

MUSEUM OF NEW MEXICO

OFFICE OF ARCHAEOLOGICAL STUDIES

ARCHAEOLOGICAL TESTING RESULTS AND DATA RECOVERY PLAN FOR ESTATES IV, LAS CAMPANAS DE SANTA FE, SANTA FE COUNTY, NEW MEXICO

by
Stephen S. Post

Submitted by
Timothy D. Maxwell
Principal Investigator

ARCHAEOLOGY NOTES 126

ADMINISTRATIVE SUMMARY

This report contains the results of archaeological testing of three sites, LA 86147, LA 86149, and LA 86151, and a data recovery plan for two sites, LA 86148 and LA 86150. These sites are located in Estates IV of Las Campanas de Santa Fe in Santa Fe County, New Mexico. Las Campanas de Santa Fe is a 4,400-acre resort development west of Santa Fe, New Mexico. The archaeological work was completed by the Museum of New Mexico, Office of Archaeological Studies, in compliance with Santa Fe County Ordinance 1988-8.

LA 86147 is a multicomponent sherd and lithic artifact scatter. It dates between A.D. 1050 and 1400 during the late Developmental and early Classic periods of the Rio Grande sequence. Archaeological testing of artifact concentrations revealed that the distribution was limited to the modern ground surface. It is recommended that LA 86147 be considered not significant based on criteria found in Santa Fe County Ordinance 1988-8. No further archaeological work should be required.

LA 86149 is a sherd and lithic artifact scatter. Occupation occurred between A.D. 1250 and 1350 during the late Developmental and early Classic periods of the Rio Grande sequence. Archaeological testing of artifact concentrations yielded low frequencies of obsidian and chert biface and core reduction flakes from 10 to 40 cm below the modern ground surface. The subsurface artifact distribution, partly buried by alluvial deposits, indicates a brief occupation related to hunting. No features, charcoal, or temporally diagnostic artifacts were recovered. Although LA 86149 has subsurface deposits, it is maintained that the data potential is limited. Therefore, it is recommended that LA 86149 be considered not significant based on criteria found in Santa Fe County Ordinance 1988-8 and no further archaeological work should be required.

LA 86151 is a spatially extensive, low density sherd and lithic artifact scatter. A Coalition period (A.D. 1175-1325) occupation is indicated by the pottery types. The lithic artifact assemblage included core reduction flakes, cores, and a side scraper, suggesting resource gathering. Archaeological testing in three areas revealed that the distribution was limited to the modern ground surface. It is recommended that LA 86151 be considered not significant according to the criteria found in Santa Fe County Ordinance 1988-8 and no further archaeological work should be required.

Two sites, LA 86148 and LA 86150, are relatively unique to the Las Campanas de Santa Fe project area. A data recovery plan has been developed to study these sites.

LA 86148 is a lithic artifact concentration consisting of Basketmaker II style projectile points, ground stone, and core and biface reduction debris. The artifact diversity and density suggests that LA 86148 may be a hunting and gathering base camp. The data recovery plan focuses on chronological and subsistence data that can be compared with other Basketmaker II sites in the Santa Fe area. These data will add to the understanding of Basketmaker II settlement and subsistence strategies in the upper Middle Rio Grande.

LA 86150 is a spatially extensive sherd and lithic artifact scatter with at least four to six hearths or roasting pits. Pottery types indicate an occupation during the late Coalition period. The

artifact and feature distribution result from at least four occupations. LA 86150 may have been an important staging area for resource gathering and processing. The data recovery plan focuses on site function, structure, and land-use patterns during the Coalition period.

MNM Project 41.547B
Santa Fe County Ordinance 1988-8

CONTENTS

ADMINISTRATIVE SUMMARY	ii
INTRODUCTION	1
CONTEMPORARY ENVIRONMENT	3
ARCHAEOLOGICAL BACKGROUND	5
Regional and Local Prehistory	5
PART I. TESTING RESULTS FROM LA 86147, LA 86149, AND LA 86151	
TESTING RESULTS	19
LA 86147	19
LA 86149	23
LA 86151	27
CONCLUSIONS	32
RECOMMENDATIONS	37
PART II. DATA RECOVERY PLAN FOR LA 86148, A BASKETMAKER II PERIOD SITE, AND LA 86150, A COALITION PERIOD HUNTING AND GATHERING SITE	
INTRODUCTION	39
LA 86148	40
Site Description	40
Research Questions	41
LA 86150	46
Site Description	46
Research Questions	48
FIELD AND LABORATORY METHODS	52
Field Methods	52
Laboratory Methods	55
Research Results	56
REFERENCES CITED	57
APPENDIX 1. Site location data (removed from copies in general distribution)	64
APPENDIX 2. Lithic artifact data for all sites	66
APPENDIX 3. Guidelines for the treatment of human remains	69

Figures

1. Project location map	2
2. LA 86147, site map	20
3. LA 86149, site map	24
4. LA 86151, site map	28
5. LA 86148, site map	41
6. LA 86150, site map	47

Tables

1. All sites by project and period	6
2. Late Archaic and Basketmaker II period sites in the Santa Fe area	8
3. Artifact type by material type, LA 86147	22
4. Artifact type by material type, LA 86149	25
5. Artifact type by material type, LA 86151	29
6. Artifact type by dorsal cortex, LA 86151	30

INTRODUCTION

At the request of Al Lilly, Construction/Engineering Manager, Las Campanas de Santa Fe the Museum of New Mexico, Office of Archaeological Studies (OAS), completed archaeological testing of three sites in May 1993. The three sites, LA 86147, LA 86149, and LA 86151, are in Estates IV of the Las Campanas de Santa Fe resort development in Santa Fe County, New Mexico. These sites were originally identified by Southwest Archaeological Consultants, Inc. (SAC), and were described in Southwest Report 305 (Scheick and Viklund 1992). The OAS study was completed in compliance with Santa Fe County Ordinance 1988-8. Timothy D. Maxwell was the principal investigator and Stephen S. Post was the project director. Field crew included OAS staff members Guadalupe A. Martinez, Susan Moga, Erin Tyler, and Marcy Snow.

The general project area is in Sections 13 and 14, T 17N, R 8E, Santa Fe County, NMPM (Fig. 1). Legal descriptions and UTM coordinates for each site are presented in Appendix 1 (removed from copies in general circulation).

Archaeological testing of LA 86147, LA 86149, and LA 86151 focused on determining if the sites had the potential to yield information important to Santa Fe and upper Middle Rio Grande prehistory. The archaeological testing program was designed to determine the extent and nature of the cultural deposits at the three sites.

This report also contains a data recovery plan for two sites, LA 86148 and LA 86150, which were also identified by SAC and described in Southwest Report 305 (Scheick and Viklund 1992). The data recovery plan offers site and regionally specific research questions, provides an outline of the data recovery methods to be used during field and laboratory phases, and briefly outlines the excavation report format.

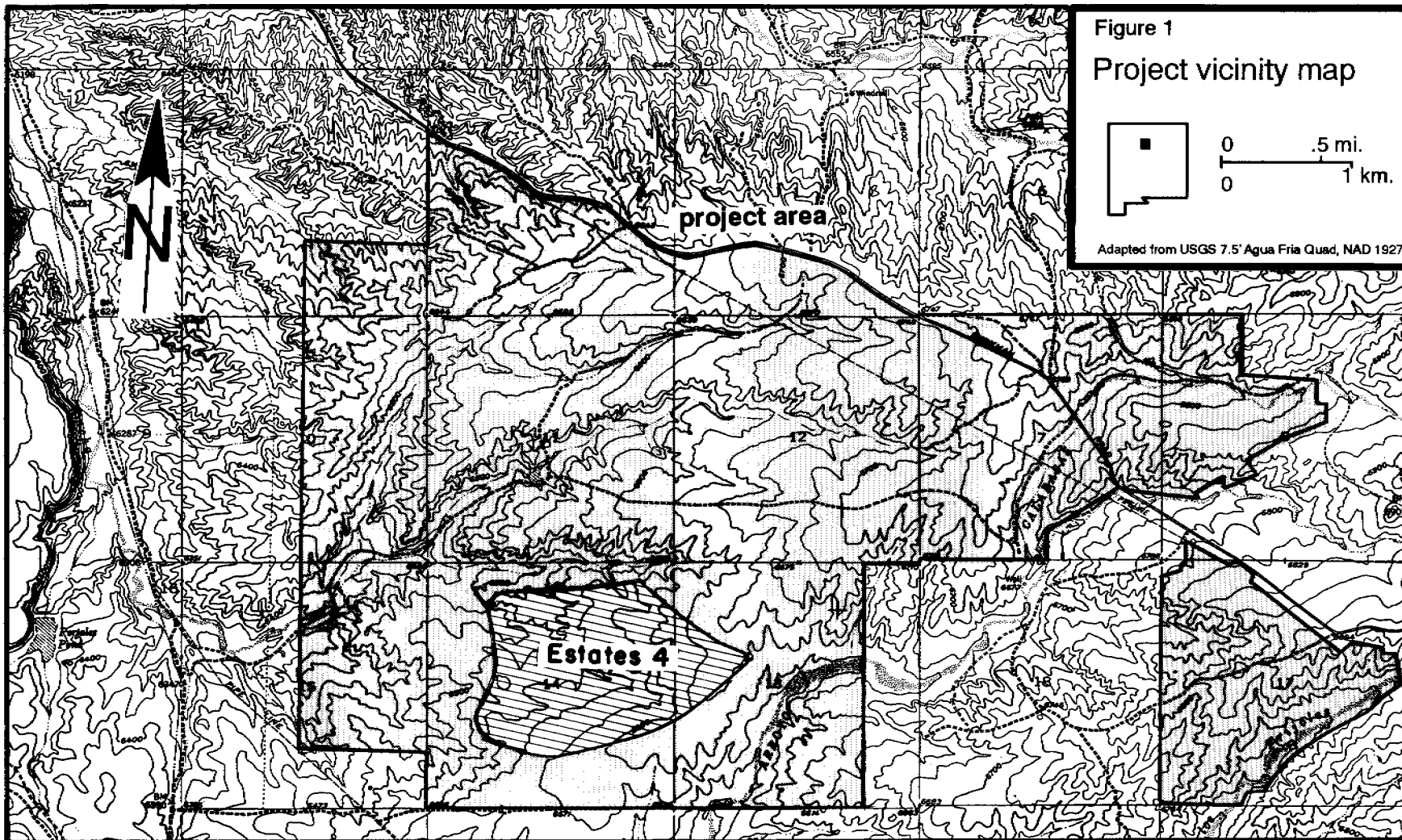
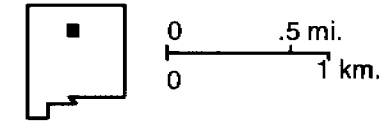


Figure 1
Project vicinity map



Adapted from USGS 7.5' Agua Fria Quad, NAD 1927

CONTEMPORARY ENVIRONMENT

The contemporary environment of the Santa Fe Basin has been thoroughly reviewed in a study by Kelley (1980) as part of the Arroyo Hondo Archaeological Project. The reader is referred to this monograph for the wealth of detail it contains. Maxwell (1988) and Scheick and Viklund (1992) concisely summarize the contemporary environment for the northwest Santa Fe and Las Campanas area.

The project area is within a structural subdivision of the Southern Rocky Mountain physiographic zone (Folks 1975:110). The basin is bounded on the west by the Jemez Mountains and to the east by the Sangre de Cristo Mountains. An alluvial plain, dissected by many arroyos, stretches westward from the foothills at the base of the Sangre de Cristos. Elevation in the project area ranges from 1,910 m to 2,252 m.

Local topography alternates among nearly level plains, rolling terraces, and steep, rocky slopes. The major drainage is the Santa Fe River, however the Arroyo Calabasas drains much of the eastern half of the Las Campanas area. The western half of the Las Campanas area drains into a series of medium-sized tributaries of Cañada Ancha. Smaller tributary arroyos have cut deeply into the alluvial plain, forming steeply sided valleys. The Rio Grande is 4 km to the east of the project area with its narrow, steeply walled channel, typified by White Rock Canyon.

Alluvial materials of ancient and modern gravel are found in all the arroyos and in slope wash and terrace deposits. Tertiary volcanic deposits, Cenozoic sediments, and Precambrian rock are exposed in surrounding areas and, combined with local alluvium, provide most of the materials needed for prehistoric lithic artifact production. In particular, cherts are available in the Ancha formation (Kelley 1980:11-12), and sandstone, siltstone, andesite, basalt, and silicified wood occur in nearby formations (Hannaford 1986:4). Small amounts of obsidian are found scattered along the basalt-capped mesas to the west (Kelley 1980:12). The primary obsidian source for the study area was probably the Jemez Mountains.

The flora and fauna in the project area are typical of Upper Sonoran grasslands. The piñon-juniper community thins as it descends from the Sangre de Cristo foothills. The piñon-woodland grades into shortgrass plains with scattered juniper about midway between the foothills and the Santa Fe River (Kelley 1980:61-62). The open, grass-covered valleys contain grama grass, muhly, Indian ricegrass, galleta grass, soapweed yucca, one-seed juniper, Colorado piñon, occasional Gambel's oak, and small stands of mountain mahogany. The arroyo bottoms contain various shrubs such as fourwing saltbush, Apache plume, rabbitbrush, big sagebrush, and wolfberry. Regional fauna include desert cottontail, black-tailed jackrabbit, and Gunnison's prairie dog. A complete list of flora and fauna found in the area is in Kelley (1980).

The area has a semiarid climate. Most of the local precipitation occurs as intense summer thunderstorms that produce severe runoff and reduce usable moisture. The area receives an average of 229 to 254 mm of precipitation per year and a mean snowfall of 356 mm (Kelley 1980:112). The growing season ranges from 130 to 220 days and averages 170 days. The last spring frost usually occurs in the first week of May and the first fall frost occurs around the middle of October. The mean yearly temperature is 10.5 degrees C.

The five sites included in this report are located on gentle southwest-facing slopes of an extensive table land that divides Arroyo Calabasas and Cañada Ancha. These gentle slopes have sandy-loamy gravelly top soils that are highly erodible. The site soils range from well stabilized by grama grass to barren, sandy soils that are recently eroded and cut by erosion channels. The vegetation is typical of piñon-juniper woodland or scrubland.

ARCHAEOLOGICAL BACKGROUND

Regional and Local Prehistory

This section will provide archaeological background for the five sites discussed in this report. Collectively, the site occupations may span from 800 B.C. to A.D. 1420. This period includes the Basketmaker II, Developmental, Coalition, and early Classic periods of the Rio Grande sequence as outlined by Wendorf and Reed (1955). The summaries are derived from regional syntheses of the upper Middle Rio Grande Valley culture history (Cordell 1979; Stuart and Gauthier 1981; Biella and Chapman 1977; Lang and Scheick 1989; McNutt 1969; Stubbs and Stallings 1953) and recent survey and excavation reports from the Las Campanas area (Viklund 1990; Scheick and Viklund 1991, 1992; Scheick 1991a, 1991b, 1992; Lang and Scheick 1991; Post 1992). For cultural-historical data not presented in this section the reader is referred to the above regional syntheses. Site frequency by period for the Las Campanas project is presented in Table 1.

Late Archaic-Basketmaker II Period (800 B.C. to A.D. 600)

Introduction. In the northern Southwest the Archaic period (5500 B.C. to A.D. 400 or 600) is generally described in terms of two major material culture traditions: the Oshara tradition (Irwin-Williams 1973) and Cochise tradition (Sayles 1983). These traditions are characterized by a hunting and gathering adaptation based on seasonal availability of critical resources, such as edible plants, game animals, and water. These traditions are divided into phases or stages based on temporal changes in material culture, site structure, and settlement patterns. The Oshara and Cochise phases are most commonly recognized by temporally diagnostic projectile point styles.

In the upper Middle Rio Grande, sites with projectile points that are similar to Oshara and Cochise materials have been identified. Early and middle Archaic period materials are similar to the Jay, Bajada, and San Jose phases of the Oshara tradition. The late Archaic-Basketmaker II period materials are similar to Armijo and En Medio phase of the Oshara tradition and Chiricahua and San Pedro stages of the Cochise tradition. The early, middle, and Armijo phase of the late Archaic period are not represented in the Las Campanas site assemblage and will not be discussed. For more information on these periods, the reader is referred to the regional syntheses cited earlier. Late Archaic-Basketmaker II sites (800 B.C. to A.D. 400 or 600) have been identified in the Las Campanas and surrounding Santa Fe and southeast Pajarito Plateau areas. This discussion will focus on this period.

During the 800 B.C. to A.D. 400/600 period, changes in settlement and subsistence patterns are evident. These changes were initiated during the Armijo phase (1800 to 800 B.C.) and had far-reaching consequences. Evidence of the important changes in settlement patterns and subsistence strategies are recognized in material culture and subsistence data, site structure, and site distributions. One of the most important changes was the transition from a highly mobile hunting and gathering adaptation to a more sedentary lifestyle. This transition is represented by the use of pit structures, storage pits, the adoption of cultivated plants, and an increase in population. To date, how and when these changes occurred in the upper Middle Rio Grande Valley is poorly understood because of the small number of excavated sites with reliable absolute

Table 1. All Sites by Project and Period

Area	Archaic Period	Developmental Period		Coalition Period		Classic Period		Historic				Unknown	Total Sites
		Early-Middle	Late	Early	Late	Early	Late	Proto-historic Period	Spanish Colonial Period	Territorial Period	Statehood to present		
E. Golf											1	3	4
W. Golf	4			9		4	1	1		1	7	26	53
Estate I					3			1	1	1	1	23	30
Estate II		3		4	1	6				2	2	92	110
Estate III	1		1	4				2				28	36
OAS Survey		1		5		2			1			8	17
Total	5	4	1	22	4	12	1	4	2	4	11	180	255

dates. Presently, most explanations and interpretations rely heavily on the data from the middle Rio Puerco Valley (Irwin-Williams 1973; Biella 1992).

The Data Base. In the Santa Fe area, the most abundant pre-Pueblo period sites are from the late Archaic and Basketmaker II-III period. Recent projects have identified late Archaic-Basketmaker II components southeast (Viklund 1989; Lang 1992), southwest (Hannaford 1986; Lent 1988), and east (Lang 1989) of Santa Fe. The greatest number of late Archaic-Basketmaker II period components was recorded and sample-excavated at Cochiti Reservoir (Chapman 1979). A search of the area comprised by the eight USGS 7.5' quadrangle maps that include and surround the Las Campanas area yielded 31 sites or components from the late Archaic and Basketmaker II-III periods (Table 2).

The sites mostly are dated with diagnostic projectile point styles. They are all open-air sites consisting of lithic artifact scatters with or without hearth complexes or fire-cracked rock concentrations. Site clusters in the Airport Road area, southwest of Santa Fe, along the Cañada de los Alamos to the south of Santa Fe and along the Santa Fe River, suggest that certain low-land locations were repeatedly occupied for short periods by small groups over a long period of time. Basketmaker II sites are reported in all environmental zones from the Santa Fe River Valley to the foothills of the Sangre de Cristo Mountains. This distribution suggests that late Archaic-Basketmaker II populations exploited resources available in all environmental zones. Because the Santa Fe River Basin and the surrounding montane and piedmont environments offer considerable resource diversity, it is possible that late Archaic-Basketmaker II groups occupied the area year-round. A vertical mobility pattern was suggested by Chapman (1980) based on the Cochiti Dam and Reservoir data. This areally less extensive settlement pattern is in direct contrast to large-area mobility patterns suggested for San Juan Basin late Archaic-Basketmaker II populations (Elyea and Hogan 1983; Vierra 1990; Fuller 1989).

In general, the artifact counts for all sites tend to be low. Only 13 sites were reported with more than 100 surface artifacts. The artifact assemblages reflect plant processing, hunting and meat processing, raw material procurement and core reduction, and tool production and maintenance. Few sites have been found that focus on a specific activity though only 11 sites have been reported with ground stone, suggesting that plant processing sites may be less widespread. Most of the assemblages reflect generalized hunting and gathering activities. Habitations only have been found at two sites, LA 84758 in the Las Campanas area and LA 54752, near Airport Road in Santa Fe. Extensive storage facilities have not been reported. Habitations imply longer occupations that may have lasted from late fall to early spring. Future excavation of late Archaic-Basketmaker II sites should focus on locating the ephemeral structural remains.

Most of the sites from the Santa Fe area could be classified as limited or temporary base camps and limited activity sites. These site types generally have a low frequency or no processing facilities and equipment, an artifact scatter of low density, or small artifact clusters and very few unbroken tools. The artifacts occur in low frequencies, which suggest a brief occupation. Facilities and equipment are associated with longer occupations (Binford 1983a; Vierra 1980; Elyea and Hogan 1983). Unbroken tools should have been discarded at residential sites instead of limited activity sites because they were personal gear, which may have been highly curated (Binford 1983b; Kelly 1988). Reuse of a limited base camp or activity area may result in overlapping or refurbishment of features and a higher artifact density (Camilli 1989). Reoccupation may result in a more scattered feature and artifact distribution.

