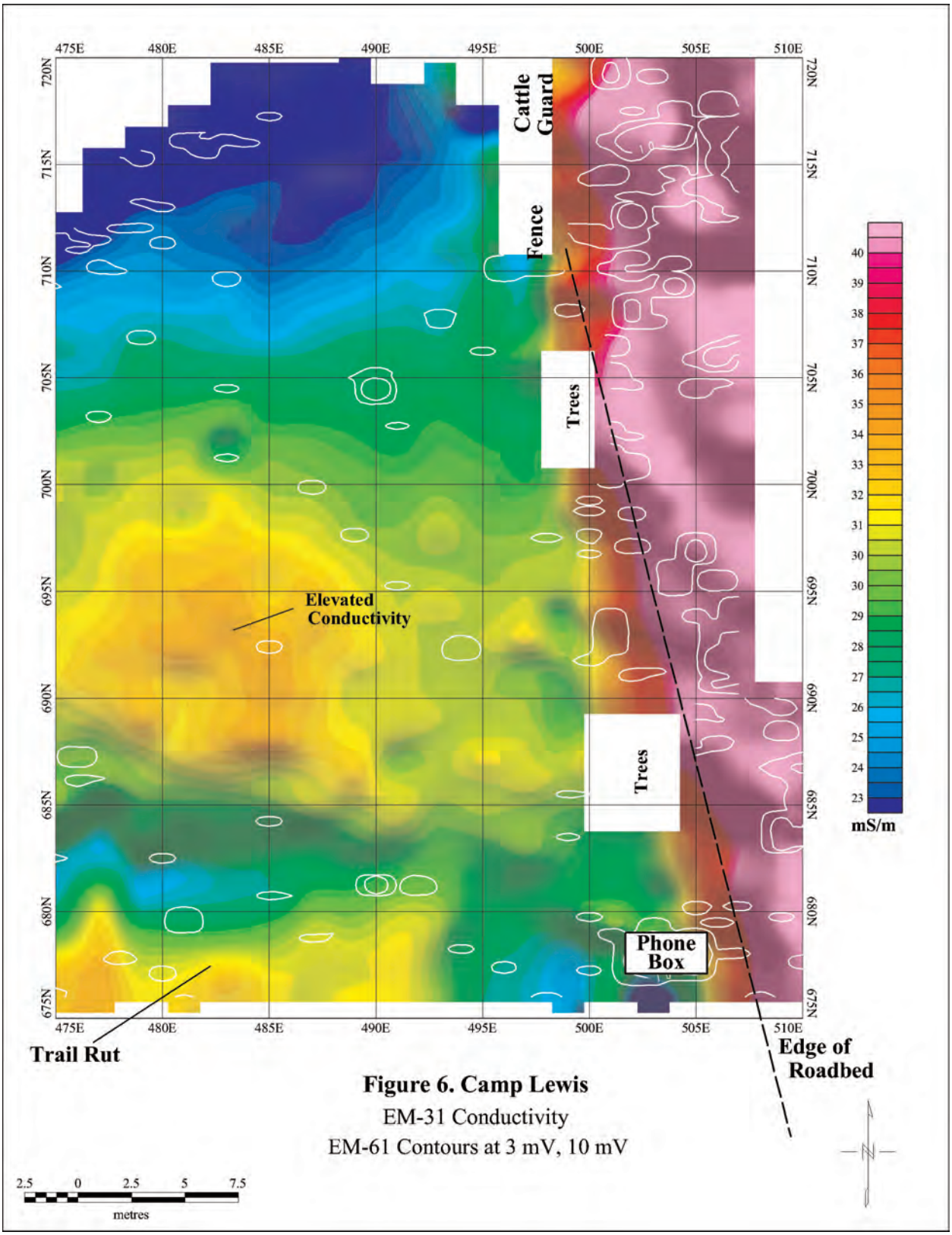

Figure 6. Camp Lewis
EM-31 Conductivity
EM-61 Contours at 3 mV, 10 mV

Phase 2

The initial scope of work for this portion of the investigation was to acquire data along two swaths, one on each side of the highway, with each 12 meters wide and centered on the highway right-of way boundary. This scope proved unfeasible due to heavy vegetation, and would have essentially required clearing all the scrub pine trees along the road. As an alternative, an approximately equal area of land was surveyed where the data acquisition could be accomplished with modest tree trimming and which seemed of potential archaeological interest. The Phase 2 coverage is shown on Figure 1.

The magnetometer results are imaged in Figure 7. The data immediately next to the highway are heavily influenced by relic fencing, signs along the highway, and other surface objects. The magnetic field is somewhat chaotic between 550N and 575N. This portion of the roadbed is on thick fill with there are several road signs on metal pickets.

A concentration of small magnetic anomalies is observed near 635N, 510E. This area contains no obvious source for the magnetic features, which are interpreted to be generated by small iron objects and/or magnetic stones ("hot rocks"). Approximately one-third of the stones and cobbles in the general area display a strong magnetic character.