Table 2. Late Archaic-Basketmaker II Period Sites in the Santa Fe Area

LA no.	Quad	Date range	# of components	Setting	Size (m)	Site type	Artifact count	Groundstone			Other tools				How dated?
								MA	MT	GF	B	S	H	O	
81382	Agua Fria	1500-500 B.C.	1	Hill slope	15 x 8	Dispersed artifact scatter	17				2				D
84772	Agua Fria	100 B.C.- A.D. 500	1	Ridge top, hill slope	120 x 85	Dispersed artifact scatter	10s				1				D
84775	Agua Fria	1500 B.C.- A.D. 300	1	Hill slope	63 x 25	Dispersed artifact scatter	18				1				D
84787	Agua Fria	100 B.C.- A.D. 400	1	Ridge top, hill slope	40 x 40	Concentrated lithic scatter	10s				1				D
86148	Agua Fria	1000 B.C.- A.D. 400	1	Ridge top, hill slope	55 x 80	Concentrated lithic scatter	10s	1			4				D
75683	Seton Village	1000 B.C.- A.D. 400	1	Hill slope	18 x 25	Lithic scatter	15				1				D
75686	Seton Village	A.D. 400-1540	1	Hill slope	270 x 165	Dense sherd & lithic scatter	100s								D
75687	Seton Village	1000 B.C.- A.D. 400	1	Hill slope	42 x 45	Concentrated lithic scatter	10s				1				D
88335	Seton Village	Late Archaic	1	Bench, arroyo edge	50 x 20	Lithic scatter, processing center	low 100s				1	1			D

LA no.	Quad	Date range	# of components	Setting	Size (m)	Site type	Artifact count	Groundstone			Other tools				How dated?
								MA	MT	GF	B	S	H	O	
54755	Turquoise Trail	800 B.C.- A.D. 400	1	Arroyo, wash	100 x 75	Lithic scatter, special purpose site	10s				1				D
54761	Turquoise Trail	800 B.C.- A.D. 400	1	Arroyo, terrace	120 x 55	Lithic scatter, special activity site	100s				1				D
65206	Santa Fe	800 B.C.- A.D. 600	1	Hill slope		Lithic procurement/ processing site	1000s				1	11	101		D
76546	Santa Fe	1000-100 B.C.	1	Ridge top	136 x 32	Special activity/ processing center	100s	1			*	*	*		D
84744	Santa Fe	Basket-maker style point	1	Ridge top	37 x 29	Special activity/ processing center		2			1				D
21547	Montoso Peak	BM II	1	Hill slope	100 x 100	Lithic artifact scatter	500+				*				D
75136	Montoso Peak	BM II	1	Low rise		Lithic artifact scatter					1				D
79652	Montoso Peak	1800-800 B.C.; 100 B.C.- A.D. 400	2	Hill slope	60 x 50	Lithic procurement	100s	1	1	1	1			1	D
											2			2	D

LA no.	Quad	Date range	# of components	Setting	Size (m)	Site type	Artifact count	Groundstone			Other tools				How dated?
								MA	MT	GF	B	S	H	O	
79657	Montoso Peak	1 B.C.- A.D. 550 or A.D. 500- 1230	1	Hill slope	24 x 29	Lithic/ sherd scatter w/possible work station	10s	1			1	1	1	D	
44835	Agua Fria	Archaic-BM II	1	Flat plain	30 x 25 dis- persed area/ 50 x 20 core area	Lithic scatter	low 100s	1			2	1		D	
44836	Agua Fria	Archaic-BM II	1	Flat plain	45 x 30 dis- persed area/ 120 x 120 core area	Lithic scatter/ seasonal camp(?)	low 100s	1	1		3			D	
54752	Agua Fria	Archaic/En Medio/ Trujillo	1	Arroyo/ wash	95 x 66	Lithic scatter/ hunting camp(?)	100s		1		6			D	
80723	Agua Fria	500 B.C.- A.D. 400	1	Arroyo, wash, flood plain	640 x 396	Artifact scatter	10s				1			D	
29791	White Rock	BM II	1	Arroyo, wash	25N 32E 35S 55W	Lithic scatter			1		1			D	
29797	White Rock	BM II	1		15N 35E 25S 0W	Sherd & lithic scatter					1			D	
64629	White Rock	BM II	1	Plain	25 x 15	Lithic scatter					1			D	

LA no.	Quad	Date range	# of components	Setting	Size (m)	Site type	Artifact count	Groundstone			Other tools				How dated?
								MA	MT	GF	B	S	H	O	
65022	White Rock	BM II	1	Mesa	45 x 30	Sherd & lithic scatter/ probable short-term camp	40-50	1			1				D
82572	White Rock	Archaic	1	Mesa	100 x 30	Dispersed lithic scatter	40-50				1				D
82613	White Rock	Late Archaic	1		245 x 150	Concentrated lithic scatter	100s				1				D
75680	Seton Village	1458 B.C. 400-700 B.C.	2	Ridge	100 x 27/42	Lithic scatter					1				O D
75681	Seton Village	A.D.310-508 A.D.379-573 1800-800 B.C.	3	Knoll		Lithic scatter					1				O O D
75687	Seton Village	1000 B.C.- A.D. 400	Five 1	Hill slope	28 x 14	Repetitive use/special activity site	350				1	2	6		D
"	"		2		30 x 26		14				1				D
"	"		3		114 x 41		203				9	5	4		D
"	"		4		36 x 20		37				2				D
"	"	1500 B.C.- A.D. 300	5		27 x 17		62	1	1		2		4		D

Key to abbreviations: Ground stone: MA - mano; MT - metate; GF - ground stone fragment; Other tools: B - biface; S - scraper; H - hammerstone; O - other tools; How dated: D - temporally diagnostic artifacts; O - obsidian hydration; LA and Quad: " - Same site LA and Quad with multiple discrete components.

A small number of late Archaic-Basketmaker II period sites may be residential base camps. These sites may have domestic features for habitation, storage, production, and consumption. The artifacts occur in high density clusters and tend to be more diverse, reflecting the greater number of site activities. If reused or reoccupied, these sites can be very difficult to interpret unless the deposits are spatially distinct. Recorded sites that may be residential sites include LA 88335 (Seton Village 7.5' Quad), LA 21547 and LA 79657 (Montoso Peak 7.5' Quad), and LA 44835 and LA 88436 (Agua Fria 7.5' Quad). These sites have lithic artifact concentrations with diagnostic projectile points, ground stone, and a small assemblage of formal tools. Without confirmation by excavation, this interpretation remains uncertain. If they are residential sites, late Archaic-Basketmaker II use of the Santa Fe River Valley and surrounding environs may have been more intensive than previously believed.

Three sites have been excavated in the Santa Fe area that have yielded numerous processing facilities, probable structures, and a diverse artifact assemblage. These sites combine with the survey data to indicate that the Santa Fe area was well-used during the late Archaic-Basketmaker II period.

The excavation of LA 61282, a late Archaic period site located along Airport Road in Santa Fe, yielded 14 pit features and the remains of a possible shallow pit structure. The site distribution has pockets of high artifact density. Suggested activities include food and resource processing, production, and food consumption. These factors indicate that the site may have been a residential or limited base camp. The accumulation and superimposition of features indicate that this base camp may have been reused, resulting in the higher artifact density.

Another site in the same area, within the Tierra Contenta development, has yielded deeply buried structural remains and high artifact diversity and density. These factors indicate that the site was a residential base camp. The diagnostic artifacts date to the late Archaic period (Schmader n.d.).

While recognizing that this might have been a simplistic classification, Chapman (1979:68) classified all sites with fire-cracked rock concentrations in the Cochiti Reservoir area as residences. The Cochiti Reservoir sites lacked diverse tool assemblages and low frequencies of formal tools, which would bring into question their classification as residential sites. Direct evidence of food processing and consumption was rare from Cochiti sites. Inferences were drawn from the presence of hearths, fire-cracked rock, and grinding implements.

Las Campanas Sites. The late Archaic period sites include spatially extensive scatters of chipped stone debris. Core reduction and tool manufacture debris are present. Recent excavations at LA 87458 by OAS yielded a pit structure and 10 hearths or roasting pits resulting from a Basketmaker II occupation or an earlier but unconfirmed late Archaic occupation. The artifact assemblage included core reduction and tool production debris, numerous one-hand manos, shallow basin metates, three projectile points, and probably utilized flakes and biface fragments.

LA 86148, a possible residential base camp, is part of the data recovery effort. The artifact assemblage, ground stone and discarded tools, may indicate a late Archaic-Basketmaker II base-camp occupation. Surrounding late Archaic-Basketmaker II period sites have less artifact diversity and frequency. These may be limited base camps or repeatedly used resource extraction

loci. One of the smaller sites has a lithic assemblage dominated by core reduction flakes. This suggests that the late Archaic period residents were actively using the local lithic materials. The small number of late Archaic-Basketmaker II period sites with limited accumulations of debris suggests part-time use of the area with longer occupations represented by LA 87458 and LA 86148.

Pueblo Period

Developmental Period (A.D. 600-1200). The Developmental period (Wendorf and Reed 1955) is divided into early (A.D. 600 to 900), middle (A.D. 900-1000), and late (A.D. 1000 to 1200) subperiods. This temporal framework roughly corresponds to the Pecos Classification system developed by Kidder (1924).

Early Developmental period sites are uncommon in the Northern Rio Grande (Wendorf and Reed 1955:138). Archaeological survey at Cochiti Reservoir found only 12 sites that could be assigned to this period (Biella and Chapman 1977:203). McNutt (1969:70) located no early Developmental period components north of La Bajada and White Rock Canyon. In the eastern Galisteo Basin only five components may date to this period (Lang 1977; Scheick and Viklund 1989). The lack of evidence for sedentism suggests that there was a long-term pattern of hunting and gathering in the Northern Rio Grande. This continued focus on hunting and gathering may be in part attributed to the rich resource diversity of the Northern Rio Grande Valley, forestalling an early reliance on small-scale farming (Cordell 1979:2).

During the middle Developmental period (A.D. 900 to 1000), site frequency increased in the Northern Rio Grande area. Excavations in the Santa Fe and Tesuque river valleys revealed pithouses associated with contiguous surface rooms, and perhaps a kiva (Honea 1971; McNutt 1969:58). The pottery was mineral painted in the Red Mesa style and neckbanded utility wares occurred. The appearance of these sites does not necessarily suggest that population increased. Instead, the settlement and subsistence pattern had shifted from one of mobility, which left ephemeral archaeological remains, to a more sedentary lifestyle, which left more structural remains and artifact accumulations. The general pattern was still one of low population density.

During the late Developmental period (A.D. 1000 to 1200), the first population increase occurred in the Santa Fe area, as inferred from increased site numbers and size (Wendorf and Reed 1955:140-41). Larger village size suggests year-round residential occupation. The predominant pottery was Kwahe'e Black-on-white, originally identified by Mera (1935) as a local Rio Grande variant of Chaco-style pottery. Occurrence of this pottery style coincided with the growth of the Chaco system in the San Juan Basin in northwestern New Mexico. Site size in the Northern Rio Grande area ranges from 1 to 100 rooms. Known sites in the project area include LA 114 (Arroyo Negro), LA 15969 (Wiseman 1978), and a minor component at Pindi Pueblo (LA 1) (Stubbs and Stallings 1953). The Pindi Pueblo component shows that some large Coalition period sites had their origins in this period (Stubbs and Stallings 1953:14-15).

Arroyo Negro (LA 114) was originally recorded by Mera in the 1920s. It has seven small (less than 10 rooms) to medium (11-25) room blocks constructed of adobe with cobble foundations (Peckham 1974, ARMS file). In 1934, W. S. Stallings collected 95 tree-ring samples from pothunted rooms and four kivas (Smiley et al. 1953:27-29). The tree-ring dates indicate an

occupation span between A.D. 1050 and 1150, with less reliable A.D. 950 to 1000 dates for Kiva C. Two construction episodes occurred between the A.D. 1050s and A.D. 1130 to 1145 (Smiley et al. 1953:29). Identified pottery types at LA 114 included Kwahe'e Black-on-white, Santa Fe Black-on-white, Socorro Black-on-white, and Wingate Black-on-red.

LA 15969 was identified by Wiseman (1978:8) on top of the gravel terrace overlooking the north prehistoric floodplain of the Santa Fe River. The site included a U-shaped 14-room structure with a kiva. It is estimated to have been occupied between A.D. 1100 and 1150, making it contemporaneous with the later occupation of LA 114.

The late Developmental component at Pindi Pueblo (LA 1) had two jacal structural remnants, a pithouse, and sparse refuse (Stubbs and Stallings 1953:9). The refuse was in the central portion of the site on a knoll. Identified pottery types included Red Mesa Black-on-white, Kwahe'e Black-on-white, and Puerco and Wingate Black-on-red (Stubbs and Stallings 1953:14). Stubbs and Stallings observed that the pre-Pindi material was very sparse and the deposit ranged from 2 to 50 cm deep (1953:15). These deposits were underneath the later Coalition period occupation.

The Las Campanas Sites. Only five sites with Developmental period components were recorded in Estates II and III. One site, LA 86147, is a dispersed artifact scatter that covers over 3,600 sq m. This site is similar to the late Archaic period sites, except that it has Kwahe'e Black-on-white and utility wares. It also had an unmodified piece of turquoise, an object not usually associated with a hunting and gathering camp site. LA 86147 is further described in this report. The other three Developmental period sites each have part of a single vessel and less than 20 core flakes of local material. These three sites are in the Estates II area, a dense complex of limited activity sites. Single episodes of core reduction and material testing occurred at most of the Estates II sites. This suggests that lithic flakes were produced as needed during resource extraction. Isolated Kwahe'e Black-on-white sherds occur in the project areas as between 1 and 16 percent of the isolated sherd assemblage. These percentages reflect the limited evidence of Developmental period use in the Las Campanas archaeological record.

Coalition Period (A.D. 1200-1325). The Coalition period is marked by three major changes in the archaeological record in the Northern Rio Grande: (1) a significant increase in the size and numbers of sites, suggesting an increase in population and an extension of the early village level organization noted in the late Developmental period; (2) pithouses as domiciles were replaced by contiguous arrangements of adobe and masonry surface rooms; and (3) a change in pottery-making technology from mineral paint to organic-based painted pottery. These changes were sufficiently important to warrant a new period in the Northern Rio Grande cultural sequence that was divided into two phases: Pindi (A.D. 1220-1300) and Galisteo (A.D. 1300-1325) (Wendorf and Reed 1955). The decorated pottery was divided into Santa Fe Black-on-white and all its local variants (Stubbs and Stallings 1953) for the Pindi phase and Galisteo Black-on-white (Mera 1935) for the later phase. Most of the large sites were established during the Pindi phase. The largest sites continued to grow into the Galisteo phase, anticipating the large villages of the Classic period. Site sizes ranged from 2 to 200 rooms; 15 to 30 rooms was the most frequent size (Stuart and Gauthier 1981:51). Site frequencies in all areas of the Northern Rio Grande increased enormously at this time (Biella and Chapman 1977:203; Orcutt 1991; McNutt 1969; Lang 1977).

In the Santa Fe River Valley large villages on the prehistoric floodplain near the river channel were established during the early Coalition period. The only reported excavations are at Pindi Pueblo (LA 1) (Stubbs and Stallings 1953) and the Agua Fria Schoolhouse site (LA 2) (Lang and Scheick 1989). LA 1, LA 2, LA 109, LA 117, LA 118, and LA 119 have Santa Fe and Galisteo Black-on-white, and at least a small amount of glaze-paint pottery, suggesting that all six sites are roughly contemporaneous. These villages formed a large continuous community that was 3.2 km (2 mi) long. Sites in the Santa Fe River Valley recorded by Carter and Reiter (1933), but not by Mera, include CR (Carter-Reiter) 178, 180, 182, 183, and 185. These sites may have Coalition and early Classic period components, since LA 1 (Pindi Pueblo) and LA 2 (Agua Fria Schoolhouse) were recorded by Carter and Reiter as historic sites.

Site data for the late Coalition period show a thriving community along the Santa Fe River. Farming along the Santa Fe River, the presence of fresh water springs, and the access to diverse environments for subsistence items and raw material all contributed to successful settlement. So successful was settlement that while the communities of the Four Corners area of the American Southwest were declining, the Santa Fe River community was growing.

The Las Campanas Sites. By numbers of sites and isolated artifacts, the Coalition period is best represented in the Las Campanas area. The tabulation in Table 1 includes sites that have ceramic assemblages of Santa Fe, Galisteo, or Wiyo Black-on-white in the Coalition period. Twenty-one sites date between A.D. 1200 and 1325. Furthermore, about 40 percent of the isolated sherds from all periods date to the Coalition period. This fact would imply that the project area was most intensively used during the Coalition period. The greatest number of Coalition period sites are in the Estates III/West Golf Course area. These are early or middle Coalition period sites, as defined by the presence of Santa Fe Black-on-white, Galisteo Black-on-white, and Wiyo Black-on-white. Generally, the Coalition period sites range from 300 to 2,800 sq m in area with two sites extending over more than 10,000 sq m. The lithic artifacts are mostly core reduction flakes with ground stone and bifaces only occasionally present. Some of these sites, especially from Estates III/West Golf Course, are multicomponent and have later occupations. The low frequency of bifacial tools and ground stone at these sites suggests they were resource extraction loci with processing or consumption occurring at the residence. Hunting may have been staged from these sites but there is very little evidence of tool production or maintenance on these sites. Basically, the Coalition period sites look very similar to the earlier Developmental period sites, except that they are more numerous.

Classic Period (A.D. 1325-1600). Wendorf and Reed (1955) mark the beginning of this period (A.D. 1325-1600) by the appearance of Glaze A and locally manufactured red slipped pottery (see also Mera 1935; Warren 1979). Characterized by Wendorf and Reed as a "time of general cultural florescence," regional populations reached their maximum size and large communities with multiple plaza and room block complexes were established. Although the reasons for the appearance and proliferation of the glaze wares are debatable, many researchers, including Eggan (1950), Hewett (1953), Mera (1935, 1940), Reed (1949), Stubbs and Stallings (1953), and Wendorf and Reed (1955), believe that the similarity of the new pottery to White Mountain Redware is evidence for large-scale immigration into the area from the San Juan Basin and Zuni region. Steen (1977) argues, however, that the changes seen during this period resulted from rapid indigenous population growth. Steen believes that the population growth was enabled by favorable climatic conditions that allowed Rio Grande populations to practice dry farming in previously unusable areas. Steen also suggests that there was "free and open" trade between the

Northern Rio Grande region and other areas, accounting for the observed changes in Classic period material culture.

It is therefore unclear how much of the population increase during this period resulted from immigration or from intrinsic growth. Besides populations migrating from the west, it has also been suggested that some population growth was due to the arrival of people from the Jornada branch of the Mogollon to the south, and perhaps from northern Mexico (Schaafsma and Schaafsma 1974).

Large villages of this period found in the Santa Fe vicinity include the Agua Fria Schoolhouse site (LA 2), Arroyo Hondo (LA 12), Cieneguilla (LA 16), LA 118, and LA 119. When Glaze B pottery appeared (ca. A.D. 1425), however, only Cieneguilla was still occupied by a large population. Dickson (1979) believes that abandonment of the large villages was due to the drought conditions revealed by tree-ring studies (Fritts 1965; Rose et al. 1981) and subsequent agricultural failure.

To the south of the project area in the Santa Fe River Valley, LA 1 and LA 2 are the best known Classic period sites. LA 1 was occupied between A.D. 1325 and 1350, which is the early part of the period (Stubbs and Stallings 1953:155). This may have been a time of population movement and village reorganization. Pindi Pueblo experienced a short interlude of decreased occupation before A.D. 1325, but by A.D. 1330 there was new building and renewed use of older parts of the pueblo (Stubbs and Stallings 1953:14). A similar pattern was suggested for LA 12 (Arroyo Hondo Pueblo) (Lang and Scheick 1989:196). A change in kiva function may be indicated by a change in their frequency (four to two) within villages and a change in their location from subterranean to surface placement. Perhaps as kiva function became more specialized, the number decreased. Plazas were more conspicuous at this time suggesting a more centralized social organization that may have required larger community areas for social or ceremonial functions. It is known that the large villages of the Galisteo Basin, the Rio Grande, and Rio Chama showed the same trends in the construction of fewer kivas and use of larger, more centrally located community space, as early Classic period Pindi Pueblo. The full florescence of the Classic period was not realized at Pindi Pueblo because it was abandoned in A.D. 1350, just as the larger villages were being established.

The limited excavation data for LA 2 suggests an occupation that lasted until A.D. 1420, which corresponds to Arroyo Hondo Pueblo and La Cieneguilla. Little is known about the early Classic period at LA 2. The abundance of Glaze A pottery suggests that the residents were engaged in regular social or economic interaction with the more southern Classic period villages (Lang and Scheick 1989). Lang and Scheick (1989:195) surmise that LA 2 was the largest village in the Santa Fe River Valley until A.D. 1420. If the village did house between 1,000 and 2,000 people as suggested by Lang and Scheick (1989:196), then the smaller surrounding villages (LA 117, LA 118, and LA 119) may have been abandoned by A.D. 1350 with the local population coalescing at LA 2. An untested hypothesis suggests that this coalescence may have been brought on by a change in social organization, and not environmental conditions. The resources of the Santa Fe River could have been successfully exploited by many little villages. Success notwithstanding, sometime after A.D. 1350, everybody may have moved into one large village. If economic resources were equally available to all, then there must have been other social or religious factors that contributed heavily to population aggregation (Cordell 1979:58).

After A.D. 1420, Santa Fe River Valley, east of Agua Fria, was mostly abandoned. The large settlement at La Cieneguilla increased in size and was still occupied by Native Americans until the Pueblo Revolt in A.D. 1680. The settlement pattern that prevailed throughout the Rio Grande, Rio Chama, and Galisteo Basin was a decrease in small villages or large farmsteads. The remaining large villages dramatically increased in size (Stuart and Gauthier 1981). Presumably these large villages had extensive subsistence catchment basins and extensive networks of social and economic interaction. The pattern of few or no Native American sites dating between A.D. 1420 and 1680 is graphically reflected in the survey results from large parcels near the Santa Fe River Valley (Hannaford 1986; Maxwell 1988; Wiseman 1978; Gossett and Gossett 1989; Lang 1980).

The Las Campanas Sites. The Classic period date, which is recognized by single or combinations of pottery types that include the Rio Grande Glaze Ware series and Abiquiu and Bandelier Black-on-gray, was assigned to 13 sites. The Classic period sites are concentrated in the Estates III/West Golf Course and Estates II. The Classic period sites range between 500 and 11,000 sq m in size. They are primarily small concentrations of sherds and lithic artifacts with a dispersed overlay of core flakes from local lithic material. Most of these sites exhibit evidence of core reduction and occasional utilized flakes or biface fragments. These sites essentially show little change from the preceding period, except the artifact scatters tend to be smaller and the pottery types are different.

The largest Classic period site, LA 98688, reflects occupation by a larger group and repeated occupations over a long period, with the bulk of the occupation occurring between A.D. 1315 and 1425, when Cieneguilla Glaze-on-yellow and Agua Fria Glaze-on-red were common. These two types suggest that the site was used by people from the Santa Fe River Valley.

PART I. TESTING RESULTS FROM LA 86147, LA 86149, AND LA 86151

TESTING RESULTS

Three sites within Estates IV required archaeological testing to determine the nature, extent, and integrity of the cultural deposits. By doing so, it was possible to assess if the sites had data potential beyond the surface indications. The archaeological testing plan was designed to address these issues with minimum impact to the sites. Field methods are outlined in the original testing proposal, on file at OAS or the State of New Mexico Historic Preservation Division (HPD) in Santa Fe. The following reports on the results.

LA 86147

Site Description

LA 86147 was a dispersed sherd and lithic artifact scatter with two possible rock features and a possible metate fragment. The site was on a wide, gentle, southeast-facing hill slope and hill top. The site covered an area of 125 m northwest to southeast by 80 m northeast to southwest (Fig. 2). The sherds numbered 14 and included micaceous-tempered utility ware and bowl fragments of Kwahe'e Black-on-white. Nineteen chipped stone fragments from core reduction and a biface fragment were present. The distribution of sherds and a biface fragment was mostly restricted to the east one-quarter of the site. The chipped stone artifacts were highly dispersed and may not be temporally associated with the sherds. Because late Developmental period sites are rare in the Las Campanas project area and dispersed lithic artifact scatters are very abundant and well documented, the testing strategy focused on the part of the site containing the Kwahe'e Black-on-white sherds.

Testing Results

Three 2-by-2-m units, 101N/98E, 124N/94E, and 124N/106E, were placed in the east portion of the site. Grids 124N/94E and 124N/106E were located near the area that had Kwahe'e Black-on-white bowl sherds. Grid 101N/98E was located at a biface fragment. Each unit was surface stripped in 1 by 1 m units.

One 1-by-1-m unit from within each 2-by-2-m unit was chosen for excavation. Excavation of these three units yielded similar stratigraphy and no subsurface artifacts below the surface strip. Surface strip depth ranged from 3 to 5 cm below the modern ground surface. Excavation in the three 1-by-1-m units halted at 20 cm below the surface strip because no cultural material was encountered.

Two rock concentrations were in the north portion of the site. An auger test was placed within each concentration and bored to 80 cm below the modern ground surface. The auger tests did not yield charcoal or other cultural material. Function of the rock concentrations was not determined but they are not closely associated with the artifacts. They may have been survey markers or natural concentrations.

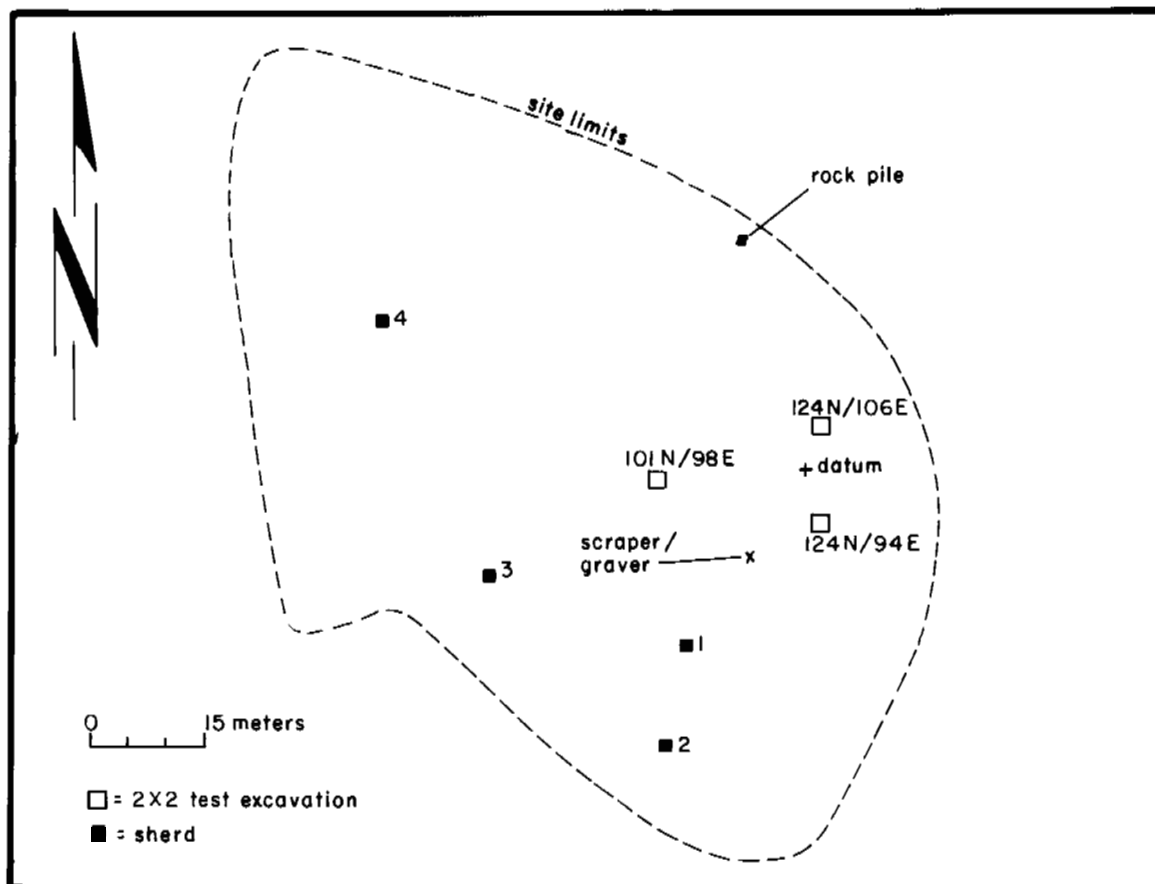


Figure 2. LA 86147, site map.

Stratigraphy. Stratum 1, which was the only soil level, was a reddish brown (5YR 4/4, dry) sandy loamy clay mixed with pebbles, an occasional quartzite or metamorphic cobble, and roots. Within the surface strip, nine lithic artifacts were recovered from Grid 123N/105E, one lithic artifact from 123N/106E, and one lithic artifact from 123N/105E. Five Kwahe'e Black-on-white sherds were recovered from the surface strip in Grid 123N/93E. At 20 cm below the surface strip the soil color is slightly lighter but still reddish brown (5YR 5/4, dry). Calcium carbonate was present and accounted for the slightly lighter color.

Artifact Assemblage. Fourteen potsherds and nineteen lithic artifacts were collected or recorded. The ceramics are described in the text. The lithic artifact assemblage is summarized. Appendix 2 contains the analysis record for each lithic artifact.

Ceramics. The diagnostic pottery types collected include Kwahe'e Black-on-white, Santa Fe Black-on-white, Galisteo Black-on-white, and Abiquiu Black-on-gray. These pottery types have a combined manufacture date range from A.D. 1100 to 1450 spanning the late Developmental to the early Classic periods of the Rio Grande sequence (Wendorf and Reed 1955).

The Kwahe'e Black-on-white (A.D. 1100 to 1200) (Breternitz 1966:81) sherds were recovered from Grid 123N/93E. The 11 sherds are from a large bowl and they include a single rim fragment. The sherds exhibit a characteristic streaky interior slip and polish and solid and hatched mineral-painted designs on the bowl interior. The temper is crushed sherd with a small

amount of basalt. The paste is gray, homogeneous, and has a blocky texture. The temper and paste are similar to Kwahe'e Black-on-white and other contemporaneous pottery types found in the Albuquerque area and the Lower Rio Puerco of the East. These sherds appear to have been imported into the Santa Fe area, probably as part of a bowl. The bowl may have been broken at the residential site and then pieces of it used as tools or temporary containers.

The Santa Fe Black-on-white (A.D. 1175 to 1325) (Breternitz 1966:95; Chapman and Enloe 1977:187) sherd was recovered from the surface outside of the main artifact area. A single bowl rim was recovered. The sherd interior is slipped and lightly polished with a carbon-painted design of concentric rectilinear lines. The sherd exterior is smoothed. The paste is gray, fine-grained, and homogeneous with silt-sized subround quartz. This paste and temper type is similar to examples from the Santa Fe/Tesuque River valleys (Lang and Scheick 1989).

The Galisteo Black-on-white (A.D. 1250 to 1350) (Breternitz 1966:76; Chapman and Enloe 1977:187) jar sherd was recovered from the surface outside of the main artifact area. The sherd has a slipped and polished exterior with carbon-painted parallel thin lines. The sherd was overfired resulting in a buff-colored paste. The temper is fine crushed sandstone with a smoky cement and occasional rounded black grains. Decorated jar sherds from this period are rare in the project area.

The Abiquiu Black-on-gray (A.D. 1350 to 1450) (Breternitz 1966:69-70; Chapman and Enloe 1977:187) bowl sherd was found outside the main artifact area. It has a slipped and polished interior with a smoothed exterior. The ticked line design is carbon painted. The paste is very fine grained and homogeneous with finely crushed crystal pumice temper. This paste and temper is typical of pottery from the Pajarito Plateau.

Each pottery type can be assigned to a different span within the Rio Grande sequence. This temporal distribution is more suggestive of a collection of isolated occurrences rather than a focused, but short-lived occupation. For the Las Campanas area, low numbers of sherds on sites can be interpreted as sherds brought to a site as a tool or temporary container. Since a single sherd of each type is represented it is unlikely that they represent actual pot-drops. The temporal interval for the sherds almost suggests generational use of the site as a short-term camp or perhaps as a marked point on a trail leading through the Las Campanas area between pueblos or from a pueblo to a resource area.

Lithic artifacts. Lithic artifacts were collected from excavated grids and recorded as the site artifact scatter. Nineteen lithic artifacts were collected or recorded. The artifact types include angular debris, core flakes, a scraper/graver, and a biface fragment. The lithic artifact attributes are described by morphological and technological attributes that reflect lithic manufacture technology and procurement strategy. Description of the lithic assemblage is separated into debitage and tools. Table 3 shows artifact type frequency by material type.

In general, the debitage assemblage reflects core reduction. Core flakes were the most numerous debitage artifact type and all of the debitage is of locally available chert. The majority of the core flakes lack dorsal cortex, but the core flakes with dorsal cortex exhibit a 100 percent covering. This suggests that a few cobbles were cleaned of cortex, creating a striking platform. The core flakes were removed from the cobble interior, and therefore lack dorsal cortex. Simple or expedient core reduction is reflected in the platform types, which are mostly cortical or single

Table 3. Artifact Type by Material Type, LA 86147

Count Row pct Column pct	Material type			
	Artifact type	Chert	Jemez obsidian	Total
Angular debris	2 100.0 11.1			2 10.5
Core flake	15 100.0 83.3			15 78.9
Scraper/graver	1 100.0 5.6			1 5.3
Late stage biface frag.			1 100.0 100.0	1 5.3
Total	18 94.7		1 5.3	19

faceted. The few multifaceted platforms would result from multiple flakes being removed from a single core platform. The core flakes tend to be medium size in length with a mean of 21 mm. There are no large flakes and only three core flakes are less than 15 mm long. The core flake lengths suggest that the raw material cobbles were not large or that they had been reduced to medium-sized cores before being brought to the site. None of the core flakes exhibited use wear and no cores were found. It seems likely that the cores and tool flakes were transported off-site for use in hunting or gathering.

Two formal tools, a scraper/graver and an obsidian biface fragment, were collected from the surface. The tools were not closely associated with the sherds and lithics, but were in the east portion of the site.

The scraper/graver is made of pinkish white, fine-grained chert. It is 30 mm long by 19 mm wide by 10 mm thick. It has an oval outline that was formed by unidirectional and unifacial retouch. The edge angle ranges from 75 to 85 degrees. The edge is step-fractured and slightly rounded suggesting the tool was used on a hard material. A single 5-mm-long projection is not rounded, but does have one crescentic scar that may have resulted from use. This tool is similar to Isolated Occurrence (IO) 5, which was collected during the OAS survey at Las Campanas. They both appear to be multipurpose tools that would have been suitable for many tasks.

The Jemez obsidian biface fragment is probably a medial fragment with the tip and base missing. The fragment is 17 mm long by 12 mm wide by 6 mm thick. The distal and proximal ends appear to be reworked and the lateral edges are extremely rounded as though the tool was

repeatedly used for cutting or sawing. The condition of the tool suggests that its utility was exhausted when it was discarded.

Conclusions

LA 86147 was a dispersed sherd and lithic scatter that extends across a 10,000 sq m area. The artifact density is very low and most of the artifacts occur in the east portion of the site. The pottery type manufacture dates suggest an occupation span from A.D. 1100 to 1450 including the late Developmental, Coalition, and early Classic periods of the Rio Grande sequence. The presence of tools, jar and bowl sherds, and an expedient core reduction strategy suggests that this was a short-term hunting and gathering camp. Use of the site for all periods was very short-term, which suggests that the artifacts are more a collection of isolated occurrences, rather than refuse from one or two occupation episodes.

LA 86149

Site Description

LA 86149 was a sherd and lithic artifact concentration along the west bank of a modern erosion channel. It was on a gentle dissected south-facing slope above a large, deeply entrenched arroyo to the south. The artifact scatter covered a 35-by-35-m area (Fig. 3). There were approximately 45 obsidian and chert core reduction and biface thinning flakes and three sherds of a polished white ware and a single jar sherd of Tesuque Indented pottery. The white ware and corrugated pottery probably date to late Coalition or early Classic period (A.D. 1275 to 1350). The soil is sandy, unconsolidated and highly erodible and unstabilized. Two shallow erosion channels cut through the site and have displaced some of the artifacts. Other sites that are within the Las Campanas area are similar to LA 86149 and have failed to yield substantial subsurface cultural deposits. The testing strategy focused on determining if significant subsurface cultural deposits or features were present.

Testing Results

Four 2-by-2-m units at Grids 116N/93E, 101N/88E, 96N/91E, and 96N/97E were excavated in 1-by-1-m units. All 1-by-1-m units were surface stripped to 5 cm below the modern ground surface. One 1-by-1-m unit was excavated until noncultural material-bearing soil was reached. These units were 116N/92E, 100N/87E, 95N/90E, and 95N/97E. Grids 116N/92E and 100N/87E lacked subsurface cultural material. Grids 95N/90E and 95N/97E yielded low numbers of lithic artifacts to 40 cm below the modern ground surface. Three stratigraphic levels were defined within these units.

Stratigraphy. Stratum 1 was loose brown (7.5YR, 5/4) clay sand with mixed organic material and roots and occasional pebbles and cobbles. The soil is unconsolidated and an alluvial deposit. This soil occurs across the site to varying depths with 60 cm encountered in Grid 95N/90E and 16 cm in Grid 116N/92E. In Grids 95N/90E and 95N/97E, low frequencies of artifacts occurred

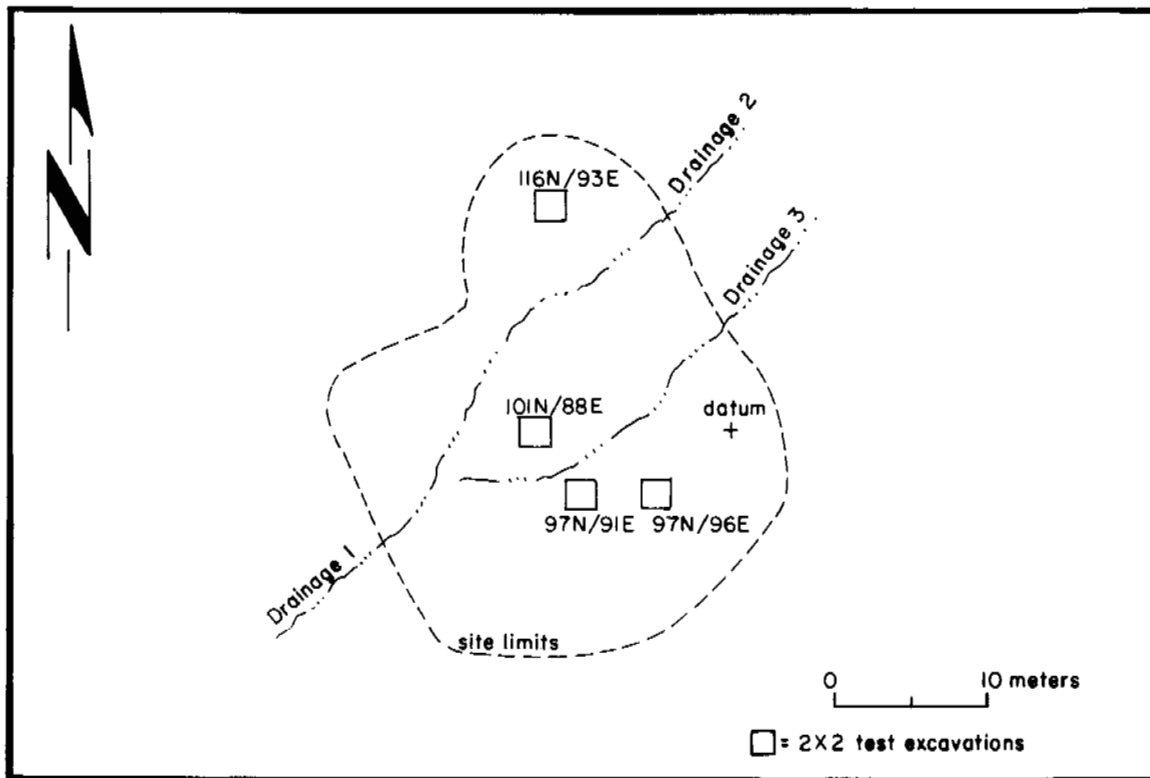


Figure 3. LA 86149, site map.

in this level to 40 cm below the modern ground surface. No other evidence of human activity was observed in this level. This homogeneous level lacks internal stratigraphy, suggesting that the artifacts are from different occupations.

Stratum 2 was consolidated clay sand mixed with clay pellet inclusions and caliche. The soil was slightly lighter in color than Stratum 1. No cultural material was recovered from this stratum. It was encountered at 50 to 60 cm below the modern ground surface in Grid 95N/97E. Stratum 2 was a noncultural material-bearing level.

Stratum 3 was coarse-grained sand mixed with consolidated and calcified sand that contained heavily calcified gravel and an occasional cobble. This stratum was only found in Grid 116N/92E. This soil has not been recently deposited and appears to be undisturbed. No cultural material was found in this stratum.

Artifact assemblage. Ceramic and lithic artifacts were observed on the site. None of the ceramics were collected because they were not temporally diagnostic. Lithic artifacts were recorded from the surface and recovered from subsurface deposits in Grids 95N/90E and 95N/97E. The ceramics will be described briefly, and individual lithic artifact data are in Appendix 2.

Ceramics. Four potsherds were observed on the site surface. Three sherds were body fragments from a single white ware bowl. The sherds were slipped and polished on the interior

and exterior, but no decoration was present. These sherds may date to the late Coalition or early Classic period based on their surface finish. A single Tesuque Corrugated jar sherd was observed. It was from the midsection of a jar and had no other distinguishing characteristics. This sherd could be contemporaneous with the undecorated white ware sherds. These sherds are within the limits of the site scatter as defined by the obsidian flake distribution. It is possible that the obsidian flakes and the sherds represent a single component.

Lithic artifacts. A total of 25 lithic artifacts were recorded on the site surface and 20 lithic artifacts were recovered from within excavation units. For this discussion, lithic artifacts from all proveniences will be treated as a unit because they appear to result from the same occupation or activity. Table 4 shows artifact type by material type, with biface flakes the most numerous, followed by core flakes and a single piece of angular debris. This discussion will focus on the biface and core flakes.

Four of the flakes are of locally available chert and the others are of undifferentiated Jemez obsidian. The obsidian could come from the Jemez Mountains or it may be the variety of obsidian that is found along the Caja del Rio (Kelley 1980). Obsidian is not an abundant lithic material type in the Las Campanas project area. It occurs as isolated tools and fewer than 10 sites have a significant frequency of obsidian. Two sites from the OAS survey, LA 98679 and LA 98690, had mostly obsidian lithic artifacts. These sites can be compared with the LA 86149 assemblage.