There are three mild magnetic features of potential interest located in the southern portion of the survey. The easternmost feature at 530N, 545E is coincident with a circular ring of partially buried stones that can be observed on the surface. Two features are located near 520N, 485E, and are marked as "?" on Figure 7. These anomalies are consistent with accumulations of magnetic stones or possibly fire alteration of the magnetic minerals in the soil.

The EM-31 conductivity data are imaged in Figure 8. These data are strongly influenced by the highway roadbed, a fence, and cables buried along the shoulder of the road. It is interesting to note the conductivity pattern along the highway. The southern end of the survey is on high ground where the roadbed is relatively thin. The measured conductivity, except near the fence and buried cables, is elevated 50% over background. In the center of the survey the roadbed is on a section of thick fill. The conductivity is elevated by approximately 200%.

An area of elevated conductivity is observed on the western side of the highway near 640N. This feature is similar to the area of elevated conductivity found in Phase 1, and may be indicative of compacted soil. This area also contains numerous small magnetic features, and may be of historical interest.

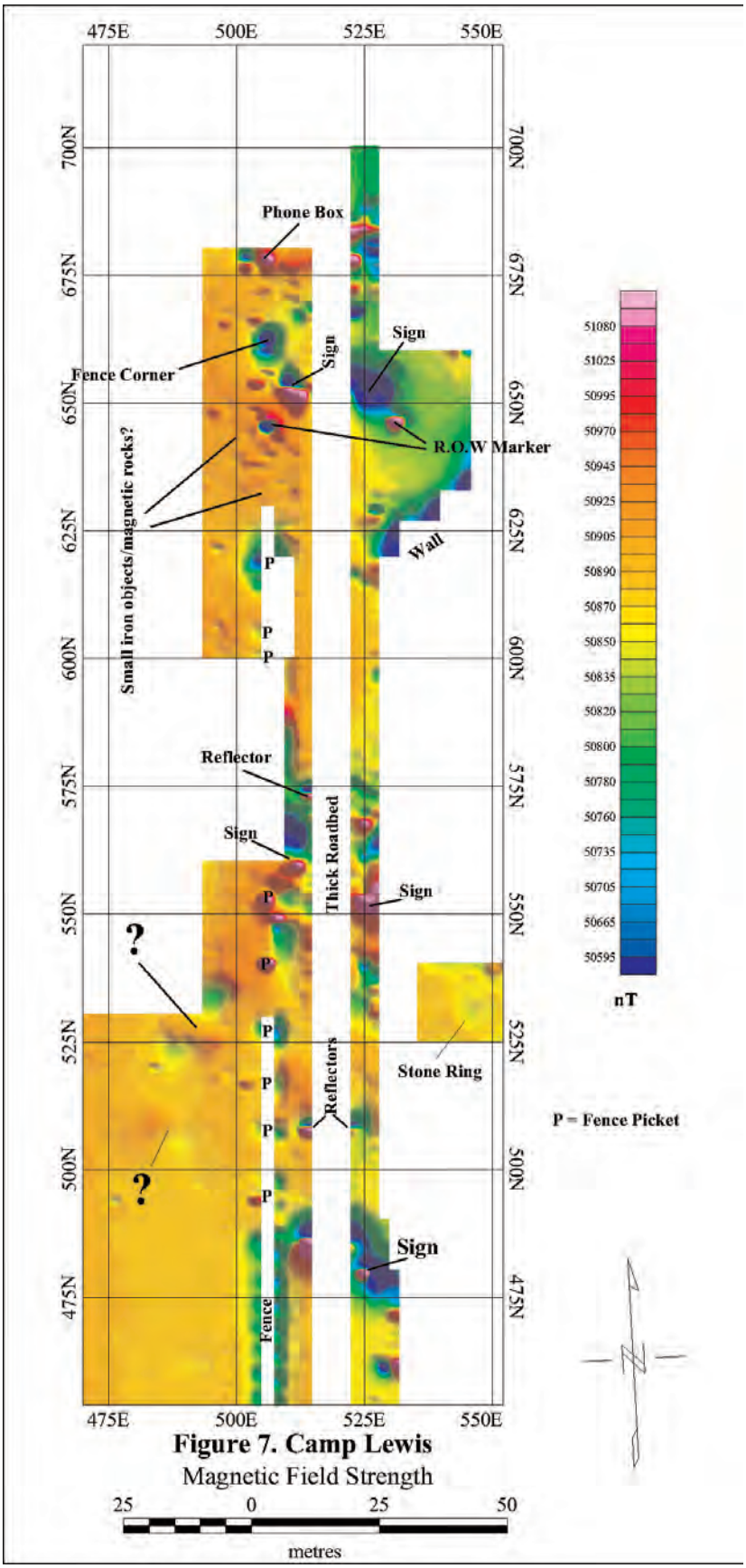

Figure 7. Camp Lewis
Magnetic Field Strength

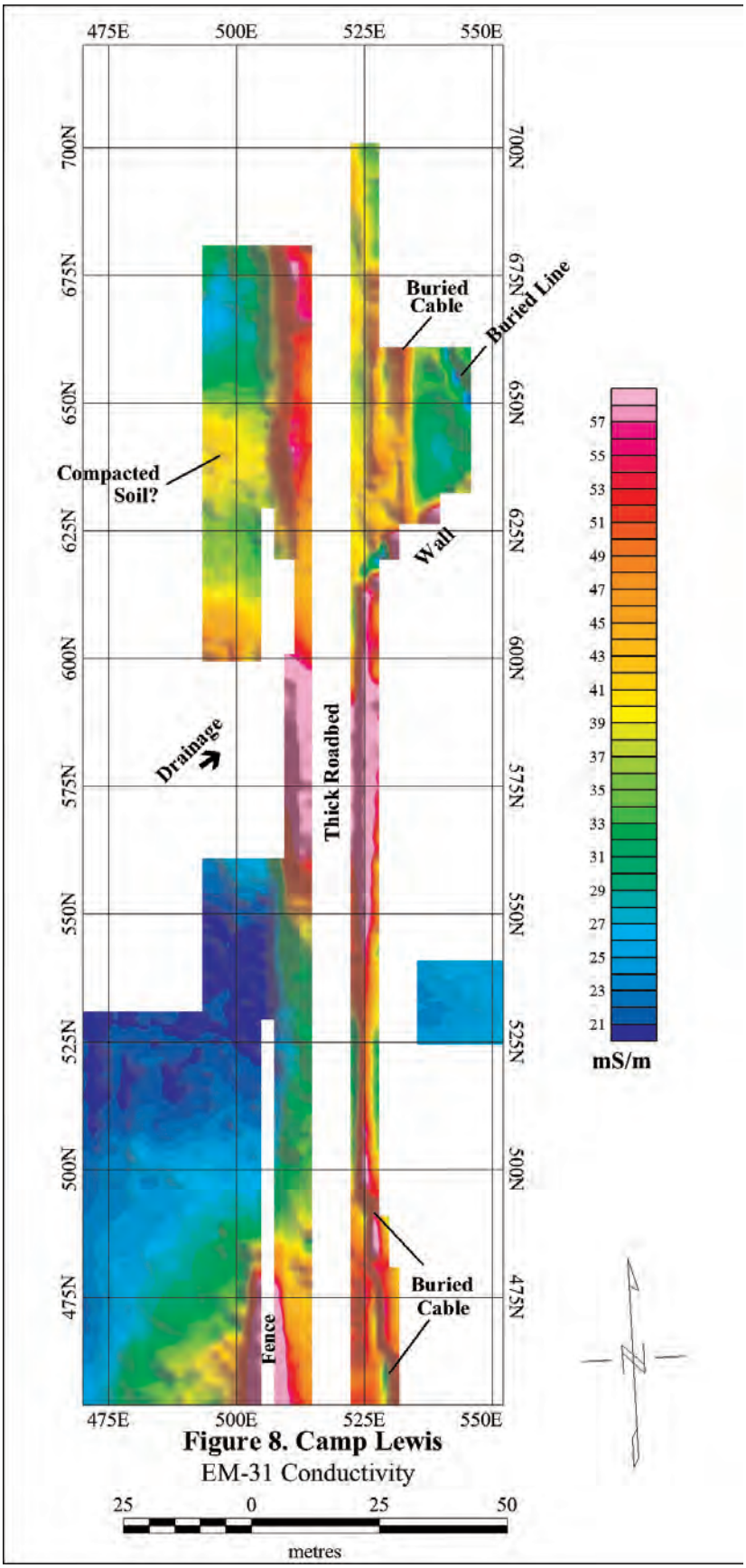

Figure 8. Camp Lewis
EM-31 Conductivity

Summary of Phase 2

The surveys along Highway 63 were strongly affected by the roadbed and surface fixtures, yielding little useful data within approximately 10 meters of the pavement.

The surveys revealed three potential targets for further investigation away from the highway. Both the magnetic and conductivity images contain anomalous features in the vicinity of 640N, 500E. This may indicate past use of this area. Two magnetic features are observed near 520N, 485E. These are suggestive of accumulated stones or fire alteration of the soil.

Conclusions

The geophysical investigation at Camp Lewis has provided insight both for further study of this site and for future application of these methods to similar sites.

Four areas were revealed to have geophysical anomalies that potentially indicate subsurface conditions of interest. Phase 1 identified an area of elevated conductivity immediately north of a trail rut that may have been a corral. A similar feature was identified in Phase 2, in the same area as some mild magnetic anomalies. Two other magnetic anomalies were observed on higher ground to the south.

The Phase 1 metal detection found numerous objects that had been missed by a previous sweep of the area. These objects, together with modern metallic fixtures, dominated the Phase 1 magnetic survey.

The Phase 2 work along the road demonstrated that a well built, medium duty two-lane highway is likely to mask magnetic and conductivity targets to the edge of any engineered fill. Buried lines, road signs, and debris were also shown to be a significant source of noise.