Thirteen core flakes were recorded. Dorsal cortex is present on only two core flakes suggesting that they were removed from a previously reduced core(s). Seven core flakes were whole, one was a proximal fragment, and five were medial fragments. Platform types reflect early or middle stage reduction with cortical and single-faceted platforms the most common. The

Table 4. Artifact Type by Material Type, LA 86149

Count Row pct Column pct	Material type		
Artifact type	Chert	Jemez Obsidian	Total
Angular debris		1 100.0 2.4	1 2.2
Core flake	3 23.1 75.0	10 76.9 24.4	13 28.9
Biface flake	1 3.2 25.0	30 96.8 73.2	31 68.9
Total	4 8.9	41 91.1	45

whole core flakes range from 19 to 30 mm long with a mean of 28 mm. These are medium-sized flakes suggesting that the core was a size that was easily transported. Most of the obsidian from LA 98679 was core flakes. Dorsal cortex occurred on 33 percent of the core flakes and the average length was 30 mm or only slightly longer than the LA 86149 core flakes. No use-wear was noted on core flakes from LA 86149 or LA 98679. The data from these two sites suggest that obsidian was brought to the Las Campanas area as partly reduced nodules or medium-sized cores. These cores were then reduced for flake tools or as blanks for formal tools.

Thirty-one biface flakes were recorded or recovered from excavation units. Except for one chert biface flake, all are undifferentiated Jemez obsidian. None of the biface flakes exhibit cortex. Fourteen are whole and two are proximal fragments. Medial fragments (n = 8) are the second most common after whole flakes. Platform types are distributed among single faceted, multifaceted, and retouched forms, with three of the platforms showing abrasion. The biface flake lengths range from 11 to 31 mm with a mean of 21 mm. Most of the biface flakes are medium-sized. Two of the biface flakes were early stage biface reduction flakes and tend to be larger. The presence of early stage biface flakes and the absence of abundant small flakes suggests that a medium to large bifacial tool was reworked rather than a bifacial blank reduced to a small projectile or dart point. The biface flake length from LA 86159 can be compared with the LA 98689 assemblage. The six whole biface flakes from LA 98689 had a mean length of 15 mm. The LA 98689 biface flakes tended to be 25 percent shorter than the LA 86149 biface flakes, indicating that the LA 98689 biface flakes could have been removed from a smaller tool blank, such as a projectile or dart point.

One of the biface flakes from Grid 95N/97E, Level 2, exhibited unimarginal retouch and unidirectional wear. The use of biface flakes as tools is suggested to reflect a more long-distance hunting strategy (Kelly 1988). This is a possible scenario for LA 86149, except that one utilized flake is not strong supporting evidence.

Of the 20 subsurface artifacts, only 2 were core flakes and 1 was a piece of angular debris. The remainder were biface flakes, which reflects the surface artifact type distribution. The surface and subsurface artifact distributions seem to result from similar activities, such as the production of medium-sized obsidian tools. Tool use did occur as indicated above, but it did not result in a high percentage of utilized flakes.

Conclusions

LA 86149 was an artifact scatter consisting mainly of core reduction and tool production debris. The main lithic material was obsidian. The core reduction and tool production focused on reduction of medium-sized cores or tool blanks. The presence of early-stage biface reduction flakes, the low numbers of small biface flakes, and the presence of a utilized biface flake suggest that a larger, more generalized tool, blank, or flake tool were produced or modified at the site. The small amount of debris indicates that occupation was short-lived and may have been a single episode. The pottery types date the site to A.D. 1250 to 1350. The spatial association of the lithic artifacts and pottery indicates that they may be contemporaneous. If the pottery and lithic artifacts are associated, then the site is an example of a Pueblo III hunting camp or special activity site. Hunting camps that can be assigned to a period have not been common in the Las Campanas area.

LA 86151

Site Description

LA 86151 was a sherd and lithic artifact scatter on a gentle, south-facing slope above a wide drainage bottom. The site was 112 m (east to west) by 45 m (north to south) (Fig. 4) covering an area of 5,040 sq m. The vegetative ground cover tended to be sparse. The soils were a combination of stabilized and eroded sandy loam. The artifact scatter was separated into three concentrations. The east concentration covers a 10 by 10 m area. It consisted of 8 to 10 chert core reduction flakes. The middle concentration also had 8 to 10 chert core reduction flakes. The west concentration was 15 by 15 m and consists of 10 to 15 chert core reduction flakes, a silicified wood biface fragment, and a Santa Fe Black-on-white bowl sherd. The three concentrations represent at least three occupations, with the west concentration dating to the Coalition period (A.D. 1175 to 1325). The presence of several isolated sherds of Santa Fe Black-on-white in the surrounding area and the occurrence of Santa Fe Black-on-white on LA 86148, a larger site located to the west of LA 86151, indicates that this area was heavily used by Coalition period populations of the Santa Fe River or southeast Pajarito Plateau. Other sites similar to LA 86151, which are located along the south Las Campanas property line, have yielded limited or no subsurface deposits.

Testing Results

The testing consisted of the excavation of three 2-by-2-m units located in artifact concentrations. The 2-by-2-m units were at 100N/92E, 105N/80E, and 92N/44E. Each unit was surface stripped in 1-by-1-m units to 5 cm deep. Then, the 1-by-1-m unit with the most artifacts was excavated in 10 cm levels until noncultural material-bearing soil was reached. All units were excavated to 20 cm below the modern ground surface.

Stratigraphy. The excavations did not yield cultural deposits deeper than 10 cm below the modern ground surface. Two soil levels were exposed by the excavation.

Stratum 1 was found in 100N/92E and 92/44E. It was a brown (10YR 5/3, dry), clay sand loam mixed with gravel and an occasional cobble. Large roots appeared in the lower portions. This soil level was about 20 cm deep in the east portion of the site. It had eroded out of the west area of the site, leaving Stratum 2 at the surface.

Stratum 2 was a pale brown (10YR 6/3, dry) sand mixed with caliche rootlets, gravel, and an occasional cobble. This soil was unconsolidated and highly erodible. It was encountered at the top of Level 1 in Grid 104N/79E and at 20 cm below the modern ground surface in Grid 92N/44E. This soil has lacked cultural material in all of the test excavations in the south part of the Las Campanas project area.

Artifact Assemblage. The artifact assemblage consists of 2 sherds of Santa Fe Black-on-white and 26 lithic artifacts. Twelve lithic artifacts were recovered from surface strip and a single lithic artifact came from Level 1 in Grid 92N/44E. Lithic artifact data are presented in Appendix 2.

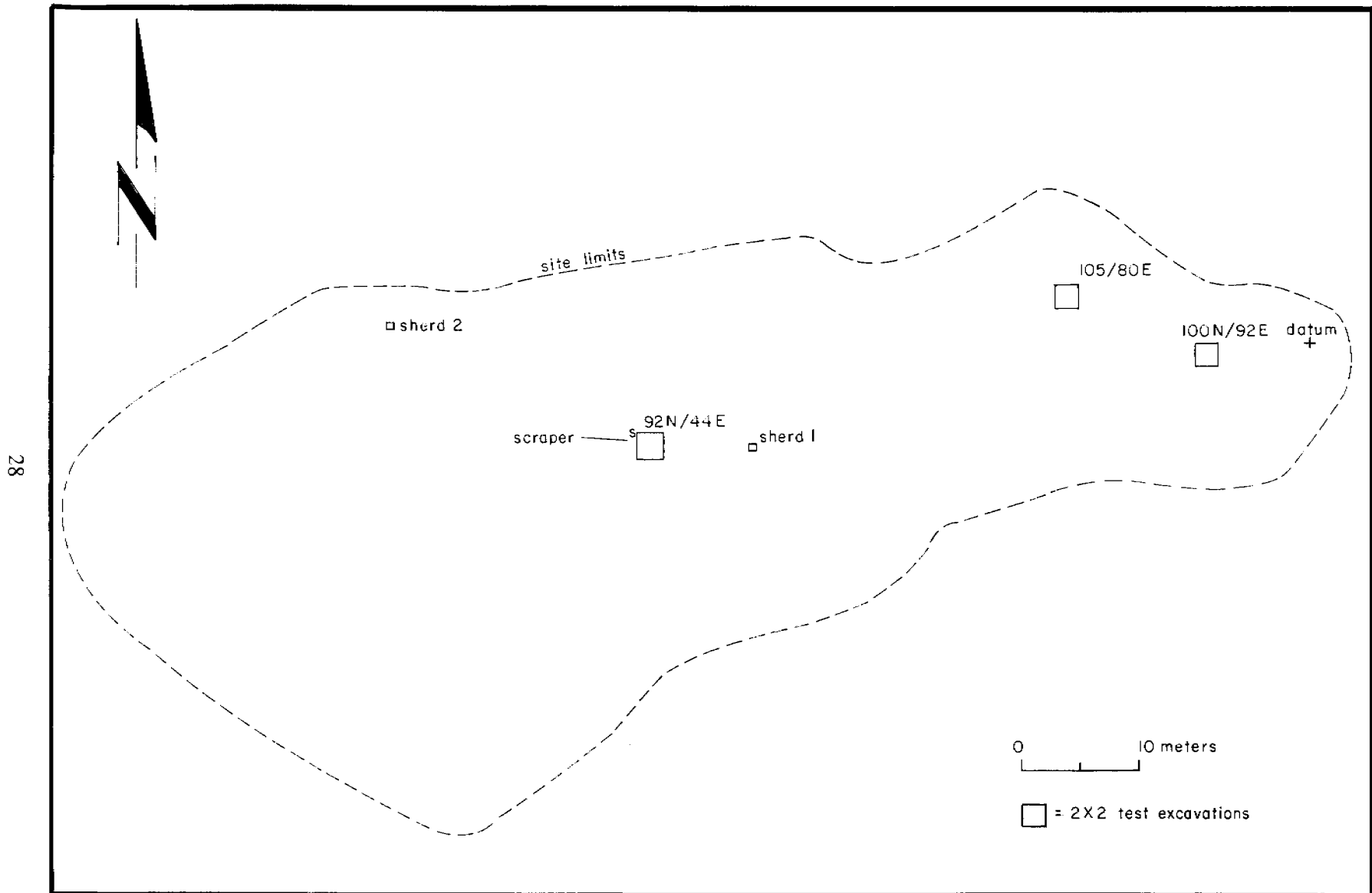


Figure 4. LA 86151, site map.

Ceramics. Two bowl sherds of Santa Fe Black-on-white pottery were surface collected. They were from the west part of the site. Santa Fe Black-on-white pottery has manufacture dates from A.D. 1175 to 1325.

Sherd 1 is a bowl rim. The interior is smoothed with a light, streaky polish. The exterior is smoothed. The carbon-painted design is too incomplete to identify motifs. The paste is fine grained with abundant, fine, subrounded quartz grains and occasional caliche inclusions. This paste is similar to other examples were probably made in the Santa Fe/Tesuque river valleys (Lang and Scheick 1989:62).

Sherd 2 is a bowl body fragment. The interior is smoothed with a light, streaky polish. The interior surface has exfoliated, leaving a small, indeterminate portion of the carbon-painted design. The exterior is smoothed. The paste is similar to Sherd 1 and indicates manufacture in the Santa Fe-Tesuque river valleys (Lang and Scheick 1989:62).

Lithic artifacts. Of the 26 lithic artifacts, 13 were recorded on-site and 13 were recovered in the test excavations. Twenty of the lithic artifacts are core reduction debitage, four are cores, one artifact is a silicified wood side scraper, and one artifact is an obsidian flake projectile point fragment. Table 5 shows the artifact types by material type.

Table 5. Artifact Type by Material Type, LA 85151

Count Row Pct Column Pct	Material type			Total
	Chert	Silicified Wood	Jemez Obsidian	
Angular debris	5 100.0 20.8			5 19.2
Core flake	15 93.8 62.5		1* 6.3 100.0	16 61.5
Tested cobble	1 100.0 12.5			1 3.8
Multidirectional core	3 100.0 4.2			3 11.5
Side scraper		1 100.0 100.0		1 3.8
Total	24 92.3	1 3.8	1 3.8	26

* Obsidian core flake is flake point described in the text.

Table 6. Artifact Type by Dorsal Cortex, Excluding Cores, LA 86151

Count Row pct Column pct	Dorsal Cortex (%)								
	Artifact type	0	20	30	60	70	90	100	Total
Angular debris		2 40.0 100.0		1 20.0 33.3				2 40.0 50.0	5 27.8
Core flake	3 25.0 100.0		2 16.7 66.7	2 16.7 16.7	1 8.3 100.0	2 16.7 100.0	2 16.7 50.0		12 66.7
Side scraper			1 100.0 33.3						1 5.6
Total	3 16.7	2 11.1	3 16.7	3 16.7	1 5.6	2 11.1	4 22.2		18

The 20 pieces of core reduction debitage are core flakes (n = 15) and angular debris (n = 5). All of the debitage are from locally available chert. The raw material may have been obtained close to the site because dorsal cortex occurs on 60 percent of the artifacts (Table 6). This percentage is unusually high for dispersed sherd and lithic artifact scatters in the Las Campanas project area. Fourteen of the sixteen sites with lithic artifacts studied during the OAS survey and testing (Post 1992:87-88) had no dorsal cortex on more than 60 percent of the lithic debitage. This suggests that sites in the south and west portions of the Las Campanas area may have been farther from the cobble source that contained the chert raw material. Early core reduction is indicated by the predominance of cortical and single-faceted core-flake platforms. The whole core flakes are medium sized with a range from 8 to 35 mm and a mean of 23 mm. The core flakes indicate that the goal of core reduction may have been the production of expedient tools. No use-wear was visible on the debitage. The flakes may have not been used enough to form visible wear patterns or the flake tools were used off-site.

The four chert cores range in texture from fine grained to coarse grained. Three cores have multidirectional striking platforms. The multidirectional cores range in size from 90 to 101 mm long to 67 to 85 mm wide by 35 to 47 mm thick. The four cores were found together and it is possible that they were cached for planned future use. They are not associated with a concentration of core reduction debris, suggesting that the flakes were removed from the site.

The core-flake projectile point was recovered from the surface strip in 100N/92E. It is a small Jemez obsidian core-flake with bimarginally retouched edges. The side notches are very shallow. The projectile point probably was discarded because the tip broke. The projectile point is 16 mm long by 10 mm wide by 2 mm thick. Flake projectile points are a common feature of Pueblo tool manufacture. The manufacture of pressure flaked points generates very small pieces of debitage that are rarely recovered because they fall through the standard ¼-inch mesh screen. A similar projectile point is shown in the Pindi report (Stubbs and Stallings 1953:98, fig. 17).

The silicified wood side scraper was made from a tabular piece of raw material. It is 58 mm long by 29 mm wide by 9 mm thick. The dorsal surface has been facially and marginally retouched. The retouched edge angle is 50 degrees. The material is not homogeneous. Step fractures along the margins may result from use or are a by-product of reduction. Because the tool was discarded far from a residential site it is most likely that it was no longer considered functional.

Conclusions

LA 86151 is a spatially extensive, but dispersed sherd and lithic artifact scatter. Based on ceramic manufacture dates, part of the occupation occurred during the Coalition period (A.D. 1175 to 1325). The ceramic paste and temper indicate that the sherds were made from materials available in the Santa Fe/Tesuque river valleys. This coincides with ceramic data from the OAS survey and testing (Post 1992) that suggested the Las Campanas area was used more frequently by people from the Santa Fe River Valley rather than the Pajarito Plateau. The artifact types indicate that LA 86151 was a special activity site within a hunting and gathering subsistence strategy. The artifact distribution reflects at least three occupation episodes. This is supported by the low artifact count that resulted from short duration occupation and limited activity. The scraper and obsidian projectile point are examples of formal tools that were expediently manufactured. The expedient manufacture and the discard of formal tools is indicative of a forager hunting and gathering strategy (Binford 1983a).

CONCLUSIONS

Archaeological testing of LA 86147, LA 86149, and LA 86151 yielded data similar to other tested or excavated sites in the Las Campanas area. The results of the testing can be summarized and put into the context of the Las Campanas area and the region between the Santa Fe River Valley and the southeast Pajarito Plateau.

The earliest occupation date comes from LA 86147. LA 86147 had a concentration of Kwahe'e Black-on-white bowl sherds (A.D. 1125-1200 [Breternitz 1966:81]), scattered sherds from later periods, an Abiquiu Black-on-gray, and a lithic artifact scatter that included a Jemez obsidian biface fragment and a chert scraper/graver. The lithic artifacts were mainly locally available chert core reduction flakes and angular debris. The Kwahe'e Black-on-white sherds are not closely associated with the lithic artifacts, and may represent an isolated occurrence. The dispersed artifact distribution suggests that they are a collection of isolated occurrences resulting from limited activity, such as resource procurement.

Kwahe'e Black-on-white is the main pottery type of the late Developmental period of the Rio Grande sequence. Late Developmental sites are not numerous in the Santa Fe River Valley, but they are more visible than sites from earlier periods. LA 835, LA 114, and LA 15969 are examples of late Developmental period residential sites. The presence of small villages and evidence for long-duration occupation indicates that year-round use of the Las Campanas area could have occurred. Occupants of LA 114 and LA 15969, above the north bank of the Santa Fe River, probably used the Las Campanas area as a subsistence resource area. Even with permanent settlements along the Santa Fe River, low population levels resulted in sparse evidence of late Developmental period use of the Las Campanas area. In a sense, the small sites in the Las Campanas area may be very good indicators of the population level of the surrounding area. Low population is indicated for the late Developmental period along the Santa Fe River Valley and a low number of late Developmental period sites have been found in the Las Campanas area. The size and number of residential sites increases dramatically in the Coalition period. The number of small special activity sites and isolated occurrences in the Las Campanas area also increases. The higher population resulted in more frequent use of subsistence areas that were infrequently used during earlier periods.

The evidence from LA 86147 for late Developmental period use reinforces the broader pattern that can be suggested for the Las Campanas area and Santa Fe River Valley. Late Developmental period population was low, as indicated by the site frequency. More distant resource areas were used sporadically because the immediate resource area could support the population's needs. A low population level probably meant that peripheral resource areas could be used by everyone. Camp or special activity sites were not reoccupied, resulting in low archaeological visibility and spatially scattered material evidence of land use and subsistence activities. In terms of low archaeological visibility and site distribution, the late Developmental period and late Archaic and Basketmaker II period use of the Las Campanas area and Santa Fe River Valley are similar. A few residential sites have been identified. Subsistence activities are evidenced by isolated occurrences, minor components at multicomponent hunting and gathering sites, and a few special activity sites.

LA 86147, LA 86149, and LA 86151 have Santa Fe and Galisteo Black-on-white, or polished white ware pottery that date to the Coalition period of the Rio Grande sequence. LA 86147, LA 86149, and LA 86151, along with 23 other Coalition period sites, indicate a marked increase in use of the Las Campanas area. LA 86147, LA 86149, and LA 86151 reflect different usage of the Las Campanas area.

LA 86147 had three Santa Fe Black-on-white bowl sherds and one Galisteo Black-on-white jar sherd scattered across the site. These sherds probably result from very short duration use of the site for resource extraction. Their occurrence is similar to the late Developmental period component of LA 86147 because they seem to be a collection of isolated occurrences. They may reflect a less concentrated use of the flat, grassy table lands. The scraper/graver and obsidian biface fragment cannot be assigned to the late Developmental or Coalition period, but they do represent a focus on hunting. The co-occurrence of Coalition and late Developmental period pottery types on such a small site could result from coincidence or they may indicate that LA 86147 was in an area of frequent passage, such as along a path or trail that was commonly used by Santa Fe River Valley hunter-gatherers.

LA 86149 had a Tesuque Corrugated jar sherd and three polished white ware bowl sherds. These sherds are not closely associated with the obsidian lithic artifact scatter that comprises the bulk of the site. However, their co-occurrence may not be coincidental or unrelated. The obsidian lithic artifacts were mostly early and middle stage biface reduction flakes, with a few core flakes and angular debris. This debitage assemblage resulted from the reduction of bifacial cores or tool blanks. One of the biface flakes was used.

The use of large bifaces as cores for bifacial and flake tool production may indicate a long-distance hunting foray (Kelly 1988). According to the bifacial core reduction model, large bifaces would have been carried on long-distance hunting and gathering forays because they would have multiple uses. A large biface could have been used to produce flake tools, reduced to form a specific tool, such as a hafted knife or projectile point, or used as a tool without further modification. A large biface would have been more reliable for flake removal resulting in less failures and providing insurance that a supply of tools would be available in the absence of suitable raw material. Evidence of this particular reduction strategy has not been previously reported for the Las Campanas and Santa Fe areas.

If the obsidian debitage does reflect a long-distance hunting and gathering strategy, then perhaps the site was used by someone from outside the middle Santa Fe River Valley, such as from the Cochiti area. To date we have very little evidence of the Las Campanas area use by Cochiti area Coalition period groups. It is possible that very low frequency and idiosyncratic assemblages, such as the LA 86149 assemblage, reflect occasional use of the Las Campanas area by more distant groups. This is one possible explanation for the differences observed for LA 86149.

LA 86149 is also different from other Las Campanas sites because it had mostly obsidian debitage. Obsidian occurred as the main material type on two sites, LA 98679 and LA 98689, identified during the OAS survey and testing project (Post 1992). Obsidian is the second most common raw material on LA 85032 (Scheick 1991b) and the most common on LA 84753 (Scheick and Viklund 1991) and LA 86139 (Scheick and Viklund 1992). Core reduction was the primary reduction activity at LA 85753, LA 86139, LA 85032, and LA 98679. Biface reduction

was the primary reduction activity at LA 98689. The core reduction sites are similar to other sites in the Las Campanas area because raw material was used to produce core flakes. Core reduction of local raw material is part of the subsistence pattern of generalized hunting and gathering that occurred during the Coalition and Classic periods.

LA 98689 and LA 86149 reflect a strategy of lithic reduction to produce more task-specific tools, such as those that would be needed during a hunting foray. Clearly, the Las Campanas area was used for hunting of small and medium game mammals, as indicated by the faunal remains from Pindi (Stubbs and Stallings 1953) and Agua Fria Schoolhouse (Lang and Scheick 1989) pueblos. It is curious that with all of the potential hunting excursions that probably occurred, only a small number of sites show evidence of tool manufacture or maintenance in support of hunting needs. This paucity of sites dominated by biface reduction flakes indicates that most hunting forays were well planned with most needs anticipated. LA 86149 may be an example of a planned tool-kit supplemented by expedient flake manufacture or tool production. This is an alternate explanation for the differences in the artifact assemblage noted for LA 86149.

LA 86151 represents a third type of Coalition period use of the Las Campanas area. LA 86151 is located at the edge of a grassy draw that is at the head of a large unnamed arroyo that drains the northern portion of Estates IV. There are three artifact concentrations that may date to the Coalition period. The eastern concentration had core reduction flakes and a projectile point fragment. Minimally, this assemblage may result from hunting. The middle concentration had core reduction flakes that were not associated with datable artifacts, but are probably from the Coalition period by association. The west concentration had two Santa Fe Black-on-white bowl sherds, cores and core reduction flakes. These three episodes appear to result from more than casual use of the area. Casual use of an area may result in a collection of isolated occurrences, as suggested for LA 86147. Instead, the three episodes reflect what may be a land-use pattern that emerged during the Coalition period.

As outlined in the Archaeological Background section, the Coalition period (A.D. 1175 and 1325 or 1350) included major changes in population size, settlement forms, and subsistence habits. A large community was formed along the Santa Fe River Valley including Pindi, Agua Fria, and Cieneguitas pueblos (Stubbs and Stallings 1953; Lang and Scheick 1989; Post and Snow 1992). There was a dramatic increase in site frequency on the southeast Pajarito Plateau as well (Orcutt 1991; Pruecel 1987). Subsistence data from Agua Fria (Lang and Scheick 1989) and Pindi Pueblo (Stubbs and Stallings 1953) suggest that the piñon-juniper piedmont was important. There are surprisingly few ethnobotanical remains from the excavations. The faunal remains indicate a heavy reliance on small- and medium-sized mammals that would populate the piñon-juniper woodland. Changes in site distribution and structure may reflect an increased reliance on the piñon-juniper piedmont resources as population increased along the Santa Fe River Valley and on the southeast Pajarito Plateau.

As a result of the increased population, the formerly marginal subsistence area between the Arroyo Calabasas and the Rio Grande became more important. Although it has not been documented it is very probable that the increased population strained the resources available in the immediate Santa Fe River Valley area. Previously, during the late Archaic to late Developmental periods, the Las Campanas area was casually used or used by a smaller population resulting in the preservation of a fairly productive environment. As more people had to use the Las Campanas area, there were greater demands on resource availability. These greater demands

may have resulted in the establishment of hunting and gathering territories. In other words, what was formerly open for anyone to use may have been more managed as it was used by more people. A possible consequence of increased control was that sites tended to be reoccupied. Reoccupied sites were probably located in areas that traditionally were the most productive. As a result, sites are found along the margins of secondary drainages containing concentrations of discarded pottery sherds, which indicate discrete activity areas.

From the OAS survey and testing (Post 1992), three sites, LA 98681, LA 98682, and LA 98690, and LA 86150 from Estates IV (Scheick and Viklund 1992) are Coalition period sherd and lithic artifact scatters. LA 98681 and LA 98682 are located north of and on the margin of a secondary drainage. Each has a small concentration of Santa Fe Black-on-white sherds from one or more bowls. LA 98690 is a spatially extensive sherd and lithic artifact scatter located within a gently sloping catchment area for a secondary drainage. LA 98690 has nine discrete concentrations of Santa Fe Black-on-white bowl sherds suggesting that it was used at least nine different times. LA 98690 is the most outstanding example of the reoccupation pattern. LA 86150, which will be part of the data recovery effort for Estates IV, has at least three and as many as seven discrete activity areas demarcated by a concentration of Santa Fe or Galisteo Black-on-white bowl sherds and a hearth or roasting pit. LA 86150 is on the north side of a grassy draw that is at the head of a major secondary arroyo. Outside the LA 86150 site area, numerous isolated bowl sherds of Santa Fe and Galisteo Black-on-white were found.

Environmental factors probably partly influenced the decision to reoccupy these areas for hunting and gathering. Social factors may have had a strong influence as well. Reoccupation implies that one location was more favorable than another. In the case of residential sites, location may be conditioned by proximity to critical resources such as water, fuel, or arable land. Fieldhouses were located near arable land. Hunting and gathering sites might have been located in areas where a maximum yield could have been obtained with the most efficient effort. Without conducting a study of the potential biomass of the Las Campanas and surrounding area, we cannot explain site locations in terms of a "mini-max" or optimal foraging model (Belovsky 1988). Hunting and gathering site location and correlation with highest potential yield cannot be demonstrated.

Assuming for the moment that an optimal foraging model might partly explain site location, sites would be expected to be located in the "best" place, if only resource abundance and distribution were considered. If a location did allow maximum resource acquisition, then repeated occupation of a site would be expected. If one site was not much better than another, then a more scattered site distribution pattern would be expected, unless other factors were affecting site selection. Before the Coalition period, there is little evidence of reoccupation of hunting and gathering sites, except for LA 84758, which is a repeatedly occupied Basketmaker II site. This suggests that resource abundance and distribution did not significantly affect site location before A.D. 1175. After A.D. 1175, the Coalition period hunting and gathering sites and surrounding areas show a marked tendency toward reoccupation. Did the resource distribution and abundance shift and therefore become more localized resulting in one site being more favorable than another? Or did the increase in population along the Santa Fe River Valley, on the Pajarito Plateau, and south in the Cochiti area, result in restrictions on hunting and gathering territory?

Climatic data suggest that the environment was not radically different during late Archaic, Developmental, and Coalition periods (Rose et al. 1981). Short-term fluctuation in precipitation may have altered resource availability and influenced site selection for a period of 5 or 10 years. A site that was reoccupied five times might have had five discrete activity areas, if something was discarded each time. Reoccupation could have been a response to short-term fluctuation in resource availability. When "normal" resource availability returned, then a site location pattern of single occupation would have been returned to, unless other factors were influencing site location.

While this discussion has been highly speculative, it does serve to remove the study of small hunting and gathering site distribution out of the realm of environmentally determined explanation into a social realm. Both environmental and social factors undoubtedly affected site location. Future study of site locations will shed more light on the apparent change in occupation strategy and its affect on site formation during the Coalition period.

In conclusion, LA 86147, LA 86149, and LA 86151 reflect a varied strategy of hunting and gathering that was employed during the late Developmental and Coalition period. LA 86147 appears to be an accumulation of isolated occurrences left from very short-term or casual use of the site. LA 86149 suggests a strategy employed for hunting by Coalition period people. Finally, LA 86151, as a reoccupied site with discrete activity areas, suggests that there may have been a change in hunting and gathering strategy in response to environmental and social factors.

RECOMMENDATIONS

Archaeological testing has been completed at LA 86147, LA 86149, and LA 86151 in Estates IV of Las Campanas de Santa Fe. Archaeological testing emphasized determining the nature and extent of the cultural deposits and their potential to yield new information on Santa Fe prehistory.

LA 86147 was recorded as a multicomponent sherd and lithic artifact scatter dating from A.D. 1100 to 1425. Diversity of artifact types indicated that LA 86147 could have been a camp or special activity site with features or subsurface deposits. Archaeological testing revealed that the artifacts were restricted to surface or modern soil levels and that subsurface features were absent. No direct association could be made between different artifact types suggesting that the site was an accumulation of isolated occurrences resulting from transhumance. LA 86147 appears to reflect one type of use of the Las Campanas area by prehistoric Pueblo groups. Data from LA 86147 will be useful in studying land-use strategies within the Las Campanas area. Archaeological testing has revealed that LA 86147 does not have the potential to yield significant data regarding Santa Fe prehistory. No further work should be required and archaeological clearance should be granted.

LA 86149 was recorded as a sherd and lithic artifact scatter, probably from the Coalition period of the Rio Grande sequence. The predominant artifact type was Jemez obsidian biface reduction flakes. One of the early-stage biface flakes was used as a tool. Lithic artifacts recovered from the subsurface to 40 cm below the modern ground were similar to the surface materials. Subsurface artifacts were mostly obsidian biface reduction flakes. This suggests that all artifacts result from a single occupation. Similarity in frequency and type of subsurface artifacts indicates that a high density or a diverse assemblage is not present. It is very unlikely that additional excavation would yield significantly different data than were recovered during the testing. Data from LA 86149 will be useful for making comparisons of land-use strategies within the Las Campanas area. Archaeological testing has revealed that LA 86149 does not have the potential to yield significant data regarding Santa Fe prehistory. No further work should be required and archaeological clearance should be granted.

LA 86151 was recorded as a sherd and lithic scatter with a single artifact concentration that dated to the Coalition period of the Rio Grande sequence. Closer examination revealed the site to be larger and to have three artifact concentrations. The three artifact concentrations are interpreted as resulting from 3 occupations. The lithic artifacts are mostly core reduction debitage with four cores, a flake projectile point fragment, and a silicified wood side scraper. These artifacts suggest that the site function was generalized hunting and gathering. The site structure may represent a change in land use that occurred as population increased during the Coalition period. Archaeological testing demonstrated that all cultural materials were restricted to surface and modern soils. Substantial subsurface deposits or features were absent. Data from LA 86151 will be useful for studying land-use strategies within the Las Campanas area. Archaeological testing has revealed that LA 86151 does not have the potential to yield significant data regarding Santa Fe prehistory. No further work should be required and archaeological clearance should be granted.

**PART II. DATA RECOVERY PLAN FOR LA 86148, A BASKETMAKER II PERIOD
SITE, AND LA 86150, A COALITION PERIOD HUNTING AND GATHERING SITE**

INTRODUCTION

Two archaeological sites, LA 86148 and LA 86150, in Estates IV of Las Campanas de Santa Fe, Santa Fe County, have been determined to have the potential to yield important information about Las Campanas and Santa Fe prehistory. In compliance with Santa Fe County Ordinance 1988-8, a data recovery plan is provided that addresses the data potential of the two sites. LA 86148 and LA 86151 were originally recorded by Southwest Archaeological Consultants, Inc. (SAC) and were described in Southwest Report 305 (Scheick and Viklund 1992). The sites were revisited by OAS staff, at which time the artifact distribution was flagged and the site limits were more carefully defined. The evaluation of the site data potential is based on the survey description and the OAS examination.

As part of the ongoing research at Las Campanas de Santa Fe, SAC developed a research design for addressing the data potential of the Estates I and II sites (Scheick 1991a). Most of the prehistoric sites were limited activity or hunting and gathering sites. The research design focused on small site variability in terms of artifact assemblages, site formation, structure, and function, and the economic and environmental factors that contributed to site location and function. This variability was to be studied from geographical and chronological perspectives. The underlying theme was that inhabitants of the upper Middle Rio Grande Valley were organized to exploit the resources of the riverine, piedmont, foothill, and montane environments. Through time, subsistence and technological strategies were altered in response to changes in resource availability and distribution, population, and social organization. Exploiting the resources of the different environments required subsistence and technological strategies that should be reflected in archaeological sites. Small-site data were to be used to conduct research at the site, intersite, microregional, and regional scales.

The goals of this data recovery plan will be less comprehensive than previously proposed for the SAC data recovery effort. This is because the site sample is small and the SAC data recovery efforts are, to date, unpublished, except for rough draft descriptive preliminary reports. These two factors render synthetic interpretations based on the OAS data recovery effort premature and potentially spurious. Instead, the OAS data recovery effort will choose research questions that can be dealt with using more site-specific data. Intersite comparisons and interpretations on a regional level will be offered as is appropriate given the data that are recovered.

This data recovery plan will be divided into a brief description of each site (more detailed information are provided in Scheick and Viklund 1992), a brief summary of the cultural-historical and functional context, and research questions for each site. The excavation and analysis methods will not necessarily follow the SAC plan, but the data should be comparable to the SAC results. The sites will be presented in chronological order.

Site Description

The site description is derived from Scheick and Viklund (1992:24). The site is on a gentle, southwest-facing hilltop at the end of a long ridge that overlooks two drainages to the south and southwest. The drainages head near the site. The vegetation is a piñon-juniper woodland with grasses, yucca, and occasional barrel cactus. The top soil is loosely consolidated sand mixed with gravel and cobbles.

The site is 80 m long by 50 m wide (Fig. 5) covering 4,400 sq m. During the survey, 102 lithic surface artifacts were recorded. These artifacts included 7 primary reduction flakes, 73 secondary core reduction flakes, 6 biface reduction flakes, 7 pieces of angular debris, 2 projectile points, 3 tested cores, and 1 mano. A possible prehistoric checkdam, 3-m long and 1 course wide, is present. The artifact assemblage indicates that hunting, gathering, and processing may have occurred at the site.

The two projectile points are similar to En Medio phase styles described for the Oshara tradition by Irwin-Williams (1973:11-13). The En Medio phase is assigned to sites that date between 800 B.C. and A.D. 400 to 600. The latter portion of this period, A.D. 1 to 400 or 600, is often termed the Basketmaker II period according to Kidder's Pecos Classification scheme (1924). Differences between late Archaic and Basketmaker II are not well understood for the upper Middle Rio Grande Valley.

This site is unique within the Las Campanas site assemblage because of the higher than usual artifact density and the relatively abundant surface artifacts. In some areas of the site, artifact density may be as high as 10 artifacts per square meter. The artifact assemblage reflects core reduction and tool production using locally available chert and quartzite. Hunting and gathering forays were probably staged from the site as indicated by the presence of the En Medio style dart points. The mano may be an indicator of on-site processing of gathered plant foods. This combination of activities is often associated with a limited base camp occupation.

If the checkdam is prehistoric it would have been constructed during the late Coalition or Classic periods of the Rio Grande sequence. The sunken placement of the rocks indicated to the survey recorder that it was older than most of the other checkdams found in the Las Campanas area. Two factors suggest that it is probably not from prehistoric times: (1) there are no artifacts in the site assemblage that date to Coalition or Classic period; (2) the checkdam is an isolated feature. Prehistoric checkdams are usually part of a system that was designed to capture runoff and slow soil erosion. Because the checkdam cannot be unambiguously assigned to a prehistoric period, it is of limited data potential that has been exhausted by the field recording. The checkdam will not be included in the data recovery effort.

Site significance is based on the Basketmaker II projectile points that date from 800 B.C. to A.D. 400 or 600, the relatively high artifact density, and the artifact diversity, which all combine to suggest that LA 86148 is more than a limited or special activity site. Sites from this period are uncommon in the project and Santa Fe areas. However, recent studies (Lang 1992;

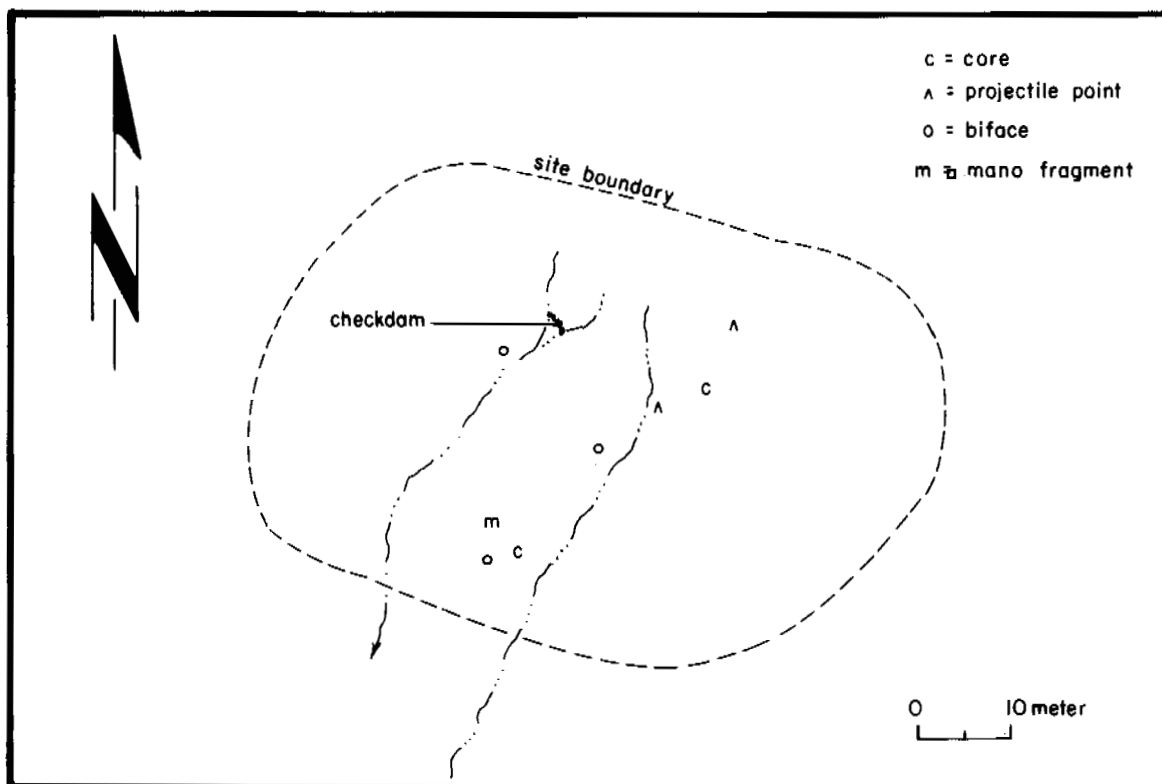


Figure 5. LA 86148, site map.

Biella 1992; Lent 1988, 1991; Moore 1989) indicate that late Archaic and Basketmaker II sites are more numerous than suggested by early studies. Basketmaker II period remains are the earliest site-based temporal component that can be used to address settlement and subsistence patterns of the Las Campanas area.

Research Questions

Previous late Archaic-Basketmaker II period research in the Santa Fe area has focused on site specific and regional problems. The Cochiti Reservoir and Dam study examined relationships between site locations and vegetative diversity, site size and artifact density, group size and feature frequency, and subsistence remains and seasonality (Chapman 1979). The Airport Road site (LA 61282) study focused on problems of population increase through immigration or indigenous growth, comparisons between logistical and residential sites using artifact assemblages and site structure, regional Archaic settlement patterns as reflected by nonlocal materials, the relationship between artifact assemblage and site function, and interregional differences in site structure and artifact assemblage reflecting use of different environments (Lent 1988:17-18).

The Las Campanas research design (Scheick 1991a:26-27) focuses on land-use patterns on the piedmont slope including temporal variability, site function and placement, and changes in regional socioeconomic organization. Within these broad issues are more site-oriented

problems of occupation history, subsistence activities, site variability, and lithic raw material procurement and reduction. Problems of a more projectwide scope include determining and reconstructing settlement and subsistence strategies on the piedmont slopes and their role within regional adaptations.

These problem domains can be addressed at site, local, regional, and interregional scales. A research design's effectiveness for dealing with the problems at different scales is conditioned by the number of sites, the availability of absolute dates, the artifact assemblage, structure of the sites, and the integrity and preservation of the archaeological deposit. The ability to deal with direct questions about site function and its role in a local and regional system depends heavily on preservation of plant and animal remains. Problems of group size and composition rely on inferences about artifact and feature assemblages that draw extensively on ethnographic analogy and ethnoarchaeological observation and replication studies.

Based on local and regional data and problem orientations, data recovery at LA 86148 can be used to address problems that focus on chronology, subsistence activities, and subsistence range. Research problems will be mainly focused at the site level. Problems at the regional and interregional scale will be addressed if appropriate data are collected.

Chronology

Where does LA 86148 fit within the late Archaic-Basketmaker II period? As straightforward as this question is, it is still the starting point for any study that would address change at the spatial scale. Archaeologists may hypothesize endlessly about changes in settlement and subsistence during the late Archaic-Basketmaker II period, but without absolute dates, there is uncertainty whether a site should be studied on a temporal or functional continuum.

The LA 86148 artifact assemblage seems to be from a single occupation. This assumption is supported by two observations: (1) the two projectile points are made in an identical fashion and are from the same raw material; and (2) only a few pieces of ground stone were present, suggesting a single tool kit. Temporal data would therefore be important for understanding where the LA 86148 occupation fits into the regional chronology. Does LA 86148 represent the continuation of an apparently stable pattern of hunting and gathering that typifies the late Archaic period, or was LA 86148 occupied during the Basketmaker II period when mobility decreased and reliance on horticulture increased?

Data Needs. To obtain absolute dates, appropriate chronometric methods need to be employed. Appropriate chronometric methods would provide a median date and date range that are less than the 1,400-year span of the late Archaic-Basketmaker II period. The best methods would yield a date range that is less than the early (800 to 1 B.C.) and late (A.D. 1 to 400) spans of the period. Chronometric methods that can fulfill this requirement are radiocarbon, obsidian, dendrochronological, and archaeomagnetic dating.

Dendrochronology is not an appropriate method because tree-ring profiles are not available for the late Archaic-Basketmaker II period. If dendrochronological specimens are encountered they will be collected and banked against the time that an appropriate curve is available.

Archaeomagnetic dating relies on the iron content of soil. Iron content in the field is gauged by how much iron oxidation results when soil is burned. At LA 84758, in the Las Campanas area, numerous burned features were excavated. Iron oxidation of these features was minimal or nonexistent. LA 84758 results suggest that archaeomagnetic dating has low potential for LA 86148.

Obsidian hydration is receiving increased use for dating a variety of contexts in the upper Middle Rio Grande. Generally, surface contexts provide the most suspect dates because of built-in error factors. Obsidian hydration from shallow contexts have a lower built-in error factor, but the samples are still of questionable reliability. Obsidian samples retrieved from more than 50 cm below the surface have the best chance to yield reliable dates. Temperature and humidity variability that afflict samples from shallower contexts is reduced. Obsidian will be collected from LA 86148. Samples from shallow contexts will only be used if samples from deeper contexts or no other chronometric samples are recovered. If obsidian is obtained from 50 cm or deeper below the modern ground surface up to 10 samples will be processed to provide a date range and a means for assessing the reliability of the dates.

Radiocarbon dating is the most often used method because carbonized material tends to be abundant or at least present on sites in a wide range of environmental and geographic settings. As Smiley (1985) pointed out, the error factors that affect radiocarbon are multitudinous. Many of the factors cause only small error and can be more or less ignored. Factors such as use of old or inner wood, however, results in errors of up to 500 years. Because these large error factors can heavily skew an absolute date, care is necessary in selecting carbon samples for processing. Charcoal will be collected whenever it is abundant or comes from a well-controlled provenience, such as the bottom of a feature. The charcoal samples will be sorted in the laboratory. Seeds, twigs, or annuals will be given first priority for processing. If only small quantities are available, then extended count or accelerated methods will be considered. If only old wood is available, then a small number of samples will be processed, but with the knowledge that the results may be too early.

Subsistence

What were the subsistence activities and can they be tied to a particular season? Subsistence can be directly inferred from dietary evidence and indirectly investigated by studying the technology used to procure and process foods. Dietary evidence includes faunal and floral remains. Seasonality can be inferred from the plant and animal remains if diagnostic portions of plants or animal skeletons are recovered. Technological evidence is inferred from the study of chipped and ground stone manufacture and use. Dietary evidence may be collected, but the prospects are low. Technological evidence is abundant in the form of the chipped and ground stone.

As has been previously discussed, the late Archaic-Basketmaker II subsistence pattern included a broad spectrum of edible plants and small- and medium-sized mammals. The abundance and distribution of food resources combined with access to critical nonfood resources probably strongly influenced location of residential sites, length of occupation, and the type of strategy that was used to obtain and process resources.

Different hunting and gathering strategies may be reflected in the artifact assemblage. For example, an abundance of plant resources would require an efficient procurement strategy with less effort expended on the procurement of less reliable resources. In other words, if abundant plant resources were available, then tool production and use would have focused on gathering and processing. Presumably, a lithic artifact assemblage that is mostly geared to plant gathering and processing would have more expedient or generalized tools and fewer tools and manufacture debris from hunting. Conversely, if plant gathering could not fulfill subsistence needs and hunting was more important, artifact assemblages and features should reflect hunting and deemphasize plant gathering and processing. Residential occupations that occurred from the late spring to the early fall when plant and animal resources were available should have assemblages that reflect mixed activities. Late fall to early spring occupations occur when plant foods are less abundant to nonexistent. Evidence for use of stored foods or an increased reliance on game mammals should be reflected in the artifact assemblage. LA 86148 may have an artifact assemblage that can be studied from the perspective of generalized versus specialized technology.

Site types and distribution should reflect subsistence strategy. Forager and collector hunting and gathering models are used to organize site types and explain their distribution across a landscape (Binford 1983b; Elyea and Hogan 1983; Fuller 1989). Foragers are characterized as residentially mobile and collectors are logistically mobile. Both models employ a functional site typology that includes a residential base camp, limited base camp, special activity sites, and resource extraction sites. Usually, Archaic period hunter-gatherers are described as being flexible with the subsistence strategy varying according to season and resource distribution. In other words, foraging and collecting were employed as was required by environmental conditions. For the upper Middle Rio Grande use of the forager-collector models are limited by a lack of data from large contiguous areas and an absence of a synthesis of existing data from a forager-collector perspective. LA 86148 can be examined from the perspective of forager-collector models, although the strength of the conclusions will be affected by a small site database and the limited number of absolute dates.

Data Needs. The subsistence and seasonality problem can be addressed using floral and faunal remains and the artifact assemblage. Floral and faunal remains are unlikely to be abundant at the site. The site is on a ridge top and may have a shallow cultural deposit. Floral and faunal remains do not preserve well in open-air contexts, therefore any floral or faunal remains may reflect a very small part of what was actually used. Lithic artifacts are often the only material culture evidence remaining at open-air pre-Pueblo period sites.

Floral and faunal remains may be present in very low abundance. Contexts where they might occur are hearths, storage pits, and in deep midden deposits. Deep midden deposits are unlikely at LA 86148 because it is a ridge top site with a very slow rate of soil formation or deposition. A midden deposit is more apt to be spread out than buried and preserved. Floor contact would be from within a pit structure. If storage pits are present, then pollen samples can be collected from the pit floors. Hearths are the most likely feature that will be found at LA 86148, and they have better potential than other feature types for yielding macrobotanical remains. In an effort to obtain macrobotanical specimens, all fill from hearths will be collected for processing and analysis. Hearths also may yield fragmentary faunal remains. Collecting 100 percent of the hearth fill will increase the chance that faunal remains will be recovered.

Chipped and ground stone are abundant relative to other Las Campanas sites. During the survey, approximately 100 artifacts were recorded, including core and biface reduction debris, projectile points, a biface fragment, and ground stone. As indirect evidence of subsistence, chipped stone and ground stone artifacts can be analyzed in a number of ways. Technological information can be derived from artifact attribute analysis and by looking at the assemblage distribution across the site. Relative percentages of different types of debris may indicate a focus on specialized, expedient, or generalized tool production. Analysis of tool edges provides data on tool use.

To address the seasonality problem with the chipped and ground stone data, the site history must be understood. Artifact distributions can be monitored to determine if spatial patterns reflect single or multiple occupations. Artifact distributions can be plotted in relation to features to define activity areas and occupation episodes. Planned discard occurs when a longer occupation is anticipated (Kent 1992). Artifact concentrations may occur peripheral to features, as work areas are cleaned of large or potentially harmful debris. If debris was discarded in a single area, then a high density concentration would be present. Debris that was scattered may appear as a medium to high density halo around the work area. More evenly distributed low to medium density discard patterns may indicate sheet-trash deposits resulting from brief multiple occupations. Lithic artifact collections will be made in ways that allow density plots and artifact distributions to be created and analyzed. If multiple occupations are indicated by the artifact and feature distributions, then conclusions about seasonality and the subsistence focus will be weakened.

Subsistence Range

What was the Las Campanas late Archaic-Basketmaker II period hunter-gatherers annual subsistence range? Identification of subsistence range primarily relies on the identification of nonlocal lithic raw material types, the interpretation of site function, and the identification of functionally different components of an annual settlement pattern that are contemporaneous (Powers and Larson, in Biella 1992). In the Four Corners area, identification of Archaic groups and their range has focused on distribution of Jemez obsidian, Pedernal chert, and Washington Pass chert. These studies assume that the Archaic groups moved annually between the lower elevations of the San Juan Basin and the Chuska and Jemez Mountains. The annual round suggested for San Juan Basin groups tends to be areally extensive with a small number of groups occupying the San Juan Basin and its periphery at any one time.

Subsistence ranges for upper Middle Rio Grande late Archaic-Basketmaker II groups are not well understood. Based on the Cochiti Reservoir and Dam data, Chapman (1979) has suggested that late Archaic groups consisted of one or two families that annually moved between the Rio Grande Valley and the mid-elevations of the Jemez Mountains. Citing different plant maturation schedules and game animal habits, he suggested that the riverine environment support warm weather occupations, while late fall and winter occupations may have been in higher elevations on top of the Pajarito Plateau where game mammals wintered. Late Archaic-Basketmaker II annual movement occurred from lower to higher elevations and north and south along the Rio Grande. Movement within this range would be partly conditioned by proximity to other groups.

Excavation probably will not provide direct evidence of the annual range of Las Campanas late Archaic-Basketmaker II groups. The data base is too small and the distribution and nature of upper elevation sites of the Sangre de Cristo Mountains are not well known. Evidence of annual round may be derived from identification of nonlocal lithic raw materials such as Jemez obsidian, Madera chert from noncobble sources, or fine-grained basalt from the Cochiti area. Because locally available lithic raw material is abundant, it is expected that they would be used for expedient or generalized tool manufacture. Nonlocal materials may occur as discarded broken or exhausted tools that were made and brought from a distant location.

Contemporaneity between different subsistence range components also will be difficult to demonstrate. As previously discussed, the dating techniques have limitations that may only allow a site or sites to be dated within a generation or two of their actual occupation. Different sites from the same period, however, may in a general way reflect the subsistence range.

Excavation of LA 84758, a late Archaic-Basketmaker II site in Las Campanas, provides a substantial data base with which other sites from this period can be compared. The site had at least three occupation episodes of short and long duration. The early part of the occupation evidence looks like a limited activity or processing site with hearths and roasting pits, but no structure. The later occupation is more sedentary with structural remains associated with intramural and exterior hearths and abundant evidence of expedient core reduction and food processing and some evidence chipped stone tool production. Ethnobotanical analysis is not yet complete and the occupation profiles are still preliminary. It does appear that LA 84758 may reflect a changing settlement and subsistence pattern with the Las Campanas area being the focus of foraging activities and a suitable location for seasonal habitation. Lithic raw material distribution and ethnobotanical remains from LA 86148 will be compared with LA 84758 and the Cochiti Dam and Reservoir sites for differences that result from changes in subsistence range.

Data Needs. Data needs for investigation of subsistence range are nonlocal lithic materials and ethnobotanical and faunal remains.

Ethnobotanical remains may be recovered from hearths, storage pits, floor contact, and in deep midden deposits. The potential for recovering ethnobotanical remains from these contexts has already been discussed. Nonlocal lithic materials will be recognized in the laboratory. Reports describing raw material source areas will be consulted and used to outline a potential subsistence range.

LA 86150 (290-26)

Site Description

LA 86150 is a Coalition period (A.D. 1200 to 1325 or 1350) sherd and lithic scatter previously described in Scheick and Viklund (1992:25). It is on a gentle, dissected, south-facing slope. The site extends along the south bank of a deeply entrenched secondary arroyo that drains a large portion of the south-central portion of the Las Campanas area. Most of the artifacts are

visible in large deflated areas. The vegetation is typical of piñon-juniper woodland. The soils are unconsolidated sand mixed with gravel and cobbles.

LA 86150 consists of three discrete sherd and lithic concentrations, a light scatter of lithic artifacts, and possibly six hearths or roasting pits. The site covers 6,000 sq m and is 120 m east-west by 50 m north-south (Fig. 6).

The easternmost concentration has two sherds of Santa Fe Black-on-white, less than 50 pieces of chipped stone debris, and at least one soil stain that is probably a roasting pit. The concentration roughly covers a 30 m north-south by 40 m east-west area.

The middle concentration consists of 18 chert core reduction flakes and 3 bowl sherds of Santa Fe Black-on-white. No soil stains or rock features were associated with the concentration, but two possible hearths are located outside the concentration. The concentration covers a 30-m-diameter area.

The westernmost concentration consists of less than 50 chert core reduction flakes, 12 Santa Fe Black-on-white bowl sherds, a metate fragment, and three soil stains or rock concentrations that are probably features. The concentration covers a 42 m north-south by 25 m east-west area.

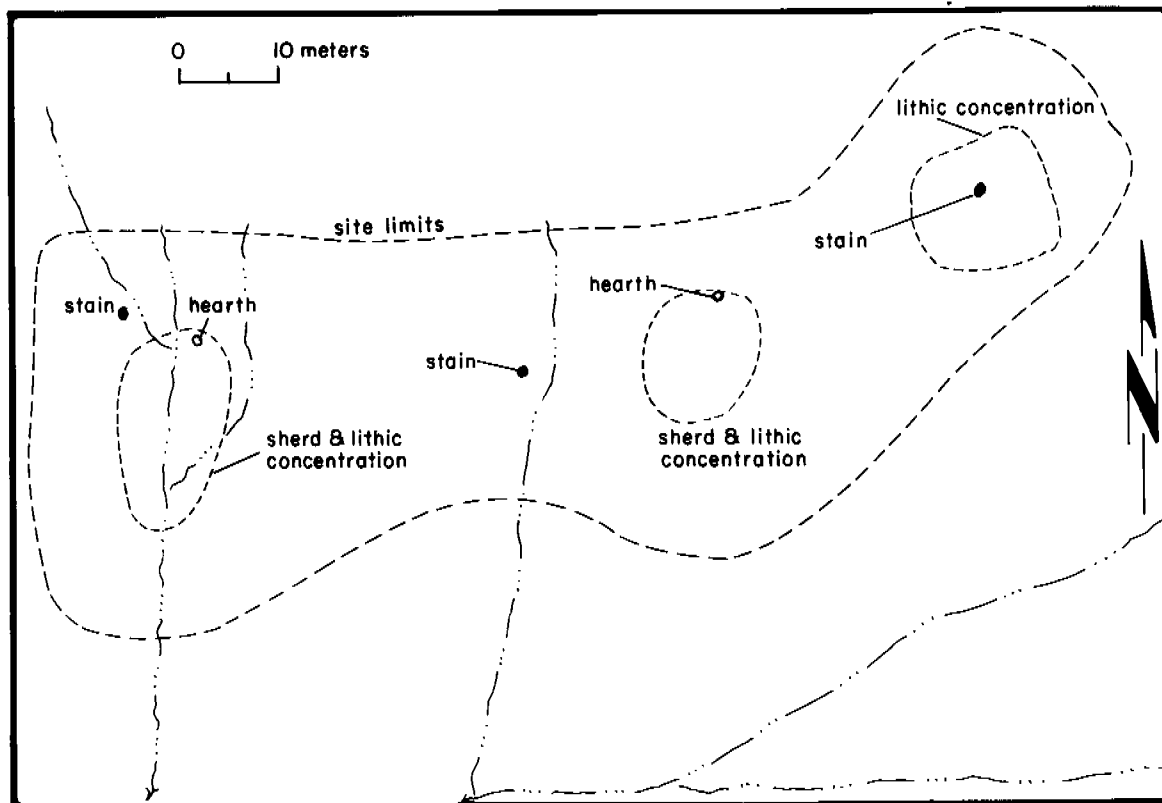


Figure 6. LA 86150, site map.

LA 86150 is important because it may represent a change in foraging strategy by Coalition period populations of the Santa Fe River Valley or the southeast Pajarito Plateau. Until the Coalition period, most dated sites consist of a single occupation or were occasionally reoccupied. Single component Coalition period sites exist within the Las Campanas area. They may represent a continuation of the more land extensive foraging pattern during the early part of the period when the population levels were still relatively stable. Evidence of reoccupation at LA 86150, LA 86151, and LA 98690 may indicate that foraging strategies were changing as population increased. Single and multicomponent Coalition period sites can be compared for differences that may reflect different foraging strategies or use of the area by different people.

Research Questions

In the Las Campanas area, 21 sites date between A.D. 1200 and 1325. Furthermore, about 40 percent of the isolated sherds from all periods date to the Coalition period. Generally, the Coalition period sites range from 300 to 2,800 sq m in area with two sites extending over 10,000 sq m. The lithic artifacts are mostly core reduction flakes with ground stone and bifaces only occasionally present. The low frequency of bifacial tools and ground stone at these sites suggests they were resource extraction loci with processing or consumption occurring at the residence. Hunting may have been staged from these sites, but there is little evidence of tool production or maintenance. As mentioned above, three sites were reoccupied at least twice during the Coalition period. Isolated Santa Fe Black-on-white sherds are clustered around LA 86150 and LA 98690, reinforcing the view that these areas were more intensively used. In terms of site structure and formation, LA 86150 and LA 98690 appear to be different from earlier or later sites in the Las Campanas area. The research will focus on differences between LA 86150 and other sites and what the differences suggest about Coalition period foraging strategies and land use. Insight about which populations most actively used the Las Campanas area may be gained from pottery temper and paste data.

Site Function

What activities are represented by LA 86150 artifacts and features? The Las Campanas site assemblage includes 240 sites that are undated or predate the beginning of the Territorial period (A.D. 1848) (Post 1992:20). Few of these sites had temporary structures and none had permanent or substantial structures. Testing and excavation have revealed that most of these sites reflect a limited number and range of activities. Most of the activities are related to the procurement of nonfood resources, gathering, and occasional processing of plant resources, and the hunting of small- or medium-sized game mammals. A low number of sites have evidence of bifacial tool production, use, and discard, which would be expected if hunting was the primary activity. For all periods, hunting was probably staged from residential sites as is suggested by the more common occurrence of hunting-related tools as isolated occurrences. Generalized or expedient tool production and use is most common--as if Las Campanas users were exploiting a wide variety of plant and natural resources. For instance, 62 plant species with potential human uses have been identified for the piedmont and Las Campanas area (Kelley 1980).

Data Needs. Determination or inferences about site function rely on a combination of information on feature function, artifact assemblage, and site structure data. LA 86150 has at least six possible hearths or roasting pits, a varied artifact assemblage, and apparent spatial relationships between features and artifacts forming discrete activity or occupation areas.

Feature function can be directly inferred from charred remains recovered from primary feature fill deposits. The presence of burned seeds and seed or plant parts represent a portion of what was processed. Broad or narrow spectrum subsistence activities may be represented by the range of ethnobotanical specimens recovered from features. The recovery of charred animal bone would indicate that the feature was used to consume meat. Ethnobotanical and faunal remains have been scarce in Las Campanas feature deposits, therefore large samples will be collected to increase the chance that charred specimens will be recovered.

Inferences about site function based on artifact assemblage data are mainly drawn from ethnographic and replication studies. Studies of lithic technologies and tool use and wear provide the basis for assigning reduction debris and tool assemblages to general functional classes. Debitage and tool analysis will focus on identifying patterns in artifact attributes that reflect raw material reduction, tool production, and tool use and maintenance.

Site structure or the spatial relationships between artifact classes and attributes and features indirectly reflects the site function. Patterned relationships between artifact types and features may further strengthen observations derived from artifact and feature data. Highly clustered artifact and feature relationships enhance the assumption that the artifacts and features are related. Concentrated refuse deposits may indicate a longer occupation that required a maintained activity area. Dispersed scatters may indicate brief occupations, and spatial requirements would therefore be unnecessary.

Changing Subsistence Strategy

Does LA 86150 represent a change in subsistence strategy during the Coalition period when compared to earlier or later sites? Through time, available Las Campanas natural resources probably showed little change with regard to diversity. Even though the available natural resources may have been similar, emphasis on obtaining a particular food or natural resource may have changed. A change in exploitation strategy may have resulted from differential abundance or distribution of resources or in response to changing technology (for example, clay resources may have been exploited after A.D. 800).

Changes in resource exploitation strategy might have been necessary as population and competition for available resources increased during the Coalition and Classic periods. Resources close to residential areas or villages may have been depleted first, or in some way controlled at household or supra-household levels. Use of more distant areas would have required new strategies for transport and intermediate storage including the use of short-duration base camps. If more distant areas were used, then there may be evidence in the spatial arrangements of features and artifacts and in the occurrence of different artifact types that might reflect longer duration occupation.

LA 86150 may be a site that reflects a change in foraging strategy during the Coalition period. To test this assumption, the artifact assemblage composition, feature construction and content, and the relationships between features and artifacts can be examined for patterns. The results can be compared with other reoccupied sites and single component sites.

Data Needs. Site structure and functional analysis rely on the morphological, technological, and functional attributes of artifacts, artifact assemblage composition, and the spatial relationships among attributes, artifacts, and features. This data can be collected from LA 86150.

Site structure or spatial relationships are important for understanding site history. Discrimination between occupation episodes leads to inferences about the activities that occurred during different occupations. Intrasite artifact and feature relationships may provide information on changing site use. The LA 86150 assemblage can be compared with other Coalition period sites from all settings. Sites with evidence of more than one occupation can be compared for similarities that would suggest that they represent a similar foraging strategy. Sites with a single occupation can be compared with reoccupied sites to determine if similarities are restricted to reoccupied sites or if they extend to all Coalition period sites. Intersite comparisons with earlier, later, and undated components will allow an assessment of foraging patterns through time. Comparisons with other Las Campanas sites will depend on the availability of assemblage and site structure data.

Land Tenure

Who used the Las Campanas area during the Coalition period? This question suggests that the Las Campanas area could have been used by residents of more than one area. The Las Campanas area is located between the Santa Fe River Valley and the southeast Pajarito Plateau. Both areas were occupied during the Coalition period. The first major occupation at Pindi Pueblo was between A.D. 1270 and 1290. Agua Fria Schoolhouse site and Cieneguitas were probably occupied at this time as well. The residents of these Santa Fe River Valley villages would have used the piedmont hills between the Santa Fe River and the Rio Grande for hunting and gathering. As described in the Archaeological Background section, the most abundant evidence of Las Campanas use dates to the Coalition period, when the three villages were occupied. To the north, along the edge of the Caja del Rio on the east side of the Rio Grande, and on the rim of the Pajarito Plateau on the west side of the Rio Grande, Coalition period villages were also occupied. Two of the closer sites are LA 174 (Caja del Rio Pueblo) and LA 211 (Sankawi). These were medium-sized villages during the Coalition period. Their residents also would have relied on piñon-juniper woodlands for hunting and gathering.

The Las Campanas area is 5 to 7 km from the Santa Fe River Valley. The Pajarito Plateau and Caja del Rio villages are 17 to 21 km distant. Based on distance alone, the Santa Fe River residents would be expected to be the most frequent users. However, the presence of tuff-tempered sherds on Las Campanas area sites suggests that Pajarito Plateau and Caja del Rio villagers also used the area (Post 1992:97). As populations of the two areas expanded during the late Coalition and early Classic period more distant, resource areas would have been exploited to supplement a farming-based diet. The presence of Santa Fe Black-on-white, a pottery type common to Santa Fe River Valley and Pajarito Plateau and Caja del Rio villages, allows a general assessment of who was the most frequent user of the Las Campanas area.

Data Needs. The three activity areas at LA 86150 have one or more vessels of Santa Fe Black-on-white. The pottery temper and paste can be examined for characteristics that are indicative of Santa Fe River Valley or Pajarito Plateau manufacture. The Santa Fe River Valley pottery has fine-grained paste and subrounded quartz and feldspar temper (Lang and Scheick 1989:62). Santa Fe Black-on-white pastes from the Pajarito Plateau are also fine but contain tuff fragments in combination with quartz, feldspar, hornblende, biotite, or muscovite (Lang and Scheick 1989:62). As pottery paste data from other Coalition period sites in the Las Campanas area become available, the frequency and distribution of the different paste types can be examined to see if there are consistent patterns that support observations about land use and tenure.

FIELD AND LABORATORY METHODS

LA 86148 and LA 86150 consist of components that can be divided into surface artifact concentrations, scatters, and features. The general excavation and recording methods will be the same for both sites. Excavation and analysis methodology will be tailored to suit the site configuration and research issues.

Field Methods

The following are the general and specific field methods that will be used at each site:

1. Each site surface will be reexamined and the concentrations, artifact scatters, features, and site limits will be pinflagged.
2. All surface artifacts will be collected. The method will depend on the distribution.

At LA 86150, concentrations will be collected using 1-by-1-m grid units. The size of the collection area will depend on the concentration size. Artifacts that are well outside the main collection areas will be piece-plotted with a transit and 30-m measuring tape.

At LA 86148, artifacts within concentrations will be pinflagged, but will be collected as part of the surface strip. Artifacts within concentrations will not be collected before surface stripping because the surface and surface strip deposits have been mixed by various visits to the site to flag artifacts and establish baselines. Artifacts that are well outside the main collection areas will be piece-plotted with a transit and 30-m measuring tape.

3. A 1-by-1-m grid system will be superimposed across each site. Each 1-by-1-m collection unit will have a north and east designation. The signature corner will be the northeast corner. All artifacts within collection grids will be placed in bags with the grid designation. Piece-plotted artifacts will be assigned consecutive numbers and will be integrated into the grid system in the lab using a computer mapping program.

4. Excavation of the two sites will emphasize data collection from contiguous units to support site structure analysis. The excavation methods will include a combination of surface stripping and deeper grid excavation.

The artifact concentrations will be entirely surface stripped in 1-by-1-m grids. Artifact density from each unit will be monitored. Grids with the highest numbers of artifacts will be further excavated in 1-by-1-m grids. At LA 86148, at least eight 1-by-1-m units within each concentration will be excavated. At LA 86150, up to four 1-by-1-m units will be excavated within each concentration depending on the artifact density. This will provide the best indication of the range of site activities and will indicate if deeper subsurface cultural deposits exist.

5. No surface indications of features were identified at LA 86148. Features will be considered indicators of an occupation level. The area surrounding the feature will be surface stripped at a level commensurate with the top of the feature. If a feature is found in a 1-by-1-m excavation unit below the surface strip, then a 2-by-2-m area around the feature will be excavated to the top of the feature. If artifacts or stained soil are evident, then more area will be exposed as is necessary to determine the nature of the feature or artifact distribution.

At least six hearths or roasting pits may be present at LA 86150. If these features are within artifact concentrations, their limits will be defined by surface stripping. Surface stripping will proceed at the level where the feature outline can be defined. If features are exposed in the 1-by-1-m excavation units, then they will be treated as described for LA 86148. Features that are not associated with artifact concentrations will be excavated by exposing a 2-by-2-m area until the feature outline is defined. If more features or artifact concentrations are encountered during feature excavation, then the 2-by-2-m area will be expanded to define their nature and limits.

6. Excavation will be by hand, using standard archaeological hand tools. All fill will be screened, with the mesh size determined by the excavation context. Screen mesh no larger than ¼-inch will be used. All 1-by-1-m excavation units will be excavated in 10-cm levels. If cultural strata are encountered, they will become the excavation unit. Within these strata, 10-cm excavation levels will be used to provide finer control of artifact locations. The 10-cm levels will allow comparisons between excavation units using density and volume measures.

As excavation proceeds, diagnostic and large artifacts or potential structural components of features will be mapped using the closest set point. Mapping of large artifacts or disarticulated feature components will aid in the identification of occupation levels or surfaces.

Excavation will continue until noncultural material-bearing soils are encountered. To insure that non-cultural material-bearing soils have been reached, auger holes will be placed in the bottom of selected units.

Excavation documentation will consist of field notes and grid forms compiled by the excavator. The forms will contain locational, dimensional, stratigraphic, and contextual information. General notes outlining excavation strategy and rationale, field interpretations, and decisions will be kept by the project director and site assistants.

7. Feature excavation will proceed by exposing the top of the feature and the area immediately surrounding it. The stain or soil change will be mapped and photographed (if appropriate). All the soil from within the feature will be collected for water-screening in the lab. Bags of soil will be separated by 10-cm levels. In the unlikely event that large features are encountered, 20-cm levels may be used to remove the overburden. From large features, soil samples will be collected from contexts that appear to be the most promising for ethnobotanical and faunal remains. The feature will be excavated in cross section in 10-cm levels, exposing the natural stratigraphy. Exposed artifacts or components will be located as described above. Artifacts that are noticed within each level will be bagged separately and added to the artifacts recovered by water screening. The exposed cross section will be profiled and the soil levels described using a Munsell Color Chart and standard geomorphological terms. The second half of the feature will be excavated in natural levels or 10-cm arbitrary levels. All the soil will be collected for water screening, if possible.

Once the feature is completely excavated, feature maps and profiles will be drawn and tied into the grid system and absolute elevations. Drawings will include a scale, north arrow, and key to abbreviations and symbols. Written description will be done on standard forms that will include provenience, dimensions, soil matrix, artifact, construction, time frame, excavation technique, and other data. Photographs will record the feature excavation progress and the final excavated form. Photographs will include a metric scale, north arrow, and mug board with the LA, feature number, and date. All photographs will be recorded on a photo data sheet.

Artifacts recovered from each provenience will be bagged and labeled by unit, stratigraphic or arbitrary level, date, and excavator's name. A specimen number will be assigned to all bags by provenience and a running field artifact catalogue maintained for each site. Materials necessary for immediate preservation of fragmentary and unstable faunal and ethnobotanical remains will be used. Large lithic artifacts will be bagged separately to minimize bag wear. Very small flakes and angular debris will be placed in vials or bags within the artifact bag so they are not lost during cleaning.

8. C-14 samples will be collected from features and other possible cultural contexts. Samples will be ranked according to their context and data potential. Preferred samples should lack sources of potential contamination from burrows and nests, prolonged exposure during excavation, and proximity to modern surfaces or disturbance. First priority samples will be taken from lower strata and feature floors and interiors. Second priority samples will come from upper feature fill or proveniences that exhibit limited evidence of disturbance. If first and second priority sample proveniences are absent, the third priority samples from disturbed or less intact contexts will be collected.

After the hearths, roasting pits, or other pit features are cross sectioned, the sample potential will be assessed. If deep features are encountered, then pollen samples may be collected separately from the soil that will be water screened. For pollen samples, 2 tbsp will be collected from the best strata. The samples will be put into plastic bags that have been kept sealed. If burned seeds or wood are encountered, up to 20 g will be collected for radiocarbon analysis. All samples will be collected with a dry, clean, trowel or tweezers and placed immediately into a bag or tin foil. Carbon samples will only be collected from first- and second-priority contexts, unless third-priority contexts are all that are available. Archaeomagnetic samples will be collected according to the processing laboratory standards.

Sample locations will be plotted on plan and profile drawings of features and proveniences. The sample bags will be labeled with the provenience designation, feature number, location within the feature, and stratigraphic position. The samples will also be recorded on specimen forms with labeling information, environmental data, contextual information, and any other comments that may be useful to the laboratory analyst.

9. It is highly unlikely that human remains will be encountered. However, the procedures outlined in Appendix 3 are offered as a guideline in the event that they are encountered. These procedures are based on OAS, Museum of New Mexico, and legally defined guidelines.

Laboratory Methods

Before artifact analysis, all recovered materials will be cleaned, and any materials requiring conservation will be treated. Collected samples of charcoal and ethnobotanical remains will be processed and prepared for shipment to the appropriate laboratory. The specialists will be consulted for special preparations required before shipment. Working copies of field maps and feature drawings will be prepared and made available to the special analysts.

The lithic artifact analysis will follow the guidelines of the Office of Archaeological Studies Lithic Artifact Analysis Manual. The lithic analysis is particularly suited to monitoring technological organization. Morphological and functional attributes emphasize reduction stage, manufacture and maintenance, and tool use and discard. These are the main foci of the research orientation and implementation.

The ceramics will be identified according to existing regional typologies for the Middle and Northern Rio Grande. Sources of information may include Stubbs and Stallings (1953), Lang and Scheick (1989), Mera (1935), and Chapman and Enloe (1977). The primary foci of the ceramic analysis will be dating, function, use-life, and source of manufacture.

Faunal remains will be analyzed in the OAS Laboratory by Linda Mick-O'Hara. Depending of the size, condition, and preservation of the specimens, they will be monitored for species, sex, age, portion, condition, evidence of butchering, and evidence of taphonomic processes. Faunal remains are important indicators of subsistence strategy and site formation. The detail of the analysis will be tempered by the abundance and condition of the faunal remains.

Upon completion of the attribute identification, the coded data will be entered into a DBase III or Statistical Package for the Social Sciences (SPSS) data entry program. Statistical manipulation of the data base will be performed using SPSS PC + Version 3. Statistical tests will be geared towards examining patterns in artifact distribution that reflect technological organization. Tests and analytical techniques that may be used include Chi-square tests for independence, correspondence, and cluster analysis to identify similar assemblages within the Las Campanas area. Results of the tests will be illustrated with graphs, tables, charts, and distribution maps. The computerized data base may be used to generate a project artifact catalogue. Artifacts with attributes important to analysis and site interpretation will be illustrated for the report.

Laboratory analysis of collected pollen samples will be conducted by a professionally recognized independent consultant. The flotation and macrobotanical remains will be analyzed at the Office of Archaeological Studies by the staff ethnobotanist. The analyses will identify plant resources that were used prehistorically.

Carbon-14 dating will be conducted by Beta Analytic, Inc., of Coral Gables, Florida. Archaeomagnetic analysis will be conducted by Dr. Daniel Wolfman, on staff at the Office of Archaeological Studies. The purpose of these analyses will be to obtain the most accurate range of dates possible for cultural strata and features. Obsidian hydration will be contracted with a consultant that can provide sourcing, measurements, and date calibrations.

Research Results

The final report will be published in the Office of Archaeological Studies' *Archaeology Notes* series. The report will present all important excavation, analysis, and interpretive results. Included will be photographs, maps, and tables. Raw data such as field notes, maps, photographs, and artifact catalogues will be given to the State Historic Preservation Division, Archeological Records Management System, currently located in the Laboratory of Anthropology in Santa Fe. The artifact collection will be curated in the Museum of New Mexico's Archaeological Research Collections or a facility of Las Campanas's choice.

REFERENCES CITED

- Biella, Jan V.
1992 *LA 70029: An Archaic Basketmaker II and Coalition Phase Site on the Pajarito Plateau*. Southwest Archaeological Consultants Research Series 266. Southwest Archaeological Consultants, Inc. Santa Fe.
- Biella, Jan V., and Richard C. Chapman
1977 Survey of Cochiti Reservoir: Presentation of Data. In *Archaeological Investigations in Cochiti Reservoir, New Mexico*, vol. 1, *A Survey of Regional Variability*, edited by J. V. Biella and R. C. Chapman. University of New Mexico, Office of Contract Archeology, Albuquerque.
- Breternitz, David A.
1966 *An Appraisal of Tree-Ring Dated Pottery in the Southwest*. Anthropological Papers of the University of Arizona No. 10. Tucson.
- Belovsky, Gary E.
1988 An Optimal Foraging-Based Model of Hunter-Gatherer Population Dynamics. *Journal of Anthropological Archaeology* 7:329-372.
- Binford, Lewis R.
1983a Organization and Formation Processes: Looking at Curated Technologies. In *Working at Archaeology*, pp. 269-286. Studies in Archaeology, Academic Press.
1983b Willow Smoke and Dog's Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. In *Working at Archaeology*, pp. 337-356. Studies in Archaeology, Academic Press.
- Camilli, Eileen
1989 The Occupational History of Sites and the Interpretation of Prehistoric Technological Systems: An Example from Cedar Mesa, Utah. In *Time, Energy, and Stone Tools*, edited by R. Torrance, pp. 17-26. Cambridge University Press.
- Carter, R. H., and Paul Reiter
1933 A Report of an Archaeological Survey of the Santa Fe River Drainage. Manuscript on file, Museum of New Mexico, Laboratory of Anthropology, Santa Fe.
- Chapman, Richard C.
1979 The Archaic Occupation of White Rock Canyon. In *Archaeological Investigations in Cochiti Reservoir, New Mexico*, vol. 4, *Adaptive Change in the Northern Rio Grande Valley*, edited by J. V. Biella and R. C. Chapman. University of New Mexico, Office of Contract Archeology, Albuquerque.
1980 *The Archaic Period in the American Southwest: Facts and Fantasy*. Ph.D. dissertation.

Department of Anthropology, University of New Mexico, Albuquerque.

Chapman, Richard C., and James G. Enloe

- 1977 Survey of Cochiti Reservoir: Methodology. *Archaeological Investigations in Cochiti Reservoir, New Mexico*, vol. 1, *A Survey of Regional Variability*, edited by J. V. Biella and R. C. Chapman. University of New Mexico, Office of Contract Archeology, Albuquerque.

Cordell, Linda S.

- 1979 *A Cultural Resources Overview of the Middle Rio Grande Valley, New Mexico*. USDA Forest Service and USDI Bureau of Land Management, Santa Fe and Albuquerque.

Dickson, Bruce D. Jr.

- 1979 *Prehistoric Settlement Patterns: The Arroyo Hondo, New Mexico, Site Survey*. Arroyo Hondo Archaeological series, vol. 2. School of American Research Press, Santa Fe.

Eggan, Fred

- 1950 *Social Organizations of the Western Pueblos*. University of Chicago Press, Chicago.

Elyea, Janette M., and Patrick Hogan

- 1983 Regional Interaction: The Archaic Adaptation. In *Economy and Interaction along the Lower Chaco River*, edited by Patrick Hogan and Joseph C. Winter, pp. 393-402. Office of Contract Archeology and Maxwell Museum of Anthropology, University of New Mexico, Albuquerque.

Folks, James J.

- 1975 *Soil Survey of the Santa Fe Area, New Mexico*. United States Department of Agriculture, Soil Conservation Service.

Fritts, Harold C.

- 1965 Tree-Ring Evidence for Climatic Changes in Western North America. *Monthly Weather Review* 93:421-443.

Fuller, Steven L.

- 1989 *Research Design and Data Recovery Plan for the Animas-La Plata Project*. Four Corners Archaeological Project Report Number 15. Complete Archaeological Services Associates, Cortez, Colorado.

Gossett, Cy W., and William J. Gossett

- 1989 *Cultural Resources Inventory of 37.15 Acres (5.11 Miles of 60 ft Right-of-Way) for the Santa Fe River Trunk Sewer Project, Phases 2, 3, and 4 Santa Fe County New Mexico*. Rio Abajo Archaeological Services, Albuquerque, New Mexico.

Hannaford, Charles A.

- 1986 *Archaeological Survey of the Tierra Contenta Subdivision, Santa Fe County, New Mexico*. Laboratory of Anthropology Notes No. 356. Museum of New Mexico, Santa Fe.

- Hewett, Edgar L.
 1953 *Pajarito Plateau and its Ancient People*. School of American Research and University of New Mexico Press, Santa Fe and Albuquerque.
- Honea, Kenneth H.
 1971 LA 356: La Bolsa Site. In *Salvage Archaeology in the Galisteo Dam and Reservoir Area, New Mexico*. Museum of New Mexico, Santa Fe.
- Irwin-Williams, Cynthia
 1973 *The Oshara Tradition: Origins of Anasazi Culture*. Eastern New Mexico University Contributions in Anthropology 5(1). Portales.
- Kelley, N. Edmund
 1980 *The Contemporary Ecology of Arroyo Hondo, New Mexico*. Arroyo Hondo Archaeological Series No. 1. School of American Research Press, Santa Fe.
- Kelly, Robert
 1988 The Three Sides of a Biface. *American Antiquity* 53(4):717-734.
- Kent, Susan
 1992 Studying Variability in the Archaeological Record: An Ethnoarchaeological Model for Distinguishing Mobility Patterns. *American Antiquity* 57(4):635-660.
- Kidder, Alfred V.
 1924 *An Introduction to the Study of Southwestern Archaeology, with a Preliminary Account of the Excavations at Pecos*. Yale University Press, New Haven.
- Lang, Richard W.
 1977 *Archaeological Survey of the Upper San Cristobal Arroyo Drainage, Galisteo Basin, Santa Fe County, New Mexico*. School of American Research Contract Program. Santa Fe.
- 1980 An Archaeological Survey near Agua Fria, Santa Fe County, New Mexico. School of American Research. Manuscript on file, Museum of New Mexico, Laboratory of Anthropology, Santa Fe.
- 1989 *A Cultural Resources Survey of the Sierra del Norte Subdivision, City of Santa Fe, New Mexico*. Southwest Archaeological Consultants Research Series 232. Santa Fe.
- 1992 *Archaeological Excavations at Dos Griegos, Upper Canada de los Alamos, Santa Fe County, New Mexico: Archaic through Pueblo V*. Southwest Archaeological Consultants Research Series 283. Santa Fe.
- Lang, Richard W., and Cherie L. Scheick
 1989 *Limited Excavations at LA 2, the Agua Fria Schoolhouse Site, Agua Fria Village, Santa Fe County, New Mexico*. Southwest Archaeological Consultants Research Series 216. Santa Fe.

1991 *An Archaeological Survey at the Headwaters of Arroyos Calabasas and Frijoles, Santa Fe River Basin: The Estates II, Las Campanas Roads System*. Southwest Archaeological Consultants Research Series 285. Santa Fe.

Lent, Stephen C.

1988 *A Proposed Data Recovery Plan for LA 61282, Located adjacent to Airport Road, Santa Fe, New Mexico*. Laboratory of Anthropology Notes No. 437. Museum of New Mexico, Santa Fe.

1991 *The Excavation of a Late Archaic Pit Structure (LA 51912) near Otowi, San Ildefonso Pueblo, New Mexico*. Archaeology Notes No. 52. Office of Archaeological Studies, Museum of New Mexico, Santa Fe.

McNutt, Charles H.

1969 *Early Puebloan Occupations at Tesuque Bypass and in the Upper Rio Grande Valley*. Museum of Anthropology, Anthropological Papers No. 40. University of Michigan, Ann Arbor.

Maxwell, Timothy D.

1988 *Archaeological Survey of the Proposed Santa Fe Bypass, Santa Fe County*. Laboratory of Anthropology Notes No. 413. Museum of New Mexico, Santa Fe.

Mera, H. P.

1935 *Ceramic Clues to the Prehistory of North Central New Mexico*. Laboratory of Anthropology Technical Series Bulletin No. 8. Santa Fe, New Mexico.

1940 *Population Changes in the Rio Grande Glaze Paint Area*. Laboratory of Anthropology Technical Series 9. Santa Fe.

Moore, James L.

1989 *Data Recovery Plan for Three Sites along State Road 502, Santa Fe County, New Mexico*. Laboratory of Anthropology Notes No. 495. Museum of New Mexico, Santa Fe.

Orcutt, Janet D.

1991 *Environmental Variability and Settlement Changes on the Pajarito Plateau, New Mexico*. *American Antiquity* 56(2):315-332.

Peckham, Stewart

1974 *Site forms on file, Archeological Records Management System, Historic Preservation Division, Santa Fe*.

Post, Stephen, S.

1992 *Archaeological Survey and Testing at Las Campanas, Santa Fe County, New Mexico*. Archaeology Notes 108. Office of Archaeological Studies, Museum of New Mexico, Santa Fe.

- Post, Stephen S., and Cordelia T. Snow
 1992 *Archaeological and Historical Survey for the Richards Avenue and West Alameda Project, Santa Fe, New Mexico*. Archaeology Notes No. 62. Office of Archaeological Studies, Museum of New Mexico, Santa Fe.
- Pruecel, Robert W.
 1987 Settlement Succession on the Pajarito Plateau, New Mexico. *The Kiva* 53(1):3-33.
- Rose, Martin R., Jeffrey S. Dean, and William J. Robinson
 1981 *The Past Climate of Arroyo Hondo, New Mexico, Reconstructed from Tree Rings*. Arroyo Hondo Archaeological Series 4. School of American Research, Santa Fe.
- Reed, Erik K.
 1949 Sources of Upper Rio Grande Pueblo Culture and Population. *El Palacio* 56:163-184.
- Sayles, E. B.
 1983 *The Cochise Cultural Sequence in Southeastern Arizona*. Anthropological Papers of the University of Arizona, no. 42. Tucson.
- Schaafsma, Polly, and Curtis F. Schaafsma
 1974 Evidence of the Origins of the Pueblo Katchina Cult as Suggested by Southwestern Rock Art. *American Antiquity* 39(4):535-545.
- Scheick, Cherie L.
 1991a *Identified Cultural Resources along Arroyo Calabasas: Archaeological Survey of Estates I*. Southwest Archaeological Consultants Research Series 281. Santa Fe.
 1991b *A Research Design for the Investigation of Limited Activity Sites at Las Campanas de Santa Fe*. Draft Report. Southwest Archaeological Consultants Research Series 287. Santa Fe.
 1992 *Archaeological Survey at the Headwaters of Arroyos Calabasas and Frijoles, Santa Fe River Basin: Phase II Survey of Estates II*. Southwest Archaeological Consultants Research Series 286. Santa Fe.
- Scheick, Cherie L., and Lonyta Viklund
 1989 *Cultural Resources Inventory Survey of a Proposed Housing Development East of the El Dorado Subdivision, Santa Fe County, New Mexico*. Southwest Archaeological Consultants Research Series 224. Santa Fe.
 1991 *Cultural Resources of Piedmont Slopes Northwest of Santa Fe: Estates III, the West Golf Course and Adjacent Properties*. Southwest Archaeological Consultants Research Series 278. Santa Fe.
 1992 *Inventory of Estates III: Cultural Resources of Arroyo Calabasas*. Southwest Archaeological Consultants Research Series 305. Santa Fe.

Schmader, Matthew

n.d. Excavations at Tierra Contenta, Santa Fe, New Mexico. Manuscript in possession of the author. Albuquerque, New Mexico.

Smiley, Francis E. IV

1985 *The Chronometrics of Early Agricultural Sites in Northeastern Arizona: Approaches to the Interpretation of Radiocarbon Dates*. Ph.D. dissertation, Department of Anthropology, University of Michigan, Ann Arbor.

Smiley, Terah L., Stanley A. Stubbs, and Bryant Bannister

1953 *A Foundation for the Dating of Some Late Archaeological Sites in the Rio Grande Area, New Mexico: Based on Studies in Tree-Ring Methods and Pottery Analysis*. Laboratory of Tree-Ring Research Bulletin No. 6. University of Arizona, Tucson.

Steen, Charles R.

1977 *Pajarito Plateau Archaeological Survey and Excavation*. Los Alamos Scientific Laboratories, Los Alamos, New Mexico.

Stuart, David E., and Rory P. Gauthier

1981 *Prehistoric New Mexico: A Background for Survey*. Historic Preservation Bureau, Santa Fe.

Stubbs, Stanley A., and William S. Stallings, Jr.

1953 *The Excavation of Pindi Pueblo, New Mexico*. Monographs of the School of American Research 18, Santa Fe.

Vierra, Bradley J.

1980 A Preliminary Ethnographic Model of the Southwestern Archaic Settlement System. In *Human Adaptations in a Marginal Environment: The UII Mitigation Project*, edited by James L. Moore and Joseph Winter, pp. 351-357. Office of Contract Archeology. University of New Mexico, Albuquerque.

1990 Archaic Hunter-Gatherer Archaeology in Northwestern New Mexico. In *Perspectives on Southwestern Prehistory*, edited by P. E. Minnis and C. L. Redman, pp. 57-67. Westview Press, Boulder, San Francisco, and Oxford.

Viklund, Lonyta

1989 *Eldorado II: Cultural Resources Survey of Pueblo Alamo and Chamisa Locita Sustaining Area*. Southwest Archaeological Consultants Research Series 230. Santa Fe.

Warren, A. Helene

1979 The Glaze Paint Wares of the Upper Middle Rio Grande. In *Archaeological Investigations in Cochiti Reservoir, New Mexico*, vol. 4, *Adaptive Change in the Northern Rio Grande Valley*, edited by Jan V. Biella and Richard C. Chapman. Office of Contract Archeology, University of New Mexico, Albuquerque.

Wendorf, Fred, and Erik Reed

1955 An Alternative Reconstruction of Northern Rio Grande Prehistory. *El Palacio* 62:131-173.

Wiseman, Regge N.

1978 *An Archaeological Survey for the Community Development Program, Santa Fe, New Mexico*. Laboratory of Anthropology Notes No. 197, Museum of New Mexico, Santa Fe.

APPENDIX 2. Lithic Artifact Data for All Sites

LA	Material type	Material texture	Artifact type	Artifact function	Dorsal cortex	Portion	Platform	Len	Wid	Thick	FS
86147	1	3	2	91	0	1	5	25	18	2	.
86147	1	3	1	90	50	0	0	30	15	14	.
86147	1	3	2	91	0	4	12	23	17	2	.
86147	1	3	2	91	100	1	1	30	32	7	.
86147	1	3	2	91	0	1	3	20	10	4	.
86147	1	3	2	91	0	1	11	20	37	5	.
86147	1	3	2	91	0	1	3	21	36	6	.
86149	200	1	2	91	0	3	12	20	90	1	.
86149	1	3	2	100	100	3	1	30	41	18	.
86149	200	1	3	91	0	5	12	19	60	1	.
86149	200	1	2	91	0	1	5	35	21	3	.
86149	200	1	2	91	0	1	1	19	22	3	.
86149	200	1	3	91	0	4	12	19	15	2	.
86149	200	1	3	91	0	3	11	13	20	3	.
86149	200	1	2	91	0	1	3	30	28	9	.
86149	200	1	3	91	0	1	5	21	16	3	.
86149	200	1	3	91	0	3	12	22	17	2	.
86149	200	1	3	91	0	3	12	16	19	3	.
86149	200	1	2	91	0	3	12	10	23	4	.
86149	200	1	3	91	0	3	12	20	20	2	.
86149	200	1	2	91	0	3	11	23	13	2	.
86149	200	1	2	91	0	2	5	19	14	5	.
86149	1	5	2	91	0	1	3	38	19	6	.
86149	200	1	3	91	0	1	5	35	18	3	.
86149	200	1	3	91	0	5	12	18	16	2	.
86149	200	1	3	91	0	2	5	25	17	3	.
86149	200	1	3	91	0	4	12	12	26	3	.
86149	200	1	3	91	0	2	3	22	13	2	.
86149	200	1	3	91	0	3	12	25	13	1	.
86149	200	1	3	91	0	4	12	17	21	2	.
86149	200	1	2	91	0	3	12	15	18	2	.
86149	200	1	2	91	0	3	12	15	11	2	.
86151	1	3	2	91	90	5	3	28	35	8	.

LA	Material type	Material texture	Artifact type	Artifact function	Dorsal cortex	Portion	Platform	Len	Wid	Thick	FS
86151	1	5	2	91	100	4	12	19	13	7	.
86151	1	3	2	91	90	1	1	35	30	8	.
86151	1	5	2	91	30	4	12	25	31	9	.
86151	1	7	24	92	0	.	.	90	85	47	.
86151	1	5	20	93	0	.	.	60	53	40	.
86151	1	3	24	92	0	.	.	93	67	47	.
86151	1	5	24	92	0	.	.	101	78	35	.
86151	1	5	2	91	0	1	3	59	47	23	.
86151	1	5	2	91	70	4	11	66	35	17	.
86151	1	5	2	91	0	1	1	77	64	28	.
86151	1	5	2	91	0	5	12	66	35	14	.
86151	1	3	2	91	100	1	1	38	45	20	.
86147	1	3	2	91	0	1	5	19	19	4	1
86147	1	3	2	91	0	1	10	12	12	2	2
86147	1	3	2	91	100	1	3	23	24	7	3
86147	1	3	2	91	0	1	1	25	21	13	3
86147	1	3	1	90	10	0	0	29	15	7	3
86147	1	3	2	91	100	1	3	31	14	6	3
86147	1	3	2	91	0	5	3	28	13	6	3
86147	1	3	2	91	100	1	5	12	15	5	3
86147	1	3	2	91	0	1	3	21	17	8	3
86147	1	3	2	91	0	1	3	11	14	7	3
86147	203	1	53	150	0	5	.	17	12	6	6
86147	1	3	42	76	0	1	.	30	19	10	11
86149	1	3	3	91	0	1	6	18	14	3	1
86149	201	1	3	91	0	1	5	22	14	3	1
86149	201	1	3	91	0	3	13	15	13	2	2
86149	1	3	2	91	10	1	1	23	24	6	3
86149	201	1	3	91	0	2	11	20	27	3	4
86149	201	1	3	91	0	1	4	22	16	2	4
86149	201	1	1	90	0	.	.	18	8	4	4
86149	201	1	3	1	0	1	6	34	27	6	5
86149	201	1	3	91	0	1	8	28	35	3	5
86149	201	1	3	91	0	1	4	31	20	4	6

LA	Material type	Material texture	Artifact type	Artifact function	Dorsal cortex	Portion	Platform	Len	Wid	Thick	FS
86149	201	1	3	91	0	1	10	24	14	2	6
86149	201	1	3	91	0	1	8	18	13	1	7
86149	201	1	3	91	0	3	7	14	11	1	7
86149	201	1	3	91	0	1	6	16	21	4	16
86149	201	1	3	91	0	4	13	18	8	1	16
86149	201	1	3	1	0	1	10	24	24	4	17
86149	201	1	2	91	0	1	11	20	10	4	18
86149	201	1	3	91	0	1	8	25	18	2	18
86149	201	1	3	91	0	1	8	8	8	1	18
86149	201	1	3	91	0	3	13	13	11	1	19
86151	1	3	1	90	20	.	21	21	16	9	2
86151	1	3	2	91	60	4	12	45	24	12	3
86151	1	3	2	91	0	1	1	22	35	10	3
86151	1	3	1	90	100	.	.	49	43	16	3
86151	1	3	1	90	20	.	.	33	29	12	3
86151	1	3	2	91	0	1	5	12	13	3	3
86151	1	5	2	91	60	2	3	24	46	15	8
86151	1	3	1	90	60	.	.	53	18	17	6
86151	201	1	2	200	.	.	.	16	10	2	6
86151	1	3	2	91	30	1	1	18	25	8	7
86151	1	5	2	91	0	1	3	39	15	10	10
86151	1	3	1	90	100	.	.	39	28	9	11
86151	50	3	42	102	30	.	.	58	29	9	4

Key: Material type: 1 - Chert; 2 - Quartzite; 3 - Obsidian; 80 - Chalcedony; 200 - Obsidian; 201 - Jemez Obsidian 202 - Polvadera obsidian; 300 - igneous; 310 - nonvesicular basalt; 510 - quartzite

Material texture: 1 - glassy; 3 - fine-grained; 4 - fine-grained and flawed; 5 - medium-grained; 6 - medium-grained and flawed; 7 - coarse-grained; 8 - coarse-grained and flawed

Artifact type: 1 - angular debris; 2 - core flake; 3 - biface flake; 4 - resharpening flake; 20 - tested cobble; 21 - undifferentiated core; 22 - unidirectional core; 23 - bidirectional core; 24 - multidirectional core; 30 - cobble tool, undifferentiated; 32 - cobble tool, bidirectional; 42 - middle stage uniface; 50 - biface, undifferentiated; 52 - middle stage biface; 53 - late stage biface; 91 - reworked early stage biface

Artifact function: 1 - utilized debitage; 2 - retouched debitage; 3 - utilized/retouched debitage; 10 - hammerstone; 11 - chopper; 51 - graver; 75 - core/chopper; 78 - core/hammerstone; 100 - uniface, undifferentiated; 101 - end scraper; 102 - side scraper; 103 - end/side scraper; 150 - biface, undifferentiated; 303 - San Jose point; 305 - En Medio point; 401 - Pueblo side-notched point

Dorsal cortex in 10%

Portion: 0 - not applicable; 1 - whole; 2 - proximal; 3 - medial; 4 - distal

Platform: 1 - cortical; 2 -cortical and abraded; 3 - single faceted; 4 - single faceted and abraded; 5 - multifaceted; 6 - mulitfaceted and abraded; 7 - retouched; 8 - retouched and abraded; 9 - abraded; 10 - collapsed; 11 - crushed; 12 - absent

Len: Length (mm) **Wid** = Width (mm) **Thick** = Thickness (mm)

1991 FEB -5 AM 11:14

APPENDIX 3.

Office of Cultural Affairs
Museum Division
(Museum of New Mexico)
P.O. Box 2087, 113 Lincoln Ave.
Santa Fe, New Mexico 87504

Rule No. 11 POLICY ON COLLECTION, DISPLAY Adopted: 01/17/91
AND REPATRIATION OF CULTURALLY
SENSITIVE MATERIALS

I. INTRODUCTION

The policy of the Museum of New Mexico is to collect, care for, and interpret materials in a manner that respects the diversity of human cultures and religions.

Culturally sensitive materials include material culture as well as the broader ethical issues which surround their use, care, and interpretation by the Museum. The Museum's responsibility and obligation are to recognize and respond to ethical concerns.

II. DEFINITIONS;

- A. "Culturally sensitive materials" are objects or materials whose treatment or use is a matter of profound concern to living peoples; they may include, but are not limited to:
1. "Human remains and their associated funerary objects" shall mean objects that, as a part of the death rite or ceremony of a culture, are reasonably believed to have been placed with individual human remains either at the time of death or later;
 2. "Sacred objects" shall mean specific items which are needed by traditional religious leaders for the practice of an ongoing religion by present-day adherents;
 3. Photographs, art works, and other depictions of human remains or religious objects, and sacred or religious events; and

- 4. Museum records, including notes, books, drawings, and photographic and other images relating to such culturally sensitive materials, objects, and remains.
- B. "Concerned party" is a museum-recognized representative of a tribe, community, or an organization linked to culturally sensitive materials by ties of culture, descent, and/or geography. In the case of a federally recognized indian tribe, the representative shall be tribally-authorized.
- C. "Repatriation" is the return of culturally sensitive materials to concerned parties. Repatriation is a collaborative process that empowers people and removes the stigma of cultural paternalism which hinders museums in their attempts to interpret people and cultures with respect, dignity, and accuracy. Repatriation is a partnership created through dialogue based upon cooperation and mutual trust between the Museum and the concerned party.
- D. The Museum of New Mexico's Committee on Sensitive Materials is the committee, appointed by the Director of the Museum of New Mexico, that shall serve as the Museum of New Mexico's advisory body on issues relating to the care and treatment of sensitive materials.

III. IDENTIFICATION OF CONCERNED PARTIES

- A. The Museum shall initiate action to identify potentially concerned parties who may have an interest in culturally sensitive material in the museum's collections.
- B. The Museum encourages concerned parties to identify themselves and shall seek out those individuals or groups whom the Museum believes to be concerned parties.

1991 FEB -5 AM 11:14

- C. The Museum's sensitive materials committee shall review all disputed individual claims of concerned-party status in consultation with the tribe, community, or organization which the individual(s) claims to represent. The Museum's sensitive materials committee shall assist, when necessary, in designating concerned parties who have an interest in culturally sensitive materials contained in the collections of the Museum of New Mexico.
- D. The Museum shall provide an inventory of pertinent culturally sensitive materials to recognized concerned parties.
- E. The Museum shall work with concerned parties to determine the appropriate use, care and procedures for culturally sensitive materials which best balance the needs of all parties involved.

IV. IDENTIFICATION AND TREATMENT OF CULTURALLY SENSITIVE MATERIALS

- A. Within five years of the date of adoption of this policy, each Museum unit shall survey to the extent possible (in consultation with concerned parties, if appropriate) its collections to determine items or material which may be culturally sensitive materials. The Museum unit shall submit to the Director of the Museum of New Mexico an inventory of all potentially culturally sensitive materials. The inventory shall include to the extent possible the object's name, date and type of accession, catalogue number, and cultural identification. Within six months of submission of its inventory to the Director of the Museum of New Mexico, each Museum unit shall then develop and submit, a plan to establish a dialogue with concerned parties to determine appropriate treatment of culturally sensitive items or materials held by the unit.

1991 FEB -5 AM 11: 14

- B. As part of its treatment plans for culturally sensitive materials, the Museum reserves the right to restrict access to, or use of, those materials to the general public. The Museum staff shall allow identified concerned parties access to culturally sensitive materials.
- C. Conservation treatment shall not be performed on identified culturally sensitive materials without consulting concerned parties.
- D. The Museum shall not place human remains on exhibition. The Museum may continue to retain culturally sensitive materials. If culturally sensitive materials, other than human remains, are exhibited, then a good-faith effort to obtain the advice and counsel of the proper concerned party shall be made.
- E. All human skeletal remains held by the Museum shall be treated as human remains and are de facto sensitive materials. The Museum shall discourage the further collection of human remains; however, it will accept human remains as part of its mandated responsibilities as the State Archaeological Repository. At its own initiation or at the request of a concerned party, the Museum may accept human remains to retrieve them from the private sector and furthermore, may accept human remains with the explicit purpose of returning them to a concerned party.

IV. REPATRIATION OF CULTURALLY SENSITIVE MATERIALS

- A. On a case-by-case basis, the Museum shall seek guidance from recognized, concerned parties regarding the identification, proper care, and possible disposition of culturally sensitive materials.

1991 FEB -5 AM 11: 14

- B. Negotiations concerning culturally sensitive materials shall be conducted with professional discretion. Collaboration and openness with concerned parties are the goals of these dialogues, not publicity. If concerned parties desire publicity, then it will be carried out in collaboration with them.
- C. The Museum shall have the final responsibility of making a determination of culturally sensitive materials subject to the appeal process as outlined under section VII A.
- D. The Museum of New Mexico accepts repatriation as one of several appropriate actions for culturally sensitive materials only if such a course of action results from consultation with designated concerned parties as described in Section III of this policy.
- E. The Museum may accept or hold culturally sensitive materials for inclusion in its permanent collections.
- F. The Museum may temporarily accept culturally sensitive materials to assist efforts to repatriate them to the proper concerned party.
- G. To initiate repatriation of culturally sensitive materials, the Museum of New Mexico's current deaccession policy shall be followed. The curator working with the concerned party shall complete all preparations for deaccession through the Museum Collections Committee and Director before negotiations begin.
- H. Repatriation negotiations may also result in, but are not limited to, the retention of objects with no restrictions on use, care, and/or exhibition; the retention of objects with restrictions on use, care and/or exhibition; the lending of objects either permanently or temporarily for use to a community; and the holding in trust of culturally sensitive materials for the concerned party.

1991 FEB -5 AM 11: 14

- I. When repatriation of culturally sensitive materials occurs, the Museum reserves the right to retain associated museum records but shall consider each request for such records on an individual basis.

VI. ONGOING RECOVERY OR ACCEPTANCE OF ARCHAEOLOGICAL MATERIALS

- A. In providing sponsored archaeological research or repository functions, the Museum shall work with agencies that regulate the inventory, scientific study, collection, curation, and/or disposition of archaeological materials to ensure, to the extent possible under the law, that these mandated functions are provided in a manner that respects the religious and cultural beliefs of concerned parties.
- B. When entering into agreements for the acceptance of, or continued care for, archaeological repository collections, the Museum may issue such stipulations as are necessary to ensure that the collection, treatment, and disposition of the collections include adequate consultation with concerned parties and are otherwise consistent with this Policy.
- C. In addition to the mandated treatment of research sites and remains and in those actions where treatment is not mandated, defined, or regulated by laws, regulations, or permit stipulations, the Museum shall use the following independent guidelines in recovering or accepting archaeological materials:
 1. Prior to undertaking any archaeological studies at sites with an apparent relationship to concerned parties, the Museum shall ensure that proper consultation with the concerned parties has taken place.

1991 FEB -5 AM 11: 14

2. When so requested by concerned parties, the Museum shall include an observer, chosen by the concerned party, in the crew of an archaeological study.
3. The Museum shall not remove human remains and their associated funerary objects or materials from their original context nor conduct any destructive studies on such remains, objects, and materials, except as part of procedures determined to be appropriate through consultation with concerned parties, if any.
4. The Museum reserves the right to restrict general public viewing of in situ human remains and associated funerary objects or items of a sacred nature and further shall not allow the public to take or prepare images or records of such objects, materials, or items, except as part of procedures determined to be appropriate through consultation with concerned parties. Photographic and other images of human remains shall be created and used for scientific records only.
5. The Museum reserves the absolute right to limit or deny access to archaeological remains being excavated, analyzed, or curated if access to these remains would violate religious practices.